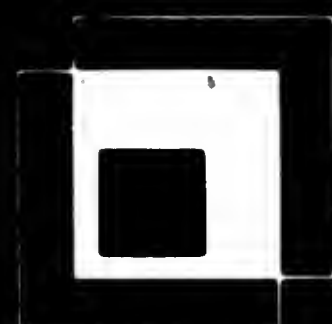


**U. S.  
OFFICIAL GAZETTE  
UNITED STATES  
PATENT OFFICE  
VOL. 910  
MAY  
1973**

**MICRO PHOTO DIVISION**



**BELL & HOWELL**

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# OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

May 1, 1973

Volume 910

Number 1

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# PATENT OFFICE NOTICES

## Notice of Daylight Saving Time

The Patent Office will operate on Daylight Saving Time from April 29, 1973 through October 27, 1973.

## Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,611,813, Sharpless and Elchert, Jr., MAGNETIC DATA STORAGE SYSTEM, filed Apr. 10, 1964, U.S. Court of Claims (Washington, D.C.), Doc. 99-64, *Technitrol Inc. v. The United States*. Order, judgment for plaintiff, Oct. 8, 1972.

2,707,984, F. C. Binnall, BAG MAKING MACHINE; 2,740,740, same, METHOD OF MAKING BAGS, filed Apr. 28, 1971, D.C. Conn. (New Haven), Doc. 14372, *FMC Corporation v. Fischel Industries, Inc.* Default judgment of injunction, entered in favor of the plaintiff, Sept. 6, 1972.

2,729,067, R. Patterson, METHOD FOR FORMING PILES, filed Nov. 8, 1971, D.C. M.D. Fla. (Tampa), Doc. 71-497-C, *Intrusion Prepakt Incorporated v. Consolidated Soils, Inc.* Order, judgment for plaintiff, Oct. 18, 1972.

2,740,740. (See 2,707,985.)

2,753,694, Trow and Nelson, ICE DISINTEGRATING AND CHIP DELIVERING SPIRAL ICE CHIP PRODUCING MACHINE; 3,283,529, M. L. Nelson, AUGER ICE MAKING APPARATUS, filed June 10, 1968, D.C., N.D. Ill. (Chicago), Doc. 68c1057, *King-Seely Thermos Co. v. Borg-Warner Corporation*. On motion of plaintiff, case dismissed with prejudice as to Patent No. 3,283,529, Mar. 31, 1970; enjoin defendant from further infringement of Patent No. 2,753,694, Oct. 13, 1972.

2,781,825, A. Lorenz, ARTICLE OF REPOSE FOR SUPPORTING THE BODY OF A PERSON; 2,918,109, F. F. Schlepke, ADJUSTABLE RECLINING CHAIR; 3,142,510, P. S. Fletcher, LEG-REST ACTUATING MEANS FOR MULTIPLE POSITION RECLINING CHAIR; 3,169,035, same, LEG-REST CONTROL ARRANGEMENT FOR RECLINING CHAIRS; 3,394,965, same, SEQUENCING ARRANGEMENT FOR RECLINING CHAIR OF THE MULTIPLE MOVEMENT TYPE, filed Oct. 27, 1972, D.C., D.D. Ill. (Chicago), Doc. 72c2721, *Peter S. Fletcher v. Lear Siegler, Inc. et al.*

2,841,056, L. D. Hinchey, PAPER EDGE FLARING MACHINE, filed May 18, 1972, D.C., Court of Appeals for the First Circuit, Mass. (Boston), Doc. 72-1165, *Custom Paper Products Co. et al. v. Atlantic Paper Box Co.* The judgment of the District Court is affirmed, Nov. 9, 1972. Same, filed May 19, 1972, Doc. 72-1171, *Custom Paper Products Co. et al. v. Atlantic Paper Box Co.* The judgment of the District Court is affirmed, Nov. 9, 1972.

2,874,406, I. T. Quarnstrom, PLASTIC MOLD BASE, filed Oct. 27, 1972, D.C., E.D. Mich. (Detroit), Doc. 39128, *VSI Corporation v. Peninsular Machinery Co. and Gulf & Western Industries, Inc.*

2,884,031, G. M. Standal, WOODWORKING, CHIPPING AND PLANING MACHINE WITH CUTTER HEAD AND CUTTER BLADES THEREFOR; 2,922,448, same, CUTTERS FOR PLANER CHIPPER WOODWORKING MACHINES; 3,282,312, same, CHIPPER KNIFE AND APPARATUS, filed Oct. 30, 1972, D.C. Oreg. (Portland), Doc. C-72-887, *Chipper Machines and Engineering Corp. and George M. Standal v. the Filer & Stowell Co. and Fremont Lumber Company*.

2,900,150, Hirt and Martino, EJECTION SEAT CATAPULT; 3,115,320, G. E. Hirt, same, filed Oct. 11, 1972, D.C. Ariz. (Phoenix), Doc. C-72-566 PHX CAM, *Talley Industries, Inc. v. United States of America*.

2,918,109. (See 2,781,825.)

2,922,448. (See 2,884,031.)

2,925,719, Robbins and Linn, REFRIGERATING PACKAGE, filed July 7, 1971, D.C., E.D. Mo. (St. Louis), Doc. N71C32, *Hospital Marketing Services Co., Inc. v. Kwik-Kold, Inc.* Consent judgment, patent valid; plaintiff has infringed, Oct. 10, 1972.

2,933,333, Bredtschneider, Drewes, Laird and Onak, PIPE COUPLING, filed Nov. 1, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2755, *Crane Co. v. Aeroquip Corporation*.

2,948,524, Sweeney and Kall, PUMP FOR MOLTEN METAL, filed Jan. 13, 1970, D.C., N.D. Ohio (Cleveland), Doc. C-70-31, *Carborundum Co. v. Metal Transfer, Inc.* Judgment is valid; plaintiff is owner; defendant has infringed. Order, defendant is enjoined; plaintiff's cause of action based on claims other than claim 4 of patent are dismissed without prejudice; defendant's counterclaims are dismissed with prejudice, Oct. 17, 1972.

2,954,621, Mosher, Goldammer and Long, ADJUSTABLE BRACELET FOR IDENTIFICATION PURPOSES; 3,059,359, same, BRACELET FOR IDENTIFICATION PURPOSES, filed Nov. 3, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72-2621-CC, *M-C Industries, Inc. v. Precision Dynamics Corporation*.

3,057,195, Bentley and Price, FORCE MEASURING SYSTEM; 3,074,279, H. D. Morris, POSITION DETECTING TRANSDUCER; Re. 27,411, Bentley and Price, FORCE MEASURING SYSTEM, filed Oct. 2, 1972, D.C.N.J. (Trenton), Doc. 1626-72, *Syston-Donner Corp v. Gulton Industries, Inc.*

3,059,359. (See 2,954,621.)

3,074,279. (See 3,057,195.)

3,088,015, Cone and Horwitt, ELECTRIC CIGAR LIGHTER; 3,435,928, L. G. Horwitt, CIGAR LIGHTER, filed Oct. 30, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2733, *Casco Prod. Corp. v. Nissan Motor Co. et al.*

3,114,349, S. Schuman, STERILIZATION INDICATORS, filed Dec. 28, 1967, D.C., S.D. Ohio (Cincinnati), Doc. 6611, *Propper Manufacturing Co., Inc. v. Adhere Corporation*. Order, motion of defendant for partial summary judgment is granted as to claim 4, but over-ruled as to claims 9 and 10, Oct. 25, 1972.

3,115,320. (See 2,900,150.)

3,142,510. (See 2,781,825.)

3,169,035. (See 2,781,825.)

3,197,299, Stull and Morrow, PROCESS FOR SPRAY APPLICATION OF PESTICIDES, filed Apr. 1, 1971, D.C. Minn. (Minneapolis), Doc. 4-71-C-140, *Hercules, Inc. v. Minnesota State Highway Department*. Stipulation and order of dismissal, Sept. 28, 1972.

3,262,027, Zaleske and Churchill, SOLENOID STRUCTURE AND MOUNTING MEANS THEREFOR, filed Nov. 3, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2788, *Automatic Switch Co. v. Emerson Electric Co.*

3,282,312. (See 2,884,031.)

3,283,140, C. H. Rex, STREET LUMINAIRE, filed Oct. 20, 1972, D.C., N.D. Ohio (Cleveland), Doc. C72-1126, *General Electric Co. v. Westinghouse Electric Corp.*

3,283,529. (See 2,753,694.)

3,318,062, P. R. Grants, PRECAST INSULATING MASONRY UNIT AND INSULATING FILLER, filed June 22, 1972, D.C.N.J. (Trenton), Doc. C-1074-72, *Formbloc, Inc. v. Paul R. Grants, individually and I.F.S., Inc.* Notice of discontinuance filed Oct. 27, 1972.

3,344,815, Lawson and Bailey, STRAP TIGHTENING AND CUTTING TOOL, filed Nov. 3, 1972, D.C., N.D. Ohio (Cleveland), Doc. C72-1201, *Thomas & Betts Corporation v. ETC, Incorporated and International Telephone & Telegraph Corp.*

3,394,965. (See 2,781,825.)

3,405,376, Gelse, Baker and Hillman, ROTARY STEPPING MECHANISM, United States Court of Claims (Washington, D.C.), Doc. 54-69, *Ledex, Inc. v. The United States*. Judgment entered for plaintiff, Oct. 27, 1972.

3,420,064, Blass and Blass, IRRIGATION DRIPPER UNIT AND PIPE SYSTEM; 3,604,728, same, DRIP LEVEL IRRIGATION, filed Oct. 17, 1972, D.C., S.D. Calif. (San Diego), Doc. 72-436-S, *Drip Irrigation Corporation of America v. Controlled Water Emission Systems*.

MAY 1, 1973

U. S. PATENT OFFICE

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3,425,500, B. H. Fuchs, EXPANDABLE UNDERREAMER; 3,485,834, same, UNDERREAMER HAVING UNEQUAL ARM EXTENSION RADII, filed Oct. 30, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72-2570-JWC, *Grant Oil Tool Company, Inc. v. Benjamin H. Fuchs and Petroleum Drilling Tools Co.*

3,433,928. (See 3,068,015.)

3,468,631, Ralbie, Bentley and De Wall, BLOOD OXYGENATOR WITH HEAT EXCHANGER; 3,488,158, Bentley and De Wall, BUBBLER ASSEMBLY FOR OXYGENATOR; 3,578,411, same, BUBBLER ASSEMBLY FOR BLOOD TREATING APPARATUS, filed Oct. 31, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72-2579-WMB, *Bentley Lab. Inc. v. William Harvey Research Corp.*

3,483,934. (See 3,425,500.)

3,487,221, L. M. Frank, LIGHT ACTIVATED TRIGGER FOR PHOTOGRAPHIC FLASH SYSTEM, filed Mar. 3, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c572, *The Lase Co. v. Honeywell, Inc.* Order, dismissed with prejudice pursuant to stipulation, June 12, 1972.

3,488,158. (See 3,468,631.)

3,496,812, White and Heyer, PLASTIC CUTTING DEVICE AND METHOD, filed Oct. 27, 1972, D.C., M.D. Fla. (Tampa), Doc. 72-641-C, *Kenneth White v. Mar-Bel, Inc. and Mr. Dan Marshallack*.

3,528,866, L. D. Stevens, METHOD OF MAKING LAMINATED PADDED ARTICLE, filed Oct. 26, 1972, D.C., S.D. Fla. (Miami), Doc. 72-1699-C, *Arvin Industries, Inc. v. Anodyne, Inc.*

3,552,051, E. B. Ritchey, EAR TAG, filed Nov. 11, 1971, D.C. Minn. (St. Paul), Doc. 3-71-C-277, *Eugene B. Ritchey v. Fearing Mfg. Co., Inc.* By consent of the parties, order of dismissal, Oct. 6, 1972.

3,578,411. (See 3,468,631.)

3,590,538, J. A. Holt, PLUG CONSTRUCTION FOR USE WITH ANCHOR INSERTS SET IN CONCRETE, filed Sept. 2, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c2142, *Superior Concrete Accessories v. Burke Concrete Accessories*. Enter order for entry of order for dismissal granted, July 13, 1972.

3,597,771, C. H. Rickmeyer, Jr., BED PANS; D: 216,059, same, BED PAN, filed Oct. 5, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2498, *The Vollrath Co. v. Premium Plastics, Inc.*

3,604,728. (See 3,420,064.)

3,613,044, W. G. Rarick, POWER SUPPLY CORD HATCH, filed Oct. 26, 1972, D.C., N.D. Ind. (South Bend), Doc. 72-S-217, *Lyall Electric, Inc. v. Glenn Moore and John Moore, doing business as Handyhome Products Co.*

3,629,931, J. M. Stanley, METHOD AND APPARATUS FOR NAILING A STRUCTURAL FRAME, filed Oct. 26, 1972, D.C., N.D. Tex. (Dallas), Doc. CA-3-6428-D, *Multi-Systems, Inc. v. Signode Corporation et al.*

3,634,891, J. M. Kemper, SELF-CONTAINED RECIRCULATING SANITARY SYSTEM; 3,662,888, same, RECIRCULATING TOILET SYSTEM AND FILTER THEREFOR, filed Aug. 11, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72-1857-MML, *Monogram Industries v. Sanco Systems International and Jade Fabrication Inc.*

3,668,833, R. S. Lucas, MEANS FOR CHLORINATING SWIMMING POOLS, filed Sept. 18, 1972, D.C., N.D. Ga. (Atlanta), Doc. 17164, *Purex Corporation, Ltd. v. Bio-Lab, Inc.* Judgment, enjoining and restraining defendant from infringing plaintiff's copyrights, Oct. 26, 1972.

3,662,888. (See 3,634,891.)

3,675,247, J. O. Ferrell, METHOD FOR FABRICATING PANTY HOSE; Re. 25,360, E. G. Rice, COMBINATION STOCKINGS AND PANTY, filed Aug. 3, 1972, D.C., M.D.N.C. (Greensboro), Doc. C-231-G-72, *Tights, Inc. v. Adams-Millis Corporation*.

3,698,427, F. Baranowski, Jr., FLUID FLOW CONTROL VALVE, filed Oct. 24, 1972, D.C. Mass. (Boston), Doc. 72-3258-LC, *Frank Baranowski, Jr. v. Wingarsheek Turbine Co., Inc.*

3,696,813, R. M. Wallach, CRYOSURGICAL INSTRUMENT, filed Oct. 10, 1972, D.C. Mass. (Boston), Doc. 72-3106-M, *Cryomedics, Inc. v. Dynatech Corporation*.

D: 216,059. (See 3,597,771.)

Re. 24,017, J. A. Henricks, COATING AND DRAWING METAL AND COMPOSITION THEREFOR, filed Oct. 30, 1972, D.C., M.D.N.C. (Winston-Salem), Doc. C-317-WS-72, *Caterpillar Tractor Co. v. Technograph, Inc. et al.*

Re. 25,360. (See 3,675,247.)

Re. 27,265, Ritchie and Glass, APPARATUS FOR AUTOMATICALLY COPYING LINES, filed Oct. 10, 1972, D.C. Conn. (New Haven), Doc. 15372, *The Gerber Scientific Instrument Co. v. Barr and Stroud Ltd. and D-Mac Limited*.

Re. 27,411. (See 3,057,195.)



## Certificates of Correction for the Week of May 1, 1973

|            |           |           |           |
|------------|-----------|-----------|-----------|
| Re. 27,392 | 3,669,186 | 3,691,066 | 3,699,427 |
| Re. 27,492 | 3,671,224 | 3,691,157 | 3,699,451 |
| D. 225,044 | 3,671,347 | 3,691,241 | 3,699,727 |
| 3,328,355  | 3,673,167 | 3,691,358 | 3,699,881 |
| 3,497,340  | 3,673,943 | 3,691,585 | 3,700,671 |
| 3,504,280  | 3,674,643 | 3,691,872 | 3,700,721 |
| 3,505,301  | 3,674,766 | 3,691,913 | 3,700,982 |
| 3,530,486  | 3,675,089 | 3,692,041 | 3,701,081 |
| 3,530,511  | 3,675,440 | 3,692,163 | 3,701,151 |
| 3,537,543  | 3,675,461 | 3,692,303 | 3,701,188 |
| 3,539,876  | 3,677,326 | 3,692,475 | 3,701,350 |
| 3,541,548  | 3,677,721 | 3,692,596 | 3,701,424 |
| 3,542,150  | 3,677,902 | 3,692,731 | 3,701,824 |
| 3,550,103  | 3,677,976 | 3,692,769 | 3,701,847 |
| 3,559,532  | 3,678,242 | 3,693,139 | 3,701,976 |
| 3,563,474  | 3,678,668 | 3,693,163 | 3,702,080 |
| 3,579,776  | 3,678,763 | 3,693,179 | 3,702,081 |
| 3,580,853  | 3,679,632 | 3,693,221 | 3,702,108 |
| 3,585,619  | 3,679,658 | 3,693,241 | 3,702,158 |
| 3,586,384  | 3,679,747 | 3,693,257 | 3,702,272 |
| 3,591,027  | 3,679,756 | 3,693,397 | 3,702,324 |
| 3,597,420  | 3,680,378 | 3,693,443 | 3,702,595 |
| 3,616,340  | 3,680,534 | 3,693,469 | 3,702,655 |
| 3,616,787  | 3,680,786 | 3,693,489 | 3,702,740 |
| 3,619,055  | 3,680,930 | 3,693,513 | 3,702,838 |
| 3,619,120  | 3,681,088 | 3,693,535 | 3,703,112 |
| 3,619,459  | 3,681,139 | 3,693,705 | 3,703,219 |
| 3,619,513  | 3,681,353 | 3,693,746 | 3,703,233 |
| 3,619,755  | 3,681,671 | 3,693,856 | 3,703,240 |
| 3,620,410  | 3,682,223 | 3,693,883 | 3,703,337 |
| 3,623,003  | 3,682,280 | 3,693,908 | 3,703,402 |
| 3,624,295  | 3,682,539 | 3,693,952 | 3,703,423 |
| 3,624,300  | 3,682,712 | 3,694,081 | 3,703,495 |
| 3,625,287  | 3,682,910 | 3,694,088 | 3,703,526 |
| 3,625,899  | 3,683,309 | 3,694,258 | 3,703,572 |
| 3,626,992  | 3,683,475 | 3,694,282 | 3,703,589 |
| 3,627,818  | 3,683,477 | 3,694,591 | 3,703,759 |
| 3,628,255  | 3,684,081 | 3,694,756 | 3,703,918 |
| 3,628,869  | 3,684,868 | 3,694,807 | 3,703,948 |
| 3,632,350  | 3,684,892 | 3,695,338 | 3,704,182 |
| 3,632,361  | 3,685,325 | 3,695,439 | 3,704,208 |
| 3,632,674  | 3,685,355 | 3,696,085 | 3,704,269 |
| 3,632,708  | 3,685,636 | 3,696,128 | 3,704,318 |
| 3,634,691  | 3,685,654 | 3,696,158 | 3,704,361 |
| 3,635,077  | 3,685,658 | 3,696,341 | 3,704,451 |
| 3,641,558  | 3,686,013 | 3,696,353 | 3,704,511 |
| 3,642,478  | 3,686,114 | 3,696,354 | 3,704,672 |
| 3,642,541  | 3,686,155 | 3,696,388 | 3,704,695 |
| 3,642,797  | 3,686,248 | 3,696,400 | 3,704,714 |
| 3,642,817  | 3,686,491 | 3,696,424 | 3,704,775 |
| 3,643,269  | 3,687,080 | 3,696,457 | 3,704,865 |
| 3,648,401  | 3,687,269 | 3,696,508 | 3,704,872 |
| 3,650,521  | 3,687,303 | 3,696,668 | 3,704,949 |
| 3,651,346  | 3,687,829 | 3,696,896 | 3,704,956 |
| 3,652,461  | 3,687,996 | 3,696,920 | 3,705,046 |
| 3,653,476  | 3,688,117 | 3,697,138 | 3,705,086 |
| 3,653,889  | 3,688,259 | 3,697,148 | 3,705,096 |
| 3,654,008  | 3,688,311 | 3,697,387 | 3,705,247 |
| 3,654,139  | 3,688,407 | 3,697,471 | 3,705,318 |
| 3,656,152  | 3,688,409 | 3,697,475 | 3,705,486 |
| 3,656,240  | 3,688,441 | 3,697,610 | 3,705,500 |
| 3,658,864  | 3,688,759 | 3,697,613 | 3,705,806 |
| 3,660,768  | 3,689,146 | 3,697,691 | 3,705,911 |
| 3,661,990  | 3,689,194 | 3,697,709 | 3,705,978 |
| 3,662,292  | 3,689,258 | 3,697,817 | 3,706,066 |
| 3,662,511  | 3,689,570 | 3,697,903 | 3,706,094 |
| 3,662,513  | 3,689,926 | 3,698,070 | 3,706,239 |
| 3,663,246  | 3,690,045 | 3,698,231 | 3,706,350 |
| 3,663,507  | 3,690,145 | 3,698,383 | 3,706,558 |
| 3,664,549  | 3,690,230 | 3,698,416 | 3,706,787 |
| 3,666,005  | 3,690,296 | 3,698,855 | 3,706,890 |
| 3,666,512  | 3,690,380 | 3,698,881 | 3,706,940 |
| 3,666,763  | 3,690,405 | 3,699,094 | 3,708,343 |
| 3,666,992  | 3,690,414 | 3,699,113 | 3,714,267 |
| 3,667,115  | 3,690,606 | 3,699,219 |           |
| 3,667,561  | 3,690,816 | 3,699,277 |           |
| 3,669,164  | 3,690,975 | 3,699,351 |           |

## National Technical Information Service

## GOVERNMENT-OWNED INVENTIONS

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The inventions listed below are owned by the U.S. Government and are available for licensing in accordance with the GSA patent licensing regulations.

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Paper copies of patents cannot be purchased from NTIS but are available from the Commissioner of Patents, Washington, D.C. 20231, at \$0.50 each. Inquiries and requests for licensing information should be directed to the "Assignee" as indicated on the copy of the patent.

DOUGLAS J. CAMPION,  
Patent Program Coordinator,  
National Technical Information Service.

## DEPARTMENT OF THE INTERIOR

Patent 3,712,821. Production of Fisheries Products. Filed January 5, 1970. Patented January 23, 1973. Not available NTIS.

Patent application 316,935. Poly(N-Amido)Imides as Semipermeable Membranes. Filed December 20, 1972. PC \$3/MF \$0.95.

Patent application 325,969. Filament Wound Reverse Osmosis Support Tubes. Filed January 23, 1973. PC \$3/MF \$0.95.

Patent application 248,705. Device and Process for Magneto-Gravimetric Particle Separation Using Non-Vertical Levitation Forces. Filed April 28, 1972. PC \$3/MF \$0.95.

## TENNESSEE VALLEY AUTHORITY

Patent application 276,591. Improved Nitrogen Solutions and Suspensions. Filed July 31, 1972. PC \$3/MF \$0.95.

Patent application 268,520. Improved Coating Processes. Filed July 3, 1972. PC \$3.50/MF \$0.95.

## DEPARTMENT OF TRANSPORTATION

Patent application 286,848. Explosive Effluent Detector. Filed September 7, 1972. PC \$3/MF \$0.95.

Patent application 310,340. Non-Linear Amplification Technique for Improving Signal to Noise Contrast. Filed November 29, 1972. PC \$3/MF \$0.95.

Patent application 273,746. Lime Silico-Phosphate Cement. Filed July 21, 1972. PC \$3/MF \$0.95.

[FR Doc. 73-6322; Filed 4-3-73; 8:45 am]

## Dedications

3,237,539.—Jack D. Layton, Salem, Oreg. LIFT MECHANISM. Patent dated Mar. 1, 1966. Dedication filed Dec. 14, 1972, by the inventor and the assignee, Layton Manufacturing Co.

Hereby dedicate to the Public the entire remaining term of said patent.

3,363,407.—William D. Drummond, Burlington, Ontario, Canada. HARVESTER PLATFORM WITH LATERAL FLOAT AND ATTITUDE CONTROL MEANS. Patent dated Jan. 16, 1968. Dedication filed Jan. 24, 1973, by the assignee, International Harvester Company.

Hereby dedicates said Letters Patent to the Public.

## Disclaimers

2,918,571.—Robert Peth, Chicago, Ill. COMMUNICATION SYSTEM. Patent dated Dec. 22, 1959. Disclaimer filed Dec. 29, 1972, by the assignee, Motorola, Inc.

Hereby enters this disclaimer to claims 8, 9 and 10 of said patent.

3,154,060.—Alf Hundere, San Antonio, Tex. RECIPROCATING-PISTON GASOLINE ENGINE FUEL-AIR RATIO CONTROL. Patent dated Oct. 27, 1964. Disclaimer filed Dec. 14, 1972, by the assignee, Alcor Aviation Inc.

Hereby enters this disclaimer to claims 1 through 5 of said patent.

3,318,062.—Paul R. Grants, Roselle Park, N.J. PRECAST INSULATING MASONRY UNIT AND INSULATING FILLER. Patent dated May 9, 1967. Disclaimer filed Oct. 24, 1972, by the inventor.

Hereby enters this disclaimer to claims 1-4, and 7 and 9 of said patent.

3,320,317.—William A. Rogers, Lake Jackson, Tex., and James E. Wochst, Savannah, Ga. QUATERNARY AMMONIUM ADDUCTS OF POLYEPICHLOROHYDRIN. Patent dated May 16, 1967. Disclaimer filed Dec. 22, 1972, by the assignee, The Dow Chemical Company.

Hereby enters this disclaimer to claims 1-4 of said patent.

3,341,982.—Robert Torresen, Muskegon, Mich. BOWLING BALL POLISHING MACHINE. Patent dated Sept. 19, 1967. Disclaimer filed Jan. 15, 1973, by the assignee, Brunswick Corporation.

Hereby enters this disclaimer to claims 9-13, inclusive, of said patent.

3,356,934.—Martin O. Halfhill, and Harold C. Stephens, San Jose, Calif. DOUBLE FREQUENCY RECORDING SYSTEM. Patent dated Dec. 5, 1967. Disclaimer filed Jan. 11, 1973, by the assignee, International Business Machines Corporation.

Hereby enters this disclaimer to claim 1 of said patent.

3,484,303.—Roger S. Babcock, Chatham, N.J. STEEL SURFACE TREATMENT. Patent dated Dec. 16, 1969. Disclaimer filed Aug. 22, 1972, by the assignee, Union Carbide Corporation.

Hereby enters this disclaimer to claims 1-12 of said Letters Patent.



# PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner  
WILLIAM FELDMAN, Deputy Assistant Commissioner

## CONDITION OF PATENT APPLICATIONS AS OF APRIL 3, 1973

### PATENT EXAMINING GROUPS

Actual  
Filing Date  
of Oldest  
New Case  
Awaiting  
Action

#### CHEMICAL EXAMINING GROUPS

|                                                                                                                                                                                                                                                                                                                                                                                         |          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director.....                                                                                                                                                                                                                                                                                                          | 1-20-72  |
| Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.                                                                                                                       |          |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director.....                                                                                                                                                                                                                                                                                                                           | 3-16-72  |
| Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.                                                                                                                                                                    |          |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director.....                                                                                                                                                                                                                                                                                                  | 12-15-71 |
| Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.                                                       |          |
| COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director.....                                                                                                                                                                                                                                                                                          | 12-17-71 |
| Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.                                                                                                                                                                             |          |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director.....                                                                                                                                                                                                                                                                                          | 12-10-71 |
| Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. |          |

#### ELECTRICAL EXAMINING GROUPS

|                                                                                                                                                                                                                         |          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director.....                                                                                                                                | 8-21-72  |
| Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Records; Weighing Scales. |          |
| SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director.....                                                                                                                                                    | 6-16-72  |
| Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.     |          |
| INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director.....                                                                                                                                   | 7-03-72  |
| Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices; and Related Arts.                                                                                     |          |
| RECEPTACLES, SANITATION AND CLEANING, WINDING AND MEASURING, GROUP 240—L. FORMAN, Director.....                                                                                                                         | 12-22-71 |
| Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.       |          |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director.....                                                                                                                                        | 1-05-72  |
| Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.                                                         |          |
| DESIGNS, GROUP 290—R. L. CAMPBELL, Director.....                                                                                                                                                                        | 5-26-71  |
| Industrial Arts; Household, Personal and Fine Arts.                                                                                                                                                                     |          |

#### MECHANICAL EXAMINING GROUPS

|                                                                                                                                                                                                                                                                                                                                                                      |         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director.....                                                                                                                                                                                                                                                                                                  | 5-01-72 |
| Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.                        |         |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director.....                                                                                                                                                                                                                                                                              | 2-03-72 |
| Manufacturing Processes; Assembling; Combined Machines; Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders; Woodworking; Tools; Cutlery; Jacks. |         |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director.....                                                                                                                                                                                                                                                                             | 4-10-72 |
| Amusement and Exercising Devices; Projectors; Animal and Plant; Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.                                                                                           |         |
| HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director.....                                                                                                                                                                                                                                                                                            | 3-06-72 |
| Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.                                      |         |
| MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director.....                                                                                                                                                                                                                                                                              | 1-28-72 |
| Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.                                                      |         |

Expiration of patents: The patents within the range of numbers indicated below expire during April 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,740,117 to 2,743,441, inclusive  
Plant Patents..... Numbers 1,467 to 1,471, inclusive

# DEFENSIVE PUBLICATIONS

PUBLISHED MAY 1, 1973

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

## T910,001 ELECTROPLATABLE POLYPROPYLENE OR POLYALLOMER COMPOSITION William Williamson Blount, Jr., 1129 Oakleaf Drive, Kingsport, Tenn.

Continuation of application Ser. No. 17,899, Mar. 9, 1970. This application Jan. 13, 1972, Ser. No. 217,691

Int. Cl. C08f 3/08

U.S. Cl. 260—23 H

No Drawing. 11 Pages Specification

This invention relates to polypropylene and polyallomer compositions having a flow rate of about 2 to 10 decigrams per minute, about 0 to 20% by weight of the composition of an inert filler and about 1 to 10% by weight of the composition of an organic epoxide or epoxy resin. It has been found that articles formed from these compositions can be readily etched and electroplated giving superior metal to substrate adhesion. A preferred embodiment includes 3 to 5% by weight of talc, clay, or silica fillers and 3 to 5% of epoxies such as epoxidized linseed oil, epoxidized tall oil ester, aliphatic diepoxyl adipate, octyl epoxytallate, or the glycidyl ether of bisphenol-A. A phenolic stabilizer and a mold release agent such as calcium stearate may also be added. Articles having a metal coating of copper or nickel are prepared by first using a chemical electroless plating systems followed by electrolytic deposition of the metal.

## T910,002 PHOTOGRAPHIC BLEACH COMPOSITIONS Lynn R. Hotter, 1669 Lake Ave., Rochester, N.Y. 14650 Filed Feb. 22, 1972, Ser. No. 228,386

Int. Cl. G03c 5/32

U.S. Cl. 96—60

No Drawing. 10 Pages Specification

Solutions containing (1) a trivalent iron complex of an aminopolycarboxylic acid, such as ammonium ferric ethylenediamine tetraacetate, and (2) an alkali metal or ammonium bromide or iodide salt are effective bleach solutions for use in color photographic processes. Following use of such bleach solutions to oxidize photographic silver images and removal of the oxidation products from the photographic element with a thiosulfate fixing solution, the silver can be recovered in high yield from the fixing solution using conventional electrolytic methods of silver recovery. This is an important advantage as compared to known bleach-fix compositions containing a trivalent iron complex of an aminopolycarboxylic acid as a bleaching agent and a thiosulfate as a fixing agent since it is difficult to recover silver from such bleach-fix solutions by electrolytic means because of the presence of iron salts. The level of bromide or iodide salt in the bleach solution should be such that substantially no fixing occurs but substantial conversion of silver to silver halide occurs. Preferably, the bleach solution should con-

tain about 30 to about 400 grams of the iron complex and about 3 to about 20 grams of iodide salt or about 50 to about 350 grams of bromide salt per liter.

## T910,003 PAINT REMOVER COMPOSITIONS Eugene D. Klug, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del. Filed May 26, 1972, Ser. No. 257,364

Int. Cl. C09d 9/00

U.S. Cl. 252—171

No Drawing. 8 Pages Specification

Improved paint removers are prepared based on chlorinated aliphatic hydrocarbon solvents thickened by means of a crosslinked allyl-hydroxyalkyl cellulose derivative. Crosslinking of the cellulose derivative is preferably effected by a nitrile N-oxide. Other more conventional crosslinking methods and materials are also effective. The disclosed paint removers are effective on substantially any conventional type of paint, varnish, shellac or the like in either scrape-off or flush-off formulations.

## T910,004 BLUE ANTHRAQUINONE DYES FOR RADIOGRAPHIC FILM BASE Robert F. Coles, Lake Elmo, Minn., assignor to Minne- sota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 18, 1972, Ser. No. 281,835

Int. Cl. G03c 1/84

U.S. Cl. 96—87 R

No Drawing. 7 Pages Specification

Heat stable, blue, anthraquinone dyes which are suitable for inclusion in polyester film base include 1,4-bis (2,6-diisopropylanilino) anthraquinone and 1,4-bis(2-ethyl-6-methylanilino) anthraquinone.

## T910,005 RADIATION SENSITIVE POLYACETYLENIC COM- POSITIONS FOR FLUORESCENT IMAGES Arthur A. Rasch, Webster, and Wilbur C. Hodges, Rochester, N.Y. (both of Kodak Park, Rochester, N.Y. 14650)

Filed Nov. 9, 1972, Ser. No. 305,200

Int. Cl. G03c 5/04

U.S. Cl. 96—48

No Drawing. 19 Pages Specification

Films prepared from specific polyacetylenic compositions may be exposed to electron beam or short wave ultraviolet radiation, resulting in colorless or low contrast image formation in the exposed areas. When these materials are subsequently subjected to overall ultraviolet radiation of longer wavelength, fluorescent images appear in exposed areas. Such images may be utilized for electronic readout, image amplification, or photocopying.

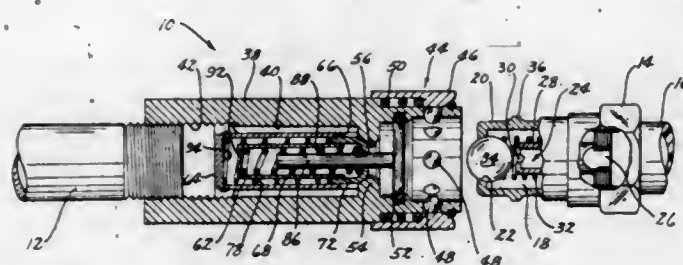






### 27,635 COUPLING DEVICE

Larry A. Kopaska, Guthrie Center, Iowa 50115  
Original No. 3,490,491, dated Jan. 20, 1970, Ser. No. 615,456, Feb. 13, 1967. Application for reissue May 10, 1971, Ser. No. 141,482  
Int. Cl. F16k 15/00; F16l 37/28  
U.S. Cl. 137—614.05 20 Claims

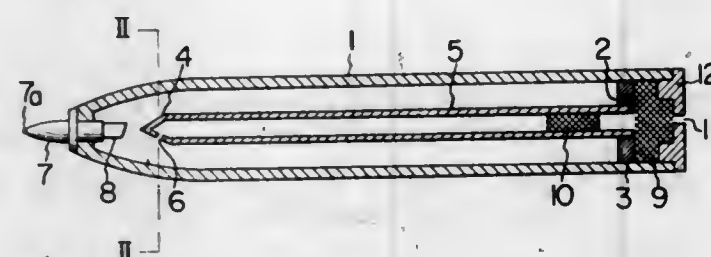


A coupling device for detachably connecting first and second conduits which are in communication with a source of hydraulic fluid under pressure and an apparatus to be powered by the hydraulic fluid, respectively, the second conduit including a check valve means, and an actuator means in the coupling device to permit the connection of the conduits when one or more thereof is under pressure, the actuator means also adapted to unseat the check valve at times and also adapted to prevent the undesirable seating of the check valve during the operation of the equipment to which the conduits are connected.

### 27,636 BALLPOINT PEN FOR WATER-SOLUBLE INK

Yukio Horie, Tokyo-to, Japan, assignor to Dainihon Bungu Kabushiki Kaisha, Tokyo-to, Japan  
Original No. 3,446,564, dated May 27, 1969, Ser. No. 668,443, Sept. 18, 1967. Application for reissue Apr. 29, 1970, Ser. No. 32,962  
Claims priority, application Japan, Mar. 31, 1967, 42/19,881  
Int. Cl. B43k 7/02 8 Claims

U.S. Cl. 401—217



A pen outer barrel is filled directly with water-soluble ink, which is fed to the ball of a ballpoint and is air vented and pressure relieved by a device including an inner cylinder with a small vent hole, a gas-permeable structure, an ink absorber, and a cap plug having an air vent hole and capping the rear end of the barrel. The gas-permeable structure and absorber permit passage of air but respectively resist ink flow and absorb ink to prevent ink leakage out of the barrel.

## PLANT PATENTS

GRANTED MAY 1, 1973

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,321

### ROSE PLANT

Maria Molina, Santa Ana, Calif., assignor to Clarence Amling Roses, Inc., Santa Ana, Calif.  
Filed Jan. 18, 1971, Ser. No. 107,599  
Int. Cl. A01h 5/00

U.S. Cl. Plt.—20

1 Claim

A rose plant of the hybrid tea class, discovered as a sport of the rose Baccara (Plant Patent No. 1,367) but of distinct red color, and is less affected by weather conditions, with more abundant flowers produced on strong growth.

3,322

### ROSE PLANT

David L. Armstrong, Upland, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.  
Filed Apr. 15, 1971, Ser. No. 134,517  
Int. Cl. A01h 5/00

U.S. Cl. Plt.—15

1 Claim

A hybrid tea rose plant which bears large yellow blooms on long, strong stems. Most stems bear a single bloom, though some may bear three or four in an irregular cluster. The flower may span as much as 5½ inches when fully opened, and may contain as many as forty petals. The plant blooms freely outdoors almost continuously during the growing season. The general effect of the newly-opened flower is almost pure rich yellow, with little if any other coloration.

3,323

### ROSE PLANT

David L. Armstrong, Upland, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.  
Filed Apr. 16, 1971, Ser. No. 134,911  
Int. Cl. A01h 5/00

U.S. Cl. Plt.—28

1 Claim

A rose plant of the floribunda class which bears small bright red blooms on normal strength, medium length

stems. Sometimes the flowers are borne singly, though usually there are from three to several to a stem in an irregular cluster. The flowers are about 2½ to 2¾ inches across when fully opened, having about 15 or 20 petals. The plant blooms abundantly outdoors almost continuously during the growing season. The general color effect of the newly-opened flowers is strong red.

3,324

### STERILE DICENTRA PLANT

Marie S. Sperka, Rte. 2, Crivitz, Wis. 54114  
Filed Apr. 26, 1971, Ser. No. 137,456  
Int. Cl. A01h 5/00

U.S. Cl. Plt.—68

1 Claim

Sterile bloom of unique deep red color (more nearly true red than the bloom of any previously known bleeding heart) is produced abundantly on a vigorous and hardy plant continuously from spring until frost.

3,325

### NECTARINE TREE

Frederick W. Anderson, Merced, Calif., assignor to Reedley Nursery, Inc., Reedley, Calif.  
Filed Sept. 23, 1971, Ser. No. 183,285  
Int. Cl. A01h 5/03

U.S. Cl. Plt.—41

1 Claim

A dwarf nectarine tree which is of medium size, vigorous, spreading, dense, foliated with large acutely pointed lanceolate leaves having a crenate margin and reniform glands, and a regular and very productive bearer of medium to small size, uniform, symmetrical, globose, clingstone fruit—which ripens about a month before the free-stone Golden Prolific (United States Plant Patent No. 2,193)—having yellow skin substantially overspread with red, and firm, crisp, yellow flesh; the surface of the pit cavity being red, and the flesh having flecks of red therein.



# PATENTS

GRANTED MAY 1, 1973

## GENERAL AND MECHANICAL

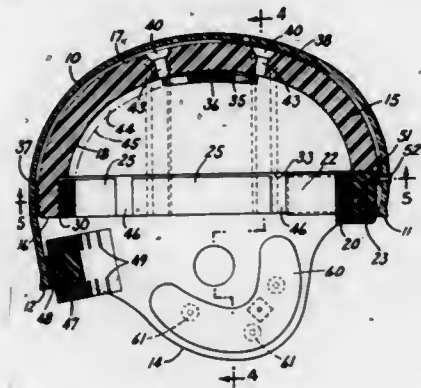
3,729,744

**PROTECTIVE HELMET FOR FOOTBALL OR THE LIKE**  
Frederick A. Rappleyea, Schiller Park, Ill., assignor to Cougac, Inc., Schiller Park, Ill.

Filed April 1, 1971, Ser. No. 130,308  
Int. Cl. A42b 3/00

U.S. Cl. 2-3 R

12 Claims



A protective helmet having an outer durable shell and an inner replaceable liner of expanded, closed cell, plastic material of a type which is capable of absorbing energy by taking a permanent set. The liner is fitted about its inner periphery, with spaced sizer pads of foam rubber or the like, the sizer pads being removably secured by pairs of fabric fastening strips having surfaces formed with hooks and loops respectively. An insert of foam rubber or the like is provided at the front edge of the liner and extending slightly below the edge of the shell to protect the bridge of the nose, as well as the forehead. The liner is moreover provided with grooves encircling the liner in a vertical direction, and the liner and shell both have perforations which communicate with the grooves for ventilating the space between the head of the wearer and the liner as well as between the liner and the shell. A neck piece in the form of a pad of resilient foam rubber or the like is removably secured inside the rear edge of the shell and extending below the level thereof in a position to bear against the neck of the wearer.

3,729,745

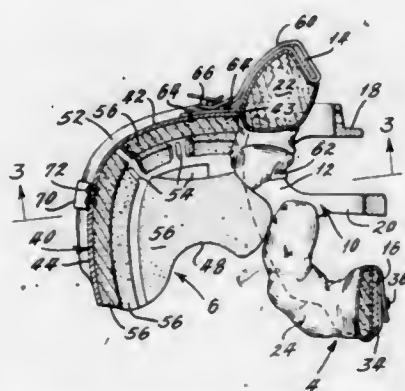
**PROTECTIVE DEVICE FOR THE HEAD**

Roland N. Latina, Belleville, Ill., assignor to A-T-O Inc., Wiloughby, Ohio

Filed Nov. 4, 1971, Ser. No. 195,647  
Int. Cl. A41d 13/00

U.S. Cl. 2-9

8 Claims



A protective device includes a face mask backed with padding and a helmet sized and configured to generally cover

the top, back and sides of the user's skull. The helmet has a top margin which abuts the padding extending along the top of the face mask and forms a line about which the mask will swing relative to the helmet. An upper strap attaches the upper part of the helmet to the top section of the face mask, but does not prevent the two from pivoting relative to each other. The midportion of the face mask is connected by means of adjustable side straps to an elastic band which extends around the back of the helmet and urges the face mask and helmet together. The protective device is easily and quickly put on and removed merely by spreading the helmet and face mask apart against the force exerted by the elastic band, in which case the face mask will swing about the upper margin of the helmet so as to temporarily enlarge the size of the protective device.

3,729,746

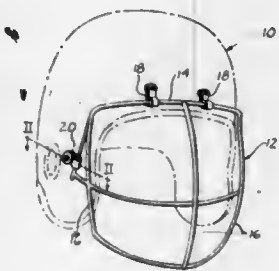
**ARRANGEMENT FOR CONNECTING A FACE GUARD TO A HELMET**

Delby C. Humphrey, Terre Haute, Ind., assignor to Schutt Manufacturing Company, Litchfield, Ill.

Filed April 30, 1971, Ser. No. 139,087  
Int. Cl. A42b 3/00

U.S. Cl. 2-9

7 Claims



The specification discloses an athletic helmet, such as a football helmet, with a face guard mounted thereon, in which the face guard is in the form of a grid of rigidly interconnected bars with a resilient coating thereon. The connector arrangement provides for pivotally connecting the face guard to the helmet at the lower front edge of the helmet so that the face guard can swing in the fore and aft direction while strap elements are provided connecting the face guard to the helmet at the sides of the helmet, and normally preventing the aforementioned fore and aft movement. The last mentioned connector elements are somewhat resilient and can be cut with a knife to permit the face guard to be swung away from the player's face in case it is necessary to give the player emergency treatment.

3,729,747

**HOSPITAL GARMENT**

Nathan L. Belkin, 4 Shepard Road, West Hartford, Conn.

Filed April 29, 1971, Ser. No. 138,499  
Int. Cl. A41b 9/00

U.S. Cl. 2-114

9 Claims

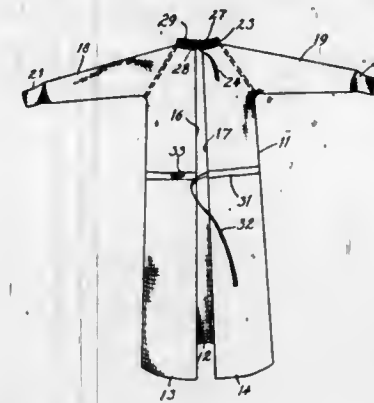
A hospital gown with a simplified tying arrangement and capable of being worn with either side out and tied easily under either condition. A single tape on one side extends through an opening or loop on the other side and is tied on itself to hold the edges closed. There may also be another tape

MAY 1, 1973

GENERAL AND MECHANICAL

13

on the other edge to engage an opening or loop on the first edge so the gown can be worn with either side out, and there



may be such tapes and openings or loops at both the neck and waist.

3,729,748

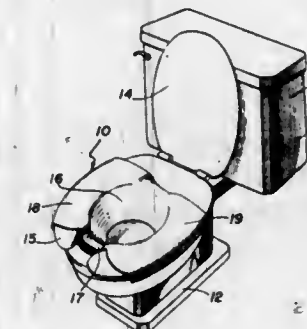
**SITZ BATH**

Richard J. Perlman, Worcester, Mass., assignor to J.M.R. Enterprises, Inc., Worcester, Mass.

Filed Dec. 2, 1971, Ser. No. 203,988  
Int. Cl. A47k 3/22

U.S. Cl. 4-6

7 Claims



This invention relates to a sitz bath comprising a bowl and more particularly, to a bowl having upwardly extending wings or flanges to embrace the seat of a toilet for medical treatment of the human body, the bowl having downwardly extending locking flanges located at the outer edge of each wing closely adjacent the sides of the toilet seat and lips to provide for overflow of medicinal liquid.

3,729,749

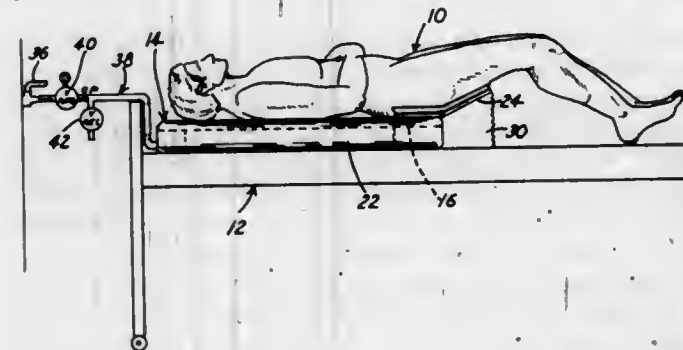
**TOILET FACILITY**

Charles E. Rosecrans, 2798 Eric Avenue, Central Point, Oreg.

Filed Nov. 23, 1971, Ser. No. 201,499  
Int. Cl. A61g 9/00

U.S. Cl. 4-113

8 Claims



This invention provides a bedpan substitute for bedridden persons. A thin rigid platform combined with an underlying

collapsed but inflatable support is placed alongside the patient and the patient is then rolled or slid onto the support in a supine posture and the collapsed support is then inflated, either with oxygen, compressed air or (preferably) carbon dioxide, uniformly to raise the support by a substantial distance, say of several inches. The support is notched at its lower end and supports at that end a peripherally recessed, partly upturned, rigid ring, which extends well beyond the platform, to which an open-mouthed, water-tight, disposable bag may be secured, open side up, by suitable means such as a rubber band.

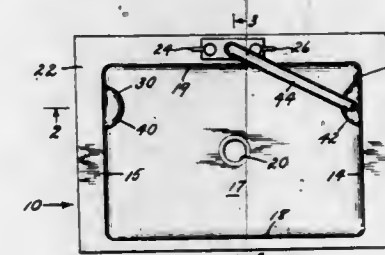
3,729,750

**LAVATORY SINK CONSTRUCTION**

Gino Giglio, 105 West 13th Street, New York, N.Y.  
Filed Sept. 10, 1970, Ser. No. 71,187  
Int. Cl. E03c 1/14, 1/18

U.S. Cl. 4-187

6 Claims



A lavatory, sink, tank, or the like, having a fluid-containing basin with a hose or pivotally mounted fluid inlet spigot dimensioned to extend to a position overlying the lateral edges of the basin. The basin itself is contoured with at least two oppositely disposed splash columns along the side walls thereof, positioned adjacent to the side walls, where the pivotally mounted fluid inlet spigot radius and side wall meet, the columns being arcuate in horizontal cross section along the side walls, and contoured so that water impinging upon the top surface of the column from the fluid inlet nozzle or hose will be deflected towards the opposite side of the basin. In effect, two oval portions of the sink bottom — where it joins the side — have been raised higher than the surface of a half-filled sink.

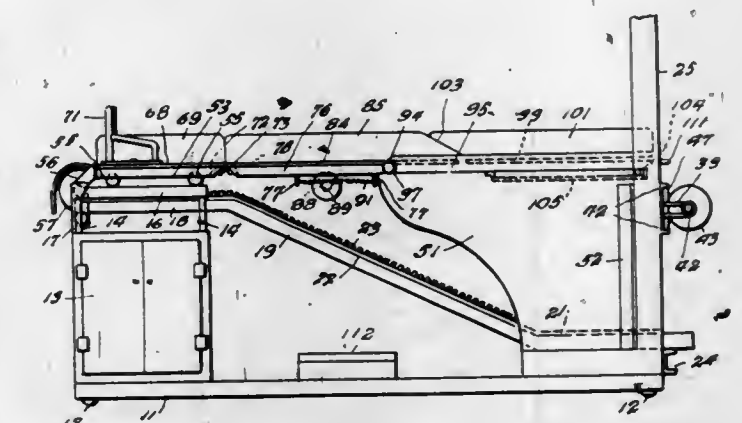
3,729,751

**PARAPLEGIC BED**

Wayne V. Kirkman, 960 42nd St., West Palm Beach, Fla.  
Filed April 26, 1971, Ser. No. 137,399  
Int. Cl. A47c 3/32

U.S. Cl. 5-66

7 Claims



This invention comprises a paraplegic bed having three portions, a foot portion, a body portion or seat portion, and a back and head portion; the portions are provided with means for maintaining all three portions in coplanar alignment, and changing the angle of the plane, and means are provided for changing the plane of each portion with respect to any of the others portions; and means are provided for selectively changing



ing the seat portion both longitudinally and transversely with respect to the foot portion and back portion; said means for changing positions and relationship of parts is preferably electric push button actuated.

3,729,752

## ORTHODONTIC CRADLEBOARD

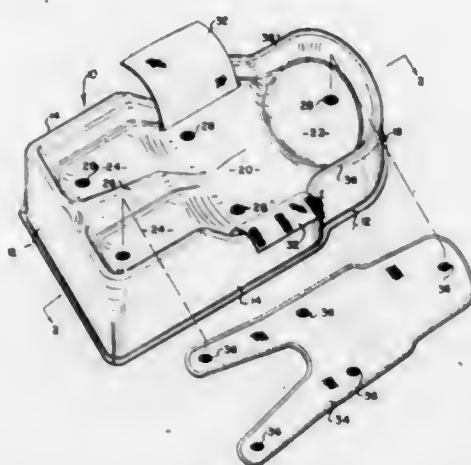
Hal A. Huggins, 100 East Cheyenne Road, Colorado Springs, Colo.

Filed July 6, 1971, Ser. No. 159,775

Int. Cl. A47d 7/00

U.S. Cl. 5-93 R

8 Claims



The orthodontic cradleboard comprising a base having head, body and leg member supporting portions, the member supporting portions having member-conforming surfaces, each having raised marginal edges for restricting lateral shift of the members when positioned thereon, the member-conforming surfaces being stepped with regard to each other downwardly from the leg member-conforming surface to the head member-conforming surface.

3,729,753

## BED AND LOUNGE UNIT

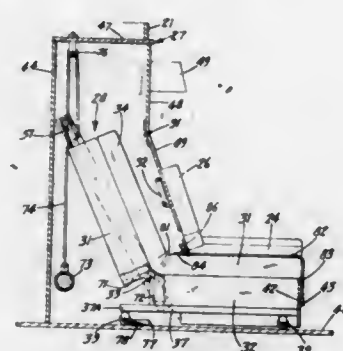
Clarence R. Johnson, 1304 Blackman Avenue, Duluth, Minn., and Jay T. Kidder, 4920 Vallacher Avenue, Minneapolis, Minn.

Filed Dec. 27, 1971, Ser. No. 212,079

Int. Cl. A47c 13/35

U.S. Cl. 5-2 R

17 Claims



A combination bed and lounge having a foldable mattress selectively usable as a bed and a seat. The mattress is supported on wheels and moves from a horizontal bed position to a seat position relative to an upright cabinet or wall. The head section of the mattress is guided upwardly into the cabinet by guide rails attached to the inside walls of the cabinet. A transverse cushion attached to the front of the cabinet alternately serves as a bed head board and a seat back rest. Upright arm rests are removably mounted on opposite sides of the foot section of the mattress. Each arm rest has a removable top cap.

3,729,754

## INFLATABLE AIR CUSHION ARTICLE

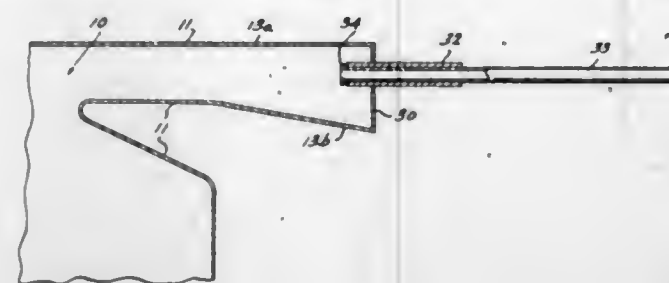
James T. Hastings, and Paul Boulaine, both of Brantford, Ontario, Canada, assignors to Canam Manufacturing & Packaging Limited, Ontario, Canada

Filed Aug. 13, 1971, Ser. No. 171,625

Int. Cl. A47c 27/08

U.S. Cl. 5-348

6 Claims



Two plies of polyethylene sheet material are sealed around their edges to form an air-tight enclosure for use as a cushion or the like. A valve preventing escape of air is constituted by a narrow elongated neck formed of the plies themselves, separate valve elements being avoided. The valve effect is due to tension in the material at the neck. The article is inflated through a tube sealed into an extension of the valve neck. In a modification, a second tube is slidably mounted within the first tube to assist in desired deflation.

3,729,755

## IMPROVEMENTS RELATING TO RELEASE MECHANISM FOR BUOYS

Peter Ronald Cochrane, Springfield, Pa., assignor to Emi Limited, Hayes, Middlesex, England

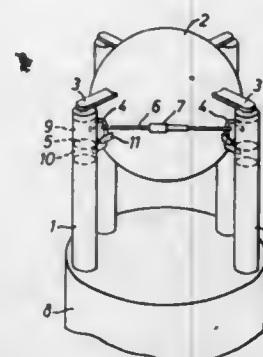
Filed Sept. 8, 1970, Ser. No. 69,655

Claims priority, application Great Britain, Sept. 10, 1969, 44,725/69

Int. Cl. B63b 21/52

U.S. Cl. 9-8 R

1 Claim



A buoy comprising a sinker, a sub-surface float and a surface float is dropped into the water as a single unit. The sinker is released by means which are not described, the invention being concerned with the means for securing and releasing the surface float. Four longerons are rigidly secured to the sub-surface float and have openings near their free ends. Attached to the surface float are four brackets each carrying a pivotable member whose ends are located in the openings of a respective longeron. The pivotable members are secured by a wire which passes around the surface float and engages each of the pivotable members, the ends of the wire being joined together by a timed release mechanism which after a predetermined time releases the ends of the wire and thus releases all the pivotable members simultaneously.

3,729,756

## FLOTATION ASSEMBLY

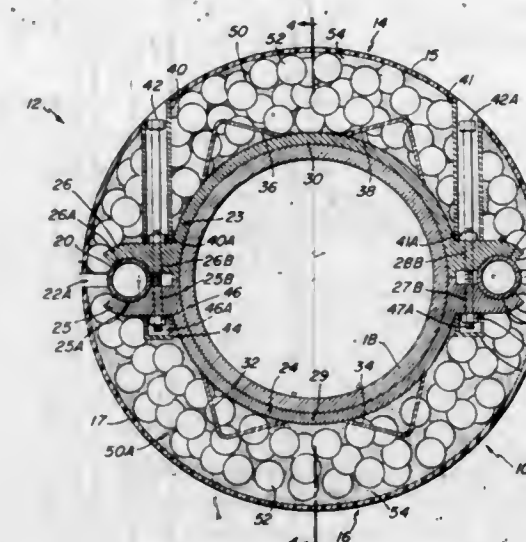
Sidney D. Cook, Warwick, R.I., and Louie W. Watkins, Jr., Brookline, Mass., assignors to Data Packaging Corporation, Cambridge, Mass.

Filed Feb. 17, 1971, Ser. No. 116,031

Int. Cl. B63b 21/52; E21b 7/12

U.S. Cl. 9-8 R

9 Claims



A riser pipe, usually used in drilling for oil, has an annular flotation collar positioned about it. This collar comprises a pair of semiannular flotation members each of which includes a semicircular outer shell of fiberglass, a semiannular low density core preferably including a plurality of plastic hollow spheres surrounded by a syntactic foam, and arcuately-shaped clamping means embedded in the core. Passages through one of the semiannular flotation members provide access to the clamping means so that it may be secured to the riser pipe. The clamping means also includes recesses for holding the choke and kill lines in place on opposite sides of the riser pipe and spaced therefrom.

3,729,757

## SELF-LOCKING NUT

Thomas B. Wright, Diamond Bar, Calif., assignor to TRW Inc., Cleveland, Ohio

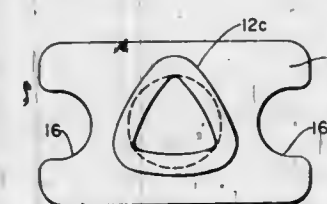
Continuation of Ser. No. 12,801, Feb. 19, 1970, abandoned.

This application Jan. 13, 1972, Ser. No. 217,682

Int. Cl. B21d 53/24

U.S. Cl. 10-86 A

1 Claim



This is a lock nut which is formed into a generally elliptical configuration or triangular configuration having arcuate walls, is then tapped and the resulting configuration is then further distorted.

## ERRATUM

For Class 11-1 R see:  
Patent No. 3,730,512

3,729,758

## TOE-LASTING MACHINE

Herbert Schindler, Wagenstrasse 38, Pirmasens, and Tilo Löffler, Gersbacherstr. 20, Pirmasens-Winzeln, both of Germany

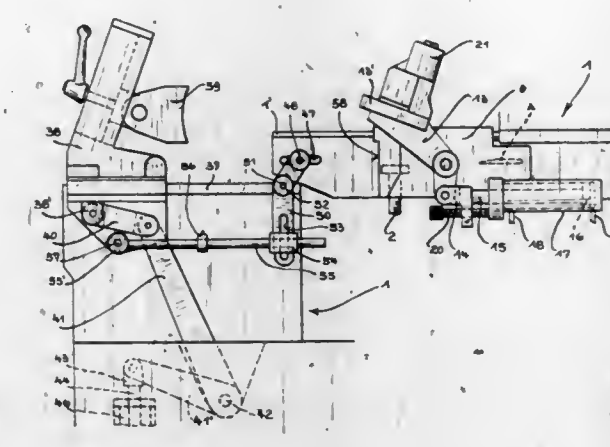
Filed Nov. 8, 1971, Ser. No. 196,480

Claims priority, application Germany, Nov. 10, 1970, P 20 55 213.0

U.S. Cl. 12-10.5

Int. Cl. A43d 21/00

8 Claims



A toe-lasting machine having wipers or tuck-in devices for an upper leather of a shoe in a joint area of a last, wherein a large part of the adjusting operations of the tuck-in devices are automatic. The toe-lasting machine includes a machine frame, a first carriage with a heel support, a second carriage with a wiper head and wipers, and a pair of support tuck-in devices. The tuck-in devices are mounted on the second carriage. An adjustable linkage system is supported on the first carriage and on the machine frame. The linkage system is set to serve as a limiting stop in co-operation with a detent associated with the second carriage which supports the tuck-in devices.

3,729,759

## BOOT TREE

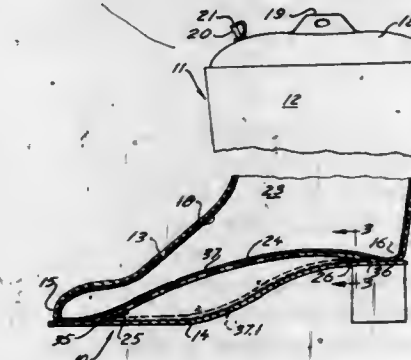
Louis Szabo, 2009 Trutch Street, Vancouver, British Columbia, Canada

Filed April 21, 1972, Ser. No. 246,395

Int. Cl. A43d 5/00

U.S. Cl. 12-114.4

7 Claims



A boot tree having an inflatable member shaped, when inflated, to conform to the inside of a boot and arched member extending longitudinally of and beneath the inflatable member for transmitting pressure of the inflatable member to the heel and toe of the sole of the boot.



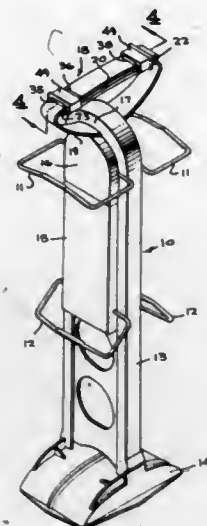
3,729,760

**STRAP FOR BOOT AND SHOE HOLDER**

Ivor J. Alsop, P.O. Box 23, Bellingham, Wash.  
 Filed May 28, 1971, Ser. No. 147,900  
 Int. Cl. A43d 5/00

U.S. Cl. 12—120.5

6 Claims



A boot and shoe holder that includes a carrying strap that can be folded, and wherein when desired, the strap can be extended to permit the user to insert the arm therethrough.

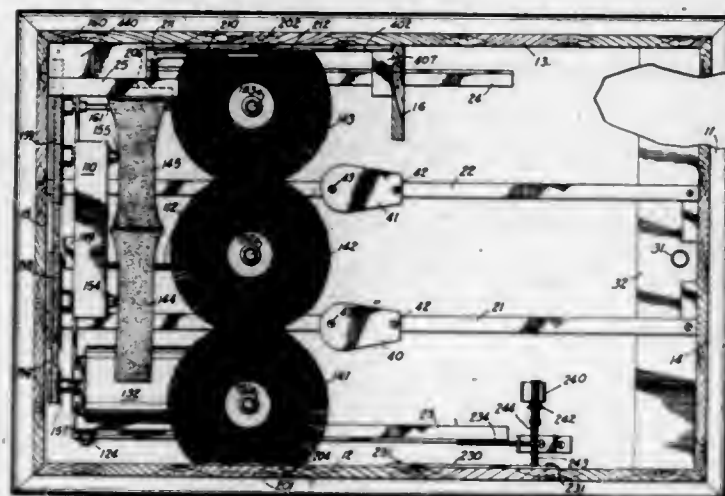
3,729,761

**AUTOMATIC SHOESHINE MACHINE**

George D. Lashley, 3098 Old Norcross Road, Tucker, Ga.  
 Filed Sept. 21, 1971, Ser. No. 182,319  
 Int. Cl. A47I 23/02

U.S. Cl. 15—31

22 Claims



An automatic shoeshine machine for use in cleaning, applying polish and buffing shoes supported in a shoeshine position. The automatic shoeshine machine includes a power driven carriage cyclically controlled for movement adjacent the shoeshine position and includes a number of power driven brush means supported thereon for effecting a brushing action of the shoes supported in the shoeshine position. The automatic shoeshine machine includes a shoe polish applying means, wherein the shoe polish applying means includes a shoe polish container means supported in position to be contacted by the shoe brushing means. The container means includes a movable cover means which is cyclically controlled for movement from a closed non-shoe polish applying position to an open shoe polish applying position, in timed relationship relative to the cycle of operation of said movable carriage means. An electrically operable control system is operatively

associated with the movable carriage means and the shoe polish applying means for effecting cyclic operation of the movable carriage and cyclic operation of the shoe polish applying means. A coin operated switch means is operatively associated with the cyclically operable control means for initiating a shoeshine operation.

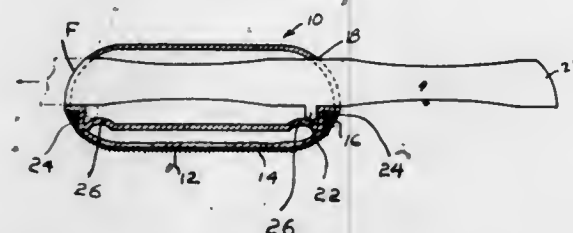
3,729,762

**BRUSH HANDLE ADJUSTMENT**

Eric Michael Roth, Unionville, Ontario, Canada  
 Continuation-in-part of Ser. No. 21,447, March 20, 1970. This application June 2, 1971, Ser. No. 149,142  
 Int. Cl. B25g 1/06

U.S. Cl. 15—144 B

8 Claims



A brush with a long handle extending from the body has bristles slanted in directions non-coincident with planes containing the handle. The handle is connected to the body to be moved between opposed positions relative thereto where opposite ends extend from the handle.

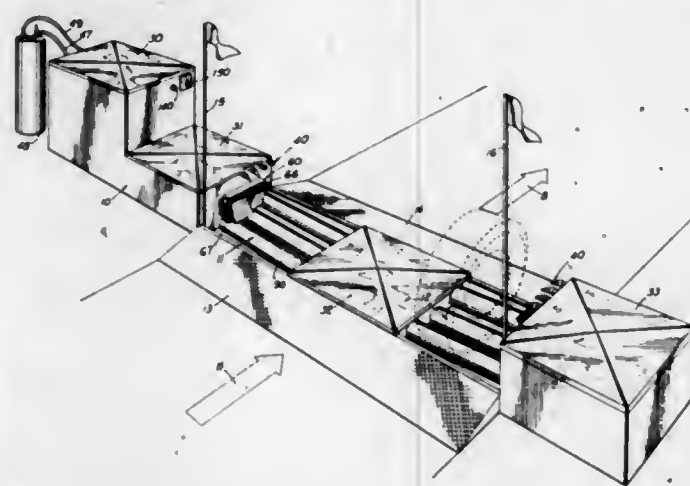
3,729,763

**WHEEL WASHING APPARATUS**

Robert M. Coley, 609 Irwin Avenue, Ocilla, Ga.  
 Filed Aug. 4, 1971, Ser. No. 168,867  
 Int. Cl. B60s 3/04

U.S. Cl. 15—21 B

23 Claims



Wheel washing apparatus adapted to be associated with automatic car wash means for use in washing the outside surfaces of vehicle wheels, either prior to or after washing the vehicle body. The wheel washing apparatus includes a pair of laterally spaced wheel washing stations located on the apparatus and operatively associated with each other for contacting and washing the outside surfaces of vehicle wheels supported in position adjacent the station. Each of the wheel washing stations includes means for dispensing a cleansing medium on the vehicle wheels and means for effecting a scrubbing action of the wheels to effectively clean the wheels in a washing operation. Wheel supporting and rotating means is positioned adjacent each of the wheel washing stations for rotating the wheels to effect the scrubbing action on the wheels. The wheel supporting and rotating means includes a roller assembly supported adjacent each wheel washing station, with the roller assembly including a number of roller elements

ments rotatable about substantially parallel axes with the axes of the roller elements being angularly disposed relative to the axis of the vehicle wheels for automatically centering the vehicle wheels between the laterally spaced wheel washing station in response to rotation of the roller support elements. The roller support elements include power drive means selectively operable between driving and non-driving conditions. The power drive means includes braking means which is applied automatically to hold the roller elements in a braked condition in response to movement of said power drive means to a non-driving condition.

3,729,764

**PAINT TRAY**

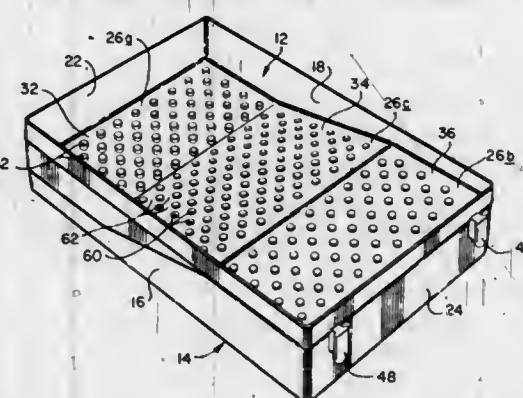
Ellsworth Vines, Wellesley Hills, Mass., assignor to Baltimore Brushes, Inc., Boston, Mass.

Filed March 10, 1971, Ser. No. 122,835

Int. Cl. B44d 3/12

U.S. Cl. 15—257.06

17 Claims



A reversible paint tray designed for serving thixotropic paint from a compartment on one side and conventional oil or water base paint from a second compartment on the other side is molded in one piece of a nonwetting plastic. A multiplicity of spaced-apart, generally cylindrical studs project up from the bottom of the one compartment. These studs have sharp upper edges which provide a toothed engagement with a napped surface of a paint roller so that when the roller is pulled across the bottom of the compartment, the teeth "dig" into the roller surface to complete a force couple which rotates the roller despite the opposition provided by the thixotropic paint. The other tray compartment has formed on its bottom wall the usual ribs arranged in a herringbone design and short stubs which suffice to rotate the roller immersed in the less viscous oil and water-base paint.

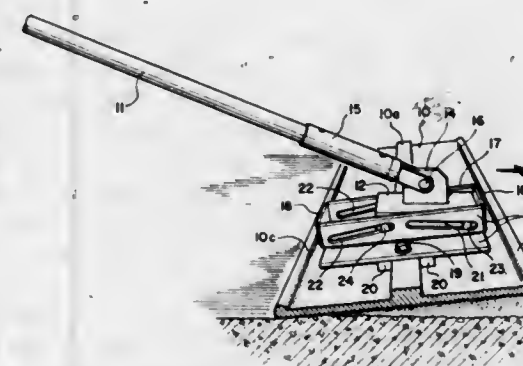
3,729,765

**SELF-TILTING TROWEL FOR CONCRETE**

William D. Peterson, Kearns, Utah, assignor to Weyer Construction Company, Salt Lake City, Utah  
 Filed Dec. 23, 1971, Ser. No. 211,354  
 Int. Cl. E01c 19/12

U.S. Cl. 15—235.8

7 Claims



A long-handled trowel device for leveling wet concrete includes mechanism attaching a handle to a trowel for automatic

cally tipping the trowel along its far edge as a fulcrum during pull strokes and along its near edge on push strokes, so the trowel will always be properly oriented during troweling action. The automatic trowel-tipping mechanism comprises a carriage pivotally attached to the handle and moveable back and forth along a trackway rigidly secured to the top of the trowel. Carriage and trackway are interconnected by camming means, preferably made up of forward and rearward cam tracks sloping upwardly towards each other to peak intermediate the width of the trowel and forward and rearward cam followers placed in the respective cam tracks at similar positions with respect to the lengths of such tracks for simultaneous back and forth travel therein at mutually different ascending and descending levels.

3,729,766

**WINDSHIELD WIPING APPARATUS**

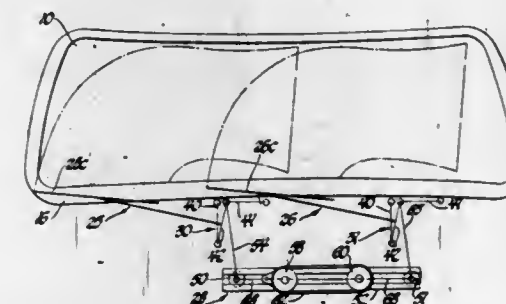
Harry Charles Buchanan, Jr., Centerville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 20, 1970, Ser. No. 82,363

Int. Cl. B60s 1/06

U.S. Cl. 15—250.21

2 Claims



In a preferred form, this disclosure relates to a windshield wiper apparatus for wiping a windshield of an automotive vehicle. The windshield wiper apparatus comprises a windshield wiper and an actuating mechanism including a swingable linkage means for supporting the wiper and for effecting movement of the wiper transversely of the windshield through one portion of its stroke and for arcuately moving the wiper between a generally vertical position toward a generally horizontal position during another portion of its stroke.

3,729,767

**DEVICE FOR FASTENING A WINDSHIELD WIPER ARM ON A DRIVE SHAFT**

Reinhard Edele, Bietigheim; Alfred Kohler, and Kurt Bauer, both of Kleiningersheim, all of Germany, assignors to SWF-Spezialfabrik fuer Autozubehoer Gustav Rau GmbH, Bietigheim, Germany

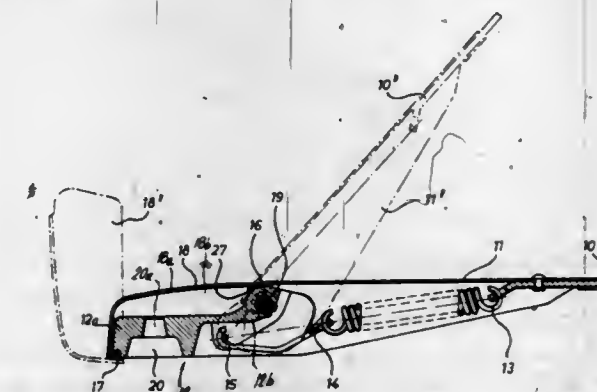
Filed Dec. 29, 1971, Ser. No. 213,472

Claims priority, application Germany, Feb. 4, 1971, P 21 05 101.4

Int. Cl. B60s 1/34

U.S. Cl. 15—250.34

17 Claims



A receiving member, formed of a first section and a second section which extends laterally from the first section, is used



for connecting a windshield wiper arm to a drive shaft. An opening is provided to the first section in which the drive shaft is secured. The wiper arm is articulated to the second section at a position spaced from the opening in the first section. To prevent leakage into the drive shaft bearing, a cover member is articulated to the first section of the receiving member and fits over the first section and a portion of the second section. The cover member is arranged so that it can be pivoted upwardly from the receiving member for permitting access to the drive shaft regardless of the position of the wiper arm. Further, the pivot axes of the cover member and the wiper arm in the receiving member are disposed in parallel relationship.

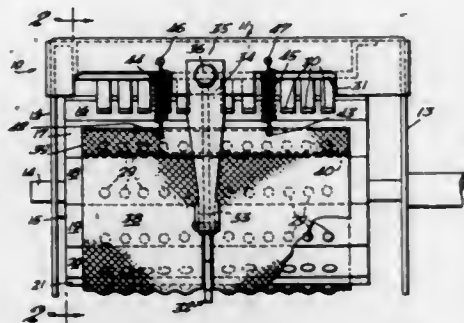
3,729,768

# BURNISHING DEVICE FOR ROTARY TELEVISION SET TUNERS' CONTACTS

David E. Gurkin, 3165 S.W. 18th Street, Miami, Fla.  
Filed July 6, 1971, Ser. No. 159,978  
Int. Cl. H03J 3/00

U.S. Cl. 15-256.51

5 Claims



A flexible fabric sling-type wiping member is described for application against longitudinally-extending sets of electrical contact points of tuner strips in a rotary drum tuner for wipe cleaning the points as the tuner is rotated during use while changing from channel to channel. A flexible woven fabric is supported in embracing, sling-like fashion over a substantial portion of the periphery of the rotary drum tuner and supported thereat by the tuner drum housing.

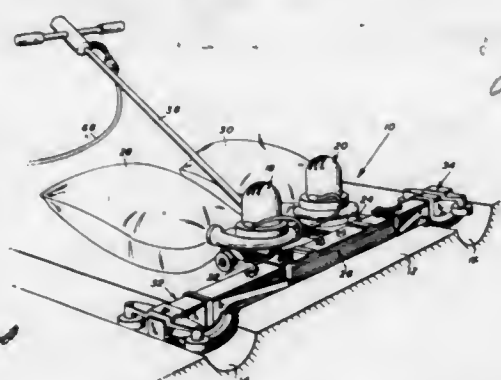
3,729,769

# BOWLING LANE VACUUM CLEANER

Samuel H. Sharpless, 61-69 N. Pine St., Hazleton, Pa.  
Filed July 8, 1971, Ser. No. 160,716  
Int. Cl. A47J 5/28

U.S. Cl. 15-347

29 Claims



A vacuum cleaning machine for cleaning the full width of a bowling alley, including the gutters or channels on either side thereof, is disclosed. The machine comprises a pair of vacuum units each connected through a plenum to a nozzle which is generally in the form of an inverted U-shaped elongated channel designed to extend across the width of the bowling lane. The nozzle carries downwardly-extending brushes which serve

to loosen the material that is to be picked up by the vacuum units. Each end of the nozzle is adapted to receive an extension which acts as an auxiliary nozzle, with each auxiliary carrying at its outer end a brush arrangement for cleaning the bowling alley gutters. The extensions are fastened to the upper surface of the main nozzle to form air passages which communicate through an opening in the nozzle so that air and entrained particles from the gutters can be drawn into the vacuum units. A pivoted arm is affixed to the front and back of the channel extension and carries at its outer, free end a curved brush which is adapted to the shape of the alley channel so as to loosen the dust which is to be picked up. The material entrained in the air flow of the vacuum cleaner is carried to a suitable storage bag, in conventional manner.

3,729,770

# ELECTRICALLY CONTROLLED HOLD-OPEN DEVICE

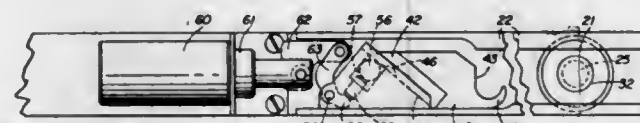
Thomas R. Lasier, Princeton, Ill., assignor to Schlage Lock Co., San Francisco, Calif.

Filed June 24, 1971, Ser. No. 156,413

Int. Cl. E05F 15/20

U.S. Cl. 16-48.5

7 Claims



An electrically releasable hold-open device for use with a door closing mechanism employing a latch device that is engaged by an element reciprocating in a trackway. The element when moved to hold-open position shifts the latch device up an inclined ramp to a location in which the latch device is releasably held by retaining means. The retaining means is controlled by an electrically energized solenoid so that it is released in the event of an emergency.

3,729,771

# LATCHING LEVER ASSEMBLY FOR DOOR HOLDER-CLOSER

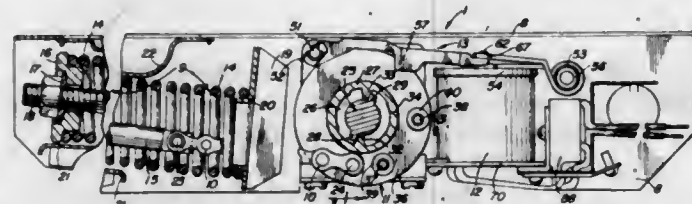
Burke J. Crane, Lombard; Richard E. D'Hooge, Wood Dale, both of Ill., and Frank D. Roberts, North Reading, Mass., assignors to Rixson-Firemark Inc., Franklin Park, Ill.

Filed March 1, 1972, Ser. No. 230,735

Int. Cl. E05F 16/20

U.S. Cl. 16-48.5

10 Claims



An improved latching lever assembly for use in an electromechanical door holder-closer having a closer spring, a dashpot, and an electromagnet. The electromagnet actuates the lever assembly to latch the spring-dashpot combination to effect a desired door hold open position. The lever assembly comprises a lever, a fulcrum at one end of the lever, and an armature located generally at the other end of the lever and electromagnetically coupled to the electromagnet. A latching detent is located on the lever intermediate the fulcrum and armature to latch a camming roller to arrest the spring-dashpot combination when the electromagnet is energized. An armature-lever coupling spring resiliently couples the armature to the lever to enable the lever to pivot about its fulcrum during manual override of the door holder-closer without a corresponding movement of the armature relative to the energized electromagnet, thereby eliminating armature release noises.

3,729,772

# TORSION BAR HOLD-OPEN HINGE

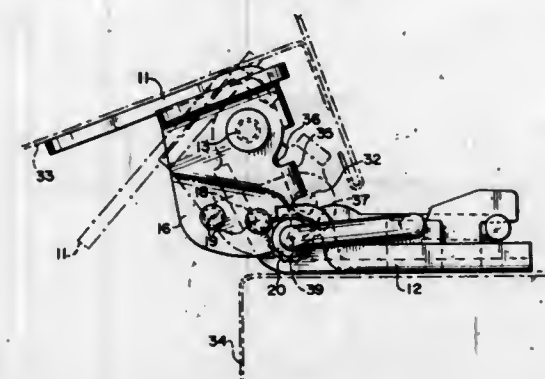
Joseph H. Marchione, Rockford, Ill., assignor to Atwood Vacuum Machine Company, Rockford, Ill.

Filed March 13, 1972, Ser. No. 233,974

Int. Cl. E05d 11/10

U.S. Cl. 16-145

13 Claims



The torsion bar on the body half of the hinge has a fluted roller rotatably mounted on and movable with one end of it in lieu of the usual arrangement of two such rollers mounted in spaced relation on the door half with rivets and spring washers. This permits using two shouldered pins riveted on a flange on the door half and spaced more or less to meet each customer's special requirements and serving as the means for actuating the aforesaid single roller to hold the door open in predetermined positions. The fluted roller has a concentric cylindrical shank portion against which a tab on the body half bears under spring loading of the torsion bar to hold the roller against turning except upon rolling contact with the striker pins. Since the fluted roller is always held against turning except during rolling contact with the pins when the shank of the roller is moved clear of the tab it is always assured of proper orientation with the respective pins, which is important because the pins have to register properly with the troughs in the flutes for correct hold-open operation in each open position of the door. The roller has a blind hole to receive the one end of the torsion bar limiting endwise movement of the roller in one direction while a horizontal surface on a flange on the door half has abutment with the flat top surface on the roller to retain it against endwise movement in the other direction, the torsion bar in turn being retained in assembled position on the body half by a flattened portion on the opposite end of the bar.

3,729,773

# METHOD FOR WASHING AND CHILLING EVISCERATED FOWL

Janus J. Dillon, Irving, Tex., assignor to FEI, Inc., Dallas, Tex.

Filed Nov. 26, 1971, Ser. No. 202,202

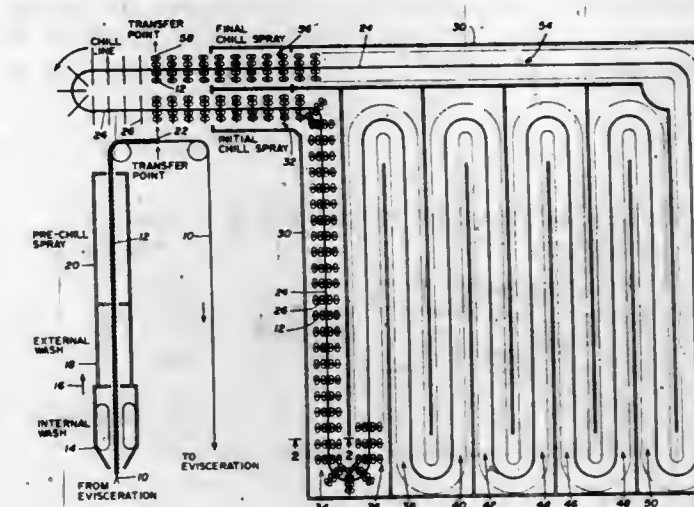
Int. Cl. A22c 21/00

U.S. Cl. 17-11

34 Claims

A process for washing and cooling fowl for human consumption includes conveying the fowl through a plurality of processing zones. After evisceration, the fowl are conveyed to a first zone where they are internally washed and externally washed. The fowl are then conveyed through a second zone where they are prechilled. Thereafter, the fowl are transferred from a first conveyor system to a second conveyor system, the latter including shackles which can suspend a plurality of fowl from a single truck on a conveyor. The fowl are then conveyed on the multiple fowl shackle through a third zone in which they are cooled by contact with a chilled liquid spray and by contact with a cold gas stream. In the third zone the fowl are conveyed through a multi-path arrangement in a plurality of subzones. Except for the entry and exit points from one subzone to another, the subzones are divided by walls. The chilled

liquid and the cold gas are directed in a predetermined pattern through the plurality of subzones. When the fowl are removed



from the third zone, they are transferred to another processing line for packaging or the like.

3,729,774

# APPARATUS AND METHODS FOR PREPARING SKEWERED FOOD PRODUCTS

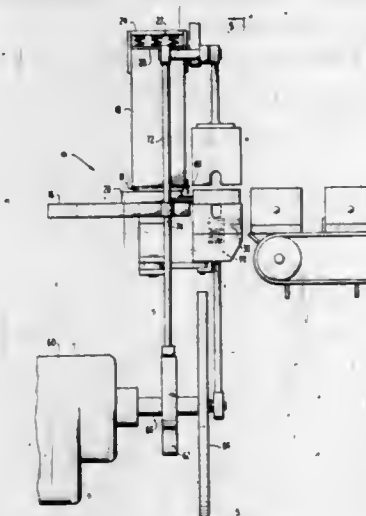
Philip Y. Chow, 3 Harran Circle, Orlinda, Calif.

Filed Sept. 15, 1971, Ser. No. 180,670

Int. Cl. A47J 43/18

U.S. Cl. 17-15

3 Claims



The food is sliced into strips and disposed between a pair of corrugated platens. The platens, when closed, have registering guide slots through their complementary corrugated faces for receiving a skewer. The skewer is inserted through the openings and a food strip between the platens while a blade cuts the next food strip. The skewered food is picked up and conveyed through a sauce bath, a dryer, an oil bath and through an oven. From the oven, the individual skewered food products are grouped and packaged with a prepackaged sauce container.

3,729,775

# APPARATUS FOR REMOVING THE SKIN FROM VERTEBRATES SUCH AS FISH & ANIMALS

Emery L. McDonald, 10395 Wunderlich Drive, Cupertino, Calif.

Filed July 26, 1971, Ser. No. 166,128

Int. Cl. A22c 25/17

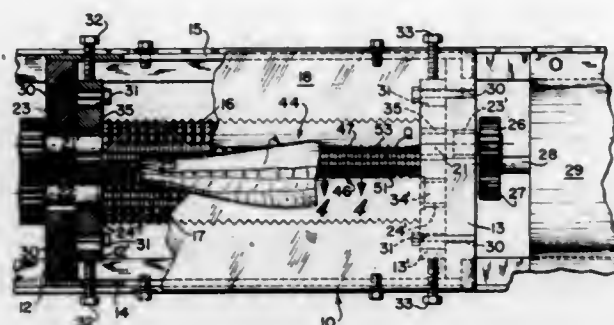
U.S. Cl. 17-62

10 Claims

A machine in which pulling rollers are covered by a counter-top lid having an opening in a depressed portion thereof exposing the pinchline between the rollers and providing a guard



with one edge of the opening overlying the inwardly turning quadrant of one roller to the pinchline thereof and the opposite edge of the opening disposed to expose the inwardly turning quadrant of the other roller to enable feeding of one flank of an eviscerated fish or animal to be fed into the



pinchline and be cleaved from the flesh as it rolls in unison with the pulling action and rotative contact with the exposed quadrant of such other roller whereby the meat is flipped over and guided upwardly and out of the depressed area by the guard overlying the upper quadrant of the adjacent roller.

3,729,776

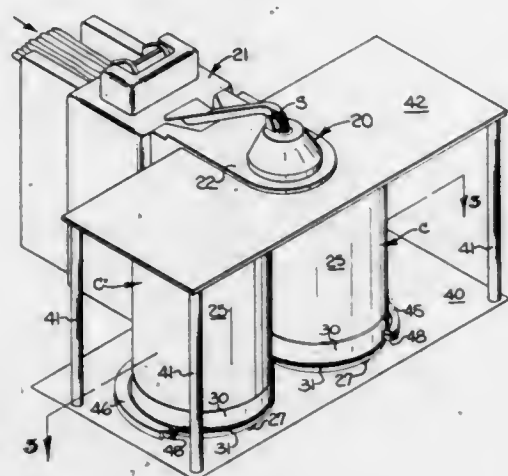
# SLIVER CAN DONNING AND DOFFING APPARATUS FOR COILERS

Herman S. Johns, Patterson, N.C., assignor to Wellman Industries, Inc., Johnsonville, S.C.

Filed Nov. 24, 1970, Ser. No. 92,435  
Int. Cl. B65h 54/80

U.S. Cl. 19-159 A

28 Claims



Sliver cans are donned by moving them inwardly in alternation, first from one side of a coiler head, then from the opposite side of the coiler head, into coiling position under the coiler head, and the coiling position under the can moved inwardly from one side of the coiler head is offset from the coiling position of each can moved inwardly from the opposite side of the coiler head. Also, each sliver can moved inwardly to coiling position from one side of the coiler head is rotated in one direction during the coiling operation, and each sliver can moved inwardly to coiling position from the opposite side of the coiler head is rotated in the opposite direction during the coiling operation. The doffing of each full can of sliver is effected simply by utilizing a succeeding can being moved into coiling position for engaging and pushing the full can outwardly from under the coiler head.

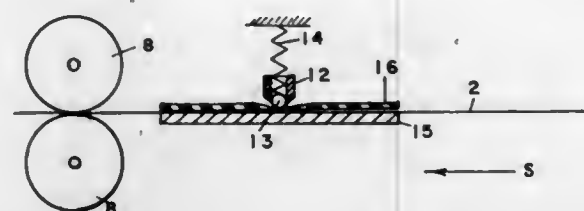
## 3,729,777 SYSTEM FOR OPENING CRIMPED MULTIFILAMENT BANDS

Manfred T. Hoffman, Newburyport, Mass., and Lawrence W. Healy, Johnsonville, S.C., assignors to Wellman, Inc., Boston, Mass.

Filed May 21, 1971, Ser. No. 145,794  
Int. Cl. D01d 11/02

U.S. Cl. 19-65 T

10 Claims



A system for opening an initially compact crimped multifilament tow includes a plurality of units arranged in tandem and performing different functions. One or more of the units are primarily intended to deregister the crimped portions of the tow, or band, by imparting a braking action on the latter at ever changing laterally spaced points. The deregistration unit of the system includes an elastomeric blanket resting on a solid support and compressed at a plurality of laterally spaced points by a plurality of roller bodies (balls or rollers) supported by a common carriage movable transversely to the band to be deregistered. The band is sandwiched between the blanket and support, and drawn by means of tension rolls, through the gap formed between the blanket and the support. The system further includes a band spreading unit for imparting the desired ultimate width to the deregistered band. The spreading action in this unit is effected by supporting the band upon a bed formed by extension springs whose length is progressively increased in the direction of the travel of the band. This, in turn, is achieved by supporting the extension springs by a pair of diverging conveyor belts.

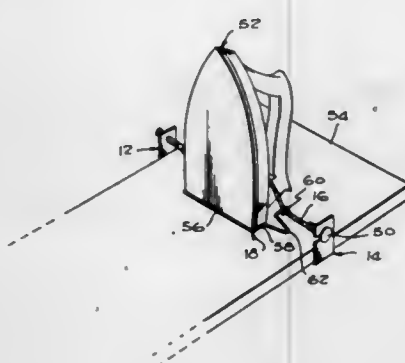
## 3,729,778 IRON GUARD

Raymond F. McGrath, 7303 Winnetka Avenue, Canoga Park, Calif.

Filed Jan. 28, 1972, Ser. No. 221,588  
Int. Cl. A44b 21/00; D06f 79/02

U.S. Cl. 24-73

9 Claims



An improved iron guard is provided which includes a spaced pair of holding means such as clamps to releasably engage the sides of an ironing board, a flexible connecting means interconnecting the holding means and adapted to releasably engage the handle of an iron, resilient means such as a spring associated with the connecting means and holding means to tension the former and to releasably secure a heel bracket in tight engagement with the heel of an iron to hold the same securely in an upright position without danger of tipping over the iron. The bracket is secured to the connecting means,

which may be a chain, cord or the like. The bracket is of special configuration to quickly and adequately engage the heel of an iron.

## 3,729,779 SKI BOOT BUCKLE

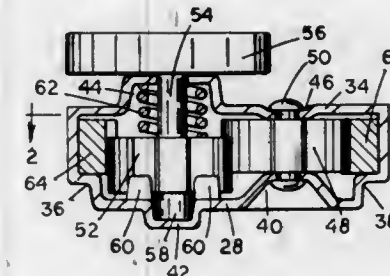
Karl A. Porth, 1522 Sylvan S.E., Grand Rapids, Mich.

Filed June 7, 1971, Ser. No. 150,392

Int. Cl. A43c 11/00

U.S. Cl. 24-68 SK

8 Claims



An adjustable boot buckle, preferably for ski boots, has a tongue member with racks which are received by a clasp having gears which engage the racks of the tongue. The gears are movable to locking and unlocking positions and have a knob for adjusting the tension of the buckle and unlocking the buckle for adjustment.

## 3,729,780 CLAMP

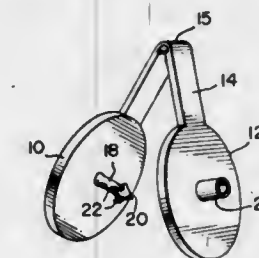
Robert L. White, 15th Michigan Bldg. B-1 No. 8, Joplin, Mo.

Filed July 8, 1971, Ser. No. 160,705

Int. Cl. A44b 9/10, 17/00

U.S. Cl. 24-156

7 Claims



A clamp having discs carried at opposed ends of a foldable connecting strap, one of said discs carrying a projecting pointed penetrating shaft, the other of said discs carrying a shaft receiving sleeve, and interengaging means between the shaft and sleeve to secure the opposed discs in folded clamping position.

## 3,729,781

### SLIDER FOR CONCEALED ZIP FASTENERS

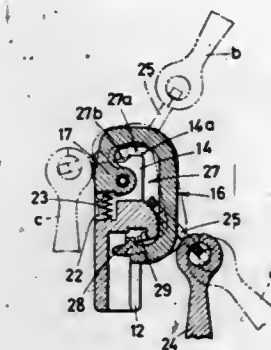
Takeo Fukuroi, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1972, Ser. No. 258,338

Claims priority, application Japan, June 2, 1971, 46/46591  
Int. Cl. A44b 19/30

U.S. Cl. 24-205.14 K

3 Claims



A slider assembly of the automatically locking type is provided for use with a concealed zip fastener and characterized by the provision of means for retaining a pull tab in the back of the slider body against unintentional movement so that the tab is normally concealed from external view.

## 3,729,782

### CLAMP ASSEMBLY WITH TUBULAR SADDLE MEMBER

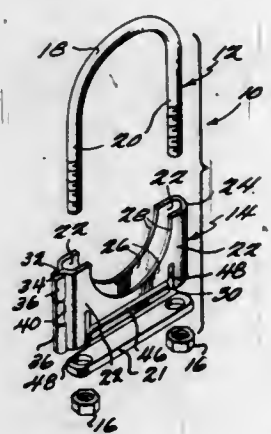
Todd R. Downing, Tinley Park, Ill., assignor to Maremont Corporation, Chicago, Ill.

Filed April 18, 1972, Ser. No. 245,169

Int. Cl. B65d 63/00

U.S. Cl. 24-277

9 Claims



A clamp assembly for effecting a substantially gas-tight connection between the telescoping end portions of two thin-walled tubes, such as exhaust system parts or the like, embodying an improved saddle member in the form of a rigid tubular structure having inwardly open end sections which receive the clamping forces and a central tube engaging section to which the clamping forces are transmitted in a manner similar to the loading of a beam to impart clamping pressure to the tube connection throughout the periphery thereof.



3,729,783

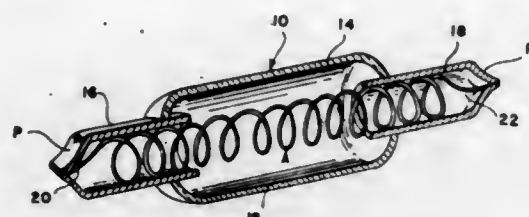
**MINIATURE INCANDESCENT LAMP AND APPARATUS AND METHOD FOR MAKING THE SAME**

Donald J. Belknap, Takoma Park, Md., assignor to Nelson H. Shapiro, Rockville, Md. and Milton M. Field, Alexandria, Va., part interest to each

Division of Ser. No. 760,852, Sept. 19, 1968, Pat. No. 3,578,429. This application May 4, 1971, Ser. No. 140,259  
Int. Cl. H01J 9/18

U.S. Cl. 29—25.13

6 Claims



Microminiature incandescent lamp having a tubular envelope with a glass central section and metal end sections heat-sealed to the central section. The envelope contains a filament coil secured to the end sections by mechanical cold-weld pinch-offs that seal the previously evacuated envelope. Envelopes are formed serially by feeding the components to an assembly station where the end sections are partially inserted into the central section. The resulting assemblies are conveyed to a sealing station where heat is directed only to the metal end regions of the envelope, so that only the end regions of the glass section are deformed in sealing. Filaments are formed and inserted into the envelopes by pulling a length of filament wire through a tubular guide, inserting an envelope over the guide, winding a filament coil from the end of the filament wire projecting from the guide, and then pulling the envelope over the finished filament. The outer diameter of the filament coil is initially greater than the inner diameter of the end sections of the envelope, so that the coil is stretched in length and reduced in diameter when it is drawn into the envelope.

3,729,784

**PROCESS FOR PRODUCING SCULPTURED EFFECTS ON THERMOPLASTIC PILE FABRICS**

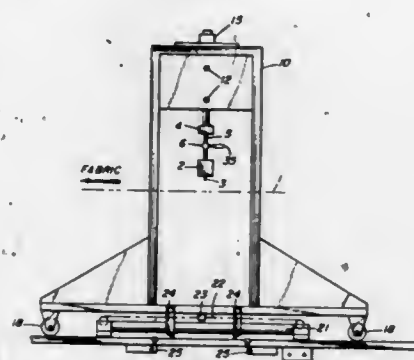
Charles P. Mazzone, Dover, and Herbert J. Pike, Martinsville, both of N.J., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

Division of Ser. No. 864,437, Oct. 7, 1969, Pat. No. 3,613,186. This application May 19, 1971, Ser. No. 144,957

Int. Cl. D06c 23/00, 29/00

U.S. Cl. 26—2 R

6 Claims



A process is described for moving a series of jets in two directions over a fabric, which may also be moving, or in one direction if the fabric motion provides the other, or the jets may be stationary and the fabric moving in one or more directions. The jets are in a heater manifold and individually supplied by connectors having individual micrometric valve adjustments, the heater head being adjacent the jets and the

air and control valves being located where they are not at high temperature. Tilting the jet heads is also described so that the jets may direct hot fluid, such as hot air, at an angle which is adjustable from 90°. The blast of hot fluid from the heated jets softens the nap or pile of the fabric and also bends it down, so that a sculptured effect is produced which resists numerous washings. Typical fabrics are napped acetates and other synthetic fabrics with thermoplastic threads.

**ERRATUM**

For Class 27—3 see:  
Patent No. 3,729,786

3,729,785

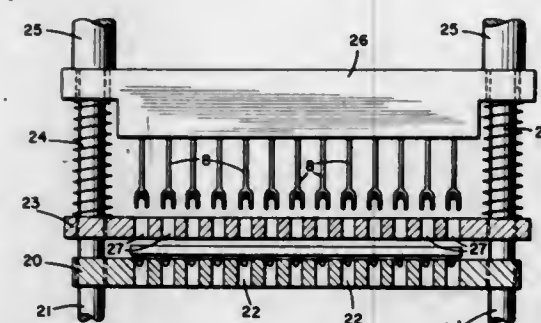
**TEXTILE, WEB NEEDLING DEVICE**

Francois Noel Sommer, Paris, France, assignor to Societe Sommer S.A., Paris, France

Division of Ser. No. 633,073, April 4, 1967, Pat. No. 3,579,763. This application Aug. 7, 1970, Ser. No. 62,090  
Int. Cl. D04h 18/00

U.S. Cl. 28—4 R

2 Claims



A needle loom for producing a napped or tufted surface upon a non-woven textile fabric which includes a movable support for a web of stretchable textile filaments of fibers to be needled said support being provided with a plurality of needle-receiving cavities in the surface thereof, a movable head spaced from said support and provided with a plurality of needles complementary to the needle-receiving cavities in the surface of the support, the needles each having a smooth shaft and at least two terminal points separated by a recess adapted to receive one or more filaments of a web being needled, and means for moving the head relative to the support whereby the needles penetrate the web and enter the complementary cavities.

3,729,786

**CARDBOARD BLANKS AND BOXES FORMED THEREFROM**

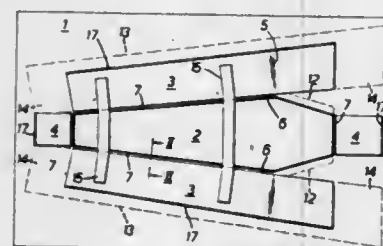
Rowland Trevor Walding, Lobstock, Churcham, Gloucestershire, England

Filed Sept. 8, 1970, Ser. No. 70,087

Int. Cl. A61g 17/00

U.S. Cl. 27—3

1 Claim



A cardboard blank for erection to form a box is of composite form. It comprises a base panel and separate wall panels attached to a backing sheet in the correct relative positions for erection to form the box with adjoining edge regions of the

separate panels appropriately abutting one another. The outline of the backing sheet is such that it projects at the free side edges of the panels to provide portions which lap over adjoining panels when the blank is erected.

**ERRATUM**

For Class 29—25.130 see:  
Patent No. 3,729,783

3,729,787

**METHOD AND APPARATUS FOR MANUFACTURING BEADED FILAMENT-COIL COMPONENTS FOR ELECTRIC LAMPS**

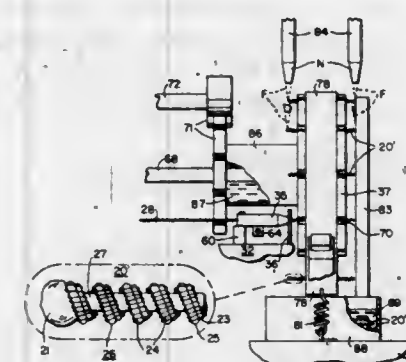
Clair M. Rively, Old Bridge, and James Petro, Little Falls, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 22, 1971, Ser. No. 182,581

Int. Cl. H01J 9/00

U.S. Cl. 29—25.18

13 Claims



The ends of helically-coiled lamp filaments are provided with integral nodules or beads of fused metal which prevent the finished coils from tangling when handled en masse. The beads are formed by mechanically cutting the mandrel-coil composite (stock wire) into segments of uniform length, feeding the segments into a notched circular conveyor means, and indexing the conveyor means relative to a pair of stationary torches so that the flames from the latter melt the ends of the stock wire segments in situ and form the desired nodules of molten metal which then solidify. The unmelted portions of the mandrel are subsequently chemically dissolved from the stock wire segments in the usual fashion — thus providing hollow filament coils of refractory wire that have a fused metal bead at each end.

3,729,788

**APPARATUS FOR ADJUSTING THE ALTITUDE OF A CHORD OF AN EXPANDING ROLL**

Kan Tawa, Takatsuki, Japan, assignor to Yamauchi Rubber Industry Co., Ltd., Osaka, Japan

Filed June 3, 1971, Ser. No. 149,519

Claims priority, application Japan, June 5, 1970, 45/48613

Int. Cl. B21b 13/02

U.S. Cl. 29—116 AD

3 Claims

An apparatus for adjusting the altitude of the chord of an expanding roll comprising:

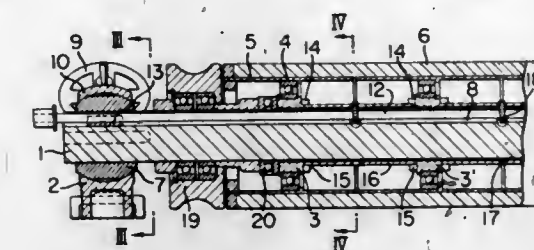
1. a central shaft bent in an arc-shape with the amount of radial deflection increasing successively toward the middle thereof with respect to an imaginary straight line corresponding to the axis of an unbent central shaft,

2. a plurality of eccentric discs or bushes rotatably fitted around said shaft and being spaced lengthwise along the axis thereof, said bushes having their eccentricities increasing successively toward the middle of said shaft,

3. a plurality of sleeves in which said bushes are inserted and are rotatably supported therein by means of intermediate ball bearings,

4. a rubber roll covering said sleeves and integrated therewith to form a single rotatable unit,

5. a plurality of annular coupling members rotatably fitted onto said central shaft and disposed between said bushes and coupled with adjacent bushes,



6. a rod disposed rotatably within a groove extending lengthwise on the periphery of said central shaft and engaged with said annular coupling members in order to rotate same relative to said central shaft,

7. and bearings journaling said central shaft so as to keep it fixed thereto, but, in case of need, to permit it to turn therein.

3,729,789

**METHOD OF REMOVING A BEARING SEAL ASSEMBLY**

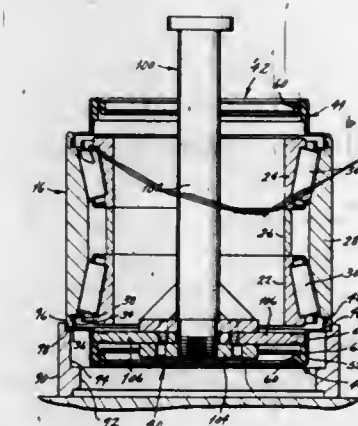
Dennis L. Otto, Malvern, Ohio, assignor to The Timken Company, Canton, Ohio

Filed April 19, 1971, Ser. No. 135,168

Int. Cl. B23p 19/00, 19/02

U.S. Cl. 29—148.4 S

1 Claim



A bearing seal assembly includes a seal case having large and small diameter circumferential walls, a radial connecting wall interconnecting the circumferential walls, and a radial end wall at the outermost end of the small circumferential wall. The free end of the large circumferential wall is press fitted into a socket at the end of a bearing cup so that the small diameter wall projects away from the bearing cup and the bearing cone encircled by that cup. The seal assembly further includes an elastomeric seal having a supporting portion which is bonded to the inner surfaces of the small circumferential wall and the radial end wall. The supporting portion is joined to a seal lip through a web, and that lip engages a wear surface as the cone and cup of the bearing rotate relative to one another. The supporting portion is provided with a shoulder which faces the interior of the bearing and provides a seat against which a removal tool bears for detaching the seal assembly from the bearing cup. The supporting portion is bonded to the seal case for substantial distances on each side of the shoulder so that the removal force does not separate the seal case and the seal.



3,729,790

## ONE-PIECE CHANNEL SHAPED PISTON RING

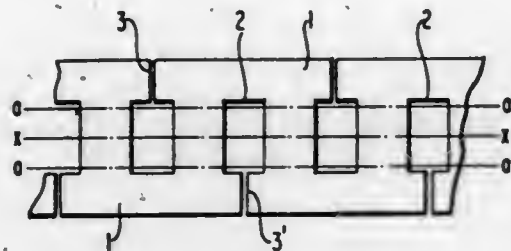
Eisuke Sugahara, Tokyo, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo-to, Japan

Filed Oct. 29, 1970, Ser. No. 85,042

Claims priority, application Japan, Oct. 30, 1969, 44/86454  
Int. Cl. B23p 15/06

U.S. Cl. 29—156.63

3 Claims



A piston ring has an electrolytic Cr plating applied to the surface of the channel shaped steel article prior to slitting by the grinder to form a plurality of lateral slits.

3,729,791

## METHOD OF EFFECTING A PIPE COUPLING

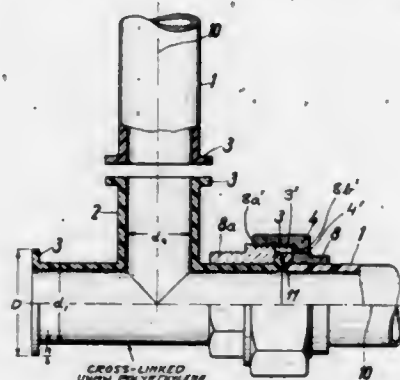
Reiner Theobald, Frankfurt am Main, Germany, assignor to Vereinigte Deutsche Metallwerke AG, Frankfurt am Main, Germany

Filed June 1, 1971, Ser. No. 148,533

Int. Cl. B21d 53/00; B21k 29/00

U.S. Cl. 29—157 R

4 Claims



A synthetic-resin pipe fitting having a plurality of tubular arms, at least one of which is provided with an annular transverse flange, is provided with a coupling ring by heating the flange to a temperature above the crystallite melting point or the glass-transition temperature, and forcing the ring over the flange. The fitting is made from a memory-effect synthetic resin, preferably cross-linked polyethylene, so that upon cooling the flange is restored to its original relatively rigid condition and undeflected configuration.

3,729,792

## METHOD OF MAKING WELDING TIP FOR CUTTING TORCH

Herbert C. Goss, Glenshaw, Pa., assignor to Goss Gas, Inc., Glenshaw, Pa.

Division of Ser. No. 92,792, Nov. 25, 1970, Pat. No. 3,648,934.

This application Nov. 3, 1971, Ser. No. 195,174

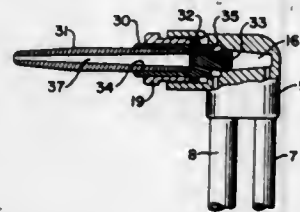
Int. Cl. B21d 53/00

U.S. Cl. 29—157 C

2 Claims

A welding tip for a cutting torch is made by forming a cylindrical head with a central stem at one end and an axial socket in the other end, and a ring of drilled passages extending from inlets around the base of the stem to the inner end of the socket. A solid rod with an inner end portion that will fit snugly in the head socket is drilled to provide it with a single passage lengthwise through it to form a nozzle. This passage is

reamed to taper it from the inner end of the rod substantially to its outer end and to provide the large end of the passage



with a diameter great enough to register with the inner ends of all of the head passages when the nozzle is inserted in the socket and sealed therein.

3,729,793

## METHOD OF CONSTRUCTING A FLUID COOLED COMBUSTION CHAMBER

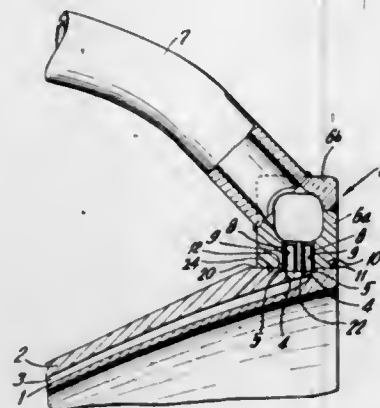
Gunther Schmidt, Ottobrunn-Riemerling; Armin Theiss, Munich; Carl-Helmut Dederra, Ottobrunn, and Leonhard Kaiser, Munich, all of Germany, assignors to Bolkow Gesellschaft mit beschränkter Haftung, Munich, Germany  
Division of Ser. No. 813,677, April 4, 1969, abandoned. This application June 12, 1970, Ser. No. 57,855

Claims priority, application Germany, April 18, 1968, P 17 51 180.7

Int. Cl. B21k 29/00; B23p 15/26

U.S. Cl. 29—157 C

2 Claims



A construction for connecting a plurality of longitudinally extending and circumferentially spaced ducts defined in a wall of a combustion chamber such as a rocket engine nozzle section includes an annular hollow member or ring having a flat connecting wall which is adapted to be abutted against a similar flat wall of the combustion chamber wall to which it is to be associated. The annular member includes an opening for receiving a connecting conduit but before the connecting conduit is applied, one or more bores defined in the annular member and communicating with the interior thereof are aligned with corresponding connecting bores defined in the combustion chamber receiving wall to which the device is to be connected. The connecting bores in the securing wall are provided with steps at the location of the junction of an outer bore of large diameter which corresponds to the diameter of the bores of the annular member and an inner bore of small diameter. After the bores are aligned, tubular connecting elements are inserted through the bores of the annular member and into the bores of the receiving member to engage on the steps. The cooling ducts in the wall of the receiving member are initially formed by filling an inner wall portion with filling material in the outline of the ducts and then forming the outer wall portion thereover and removing the filling material by melting. After the connecting tubes are positioned between the annular member and the receiving member the abutting flat surfaces of the annular member and the receiving member are connected together by applying a solder to the outer

abutting walls along a widened joint portion formed by a notch in the outer annular member. The two parts are then advantageously heated so the solder flows across the entire abutting joint surface between the annular member and the receiving member. Thereafter, the connecting tube is applied to the annular member and suitably secured and sealed in position such as by welding or by soldering.

3,729,794

## FIBERED METAL POWDERS

Richard W. Douglass, Needham, Mass., assignor to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 807,129, March 13, 1969,

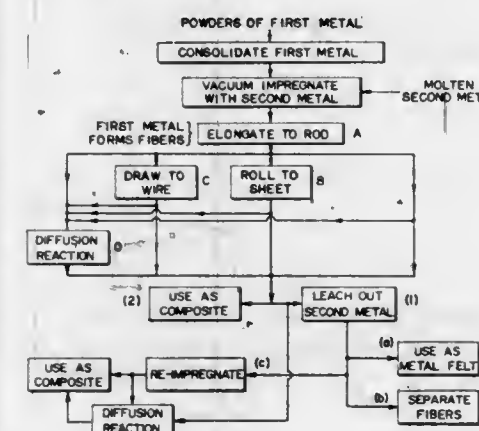
Continuation of Ser. No. 626,773, March 29, 1967,

abandoned. This application Sept. 24, 1970, Ser. No. 74,962

Int. Cl. B22f 7/00

U.S. Cl. 29—182.1

12 Claims



Refractory metal powder compacts are sintered and impregnated with a softer metal. The compacts are reduced to rod, wire or sheet. In the process fine fibers of the metal powder are formed.

3,729,795

## METHOD FOR FORMING METAL WHEELS

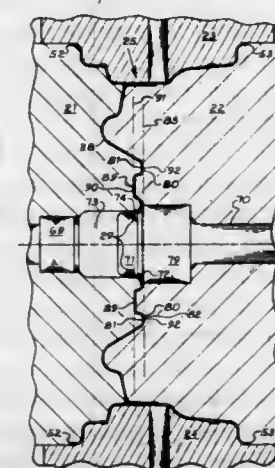
Ralph E. Roper, Indianapolis, Ind., assignor to Wallace Expanding Machines, Inc., Indianapolis, Ind.

Filed May 17, 1971, Ser. No. 144,155

Int. Cl. B21h 1/02; B21k 1/32

U.S. Cl. 29—159.01

12 Claims



A method and apparatus for forming metal wheel assemblies having a rim and attached spider. A pair of outer dies complementary to the final radial form of the wheel rim are moved together to enclose an annular metal workpiece. A pair of horizontally opposed conical dies are then moved interiorly of the outer dies and annular workpiece. Each conical die has an annular stuffing ledge which contacts the edge of the workpiece. Force is then exerted against the workpiece edges so as to plastically regenerate the workpiece between the conical

dies and outer dies; thus, providing thickening of the material in desired areas. A spider extending across the workpiece is axially loaded with the conical dies causing plastic deformation of the spider. A center rod mounted to and projecting from one of the conical dies is concentric with the conical dies and extends through the spider as the spider plastically deforms therearound. A groove formed in one of the conical dies forms a seating ridge in the spider which is defined by a plane perpendicular to the longitudinal axis of the wheel rim. A plurality of seating bosses are formed into the spider by the conical dies.

3,729,796

## CORE ASSEMBLY FIXTURE

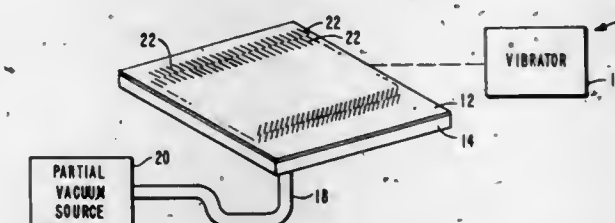
Victor L. Sell, Santa Monica, and Syed M. S. Alvi, Placentia, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed July 26, 1971, Ser. No. 165,982

Int. Cl. H05k 13/04; H01r 43/00

U.S. Cl. 29—203 MM

9 Claims



A core assembly fixture for small toroidal magnetic memory cores includes a cavity plate, a partial vacuum generator connected to maintain a partial vacuum on a bottom side of the cavity plate and a vibrator connected to vibrate the cavity plate. A plurality of contoured core receiving cavities are located on the top side of the cavity with a proper orientation for holding magnetic cores in a desired matrix pattern prior to transfer to a substrate for subsequent wiring. The contoured cavities generally conform to the shape of a core, thereby increasing the amount of material in the cavity plate and permitting very thin separator walls between cavities without damage from vibration. The cavity plate construction is laminated in a fashion enabling manufacture with conventional etching techniques.

3,729,797

## TEMPORARY SUPPORT LUG SYSTEM ON HANGER TUBES FOR ERECTION OF PRESSURE PARTS

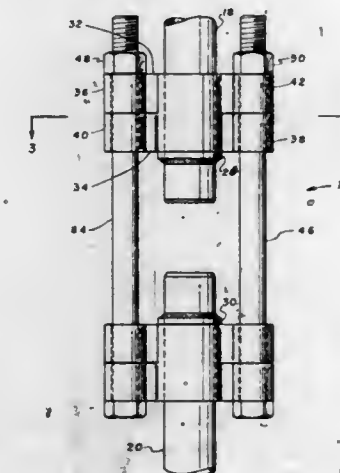
Alwin W. Ambrose, Enfield, and Hersey B. Nelson, West Granby, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed June 11, 1971, Ser. No. 152,320

Int. Cl. B23k 37/04

U.S. Cl. 29—200 P

1 Claim



A temporary support lug system for hanger tubes is provided by means of which tubular heat exchange members can



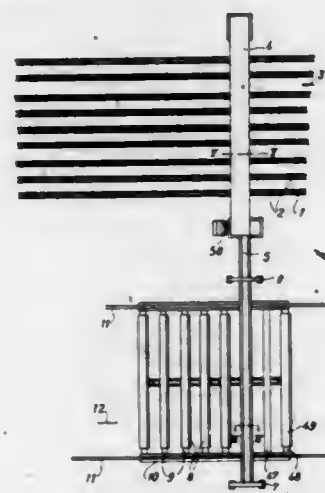
be tied together and held in place within a steam generator before and while the necessary welding is accomplished.

3,729,798

**STEEL SECTION HANDLING MECHANISM**

Bent Ejlersen, Herlev, Denmark, assignor to H. Nielsen & Son Maskinfabrik A/S, Herlev, Denmark  
Continuation-in-part of Ser. No. 107,233, Jan. 18, 1971, abandoned. This application July 22, 1971, Ser. No. 165,305  
Int. Cl. B23p 19/00

U.S. Cl. 29—200 A



A structural steel section handling apparatus for feeding elongated steel sections to a welding machine to be welded to plates. The apparatus includes a traveling crane supported on fixed rails and carrying a plurality of electromagnets arranged in a row and mounted for rotation about a common axis to support the steel sections for transportation in their longitudinal direction to the welding machine and to relate the sections about an axis parallel to the direction of movement.

3,729,799

**BATTERY TESTING AND CRIMPING DEVICE**

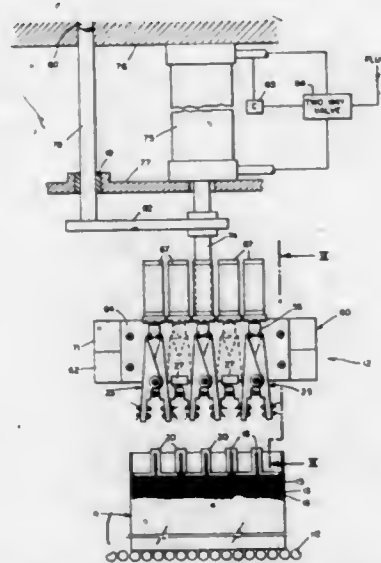
William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed Oct. 21, 1971, Ser. No. 191,249

Int. Cl. H01m 35/18; H01s 4/00

U.S. Cl. 29—204

20 Claims



Batteries having posts that are welded together across cell partitions are mechanically crimped by a novel apparatus that moves crimping jaws into engagement with post portions to engage the cell partitions to prevent release upon inverting the batteries, such crimping being done substantially simultaneously with respect to a plurality or all of the welded posts that

traverse cell partitions, and with these weldments being checked for electrical conductivity, preferably during such crimping operation, as a sequential check, with electrical probes that check the posts for electrical continuity being substantially simultaneously applied to the several posts of a battery.

3,729,800

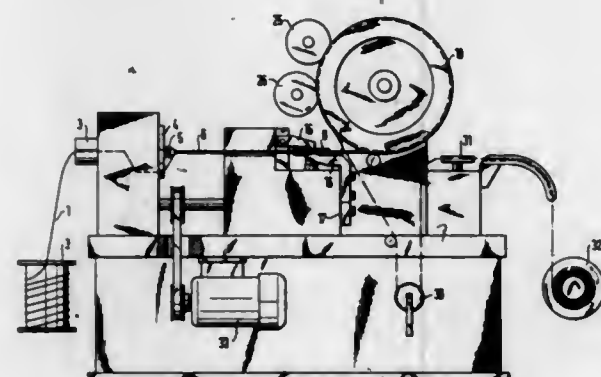
**APPARATUS FOR MANUFACTURING A CONTINUOUS STRINGER FOR A SLIDING CLASP FASTENER**

Ernst Popovitch, Stuttgart-Steckfeld, Germany, assignor to Dr. Karl F. Nagele Feinmaschinenbau, Stuttgart, Germany  
Division of Ser. No. 33,469, April 30, 1970, Pat. No. 3,666,853. This application June 8, 1971, Ser. No. 151,017  
Claims priority, application Germany, May 2, 1969, P 19 22 605.2

Int. Cl. B23p 19/04; B29d 5/00

U.S. Cl. 29—207.5 R

8 Claims



A strand of plastics material is converted into a slide fastener stringer by apparatus including a device for coiling the strand on a mandrel; a pair of wheels toothed according to the desired spacing of the elements in the stringer, the reduced terminating end of the mandrel engaging between the wheels; a braking member in the reception area of the pair of wheels on one side of the mandrel; a heatable shaping wheel having peripheral recesses between radial cross pieces to receive the elements, and pins projecting between the elements to support the element-interconnecting portions of the coiled strand. A kinking disc cooperates with the shaping wheel by means of teeth which face the pins of the shaping wheel and the interconnecting portions supported on the pins and align the same in the longitudinal direction of the stringer.

3,729,801

**NUTPLATE RIVETING DEVICE AND METHOD**

Gerrett W. Gregory, Chula Vista, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed June 18, 1970, Ser. No. 47,541

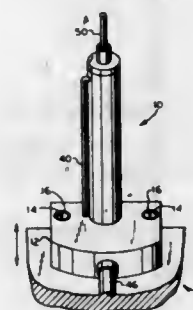
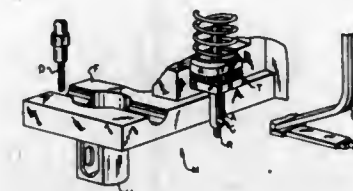
Int. Cl. B23p 11/00

U.S. Cl. 29—243.53

6 Claims

An upstanding housing serves as a lower pressure foot and contains a ram member having a spring loaded pilot pin extending exteriorly above the housing. The pin is adapted to engage in a hole in a nutplate attached to an apertured workpiece by a screw. The pin aligns the hole for drilling and rivet insertion and squeezing. The pin is retractable and becomes

coterminal with the ram member for forming therewith a rivet of metal pipes with glass including positioning glass bulbs in the pipes and, under pressure, preheating the pipes and glass



removed, leaving the nut of the nutplate in proper alignment with the aperture in the workpiece.

3,729,802

**CARBURETOR IDLE LIMITER TOOL**

Edward E. Lorenz, 184 Evergreen Parkway, Oceanside, Calif.

Filed Dec. 21, 1970, Ser. No. 99,733

Int. Cl. B23p 19/04

U.S. Cl. 29—254

1 Claim



A carburetor idle limiter tool for installing and removing carburetor idle limiters in situ in which a tool rod is provided bent in a generally "S" shape having an insertion tool at one end contiguous with the rod and a withdrawal fitting rotatably coupled to the other end of the rod; first and second hammer stops fixedly attached to and carried by the rod intermediate its ends; and a hammer slidably carried by the rod having a key slot therein for sliding past one of the hammer stops for contact with the other hammer stop.

3,729,803

**PROCESS FOR COATING WITH GLASS THE INTERNAL SURFACE OF METAL PIPES**

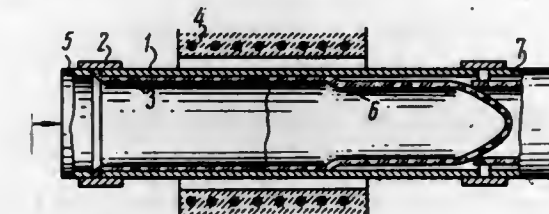
Rafikhat Maksutov, ulitsa Tukseva, 75, kv. 35; Khalim Akhmetovich Anfandiyarov, ulitsa Tukseva, 73, kv. 48; Vasily Fedorovich Pashin, ulitsa Neftyanikov, 5, kv. 6; Yakov Fedorovich Gubarev, ulitsa Gogolya, 51, kv. 8; Rifgat Sulimanovich Sadykov, ulitsa Shevchenko, 57, kv. 39; Albert Musagitovich Akhunov, ulitsa Gogolya, 53, kv. 8; Gadel Galyautdinovich Vakhitov, ulitsa Tukseva, 53-a, kv. 31, all of Bugulma, U.S.S.R., and Boris Fedorovich Efanov, deceased, late of ulitsa Shevchenko, 53, kv. 35, Bugulma, U.S.S.R. (Olga Iosifovna Efanov, administratrix)  
Filed Sept. 12, 1969, Ser. No. 861,217

Int. Cl. B23p 17/00

U.S. Cl. 29—421

1 Claim

A process and installation for coating the internal surfaces



bulbs, and rotating the pipes to effect a uniform coating of the glass over the internal pipe surfaces.

3,729,804

**METHOD OF MAKING A MECHANICAL JOINT**

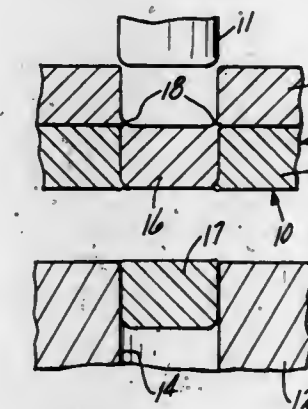
Verne L. Middleton, East Alton, Ill., assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 19, 1970, Ser. No. 64,983

Int. Cl. B23p 11/00

U.S. Cl. 29—432

3 Claims



A method and apparatus for joining two or more sheets of metal together and the composite metal blank and mechanical joint produced thereby. A punch and die apparatus is employed wherein a slug is extruded from a first sheet and embedded in a hole provided in a second sheet by the punching action of the slug. The punch never contacts the die itself and the resulting joint is between the slug from the first sheet and the second sheet in which it is embedded. The slug formed from the second sheet is sheared from the composite. By performing this operation in opposing corners of the two sheets, the sheets are secured together so as to prevent relative motion between them. The invention is particularly applicable to the formation of composite metal blanks having a pattern of stop-weld material sandwiched between the sheets.

3,729,805

**METHOD OF PRODUCING STAINLESS STEEL-LOW CARBON STEEL COMPOSITES**

Richard J. Mollica, Jr., Royal Oak; Joseph E. Hunter, Jr., Rochester, and Kenneth R. Bladzki, Plymouth, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 8, 1971, Ser. No. 196,528

Int. Cl. B23k 31/02

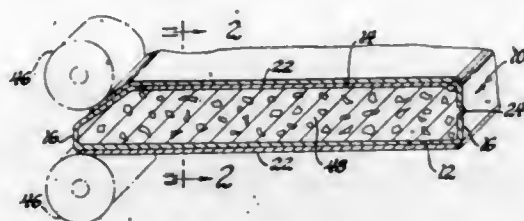
U.S. Cl. 29—471.7

7 Claims

Stainless steel-low carbon steel composite sheets are prepared by welding a sheet of stainless steel to one side of a sheet of low carbon steel, the carbon steel sheet being preferably in the form of a tray, depositing many small pieces of low carbon steel scrap (offal) on the carbon steel sheet in a thick, porous layer of uniform thickness, heating the welded sheets and scrap particles to a temperature of about 2000°F., and passing them through at least one set of rollers to weld the low carbon steel scrap into a fully densified, solid layer including the carbon steel sheet and to weld the carbon steel layer to



the adjoining stainless steel sheet. The resulting product is a flat-rolled composite sheet wherein the relatively thick low



carbon steel portion is simultaneously formed from scrap particles and welded to a thinner stainless steel layer.

3,729,806

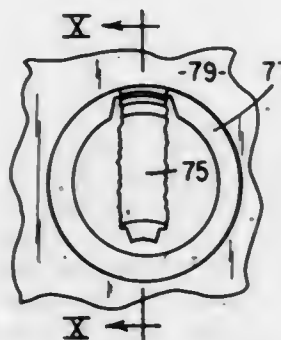
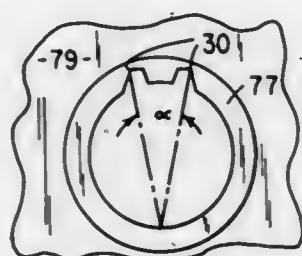
## METHOD FOR TUBE REMOVAL

William B. Bronne, and Harley E. Linthicum, both of Springfield, Ohio, assignors to Carrier Corporation, Syracuse, N.Y. Division of Ser. No. 757,963, Sept. 6, 1968, Pat. No. 3,628,246. This application July 31, 1970, Ser. No. 64,932

Int. Cl. B23p 19/02

U.S. Cl. 29-427

1 Claim



A method and apparatus for relieving the hoop stresses securing a tube in a tube sheet to allow removal of the tube therefrom, the hoop stresses being relieved by removing material from the tube to form two axial slots having a radial depth less than the tube wall thickness and depressing the portion of the tube between the slots to break the portion loose from the remainder of the tube to relieve the hoop stresses therein.

3,729,807

## METHOD OF MAKING THERMO-COMPRESSION-BONDED SEMICONDUCTOR DEVICE

Shohei Fujiwara, Takatsuki, Japan, assignor to Matsushita Electronics Corporation, Kadoma, Osaka Prefecture, Japan

Filed Oct. 29, 1971, Ser. No. 193,956

Claims priority, application Japan, Oct. 30, 1970, 45/96128; Nov. 5, 1970, 45/97672; Nov. 5, 1970, 45/97673; Nov. 7, 1970, 45/98605

Int. Cl. B23k 31/02

U.S. Cl. 29-473.1

5 Claims

In making a semiconductor device comprising a die of silicon, germanium or gallium arsenide, the bonding of the die onto a metal header (i.e., holding member) is made firmly without insertion of a conventional thin gold film

therebetween, by depositing gold onto the bonding face of a slice, which is to be cut into the die, in such a manner that at



least the surface of the deposited layer is gold or an alloy of gold containing small amounts of an additive.

3,729,808

## MILLING CUTTER AND APPARATUS

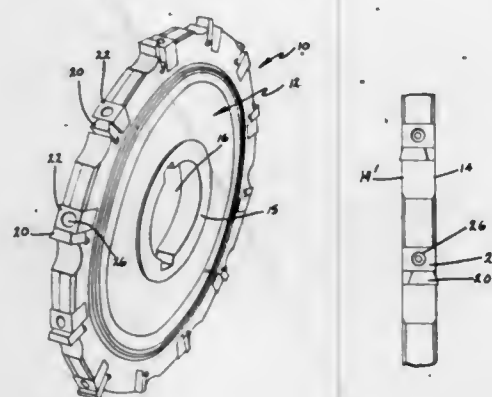
Heinz K. Wolf, and Ralph W. Lacey, both of Farmington, Mich., assignors to Kysor Industrial Corporation, Cadillac, Mich.

Filed July 28, 1971, Ser. No. 166,739

Int. Cl. B26d 1/12

U.S. Cl. 29-105 R

6 Claims



This disclosure relates to milling cutter apparatus employing a cutter body with peripheral slots that extend through the body and receive blade inserts retained normal to the cutter body end faces by wedges, the inserts preferably being positioned by a novel magnetically retained hand gauge, with or without a novel supplemental setting stand.

3,729,809

## NUT PLATE RIVETING DEVICE

Verne E. Vawter, Bonita, and Richard E. Fernandez, San Diego, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Nov. 22, 1971, Ser. No. 200,953

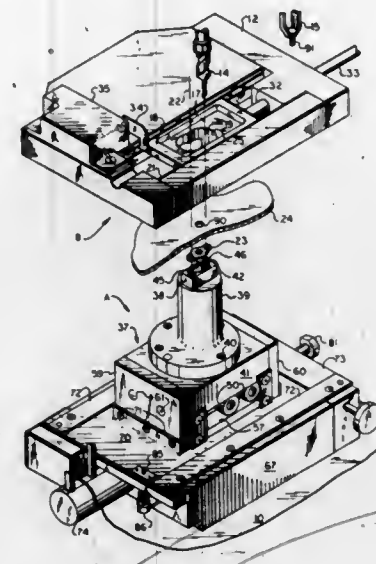
Int. Cl. B23p 11/00

U.S. Cl. 29-243.53

15 Claims

For use with a rivet setting machine of the type having a single working axis, and which first drills a hole for a rivet on the working axis, and then replaces the drill on the working axis with a rivet inserting and squeezing mechanism, a nut plate having a threaded, screw receiving hole, and two rivet receiving holes is clamped to a workpiece with a pre-drilled hole in the work piece in register with the threaded hole in the nut plate. Two spring biased indexing pins enter, respectively, the two rivet holes in the nut plate to thereby index first rivet hole of the nut plate in the working axis of the rivet setting machine. The rivet setting machine is then actuated in a usual manner to drill a rivet hole in the work piece in register with the first hole in the nut plate and to then insert and squeeze a first rivet therein. The mechanism of the present invention then moves the assembly of nut plate, work piece and indexing pins laterally to index the second indexing pin and rivet hole in the nut plate on said working axis. Thereupon the rivet setting machine drills a second rivet hole in the work piece in register with the second rivet hole in the nut plate, and inserts and squeezes the second rivet to complete the nut plate attaching operation. The rivet setting machine and the mechanism of

the present invention then return to starting position ready to repeat the operation. Means are provided on the mechanism of the present invention to measure and adjust the lateral



movement of the mechanism of the present invention between the first and second drilling and rivet setting operations to conform to the spacing between rivet holes in a nut plate to be attached.

3,729,810

## COMPENSATING BASE FOR LEAD-FRAME BONDING

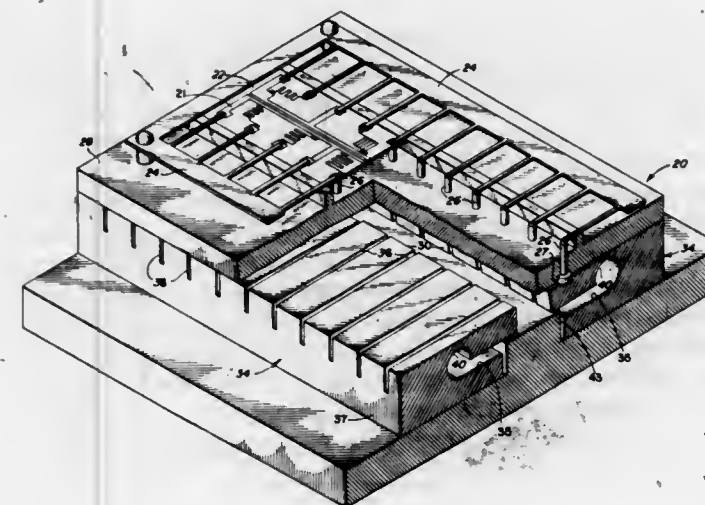
Benjamin Plechocki, Bethlehem, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Dec. 14, 1971, Ser. No. 207,854

Int. Cl. B23k 5/22

U.S. Cl. 29-493

2 Claims



Bonding of lead frames to ceramic substrates is performed on a bonder with a compensating base. The compensating base includes a series of cantilever spring elements attached to a rigid support. The elements are reduced in cross-sectional area near the point of attachment to the rigid support. A free end of each of the spring elements is placed under each point of the substrate to which a lead is to be bonded. The elements accommodate to variations in thickness and waviness of the substrate so that it does not crack during the bonding operation.

3,729,811

## METHODS OF MANUFACTURING A SEMICONDUCTOR DEVICE

Julian Robert Anthony Beale, Reigate, and John Anthony Kerr, East Grinstead, both of England, assignors to U.S. Phillips Corporation, New York, N.Y.

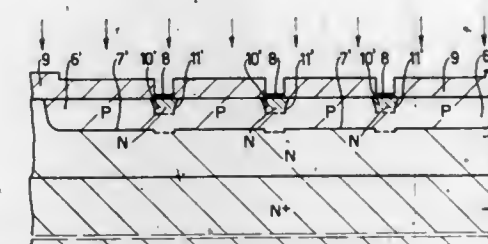
Filed Nov. 30, 1970, Ser. No. 93,555

Claims priority, application Great Britain, Dec. 1, 1969, 58,514/69

Int. Cl. B01j 17/00

U.S. Cl. 29-578

7 Claims



A method of making a semiconductor device is described which combines ion implantation with another process of forming an impurity-containing semiconductor region. In particular, a surface-adjointing region of a semiconductor is formed in such manner that the portion of that region adjacent the surface is formed by a process other than ion implantation, whereas a surface remote or buried portion of that region which defines a P-N junction is formed by ion implantation. This combination of steps yields improved semiconductor devices.

3,729,812

## MANUFACTURE OF THIN-WALLED CONTAINERS

Lindsay Maitland Thomas, Chisworth, England, assignor to Fairey Stainless Limited, Heston, Middlesex, England

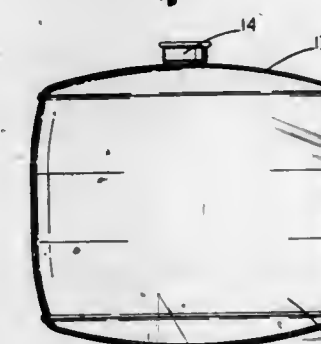
Filed Dec. 2, 1971, Ser. No. 204,250

Claims priority, application Great Britain, Dec. 2, 1970, 57,247/70

Int. Cl. B23k 31/02

U.S. Cl. 29-471.1

20 Claims



Metal containers, particularly for beer, have been made from stainless steel which is compatible with beer or aluminium which is specially coated to make a compatible inner surface. The stainless steel container is expensive when the wall thickness is such as to withstand rough handling and the cheaper aluminium container has a limited life depending on the internal coating. The present invention provides a double wall container of which the inner wall is of thin stainless steel. The invention solves the hitherto insurmountable problems of forming a thin walled inner vessel and expanding it inside an outer vessel so that the resulting inner vessel is without crevices which would otherwise be extremely difficult to clean to meet strict hygiene regulations.



# 3,729,813 METHOD OF FORMING AN IMPREGNATED TEXTILE BOBBIN

James W. Marston, and Percy J. Bolton, both of Campton, N.H., assignors to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Jan. 24, 1972, Ser. No. 220,185  
Int. Cl. B23p 25/00

U.S. Cl. 29—527.2

7 Claims



A process for producing textile bobbins having improved performance characteristics and life properties which comprises impregnating a bobbin blank which is at least in part of greater than final dimensions with a selected impregnant that will cure into a hard non-softening wear-resistant surface, curing the impregnant to form the surface aforesaid and subjecting the cured surface to an abrading operation reducing the oversize part of the bobbin to final dimensions.

3,729,814

## METHOD FOR MAKING A COMPOSITE

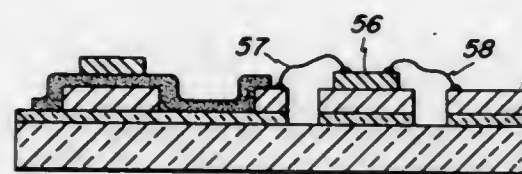
Archibald N. Wright, and Wilfred F. Mathewson, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 822,262, April 1, 1969, Pat. No. 3,619,259, which is a continuation-in-part of Ser. No. 628,447, April 4, 1967, abandoned. This application July 1, 1971, Ser. No. 158,804

Int. Cl. B01j 17/00

U.S. Cl. 29—577

5 Claims



Thin, continuous films can be formed on various substrates by the ultraviolet surface polymerization of the vapor of a N-substituted maleimide or bis-maleimide. The films are useful as coatings on metallic and non-metallic substrates, capacitor dielectrics, insulation for microelectric devices, insulation on electrically conductive wire, and for corrosion protection.

3,729,815

## METHOD FOR INSTALLING MULTIPLES OF DUST COLLECTOR PLATES

Bartholomew F. Quintilian, Baltimore, and Robert J. Williams, Lutherville, both of Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.

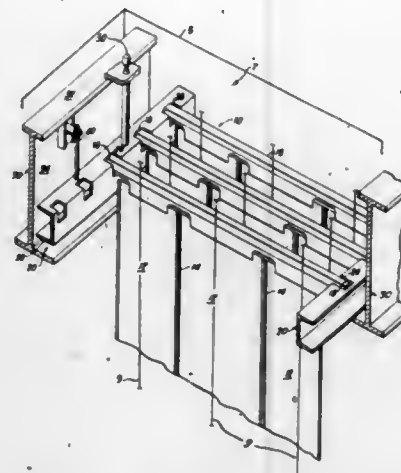
Filed Jan. 25, 1971, Ser. No. 109,323  
Int. Cl. H01s 4/00

U.S. Cl. 29—592

3 Claims

A plurality of dust collector plates are secured together to form a bundle of such plates. The bundle is introduced into the shell of an electrostatic precipitator. Supports are provided within the shell for supporting the secured bundle of plates, prior to installation, and for supporting the plates after

the bundle is unsecured and each plate is installed in its respective position.



3,729,816

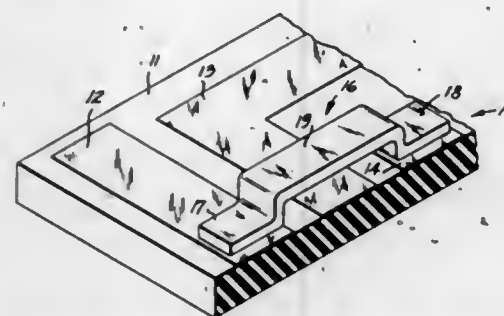
## METHOD OF FORMING A CIRCUIT

John Andrew Burns, New Hope, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Dec. 2, 1971, Ser. No. 203,997  
Int. Cl. B01j 17/00

U.S. Cl. 29—593

22 Claims



An electrical circuit is formed by a process which permits the electrical testing of portions of the circuit during the circuit forming process. One or more temporary crossover members are formed, which may interconnect certain circuit paths, while spanning and not contacting other paths eventually to be interconnected into the circuit. The temporary crossover members are preferably formed, along with any other crossover members and/or electrical components desired, on a carrier member and then transferred onto a dielectric substrate carrying the circuit paths. Electrical testing of the incomplete circuit follows. The circuit is thereafter completed with deformation of the temporary crossover members into electrical contact with the spanned circuit paths and bonding the deformed crossover portions to the spanned paths.

3,729,817

## METHOD OF MAKING ROTATABLE ELEMENT POTENTIOMETER

Joseph R. De Rouen, Banning; Kenneth B. Baldwin, Corona, and Henry F. Martin, Rialto, all of Calif., assignors to Bourns, Inc., Riverside, Calif.

Filed Sept. 23, 1971, Ser. No. 182,997  
Int. Cl. H01c 17/00

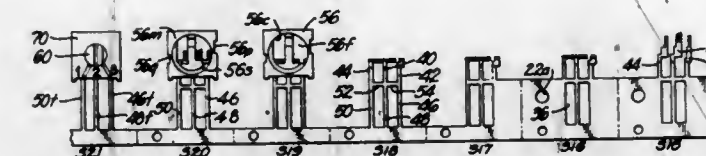
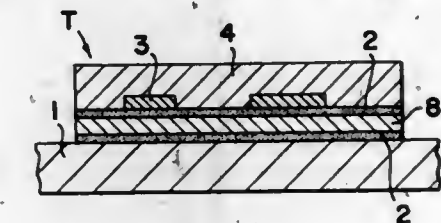
U.S. Cl. 29—610

5 Claims

A method of producing a potentiometer by advancing a long thin sheet of metal progressively through sets of die means at respective stations at which uniformly spaced registry holes are punched, other portions of material are punched out by each of successive die means to remove metal to com-

mence formation of terminal means, an edge portion of the strip is thinned as by spanning to provide for formation of thin work-hardened resilient contact fingers, material removed or formed by additional die means and integral contact leaves and terminals formed, one or more contact members sheared to form at least one multi-finger contact member, the contact members and fingers bent to stand up from the strip, potentiometer housing bodies molded about portions of the strip to

or the like are fabricated by printing a circuit pattern on the base layer and covering same with the carrier layer, removing



provide a body at each station of the strip, the upstanding contact members cupped to form respective sets of contacts, rotatable ceramic members which cermet resistive elements and slip-ring conductor sectors thereon inserted into respective housing bodies, covers applied to the bodies and ultrasonically sealed thereto, and the terminal means freed by shearing from the strip to separate individual potentiometers from the strip; and the product produced by the process.

3,729,818

## SEMICONDUCTIVE CHIP ATTACHMENT MEANS

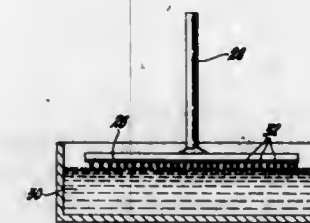
Carl E. Bleil, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 874,516, Nov. 6, 1969. This application Oct. 15, 1971, Ser. No. 189,684

Int. Cl. H01r 9/00

U.S. Cl. 29—630

1 Claim



A method for mounting a semiconductor chip on a substrate, using integral leads, and a method for making the leads. The techniques described are particularly useful in making integral leads on a semiconductor chip which can be flipped onto a complementary conductor network. The leads are preferably formed on the chip while the chip is still part of a slice. The leads are simultaneously formed on the slice by progressive solidification from a melt material, and the slice subsequently diced to form the individual leaded chips.

3,729,819

## METHOD AND DEVICE FOR FABRICATING PRINTED WIRING OR THE LIKE

Isao Horie, Chigusa-ku, Nagoya-shi, Japan, assignor to Nippon Toki Kabushiki Kaisha, Nagoya-shi, Aichi-ken, Japan

Filed Jan. 9, 1970, Ser. No. 1,816  
Int. Cl. B41m 3/08; H05k 3/20

U.S. Cl. 29—625

8 Claims

A transfer device comprises a base layer of paper or the like, an adhesive layer attached to said base layer directly or by means of a thin paper, a conductive pattern or circuit element pattern printed on said adhesive layer and, further, a carrier layer over said pattern. Printed wiring, integrated circuits

the base layer and mounting the circuit pattern and carrier layer on a substrate.

3,729,820

## METHOD FOR MANUFACTURING A PACKAGE OF A SEMICONDUCTOR ELEMENT

Takahiko Itochi, and Tomio Yamada, both of Kodaira, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

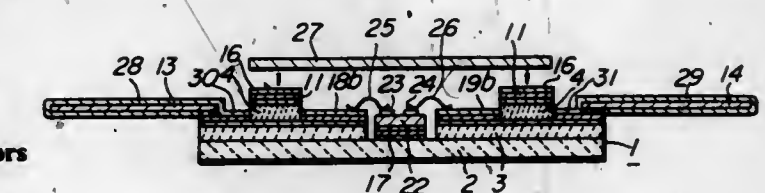
Filed March 6, 1970, Ser. No. 17,207

Claims priority, application Japan, March 12, 1969, 44/18330

Int. Cl. H05k 3/28

U.S. Cl. 29—627

1 Claim



A method of manufacturing a flat package having a casing for accommodating semiconductor elements, in which a conducting lead is adherent to a portion of a metallized layer leading out from the casing to the surface of the package, and the exposed surface of the metallized layer outside the casing is coated with an alloy layer of lead-tin, thereby preventing the corrosion of the metallized layer.

3,729,821

## DRYSHAVER WITH REMOVABLE LONG-HAIR CUTTER ASSEMBLY

Gunter Voigt, Schonberg, Tannus; Norbert Metzger, Schwalbach, Tannus, and Jürgen Golob, Friedrichsdorf, Tannus, all of Germany, assignors to Braun Aktiengesellschaft, Frankfurt, Germany

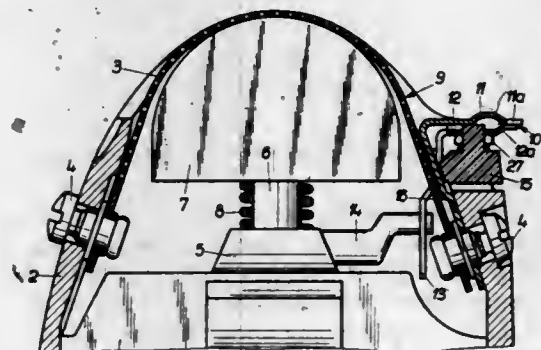
Filed April 22, 1971, Ser. No. 136,320

Claims priority, application Germany, April 24, 1970, P 20 19 978.4

Int. Cl. B26b 19/20

U.S. Cl. 30—34.1

6 Claims



A housing of a dryshaver has a short-hair cutter mounted in it. It further comprises a long-hair trimming unit which is con-



structed as a unitary assembly and includes a support, a stationary and a cooperating movable trimmer blade, mounting means mounting the blades on the support and guiding the movable trimmer blade for movement relative to the stationary trimmer blade, and biasing springs which bias the trimmer blades into engagement. Screws or other securing means detachably secure the trimming unit to the housing means so that it can be secured thereto and removed therefrom as a unit, rather than in form of its individual components.

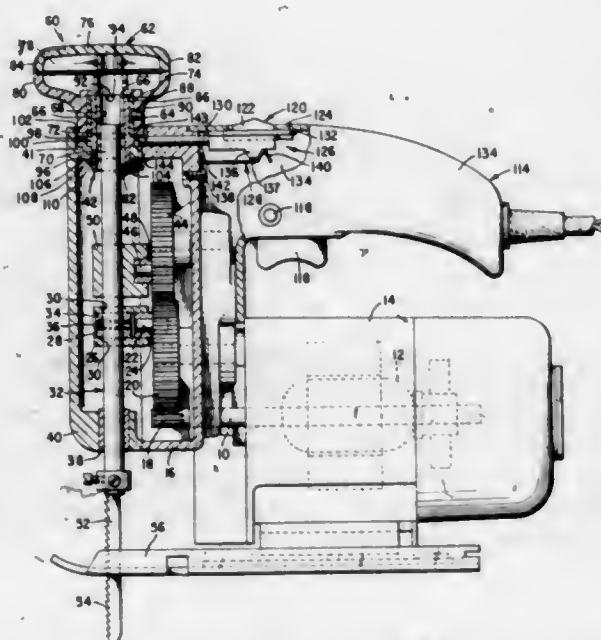
3,729,822

**SABRE SAWS WITH LOCKABLE SWIVEL SAW BARS**  
William A. Batson, Pickens, S.C., assignor to The Singer Company, New York, N.Y.

Filed March 9, 1972, Ser. No. 233,208  
Int. Cl. B27b 19/08

U.S. Cl. 30—394

7 Claims



A sabre saw is provided with means for driving the saw bar in a linear reciprocatory motion from a rotary electric motor, while at the same time, permitting the saw bar to be manually rotated or selectively locked in position about its own axis to set the cutting edge of the saw blade in different angularly oblique positions relative to the line of movement of the tool. A control knob is journaled to rotate within the housing, at the top of the front end thereof. The control knob is coupled to the saw bar by means of an internally slotted saw bar bushing in the control bar which reciprocally receives a pin fixed in the saw bar. Though the saw bar is free to reciprocate within the control knob, turning of the control knob will cause a like turning of the saw bar, so that the control knob determines the angular position of the saw bar. A lock pin is transversely slidable with respect to the control knob, and is actuated by a slide button mounted in the handle of the housing. The lock pin has a tapered tip which will lock or unlock the control knob by engagement with angled slots found in the external flange of the saw bar bushing upon aligning said slot with the lock pin by turning the control knob. The slots are set at convenient angles of cutting. When the lock pin is removed from the slots in the flange, the control bar is in an unlocked position and can be manually manipulated so as to suitably position the cutting edge of the saw blade, as in scroll cutting.

### 3,729,823 RECIPROCATION DRIVE AND COUNTERWEIGHT ARRANGEMENT FOR POWER SAWS

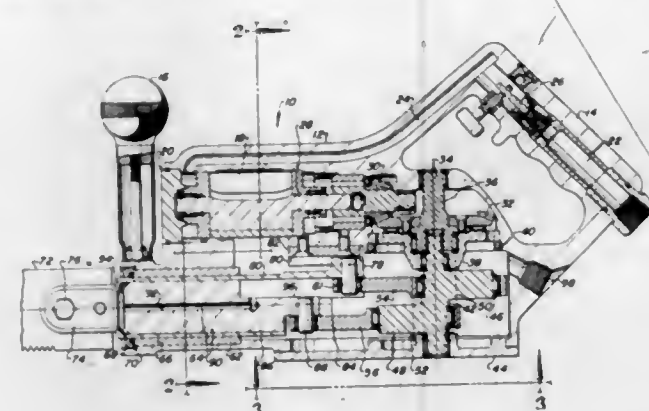
John R. Bos, Grand Haven; Clarence A. Sorensen, Fruitport, and Laurens Van Elzelingen, Grand Haven, all of Mich., assignors to Gardner-Denver Company, Quincy, Ill.

Filed May 5, 1971, Ser. No. 140,391

Int. Cl. B27b 19/04

U.S. Cl. 30—394

5 Claims



A drive arrangement for a portable reciprocating power saw or the like including a crankshaft having a pair of closely spaced opposed crank throws and connecting rods attached to each throw. One connecting rod is connected to a tubular reciprocating blade drive member and the other connecting rod is connected to a cylindrical counterweight slidably housed in telescoping relationship within the tubular blade drive member. The saw blade drive member and counterweight reciprocate in opposite directions along a common axis and the saw blade drive member also serves as a bearing support for the counterweight.

### ERRATUM

For Class 30—391 see:  
Patent No. 3,730,239

3,729,824

### ORTHODONTIC ARCH WIRE

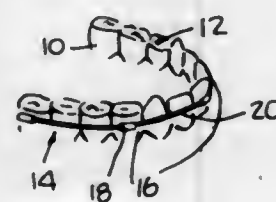
Dietrich Baues, Jackson Heights; Richard Marini, Bellerose, and Donald McCauley, Huntington, all of N.Y., assignors to G.A.C. International, Inc., Farmingdale, L.I., N.Y.

Filed Dec. 7, 1970, Ser. No. 95,699

Int. Cl. A61c 7/00

U.S. Cl. 32—14 A

14 Claims



Orthodontic arch wire comprising three segments of wire twisted together to form a single stranded arch wire with turns which have an angle with the longitudinal axis of the wire of sufficient magnitude but less than 90° and which have a sufficient number of turns per inch of length of wire such that the wire has the characteristics that it does not fray when cut and the segments do not separate when bent at an angle of at least 90° and when the ends thereof are flicked repeatedly. The twisted wire is preferably subjected to precipitation hardening at a temperature of from about 950° to about 975° Fahrenheit to increase its tensile strength. Apparatus for twisting the wire comprises a rotatable chuck and a fixed chuck mounted on a

slidable shaft, each chuck having a pair of posts for forming a continuous length of wire into three spaced substantially equal and parallel segments. Affixed to the end of the slidable shaft is a weight for maintaining the parallel segments of wire under substantially constant tension. A set screw engageable with a V slot in the shaft prevents rotation of the shaft during twisting of the wire but permits rotation thereof after completion of twisting to relieve torsional stresses in the wire built up during the twisting operation. A method of forming the arch wire is also disclosed.

3,729,825

### ORAL IMPLANT

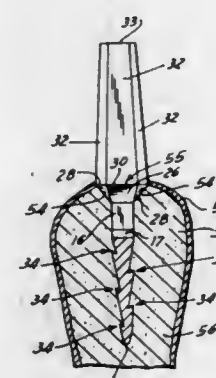
Leonard I. Linkow, Cedarhurst; Charles M. Weiss; Lillian Bishop Weiss, both of New York, and Abram Liwerant, East Meadow, all of N.Y., assignors to Oratronics, Inc., New York, N.Y.

Filed Aug. 2, 1971, Ser. No. 168,129

Int. Cl. A61c 13/00

U.S. Cl. 32—10 A

23 Claims



An oral implant of the vented blade type is disclosed with a series of major improvements. The implant generally comprises a relatively thin vented blade portion adapted to be driven into a groove in the patient's jawbone, a crown supporting head and a neck portion connecting the crown supporting head to the blade portion.

The head is formed in the shape of a truncated pyramid and is provided at its underside with inclined beveled surfaces adapted to securely seat on chamfered surfaces at the mouth of the groove in the ridge crest of the patient's jawbone thereby to provide an automatic limitation on depth of insertion and tremendous increased lateral stability. The head portion is also provided with a plurality of accurately spaced score lines for facilitating measurement of depth of insertion.

The blade portion may take on a variety of contours designed to conform to various anatomical structures encountered and is preferably provided with a series of bone engaging teeth extending parallel to the sharp blade edge. Various blade contours and tooth profiles are disclosed including a preferred staggered tooth arrangement.

3,729,826

### LOCK RING FOR EDGEWISE BRACKET

Peter C. Kesling, Green Acres, La Porte, Ind.

Filed July 16, 1971, Ser. No. 163,313

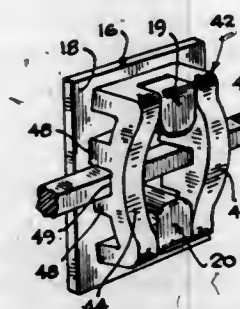
Int. Cl. A61c 7/00

U.S. Cl. 32—14 A

20 Claims

An orthodontic appliance for locking an archwire or archwires to an edgewise orthodontic bracket, and to provide movement control wherein the appliance is in the form of a ring that fits over the projections of the bracket and is locked in place on the projections to lock the archwire in the

archwire slot. Lingual extensions may be provided on the ring for engagement with the archwire to provide mesio-distal



inclination control when using round wire, and additionally labio-lingual control when using rectangular wire.

3,729,827

### CARRIAGE FOR DRAWING DEVICES

Evgeny Mikhailovich Perminov, ulitsa Angarskaya 26, Korpus 1, kv. 10, Minsk, U.S.S.R.

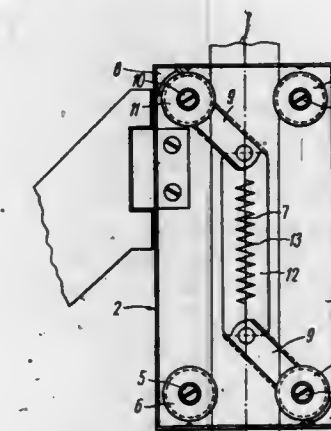
Filed July 22, 1970, Ser. No. 57,130

Claims priority, application U.S.S.R., Aug. 14, 1969, 1358219

Int. Cl. B43l 13/02

U.S. Cl. 33—79 R

2 Claims



A carriage for use with guide means in drawing devices, in which two carrying rollers are mounted on axles stationarily secured to a base for the carriage, and two pressure rollers are mounted on axles secured to slides.

The slides are disposed in slots provided in the base for the carriage at an angle relative to the longitudinal axis of the carriage and interconnected by means of a resilient member whereby the pressure rollers are constantly urged against the carriage guide means to preclude skewing and playing.

3,729,828

### BRICKLAYERS LINE HOLDER

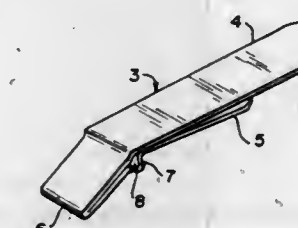
Leo A. McKenzie, 3540 Ridgeway Drive, Bethel Park, Pa.

Filed Oct. 26, 1971, Ser. No. 192,416

Int. Cl. B43l 7/00; E04g 21/18

U.S. Cl. 33—86

3 Claims



A bricklayer's "trig" for holding intermediate portions of a stretched guide line accurately in place so that intervening



bricks of each course may be laid in proper alignment in the same horizontal and vertical planes. The trig is so shaped as to facilitate insertion of an intermediate portion of the line and for positioning the line to correspond exactly to the height of the top surface of the guide brick, also so that a portion of the trig serves as a stop to limit the extent of insertion beyond the front face of the brick.

3,729,829

# DOUBLE CANTILEVER SPLIT-PIN DISPLACEMENT GAGE

Eugene A. Lange, Washington, D.C., and Renald F. Bryner, Oxon Hill, Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 22, 1971, Ser. No. 191,697

Int. Cl. G01b 7/16

U.S. Cl. 33—148 D

3 Claims



This disclosure is directed to a double cantilever split-pin displacement gage for measuring small displacements such as the opening of a crack in a test specimen. The device is provided with two legs of a particular shape to which strain gages and a half section of a split-pin have been secured. The split-pin halves are formed with cylindrical end probes which are inserted into a hole drilled into a test specimen and as the test specimen separates the strain gages will produce an appropriate electrical signal to indicate the displacement of the separation due to movement of the split-pins in the hole.

3,729,830

# STEREOCOPLIER

Theodore J. Blachut, Ottawa, Ontario; Manfred Paulun, Kirk Ferry, Quebec, both of Canada, and Angel Garcia Amaro, Mexico City, Mexico, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

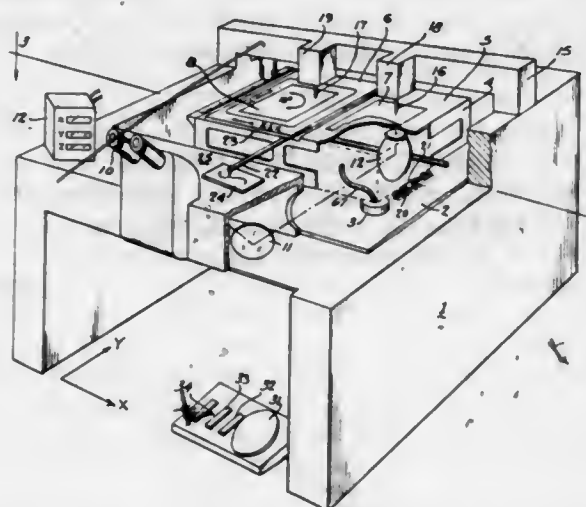
Filed Jan. 18, 1971, Ser. No. 106,995

Claims priority, application Canada, Jan. 19, 1970, 072475

Int. Cl. B43i 13/16

U.S. Cl. 33—20 D

13 Claims



A photogrammetric method and apparatus for the stereoscopic examination and preparation of maps of featured surfaces in which a pair of stereo images is mounted on a carriage and a three dimensional measuring mark can be brought into

conjunction with features on the three dimensional optical model produced from the stereo pair. Marking means are provided so that as the measuring mark means and the optical model are moved relatively to one another, drafting can be carried out on one or both of the stereo image pair. The apparatus can also provide for the recording of co-ordinate data of points on the model moved into conjunction with the measuring mark means.

3,729,831

# PROCESS AND APPARATUS FOR CONTINUOUSLY RELAXING TEXTILE YARNS

Kenzo Kosaka, Chigusa-ku, Nagoya-shi, Aichi-ken; Kiyoshi Adachi, Moriyama-ku, Nagoya-shi, Aichi-ken; Hiroshi Kitagawa, Moriyama-ku, Nagoya-shi, Aichi-ken; Tsuchika Nakamura, Nishi-ku, Nagoya-shi, Aichi-ken, and Osami Kato, Moriyama-ku, Nagoya-shi, Aichi-ken, all of Japan, assignors to Mitsubishi Rayon Company Limited, Tokyo, Japan

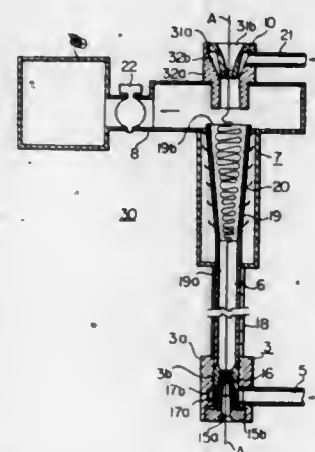
Filed Dec. 7, 1971, Ser. No. 205,677

Claims priority, application Japan, Dec. 7, 1970, 45/107935

Int. Cl. F26b 3/10

U.S. Cl. 34—23

17 Claims



A textile yarn is continuously relaxed during its advance through a relax tube extending along the path of advance of the yarn and an accumulation tube wherein the yarn is accumulated so as to stay therein for a predetermined time by flowing a heating medium through the relax tube and the accumulation tube.

3,729,832

# METHOD OF AND APPARATUS FOR DRYING MOTOR COMPRESSORS

Egon Lund, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

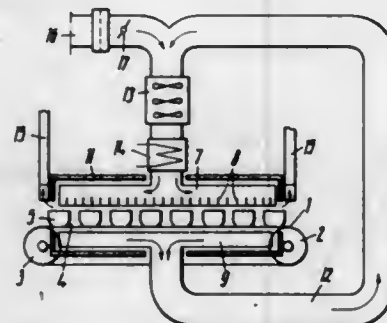
Filed May 12, 1971, Ser. No. 142,554

Claims priority, application Germany, May 5, 1970, P 20 21 948.1

Int. Cl. F26b 3/00

U.S. Cl. 34—34

7 Claims



The invention relates to a method and apparatus for drying motor compressors of the type having a semispherically

shaped casing with a motor compressor unit mounted in the casing. The drying object is achieved by introducing, under pressure, a directed stream (or streams) of a gaseous drying medium into the gap between the wall of the case and the motor compressor unit at several peripheral points and the internal curvature of the casing causes the streams to respectively leave the gap at other peripheral points.

the trailing end of the vane determined with respect to the direction of rotation of the drum.

3,729,835

# SPECIMEN DRYING APPARATUS

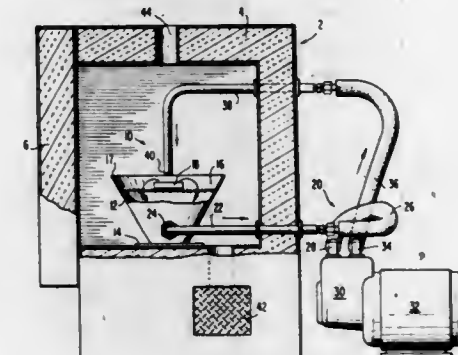
Franklin Louis Massett, 5261 Algiers Drive, Memphis, Tenn.

Filed June 1, 1971, Ser. No. 148,377

Int. Cl. F26b 19/00

U.S. Cl. 34—225

1 Claim



For quantitative determination of water in a specimen of known weight, the specimen is supported in an oven in a manner that air can circulate freely around it. A high velocity stream of hot air is blasted against the sample until the specimen is dried.

3,729,836

# TEACHING APPARATUS

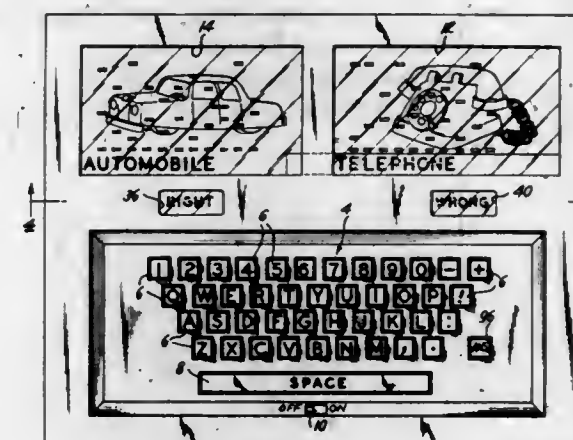
Wataru Mayeda, 1106 S. Wester, Champaign, Ill.

Filed April 10, 1967, Ser. No. 629,716

Int. Cl. G09b 13/00

U.S. Cl. 35—6

11 Claims



A teaching apparatus having a keyboard, each key of which closes a switch; and cards to be fed through the machine, each card having for example a picture and the name of the article depicted, and driving means for stepping the card through a control station, the card having circuit conditioning means operable at the control station to successively condition predetermined circuits to the driving means for completion only by actuation of particular keys corresponding to the successive letters of the name. Masking means conceal those portions of the name approaching the control station and operation of a correct key causes the card to advance one step. The keys must be operated in proper sequence to correctly spell the name and thus advance the card through the machine.

3,729,833

# DRYNESS SENSOR CIRCUIT WITH STATIC ELIMINATING MEANS FOR DRYER

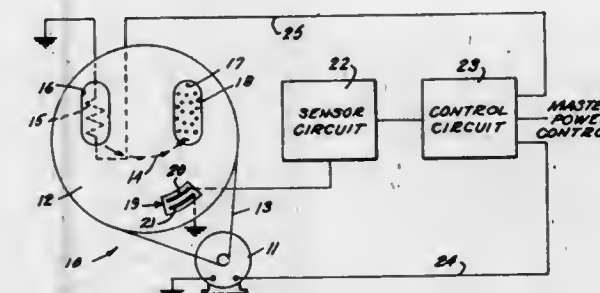
Donald E. Janke, Benton Harbor, and Roque D. Marcade, Stevensville, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 12, 1971, Ser. No. 198,352

Int. Cl. F26b 21/00

U.S. Cl. 34—48

7 Claims



A static suppression circuit is provided for a dryness sensor of a clothes dryer wherein the sensing electrodes of the sensor circuit have connected thereto circuit means which function as a charge source and a charge sink for respective opposite polarities of static signals.

3,729,834

# LAUNDRY DRYER WITH OBLIQUE TUMBLING VANES

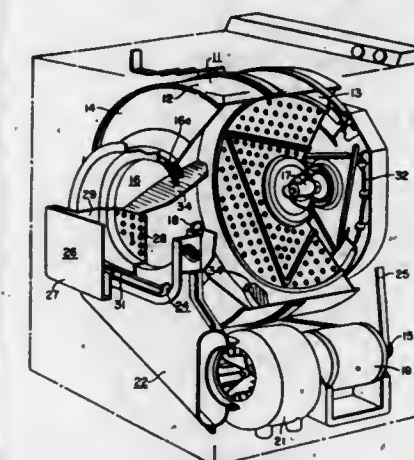
John J. Fox, Lexington, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed April 23, 1971, Ser. No. 136,703

Int. Cl. F26b 11/02

U.S. Cl. 34—139

7 Claims



A laundry dryer is provided having three tumbling vanes generally equidistantly disposed on the internal cylindrical wall of the dryer drum. The vanes are oriented such that they intersect a straight line generatrix of the cylindrical surface of the drum at an angle of approximately 30°, with one of the vanes pivoted about its point of intersection in a direction opposite the two remaining vanes. The vanes in cross-section are generally V-shaped with each leg of the V lying adjacent the internal cylindrical wall of the drum, while the apex of the V is generally rounded and forms an upper surface along the length of the blade. The height of the upper surface is tapered from a maximum at generally the mid-point to a minimum at



3,729,837

## GRAPHICS TEACHING MACHINE

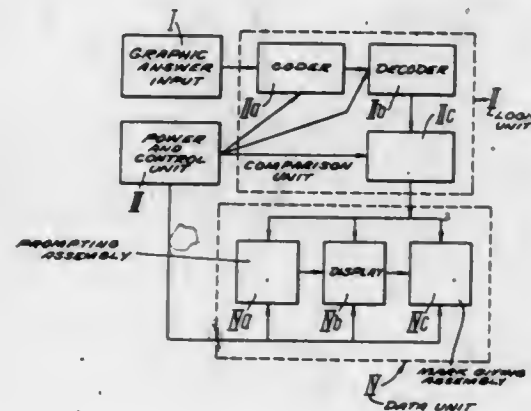
Igor Rafailovich Tarnopolsky, ulitsa Zavookskaya 33, kv. 27, and Gennady Vasilievich Akimov, ulitsa Furmanova 23, both of Frunze, U.S.S.R.

Filed Feb. 23, 1972, Ser. No. 228,703

Int. Cl. G09b 7/00

U.S. Cl. 35-9 R

4 Claims



A graphics teaching machine for teaching a student includes: a graphic answer input device, a logic unit and a data unit interconnected in series, as well as a control unit connected to the logic and data units. The logic unit in turn comprises a coder, a decoder and a comparison assembly interconnected in series, while the data unit comprises a "prompting" assembly, a display and a mark-giving assembly interconnected in series, the input of each of these assemblies being connected to the output of the comparison assembly. The decoder uses an AND-circuit that operates in case the student gives a correct answer, and a delay element resetting this circuit to its original state with certain time delays after its operation.

3,729,838

## EDUCATIONAL AND RECREATIONAL DEVICE

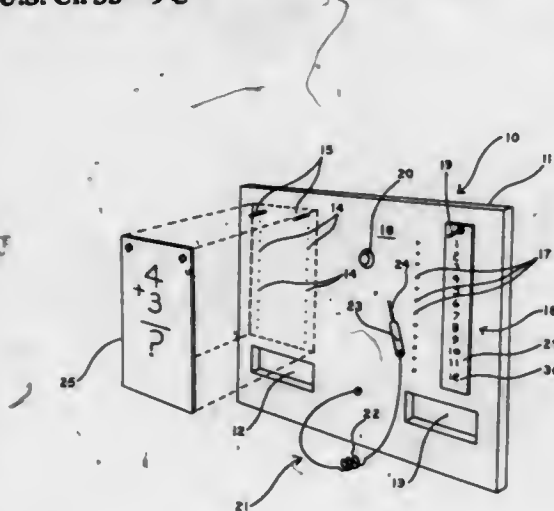
Carolyn Adcock, 3319 Heritage Place, and Troy L. Stewart, 3320 Heritage Place, both of Raleigh, N.C.

Filed Feb. 3, 1971, Ser. No. 112,264

Int. Cl. G09b 7/06

U.S. Cl. 35-9 C

7 Claims



In abstract, a preferred embodiment of this invention is a programmable, comparative response system in the form of an electrically conductive question card and a matched answer card adjacent contact circuit terminals. This system can be used as a teaching aid, a learning aid or a recreational device.

3,729,839

## INSTALLATION FOR TRYING ON WEARING APPAREL AND ACCESSORIES

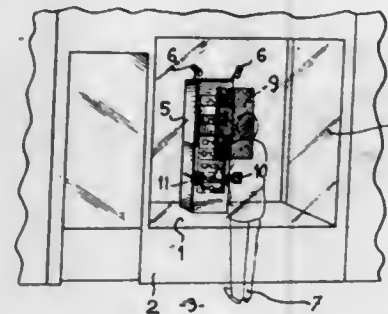
Jean-Claude Bourdier, 22 bis rue Jouffroy, Paris, France

Filed Dec. 30, 1971, Ser. No. 213,969

Int. Cl. G09b 25/00

U.S. Cl. 35-58

16 Claims



The invention relates to an installation enabling an observer to see the image of a part of himself combined successively with a series of articles of wearing apparel or accessories, said installation permitting the observer to try said articles and choose among them without wearing said articles in reality, said installation comprising: a fixed structure carrying a vertical semi-transparent mirror facing the observer, a housing mounted on said fixed structure and opposite the observer with respect to said semi-transparent mirror, said housing having an opened front wall, a sighting frame slidably mounted on said opened front wall of said housing and arranged to be adjustably displaced on a vertical plane, said frame having a window equipped with a guide mark intended to be placed on a level with said part of the observer, and a movable support mounted into said housing at the rear of said sighting frame, said movable support, on which is placed a succession of articles, being actuated by a driving system which causes the articles to appear successively one at a time behind the window of the sighting frame. The invention is applicable, for example, for displaying real articles, such as spectacles, wigs, etc. and in this case, the installation is disposed in the show window of a store.

3,729,840

## BACKLESS CLOG CONSTRUCTION

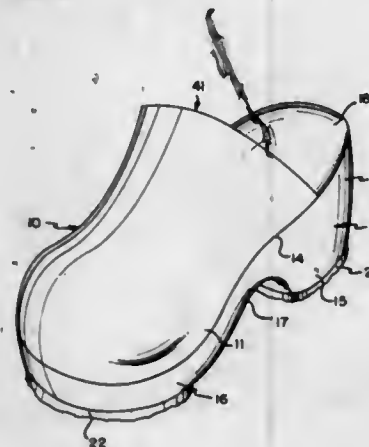
Joseph P. Famolare, Jr., New York, N.Y., assignor to Famolare, Inc., New York, N.Y.

Filed March 3, 1972, Ser. No. 231,505

Int. Cl. A43b

U.S. Cl. 36-2.5 J

21 Claims



A comfortable, backless clog having a specially shaped rigid upper and a rigid lower is disclosed herein. The clog is held comfortably and snugly to the foot of the wearer by a unique arrangement including a foam lining which cooperates with the rigid upper and lower to define a "keyhole" opening into which the skewed foot of the user may be inserted and then rotated to lock the foot securely in the clog. The clog may be

made from wood or plastic and provides a new shoe construction having the appearance of so-called "wooden" shoes, or "Dutch" shoes.

3,729,841  
SKIBOOT

Friedrich Wagner, Rheinstrasse 68, Darmstadt, Germany

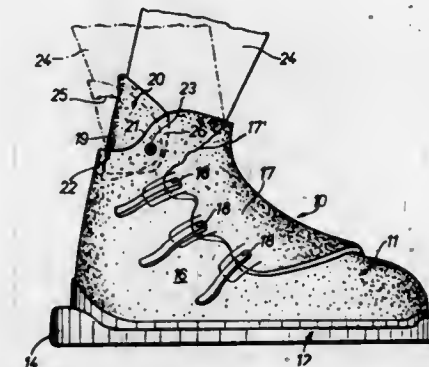
Filed March 22, 1971, Ser. No. 126,403

Claims priority, application Switzerland, April 2, 1970, 4925/70

Int. Cl. A43b

U.S. Cl. 36-2.5 AL

15 Claims



There is disclosed a skiboot of the type possessing a one-piece upper extending at least to the height of the ankle of the user and formed of a flexurally stiff material. According to the invention, the rear portion of the upper edge of the upper is bridged by a flap member destined to flatly bear against the leg of the user, this flap member is pivotably secured to the upper, so that it can pivot about a pivot axis extending transversely with respect to the lengthwise direction of the boot and parallel to the plane of the sole of the boot.

3,729,842

## SKI BOOT

Werner Stelzer, Tuttlingen, Germany, assignor to Messrs. Dr. Justus Ricker & Co., Tuttlingen, Germany

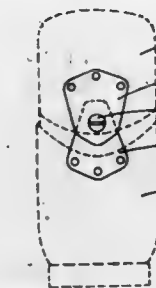
Filed Nov. 9, 1971, Ser. No. 196,957

Claims priority, application Germany, Dec. 1, 1970, P 20 58 969.9

Int. Cl. A43b 00/00

U.S. Cl. 36-2.5 AL

8 Claims



The invention relates to a ski boot in which the neck of the upper is adapted to pivot or bend, in relation to the lower part of the upper about a transverse axis located approximately ankle height, and in which a supporting connection restricted the pivoting motion of the neck is provided between the lower part of the upper and the neck of the upper.

In order to provide, for a ski boot of this kind, a supporting connection which is simple, and therefore inexpensive, permits simple adjustment of the pivoting range, and adapts itself unobtrusively to the line of the ski boot, the invention proposes that plates be attached to the neck and the lower part of the upper, the said plates at least partly covering each other, and being connected together by means of a pin element, the shank of the said pin element exhibiting, in the

vicinity of one of the holes in the plates through which it passes, at least two stop surfaces located at different distances from the centerline of the shank of the pin, the position of the said stop surfaces being variable in relation to the relevant hole.

3,729,843  
SOFT-SOLED FOOTWEAR

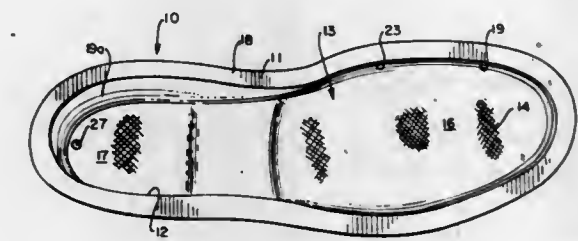
David Greenblatt, 135 Redwood Drive, Roslyn, N.Y., and Allan Greenblatt, 5 Hickory Dr., Great Neck, N.Y.

Filed May 26, 1971, Ser. No. 146,885

Int. Cl. A43b 1/10

U.S. Cl. 36-4

11 Claims



An article of footwear and method and apparatus for making the same are disclosed. The footwear article consists of a unitary upper and an integral one-piece bottom, substantially the same thickness as the upper and preferably formed of injected molded thermoplastic composition. The bottom is provided with an integral upwardly extending peripheral sidewall portion overlying and bonded to a lower portion of the upper. The sidewall portion has an outer surface merging substantially continuously in rounded manner into the tread surface of the bottom. The mold assembly consists of a one-piece cavity mold having an inwardly directed edge formed along at least a portion of the outer periphery of the cavity.

3,729,844

## MULTI-PURPOSE BULLDOZER BLADE

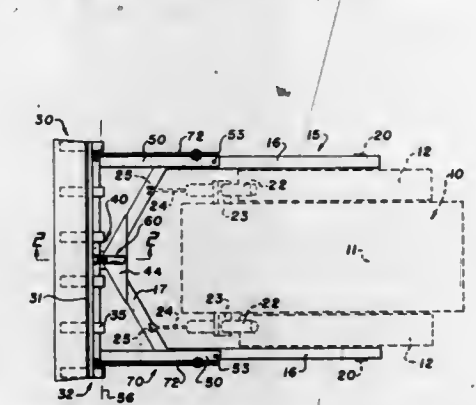
Helmut W. Deglan, 10443-70th Avenue R.R. No. 4, Langley, B.C., Canada

Filed March 11, 1971, Ser. No. 123,355

Int. Cl. E02f 3/76; A01b 63/00

U.S. Cl. 37-117.5

3 Claims



An implement is provided for attachment to the front of an earth moving machine and is supported for rocking movement about a transverse axis and is vertically movable between a substantially ground level position and an elevated position about the machine. The arrangement enables the implement to function as a bulldozer blade, a scraper blade, or a loader bucket. Digging teeth are provided on the implement and a removable plate normally covers the teeth.



3,729,845

**SELF CONTAINED RETAINING MEANS FOR REMOVABLE DIGGING TOOTH**

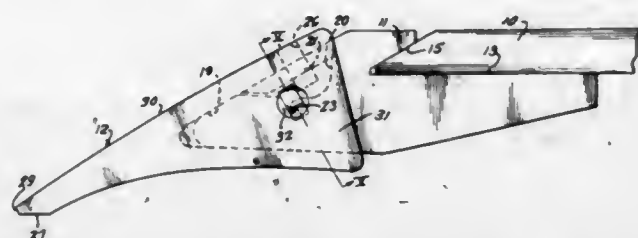
James S. Flippin, Aurora, Ill., assignor to Barber-Greene Company, Aurora, Ill.

Filed March 1, 1971, Ser. No. 119,533

Int. Cl. E02f 9/28

U.S. Cl. 37-142 A

4 Claims



Self contained retaining means for removable digging teeth for digging buckets, wheels and the like. The digging tooth has a hollow interior portion in the form of a socket fitting along the leading end of a shank attached to and extending from the leading edge of a digger bucket. A retainer bar is carried by the shank for movement laterally of the shank and is held in position by a rubber insert in the bar and is retained to the shank when in its locked and release positions. The retainer bar has an upwardly opening slot positionable to register with a projection extending from the digger tooth into the socket. Access to the retainer bar for moving the bar into its locking and releasing positions is provided through the side walls of the tooth, to accommodate movement of the bar to position the slot into and out of alignment with the projection to release or hold the tooth to the shank.

3,729,846

**LAUNDRY FEEDING MACHINE**

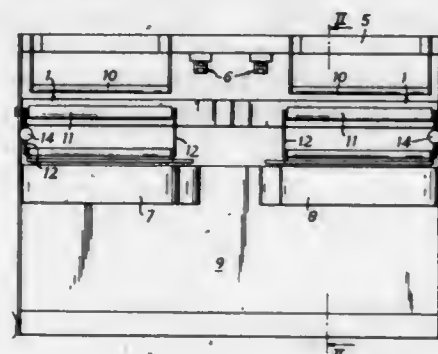
Henry John Weir, Dublin, Ireland, assignor to McGraw-Edison Company, Elgin, Ill.

Filed April 30, 1971, Ser. No. 139,026

Int. Cl. D06f 67/04

U.S. Cl. 38-143

10 Claims



A laundry feeding machine having a conveyor with an upper run which moves in a forward direction, a pair of clamps above the conveyor adapted to grip the tow corners of a leading edge of an article to be fed, means for moving the clamps apart transversely and holding them apart against tension in the leading edge, and air jet means for directing, against an article so held, a forward blast of air such that on release by the clamps the leading part of the article is blown forward on to the conveyor.

3,729,847

**INFLATABLE DISPLAY BANNER**

Laurence R. Chandos, Riverside, Ill., assignor to G. B. Frank Incorporated

Filed Dec. 14, 1970, Ser. No. 97,620

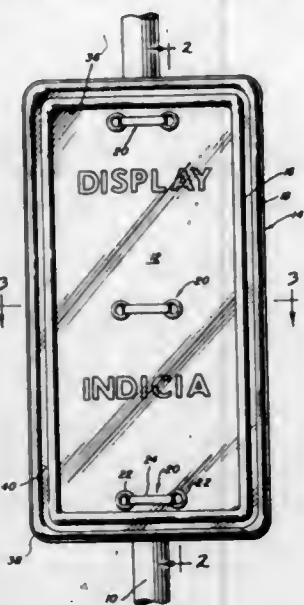
Int. Cl. G09f 7/18

U.S. Cl. 40-125 F

1 Claim

An inflatable display banner that may be collapsed for storage and/or shipment and inflated to display advertising in-

dicia or the like. The banner is comprised of a flexible sheet adapted to receive indicia and a flexible, inflatable tube



secured to the sheet about the periphery of the latter. Securing elements are also provided for securing the inflated banner to a standard.

3,729,848

**HAND GUN AND AMMUNITION THEREFOR**

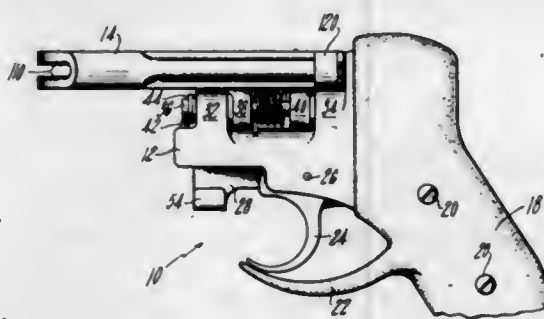
Gary Wilhelm, 55 Kelly Road, Hamden, Conn., and Mark C. Yellin, 46 Fulton Pl., West Hartford, Conn.

Filed Sept. 17, 1970, Ser. No. 73,047

Int. Cl. F41c 9/00, 21/00; F42b 7/04

U.S. Cl. 42-13

22 Claims



A hand gun and a shot-type ammunition cartridge which provides a linear shot pattern. The gun includes a barrel which is pivotally mounted to the gun frame to fold the barrel against the frame for easy storage or for concealment under clothing. The barrel has a specially shaped bore which is oblong in cross section and a fan-shaped muzzle to provide a planar field of fire when a shot-type gun shell is employed. A shell having a special configuration conforming to the shape of the bore cooperates with the barrel in developing an even distribution of shot in a linear shot pattern.

**ERRATUM**

For Class 42-65 see:  
Patent No. 3,729,853

3,729,849

**ICE FISHING APPARATUS FOR SIGNALLING THE BITING OF A FISH**

David D. Richard, 4944 Welcome Avenue North, Crystal, Minn.

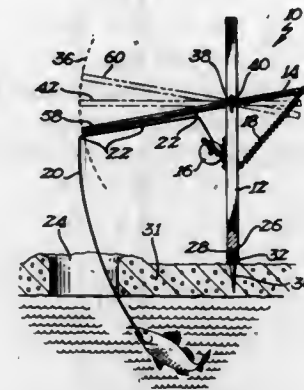
Filed March 4, 1971, Ser. No. 120,812

Int. Cl. A01k 97/12

U.S. Cl. 43-17

An ice fishing apparatus for signaling the biting of a fish, including an upright post with a pole pivotally mounted thereto

and extending therefrom, the pole retained in an equilibrium position by a spring extending between post and pole. A fishing reel is mounted on the apparatus, and fishing line stored thereon passes along the pole and downward into an ice hole. The tugging of a biting fish causes the spring supported pole to oscillate about the equilibrium position along a path thereby



visually signalling the biting of the fish. The reel may be positioned on the post in the path of the pivotally mounted pole so that a strong tug on the line causes the pole to swing toward and bear against the reel thereby retarding the playing out of fishing line by increasing the drag on the line. When the equilibrium position of the pole is horizontal, the pole is substantially unaffected by wind forces acting thereon, assuring that the fisherman is not falsely signalled by pole oscillation generated by the wind.

3,729,850

**FISHING LURE**

John E. Waters, Jr., 1620 West Collins, Orange, Calif.

Filed March 15, 1971, Ser. No. 124,112

Int. Cl. A01k 85/00

U.S. Cl. 43-42.37

10 Claims



A fishing lure of the jig class in which the jig body is weighted, which includes a resilient vane arranged uprightly in a transverse plane behind the jig body and forwardly of the barb, and in which the fishing line attachment point lies above the center of gravity of the lure approximately over its center of gravity to the end that the lure exhibits oscillatory motion rotationally about the hook shank as the lure is drawn through the water. A number of constructional features account for that kind of motion over a wide range of lure velocities. These features include the use of a jig body which is circular in cross-section, a design which is symmetrical about a vertical mid-plane and the use of prescribed dimensional ratios in the several parts.

3,729,851

**LIVE SHRIMP SECURING FISHING LURE**

Gilbert C. Garcia, 163 Tabard Drive, San Antonio, Tex.

Filed Aug. 25, 1971, Ser. No. 174,819

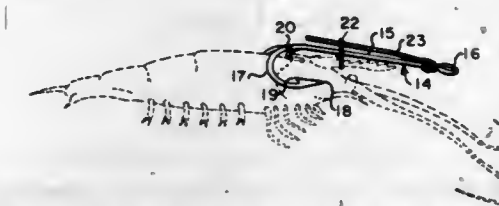
Int. Cl. A01k 83/06

U.S. Cl. 43-44.8

9 Claims

A combined fish hook live shrimp holding device primarily designed as a salt water fishing lure. The device employs a

long shank double or treble hook to which is secured adjacent the bight of the hook a shell grasping member. The device is



further attached to the shrimp by means of a shrimp horn ring that is secured in position by either spring loading or friction or a combination of both.

3,729,852

**RODENT TRAP**

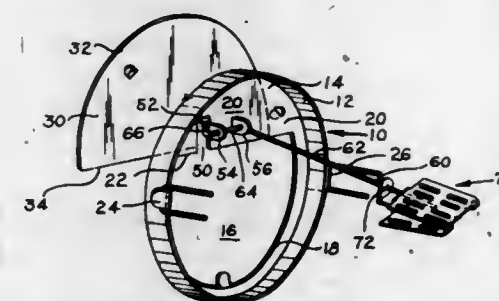
Stannard D. Holmes, Box 331, Naranjito, P.R.

Filed May 14, 1971, Ser. No. 143,442

Int. Cl. A01m 23/18

U.S. Cl. 43-61

4 Claims



An apparatus is provided which is attached to the open end of a container such as an empty tin can to provide a rodent trap. The apparatus comprises a cover having an opening and a closure for the opening which is releasably held in open position on the container by a latch having a release mechanism within the container. When a rodent enters the container it pulls a bait holder tripping the release mechanism, and causing the cover to be moved to a position closing the opening.

3,729,853

**UNDERWATER PISTOL**

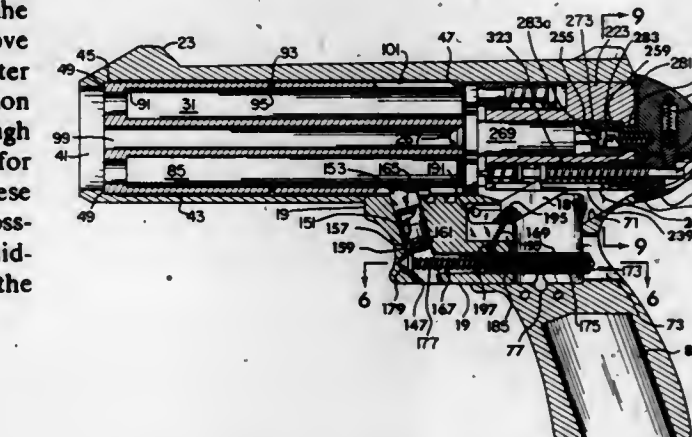
John L. Critcher, Cockeysville, Md., assignor to AAI Corporation, Cockeysville, Md.

Filed Nov. 24, 1967, Ser. No. 688,647

Int. Cl. F41c 1/00, 19/00, 17/00

U.S. Cl. 42-65

12 Claims



A pistol is disclosed which is suitable for underwater use and adapted to fire a cylindrical cartridge with laterally opposite notches formed therein. The cartridges are inserted into a plurality of circumferentially-disposed cartridge-receiving



chambers formed in a cylindrical magazine having an annular slot extending radially into the chambers with a snap retaining ring disposed therein and engaging the notched portion of the cartridges to retain them in the magazine. The cylinder magazine is inserted into a magazine chamber portion formed in the pistol barrel through a longitudinally extending lateral opening.

3,729,854

## LURE RELEASING DEVICE

Kauko K. Satama, Post Office Box 1222, Apache Junction, Ariz.

Filed May 10, 1971, Ser. No. 141,834

Int. Cl. A01k 97/00

U.S. Cl. 43-17.2



A lure releasing mechanism for use with fishing tackle employing a weighted member having a retrieving line attachment means at one end and a plate extending laterally from the weighted member at the other end. A plurality of chains are suspended from the plate with each chain provided with a hook. The plate has a slot for receiving the fishing line and includes means for detachably holding the fishing line therein. The mechanism is lowered along the fishing line to a snagged lure whereby a hook grabs the lure and disengages it from the obstacle when a pull is imposed on the retrieving line.

3,729,855

## APPARATUS FOR SEQUENTIALLY DEPLOYING SPECIMEN COLLECTORS AT SELECTED DEPTHS IN A BODY OF WATER

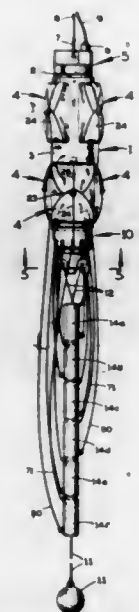
Shale J. Niskin, 9400 S. W. 63 Court, Miami, Fla.

Filed Dec. 9, 1971, Ser. No. 206,365

Int. Cl. A01k 73/02

U.S. Cl. 43-8

6 Claims



An oceanographic apparatus adapted to be submerged from a craft in a body of water by an end weighted cable for retain-

ing a plurality of compacted specimen collectors for sequential release by remote electric control from the surface craft to descend along the cable to a plurality of predetermined distances for electric deployment for each specimen collector at a predetermined depth when the cable and collectors are towed by a craft or held in a current including automatic means for closing each collector to retain collected specimens therein prior to retraction to the surface by the cable.

3,729,856

## HOLDER FOR FISH HOOKS

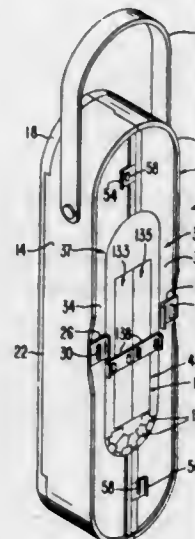
Ludwik Ziemba, 441 Cambridge Avenue, Palo Alto, Calif.

Filed Feb. 2, 1972, Ser. No. 222,812

Int. Cl. A01k 97/06

U.S. Cl. 43-57.5 R

14 Claims



Apparatus for holding a plurality of fish hooks having leaders attached thereto wherein the apparatus includes a pair of hook-holding sections, one section having a central recess for receiving the other sections. Each section has a number of hook mounts for releasably holding fish hooks in fixed positions and means for keeping the leaders of the hooks separated from each other. Each mount includes a base pivotally mounted on a support and a flexible extension rigid to the base and provided with a free outer end for engaging the barb of a fish hook while the remainder of the extension conforms to the shank of the hook. The two sections are disposed in a shell which can be opened to permit access to the outer section, the latter being separated into two parts to permit it to swing away from the inner section and thereby allow access to the latter.

3,729,857

## INSECT ELECTROCUTOR

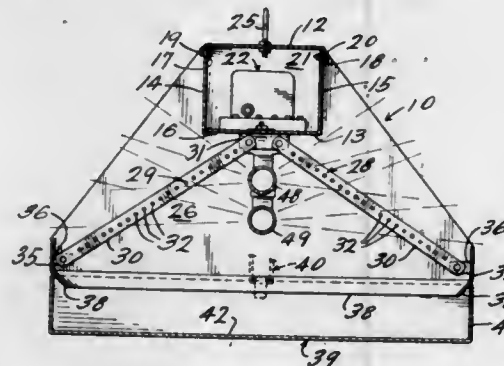
Frank L. Giordano, Stone Mountain, Ga., assignor to Insect-O-Cutor, Inc., Stone Mountain, Ga.

Filed Feb. 23, 1971, Ser. No. 117,944

Int. Cl. A01m 1/22

U.S. Cl. 43-112

8 Claims



The disclosure relates to a flying insect electrocutor including a pair of spaced side panels, and two bottom supports

spaced below the housing and also extending between the side panels. A pair of planar electric grids are positioned between the side panels. The grids diverge outwardly in a downward direction. Black light lamps are positioned within the grids to attract the insects. A collection tray is removably positioned beneath the grids.

3,729,858

## INSECT TRAP

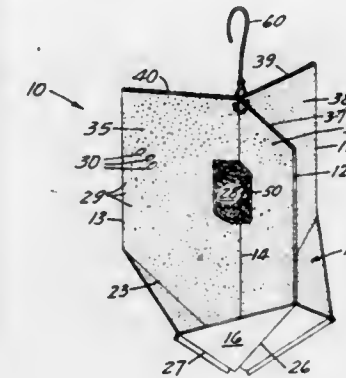
Thomas I. Bradshaw, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing, St. Paul, Minn.

Filed June 15, 1971, Ser. No. 153,223

Int. Cl. A01m 1/14

U.S. Cl. 43-114

4 Claims



A disposable, collapsible, water-resistant insect trap having a high degree of structural stability comprising a suitable flexible material folded into a structure having at least three projecting surfaces radially extending from a central axis and connected at one end by inwardly canted connecting members defining a containing area between said members and said surfaces, thereby exposing a relatively large exposed contact surface area which optionally has thereon an insect attractant and a tacky material to hold insects on said trap after they are attracted thereto.

3,729,859

## GURGling BABY BOTTLE

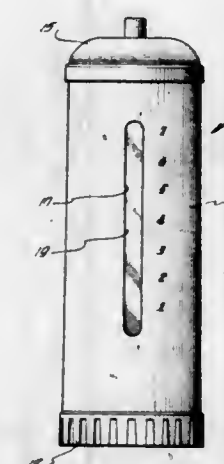
Jay Smith, III, Pacific Palisades; Gerald W. Schmidt, Woodland Hills, and Lawrence T. Jones, Pacific Palisades, all of Calif., assignors to California R & D Center, Pacific Palisades, Calif.

Filed Jan. 11, 1972, Ser. No. 216,996

Int. Cl. A63h 33/00

U.S. Cl. 46-1 D

10 Claims



A toy baby bottle is disclosed which produces a simulated gurgling sound of an emptying bottle and a visual simulation of a lowering liquid level as the bottle empties. The bottle comprises a cylindrical housing having a base plate mounted at the lower end and a nipple cover mounted on the upper end. A

shaft is concentrically located within the housing and extends along the entire length thereof. A vibrating hammer is mounted on the shaft and is axially movable thereon. The hammer comprises a sleeve having a bore formed therein for receiving the shaft. The bore is dimensioned slightly larger than the diameter of the shaft to enable the sleeve to wobble as it slides down the shaft toward the nipple during the inversion of the baby bottle. The hammer further includes a flexible arm extending radially outward from the sleeve with the extremity of the arm having a weighted element mounted thereon. A disc is also mounted on the shaft and is adapted to follow the hammer in its downward travel during the inversion of the baby bottle. The weighted element and arm assembly functions to vibrate as the sleeve is wobbling down the shaft and strike the speaker disc to produce the simulated gurgling sound. The disc is preferably made of rigid styrofoam and the bottom surface coated with aluminum foil to form a reflecting surface. The base plate includes a plurality of apertures formed thereon for admitting light and sound. The light reflecting onto the surface of the disc is emitted through a pair of translucent windows formed in the sides of the housing to simulate the varying liquid level of an emptying bottle.

3,729,860

## CENTRIFUGALLY EXPANSIBLE HULA HOOP

Aloysius S. Kargul, 24 Williams Street, Jewett City, Conn.

Filed April 4, 1972, Ser. No. 240,941

Int. Cl. A63h 33/02

U.S. Cl. 46-47

6 Claims



A circumferentially curved member has its one end portion slidably telescoped in its other end portion and thus forms a closed annulus, the telescoped end portions being relatively slidable with sufficient freedom to permit diametric expansion of the annulus by centrifugal force when the hoop is gyrated by the body of a user. The annulus remains in its expanded position to show its enlargement, more-or-less in relation to the gyrating effort involved in expanding the same.

3,729,861

## MECHANICAL TOY WHEEL

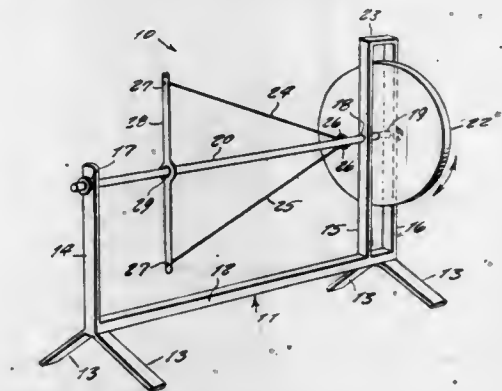
Jack Lemolne, Simmesport, La.

Filed Sept. 20, 1971, Ser. No. 181,833

Int. Cl. A63h 33/40

U.S. Cl. 46-59

1 Claim



An operative toy of mechanical type for providing diversion to a child or person, the device consisting of a frame support-



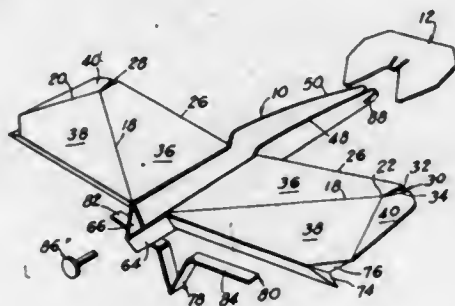
ing a horizontal, freely rotatable shaft upon which there is rigidly attached a wheel or fly wheel, a pair of strings being attached to diametrically opposite sides of the shaft, the opposite ends of the strings each being attached to one end of a pull and recoil bar having a transverse central opening there through so to be fitted upon the shaft so that when the wheel and shaft are rotated, the strings wind up upon the shaft after which subsequently a pull of the bar along the axis of the shaft causes the shaft and wheel to rotate in an opposite direction, the device thus winding up the strings in the opposite direction so that the toy can be continued to operate with the wheel and shaft alternately rotating in opposite directions.

### 3,729,862 TOY GLIDER

Richard S. Halsey, 2593 Riggs Drive, East Point, Ga.  
Filed April 4, 1972, Ser. No. 240,944  
Int. Cl. A63h 27/00

U.S. Cl. 46-79

10 Claims



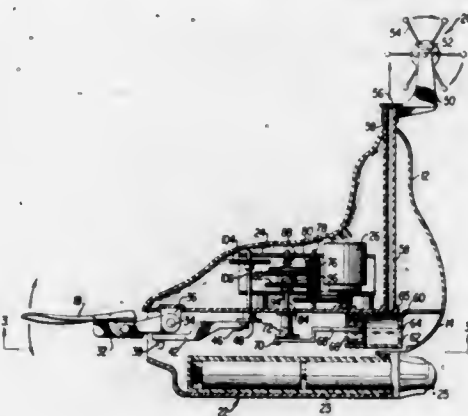
A toy glider having an improved form of wing construction is disclosed. The glider is made from initially flat sheet stock which is expanded polystyrene. In one embodiment the body and wings are integral while in another the body and wing are separate. In each case the semispans of the wing are provided with score lines and V-notches and when in operative form, the edges of the V-notches are held together so as to give washout twist to the semispans. A shape-holding, rigidifying and balance-providing metal strip is employed, being positioned between folded-over strips along the leading edges of the semispans and the body, and the overlying portions thereof.

### 3,729,863 TOY SEAL AMUSEMENT DEVICE

Kiyozumi Asano, Sumida-ku, Tokyo, Japan, assignor to Shinsai Kogyo Co., Ltd., Tokyo, Japan  
Filed March 1, 1972, Ser. No. 230,849  
Int. Cl. A63h 23/10

U.S. Cl. 46-92

5 Claims



The present invention is a toy simulating a circus seal. A flipper is mounted for movement at one end of the casing which is configured as the seal while a moving wheel is positioned adjacent the seal's mouth. A conduit passes downwardly from the seal's mouth to a pump located within

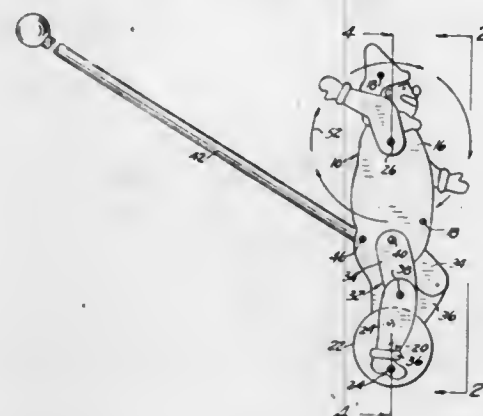
the bottom of the casing. A miniature electric motor powered by batteries is located within the bottom of the casing and is operatively connected to a gear train which sequentially drives the flipper propelling the seal and operates the pump propelling water through the seal's mouth to turn the wheel.

### 3,729,864 ANIMATED PUSH TOY

Joseph E. Welk, 6085 Chopin, Detroit, Mich.  
Filed May 18, 1972, Ser. No. 254,699  
Int. Cl. A63h 13/02

U.S. Cl. 46-105

2 Claims



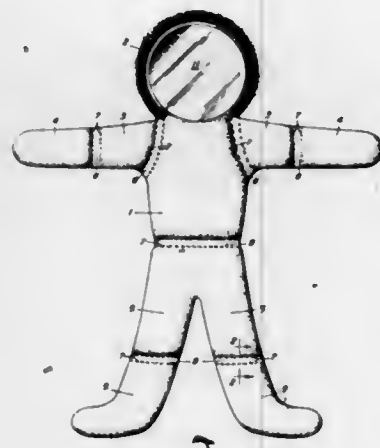
An animated push toy, consisting of an elongated hollow member shaped to resemble a human body, and supported on a wheeled axle. Articulated leg members, pivotally attached to the elongated hollow member, are connected to the wheels by pintles disposed from each other by 180° so as to simulate a pedaling action as the wheels are turned by pushing the toy. Oppositely disposed arms are fixed on a driven shaft rotatably supported in the upper portion of the elongated hollow member. An endless belt in the elongated hollow member drivably connects the drive axle and the driven shaft so as to actuate the arm members as the toy is being pushed on a bearing surface by means of a rod attached to the elongated hollow member.

### 3,729,865 STUFFED, JOINTED DOLL WITH MIRROR FACE

Geraldine R. Naunheim, St. Louis, Mo., assignor to ME Company, St. Louis, Mo.  
Filed Feb. 4, 1971, Ser. No. 112,753  
Int. Cl. A63h 3/02, 3/36

U.S. Cl. 46-116

4 Claims



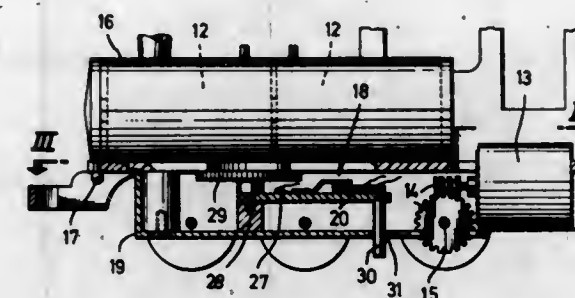
A doll or doll-like container, particularly of the rag doll type, having a mirrored face and jointed appendages, the joints for the appendages being formed by gaps in the filler at location of the joints.

### 3,729,866 TOY RAILROAD VEHICLE AND SWITCHING SECTION

Edwin Faller, and Hermann Faller, both of 7741 Gutenbach, Black Forest, Germany, assignors to Gebr. Faller GmbH Fabrik feiner Modellspielwaren, Black Forest, Germany  
Filed Oct. 18, 1971, Ser. No. 190,124  
Claims priority, application Germany, Oct. 20, 1970, P 20 51 343.3; July 23, 1971, P 21 36 808.1

U.S. Cl. 46-216

16 Claims



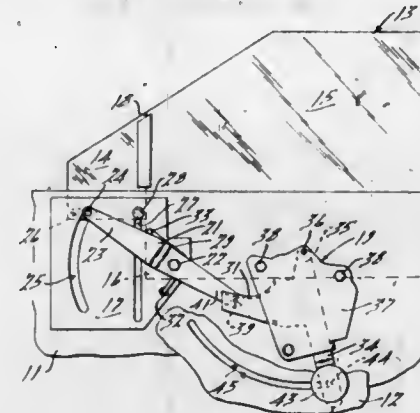
A toy vehicle system, such as a battery powered toy railway, comprises a vehicle adapted to run on a base which guides the vehicle. The vehicle has three travelling states, viz. forward, stop and reverse. The base includes at least one switching section provided with a guide adapted to cooperate with a switching element on the vehicle when the vehicle enters said switching section from either direction. The guide may be set for travel in a selected direction or "stop" and thereby changes over the switching element to correspond to the desired setting unless the switching element is already at that setting when the vehicle enters the switching section. The guide may be movable by means of a lever between three transverse positions corresponding to the three settings, or may be movable between only two of these settings or may have a fixed setting.

### 3,729,867 VEHICLE WINDOW SYSTEM

John A. Boschen, Royal Oak, Mich., and Reid E. Francis, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.  
Filed Sept. 13, 1971, Ser. No. 179,894  
Int. Cl. E05f 11/38

U.S. Cl. 49-98

4 Claims



A vehicle window system for raising and lowering in a window opening in a vehicle body structure a window panel vertically divided into coplanar visibility and ventilation sections. The system includes a window regulator mechanism for vertically moving the ventilation section of the window panel relatively to its visibility section. The window regulator mechanism is characterized in that it comprises a guide bracket supported on the visibility section for directing movement of the ventilation section, arm means carried by the guide bracket supporting and controlling the movement of the

ventilation panel and biasing means normally urging the arm means and, therefore, the ventilation section in a direction of vertical displacement relative to the visibility section. Movement of the ventilation section relative to the visibility section is controlled by a cam member carried on a vehicle body panel. The vehicle body panel forms one wall of the window well receiving the window panel in lowered position.

### 3,729,868 FRAME CONNECTING PIECE

Harold J. Burum, 2441 Sellers Way, Box 156, Sacramento, Calif.  
Filed Nov. 25, 1970, Ser. No. 92,757  
Int. Cl. E05d 13/02

U.S. Cl. 49-420

1 Claim



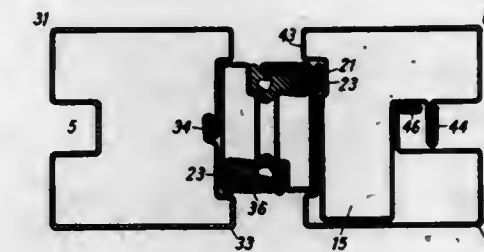
A connector for door frames and the like defined by perpendicular stiles and rails and disposed at corners between them. A central portion of the connector flush with the exterior of the adjacent stiles and rails. Connector extensions are disposed interiorly of the stiles and rails and frictionally connect the stiles and rails to each other to form a rigid door frame. Connecting members are also disclosed which can be placed between aligned sections of a stile or a rail for mounting handles, door locks and the like to the frame.

### 3,729,869 METAL DOOR FRAME

Hans Wenig, Mullerstrasse 2, 58 Hagen/Westphalia, Germany  
Filed Aug. 13, 1970, Ser. No. 63,551  
Claims priority, application Switzerland, Aug. 16, 1969, 12574/69

U.S. Cl. 49-489

16 Claims



This invention relates to metal door frames and is concerned with the problem of simplifying the manufacture of such door frames and, therefore, rendering them less costly to produce. According to the invention metal door jams and wing frames are constructed in the form of special hollow profiles capable of being combined with one another to form boxlike posts so that many different kinds of metal doors can be manufactured using a relatively small number of profiles. In each case a jamb profile and a wing profile has a groove on the sides facing away from each other and, on their adjacent sides,



other grooves the width of which increases with the depth of the grooves, which other grooves receive draught excluding sealing strips.

3,729,870

# METHOD AND ASSEMBLY OF UNIVERSAL JAMB AND TRIM MOLDING

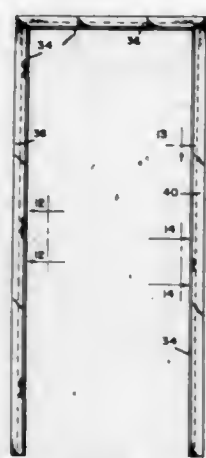
Andrew M. Kvalheim, and Irwin S. Kvalheim, both of P.O. Drawer A, Petaluma, Calif.

Filed June 19, 1970, Ser. No. 47,686

Int. Cl. E06b 1/04

U.S. Cl. 49-504

16 Claims



A multiple use molding assembly, primarily designed as a door jamb or window frame molding, including a central elongate member forming the jamb, and a pair of elongate stock pieces, forming jamb trim, all joined by a decorative laminate so that the trim may be folded about the jamb to accommodate the surface on which the assembly is mounted. The central member may be split, joined by pins, and have a door stop over the split. Rigid clips or flexible straps may join the jamb pieces together. The straps have tension means to anchor the straps firmly. When used as a door jamb assembly, the trim pieces are folded so that the jamb assembly may be inserted into a doorway opening; the trim pieces are then unfolded and nailed or secured into place. The method of making the molding includes rabbeting a shallow groove in a stiff sheet surface, along a folding line, rabbeting a deep groove in the reverse side of the sheet along the same line, applying an adhesively fixed laminate over the shallow groove, and re-rabbeting the deep groove to the shallow groove so that the sheet may be folded.

3,729,871

# ABRASIVE CLEANING

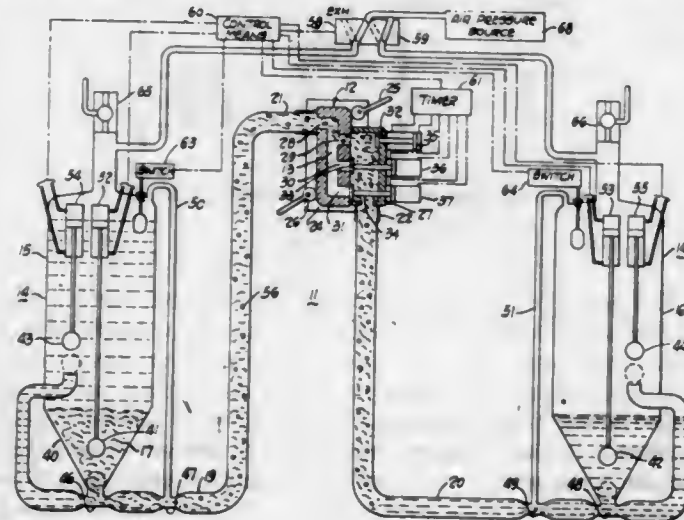
Samuel K. Taylor, Cleveland, Ohio, assignor to Acme-Cleveland Corporation, Cleveland, Ohio

Filed Aug. 5, 1971, Ser. No. 169,261

Int. Cl. B24b 31/00

U.S. Cl. 51-17

31 Claims



Abrasive and a fluid are mixed and supplied from a container to a first part of a workpiece to be cleaned and then

returned to the container means. The abrasive cleaning is accomplished by reversing the flow of the fluid and abrasive mixture to direct the mixture to a second part of the workpiece and the cleaning is also effected by utilizing the mixture of air and a liquid as the fluid carrier of the abrasive. This mixture is used to clean metal castings or to debur machined metal parts. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,729,872

# ABRASIVE DEVICE

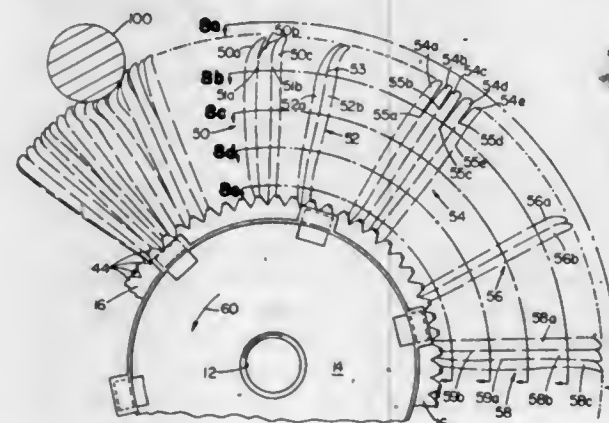
Elisha Winthrop Hall, Jr., Scituate, Mass., assignors to FL & JC Company, Rockland, Mass.

Filed May 5, 1971, Ser. No. 140,451

Int. Cl. B24d 17/00, 11/00

U.S. Cl. 51-358

22 Claims



Rotary abrasive members formed of strip-defining sheet material gathered about a hub and having pre-weakened lines defining a plurality of abrasive strips which at the periphery can separate and conform to the work piece.

3,729,873

# ENDLESS FLEXIBLE ABRASIVE BELT HAVING SOLDERED SEAMS AND A METHOD FOR MAKING SUCH SEAMS

Torsten Wilhelm Sandell, Markaryd, Sweden, assignor to Fabriksaktiebolaget Eka, Markaryd, Sweden

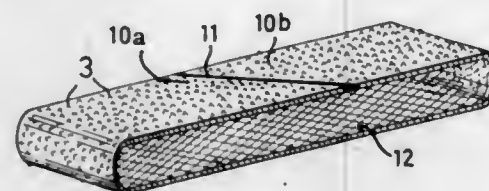
Filed Jan. 14, 1971, Ser. No. 106,458

Claims priority, application Sweden, Jan. 20, 1970, 634

Int. Cl. B24d 11/00

U.S. Cl. 51-399

2 Claims



An endless flexible abrasive belt is made up from one or more pieces of abrasive sheet material. Abrasive sheet material of the kind referred to comprises a flexible backing member of paper or fabric, one side of which is provided with a coating of abrasive grits. The abrasive grits are anchored to the flexible backing member by one or more layers of glue. In order to form an endless belt the piece or pieces have to be joined at a pair of opposite or at successive edges respectively. The joint between abutting edges is made with thermoplastic resin as a solder so as to form a soldered seam the thickness of which is essentially equal to the thickness of the abrasive sheet material. Fiber reinforced or non-reinforced polyamide is a suitable material for the thermoplastic solder, and results in joints having good flexural and tensile strength.

The soldering operation is simple and comprises the fixing of the edges to be joined in spaced or abutting parallel relation

to one another so as to form a narrow channel between the edges and melting thermoplastic resin into the channel to form a solder seam having a thickness which should not exceed the thickness of adjacent portions of the belt, so as to cause no "chatter marks" on a working piece.

3,729,874

# VENTILATED AWNING

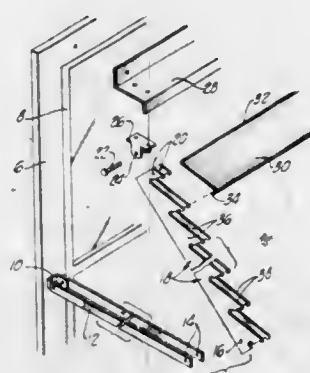
Stanley J. Albany, 9951 Voyager Circle, Huntington Beach, Calif.

Filed Sept. 22, 1969, Ser. No. 859,649

Int. Cl. E04f 10/08

U.S. Cl. 52-78

1 Claim



A louver awning of resilient material wherein each louver has an upwardly rolled upper edge and a downwardly rolled lower edge, the louvers being supported between spaced stringers, the stringers having louver receivers formed in upstanding edges thereof, one receiver being in the form of a curved socket to receive one rolled edge, the other receiver being a curved projection to receive the other rolled louver edge, the louvers being reversible about their longitudinal axes to expose first one side then the other to exterior view, and the louvers being held by their receivers under transverse tension to hold them in place without rattling.

3,729,875

# PREFABRICATED BUILDING

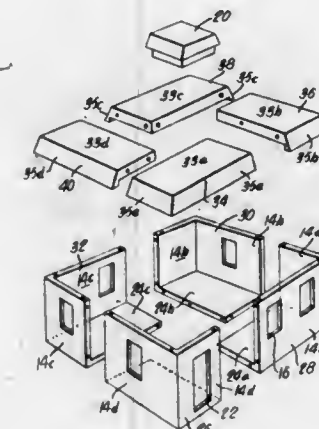
Raymond Felton, 56 Rugby Place, Montreal West, Quebec, Canada

Filed Dec. 17, 1970, Ser. No. 99,023

Int. Cl. E04b 1/348

U.S. Cl. 52-79

7 Claims



A building construction made up of a plurality of interlocking modular sections each section forming part of the floor and wall and/or roof and wall portions.

3,729,876

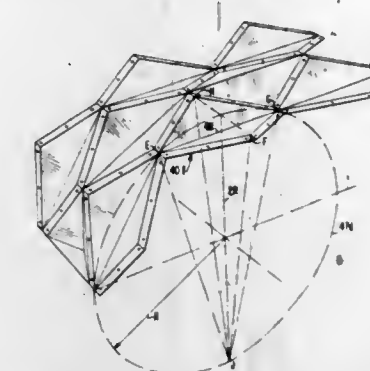
# STRUCTURAL COMPONENT AND STRUCTURES COMPRISING THE SAME

Arpad Kolozsvary, 180 Morris Avenue, Mountain Lakes, N.J. Division of Ser. No. 789,845, Jan. 8, 1969, Pat. No. 3,557,501, which is a continuation-in-part of Ser. No. 537,829, Feb. 28, 1966, abandoned. This application Jan. 25, 1971, Ser. No. 109,169 The portion of the term of this patent subsequent to Jan. 6, 1988, has been disclaimed.

Int. Cl. E04b 1/32, 7/08

U.S. Cl. 52-81

22 Claims



A universal folded plate component for structures, fastening means for joining such components together and structures comprising such components, the components themselves and the fastening means being geometrically designed so that the folded plate components can be connected in precise alignment in either the same or reversed fold position relative to one another to thereby build up structures having all curved configuration, all straight configuration or curved and straight configuration combined and having a variety of different ground plans.

3,729,877

# FOLDING TRUSS

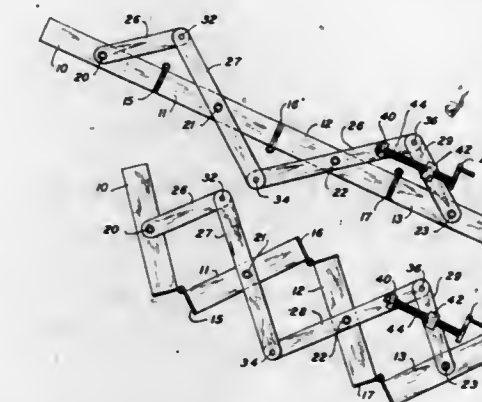
Raymond L. Hall, 19 Hamilton Court, Whippany, N.J.

Filed Sept. 29, 1971, Ser. No. 184,758

Int. Cl. B66f 3/22

U.S. Cl. 52-109-

7 Claims



A folding truss is disclosed wherein the main beam member in a fully opened condition is arranged in a straight line and in a folded condition is disposed to be compacted to lay in an accordion style. The members providing the straight beam are hinged so as to mate and engage each other in an end-to-end arrangement when the beam is fully opened. A series of connected support arms are pivotally mounted on pins secured to the mid-portions of the main beam members. The connected support arms are pivotally connected at their ends to each other and when the main beam members are in the straight line fully opened condition the support members, which are longer than the main beam members, are disposed in a zig-zag pattern which may be about a 30 to 40° angle or slope to the axis of the main straight beam.



3,729,878

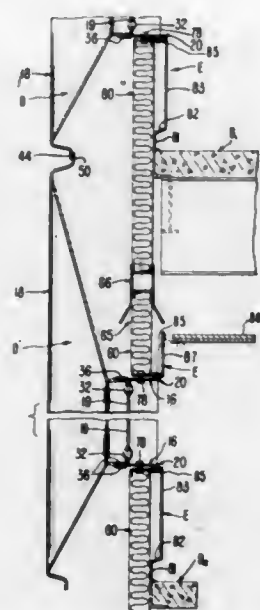
**CURTAIN WALL CONSTRUCTION**

David E. Termohlen, Atherton, and William G. Irvine, Cupertino, both of Calif., assignors to International Environmental Dynamics, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 876,407, Nov. 13, 1969, abandoned. This application June 25, 1971, Ser. No. 156,634  
Int. Cl. E04b 2/88

U.S. Cl. 52—126

4 Claims



A curtain wall construction and process of erecting the construction is provided for a building which has each of its floors constructed at ground level and thereafter raised to the floors respective elevated positions. Modular curtain wall sections are fastened to frameworks attached to the floor edges when each building floor is at ground level. Thereafter, when the floor is raised to its elevated position, the top edge of the framework attached to the elevated floor keys into the bottom edge of the overlying framework attached to the floor above for a sliding engagement and the contiguous edges of the curtain walls overlap one another to provide a continuous weather surface on the exterior of the building. Thus, each floor is completely enclosed upon being raised to its final elevational position.

3,729,879

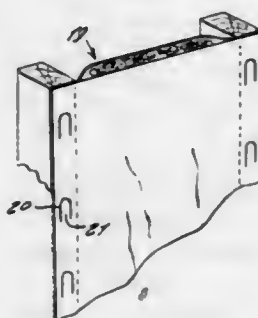
**STICK ON INSULATORS**

Andrew T. Franklin, Togiak, Alaska

Filed Aug. 9, 1971, Ser. No. 170,228  
Int. Cl. E04b 1/88

U.S. Cl. 52—173

1 Claim



An insulation assembly for a building structure and which includes a device for quickly and easily securing the insulation, to wall joists so to eliminate the job of stapling insulation to the joists, the present insulator consisting of soft woolly insulation material such as glass-fiber placed between paper or equivalent sheets which are glued together along their side edges, and these side edges on one outer side of having a pres-

sure sensitive adhesive applied thereto which is covered by a removable protective strip of paper that can be peeled off to expose the adhesive for placements against the wall joists.

3,729,880

**INSULATED WALL CONSTRUCTION**

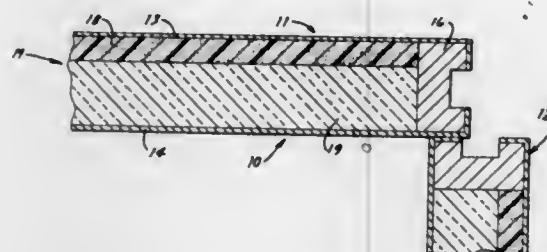
Carlyle R. Eliason, Kalamazoo, Mich., assignor to Eliason Corporation, Kalamazoo, Mich.

Filed Nov. 4, 1971, Ser. No. 195,716

Int. Cl. E04c 2/24

U.S. Cl. 52—232

10 Claims



An improved insulated wall construction, particularly preformed wall panels, having metal outer sheets spaced a predetermined distance apart and having heat insulating material disposed between and completely occupying the space between the metal sheets. The insulating material preferably includes at least a first layer of foamed plastic and a second layer of matted fiber glass positioned in parallel relationship between the spaced metal sidewalls. The layer of fiber glass preferably has an initial uncompressed thickness substantially equal to the spacing between the metal sheets but, during assembly of the panel, is compressed a substantial amount to occupy only a portion of the space between the sheets, the remaining portion of the space being occupied by one or more layers of foamed plastic. The compressed layer of fiber glass will readily expand to substantially completely occupy the space between the metal sheets in the event the foamed plastic layer is destroyed, as by a flash fire.

3,729,881

**CHILDREN'S PLAYHOUSE**

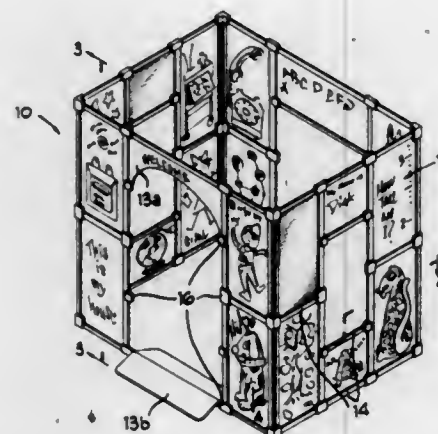
Harry Disko, Park Ridge, Ill., assignor to Marvin Glass and Associates, Chicago, Ill.

Filed April 12, 1971, Ser. No. 133,277

Int. Cl. E04b 2/60; A63h 33/00

U.S. Cl. 52—280

1 Claim



A children's playhouse comprised of interfitting frame and panel members which are easily assembled and disassembled and which may be assembled in different modes to create differing simulated house structures.

3,729,882

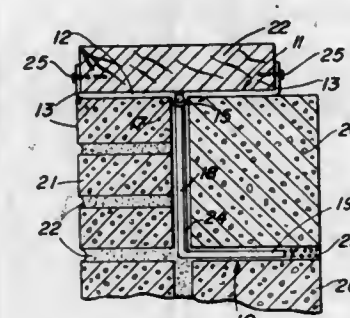
**DEVICE FOR TYING WOODEN MEMBERS TO COMPOSITE BRICK AND MASONRY WALLS**

George E. Allen, 15513 South Dobson Avenue, Dolton, Ill.  
Filed Dec. 28, 1970, Ser. No. 101,596

Int. Cl. E04b 1/38; E04b 12/00

U.S. Cl. 52—300

1 Claim



A device for anchoring and tying a wooden member to masonry wall constructions including a tying member embodying a base plate which is adapted to underlie the wooden member between the latter and the upper surface of a masonry wall construction and having portions which extend upwardly along the sides of the wooden member and are fastened thereto by suitable fastening means, such as nails or the like. The device includes an anchoring member which includes an upper and main body portion which in use is mounted in a transversely extending groove or recess formed in the base plate of the tying member. The anchoring member also includes a vertically extending depending arm portion which in use is anchored in a vertical position in a mortar joint between a tier of bricks and a tier of concrete blocks and the anchoring member also includes a lower end portion which extends angularly from the vertically extending depending arm portion of the anchoring member and in use is anchored in a horizontal position in a mortar joint between two tiers of the concrete blocks.

3,729,883

**DEMOUNTABLE PARTITION ASSEMBLIES AND THE STUDS THEREFOR**

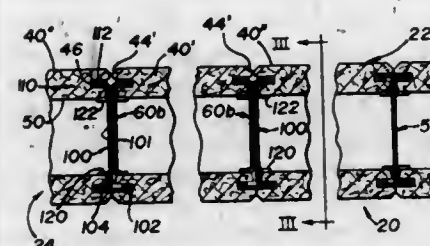
Palmer B. Thompson, La Canada, Calif., assignor to United States Gypsum Company, Chicago, Ill.

Filed April 21, 1971, Ser. No. 136,106

Int. Cl. F04b 2/74

U.S. Cl. 52—481

6 Claims



An improved stud and demountable partition assembly or wall constructed therewith, the stud being characterized by a single partition member interengaging means projecting from one edge, and double partition member interengaging means from the other edge, whereby the wall is constructed progressively up to that stud, leaving the partition member adjacent to the single partition member free of any connection to the improved stud and thereby completely accessible independently from the remaining wall portions.

3,729,884

**ROOF LOCK ASSEMBLY METHOD**

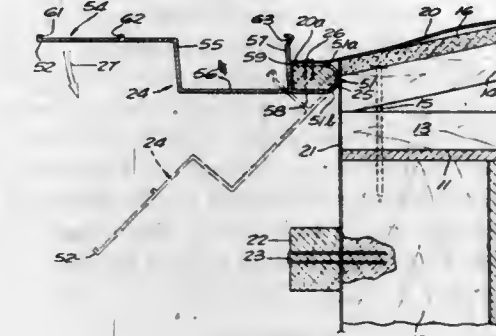
R. S. Dunn, Los Angeles, Calif., and William J. Rife, Phoenix, Ariz., assignors to Neet Products Incorporated, City of Industry, Calif.

Filed June 1, 1971, Ser. No. 148,470

Int. Cl. E04b 7/00, 7/14

U.S. Cl. 52—747

5 Claims



A method of roof construction in which a flexible roof cover sheet is placed over the upper surface of a roof frame and is attached to that upper surface at points spaced inwardly from its outer edge, an elongated roof lock member is positioned adjacent the outer edge of the roof frame, the cover sheet is extended out over the upper surface of the roof lock member, the cover sheet is attached to the upper surface of the roof lock member at various points spaced along the length of the member, the outer longitudinal edge of the member is rotated downwardly so as to stretch the cover sheet in a lateral direction, and then the roof lock member is rigidly fastened in its rotated position so as to maintain the lateral tension in the cover sheet.

Apparatus for carrying out the foregoing method, including a roof lock member which is formed as an aluminum extrusion, the outer surface of one longitudinal edge of the extrusion being rounded to provide a pivotal bearing upon the roof frame edge, and the extrusion being hollow adjacent its rounded edge so as to receive a wooden insert member for purpose of attachment of the cover sheet.

**ERRATA**

For Classes 52—264 thru 52—663 see:  
Patents Nos. 3,729,889 thru 3,729,891

3,729,885

**FLEXIBLE NAIL STRIP AND METHOD OF AND APPARATUS FOR MANUFACTURING THE SAME**

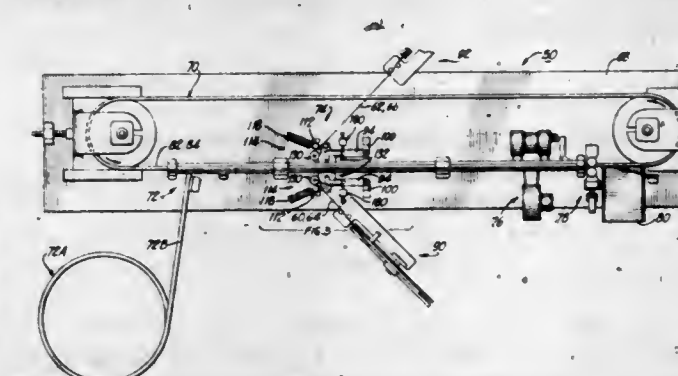
Ronald J. Mosetich, Glen Ellyn, and Joseph Mosetich, Westchester, both of Ill., assignors to Fastener Corporation, Franklin Park, Ill.

Filed Nov. 18, 1970, Ser. No. 90,688

Int. Cl. B65b 13/04, 27/10

U.S. Cl. 53—3

11 Claims



A strip of nails is formed of spaced and parallel nails joined together by two pairs of spaced, flexible tapes and a thin layer



of adhesive. Each pair of tapes is bonded together in face-to-face relation between the nail shanks and bonded or adhered to the nails. Each pair of tapes is provided with a narrow outwardly bowed portion extending along the length of the tapes which fills with adhesive to prevent the adhesive from being squeezed out from between the tapes, to provide an increased mass of adhesive for bonding to the nail shanks, and to provide a small amount of resistance to compression without affecting the ability of the strip to be rolled or folded. The method of making the strip includes the steps of moving the spaced nails along a path, applying a thin layer of adhesive to the inner surfaces of the tapes, deforming the tapes slightly to provide a small longitudinally extending pocket, and forcing the tapes against the nail shanks and each other to form a flexible strip with a longitudinal adhesive-filled cavity or rib between the shanks. The apparatus for carrying out the method uses a pair of tape-applying rollers with spaced axially extending shank receiving openings and a peripherally extending recess into which the tape is drawn by vacuum to form the rib.

3,729,886

**METHOD AND APPARATUS FOR BANDING ARTICLES**

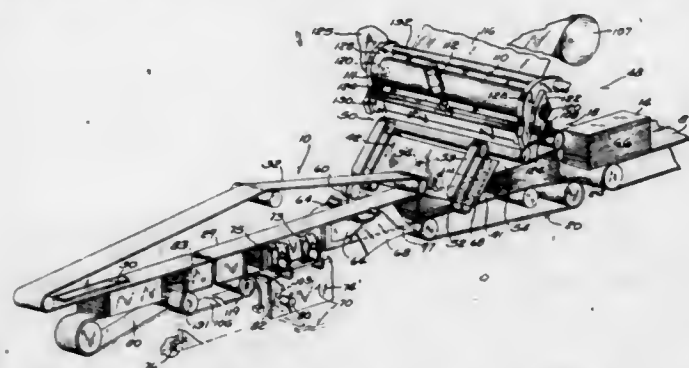
William H. Lucas, Green Bay, and Kenneth G. Jones, De Pere, both of Wis., assignors to LeRoy E. Olsen and Sylvester A. Patrickus, both of Green Bay, Wis., part interest to each

Filed May 17, 1971, Ser. No. 143,783

Int. Cl. B65b 63/02, 13/20

U.S. Cl. 53—24

32 Claims



A method and apparatus for applying restraining bands to layered articles such as a stacks of paper towels in which the apparatus includes upper and lower conveyors with converging runs to compress the stacks prior to application through a band delivery gap between two upper conveyors of pre-cut sheets of banding material to the upper surface of the compressed stacks. The banding sheets are cut from a web by a cut-off knife. The knife and apparatus for feeding the web are controlled by micro switches located in the article feed path which energize driven timing cams which control web feed and the cut-off knife. In addition to applying bands to discrete stacks or articles, a succession of longitudinally spaced bands can be applied to elongated stacks or "logs" such as a bolt of paper toweling of a length corresponding to the web width of the paper supplied to a towel interfolding machine. The log can be subsequently cut between the bands. Novel means are provided to maintain stack compression as the band is wrapped thereabout during continued advance of the stack to a point of discharge.

3,729,887

**APPARATUS FOR FORMING CONTAINERS**

Robert E. Reeves, Indianapolis, Ind., assignor to Inland Container Corporation, Indianapolis, Ind.

Filed Nov. 17, 1970, Ser. No. 90,273

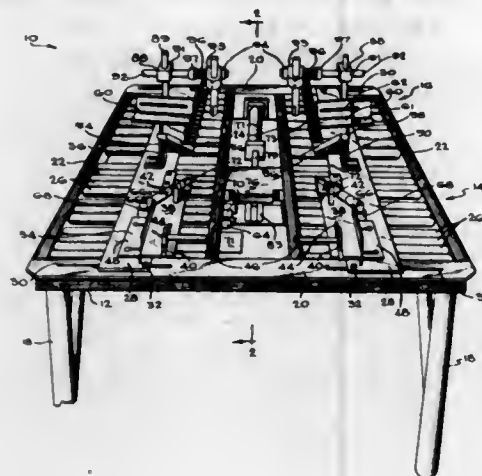
Int. Cl. B65b 43/26

U.S. Cl. 53—194

1 Claim

Apparatus for forming a container from a flat blank includes a forming station having a plurality of camming elements for folding the panels and flaps of the blank into an upwardly open container. The operator manually fills the container in the forming station, and the filled container is slid

horizontally therefrom past a pair of adhesive applicators. The horizontal movement folds closed the remaining flaps of the



end closures as the container is pushed into a compression station where the adhesive sets.

3,729,888

**MACHINE FOR TRANSFERRING MOLDED CHOCOLATE PRODUCTS FROM THEIR SHAPING MOLDS TO PACKING BOXES**

Giovanni Carle, Via Neera 39, Milan, Italy

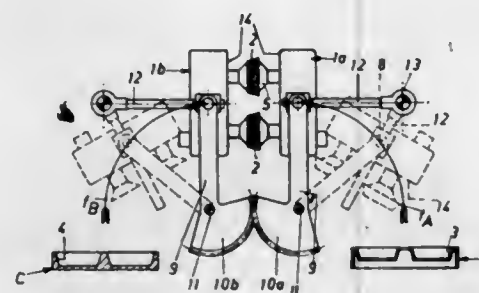
Filed May 10, 1971, Ser. No. 141,702

Claims priority, application Italy, June 20, 1970, 26315 A/70

Int. Cl. B65b 5/08

U.S. Cl. 53—251

10 Claims



A machine for transferring molded chocolate products from their shaping molds to packing boxes, of the type designed to operate between a first conveyor band or the like whereon the molds, coming from the molding plant, are continuously fed, and a second conveyor band or the like, located parallel to, and at the level of said bands. The second band feeds the empty packing boxes. The machine comprises two sets of pneumatically operated, similar members, designed to take-up and to lay down, respectively, the chocolate products only, to which products oppositely directed swinging motions through 90° are imparted in respect of a vertical middle plane, whereby to bring said sets from their horizontal position, above of related conveyor bands, to a vertical position wherein they are confronted with each other, a vacuum distribution being timed in such a manner that the chocolate products are taken-up from the molds, coming from the molding plant on the related conveyor band, by one set of members, then transferred to the other set of members while both sets are confronted with each other, and finally laid down, overturned through 180°, into the packing boxes conveyed by the second band, or directly on to the second band to be conveyed to wrapping equipment.

3,729,889

**MODULAR INSULATED PANEL SYSTEM**

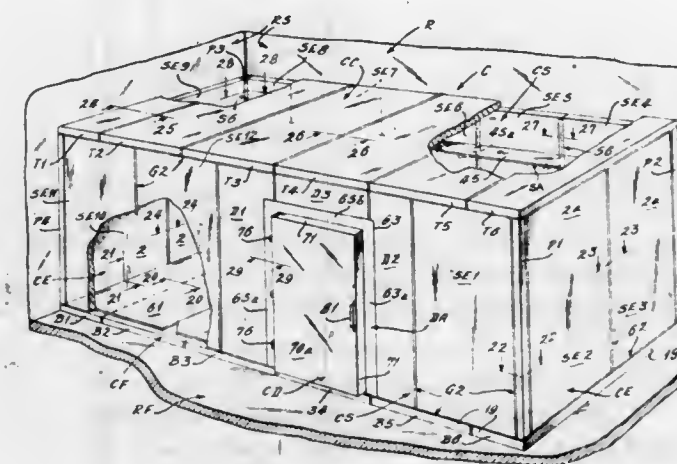
Gino L. Baruzzini, O'Fallon, Mo., assignor to Pet Incorporated, St. Louis, Mo.

Filed Sept. 14, 1970, Ser. No. 71,735

Int. Cl. E04b 1/343, 1/38

U.S. Cl. 52—264

13 Claims



A modular insulated panel system in which a series of panels are assembled together with panel locking and sealing members to form an enclosed insulated space adapted for different environmental conditioning than the contiguous area.

3,729,890

**SHIFTABLE PILLAR WHEEL SUPPORTING DEVICE**

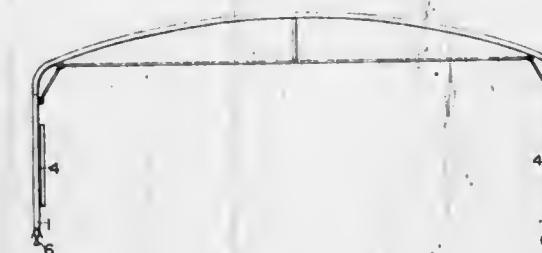
Shigekazu Yamamoto, Osaka, and Yasuo Ito, Nagoya, both of Japan, assignors to Taiyo Kogyo Company Limited, Osaka, Japan

Filed April 22, 1971, Ser. No. 136,540

Int. Cl. E04b 1/36, 1/347; E04b 12/18

U.S. Cl. 52—646

8 Claims



This invention relates to a pillar moving and supporting wheel mechanism provided in a pillar device for shelters wherein the friction with the upper flange of a rail is reduced to make the movement of the pillar smooth and light and to control the lateral sway and upward action of the pillar.

3,729,891

**DECORATIVE OPENWORK PANEL STRUCTURE**

Robert W. Olsen, Chatham, N.J., assignor to Construction Specialties Inc., Cranford, N.J.

Filed Nov. 8, 1971, Ser. No. 196,363

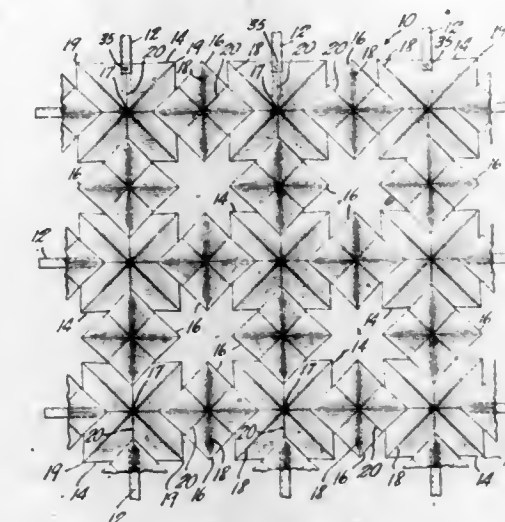
Int. Cl. E04c 2/42; E04f 19/06

U.S. Cl. 52—663

8 Claims

A panel structure has a framework of criss-crossing support members, a primary panel fastened to the framework at each intersection of the support members and a secondary panel fastened to each pair of adjacent primary panels. Portions of each secondary panel overlap a portion of the pair of adjacent

primary panels to which the secondary panel is fastened, so that the fasteners which are used to secure the primary panels



to the support members are concealed by the secondary panels.

3,729,892

**METHOD AND A DEVICE FOR MANUFACTURING A PACKAGE CONTAINING A PLURALITY OF EAR-PLUGS**

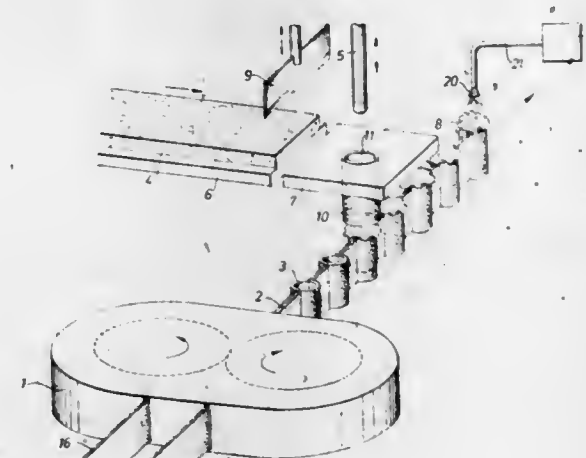
Bert Ake Aslund, Halsingborg, and Alf Harald Liljeqvist, Mjohult, both of Sweden, assignors to Gullfiber AB, Sweden

Filed Nov. 9, 1970, Ser. No. 87,699

Int. Cl. B65b 43/08

U.S. Cl. 53—23

15 Claims



The invention relates to the manufacture of a package containing a plurality of ear-plugs. Pieces of mineral fiber felt are successively by means of a plunger pressed through a hole of a mould down into the sleeves of a sleeve band fed below the mould.

3,729,893

**CHAIR PACK**

Paul D. Bobb, High Point, N.C., assignor to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 886,531, Dec. 19, 1969. This application

June 25, 1971, Ser. No. 157,013

Int. Cl. B65b 53/00

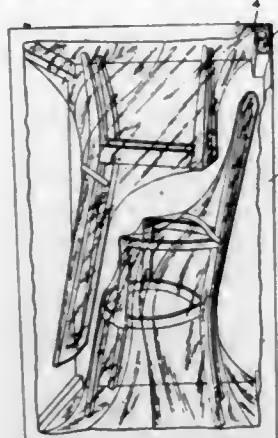
U.S. Cl. 53—27

2 Claims

A chair pack is provided for the shipping of two chairs within one carton. Each individual chair is fastened by a heat-shrinkable film to a piece of rigid corrugated fiberboard. The



fiberboard is then fastened to the end of a carton to hold the fiberboard and chair in place. The fastening of a chair at each



end of the carton with the proper orientation of the chair backs provides a chair pack with two chairs therein.

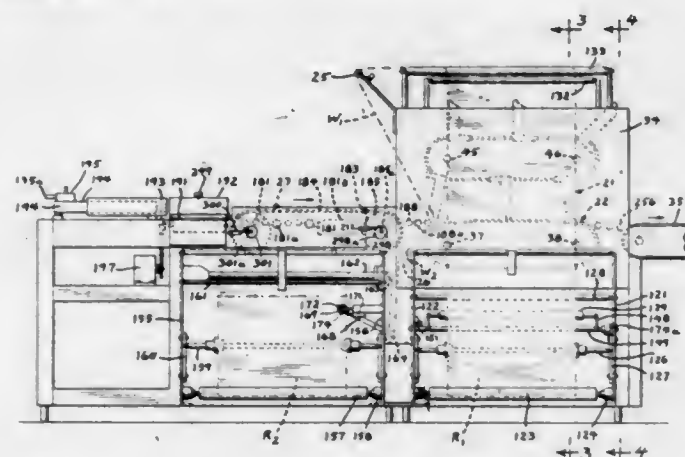
3,729,894

**METHOD AND APPARATUS FOR WRAPPING ARTICLES**  
Roger H. Stohlquist, Rockford, Ill., assignor to Anderson Bros. Mfg. Co., Rockford, Ill.

Filed Dec. 2, 1971, Ser. No. 204,082  
Int. Cl. B65b 9/02, 57/10

U.S. Cl. 53-28

25 Claims



A method and apparatus for wrapping articles as they move along an article path in which a plurality of opposed pairs of jaws are moved in spaced succession forwardly along the article path in a sealing run having a length substantially greater than the spacing between adjacent pairs of jaws, articles are advanced through a curtain of the material to a position in front of a pair of jaws adjacent the inlet end of the sealing run for advance therewith along the sealing run, the presence or absence of an article in front of each pair of sealing jaws is sensed as they move along the sealing run, and the sealing jaws are relatively moved toward each other into clamping engagement with the curtain therebetween when an article is present in front of the sealing jaws as they move along the article path and the sealing jaws are moved out of clamping engagement with the web in the absence of an article in front of the sealing jaws, and the curtain of material is retracted when all of the pairs of sealing jaws along the sealing run are out of clamping engagement with the curtain.

3,729,895

**CARTON LOADING APPARATUS**

Franklin Kramer, Lexington; Albert W. Soeldner, Dedham, and Joseph R. Paradis, Wayland, all of Mass., assignors to LaTouraine-Bickfords Foods, Inc., Newton, Mass.

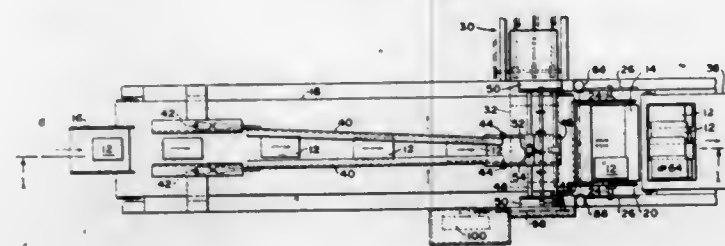
Filed July 6, 1971, Ser. No. 159,695  
Int. Cl. B65b 57/20

U.S. Cl. 53-59 R

17 Claims

A machine for automatic three-dimensional pattern loading of pouch packages in cartons, counting the packages and

sequentially ejecting loaded cartons. The packages move in single file on a conveyor between movable lateral positioning guides, falling off the end of the conveyor past a photocell de-



detector and into a carton. Indexing of the guides and rocking of the carton are controlled by the detector, and ejection of the carton is controlled by a counter associated with the detector.

3,729,896

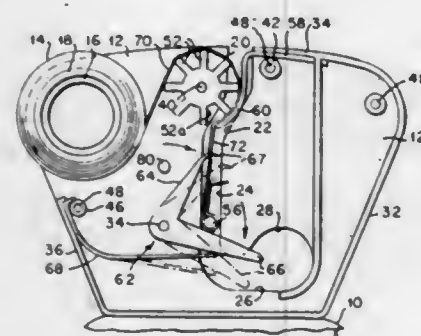
**DEVICE FOR TYING THE ENDS OF BAGS**

Aribert J. Lehmann, 473 West End Avenue, New York, N.Y.  
Filed July 19, 1971, Ser. No. 163,574

Int. Cl. B65b 51/06

U.S. Cl. 53-198 A

7 Claims



A device for tying the end of a bag with an adhesive tape strip severed from a tape roll, in which a slot is provided for the movement of the compressed end of a bag. A star wheel is mounted adjacent the inlet end of the slot with its poke ends overlapping the slot and serving to support the tape with its adhesive side outwardly facing. A curved spring is held by one end in close proximity of the spoke ends disposed over the slot, with its free end terminating at a midpoint of the slot width, on the inner side of the star wheel. A tape severing means, movable into severing position by the passage of a bag neck through the slot is arranged to sever the tape around the bag neck from the roll at a point spaced inwardly from the free end of the spring.

3,729,897

**PENDULUM MOUNTED HEAT SEAL**

George F. Howe, Poplar Grove, Ill., assignor to Champion International Corporation, Hamilton, Ohio

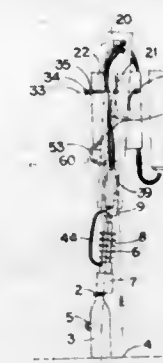
Filed Aug. 6, 1971, Ser. No. 169,754  
Int. Cl. B65b 51/14

U.S. Cl. 53-329

10 Claims

A cap is heat sealed over the mouth of a plastic bottle by a heat sealing mechanism which is mounted on a pendulum whereby the bottle is conveyed past the heat sealing device on a conveyor belt and at the same time heat sealing is accomplished. The pendulum mounting permits the heat seal device to follow the bottle. The cap has a plastic lining within a conventional bottle cap. A typical application is the heat sealing

of a bottle containing dairy products, uncarbonated, or carbonated beverages where the bottle is made of polyethylene



and the bottle cap is made of aluminum lined on the side adjacent the bottle with polyethylene.

3,729,898

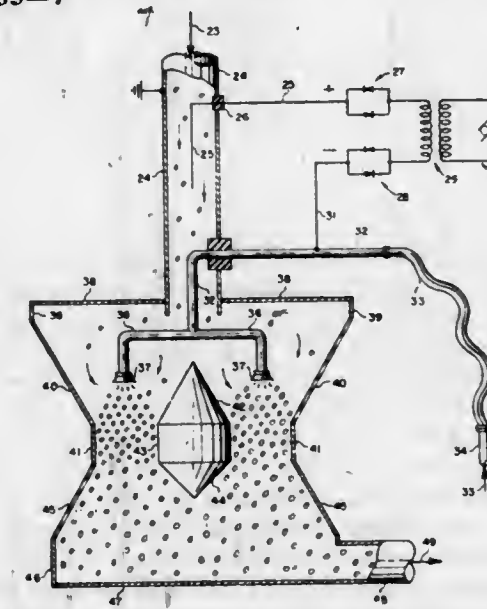
**REMOVAL OF ENTRAINED MATTER FROM GAS STREAMS**

Harry L. Richardson, New York, N.Y., assignor to Chemical Construction, New York, N.Y.

Filed June 1, 1971, Ser. No. 148,452  
Int. Cl. B03c 3/16

U.S. Cl. 55-7

13 Claims



Particulate material such as a fume, fog or mist, is removed from a gas stream by passing the gas stream laden with entrained solid or liquid particulate material through a venturi scrubber, and dispersing scrubbing liquid droplets into the venturi scrubber passage. The scrubbing liquid droplets are provided with a high voltage electrostatic charge, so that the liquid droplets attract and entrain the particulate material, which is preferably also provided with an electrostatic charge of opposite polarity to the charge on the liquid droplets. Improved gas scrubbing efficiency is attained, especially when removal of sub-micron or colloidal particles is required, in order to recover the particulate material and/or prevent air pollution.

3,729,899

**RECOVERY OF ETHYLENE OXIDE FROM ADMIXED INERT GASEOUS COMPONENTS**

Jack Cunningham, Oakland; E. Gordon Foster, Emeryville, and Robert G. Vanderwater, El Cerrito, all of Calif., assignors to Shell Oil Company, New York, N.Y.

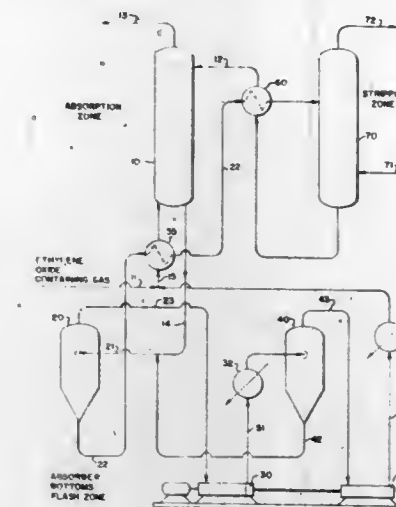
Filed June 23, 1971, Ser. No. 155,959  
Int. Cl. B01d 19/00

U.S. Cl. 55-44

6 Claims

Ethylene oxide is separated from admixed inert gaseous components and recovered as a gaseous fraction by (a) con-

tacting the gaseous mixture with a lean aqueous absorbant to produce an ethylene oxide-rich absorbate; (b) flashing the ethylene oxide-rich absorbate at a temperature below about 65°C to produce a condensate lean in inerts; and (c) contact-



ing, in an ethylene oxide stripping zone, the inerts-lean condensate with a stripping vapor at or slightly above atmospheric pressure to produce a gaseous overhead rich in ethylene oxide.

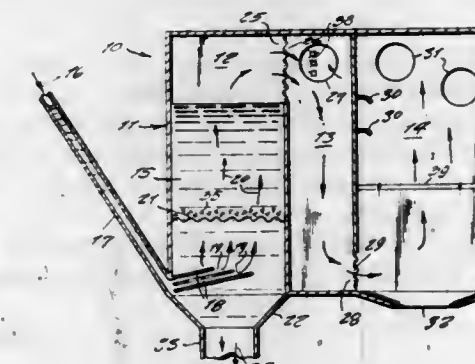
3,729,900

**DE-SMOGER**

William G. Denning, P.O. Box 321, Hudson, Colo.  
Filed Nov. 30, 1970, Ser. No. 93,653  
Int. Cl. B01d 47/02

U.S. Cl. 55-100

7 Claims



In apparatus for filtering out objectionable solids and harmful gasses from the exhaust gasses of a combustion engine, a first compartment or chamber containing liquid and through which the exhaust gas passes upwardly so as to remove solids such as ash, carbon, soot and the like, a second chamber, where neutralizers are introduced to neutralize poisonous gasses passing downwardly, and a third chamber wherein ozone gas can be added and magnetism is incorporated for filtering out metal particles as gasses pass downwardly.

3,729,901

**EMISSION AND POLLUTANT RECOVERY PROCESS AND APPARATUS**

Dennis Hurshel Jackson, 850 West Osborn Road, Phoenix, Ariz.

Continuation-in-part of Ser. No. 888,021, Feb. 3, 1970, abandoned. This application July 20, 1971, Ser. No. 164,364  
Int. Cl. B01d 47/02

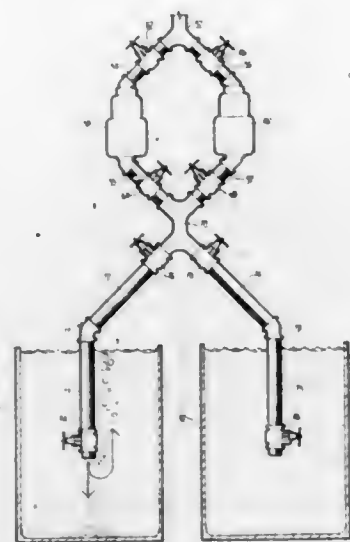
U.S. Cl. 55-244

4 Claims

The recovery apparatus includes a collector device which may be connected to the exhaust flue or a furnace or disposed in a relatively confined area for collecting the exhaust gases or surrounding contaminated air. The collector device is con-



ected by a conduit to a suction-blower device which may be comprised of two suction-blowers disposed in parallel for reliability. A pair of liquid filled tanks are provided and conduits are connected at one end to the suction-blower device with the opposite ends being disposed beneath the surface of the



liquid. The process involves drawing the exhaust gases or contaminated air into the collector device by means of the suction-blower device and bubbling the exhaust gases or contaminated air through the liquid in the tank to remove all contaminants therefrom.

3,729,902

#### CARBON DIOXIDE SORBENT FOR CONFINED BREATHING ATMOSPHERES

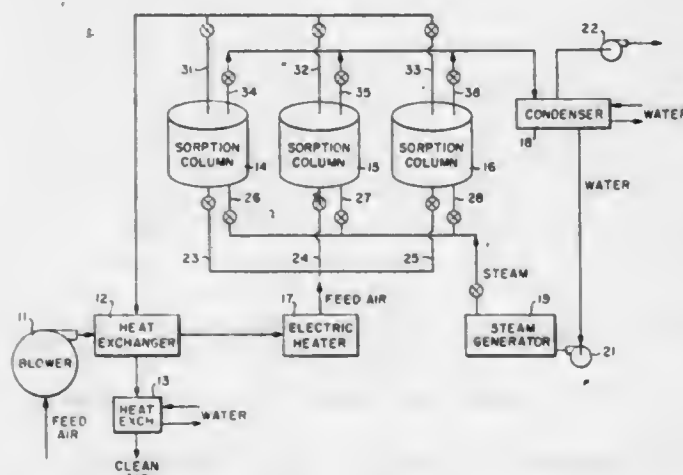
Frank J. Ventriglio, 790 Fairview Avenue; David M. Zall, 10 N. Southwd Avenue; Cyril J. Stockhausen, 1977 Fairfax Road, all of Annapolis, and Donald R. Decker, Jr., 14-17 Taylor Avenue, Baltimore, all of Md.

Division of Ser. No. 755,548, Aug. 27, 1968, Pat. No. 3,619,130. This application April 21, 1971, Ser. No. 136,168

Int. Cl. B01d 53/04

U.S. Cl. 55—389

3 Claims



An apparatus for removing CO<sub>2</sub> from air by passing said air through sorbent material made by treating molecular sieve-

type zeolite with aqueous solution of any alkali carbonate. The sorbent material may be regenerated repeatedly by passing either heated air or superheated steam therethrough.

3,729,903

#### PNEUMATIC DUST COLLECTION SYSTEM

Frans Joris Espeel, Rosenbergstrasse 25, Oberuzwil, and Ernst Ackermann, Egghalden, 9231, Egg/Flawil, both of Switzerland

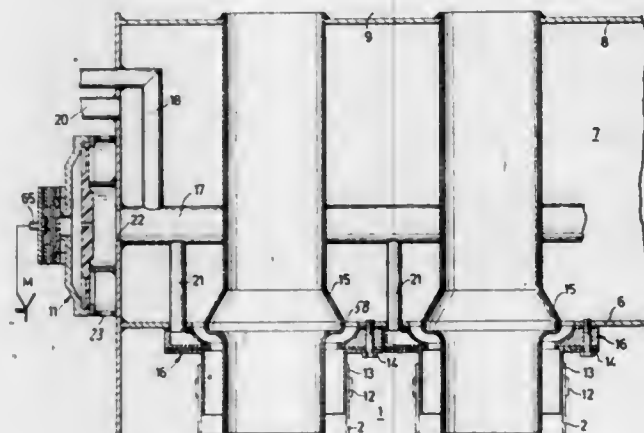
Filed Aug. 24, 1971, Ser. No. 174,473

Claims priority, application Switzerland, Aug. 28, 1970, 12902/70

Int. Cl. B01d 46/04

U.S. Cl. 55—283

17 Claims



A pneumatic dust collection system includes a housing which defines a dust-air chamber portion, a flushing air chamber portion and a clean air portion arranged one above the other. A separating wall between the flushing air chamber and the dust-air chamber is penetrated by fittings for suspending filter hoses in the dust-air chamber portions which communicate through the fittings into the flushing air chamber. A connecting tube extends from the clean air chamber into the interior of each filter hose fitting and the filter hose which is carried thereby and defines an annular flow space between the interior of the hose and the flushing air chamber. This annular flow space may be closed off by an inflatable member which is disposed at the connection of the fitting to the separating wall. At this annular space the connecting tube includes a widened portion around which the flow is diverted and which is located opposite to the inflatable membrane. The interior of the inflatable membrane is connected to an air pressure line and it is inflated to close the annular flow passage between the interior of the filter hoses and the flushing air chamber. The apparatus includes a control system for controlling flushing air to the flushing air chamber and for filling this chamber before the membrane is deflated. An over and underpressure control is connected between the clean air chamber and the dust-air chamber to maintain a selected pressure difference between the clean air chamber portion and the dust-air chamber portion during operation. The flushing air chamber and the control line for supplying the air to the chamber is closed by a rapid depressurizer member which is closed by a signal from a preferred output of a monostable fluid mechanism element. An overpressure in the flushing air chamber causes the depressurizer to open rapidly.

3,729,904

#### GAS-LIQUID SEPARATOR

Jesse Louis York, 3893 West Liberty Road, Ann Arbor, Mich.

Filed June 16, 1969, Ser. No. 833,310

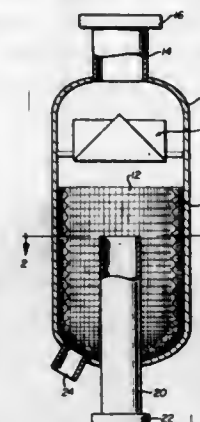
Int. Cl. B01d 45/12

U.S. Cl. 55—457

5 Claims

A centrifugal gas-liquid separator having a boundary layer

control screen for inhibiting re-entrainment of separated



liquid with the gas stream.

3,729,905

#### FILTERING DEVICE

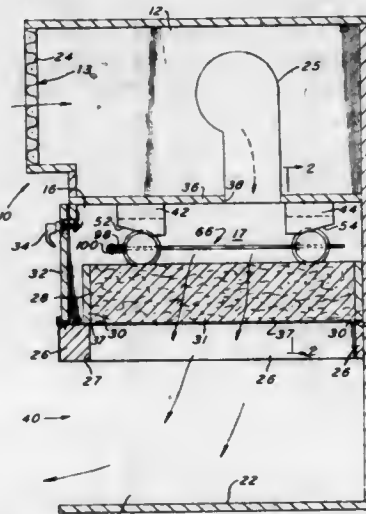
Anthony M. Diccianni, Norristown, Pa., assignor to Laminar Flow, Inc., Conshohocken, Pa.

Filed Aug. 20, 1970, Ser. No. 65,559

Int. Cl. B01d 25/22

U.S. Cl. 55—490

6 Claims



An air filtering device with its filter in a housing. The filter is restrained in the housing by the cooperation of opposed cylindrical members that bear against wedge-like surfaces so that the filter is urged against a support inside the housing.

3,729,906

#### HARVESTING SYSTEM USING TREE FRAME

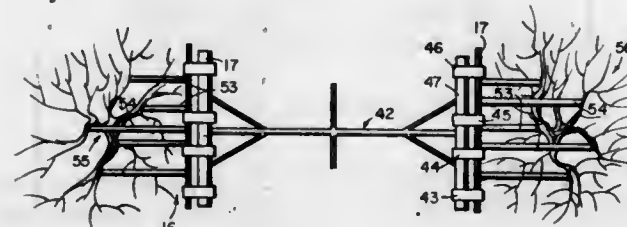
Robert C. Coblenz, P.O. Box 2645, Winter Haven, Fla.

Filed Sept. 7, 1971, Ser. No. 178,177

Int. Cl. A01g 19/00

U.S. Cl. 56—1

5 Claims



The present invention relates to a harvesting method and apparatus for harvesting fruit, and the like, from trees. It includes a frame connected between limbs of a tree in a manner that shaking the frame shakes all of the limbs connected

thereto and means for gripping the frame and shaking it. The frame is permanently installed in the tree at predetermined points on the limbs of the tree, so that shaking one point of the frame will shake all of the limbs at predetermined points for loosening the fruit located in the tree. A method is also provided for attaching the frame in the trees either by drilling holes in the limbs or placing a clamp around the limbs at predetermined points and connecting frame arms with bolts either extending through the holes drilled in the tree or through clamps around the limbs.

3,729,907

#### MOWER CONDITIONER

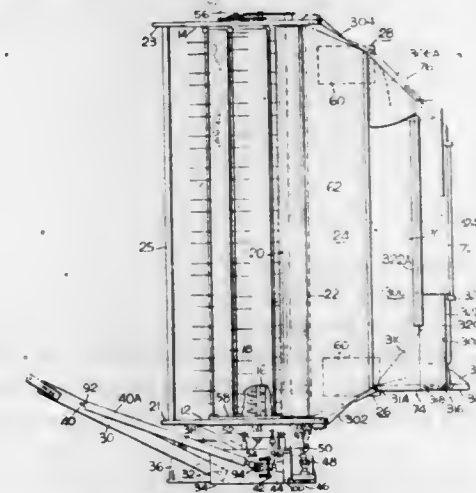
Donald E. Burrough, and Benjamin A. Braunberger, both of West Bend, Wis., assignors to Gehl Company, West Bend, Wis.

Filed Feb. 25, 1972, Ser. No. 229,323

Int. Cl. A01d 45/04

U.S. Cl. 56—14.1

10 Claims



A tractor drawn and powered agricultural machine, such as a mower-conditioner for hay-like crops, comprises a main frame having a pair of spaced apart side walls between which a sickle mower, a tine reel, a pair of conditioning rolls, a crop gathering hood and windrowing means, and a pair of transport wheel assemblies are mounted. Operating power from the tractor is supplied through a rotatable power take-off shaft and clutches to a transmission unit comprising enclosed gears which is mounted on the main frame outboard of one side wall. The transmission unit is connected to and drives the conditioning rolls by means of universal drive shafts and the upper roll is spring mounted so as to be relatively movable and self-adjusting with respect to the lower roll. The transmission unit is also connected to and drives the sickle mower through a reciprocating pitman drive which includes a break-away bolt which breaks if the sickle-bar jams. The time reel, which is adjustably mounted on the side walls, is chain driven from the upper conditioning roll and tine pitch is adjustable by adjustable cam means.

3,729,908

#### HOUSING FOR A VEHICLE

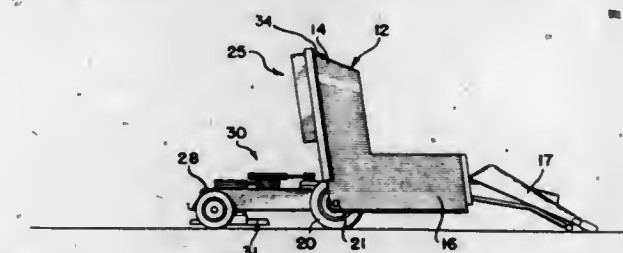
Earl L. Miner, Moran, Kans., assignor to Lawlor Industries Inc., Addison, Ill.

Filed April 21, 1972, Ser. No. 246,360

Int. Cl. A01d 35/22

U.S. Cl. 56—16.7

4 Claims



An improved L-shaped housing for a vehicle which is constructed and affixed to the vehicle in a fashion such that the



housing can be pivoted to expose the drive mechanisms, the driven members and the like of the vehicle, whereby they can be easily serviced.

3,729,909

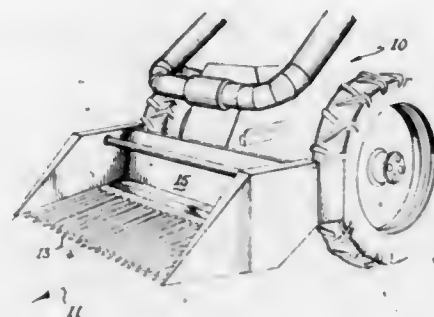
## COTTON STRIPPING MEANS

James H. Gray, Paradise Valley, and William E. Rood, Jr., Phoenix, both of Ariz., assignors to Garland Steel Company, Phoenix, Ariz.

Filed April 24, 1972, Ser. No. 247,018  
Int. Cl. A01d 45/20

U.S. Cl. 56—34

9 Claims



Cotton stripper fingers are disclosed incorporating finger supports having pairs of finger arms extending from the forward ends of the finger supports upwardly and backwardly along the finger supports. The finger arms are parallel to each other and incorporate longitudinal edges protruding into stalk-receiving channels between adjacent finger supports.

3,729,910

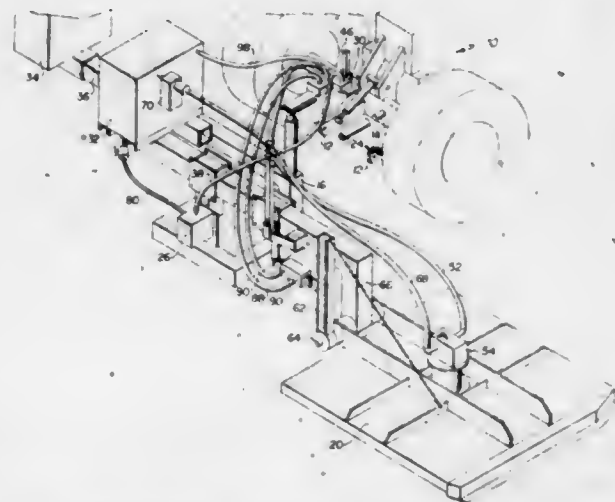
## HYDRAULICALLY OPERATED OFFSET CUTTER

Eldred V. Hardee, Mount Vernon, Route 4, Lons, S.C.  
Filed Nov. 19, 1971, Ser. No. 200,388

Int. Cl. A01d 69/00

U.S. Cl. 56—11.9

10 Claims



A hydraulically operated offset cutter having a hydraulic circuit driving a cylinder for raising, lowering or stabilizing the position of a hydraulically driven cutter driven from the same pump as said cylinder piston. The cylinder circuit has a uniquely provided control valve to accomplish the selective operations of raising, lowering or stabilizing the hydraulically driven cutter. The control valve contains a bypass line containing one or more pressure-restricting orifices for passing oil to the motor under conditions when the control valve provides useful flow of oil to a piston for raising or lowering the offset cutter, enabling the motor to continue operating. Thus a back pressure builds up behind the orifices and the oil is directed by the control valve to the cylinder piston causing it to operate as desired.

3,729,911

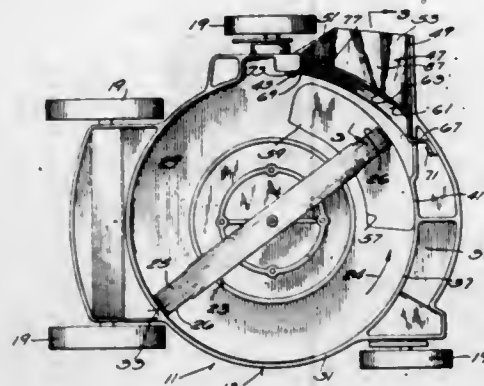
## ROTARY LAWN MOWER WITH SAFETY FEATURES

Einar S. Dahl, and Earl H. Kidd, both of Galesburg, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed April 3, 1972, Ser. No. 240,476  
Int. Cl. A01d 67/00

U.S. Cl. 56—320.2

12 Claims



Disclosed herein is a rotary lawn mower including a discharge chute of inverted U-shape form and including spaced side walls and an upper portion including a downwardly projecting central portion extending in the middle between the side walls and increasing in width in the direction between the side walls with increasing distance from the periphery of the path of the cutter blade, and decreasing in height above the ground with increasing distance from the periphery of the path of the cutter blade. In addition, the lawn mower includes a protective bar extending across the discharge chute in spaced relation below the upper discharge chute wall and including an arcuate portion located adjacent to the periphery of the cutter blade path. In one embodiment, the radial distance between the bar and the periphery of the cutter blade path decreases in the direction of rotation of the cutter blade. Still further, the bar includes a surface extending adjacent to the periphery of the cutter blade path and in inclined, radially outward and downward relation to the periphery of the cutter blade path.

3,729,912

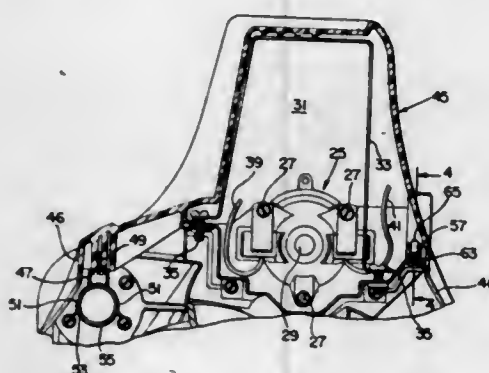
## SNAPON SHROUD MOUNTING

Edwin J. Weber, Baltimore, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Sept. 14, 1970, Ser. No. 71,634  
Int. Cl. A01d 67/00

U.S. Cl. 56—320.1

4 Claims



A lawnmower including a frame supported for movement over the ground by ground engaging wheels. A rotatable reel is mounted on the frame and cooperates with a bed knife. The reel is driven by a D.C. motor powered by a storage battery, both of which are disposed on the frame and covered by a shroud attached to the frame. The shroud serves to protect the motor and battery and is readily detachable from the frame for servicing of the motor and/or battery.

3,729,913

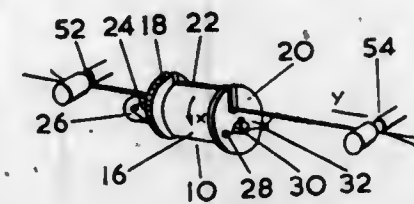
## APPARATUS FOR JOINING TOGETHER TWO CONTINUOUS STRANDS

Raymond Patrick Wray, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England  
Filed March 1, 1971, Ser. No. 119,611

Int. Cl. B65h 69/06, 69/00

U.S. Cl. 57—22

3 Claims



Apparatus for wrapping a thread about the overlapping portion of two continuous strands, e.g. two macrofil tire yarns, to form a joint, wherein a thread supply means is movable in a rotary path about the overlapping portion of the strands by a first drive means, and a second drive means is operable to impart relative movement between the overlapping portion of the strands and the thread supply means longitudinally of the strands.

3,729,914

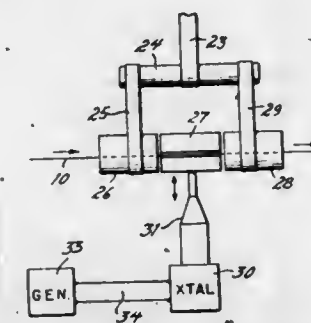
## STRAND TREATMENT

Charles A. McClure, R.D. 2, Malvern, Pa.

Filed June 8, 1971, Ser. No. 150,962  
Int. Cl. D02g 1/00

U.S. Cl. 57—34 HS

17 Claims



In vibratory bulking or crimping of textile strands, the twist-stopping tendency of a vibratory crimping head is overcome by false-twisting in the vicinity of the locus of vibration and thereby, in effect, forwarding twist therethrough. The crimping step conveniently is preceded by a step of drawing the strands to increased length.

3,729,915

## AUTOMATIC DEVICE FOR LOADING TEXTILE MACHINE SPINDLES

Manfred Mayer, Remscheid-Lennep, and Reinhard Naydowski, Remscheid, both of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed April 19, 1971, Ser. No. 135,143

Claims priority, application Germany, April 22, 1970, P 20 19 370.8

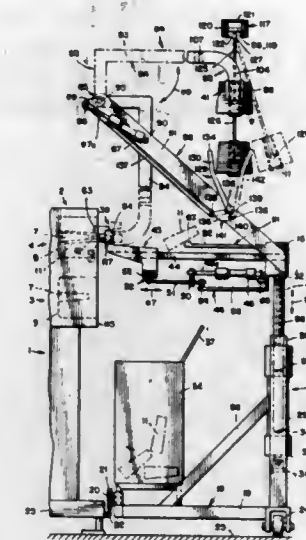
Int. Cl. D01h 9/10

U.S. Cl. 57—53

12 Claims

Device or apparatus for automatically unloading and loading spools, cops, bobbins, cores, tubes and the like carried by textile machine spindles, e.g., in rows or banks along the face of the machine, said device essentially including a movable framework carrying two different gripping means reciprocating in a linear and curved path, respectively, so as to rapidly unload and load the same spindle without mutual interference. The device is particularly useful in combination with double-

twist twisting machines or similar machines equipped with twisting spindles in order to properly mount and assemble all



of the spool and spindle elements in a rapid sequential operation.

3,729,916

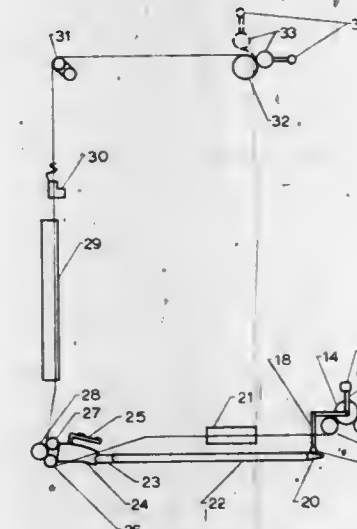
## METHOD FOR TREATING YARN

Harold B. Lusk, Raleigh; Herbert E. Cooke, Burlington, and Leon D. Pryor, Raleigh, all of N.C., assignors to Beaufit Corporation, New York, N.Y.

Filed March 30, 1971, Ser. No. 129,512  
Int. Cl. D02g 1/02; D01h 1/28

U.S. Cl. 57—34 HS

2 Claims



A method and apparatus for drawing and texturizing yarn in a continuous operation is described. Useful in a conventional drawing and texturizing operation wherein the yarn is passed through a drawing zone, a heating zone, and a false twisting zone to obtain drawn yarn having stretch characteristics. The improvement of this invention provides feeding and drawing means in the drawing zone which are synchronized to be engaged or disengaged simultaneously. This may be accomplished through the use of a connecting shaft and cam system which causes draw rolls and feed rolls to be simultaneously engaged and disengaged. This unique system allows an operator to "thread up" the entire apparatus prior to simultaneously initiating the operation.



3,729,917

**REINFORCED ASBESTOS PAPER YARN AND METHOD OF MAKING SAME**

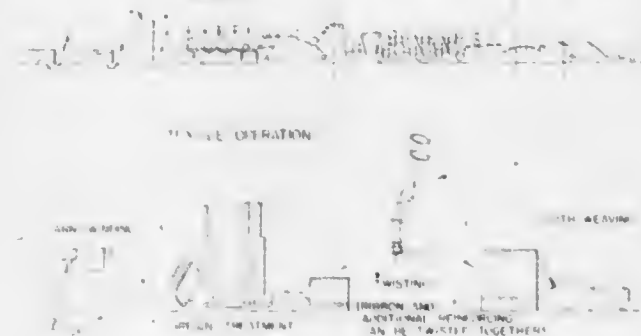
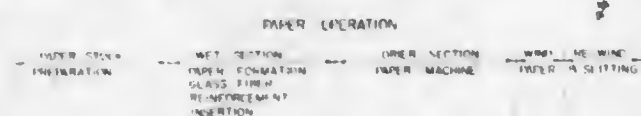
Ivan Henry Sloane, deceased, late of Ottawa, Ontario, Canada (by Laura Catherine McConnel Sloane, executrix); Armand Ludovic Mailhot; Roger Louis Bellevue, both of Danville, Quebec, Canada, and Harbans Lal Sawhney, Longueuil, Quebec, Canada, assignors to Johns-Manville Corporation, New York, N.Y.

Filed Aug. 13, 1971, Ser. No. 171,655

Int. Cl. D02g 3/04, 3/18, 3/20

U.S. Cl. 57—140 G

18 Claims



Asbestos yarn is produced by slitting a web of asbestos paper reinforced with spaced, longitudinally extending strands of glass fibers. Each ribbon formed by slitting includes at least one longitudinally extending strand of glass fibers. The ribbons are wetted and twisted to form an asbestos yarn. The yarns are uniform in diameter and suitable for use in dryer felts.

3,729,918

**BULKY YARN AND METHOD OF PRODUCING THE SAME**

Kentaro Kawasaki, Kamo; Takyuki Ono, Osaka, and Keizo Takizawa, Amagasaki, all of Japan, assignors to Chori Company, Ltd., Osaka-shi, Japan

Filed Feb. 3, 1971, Ser. No. 112,186

Int. Cl. D02g 3/04, 1/02

U.S. Cl. 57—140 BY

6 Claims



A bulky yarn comprising staples constituting a spun yarn and thermo-plastic synthetic filaments both of which are crimped and mixed uniformly in a loose and twisting state. The bulky yarn may be produced by feeding the spun yarn and the thermo-plastic synthetic filaments, and then crimping by passing them through processes of twisting-heat setting-releasing twist.

3,729,919

**DRAG ROPE FOR SUBMARINE MEASURING EQUIPMENT**

Helmut Weichardt, Hannover-Linden; Fritz Glander, Isernhagen NB; Gerhard Ziemek, Hannover; Walter Schuppe, Hannover; Hans Meyer, Hannover, and Bernd Eilhardt, Vinnhorst, all of Germany, assignors to Kabel- und Metallwerke Gutehoffnungshütte Aktiengesellschaft, Hannover, Germany

Filed Nov. 13, 1970, Ser. No. 89,299

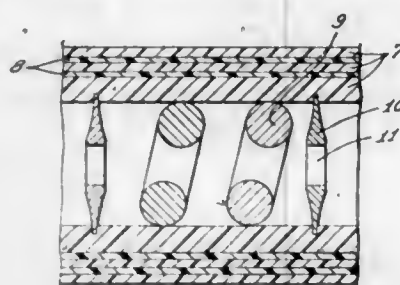
Int. Cl. D07b 1/12, 1/16

U.S. Cl. 57—144

10 Claims

A multi-layer drag rope for submarine measuring cables

having plural layers of polyurethane and polyamide mesh,



with solid or hollow core.

3,729,920

**NOVELTY TEXTILE YARNS**

Leslie W. Sayers, Macclesfield; Jeffery W. Barnes, Coventry, and Norman Jackson, Leamington Spa, all of England, assignors to Courtaulds Limited, London, England

Filed March 6, 1970, Ser. No. 17,315

Int. Cl. D02g 3/02, 3/38

U.S. Cl. 57—144

4 Claims

A novelty core yarn comprising a continuous filamentary glass core, preferably texturized, provided with a sheath consisting of a roving of textile fibers having flame-resistant properties. The sheath may consist of a roving of modacrylic textile fibers having inherent, built-in flame-resistance and composed of a copolymer of acrylonitrile with vinylidene chloride, vinyl chloride or both.

3,729,921

**NON-ROTATING ROPE WITH SPIRAL STRANDS**

Bernhard Stroh, Wien, Austria, assignor to Cordeurop Establishment, Vaduz, Liechtenstein

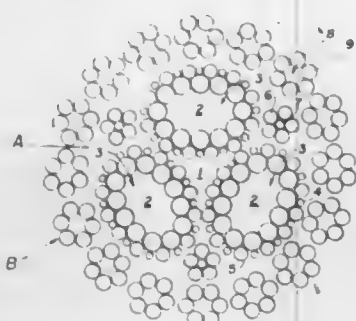
Filed April 22, 1971, Ser. No. 136,387

Claims priority, application Austria, April 27, 1970, 3804

Int. Cl. D07b 1/08, 1/06

U.S. Cl. 57—145

14 Claims



The present rope is torsion free mainly because it has an inner rope formed by an inner layer of strands which is surrounded by an outer layer of strands and since the inner rope is constructed of at least three flattened strands and at least three round strands which are smaller than the flattened strands to fill the spacings between adjacent flattened strands. The inner strands surround a center member of elastic material.

3,729,922

**TIMEPIECE**

Irving L. Wein, Chicago, Ill., assignor to Clinton Watch Company, Chicago, Ill.

Filed Sept. 13, 1971, Ser. No. 179,847

Claims priority, application Switzerland, July 2, 1971, 9730/71

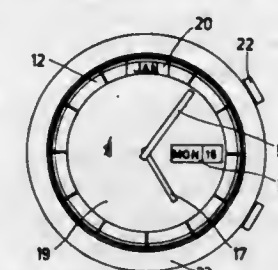
Int. Cl. G04b 19/24

U.S. Cl. 58—5

9 Claims

A timepiece, for example a wristwatch, having indicating means driven by a movement for indicating the hours and

minutes and also the date, characterized in that designation of the twelve months of the year are disposed on an annular surface surrounding the said indicating means. Associated with said annular surface is a predetermined reading position or an



index mark or a window, on or in which only one of the 12 month designations can be read at a time. The annular surface and/or the index mark or window, respectively, is adapted to be turned manually about the axis of the annular surface.

3,729,923

**WRIST WATCH WITH DIAL ILLUMINATING**

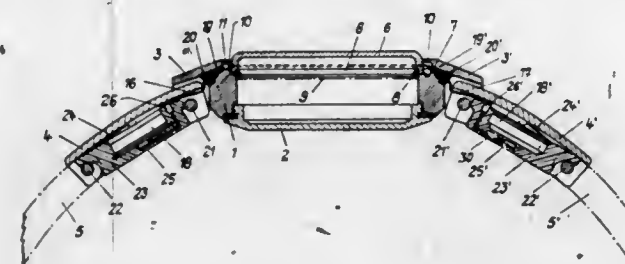
Florent Briggiano; Ernest Vogt, and Edmond Marmoud, all of Geneva, Switzerland, assignors to Fabrique de boites de montres F. Kuhn SA, Geneva, Switzerland

Filed March 11, 1971, Ser. No. 123,336

Int. Cl. G04b 19/30; G04c 3/00

U.S. Cl. 58—50 R

3 Claims



A wrist watch has a glass fitted in a snap. An inwardly facing groove in the snap, normally closed by the glass, houses a miniature bulb connected by wires passing through watertight-closed openings communicating the snap with the outside of the watch case. The wires are connected to batteries housed in extensions to the watch case, said extensions including a switch to enable illumination of the bulb by a pressure on the wearer's wrist.

3,729,924

**WATERTIGHT WATCH CASE AND WATCH**

Masayoshi Aoki, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Keikoshu, Tokyo, Japan

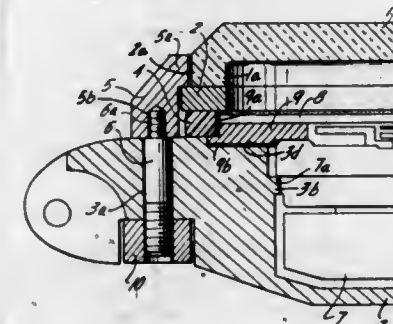
Filed May 30, 1972, Ser. No. 257,556

Claims priority, application Japan, June 2, 1971, 46/45343

Int. Cl. G04b 37/08

U.S. Cl. 58—90 R

4 Claims



A watertight watch and watch case construction in which a watch case body has an integral back cover and a cavity hous-

ing the watch movement. A seal gasket of elastic, deformable material is disposed circumferentially of the watch dial and a crystal support ring overlies the gasket with a watch crystal bonded thereto. A bezel has a flange or rim overlying a marginal circumferential part of the ring and is tightened by screws spaced around the watch case body deforming the seal so that a positive watertight seal is formed to protect the interior of the watch.

3,729,925

**DRIVE ARRANGEMENT FOR TIMEKEEPING SYSTEM**

Frank W. Emerson, Peterborough, Ontario, Canada, assignor to General Time Corporation, Thomaston, Conn.

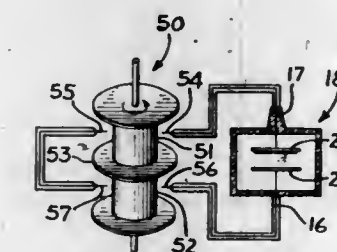
Division of Ser. No. 830,063, June 3, 1969, Pat. No. 3,545,655.

This application Aug. 26, 1970, Ser. No. 67,215

Int. Cl. G04c 3/00; H02n 1/00

U.S. Cl. 58—23 D

2 Claims



A drive arrangement for a timekeeping system comprising an electrostatic motor including a rotor having a dielectric surface and a pair of electrodes operatively associated with the rotor for driving the rotor in response to a d-c potential applied across the electrodes. In one embodiment, one of the electrodes is mounted on one of the tines of a tuning fork, and the dielectric rotor surface is serrated for impulsing the tuning fork to vibrate the same while synchronizing the speed of the rotor with the natural frequency of the tuning fork. In another embodiment, both electrodes are mounted on the two tines of a tuning fork, and the serrated rotor is mounted between the electrodes for impulsing both tines of the tuning fork. In a further embodiment, a rotor having a dielectric surface is associated with two pairs of electrodes, each pair being associated with a different circumferential band of the dielectric surface, with one of the electrodes in the first pair connected to one terminal of the d-c voltage source, one electrode in the second pair being connected to the other terminal, and the other two electrodes being interconnected to form a voltage divider across the voltage source. In still another embodiment, the rotor is provided with a discontinuous dielectric surface, and the electrodes are connected to an a-c power source, with a source of ionizing radiation being associated with each electrode for ionizing the gas in the space between each electrode and the dielectric surface to increase the driving force applied to the rotor surface.

3,729,926

**CLAW HOOK FOR CHAINS**

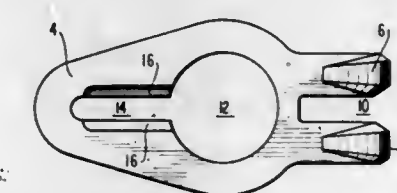
Ervin Buske, P.O. Box 190, Gowrie, Iowa

Filed May 25, 1971, Ser. No. 146,643

Int. Cl. F16g 15/00

U.S. Cl. 59—93

1 Claim



Two claws spaced to provide a slot therebetween extend from a flat body having an enlarged aperture with a slot ex-



tending from one side. Chain links can be engaged in either the claw slot or the body slot. An attachment fitting in the body slot has a post engagable into an aperture in a device to which the attachment may be anchored.

3,729,927

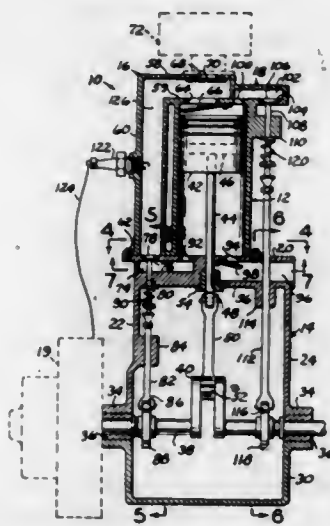
**TWO-CYCLE INTERNAL COMBUSTION ENGINE**

James G. Graves, 115 Lake Aluma Drive, Oklahoma City, Okla.

Filed Jan. 3, 1972, Ser. No. 214,986

Int. Cl. F02g 3/02

U.S. Cl. 60—39.6



A piston driven compressionless engine having a combination intake and combustion manifold communicating with the upper end of the cylinder through a flap valve is filled with an explosive mixture from a carburetor by the upstroke of the piston in response to the opening of a suction valve opened by a crankshaft actuated cam with the previously burned gases being discharged from the cylinder during the piston upstroke by a crankshaft operated exhaust valve.

3,729,928

**TORQUE CONTROL SYSTEM FOR A GAS TURBINE**

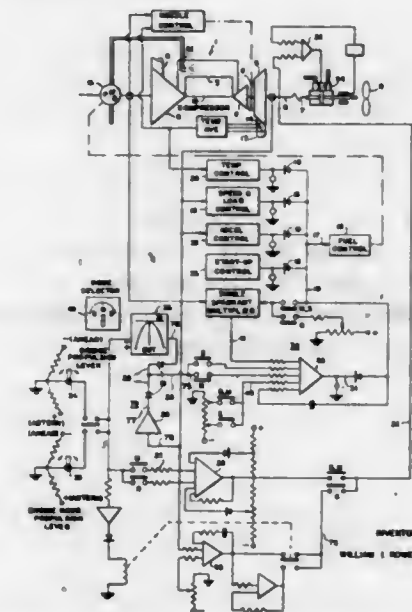
William I. Rowen, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed March 26, 1971, Ser. No. 128,399

Int. Cl. F02c 9/08

U.S. Cl. 60—39.28 P

2 Claims



A gas turbine control system has a plurality of closed loop controls, each depending on a different operating parameter and providing a fuel control signal in accordance therewith. A

predetermined linear relationship exists among the power output and the output shaft speed at the upper limit of acceptable output torque which is developed. A comparator is employed to compare the predetermined power setting signal applied to the gas turbine and a signal representative of the output shaft speed. Through this comparison it is possible to limit the output torque developed in the transmission components to an acceptable maximum value.

3,729,929

**FUEL CONTROL SYSTEM FOR A GAS TURBINE**

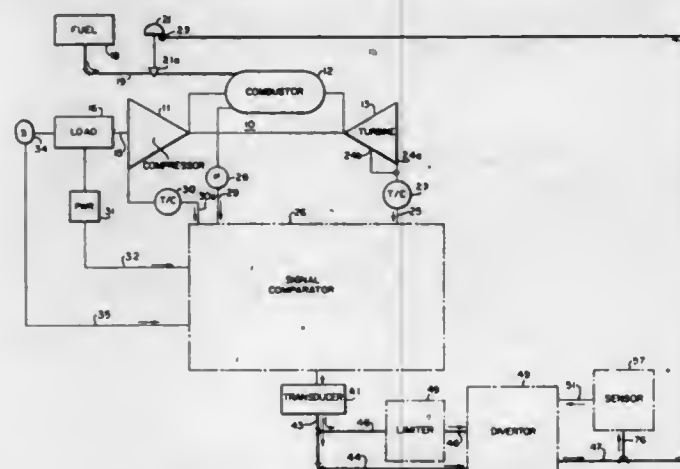
Roy W. Kiscaden, Springfield, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 9, 1971, Ser. No. 122,427

Int. Cl. F02c 9/06

U.S. Cl. 60—39.28 R

13 Claims



A system for controlling the quantity of fuel supplied to the combustion chambers of a gas turbine during the ignition and operating periods, wherein a fuel signal is developed from at least one turbine operating parameter, to regulate a fuel control valve. The signal flows through a first alternate path during the ignition period and a second alternate path during the operating period. A diverting device switches the signal from the first path to the second path upon response to a predetermined level of the control signal. A limiter device is provided in the second path to maintain a minimum signal to the valve corresponding to the level required to maintain combustion.

3,729,930

**GAS TURBINE ENGINE**

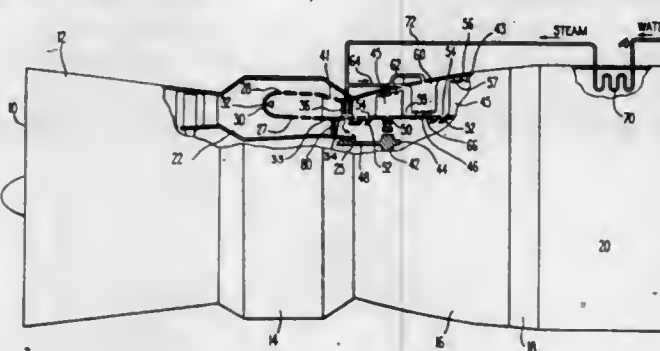
David Eyre Williams, Brinklow, England, assignor to Rolls Royce Limited, Derby, England

Filed June 23, 1970, Ser. No. 49,146

Int. Cl. F01d 5/08

U.S. Cl. 60—39.58

3 Claims



An industrial gas turbine engine comprises a multi-stage axial compressor, combustion equipment, a multi-stage compressor driving turbine, a power turbine and an exhaust duct, the compressor driving turbine being provided with cooling means to cool the blades of said turbine. The cooling means comprises a flow of steam from the compressor which flows

onto the surface of each turbine rotor blade through slots in the rotor rim. The steam also flows over the surface of the turbine rotor between adjacent blades and the space between adjacent blades is filled with a honeycomb material, the cells of which constitute ducts for the flow of steam. The stator vanes of the compressor driving turbine are cooled by steam from a heat exchange means which comprises a supply of pure water to a coil in the exhaust duct and a duct from this coil which is in communication with slots upstream of the nozzle guide vanes, the interiors of the nozzle guide vanes, the slots in the turbine rotor, slots in the engine casing upstream of the stator vanes and the interior of the stator vanes.

3,729,931

**BOOSTED HYDRAULIC SYSTEMS**

Brian Roger Shilton, and Donald John Byron, both of Lincoln, England, assignors to Clayton Dewandre Company Limited, Lincoln, England

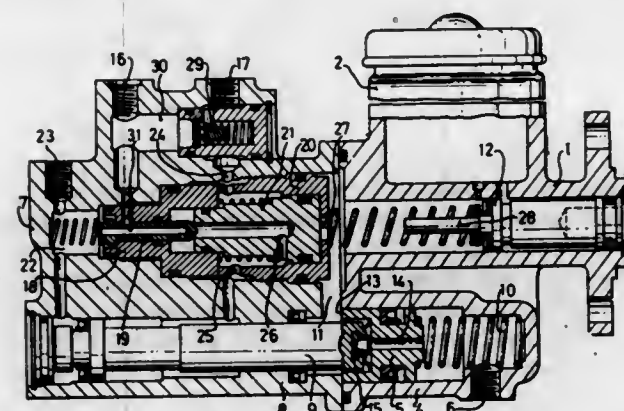
Filed Dec. 14, 1970, Ser. No. 97,882

Claims priority, application Great Britain, Dec. 19, 1969, 62,006/69

Int. Cl. F15b 7/00

U.S. Cl. 60—54.5 P

10 Claims



A boosted hydraulic system for brake, clutch or similar actuation and adapted to actuate two independent load circuits comprises a manually-operable master cylinder, valve means actuated hydraulically or mechanically by movement of the master cylinder piston and controlling flow of pressurized fluid to a servo device and to one load circuit, and a supplementary hydraulic cylinder actuated mechanically by the piston of the servo device and the output of which actuates the second load circuit, the fluid delivered by the master cylinder also acting on the piston of the supplementary hydraulic cylinder but, in the event of failure of the servo device, bypassing said piston to flow directly to said second load circuit.

3,729,932

**TANDEM MASTER CYLINDER**

Katsushi Nakashima, Kariya-shi, Aichi-ken, Japan, assignor to Aisin Seiki Company Limited, Kariya-shi, Aichi-ken, Japan

Continuation of Ser. No. 835,635, June 23, 1969, abandoned.

This application July 16, 1971, Ser. No. 163,441

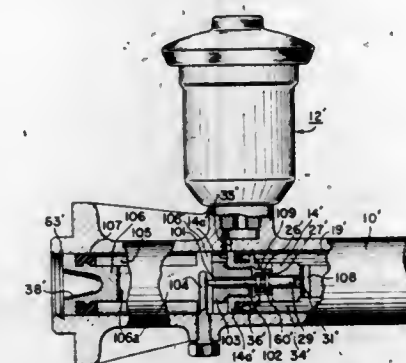
Int. Cl. F15b 7/00

U.S. Cl. 60—54.6 E

2 Claims

A tandem type hydraulic master cylinder is provided with a working piston and is adapted for establishing two hydraulic pressure chambers hydraulically connected with two respective hydraulic brake systems, said chambers being hydraulically connected with respective oil reservoirs. Automatic valve means are provided in communication passages between

each of said chambers and reservoirs. A balance pressure cylinder is further provided as being connected hydraulically



with said both hydraulic pressure chambers for pressure balancing service between said both chambers.

3,729,933

**DRIVING ARRANGEMENT FOR RAIL VEHICLES, ESPECIALLY HIGH OUTPUT SELF-PROPELLED RAIL VEHICLES**

Alfred Knebel, 43 Essen-Bredene, Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Germany

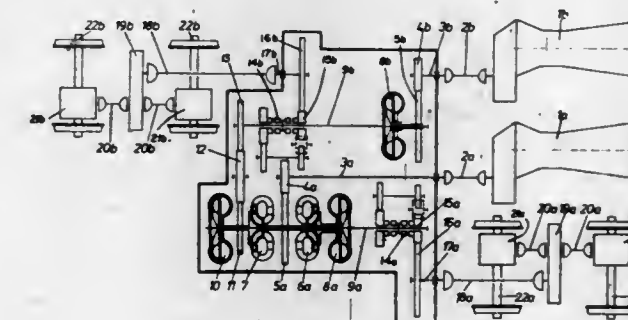
Filed Nov. 12, 1970, Ser. No. 88,855

Claims priority, application Germany, Nov. 12, 1969, P 19 56 742.1

Int. Cl. F01d 13/00

U.S. Cl. 60—102

6 Claims



A driving arrangement, especially for a high performance rail vehicle having at least two independent sources of power and at least two driven axles and a power transmission connecting said sources of power with said axles and adjustable so that when only one source of power is operating it will supply power to a greater number of axles than when both sources of power are operating.

3,729,934

**GAS TURBINE ENGINES**

Ralph Murch Denning, Reginald Harold Wiltshire, and Clifford Stanley Woodward, all of Bristol, England, assignors to Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain & Northern Ireland, London, England

Filed Nov. 8, 1971, Ser. No. 196,662

Claims priority, application Great Britain, Nov. 19, 1970, 54966/70

Int. Cl. F02k 3/04

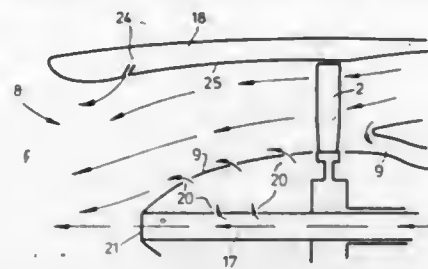
U.S. Cl. 60—226 R

5 Claims

A turbo-fan engine having four blades capable of being turned from a forward thrust-producing position to a reverse thrust position, also includes means for biasing the flow



through the fan in the reverse thrust mode of operation towards the engine axis, to reduce the base drag due to low



pressure air on the engine axis, and to prevent attachment of the flow to the fan intake lip.

3,729,935

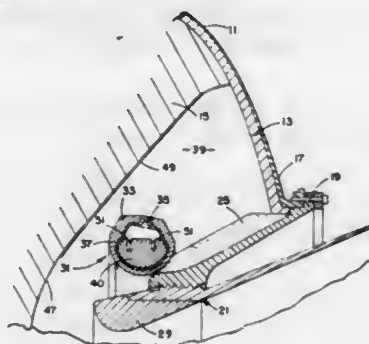
## SOLID PROPELLANT ROCKET MOTOR

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to the invention of; Warren L. Dowler, Sierra Madre; John I. Shafer, Pasadena; John W. Behm, San Pedro, and Leon D. Strand, Pasadena, all of Calif.

Filed May 28, 1971, Ser. No. 147,996  
Int. Cl. F02k 9/04

U.S. Cl. 60-256

5 Claims



A solid propellant rocket motor having a controlled rate of thrust buildup to a desired thrust level by the combined utilization of a regressive-burning controlled flow solid propellant igniter and a progressive-burning main solid propellant charge wherein the igniter is capable of operating in a vacuum and sustaining the burning of the propellant below its normal L\* combustion limit until the burning propellant surface and motor chamber pressure has increased sufficiently to provide a stable motor chamber pressure.

3,729,936

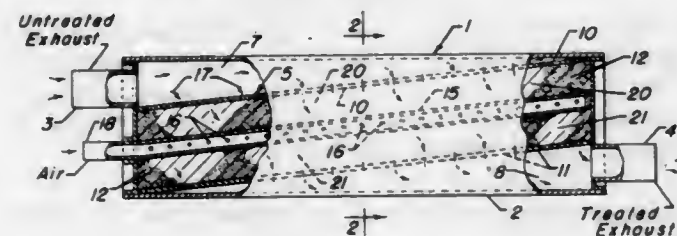
## METHOD AND MEANS FOR CATALYTICALLY TREATING ENGINE EXHAUST GASES

Ted V. De Palma, Roselle, Ill., and Martin W. Perga, Billings, Mont., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed May 24, 1971, Ser. No. 146,216  
Int. Cl. F01n 3/14

U.S. Cl. 60-274

5 Claims



The method and means for catalytically treating engine exhaust gases which utilize a catalytic converter having a single bed of catalyst material which has an upstream reduction zone and a downstream oxidation zone. Air is introduced into the

oxidation zone of the catalyst material in a direction generally transverse to the direction of flow of the exhaust gases. The engine is operated in a manner to maintain the content of the untreated exhaust gases generally low in oxygen and high in carbon monoxide. Therefore, the nitrogen oxides in the untreated exhaust gases are reduced by the carbon monoxide in the exhaust in the upstream zone of the bed and the air is admixed with exhaust gases to oxidize the hydrocarbons and carbon monoxide in the downstream zone of the bed.

3,729,937

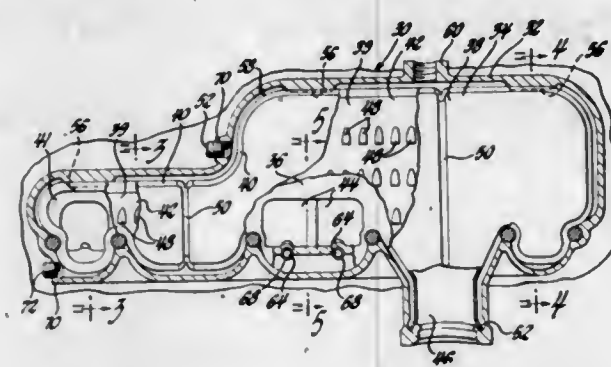
## ENGINE EXHAUST REACTOR AND METHOD OF MAKING

Mitchell J. Haddad, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 17, 1971, Ser. No. 209,149  
Int. Cl. F01n 3/10

U.S. Cl. 60-298

4 Claims



In preferred embodiments, exhaust reactors for internal combustion engines are formed as large volume manifolds having cast iron outer shells containing baffled sheet metal inner liners spacedly supported within their respective outer shells to provide an insulating air space between the walls of the inner liner and outer shell. Means for providing a flow of air through the insulating space may be provided with the preheated air being delivered through means, internal or external of the manifolds, to the incoming exhaust gas stream for mixture therewith to aid combustion of the exhaust products. Construction of such reactors includes the steps of fabricating a metal inner liner, forming a sand core along the outer surfaces of the liner exclusive of certain supporting portions, casting a metal outer shell around the sand core and sheet metal liner so as to provide a protecting and supporting housing, and removing the core sand from the insulating space, preferably by shaking it out through openings formed in the outer shell.

3,729,938

## TRENCH SHORING FRAME

Anthony Ronald Seaton Morrice, 72 Kent Rd., Harrogate, England

Filed July 13, 1971, Ser. No. 162,168  
Claims priority, application Great Britain, July 18, 1970, 34,939/70

Int. Cl. F21d 5/12

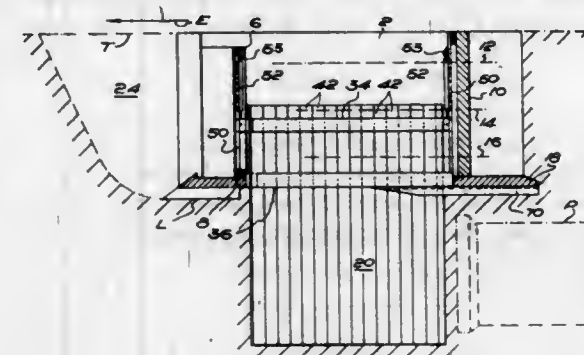
U.S. Cl. 61-41 A

7 Claims

A trench shoring frame comprising a pair of side wall structures for engaging the side walls of a ground trench when said shoring frame is in said trench, said side wall structures being supported in spaced-apart relationship so as to be capable of supporting the trench walls, and a plurality of vertically disposed plate means movably connected to at least one guide frame so as to be capable of being moved vertically relative to said side wall structures and into and out of the ground below the lowermost level of the side wall structures when the frame is in said trench.

The plate means are preferably guided during their movement relative to the side wall structures by two vertically

spaced guide frames through which the plate means are clusters solely on opposite sides of the vertical columns. The slotted, an upper one of said guide frames being movable up- region between alternate batter braces and pile jacket clusters



wards and downwards so as to move said plate means by a plurality of fluid pressure piston-and-cylinder devices.

3,729,939

## DEVICE FOR SEALING WATER AT COUPLING PORTION OF TUNNEL TUBES

Solchiro Shimizu, 7-5 2-chome, Higashi-Shimbashi, Minato-ku, Tokyo, Japan

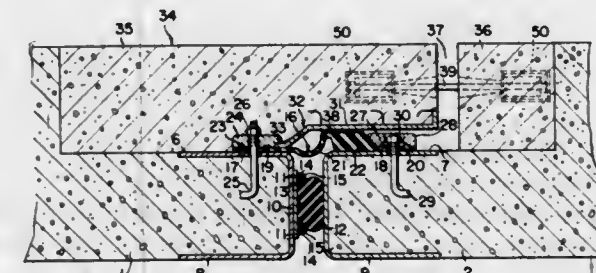
Filed Sept. 9, 1971, Ser. No. 179,101

Claims priority, application Japan, Sept. 10, 1970, 45/78869

Int. Cl. E02d 25/00; F16l 49/00

U.S. Cl. 61-43

8 Claims



A device for sealing water at the coupling portion of tunnel tubes which has first and second tunnel tubes disposed opposite at the respective end surfaces, an outside gasket fixed at the base end of the first tunnel tube and contacted at the end with the second tunnel tube, an inside strip gasket secured at both sides to the stepped recess formed along the inner peripheral ends of the first and second tunnel tubes, and a coupling tube secured to the stepped recess of the first tunnel tube for supporting the inner surface of the inside gasket.

3,729,940

## OFFSHORE TOWER

Albert M. Koehler, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

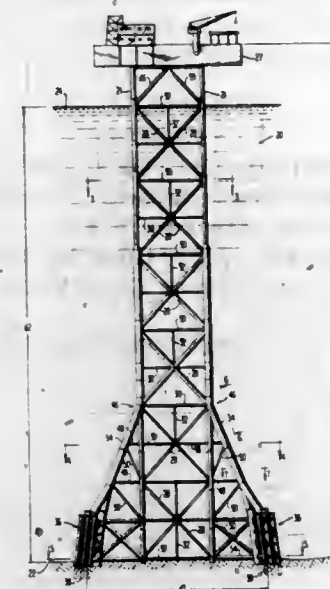
Division of Ser. No. 13,122, Feb. 20, 1970, Pat. No. 3,585,801. This application March 5, 1971, Ser. No. 121,464

Int. Cl. E02b 17/00; E21b 40/00

U.S. Cl. 61-46.5

10 Claims

A tower suitable for use in offshore well operations and the like and including a plurality of generally vertical columns extending from the bed of a body of water to a position above the surface of the body of water for supporting a platform thereupon. A quaternary batter brace system is connected to the generally vertical columns in a position intermediate the ends of the columns and beneath the surface of the body of water. Piling jacket clusters are connected to the free end of each of the batter brace members and are designed to rest upon the bed of the body of water. A plurality of piles extend through the batter piling jacket clusters and pin the offshore tower to the bed of the body of water. A reinforcing lattice connects adjacent batter brace members and pile jacket



on opposite sides of the vertical columns are free of inner connecting reinforcing structure.

3,729,941

## METHOD AND APPARATUS FOR LAYING PIPELINE

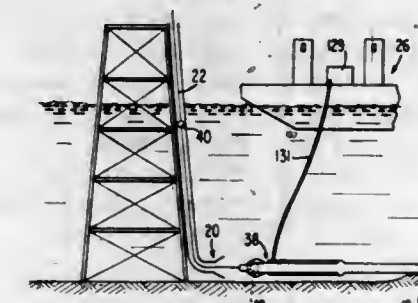
William R. Rochelle, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Division of Ser. No. 822,409, May 7, 1969. This application Sept. 7, 1971, Ser. No. 177,964

Int. Cl. F16l 1/00, 27/12

U.S. Cl. 61-72.3

17 Claims



A method and apparatus for making a connection between conduits, either submerged or to be submerged, characterized by the provision of a telescoping terminus on a flowline. In some operations where the flowline is laid either toward or away from an underwater installation, it may be lowered, while maintaining the terminus substantially fixed with respect to the remainder of the flowline, to a submerged position where the terminus is spaced from the installation. Subsequently, the terminus is telescoped into engagement with an alignment means, such as a riser adapter, either through diver assistance, or by remote operation of a terminus moving means. This means may be provided by a flexible drawline, which may be threaded through the alignment means, attached to the terminus, and subsequently tensioned to telescope the terminus. Release of the drawline may be accomplished through the application of fluid pressure.

Means are provided for latching the terminus into the riser adapter and for locking a slip joint between the terminus and the remainder of the flowline.

Other connections between the terminus and an installation conduit may be accomplished adjacent the surface of the water. The conduit and pipeline may be lowered together, with the terminus locked, and after lowering the terminus may be freed to permit proper positioning of the installation conduit relative to the installation. Alternatively, the lowering



operation may take place with the installation conduit in its proper position relative to the installation and with the terminus unlocked, whereupon relative movement of the telescoping terminus facilitates the operation of lowering the installation conduit and the connected flowline. After lowering the slip joint may be locked.

3,729,942

**RAPID CONSOLIDATION OF FLUIDIZED SAND BED**  
Johannes Van Steveninck, Rijswijk, Netherlands, assignor to Shell Oil Company, New York, N.Y.

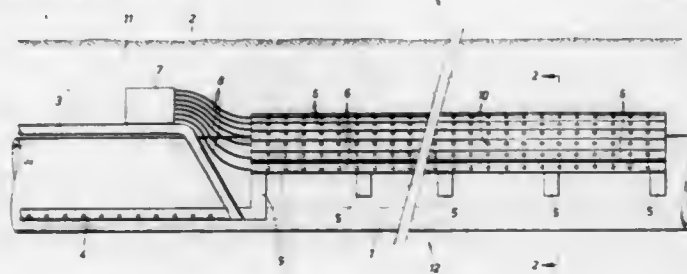
Filed July 23, 1971, Ser. No. 165,602

Claims priority, application Great Britain, Aug. 21, 1970, 40,451/70

Int. Cl. F16L 1/00; E02F 5/02

U.S. Cl. 61—72.4

7 Claims



Method and apparatus for obtaining rapid consolidation of the fluidized sand mass on top of a submarine pipeline buried in the bottom of a body of water by fluidization of the bottom. Rapid consolidation is obtained by reducing the flow rate of the water injected into the bottom to about a third of the minimum flow rate necessary for fluidization of the bottom.

3,729,943

**PROCESS FOR SEPARATION OF TERNARY GASEOUS MIXTURES BY RECTIFICATION**

Pierre Petit, Chateaufort-Malabry, France, assignor to L'Air Liquide Societe Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude, Paris, France

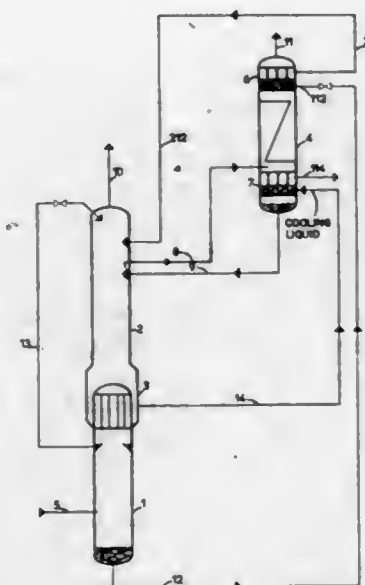
Filed April 28, 1970, Ser. No. 32,613

Claims priority, application France, May 5, 1969, 6914244

Int. Cl. F25J 1/00, 3/04, 3/02

U.S. Cl. 62—22

4 Claims



The present invention concerns a process in which a gaseous fraction is withdrawn from an intermediate level of a main rectification and subjected to a rectification in an auxiliary zone, the liquid fraction obtained in this auxiliary zone being returned to the said intermediate level of the main rectification.

The improvement according to the invention concerns the condensation of the said withdrawn gaseous fraction which is effected at the bottom and possibly simultaneously at the top of the said auxiliary zone by the vaporization of the liquid fractions originating from the main rectification. The process is applicable to the separation by rectification of a mixture formed of at least three constituents, two of which are in major proportions, the boiling point of the constituent in small proportions being between the boiling points of the two constituents in major proportions and being closer to that of the less volatile of these two constituents. For example, the invention is applicable to a two-stage air-separation plant with an argon side column.

3,729,944

**SEPARATION OF GASES**

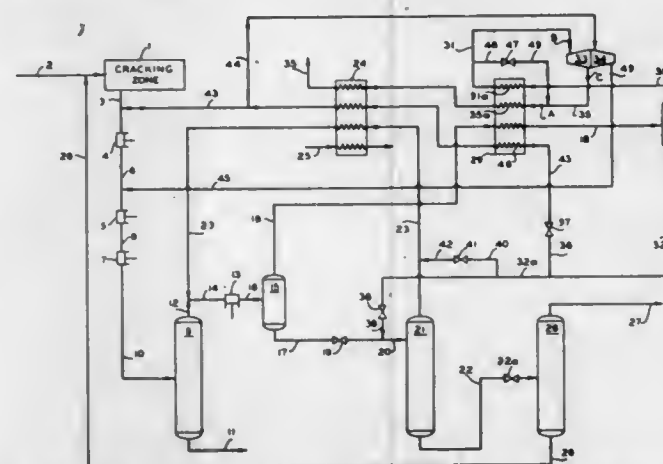
Carl S. Kelley, Bartlesville, Okla., and Frank H. Thorn, Antwerp, Belgium, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 23, 1970, Ser. No. 57,493

Int. Cl. F25J 3/00, 3/02, 3/06

U.S. Cl. 62—39

7 Claims



A gas-liquid mixture is introduced into a phase separation zone wherein there is effected a separation between a gas phase and its equilibrium liquid; the gas phase is required to perform a maximum of expansion work and then passed in indirect heat exchange with the gas-liquid mixture; the desired cooling of the gas-liquid mixture not completely supplied by the gas phase is supplied by a portion of the equilibrium liquid with the remaining portion of the equilibrium liquid being passed to convenient locations for further processing.

3,729,945

**MULTI-COMPONENT REFRIGERANT FOR THE LIQUEFACTION OF NATURAL GAS**

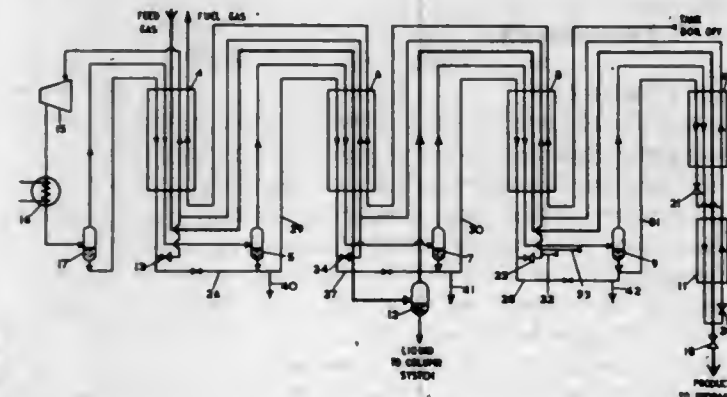
David T. Linnett, 83 Highwood Road, Hoddeston, England  
Filed Nov. 26, 1969, Ser. No. 880,009

Claims priority, application Great Britain, Nov. 29, 1968, 56,830/68

Int. Cl. F25J 1/00, 5/00, 3/02

U.S. Cl. 62—40

10 Claims



The efficiency of mixed refrigerant gas liquefaction process, for example liquefaction of natural gas using a refrigerant con-

sisting of components extracted from the natural gas, may be improved by controlling the composition, and hence the temperature/enthalpy profiles, of the refrigerant streams in each heat exchange stage. Coarse control is effected by adding portions of a refrigerant mixture extracted from the previous heat exchange stage, and fine control is effected by adding pure liquefied gases.

3,729,946

**CRYOGENIC LIQUID HANDLING SYSTEM**

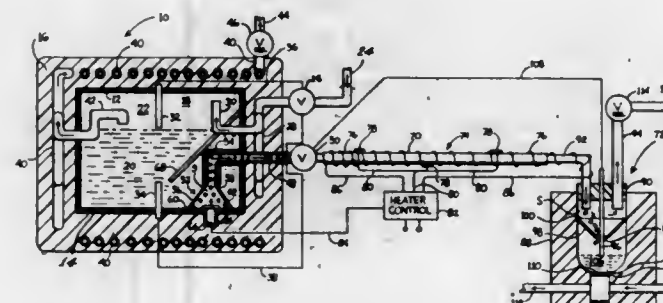
Alton A. Massey, 485 Fries Road, Tonawanda, N.Y.

Filed May 26, 1971, Ser. No. 146,903

Int. Cl. F17c 7/02

U.S. Cl. 62—51

21 Claims



A cryogenic liquid handling system for infrared detection or the like having a cryogenic liquid supply container which is insulated in part by the flow of cryogenic vapor existing above the liquid level, a two phase flow generator in the container, a heated delivery line to maintain the two phase flow and a separator at the point of use, including a vapor feedback passage to prevent the formation of frost in the lens of the infrared detection system.

3,729,947

**PROCESS FOR STORING BLOOD PLATELETS**

Takeru Higuchi, Lawrence, Kans., assignor to ALZA Corporation, Palo Alto, Calif.

Filed Dec. 4, 1970, Ser. No. 95,353

Int. Cl. B65b 63/08; C12k 9/00; A61k 17/00

U.S. Cl. 62—60

5 Claims

A process for storing blood platelets while simultaneously preserving the viability and integrity of the platelets by maintaining the platelets at a pressure of 100 to 1,000 psi and at a temperature of just above the freezing temperature of the platelets to about ambient temperature. The platelets may be stored alone or with platelet preserving agents.

3,729,948

**METHOD FOR PRESERVING COMESTIBLES**

Ralph E. Schwartz, Elgin, Ariz., assignor to Ovitron Research Corporation, Elgin, Ariz.

Filed Nov. 5, 1970, Ser. No. 87,060

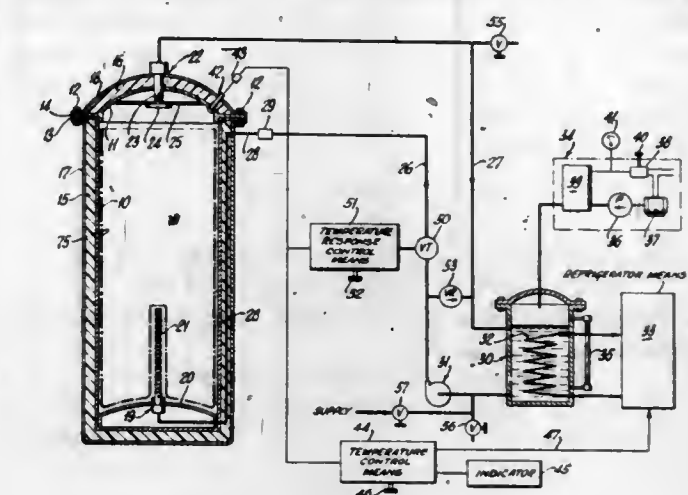
Int. Cl. F25d 17/02

U.S. Cl. 62—64

4 Claims

Solid living comestibles such as fish are stored under pressure at below 0°C temperatures, in a substantially non-dilatable vessel. The environment for such storage is a coolant liquid such as seawater which is, of course, subjected continuously to the storage pressure but which is circulated through the vessel from a point outside the vessel. Thus, external to the vessel, means are provided for controlling the coolant tem-

perature and pressure, and thereby also the environmental



temperature and pressure of the stored comestibles within the vessel.

3,729,949

**REFRIGERANT CHARGING CONTROL UNIT**

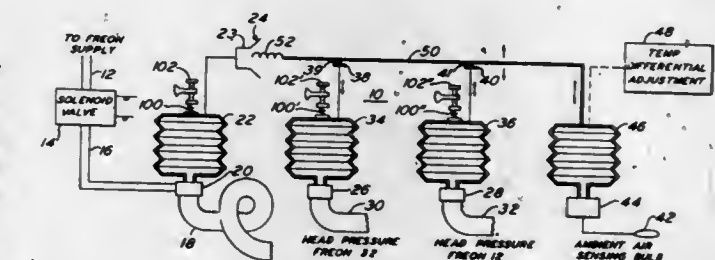
Jack James Talbot, 430 West Doren Terrace, Vineland, N.J.

Filed Dec. 6, 1971, Ser. No. 205,184

Int. Cl. F25b 45/00

U.S. Cl. 62—149

1 Claim



Movable switch elements responsive to temperature and pressure control the operation of a refrigerant charge unit during charging.

3,729,950

**ARRANGEMENT FOR AIR CONDITIONING EQUIPMENT CONTAINING A NUMBER OF CONDITIONING UNITS**

Lennart Astrom, Saltsjobadsavagen, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

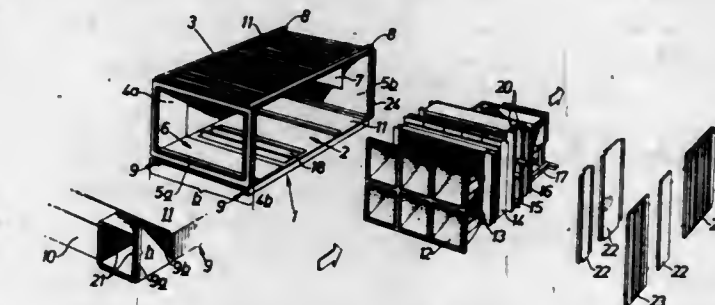
Filed May 24, 1971, Ser. No. 146,200

Claims priority, application Sweden, May 29, 1970, 7497/70

Int. Cl. F25d 23/12

U.S. Cl. 62—259

8 Claims



Air conditioning equipment containing several conditioning units comprising a bottom and a top, two opposing sides and two ends having an inlet and an outlet for the air to be conditioned, the bottom consisting of a bottom foundation resistant to torsional and bending forces, made up of two beams extending over the entire length of the equipment and two spacing elements resistant to torsional forces, adjoining each end,



the top consisting of a corresponding element, the beams having a web arranged somewhat rearward in relation to the sides of the equipment and one flange extending to said sides, the plates forming the bottom and top of the equipment being fully bent back round the said protecting flange, the top and the bottom being interconnected by cornerposts, secured to the bottom and the top.

3,729,951

# AIR CONDITIONING UNIT HAVING MEANS FOR PROVIDING FILTERED MAKE-UP AIR

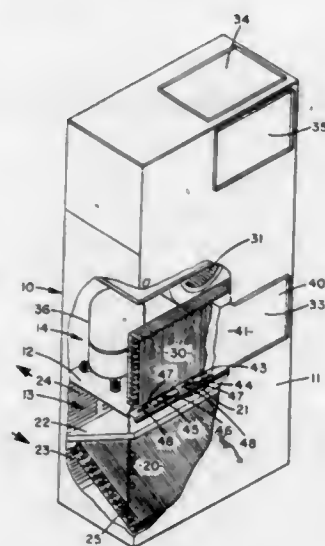
Isaac Berger, Hacienda Heights, Calif., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 6, 1971, Ser. No. 204,936

Int. Cl. F25d 17/06

U.S. Cl. 62-427

7 Claims



An air conditioning unit having a housing divided into a lower compartment containing a refrigerant condenser and condenser fan and an upper compartment containing an evaporator and a conditioned air fan, is provided with a make-up air passage in the partition dividing the two compartments. An air filter pad is positioned between an air inlet opening to the second compartment and the refrigerant evaporator so that its large area face is exposed for filtering air passing to the evaporator. The make-up air passage is disposed along the bottom side of the air filter pad so that the make-up air passes from the condenser fan upwardly through the small area bottom side of the air filter pad before passing in heat exchange relation with the refrigerant evaporator. A modified embodiment is described wherein the make-up air bypasses the refrigerant condenser.

3,729,952

# SELF-CONTAINED AIR CONDITIONING UNIT

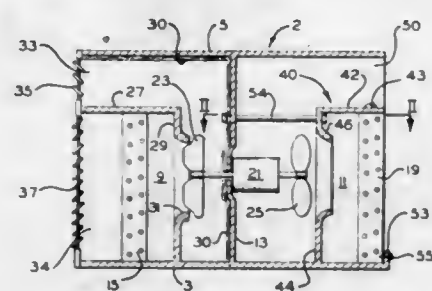
David E. Macleod, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sept. 9, 1971, Ser. No. 178,981

Int. Cl. F25d 17/06

U.S. Cl. 62-428

4 Claims



A self-contained air conditioning unit adapted for passage of air into and out of the condenser section of the unit through

the back fence thereof, the condenser air inlets being arranged to provide improved fan loading for increased condenser efficiency and minimal sound generation.

3,729,953

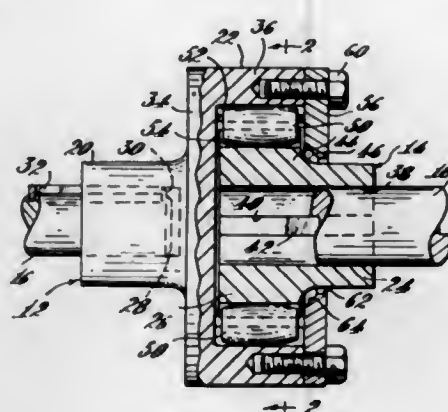
# COUPLING FOR CONNECTING THE ADJACENT ENDS OF SHAFTS

Arthur W. Wanzer, 9 Camolot Road, Yarmouth Port, Mass. Substitute for Ser. No. 14,337, Feb. 26, 1970, abandoned. This application Feb. 17, 1972, Ser. No. 227,224

Int. Cl. F16d 3/18

U.S. Cl. 64-9 A

1 Claim



A flexible coupling for connecting the adjacent ends of shafts, comprising hubs adapted to be non-rotatably fixed to the adjacent ends of the shafts, said hubs providing radially spaced concentric bearing members, containing peripherally spaced, longitudinally extending opposed grooves within which are mounted roller bearings and walls at the end of the bearing members for retaining said roller bearings in the grooves and the inner bearing member within the outer bearing member, said grooves being of uniform cross-section from end-to-end and said roller bearings being shorter than the distance between the walls and tapering from a maximum diameter at their midlengths toward their ends.

3,729,954

# RACHEL TYPE LOOMS

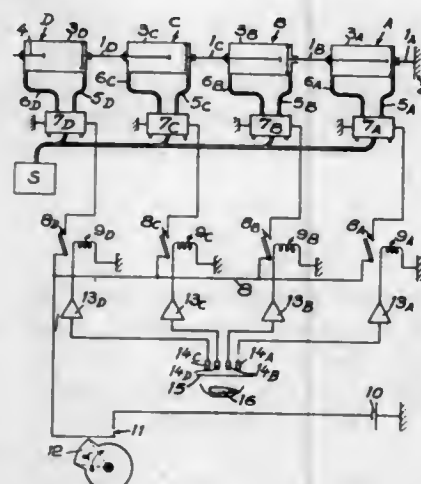
Jean-Paul Ducol, Bois D'Oingt, France, assignor to Centre Technique Industriel dit: Institut De France, Boulogne S/Seine, France

Filed May 18, 1971, Ser. No. 144,596

Int. Cl. D04b 23/00

U.S. Cl. 66-86

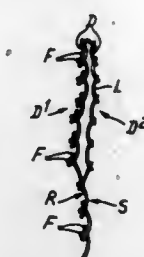
9 Claims



This invention relates to Rachel type warp knitting machines and particularly to an arrangement for controlling the guide bars thereof. Normal arrangements for this purpose comprise a number of jacks mounted in series with their operating rods coaxially arranged, so that the length of their

strokes is additive. One of the end jacks is fixed by one of its parts to the knitting machine frame with the cylinders of the jacks being coaxially guided along the frame and a plurality of distributors is provided, each being associated with a corresponding jack and arranged to connect the jack to a source of fluid under pressure and to be controlled selectively in accordance with a pre-established program. In accordance with this invention, the end jack opposite that end jack that is linked to the frame is securely attached to the heddle bar by one of its components and the piston rod of an end jack and intermediate jacks are securely attached to the cylinder of an adjacent jack passing into the cylinder thereof, in such a manner that its free end forms a stop for the end of the piston stroke of the associated adjacent jack: all the jacks are of the double-acting kind.

of elastic fabric at the top, at least one elastic band being within the welt area, and both bands having internally exposed, non-slip elastic yarn floats adapted to contact and grip the leg of the wearer.



3,729,957

# FAN

James Alexander Petrie, Littleover, and Kenneth Edward George Bracey, Findern, both of England; assignors to The Secretary of State for Defence, in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

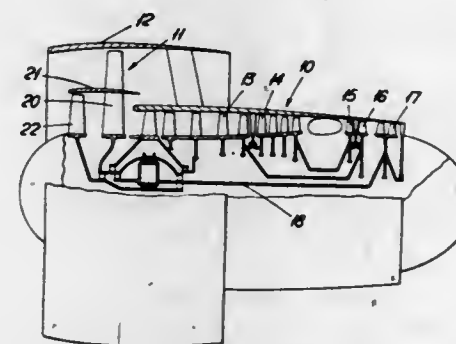
Filed Dec. 21, 1971, Ser. No. 210,490

Claims priority, application Great Britain, Jan. 8, 1971, 19,387/69

Int. Cl. F02k 3/06; F16h 37/06

U.S. Cl. 60-226 R

9 Claims



A fan comprises first and second rotor stages driven through a differential gear. The first stage is driven from the sun gear of the differential while the second stage is driven from the annulus gear of the differential. The planet carrier is driven from drive means. The invention is particularly applicable to gas turbine engines in which case the first stage of the fan may comprise a hub compressor and the drive means may comprise a gas turbine.

3,729,958

# LIQUID TREATING APPARATUS FOR TEXTILE MATERIALS AND METHOD THEREFOR

Donald K. Christian, Spartanburg, S.C., and Dennis L. Lomax, Ashboro, N.C., assignors to Piedmont Engineering and Machine Company, Inc., Spartanburg, S.C.

Filed May 3, 1971, Ser. No. 139,595

Int. Cl. B05c 3/04, 3/132

U.S. Cl. 68-19.1

18 Claims

Apparatus is disclosed herein for the liquid treatment of textile materials. Specifically, the liquid treating apparatus comprises a vessel in which are positioned a plurality of textile guides. The textile guides define a fabric path through the vessel and are positioned along both sides of the path. Fluid movement means such as a polygonal shaped rotatable element, especially a triangular shaped rotatable element is positioned adjacent the fabric path and acts on fluid in the vessel to create undulations in the textile material around certain of the guides as the textile material passes thereby. Preferably,

3,729,956

# SELF SUPPORTING KNITTED LADY'S STOCKING

Max Bruno Nebel, Andreas-Schluter Strasse 18, Wiesbaden, and Erhard Max Nebel, Wilhelmstrasse, Hettenhain, both of Germany

Continuation of Ser. No. 763,098, Sept. 27, 1968, abandoned.

This application April 28, 1971, Ser. No. 138,319

Int. Cl. D04b 9/46

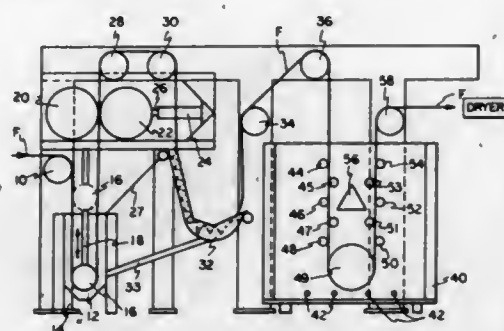
U.S. Cl. 66-172 E

5 Claims

A self-supporting knitted lady's stocking having an outwardly turned, non-rolling welt and two spaced annular bands



the textile material follows a U shaped path through the vessel. Ancillary apparatus is also disclosed as well as a method for



the liquid treatment and bulking of textile fabrics, especially knit fabrics.

3,729,959

### CASSETTE AND INTIMATE SYSTEM OF WASHING SOILED FABRICS AND MATERIAL

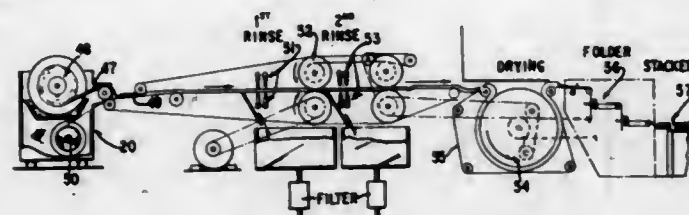
Benjamin Alvin Buss, and Donald C. Buss, both of 1315-23rd Avenue Court, East Moline, Ill.

Filed Aug. 10, 1971, Ser. No. 170,549

Int. Cl. D06f 89/00; B05c 3/10, 3/132

U.S. Cl. 68-19.1

13 Claims



A washing apparatus and system wherein soiled material is fed between impervious belts and onto a drum into a cassette with washing liquid. The weight of said belts and soiled material compresses the soiled material and belts together at the top of the drum which move apart relative to each other at the lower zone of said drum, said movement subjecting said soiled material to a washing action. There is intimate contact between the flat soiled material between two successive layers of belts and the washing liquid. The cassette can function to wash the soiled material separately from any subsequent treatment.

3,729,960

### LEAF SPRING SUSPENSION FOR AUTOMATIC WASHER

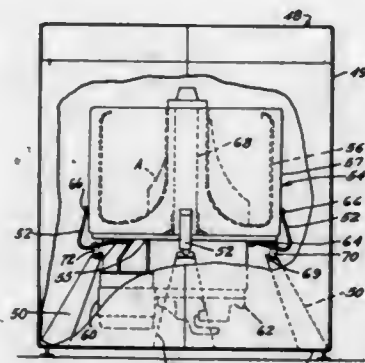
Frank R. Skinner, II, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 27, 1971, Ser. No. 212,590

Int. Cl. D06f 37/24

U.S. Cl. 68-23.3

9 Claims



A suspension assembly in a clothes washing machine which includes a rotatable clothes receptacle disposed in a tub hav-

ing a bottom side and a circumferential vertical side and susceptible to off-balance spinning characteristics when unevenly loaded. A plurality of leaf springs are provided, each having a fastened end and a free end, the fastened end being attached to the bottom side of the tub and the free end being disposed adjacent the vertical side of the tub. Dampening means are attached to the free end of the springs and are in frictional contact with the vertical side of the tub. Support means are provided to support the springs, and thereby support the tub resiliently on the springs.

3,729,961

### APPARATUS FOR THE WASHING OF PREFERABLY CELLULOSIC PULP

Nils Gustav Leffler, Sundsvale, Sweden, assignor to Sands Aktiebolag, Sundsbruk, Sundsvall, Sweden

Division of Ser. No. 720,717, April 11, 1968, Pat. No.

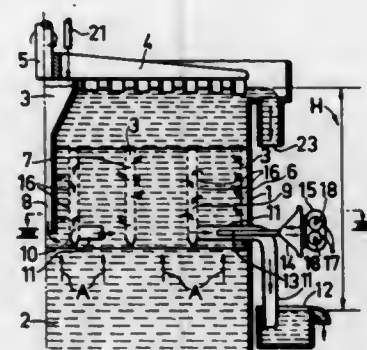
3,622,262. This application March 17, 1971, Ser. No. 125,349

Claims priority, application Sweden, April 13, 1967, 5183/67

Int. Cl. D21c 7/00

U.S. Cl. 68-181 R

8 Claims



Apparatus for washing a suspension of a fibrous material as it passes through a container in which a washing liquid is passed from a supply chamber having a perforate wall into and through the suspension and then into a collecting chamber. Means are provided for interrupting the influx of washing liquid into the collecting chamber at suitable intervals by pressure variations in the liquid.

3,729,962

### COMBINATION LOCK

Richard P. Harrington, and Russell J. Harrington, both of 17811 Riverside Drive, Channelview, Tex.

Filed Aug. 2, 1971, Ser. No. 168,113

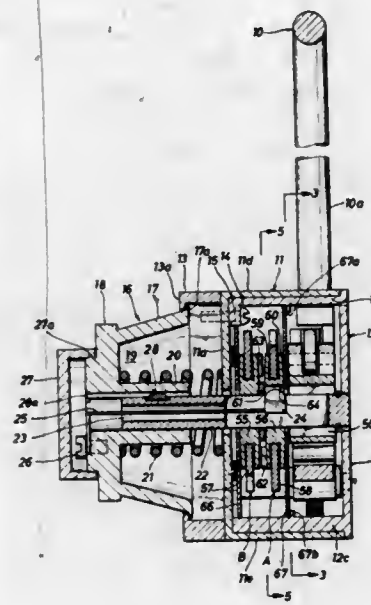
Int. Cl. E05b 37/04

U.S. Cl. 70-25

19 Claims

A combination lock of the exposed shackle type is disclosed. The shackle is held in its locked position by locking means that are released when a fence member is moved into gates located in the periphery of two tumbler wheels. The tumbler wheels are positioned for the gates to receive the fence by a dial and keyed shaft, after which the key is moved axially of the shaft out of driving connection with the tumbler wheels and into driving connection with the fence means. Rotation of the dial moves the fence means to release the shackle. The tumbler wheels have a rim and hub that are connected through a friction clutch type connection to allow the rim to be held while the hub is rotated. This allows the combination of the lock to be changed, when the lock is open, by actuating a lever mounted externally on the side of the lock housing that holds the fence means in engagement with the gates in the periphery of the tumbler wheels while the hubs are

rotated by the dial. If the combination is forgotten, apparatus is provided to locate the rims in a predetermined position from persons having lock opening capability. The lock is setable to a trapping phase whereby a key normally operable to open the



which position a master combination can be used to open the lock.

3,729,963

### LOCKING DEVICE FOR OUTBOARD MOTORS

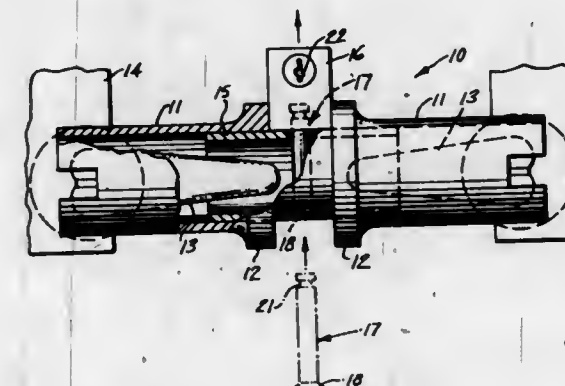
Martin F. Hintz, R-1-694-A, Alexandria, Minn.

Filed April 28, 1971, Ser. No. 138,117

Int. Cl. F16b 41/00; E05b 73/00

U.S. Cl. 70-230

4 Claims



A lock for preventing the theft of outboard motors. This lock includes a pair of sleeve members which insertible receive the motor mounting clamp arms and a smaller sleeve receives a key which is held in locking engagement with a removable block type lock.

3,729,964

### LOCK

Sam Shiao-Ming Hsu, New York, N.Y., assignor to Proof Lock International, Inc., New York, N.Y.

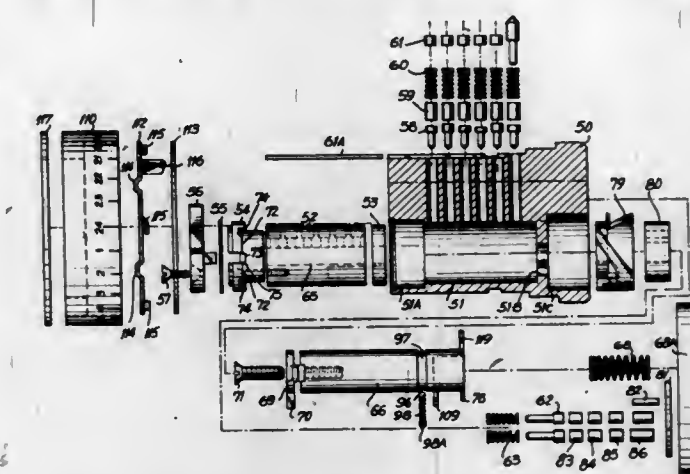
Filed June 21, 1971, Ser. No. 155,162

Int. Cl. E05b 27/00, 35/08

U.S. Cl. 70-338

19 Claims

A lock capable of being operated by a limited access key and an unlimited access key so as to control the number of



lock will be rendered inoperable and attempted use of the key will result in the key being trapped in the lock.

3,729,965

### MULTIPLE PART KEY FOR CONVENTIONAL LOCKS

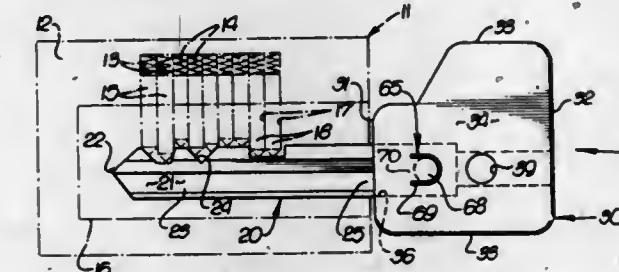
Klaus W. Gartner, 5711 Ravenspur Drive, Palos Verdes Peninsula, Calif.

Filed April 29, 1971, Ser. No. 138,675

Int. Cl. E05b 19/10

U.S. Cl. 70-395

14 Claims



The multiple part key includes an elongated extruded shank having a lock end portion and an opposite apertured end portion, and includes a hilt having a guideway with opposed shoulder portions therein for receiving the opposite end portion to be secured therein by opposed shoulder portions from the hilt extending into an aperture in the shank. In a second embodiment, the opposite end portion of the shank is located in the guideway portion of an inner part of the hilt, with the shank aperture around a hilt inner part shoulder portion, and this assembly is telescoped into an outer hilt part with the shank extending through a guideway portion of the outer hilt part to extend therefrom while tabs from the hilt inner part extend into openings in the hilt outer part to locate the sides of the hilt outer part around the hilt inner part to secure the shank and the hilt together.

3,729,966

### APPARATUS FOR CONTOURING THE SURFACE OF THIN ELEMENTS

Henri A. Khoury, Yorktown Heights, and Hans R. Rottmann, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 2, 1972, Ser. No. 223,681

Int. Cl. B21d 26/00

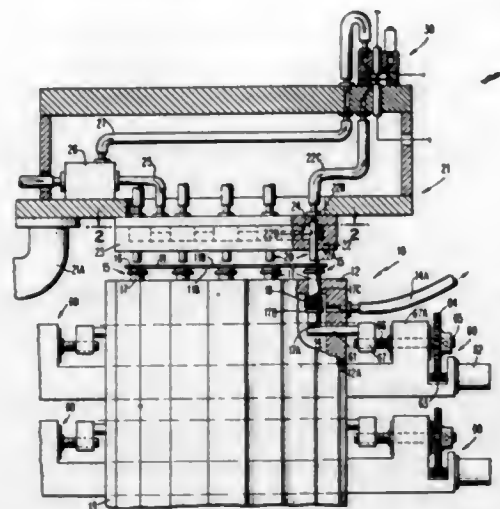
U.S. Cl. 72-12

20 Claims

Apparatus and a method for contouring the surface of a thin element such as a semiconductor wafer, the apparatus including a plurality of individual reciprocable suction cups for grasping at selected places the lower surface of the wafer. Superimposed of the wafer is a plurality of sensors for directing air against the opposite surface of the wafer and which senses,



by back pressure, the distance from the terminal end of the sensor to the wafer thereby sensing the contour of the surface of the wafer. Each sensor is connected to a comparator which responds to its associated sensor to actuate through a stepping



motor and cam the individual reciprocable suction cups to elevate or retract the same when the comparator indicates a difference between the desired contour at that particular place on the surface and the actual contour of the wafer.

3,729,967

# APPARATUS AND METHOD OF FINISHING GEAR TEETH

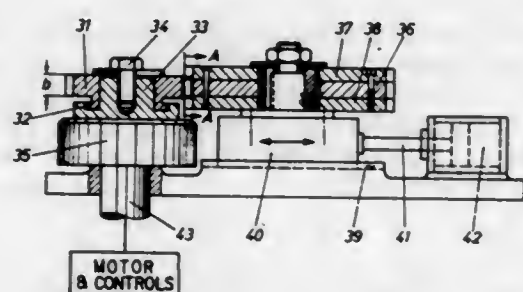
Otto Bauknecht, and Adolf Hurl, both of 7990 Friedrichshafen, Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany  
Filed May 10, 1971, Ser. No. 141,708

Claims priority, application Germany, May 12, 1970, P 20 22 937.2

Int. Cl. B21h 5/00

U.S. Cl. 72-102

5 Claims



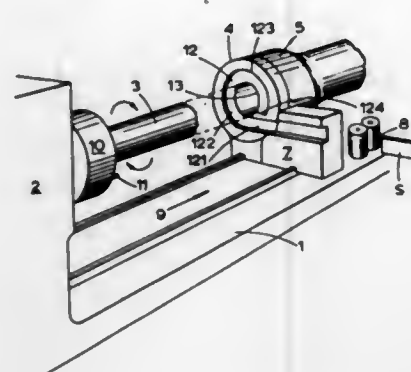
Rolled or machine-cut gears are finished by a rolling action in engagement with a die roll comprising a guide gear intermediate a pair of side gears. The outer gears form chamfers on the tooth edges while the guide gear, when working without flank clearance against the work gear, prevents flank bulging and effects smoothing. The teeth of the work gear are substantially confined by the teeth of the three gears of the die roll to prevent bulging of material due to the effect of chamfering as well as effecting burr trimming and smoothing.

3,729,968  
**WORKING OF STRIP METAL**  
Douglas C. Norris, 6 Saviles Close, Eaton Socon, England  
Continuation-in-part of Ser. No. 33,856, May 5, 1970, abandoned, which is a continuation-in-part of Ser. No. 832,804, June 12, 1969, abandoned. This application Dec. 22, 1971, Ser. No. 211,005  
Claims priority, application Great Britain, May 5, 1969, 22,795/69

Int. Cl. B21d 11/06

U.S. Cl. 72-129

12 Claims



Annular metal rings are manufactured by winding metal strip into a tightly compacted helical coil, cutting the coil, and securing together the ends of the individual rings so formed. Compensation for distortion of the strip produced by winding the strip is made by a die against which the strip being wound is pressed by force applied through the coil.

3,729,969

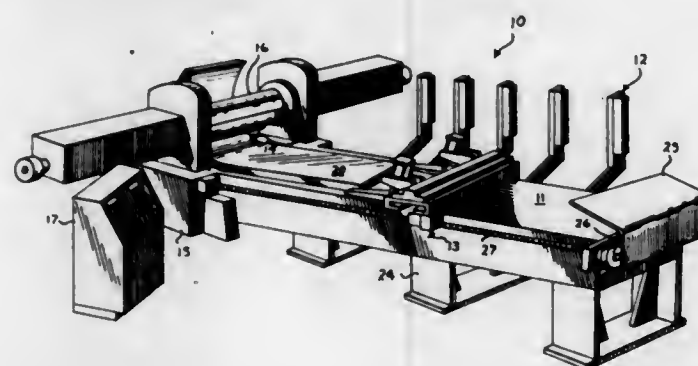
# BARREL FORMING PRESS

James W. Gibson; Donald A. Videtto, both of North East, and Richard C. Linse, Erie, all of Pa., assignors to General Electric Company, Erie, Pa.

Filed Aug. 19, 1971, Ser. No. 173,028  
Int. Cl. B21b 3/00; B21c 37/02; B21d 51/00

U.S. Cl. 72-127

36 Claims



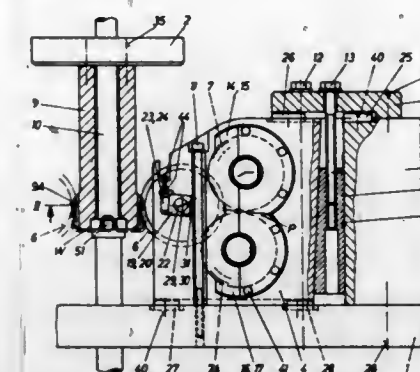
A numerically controlled apparatus and method for forming barrels of a desired diameter by successively advancing incremental portions of flat metal stock along a longitudinal path, and transversely deforming each portion with a ram reciprocally disposed in a vertical plane and acting against an oppositely disposed non-uniform concave die, the apparatus including a sensor and feedback system responsive to determine magnitude of permanent deformation and to actuate the ram in relation thereto to correct for errors, and including the provision for transversely retracting the ram to allow for removal of a completed cylinder.

3,729,970  
**GROOVE FORMING COLD ROLLING TOOL**  
Otto Propach, Markdorf; Heinz Velttinger, Langenargen, and Karl Jauch, Ravensburg, all of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Germany  
Filed April 9, 1971, Ser. No. 132,854  
Claims priority, application Germany, April 14, 1970, P 20 17 709.7

Int. Cl. B21b 17/06, 31/30

U.S. Cl. 72-208

9 Claims



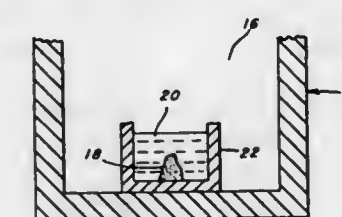
A ram or mandrel having a splined end to effect a die or drives a cup shaped workpiece into engagement with rollers arranged to press radially against the outer wall of the workpiece and force the workpiece material into the valleys between splines thus forming a complementary splined formation of the cup. A plurality of forming rollers are operative as a male die. Each roller is backed by a pair of supporting rollers wherein a forming roller and a pair of backing rollers form a unit radially adjustable relative the workpiece, each such unit being carried in a relatively stationary sector shaped body, all units being surrounded by a common reinforcing radial support ring and carried on a bed plate, there being one such unit for each formation, such as a crevice, to be formed in the workpiece.

3,729,971

**METHOD OF HOT COMPACTING TITANIUM POWDER**  
Thomas B. Gurganus, Avon; Gordon K. Turnbull, Rocky River, and Allen M. Montgomery, Cleveland, all of Ohio, assignors to Aluminum Company of America, Pittsburgh, Pa.  
Filed March 24, 1971, Ser. No. 127,457  
Int. Cl. B22f 3/24

U.S. Cl. 72-226

15 Claims



Hot isostatic compacting of titanium or titanium-base alloy powder to a product having controlled interstitials and microstructure and possessing outstanding end properties, low porosity and high density and one which does not require subsequent forging.

3,729,972

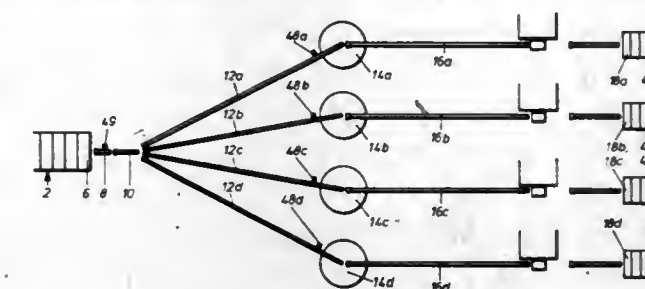
**METHODS AND APPARATUS FOR ROLLING**  
Friedrich Kocks, Freiligrathstrasse 1, Düsseldorf, Germany  
Filed Feb. 1, 1972, Ser. No. 222,551  
Int. Cl. B21b 41/00, 39/18

U.S. Cl. 72-228

10 Claims

A continuous small section rolling mill is provided including a roughing mill line and a plurality of finishing mill lines

spaced therefrom, the lines being operated so that the output from the last stand of the roughing mill line is approximately the same as the product of the combined intake speed of the several finishing lines, a coil furnace in front of each finishing



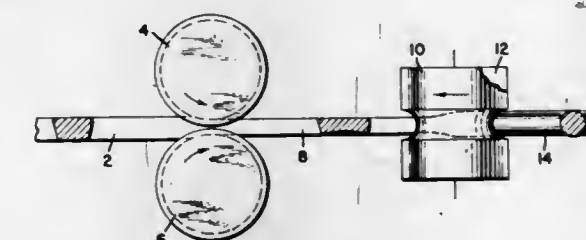
mill line, coiling means in each furnace, a distribution guide for selectively feeding stock from the roughing mill line to each coiling means and delivery guide means at each furnace whereby the stock can be directed to the finishing mill line associated with said furnace.

3,729,973

**ROLL PASSES FOR ROLLING A BAR OF CONTINUOUSLY CAST NON-FERROUS METAL AND THE METHOD IMPROVING THE METAL STRUCTURE**  
Robert D. Wykes, Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass.  
Filed April 2, 1971, Ser. No. 130,702  
Int. Cl. B21b 13/12

U.S. Cl. 72-234

18 Claims



A first pair of rolls preferably of unequal diameter and grooved in a manner to change the cross-sectional configuration of a bar of non-ferrous metal delivered from a continuous casting machine, from a generally trapezoidal section of substantial depth to a wider flattened less asymmetrical section, flat on both sides or flat on one side and concave on the other, and a second pair of rolls having concave grooves which will reduce the flattened bar delivered by the first pair of rolls to a generally symmetrical bar. The successive passes effectively carry out a method of operation which works the loose structure of the continuously cast bar into a more homogeneous fibrous structure.

3,729,974

**VEHICLE BODY TOOL FOR TWISTING DOORS**  
Ersey Clinton Tidwell, Route 2, Dickson, Tenn.  
Filed Feb. 3, 1972, Ser. No. 223,135  
Int. Cl. B21d 31/00; B21j 13/02

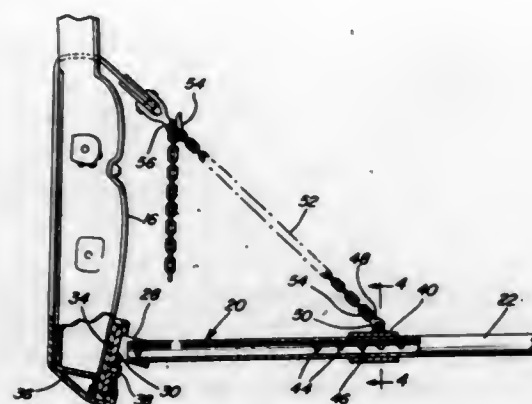
U.S. Cl. 72-292

6 Claims

An elongated lever bar defining a handle at one end and including an abutment pad at the other end for engagement with either the inner or outer surface of a vehicle door. One end of a wide strap is anchored to the abutment pad and the strap may be passed about the side of a vehicle door remote from the side thereof against which the abutment pad is abutted. The free end of the strap includes an anchor hook and one end of a tension member is anchored to the midportion of the lever bar and the other end of the tension member is engageable with the anchor hook carried by the free end of the strap. The

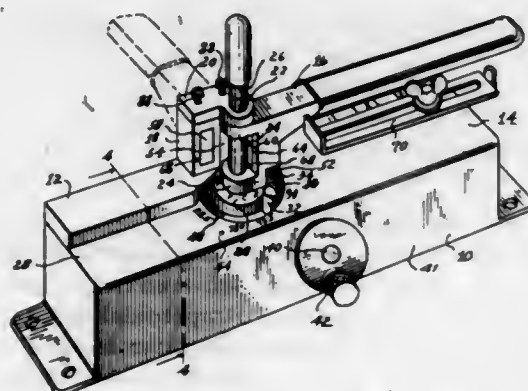


bar may be engaged with a vehicle door in the prescribed manner in order to twist the door in order to straighten on the face of the saw opposite the face against which the bearing means are applied. Sufficient pressure is applied to



damaged doors and assist in aligning vehicle doors relative to the associated vehicle body door opening.

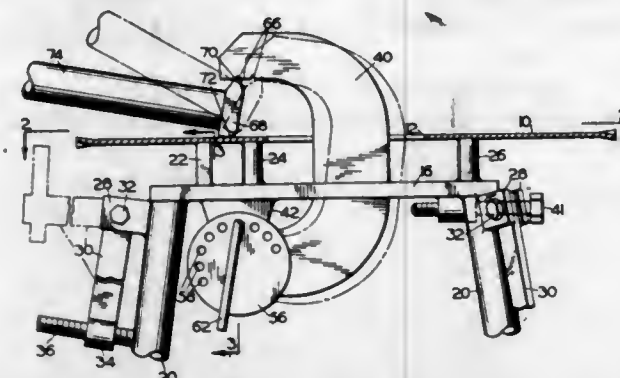
**3,729,975**  
**BENDER FOR WIRE OR FLAT STOCK**  
Peter P. Del Monca, 10 London Drive, Bordentown, N.J.  
Filed May 10, 1971, Ser. No. 141,843  
Int. Cl. B21d 9/05; B21j 13/08  
U.S. Cl. 72-388 9 Claims



A small bender designed to perform the accurate bending of metal or thermo-plastic round or flat stock; worm-gear means for adjusting the lever stop pin to various angular positions; means for adjusting the width of the stock-receiving space; and means for controlling the extent of the bending stroke of the lever in accordance with the degree of resiliency of the stock.

**3,729,976**  
**METHOD AND APPARATUS FOR STRAIGHTENING SAWS**  
Russell A. Heitzman, 5005 Kenway Drive, Tillamook, Oreg.  
Filed Dec. 28, 1970, Ser. No. 101,657  
Int. Cl. B21d 3/16

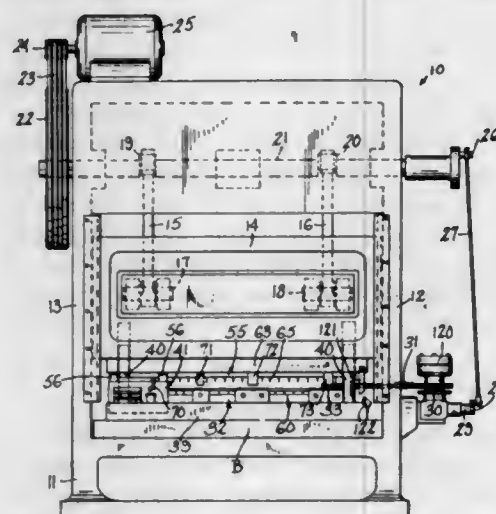
U.S. Cl. 72-389 9 Claims  
A saw having a deformation extending laterally with respect to the plane of the saw is straightened by placing it on bearing means bearing against one face of the saw on opposite sides of the deformation. Pressure is applied against the deformation



bend the deformation into the plane of the saw, without thinning or otherwise altering the saw thickness.

**3,729,977**  
**FORMING METHOD AND MACHINE**  
Alfred E. Motzer, Meriden, and Henry Zollinger, Jr., Cheshire, both of Conn., assignors to Hobson and Motzer, Wallingford, Conn.  
Filed April 29, 1971, Ser. No. 138,710  
Int. Cl. B21d 43/12

U.S. Cl. 72-405 15 Claims



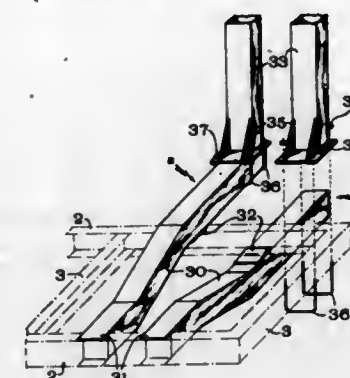
This disclosure relates to the forming of workpieces in a plurality of steps at a plurality of forming stations. The workpieces are carried by recirculating fixtures and intermittently advanced along the work stations. At the work stations, the fixtures are located and held, and a forming operation performed on the workpieces while in the fixture. The fixtures are then advanced to the next work station and the foregoing steps repeated until the workpieces are completely formed and then discharged from the fixtures.

**3,729,978**  
**ROAD VEHICLE BENCHES FOR STRAIGHTENING INDENTATIONS IN VEHICLE BODIES**  
Alipio Lunardini, piazza Betti 46, Marina di Massa, Massa Carrara, Italy  
Filed March 12, 1971, Ser. No. 123,775

Claims priority, application Italy, Dec. 18, 1970, 71.211-A/70

U.S. Cl. 72-457 3 Claims  
In a thrust member for use on road vehicle benches for straightening indentations in vehicle bodies, comprising an L-shaped beam having an upright portion and a base portion extending transversely of the upright portion, the base portion being applied to the vehicle bench while the upright portion carries means such as a pneumatic ram for exerting a pulling or pushing stress on the vehicle body to straighten the indenta-

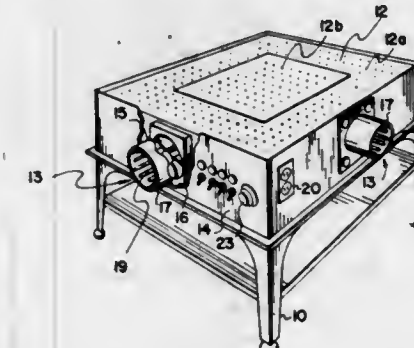
tions therein, the improvement comprising means for detachably securing said base portion to said upright portion, means to ensure firm engagement of said base portion with said vehicle supporting bench, and a bend in said base portion to allow it to pass either above or below a longitudinal or



transverse beam of said vehicle supporting bench when the free end of the base portion is brought into engagement with another longitudinal or transverse beam of said vehicle supporting bench, which is spaced from and extends parallel to said first longitudinal or transverse beam.

**3,729,979**  
**COMBUSTION PRODUCTS GENERATING AND METERING DEVICE**  
Richard E. Wiberg, Crofton, Md., and John A. Klisch, Alexandria, Va., assignors to The Boeing Company, Seattle, Wash.  
Filed May 28, 1971, Ser. No. 147,940  
Int. Cl. G01m 19/00

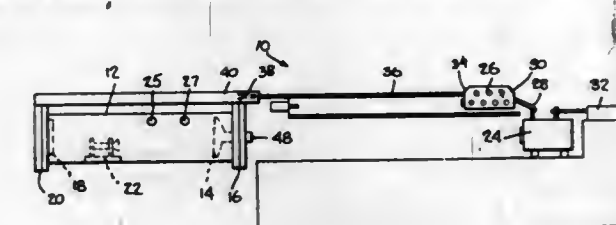
U.S. Cl. 73-1 R 17 Claims



An apparatus for generating combustion products at a predetermined fixed rate, mixing the combustion products with air to achieve a given concentration, and distributing the resultant mixture to an area or device to be tested, wherein the apparatus comprises blowers, a holder for the combustion products generating materials (which materials burn at a predictable and controlled rate), a mixing plenum chamber, and means for distributing the air-combustion products mixture.

**3,729,980**  
**HYDRODYNAMIC SHOCK SIMULATOR**  
Cameron D. Johnson, Mystic; Gerald M. Mayer, East Lyme, and Roger L. Moresco, Voluntown, all of Conn., assignors to The United States of America as represented by the Secretary of the Navy  
Filed March 2, 1972, Ser. No. 231,272  
Int. Cl. G01n 3/30

U.S. Cl. 73-12 6 Claims  
A hydrodynamic shock simulator for providing an underwater explosive shock environment for a sonar transducer under test. The simulator comprises a mechanically driven accelerator which drives a projectile. The moving projectile then hits a piston in a tank full of an incompressible fluid, thus



sure wave due to its reflection at the end farther away from the piston is limited by a shock absorber in the end of the tank.

**3,729,981**  
**APPARATUS FOR DETERMINING VISUAL PHASE EQUILIBRIA DATA**  
Guido O. Grady, Tulsa; Everett L. Swalley, Barnsdall, and Sam C. Swift, Tulsa, all of Okla., assignors to Cities Service Oil Company, Tulsa, Okla.  
Filed Sept. 17, 1971, Ser. No. 181,501  
Int. Cl. G01n 25/02

U.S. Cl. 73-17 A 1 Claim



Apparatus is disclosed comprising a capillary tube having piston means contained therein such that the tube may be loaded with a sample system for visual phase equilibria study. Pressure is equalized within and without the capillary tube through movement of the piston for changing volumes required while the temperature remains constant throughout the system.

**3,729,982**  
**APPARATUS FOR ACCURATE DETERMINATION OF ABSOLUTE DENSITY OF A FLUID**  
Osamu Senda, Tokyo, Japan, assignor to Agency of Industrial Science and Technology, Tokyo, Japan  
Filed Sept. 10, 1971, Ser. No. 179,326

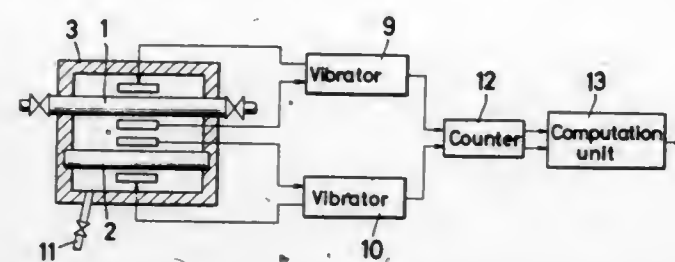
Claims priority, application Japan, Sept. 11, 1970, 45/079229

Int. Cl. G01n 9/00 2 Claims

U.S. Cl. 73-32  
In a vacuum vessel, a pipe and a bar which have the same outside diameter and are made of the same material are disposed parallelly to each other, with the ends thereof fixedly fastened to the side walls of the vessel. Said pipe and bar are provided with vibrating means which cause the pipe and the bar to vibrate. The pipe is first vibrated when the pipe interior is devoid of matter. The inside diameter of the pipe is determined indirectly from the consequent frequencies of the pipe and the bar. The pipe is then filled with a fluid whose density is to be determined and it is thereafter vibrated. The absolute



density of the fluid contained in the pipe is directly determined with high accuracy on the basis of the frequency of the



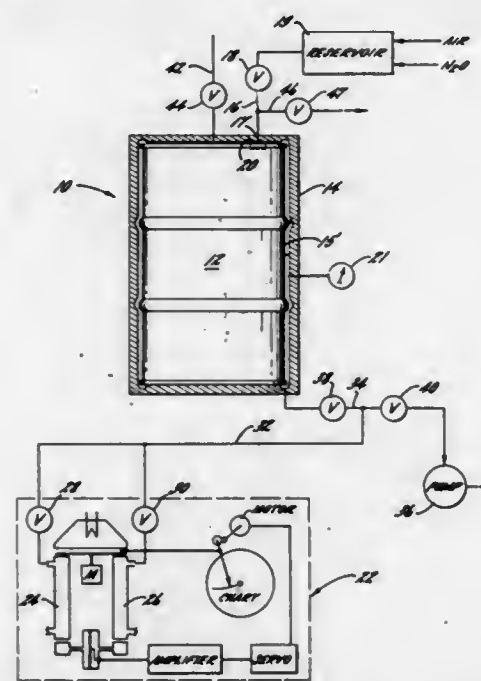
pipe in the packed state and the former frequency of the pipe in the empty state.

3,729,983

**LEAK TIGHTNESS TESTING METHOD AND APPARATUS**  
Matthijs Johannes Martinus Coppens, Helde-Kalmthout, Belgium, assignor to Inland Steel Company, Chicago, Ill.  
Filed Aug. 27, 1970, Ser. No. 67,427  
Int. Cl. G01m 3/20

U.S. Cl. 73-40.7

11 Claims



The disclosure relates to methods and apparatus for leak tightness testing of articles such as metal drums wherein the article is placed in a testing enclosure with a detectable gas such as nitrous oxide adjacent one closed side of the article and the space between the other side of the article and the enclosure is evacuated to a pressure lower than the gas pressure on said one closed side of the article. After the test time has passed the entire content of the evacuated enclosure space is flushed to a detector apparatus by an inert gas, preferably air, introduced into the enclosure space at a pressure higher than the pressure to which the space had been evacuated.

3,729,984

**APPARATUS FOR TESTING PRESSURIZED CONTAINERS**

Richard J. Waldherr, Mannheim-Seckenheim, Germany, assignor to Johann Waldherr OHS, Mannheim, Germany  
Filed April 24, 1972, Ser. No. 246,643

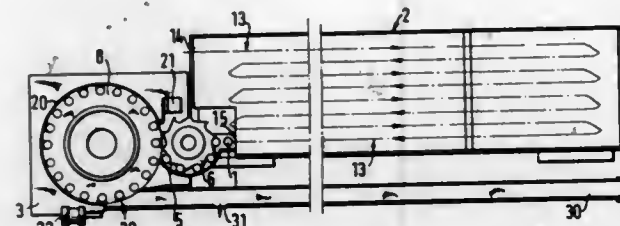
Claims priority, application Germany, April 26, 1971, P 21 20 348.5; April 6, 1972, P 22 16 556.6  
Int. Cl. G01m 3/00

U.S. Cl. 73-52

16 Claims

A succession of pressurized containers are delivered by a conveyor band to a heating station, a rotary feeding wheel receives the containers from the conveyor band in peripheral

pockets, and a rotary star wheel is arranged in tangential relationship to the feeding wheel to receive the successive containers in peripheral chambers from the feeding wheel. The containers are held in the chambers, while the chambers are



sealed, until the respective chambers have almost reached the feeding wheel after almost a full rotation of the star wheel, and then the containers are removed from the chambers of the star wheel after their fluid tightness has been tested.

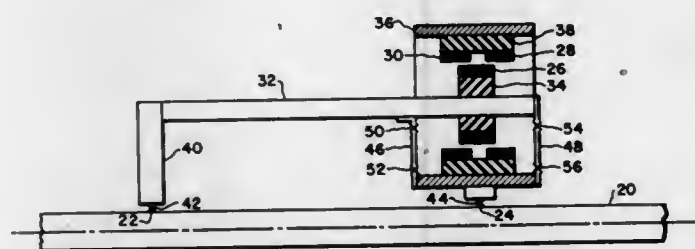
3,729,985

**STRAIN GAGE**

Charles F. Sikorra, 19715 1st Place S.W., Seattle, Wash.  
Filed Feb. 9, 1972, Ser. No. 224,725  
Int. Cl. G01b 7/10

U.S. Cl. 73-88.5 R

10 Claims



Strain gage apparatus of the type in which a pair of elements, connected at spaced points to a specimen under test, move relative to each other as the specimen is loaded to effect a change in an electrical signal indicative of the magnitude of the strain. Means are provided to maintain relative movement of the aforesaid elements the same and proportional to strain regardless of whether the strain occurs along the axis of the specimen or is due to bending. This is accomplished by inserting pivots or flexures in a specified geometrical pattern in the strain gage configuration to maintain the movable elements of the strain gage coaxial at all times regardless of whether the specimen is subjected to bending or axial loads.

3,729,986

**MEASURING AND SERVICING THE DRILLING FLUID IN A WELL**

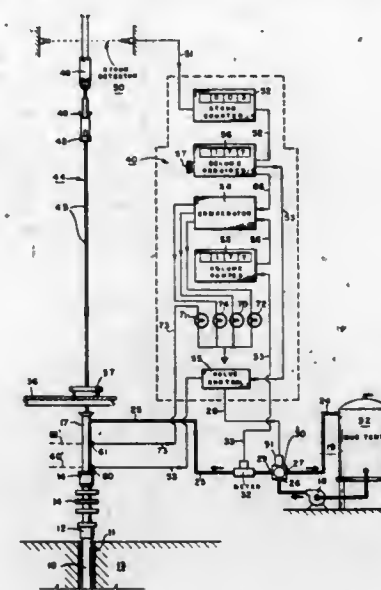
Loren W. Leonard, 8345 Trilola, No. 33, Houston, Tex.  
Continuation-in-part of Ser. No. 67,706, Aug. 28, 1970, Pat. No. 3,646,808. This application July 29, 1971, Ser. No. 167,194  
Int. Cl. E21b 47/10

U.S. Cl. 73-155

11 Claims

This invention relates to a method and system for detecting the condition of a well. During tripping the drilling fluid in the well is controlled to provide an early warning indication of an abnormality in the well. The volume of solid materials moved during each trip is measured and a corresponding required volume of drilling fluid is determined. A measured volume of

drilling fluid is delivered in order to restore in the well the drilling fluid to a reference level. The required volume is com-



pared with the measured volume to obtain signals which are indicative of the condition of the well.

3,729,987

**METHOD AND APPARATUS FOR MEASURING SLURRY CONCENTRATION AND VELOCITY DISTRIBUTION IN A SLURRY PIPELINE**

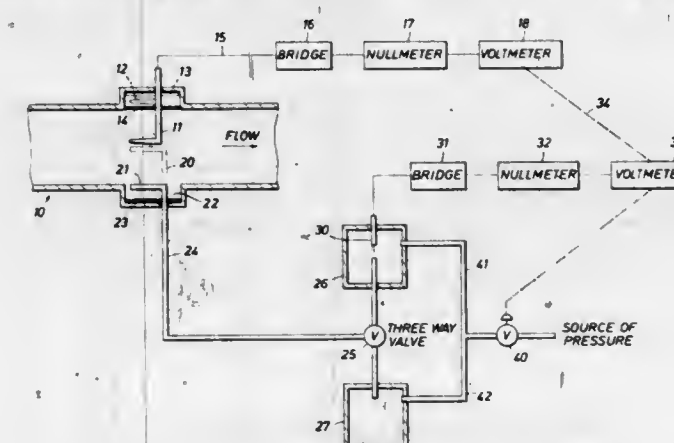
Junn-Ling Chao, Pasadena, Calif.; Moye Wicks, III, and Thomas W. Pounds, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Sept. 17, 1971, Ser. No. 181,488

Int. Cl. G01n 15/06

U.S. Cl. 73-61 R

6 Claims



A method and apparatus for measuring the slurry concentration and velocity distribution in a pipeline wherein a first probe is used to determine the velocity at a predetermined position in the pipeline and a sample probe is then moved to the position and sampling rate adjusted until the velocity response to the two probes are equal. The local value of the velocity is obtained by dividing volume per unit of time of the sample by the cross-sectional area of the probe while the slurry concentration and particle size distribution are obtained by analysis.

3,729,988

**APPARATUS FOR MOUNTING TENSION INDICATORS**  
Robert I. Swanson, Butler, Pa., assignor to Dake Corporation, Grand Haven, Mich.

Filed Oct. 29, 1970, Ser. No. 84,991

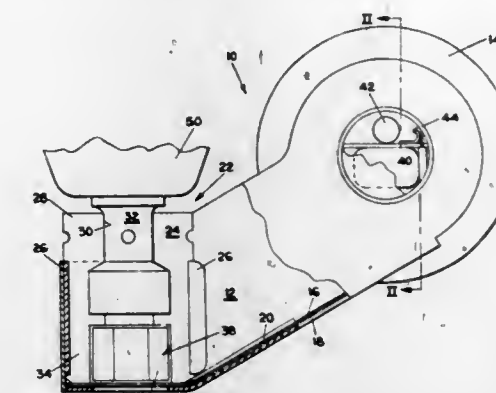
Int. Cl. G01l 5/24

U.S. Cl. 73-133

13 Claims

In an apparatus or device for use with a tool for tightening fastener elements such as bolts, nuts, screws and the like, a socket is rotatably mounted in a housing for receipt of one ele-

ment of the threaded fastening joint such as the bolt, screw or nut. A guide in the housing positions the tab in alignment with the socket and fastening element so that when the joint is tightened, the tab is compressed between two bearing surfaces in the joint. The tab is comprised of a plastic strip having a current conducting wire embedded along each edge which wires are connected in an electric circuitry mounted in the housing. When the joint has been loaded in tension a predetermined amount, the plastic tab partially deforms and extrudes



to establish electrical continuity between the joint and wires to close the circuit thereby signalling pre-load. Further tightening of the joint completely shears the plastic tab and wires to signal that minimum proof load has been reached. A magazine or reel is mounted in the housing to permit continuous and automatic loading of a plurality of tabs collated into a continuous strip. The electric signal can inform the operator or control the tool when the indicated loads are reached.

3,729,989

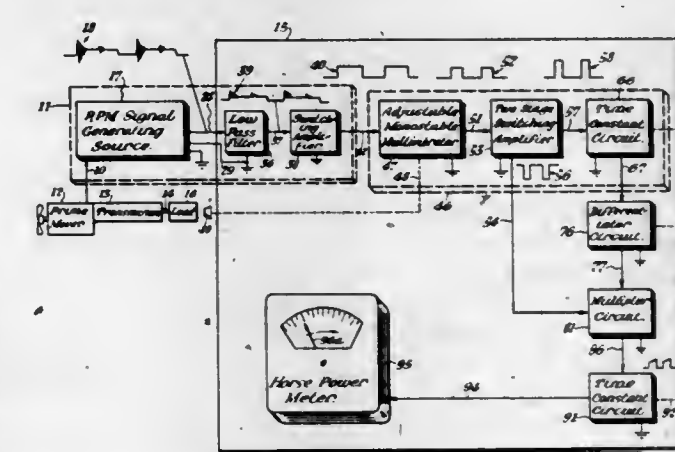
**HORSEPOWER AND TORQUE MEASURING INSTRUMENT**

Donald R. Little, 132 Chestnut Drive, Greensburg, Pa.  
Filed Dec. 10, 1970, Ser. No. 96,725

Int. Cl. G01l 5/13

U.S. Cl. 73-133 R

13 Claims



This invention relates to a readily portable apparatus and the related method of determining the useful torque and horsepower wherein the apparatus includes a first unit which provides a velocity signal directly proportional to the velocity of rotation of the prime mover and has as an output a signal indicative of the velocity of rotation of the prime mover. A second unit is coupled to the first unit to provide a signal directly proportional to acceleration. A third unit is coupled to the first and the second units, respectively, and provides an output which is directly proportional to the useful horsepower and torque developed at any given instant during operation of the prime mover.



3,729,990

## LOAD CELL FOR AIRCRAFT CONTROL STICK

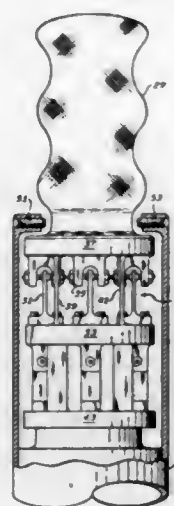
Kenneth L. Oliver, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed May 10, 1971, Ser. No. 141,570

Int. Cl. G0115/16

U.S. Cl. 73-133

9 Claims



An aircraft control stick contains a load cell for measuring shear forces applied to the stick. The cell includes a flat base plate for mounting the cell in the control stick, an upper plate for receiving the forces applied to the control stick, and an intermediate plate for mounting the force-responsive elements of the cell. The intermediate plate is supported above and parallel to the base plate by a plurality of flat spring flexure members disposed in planes normal to the plane of the two plates and parallel to one another so as to permit relative motion between the two plates only in the direction at right angles to the planes of the spring flexure members. A plurality of flat cantilevered load beams are also mounted on the base plate in planes parallel to the spring flexure members. Yoke members mounted on the intermediate plate straddle the free ends of the load beams so as to contact and deflect the load beams when deflections of the spring flexure members exceed a preset threshold value. Electrical strain gauges in each cantilevered load beam provide electrical output signals representative of the deflection of the load beams. The upper flat plate is disposed in the plane parallel to and above the intermediate plate. The upper plate is mechanically coupled to the intermediate plate by a second array of spring flexure members and cantilevered load beams.

3,729,991

## CAPACITIVE DISPLACEMENT TRANSDUCER

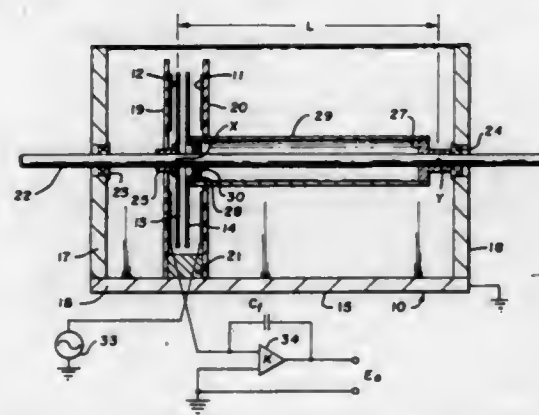
Edward V. Hardway, Jr., Houston, Tex., assignor to Spearhead, Inc., Houston, Tex.

Filed May 17, 1971, Ser. No. 144,016

Int. Cl. G0113/10

U.S. Cl. 73-136 A

17 Claims



A capacitive displacement transducer for measuring relative displacement between two points or objects is disclosed as

including a driven element connected to a source of input electrical signals, a receptor element connected to an electrical output signal circuit means, and two shield elements mounted between the driven and receptor elements for relative movement with respect to each other. One of the shield elements mechanically responds to one of the objects and the other shield element mechanically responds to the other object and any resulting relative movement between the shield elements changes the capacitive coupling between the driven and receptor elements to provide an electrical output signal proportional to this movement and the displacement between said objects.

3,729,992

## TIRE-TESTING DEVICE

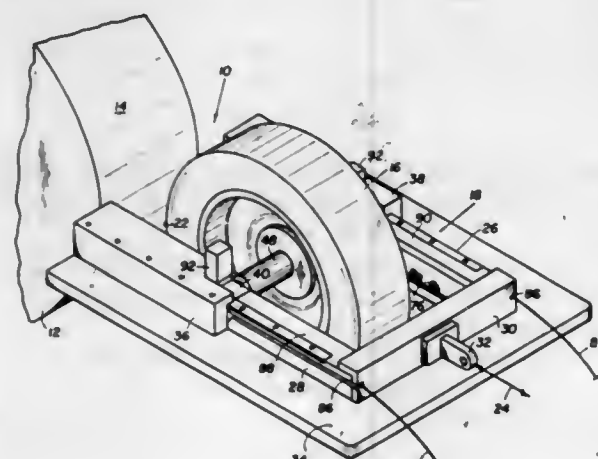
Jerome Lichtman, Commack, and Joseph Salvi, Bayville, both of N.Y., assignors to Stanford Technology Corp., Woodside, N.Y.

Filed June 16, 1971, Ser. No. 153,635

Int. Cl. G01m 17/02

U.S. Cl. 73-146

5 Claims



A tire-testing device in which a test tire is powered in rotation by a road wheel while the tire is held by an appropriately directed force against the road wheel. The holding force is also used advantageously to confine the opposite ends of a strain gauge against movement while permitting the medial portion thereof to deflect in response to operating characteristic movements caused during the testing rotation of the tire.

3,729,993

## DIGITAL KNOTMETER AND LOG

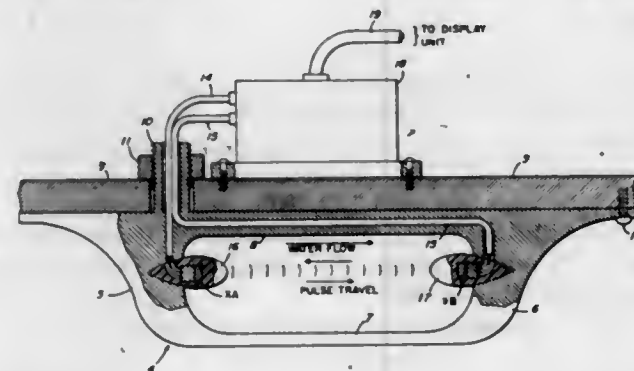
Calvert F. Eck, Osterville, and Howard H. Hill, Pocasset, both of Mass., assignors to Datamarine International Inc., Pocasset, Mass.

Filed March 8, 1971, Ser. No. 121,869

Int. Cl. G01c 21/10

U.S. Cl. 73-181

10 Claims



A digital knotmeter and log for registering the speed of a boat in knots, and its elapsed distance in terms of the integral of its relative velocity through the water, in which the higher

3,729,996

## AVERAGING DIGITAL RATE INDICATOR

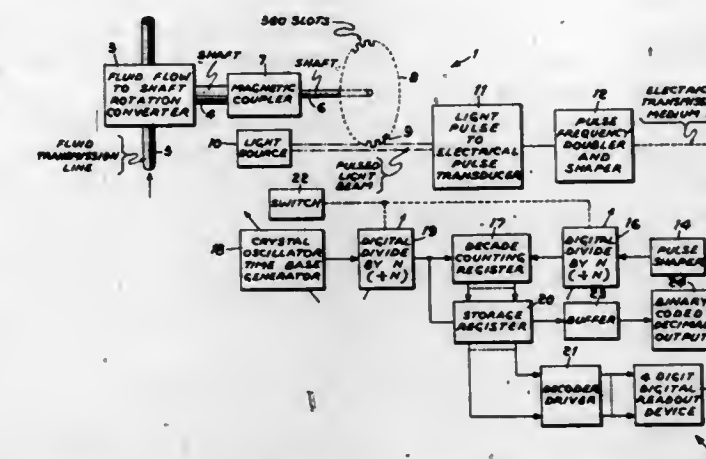
Thomas R. Metz, Haddonfield, N.J., assignor to Conoflow Corporation, Blenheim, N.J.

Filed Sept. 16, 1971, Ser. No. 180,958

Int. Cl. G0111/00

U.S. Cl. 73-194 E

14 Claims



3,729,994

## FLOW METERING SYSTEM FOR LIQUID WASTES

Henry G. Klug, 2029 N. 67th Avenue, Omaha, Nebr.

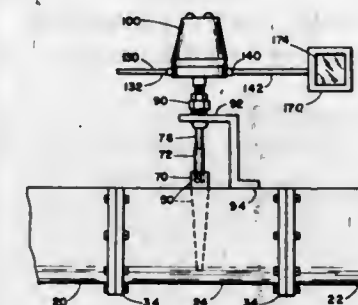
Continuation of Ser. No. 56,329, July 20, 1970. This

application Feb. 7, 1972, Ser. No. 224,214

Int. Cl. G0111/00

U.S. Cl. 73-194 E

24 Claims



A liquid flow metering system comprising a flow conduit, many of such conduits having a dielectric lining supported for strength by a moisture bearing material such as concrete, the concrete itself often having still other moisture bearing material on the outside of it such as dirt, a capacitive electrode imbedded in or attached to a side wall of the conduit, a dielectric medium disposed between the capacitive electrode and the moisture-bearing concrete, dirt or other material, the dielectric medium being disposed on the side of the capacitive electrode which faces away from the center of the conduit to prevent the capacitive electrode from sensing the moisture in the concrete, dirt, or other moisture-bearing material whereby the capacitive electrode senses only liquid in the conduit so as to give accurate sensing thereof.

3,729,995

## PRESSURE AND TEMPERATURE COMPENSATION SYSTEM FOR FLOWMETER

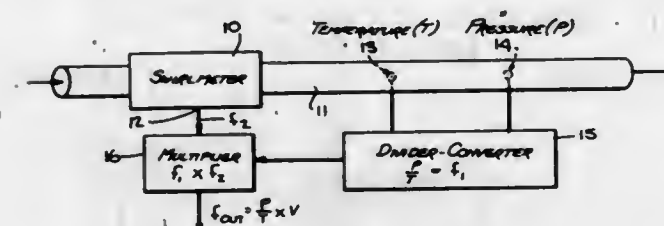
Lazlo I. Kovacs, Hathboro, and Roy F. Schmoock, Ivyland, both of Pa., assignors to Fischer &amp; Porter Co., Warminster, Pa.

Filed Aug. 26, 1971, Ser. No. 175,082

Int. Cl. G0111/00, 15/02

U.S. Cl. 73-194 B

11 Claims



A pressure and temperature compensation system for a gas flowmeter yielding a pulsatory signal whose frequency is a function of flow rate, which signal is affected by changes in the pressure and temperature of the gas being measured. The system includes sensors generating signals proportional to prevailing values of pressure and temperature, the pressure signal being divided by the temperature signal in a divider-converter adapted to produce a variable duty-cycle signal whose duty cycle is proportional to the quotient of the applied signals. The variable duty-cycle signal is multiplied by the pulsatory flowmeter signal, the product thereof being an output signal whose frequency is directly proportional to volumetric flow corrected with respect to both the temperature and pressure.

3,729,997

## LIQUID LEVEL SENSOR

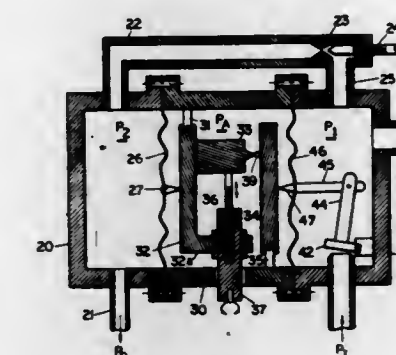
Owen B. Luke, 51 Mitchell Road, Cape Elizabeth, Maine

Filed Dec. 27, 1971, Ser. No. 212,163

Int. Cl. G01123/16

U.S. Cl. 73-302

11 Claims



A device of the gas-bubbling type for determining the level of a body of liquid comprises a dual-diaphragm, multiplying lever arrangement whereby the pressure necessary to effect bubbling is multiplied or amplified to a higher pressure which can be read directly as hydrostatic head and/or used to operate a control switch.

The sensor comprises two chambers, one at a low and the other at a high pressure. Each chamber has like diaphragms



exposed to ambient pressure and connected by a lever mechanism whereby the movement of the low pressure diaphragm causes an opposite and greater movement of the high pressure diaphragm. The low pressure chamber receives the pressure necessary to effect bubbling through a conduit placed in the body of the liquid, the level of which is to be measured. The high pressure chamber receives instrument air (or other control gas) through a regulating valve operated by the high pressure diaphragm, and a small amount of air is continuously passed from the high pressure chamber through a throttling or needle valve into the low pressure chamber; and thence to the bubbler conduit in the liquid.

Because the control pressure is taken from the high pressure side of the sensor, a regular commercially available pressure-operated switch can be used with good results. Springs are not required to load the diaphragm. Instead, the sensor operates by mechanically balancing two pressures without the aid of springs, making it very sensitive and accurate, and the diaphragms can withstand over pressures without rupturing.

3,729,998

**ELECTRONIC, DIGITAL THERMOMETER**

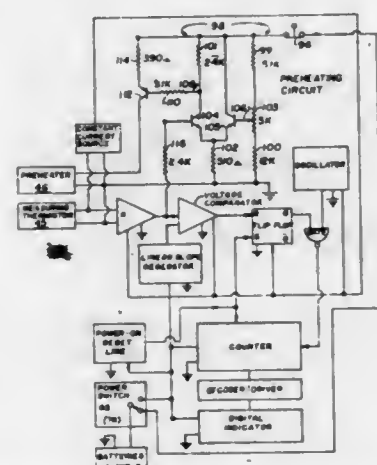
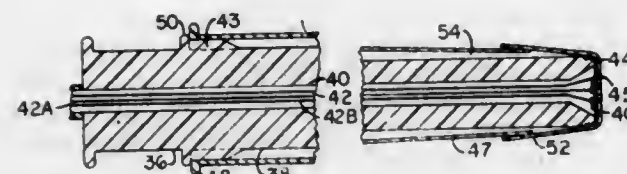
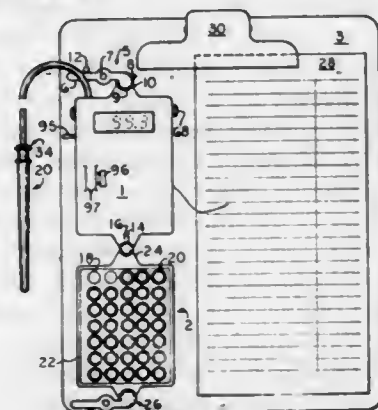
Fritz Kurt Mueller; Billy Otis Martin; James Parker Chandler, and Robert Cherry Martin, all of Huntsville, Ala., assignors to Royal Medical Corporation, Huntsville, Ala.

Filed Aug. 10, 1970, Ser. No. 62,481

Int. Cl. G01k 7/24, 1/08

U.S. Cl. 73—362 AR

34 Claims



An electronic thermometer having a probe for insertion into the mouth or other cavity where temperature is to be mea-

sured; disposable probe sheaths that are easily assembled with and removed from the probe; an electronics system comprising means for preheating the mouthward end of the probe, thus achieving very quick temperature measurement; and a digital temperature indicator. The invention includes means for quickly disengaging the disposable sheath from the probe and means for supporting the assembly on a nurse's hospital board or from a neck strap. The electric circuitry receives power from batteries that are permanently fixed to a removable and quickly replaceable bottom (back) cover of the case.

3,729,999

**BAROMETRIC ALTIMETER**

Naonobu Shimomura, No. 13-8 Sakuragaoka-cho, Shibuya-ku, Tokyo, Japan

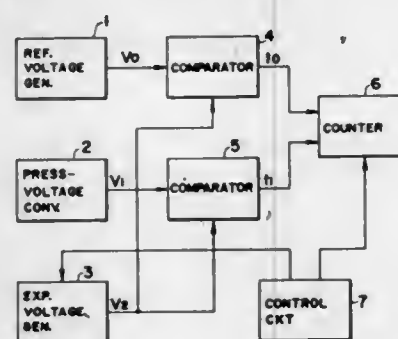
Filed May 12, 1972, Ser. No. 254,784

Claims priority, application Japan, May 12, 1971, 46/31858

Int. Cl. G011 7/00

U.S. Cl. 73—384

18 Claims



Apparatus is disclosed for comparing the magnitude of an exponentially changing signal with time respectively with that of a signal proportional to the atmospheric pressure at a reference altitude and that of a signal proportional to the atmospheric pressure at the altitude to be measured; further, their respective times of coincidence are measured. The altitude can then be measured because this time difference is proportional to the difference between the altitude to be measured and the reference altitude and, furthermore, the accurate altitude can be measured executing a correction of the temperature distribution.

3,730,000

**STEPPED DIAL PRESSURE GAUGE**

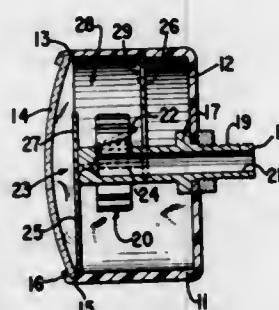
Ralph D. Walte, Sellersville, Pa., assignor to Ametek, Inc., New York, N.Y.

Filed Feb. 12, 1971, Ser. No. 115,015

Int. Cl. G011 7/04

U.S. Cl. 73—411

6 Claims



A pressure gauge of the Bourdon tube type, especially useful in conjunction with fire extinguishers, has a diametrically extending step in its dial face with a central opening in the step and the Bourdon tube positioned in this opening. A pointer on one end of the Bourdon tube extends at right angles thereto and moves in the space between a viewing window of the gauge and the dial face rear portion which is spaced inwardly

from the window. The pointer is bendable so as to be adjustable.

3,730,001

**AUTOMATIC WORKING LIQUID SAMPLER FOR PROVIDING LIQUID SAMPLES FOR SPECTROGRAPHIC WEAR ANALYSIS**

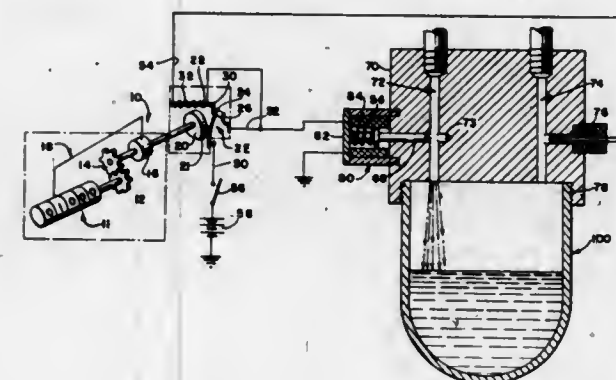
Richard Rohland Goodwin, 8604 Battalies, Annandale, Va.

Filed Feb. 8, 1972, Ser. No. 224,458

Int. Cl. G01r 1/10

U.S. Cl. 73—422 R

7 Claims



A system which takes a sample of a working liquid in a machine for subsequent study, such as by spectrographic analysis. The sample is taken after a predetermined amount of machine usage has accumulated. The system comprises accumulating means for recording machine usage and providing a control output which activates a sampling means to take a sample of the working liquid. Delay means are preferably incorporated to assure that the sample is representative of the overall condition within the machine of the working liquid being so sampled.

3,730,002

**SAMPLE INTRODUCTION SYSTEM FOR A FLUID CHROMATOGRAPH**

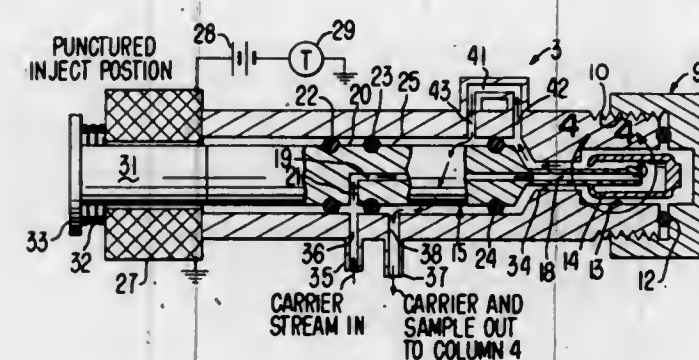
James R. Penton, Oakland, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed June 24, 1969, Ser. No. 836,069

Int. Cl. G01n 1/22

U.S. Cl. 73—422 GC

3 Claims



A gas chromatograph system wherein a sample filled capsule is inserted into the system through an airtight lock. The sample capsule is punctured by a puncture tube in fluid communication with the carrier stream. The carrier stream passes through the tube and flushes the sample material from the capsule into the chromatographic column for separation and analysis.

3,730,003

**RPM REGULATOR FOR INTERNAL COMBUSTION ENGINES, PARTICULARLY ENGINES FOR AGGREGATES**

Takujji Isomura, Kariya, Aichi Pref., Japan, assignor to Nippondenso Co. Ltd., Kariya-shi, Aichi-ken, Japan

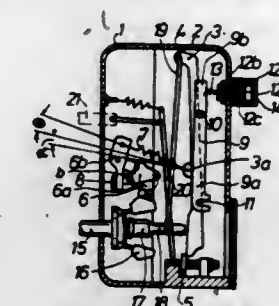
Filed Sept. 22, 1971, Ser. No. 182,762

Claims priority, application Japan, Sept. 28, 1970, 45/84812

Int. Cl. F02d 31/00

U.S. Cl. 73—541

5 Claims



In an rpm regulator for an internal combustion engine settable to two operational rpm's for obtaining two different current frequencies from a generator driven by said engine, in order to ensure that the P-degree of the regulator remains the same, there is provided an auxiliary regulator spring which, in an arbitrary manner, is connectable to the rpm regulator to combine with a main regulator spring for one of the operational rpm's.

3,730,004  
SENSOR

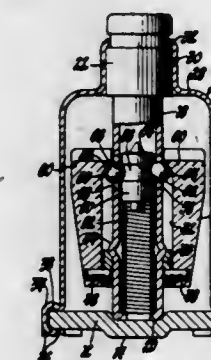
Walter Cwycyshyn, Detroit, and Elwyn L. Kitchen, Jr., Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed April 23, 1972, Ser. No. 136,880

Int. Cl. G01p 15/02

U.S. Cl. 73—514

5 Claims



A sensor includes a base plate and a generally vertically extending tubular guide provided intermediate the ends thereof with two diametrically opposed radial openings. A firing pin is slidably mounted within the guide and is spring biased toward one end of the guide to an actuated position wherein the pin engages a cartridge to fire the cartridge and actuate an inflatable cushion of an occupant-restraint system. An annular seismic mass surrounds the guide and is pivotally supported thereon for movement about an axis transverse of the guide axis and direction of movement of the operator. The mass axis is further coplanar with the axis of the openings in the guide. The mass includes a pair of diametrically opposite axially and radially directed shoulders having grooves which open to the guide openings and cooperate with an annular groove on the firing pin to trap respective balls therebetween and detent the firing pin against movement. The balls are freely received within the guide openings. When the mass receives an acceleration pulse of predetermined amplitude and time directed angularly and preferably normal to the axis thereof, it



swings about the axis to move the grooves thereof out of engagement with the balls and permit the firing pin spring to move the firing pin to actuated position as the balls move outwardly of the guide openings.

3,730,005

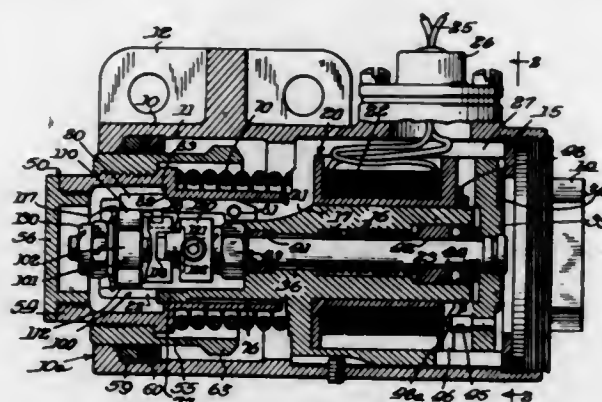
**ELECTROMECHANICAL ACTUATOR**

Haas U. Hjermstad, Chicago, and Carl J. Kopp, Arlington Heights, both of Ill., assignors to C. P. Clare & Co., Chicago, Ill.

Filed Dec. 20, 1971, Ser. No. 209,896  
Int. Cl. G05g 17/00

U.S. Cl. 74-2

10 Claims



An energy-storing and release mechanism usable to actuate bomb shackle release devices and the like. The mechanism includes a plunger capable of forcibly moving from a cocked position to a released position in response to a control signal from actuating means. Locking means are provided to respond to the actuating means and to releasably lock the plunger in the cocked position to prevent accidental release of the plunger as a result of shock loads having a substantial rotational force component.

3,730,006

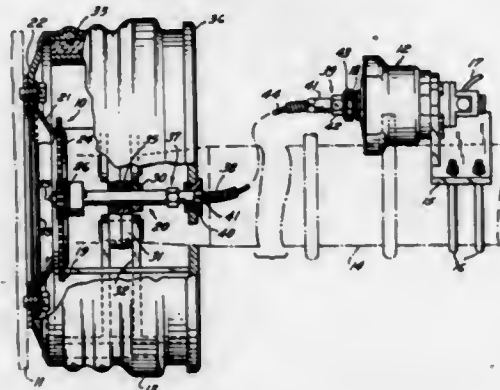
**GEAR DRIVE ASSEMBLY FOR ANTI-WHEEL LOCK-UP CONTROL SYSTEMS IN MOTOR VEHICLES**

Robert B. Price, Manchester, and Francis W. Stager, Stafford Springs, both of Conn., assignors to The Jacobs Manufacturing Company, West Hartford, Conn.

Filed June 7, 1971, Ser. No. 150,294  
Int. Cl. F16h 37/00

U.S. Cl. 74-13

6 Claims



A gear drive assembly for use in an anti-wheel lock-up control system to transmit rotation of a wheel of a motor vehicle to a control device. One embodiment includes gearing connected with the drum and confined within its interior having connection by means of a flexible casing and drive shaft with an externally located control device.

In a second embodiment including the flexible casing and shaft, the gearing is arranged adjacent the open end of the drum.

In a third embodiment, the flexible casing and shaft is omitted and the control device is connected directly with the gearing located adjacent the open end of the drum.

In each embodiment, a dust cover arrangement over the open end of the drum protectively guards the drum and gearing against entry of foreign matter.

3,730,007

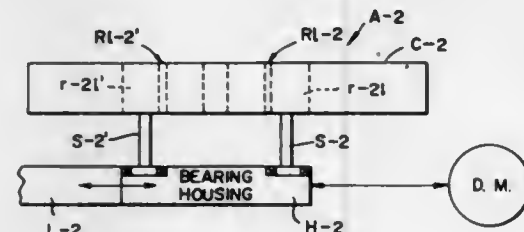
**ROLAMITE**

Charles K. Wellington, Nashua, N.H., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 30, 1969, Ser. No. 1,907  
Int. Cl. F16h 27/02

U.S. Cl. 74-89.2

8 Claims



Improvement features in "rolamite" type precision rolling suspension are taught, such a "rolamite" being known in the art as comprising cylindrical rollers held captive within a roller cage, between the S-shaped bends of a roller band therein. These features relate to "double rolamites" particularly involving two pairs of such rollers and especially "linear rolamites" adapted for unidirectional motion. Other features include arranging a plurality of rolamite/cage assemblies in a single operative combination; adapting a rolamite cage as part of an actuated load structure; arranging one, or several, "drive-magnets" along the roller-track of a rolamite assembly for prescribed magnetic attraction of the rollers and, thus, the magnetic incrementing thereof; and providing an array of detect-cells along such a roller-track to monitor incremental movements of the band and roller assembly.

3,730,008

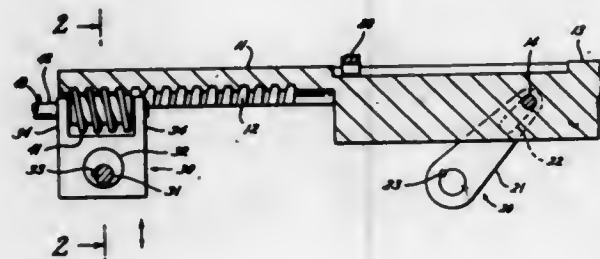
**DISENGAGEABLE SLIDE NUT**

John M. Sheesley, Houston, Tex., assignor to Research Engineering Company, Houston, Tex.

Filed May 27, 1971, Ser. No. 147,419  
Int. Cl. F16h 27/02

U.S. Cl. 74-89.15

7 Claims



A device for translating rotary motion of one member into linear motion of another. It includes a rotating member, such as a screw, which is removably engageable with a threaded partial nut. On engagement, screw rotation causes linear nut movement. This movement may be used to control motion of further devices.

3,730,009

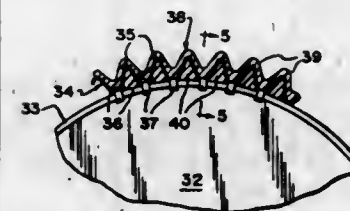
**COMPOSITE DRIVE WHEEL**

Robert H. Mead, and George A. Zimmer, both of Ithaca, N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.  
Continuation of Ser. No. 884,094, Dec. 11, 1969, abandoned, which is a continuation-in-part of Ser. No. 678,831, Oct. 30, 1967, abandoned. This application Dec. 15, 1971, Ser. No. 208,495

Int. Cl. F16h 55/06, 55/14, 55/30

U.S. Cl. 74-243 R

5 Claims



Composite drive wheel devices are disclosed herein to provide illustrations of this invention. These wheels include a stamped circular plate having tooth roots on the periphery thereof with a plastic toothed rim molded over the tooth roots.

3,730,010

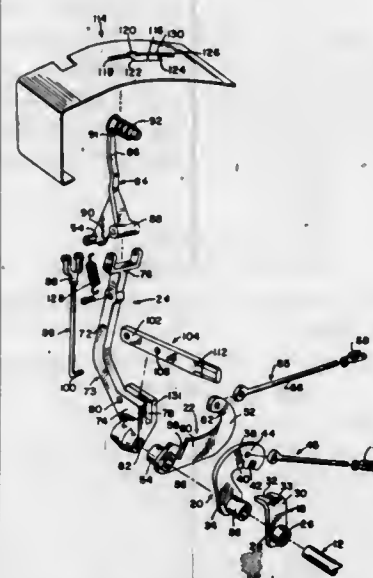
**SHIFT MECHANISM FOR MECHANICAL TRANSMISSIONS**

Josef F. Prokop, Addison, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Sept. 30, 1971, Ser. No. 185,107  
Int. Cl. G05g 5/10

U.S. Cl. 74-477

8 Claims



A single control lever pivotally actuating a latch progressively in a first and a second plane. When it is desired to change from one to the other of two transmission gear set levers, the latch is pivoted from a gap contained therein through a fixed gate into a gap contained in the other transmission gear set lever. The shift being possible only when the two gaps and the gate define a common plane.

3,730,011

**PRECISION DRIVE FOR PRINTING CYLINDER**

Lysle D. Cahill, Dayton, and George William Dealinger, Franklin, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

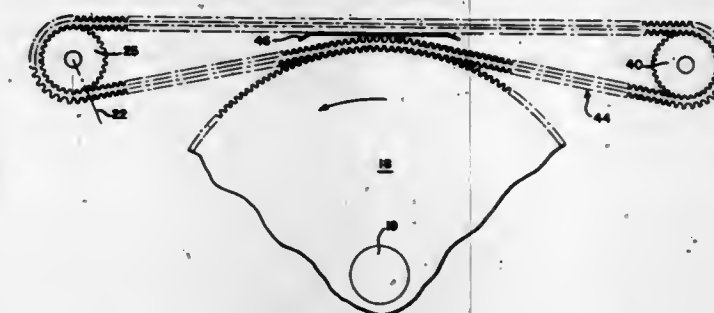
Filed July 9, 1971, Ser. No. 161,225  
Int. Cl. F16g 1/100

U.S. Cl. 74-221

4 Claims

A precision rotary drive for a printing cylinder includes a toothed belt having outer and inner teeth, the outer teeth engaging a toothed driven wheel to the printing cylinder, with

the wheel having the same number of teeth as the outer teeth on the belt, and a power driven smaller toothed wheel engaging the teeth on the interior of the belt. The belt is constructed



initially of one piece, and split longitudinally and the parts moved longitudinally with respect to each other in order to have teeth formed from like parts of material spaced longitudinally from each other in the separate sections.

3,730,012

**SPEED-CHANGE MECHANISM FOR A BICYCLE**

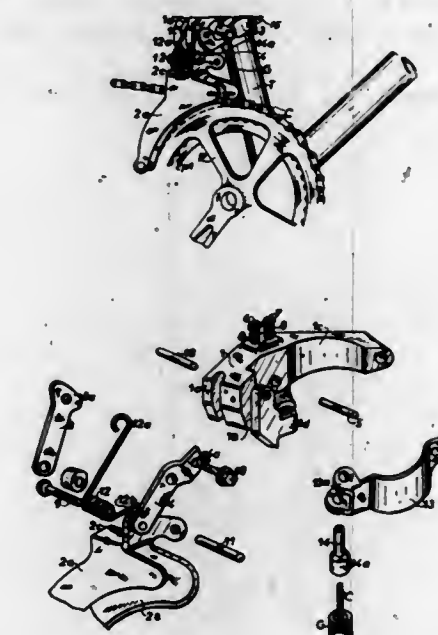
Lucien Charles H. Juy, 75 rue General Fauconnet, Dijon, France

Filed June 7, 1971, Ser. No. 150,395

Claims priority, application France, June 8, 1970, 7020893  
Int. Cl. F16h 7/08

U.S. Cl. 74-242

11 Claims



A speed change mechanism for a bicycle comprises a replaceable fork connected by a parallelogram linkage to a casing which can be fixed to the frame of the bicycle. The linkage includes a pair of levers, the first of which is connected to a control cable while the second is engagable with a pair of stops to limit the movement of the fork in opposite directions. The casing is a one-piece plastic body with a groove to receive the major portion of the second lever, the latter having a flattened end which selectively engages one of two screws projecting into the groove and serving as the stops.

3,730,013

**DYNAMICALLY BALANCED POWER TRANSMISSION**

Arthur J. Slemmons, Los Gatos, Calif., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 849,404, Aug. 12, 1969, Pat. No. 3,578,822. This application Oct. 19, 1970, Ser. No. 81,707  
Int. Cl. F16h 55/30; F16f 15/22; B62d 55/08

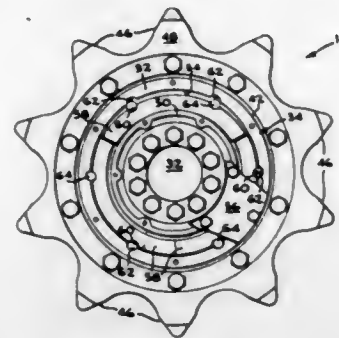
U.S. Cl. 74-243 FC

5 Claims

A rotating power transmission member engaged with a segmented power transmission means is balanced to counteract



vibratory torques and forces by three tuned pendulum balance weights spaced 120° apart. A specific application is to a crawler vehicle with tuned pendulums in the track drive, bogey and idler wheel assemblies to balance and counteract vibratory forces and torques transmitted to the wheels by the track. The balance weights are built into each wheel assembly



and are tuned to the same order as the number of teeth on the track drive wheel so that the balance weights produce counterforces and counter-torques, per revolution, equal to those from the number of track segments, per revolution, causing the imbalance forces and torques. In the case of the idler and bogey wheels, the tuning order is the effective pitch circumference divided by the track pitch.

3,730,014

## ROTARY INDEXING MECHANISM

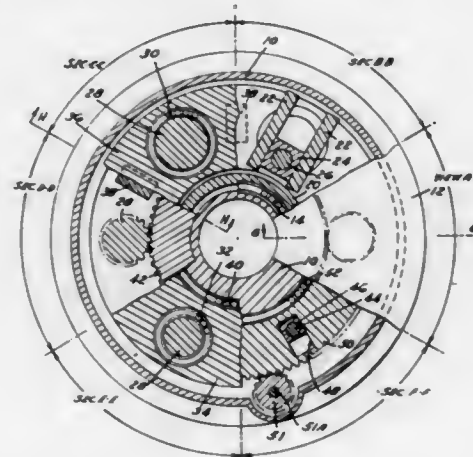
John Henry Brems, 32867 White Oaks Trail, Birmingham, Mich.

Filed Dec. 17, 1971, Ser. No. 209,319

Int. Cl. F16h 57/10

U.S. Cl. 74—394

11 Claims



A multiple step rotary indexing machine which is used for indexing a rotary table around an axis. A stationary reaction member such as an internal gear or a sun gear is surrounded by a plurality of planetary gears having an input shaft on one side and an output shaft on the other side. Radial slide members or links connect the input shafts to a rotary power input and similar members connect the output shafts to the rotary table such that a constant input speed can produce a suitably accelerated and decelerated output with a selected dwell period at a selected angle on the rotation.

3,730,015

## TORSIONAL ELASTOMER SNUBBER

Robert W. Cornell, West Hartford, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 16, 1971, Ser. No. 181,127

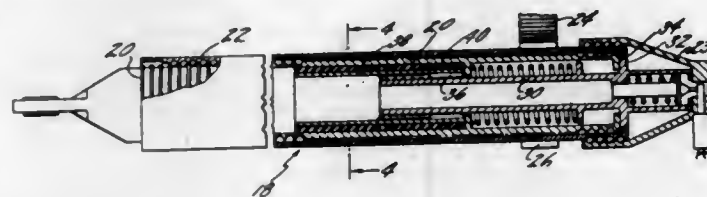
Int. Cl. F16h 1/18

U.S. Cl. 74—424.8 R

6 Claims

The torsional energy of a rotational member occasioned by

its deceleration to a complete stop is absorbed by an elastomer



sandwiched between concentric shafts such that the elastomer is placed in radial shear.

3,730,016

## FRICTION DRIVE DIFFERENTIAL SCREW

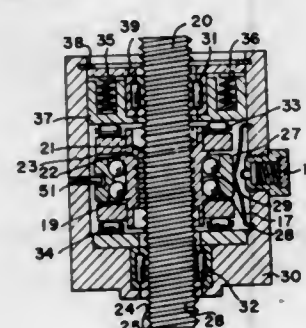
Donald E. Miller, Mt. Prospect, Ill., assignor to Continental Can Corporation, Inc., New York, N.Y.

Filed June 14, 1971, Ser. No. 152,937

Int. Cl. F16h 1/18, 55/18

U.S. Cl. 74—424.8 B

33 Claims



A machine for converting rotary motion to rectilinear motion which machine is an anti-friction differential screw. This machine utilizes variations in nut bias force, thread profile; pitch diameter, nut and screw lead angle, double nuts and variations of the combinations to effect different rates of travel per revolution. Other variables are discussed.

3,730,017

## CONTROL MECHANISM

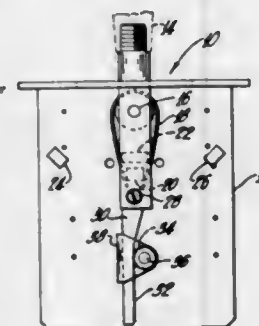
Arlyn G. Liddell, Bountiful, Utah, assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 20, 1971, Ser. No. 173,440

Int. Cl. G05g 9/00

U.S. Cl. 74—471 R

7 Claims



A control mechanism for an electrical apparatus includes a frame member, a handle pivotably mounted on the frame member and adapted to be manually grasped for operating the control mechanism. The control mechanism includes first and second electrical control means. The first electrical control means is operably associated with the control handle and adaptable to provide one polarity of output signal in response to movement of the control handle in one direction from an initial neutral position and the opposite polarity of output signal in response to movement of said control handle in the opposite direction from the neutral position. The control

mechanism further includes a linkage means connected between the control handle and the second electrical control means whereby the second electrical control means will be operated in the same direction and to the same extent for a given amount of movement of the control handle in either direction from the neutral position thereby enabling the second electrical control means to be adapted to regulate the magnitude of output signal of the control mechanism irrespective of the direction of control handle movement.

3,730,018

## TORQUE-BALANCED STEERING SYSTEM

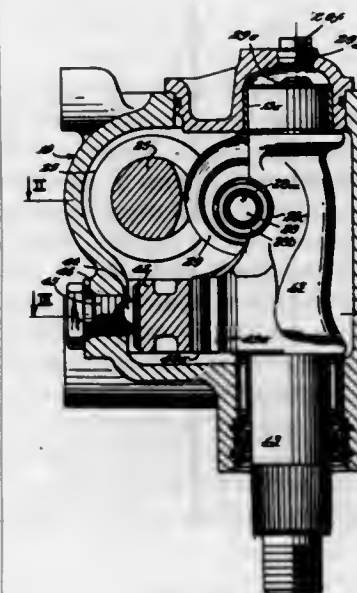
Arthur E. Bishop, and Richard E. Henrich, both of Barrington, Ill., assignors to Arthur E. Bishop, Barrington, Ill.

Filed Jan. 29, 1970, Ser. No. 6,747

Int. Cl. B62d 1/20

U.S. Cl. 74—498

3 Claims



An improved power steering system for automotive vehicles employing a compact integral gear box having a variable ratio steering output coupled with a torque-matching geared variable ratio interconnection between the steering output shaft and the source of power assist to provide substantially improved on-center turn rate capability, improved on-center feel, and increased torque availability in the parking range. Substantially increased steering system efficiency is provided while, at the same time, a low-cost gear construction is incorporated.

3,730,019

## AIRCRAFT SEAT LOCK ACTUATOR

Charles U. Ballard, 4253 Lenox Boulevard, Inglewood, Calif.

Filed July 14, 1971, Ser. No. 162,411

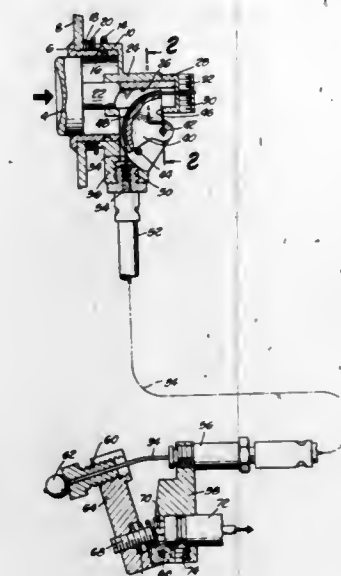
Int. Cl. F16c 1/18

U.S. Cl. 74—502

9 Claims

A device for transmitting motion and force to actuate a slave element and more particularly to remotely operate a trigger for an airplane seat lock or the like including a push button, a flexible element for transmitting the force exerted on the push button to a remote trigger actuator, including means

for translating linear movement of the push button in one path to movement of the flexible element in another path at an



3,730,020

## CONNECTING ROD AND CAP CONSTRUCTION

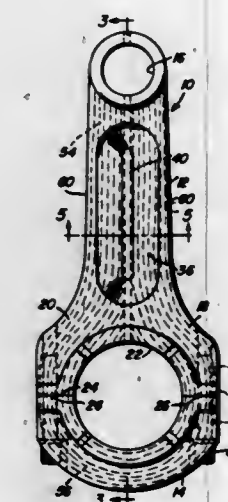
Vincent J. Di Matteo, Sr.; Bartolo Di Matteo, and Vincent J. Di Matteo, Jr., all of 7415 8th Avenue, Los Angeles, Calif.

Filed Oct. 13, 1971, Ser. No. 188,867

Int. Cl. F16c 7/00

U.S. Cl. 74—579 E

8 Claims



An aluminum connecting rod including an elongated shank portion having wrist pin bearing defining means at one end and a removable cap portion at the other end. The cap portion and adjacent end of the elongated shank portion coact to define a bearing bore and include opposing parting surfaces disposed on opposite sides of the bore with at least one elongated tension member extending between each pair of opposing parting surfaces and clamping the cap to the adjacent end of the shank. The opposite side outer boundary surfaces of the cap and shank portions defining the aforementioned bearing bore include generally radial oil relief grooves, the shank portion includes a center longitudinal oval passage communicating the bearing bore and the wrist pin bearing defining structure and the shank portion includes a central longitudinal zone thereof through which the aforementioned oil passage extends and which tapers in at least one transverse dimension away from the aforementioned bearing bore.



3,730,021

## INLINE TRANSMISSION FOR HIGH SPEED ENGINES

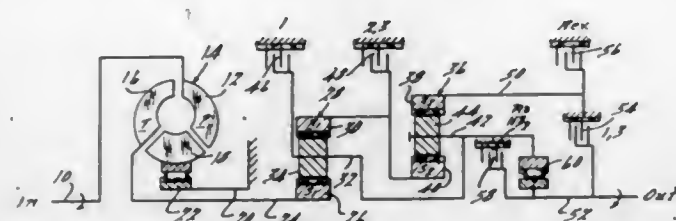
Thomas R. Stockton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 3, 1971, Ser. No. 204,526

Int. Cl. F16h 57/10

U.S. Cl. 74-759

2 Claims



A simplified planetary gear mechanism for distributing driving torque from a high speed engine to the driveshaft of a wheeled vehicle wherein relatively high torque multiplying ratios are available and wherein clutches and brakes are arranged in strategic disposition with respect to simple planetary gear elements to provide uniformly stepped ratios from the lowest ratio to a high ratio with a simplified engagement and release pattern, the high ratio being substantially greater than unity, and wherein a minimum number of friction torque establishing devices is required.

3,730,022

## POWER TRANSMISSION

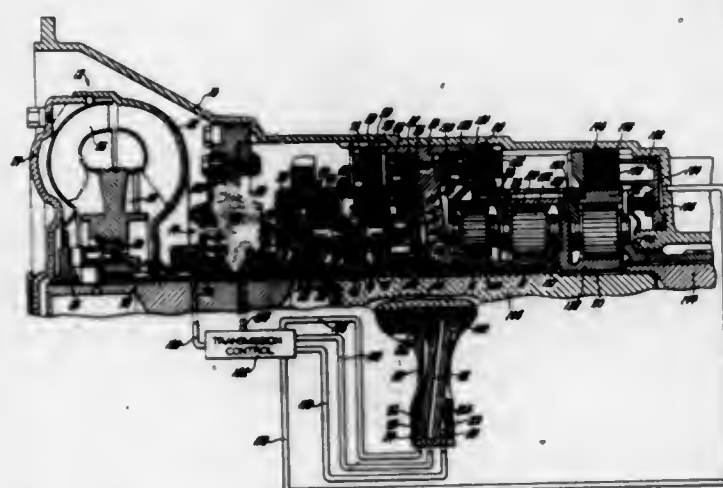
John J. O'Malley, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed March 7, 1969, Ser. No. 805,190

Int. Cl. F16h 57/10

U.S. Cl. 74-759

8 Claims



This disclosure relates to a transmission providing four forward drive ratios, neutral and reverse wherein all changes of forward drive ratio other than changes to direct drive are accomplished simply by release of one brake and application of a second brake. Three planetary gear units and two brakes are located in the housing rearwardly of a support web and two clutches and one brake are located forwardly of the support web. Change of ratio to direct drive is accomplished by release of a brake and engagement of a clutch. All clutches and brakes are of the disc type to eliminate the need for band adjustment. In the gearing, the planet carriers of two of the gear units and ring gear of one unit are fixed for rotation as a unit with the output shaft, the sun gears of two units are fixed to each other, and the sun gear of one unit and ring gear of another unit are fixed to each other.

3,730,023

## AXE SHARPENING DEVICE

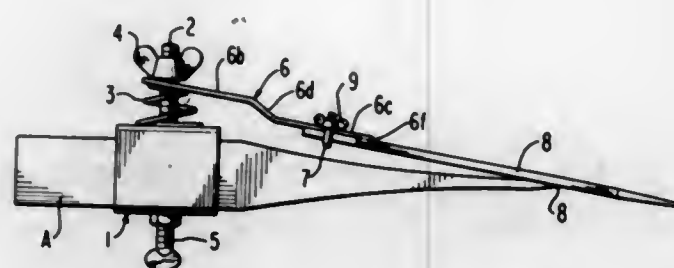
Lloyd W. Otto, 2317 South Hampton, Springfield, Mo.

Filed Jan. 26, 1972, Ser. No. 220,874

Int. Cl. B24b 3/40

U.S. Cl. 78-82

11 Claims



A device for sharpening axe heads comprising a generally U-shaped frame placed over the head of the axe with opposite legs of the frame straddling opposite side faces of the axe head. Securing the frame to the head is a thumb screw threaded through one of the frame legs to engage one side face of the axe head. The other leg of the frame has an elongated aperture therein receiving a threaded bolt which in turn receives an elongated file holder arm to mount the same relative to the main frame for pivotal movement about the bolt. The inner end of the bolt has an enlarged head engaging the adjacent side face of the axe head while the other end of the bolt has a wing nut threaded thereon. A coil compression spring between the leg and the file holder arm yieldably urges the latter against the wing nut which acts as an adjustable stop. The file is mounted to the holder arm as an extension thereof by a U-shaped clamp secured across the file by wing nuts received on threaded studs of the clamp. In use the file may be grasped and oscillated across the cutting edge of the axe head as the file and its associated holder arm pivot about the bolt.

3,730,024

## SAW MANUFACTURE

Shigetatsu Takigawa, 18 Kyukenchō Nishi 2-cho, and Masahiko Takigawa, 12 Kyukenchō Nishi 2-cho, both of Sakai City, Osaka, Japan

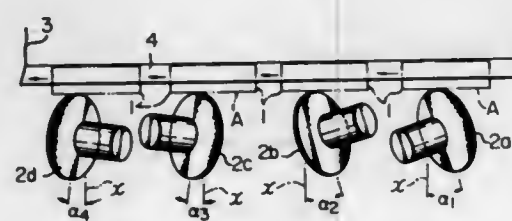
Filed Oct. 20, 1971, Ser. No. 190,718

Claims priority, application Japan, Oct. 20, 1970, 45/94813

Int. Cl. B23d 65/02

U.S. Cl. 76-112

9 Claims



A method is provided for the manufacture of saws made of band steel plates having an extended trapezoidal cross-section. The plates are preliminarily quenched and plated prior to the saw manufacture. A set of four thin disc grinding stones arranged in respective predetermined inclination, when positioned against one edge of the band steel plate, completes the process of blade shaping and edge forming simultaneously in a single operation.

3,730,025

## GRIPPER FOR UNSCREWING CAPS

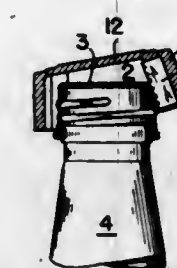
Walter Monnerjahn, Manzer Strasse 89, 6509 Gau-Odernheim, Germany

Filed May 28, 1971, Ser. No. 148,094

Int. Cl. B67b 67/00

U.S. Cl. 81-3.4

5 Claims



A gripper for unscrewing caps from bottles and the like being substantially disc-shaped and palm-sized and having a conical socket therein. The gripper may comprise a resilient material and have a metal knife edge mounted to project into the socket.

3,730,026

## RING-STYLE CAP OPENER

Haruo Matsumoto, Amagasaki, Japan, assignor to Matsumoto Metal Company Limited, Amagasaki-shi, Japan

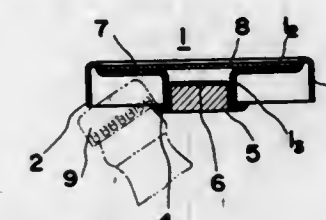
Filed Jan. 21, 1972, Ser. No. 219,617

Claims priority, application Japan, March 10, 1971, 46/16155

Int. Cl. B67b 7/16

U.S. Cl. 81-3.46 R

3 Claims



A ring-style cap opener has a ring-shaped sheet metal element including outer peripheral portion and a top portion. A cylindrical portion depends from the center of the top portion. The lower edge of each of the outer peripheral portion and the cylindrical portion are bent toward each other, the lower edge of the outer peripheral portion lying above the edge of the cylindrical portion. The bent lower edge of the outer peripheral portion acts as a fulcrum, and the bent edge of the cylindrical portion engages under the flared edge of the crown cap for removing a cap from the bottle.

3,730,027

## ADJUSTABLE TRUCK WRENCH SUPPORT

Donald M. Rohn, 16823 Huntington, Detroit, Mich.

Filed May 18, 1971, Ser. No. 144,480

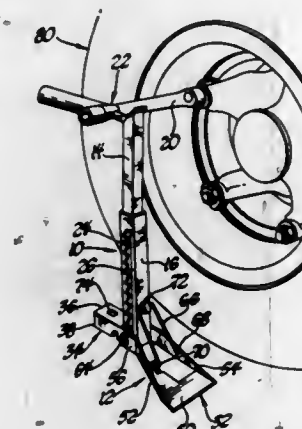
Int. Cl. B25b 13/58

U.S. Cl. 81-180 R

6 Claims

A stand for supporting the shaft of a lug wrench so that relatively high forces may be imposed on wheel nuts without twisting the wrench off the nuts includes a pair of telescoping tubular members having a cradle for the wrench at one free end and a foldable base at its other free end. A pin projecting from the telescoped end of one of the members engages a longitudinal slot in the other member so as to adjust the effective length of the support. The foldable base consists of a pair of plates with bent edges, each having a set of ears pivotally mounted to the tubular member forming the lower end of the support. In use, the base plates extend laterally in opposite directions from the support. A wire bale affixed to one of the

plates engages a projection on the side of the support to maintain it in position and an edge surface of the other plate abuts the opposite side of the support to maintain that plate in ex-



tended position. One of the plates has a cut-away section which allows the other plate to fold therein so that both plates may lie against the same side of tubular member when folded.

3,730,028

## MULTIPLE SPINDLE AUTOMATIC LATHE

Hermann Filsch, Eichholz, Malenfeld, Switzerland, assignor to Eumpp, AG, Zug, Switzerland

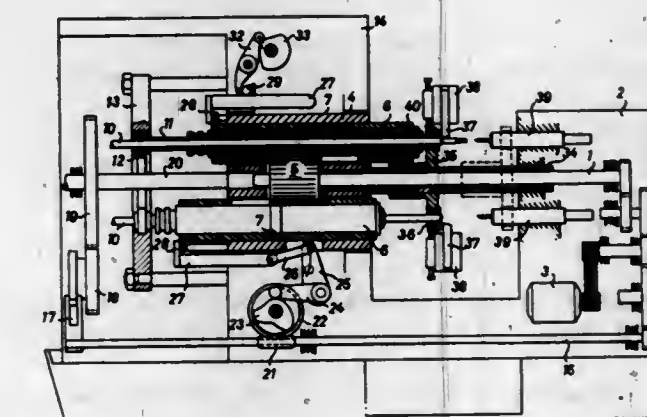
Filed Nov. 27, 1970, Ser. No. 93,152

Claims priority, application Switzerland, Dec. 3, 1969, 18,101/69

Int. Cl. B23b 9/10

U.S. Cl. 82-3

10 Claims



Multiple spindle automatic lathe having means for enabling axial movement of the spindles in the spindle carrier and means for enabling automatic movement thereof.



3,730,029

**PRECISION BORING MACHINE**

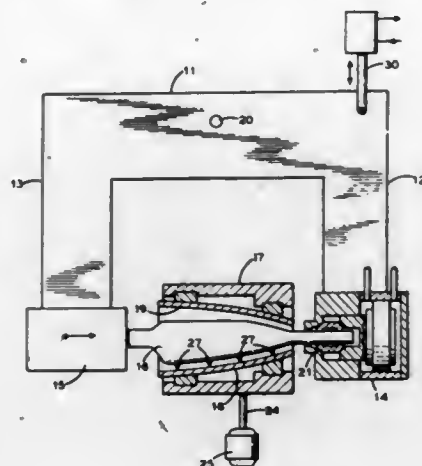
Forest E. Block, 4892 Spring Brook Road, Rockford, Ill., and Kenneth E. Peterson, 822 Hawthorne Avenue, Rockford, Ill.

Filed Nov. 1, 1971, Ser. No. 194,312

Int. Cl. B23b 5/40

U.S. Cl. 82-12

4 Claims



A machine for use in precision boring of elongated workpieces.

3,730,030

**AUTOMATIC LATHES**

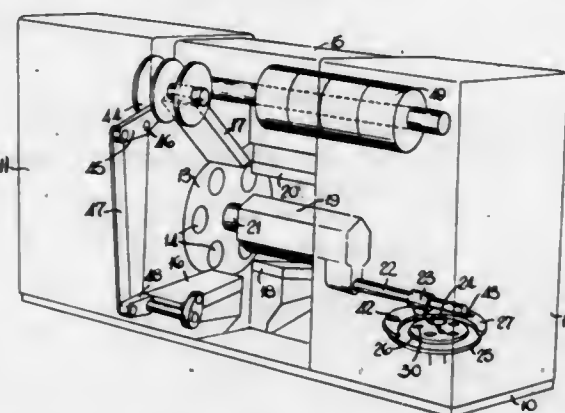
Harold James Gilbert, Coventry, and Reginald John Dixon, Solihull, both of England, assignors to Wickman Machine Tool Sales Limited, Coventry, England

Filed Nov. 14, 1969, Ser. No. 876,956

Int. Cl. B23b 21/00

U.S. Cl. 82-21 R

7 Claims



An automatic machine having a plurality of tool carrying slides, one of the slides being controlled by a cam comprising a rotatable member mounted upon a driving shaft, and at least one part adjustably mounted upon the rotatable member, said part having cam forming edges, the distance of which from the axis of rotation of the shaft varies with the adjusted position of the part on the member, and a cam follower connecting the slide with the cam.

3,730,031

**APPARATUS FOR CONTINUALLY CUTTING BLANKS WITH TRIDIMENSIONAL SURFACES FROM FOAM OR THE LIKE MATERIAL**

Werner Huttmann, Krischerstrasse 80, 4019 Monheim, Germany

Filed Aug. 17, 1971, Ser. No. 172,512

Claims priority, application Germany, Oct. 16, 1970, P 20 50 845.6

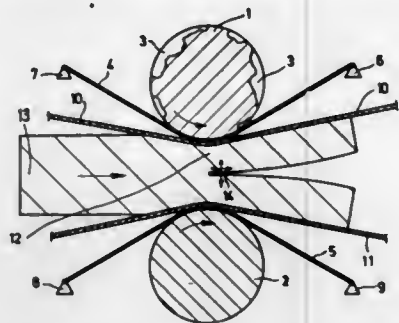
Int. Cl. B26d 3/28

U.S. Cl. 83-4

7 Claims

Apparatus for cutting tridimensional surfaces from foam or like material in which the foam is compressed by two verti-

cally adjustable rollers in the cutting area and moved relative to a cutter. At least one of such rollers is provided with a shaped casing or circumferential surface, and a flexible conveyor belt is interposed between each of the rollers and the foam material for pulling the foam material through the cutting area.



3,730,032

**BREAD AND PASTRY PROCESSING APPARATUS**

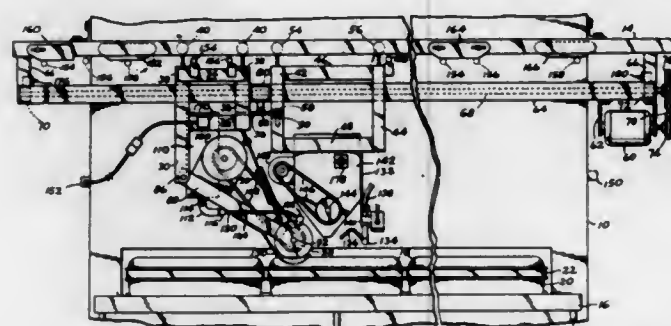
Edward I. Marckx, Portland, and Harvey F. Stines, Gresham, both of Oreg., assignors to Stinemark Corporation, Gresham, Oreg.

Division of Ser. No. 824,723, April 17, 1969, Pat. No. 3,614,933, and a continuation of Ser. No. 639,343, May 18, 1967, abandoned. This application July 29, 1970, Ser. No. 64,847

Int. Cl. B26d 3/08

U.S. Cl. 83-11

1 Claim



Apparatus for splitting, water-spraying and seeding the upper surfaces of bakery products preliminary to baking them is mounted directly in front of the oven. It includes a track, a carriage, and a carriage drive for moving the carriage across the bakery products. Mounted on the carriage are cutters, a spray, and a seeder arranged, respectively, for splitting, spraying, and seeding the upper surfaces of the bakery products. These units work during a continuous passage of the carriage across the oven door. The processed products then may be introduced immediately into the oven for baking.

3,730,033

**METHOD TO CONTROL THE FEEDING AMOUNT IN BAND SAWING MACHINES**

Tsuneo Atzawa, Ischawa, Japan, assignor to Amada Co., Ltd., Tokyo, Japan

Division of Ser. No. 710,839, March 6, 1968, Pat. No. 3,575,074. This application Jan. 18, 1971, Ser. No. 107,162

Claims priority, application Japan, June 12, 1967, 42/37241

Int. Cl. B26d 1/46

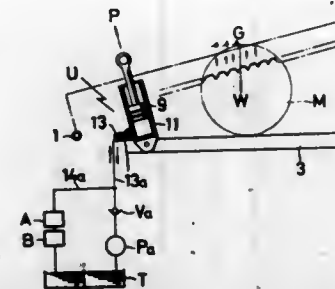
U.S. Cl. 83-13

4 Claims

Method to control the feeding amount in hydraulically controlled band sawing machines having a pivotable frame which supports the band saw, and a hydraulic cylinder for lifting and lowering the frame with respect to the material to be cut, comprising a hydraulic pressure control means for cylinder, valve

means (preferably with a knife-edge shaped outlet) for controlling the quantity of hydraulic fluid reaching the cylinder,

the tubes wherein a fluid pressure differential is created between the inside and outside of the tube on both sides of the cutting knife so as to keep the tube from collapsing under the pressure of the knife.



and at least one hydraulic connection, namely between the outlet of the control means and the inlet of the valve means.

3,730,034

**CUT-OFF DEVICES FOR CONTINUOUS ROD-MAKING MACHINES**

Edward George Preston, Deptford, London, England, assignor to Molins Limited, London, England

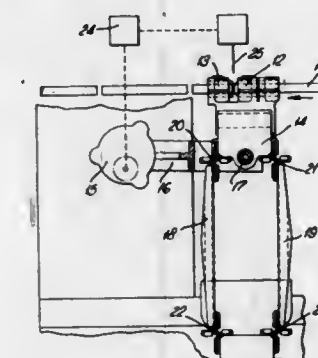
Filed May 24, 1971, Ser. No. 146,037

Claims priority, application Great Britain, May 26, 1970, 25,192/70

Int. Cl. B26d 1/56

U.S. Cl. 83-38

11 Claims



In a cut-off device for a continuous rod making machine, in which the rod is supported during cutting by a reciprocating ledger, the cut is timed so that it takes place either completely before or completely after the ledger reaches its peak velocity.

3,730,035

**CUTTING TUBULAR PLASTIC EXTRUSION**

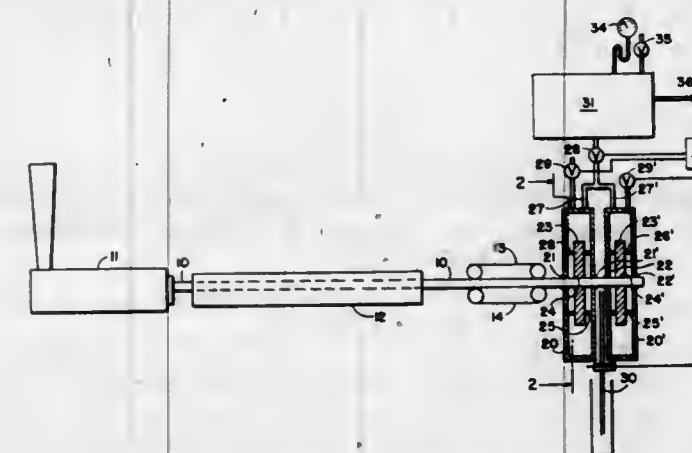
Mahesh Bhatia, Woodside, N.Y., assignor to Anchor Plastics Company, Inc., Long Island City, N.Y.

Filed Oct. 12, 1971, Ser. No. 188,360

Int. Cl. B26d 3/16

U.S. Cl. 83-54

4 Claims



The disclosure relates to a process and apparatus for cutting extruded plastic tubes while avoiding excessive distortion of

3,730,036

**DEVICES FOR APPLYING FORCES**

Bela Istvan Bathory, Yorkshire, England, assignor to Davy and United Engineering Company Limited, Sheffield, England

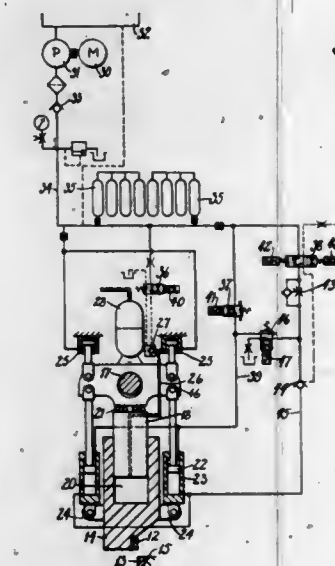
Filed Feb. 2, 1971, Ser. No. 111,996

Claims priority, application Great Britain, Feb. 4, 1970, 5,399/70

Int. Cl. B26d 5/08

U.S. Cl. 83-554

9 Claims



A shear comprises two co-operating force-applying members such as blade holders with a shear blade, one of the members is coupled to a short stroke reciprocable drive member such as a rotary eccentric and a crosshead, and one of the members is connected to a variable spacing device which is in the form of at least one piston and cylinder, the cylinder is sealed off during movement of the drive member in one direction and the cylinder is permitted to move relative to its piston in the reverse direction of movement of the driving member so that a workpiece can be cut in a series of shearing operations.

3,730,037

**REVERSIBLE TRANSMISSION, ESPECIALLY FOR FIELD HARVESTERS**

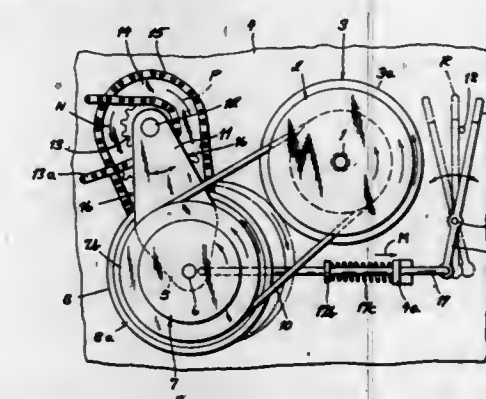
Josef Purrer, Gottmadingen, Germany, assignor to Maschin-fabrik Fahr A G, Gottmadingen, Germany

Filed March 8, 1971, Ser. No. 121,939

Int. Cl. B26d 5/10

U.S. Cl. 83-68

7 Claims



A reversible transmission, especially for the pickup, feed and/or drums of a field harvester, in which a pair of fixed shafts from input and output members of the transmission and



a further shaft is mounted upon a support swingable about the axis of one of the shafts. This intermediate or swingable shaft carries a V-belt pulley which may be connected with the V-belt pulley of the other fixed shaft when the intermediate shaft is urged away from the latter to tension the belt. A pair of friction wheels on this intermediate shaft and on the other shaft are brought into engagement when the intermediate shaft is swung in the other direction. The wheels of the intermediate shaft are connected operatively to a wheel of the first-mentioned shaft about which the support is swingable.

3,730,038

## SAW BLADE CONSTRUCTION

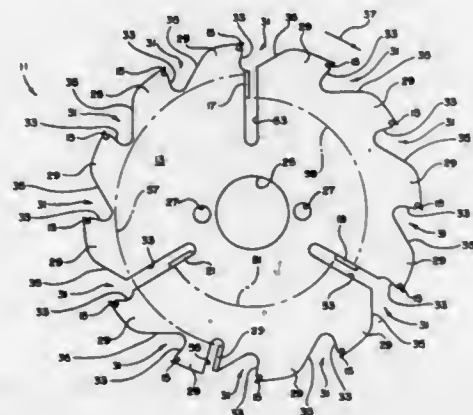
Joseph L. Farb, 1519 E. Northside Drive, Jackson, Miss.

Filed Dec. 3, 1970, Ser. No. 94,665

Int. Cl. B27b 33/08

U.S. Cl. 83—837

4 Claims



A saw blade intended to be mounted on an arbor and rotatably driven thereby. The saw blade includes tungsten carbide tipped teeth; however, these tips are brazed into unique pockets or recesses providing structure that substantially precludes the heretofore hazardous possibility of the teeth being broken loose from the blade or separated from the braze. The saw blade further includes several tungsten carbide side cutting teeth spaced in a unique staggered arrangement about the blade at different distances radially from the center thereof to assure against pinching of the blade when sawing green lumber or the like, and cooling slots which obviate cracked and/or warped blades by allowing for expansion and contraction of the steel blade. It is within these cooling slots that the side cutting teeth are fixedly received in a manner which facilitates free access of an abrading wheel for movement therein to and fro along the length of each side cutting tooth for sharpening the teeth.

3,730,039

## HIGH VELOCITY PRESS

Renzo Fedrigo, Turin, Italy, assignor to Ing. C. Olivetti, Ivrea (Turin), Italy

Continuation-in-part of Ser. No. 869,059, Oct. 24, 1969, abandoned. This application Sept. 14, 1971, Ser. No. 180,367

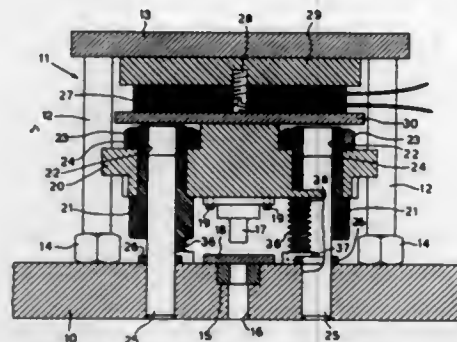
Int. Cl. B26d 5/08

U.S. Cl. 83—170

11 Claims

Presses for metal or other hard material in which the driving power for the punch is derived primarily from the kinetic energy of the punch element and the supporting structure moving at high speed. Capacitive discharge through a coil produces an electromagnetic interaction with a conductive

plate adjacent to the coil and secured to the punch element to achieve the high velocity and therefore the desired kinetic



energy, which energy is transformed to mechanical punching force.

3,730,040

## ENERGY ABSORBER FOR HIGH PRESSURE FLUID JETS

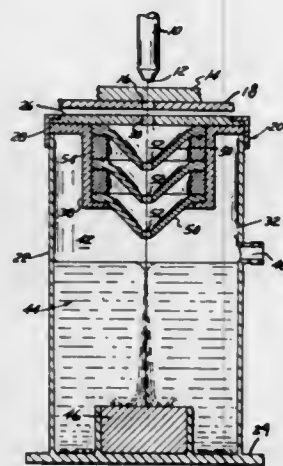
Ray F. Chadwick, Troy, and John H. Robertson, Detroit, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Aug. 17, 1971, Ser. No. 172,530

Int. Cl. B26f 1/26, 3/00

U.S. Cl. 83—177

14 Claims



A device is disclosed for absorbing the energy of a fluid cutting jet after it has passed through the workpiece in order to reduce the sound level as well as the spray and vapor normally accompanying the fluid jet cutting process. The device includes a baffle arrangement disposed immediately adjacent the workpiece and enclosed in a housing to receive and contain the jet after it has passed through the workpiece so as to prevent the sonic energy and spray from emanating into the surrounding environment. The jet itself is directed through the baffle arrangement to impact a liquid bath, backed up with a hardened steel block, thereby dissipating its momentum.

3,730,041

## AXIAL LEAD DISPENSER HEAD

Albert W. Zemek; Robert H. Holmes, and Frank J. Orzelek, all of Binghamton, N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Nov. 3, 1971, Ser. No. 195,253

Int. Cl. B26d 7/06

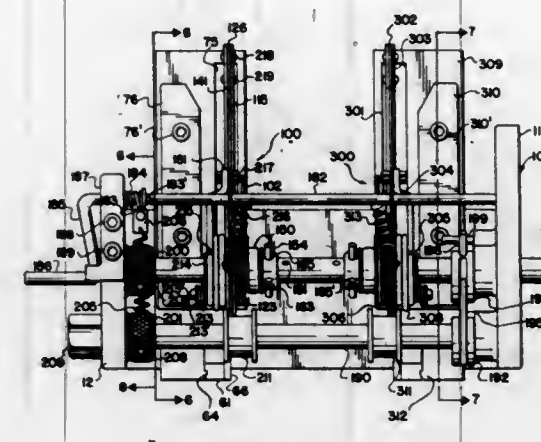
U.S. Cl. 83—278

7 Claims

An axial lead component dispensing apparatus which has the capacity to handle components having extremely long axial leads in relation to the longitudinal dimensions of the body of the component. The device incorporates a pair of notched feeder blades which are reciprocal to advance rolls of taped components. The feeder blades and accompanying

components are transversely adjustable along a feed shaft from which the feeder blade gets its reciprocal motion and

ble engagement between the shearing blades. Preferably, the second set of blades have shearing surfaces harder than shear-



which also powers a cutter shaft to sever the leads below the feeder portion of the apparatus.

3,730,042

## SAWING MACHINE

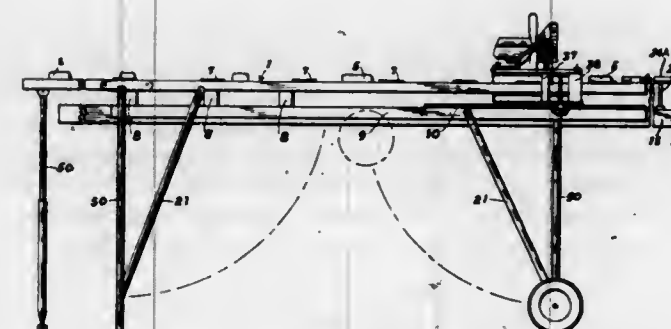
Ira Emmet Price, 13606 Emery Avenue, Cleveland, Ohio

Filed Oct. 2, 1970, Ser. No. 77,566

Int. Cl. B27b 5/20, 9/04

U.S. Cl. 83—471.3

3 Claims



A portable sawing machine having a sawing table and hinged saw guide tracks adapted to movably retain a normally hand-held, portable, motor-driven saw thereon for rapid and precise angular cross-cutting of workpieces placed on the table.

3,730,043

## APPARATUS FOR SHEARING WEBS

Ernest F. Zimmermann, Buffalo Grove, Ill., assignor to Ampex Corporation, Redwood City, Calif.

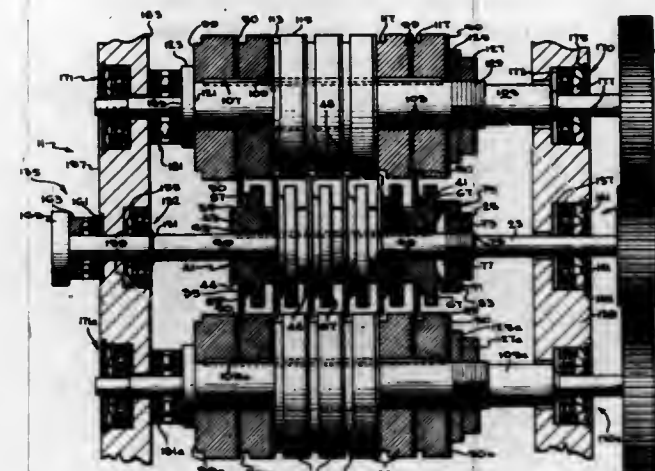
Filed Nov. 9, 1970, Ser. No. 87,890

Int. Cl. B23d 19/06

U.S. Cl. 83—502

6 Claims

Thin webs are sheared into a plurality of strips having straight line parallel edges by a shearing apparatus having first and second sets of rotatable shearing blades. Preferably, a third set of rotatable blades engages the first set of shearing blades to balance the loads exerted thereon due to engagement with the second set of blades. Individual springs bias the first set of blades to slide longitudinally along a support shaft to compensate for wear and to maintain a preloaded and forced



ing surfaces on the first set of blades so that wear predictably occurs on the first set of blades.

3,730,044

## FLUID OPERATED APPARATUS

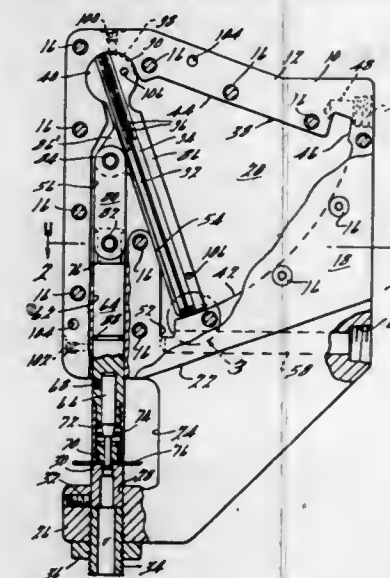
Edwin G. Sawdon, Marysville, Mich., assignor to BTM Corporation, St. Clair, Mich.

Filed Oct. 8, 1971, Ser. No. 187,645

Int. Cl. B26d 5/12

U.S. Cl. 83—513

23 Claims



An improved fluid motor including a rotationally oscillating piston within a generally sector-shaped chamber, a reciprocating ram element for performing work, linkage means interconnecting the ram element and piston, and means for supplying a fluid under pressure to said chamber, selectively to either one side or the other side of said piston to actuate the latter. The fluid motor of the present invention is disclosed, for exemplary purposes, embodied in an improved punching machine. The motor and machine are so constructed and are of such a configuration that a number of them may be stacked or mounted side by side to provide punching or other operations on very close centers.



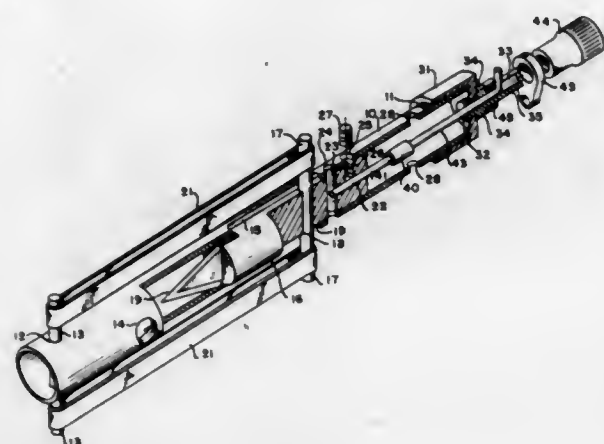
3,730,045

**PROGRAMMED CORD CUTTER**

Michael L. Greene, Hillcrest Heights, and Theodore R. Waugh, Bladensburg, both of Md., assignors to The United States of America as represented by the Secretary of the Navy  
Filed Nov. 24, 1971, Ser. No. 201,906  
Int. Cl. B26d 5/08

U.S. Cl. 83-580

4 Claims



A device for cutting a cord at any ocean depth in order to release buoys, floats, corders, mines etc. The device includes a knife blade which is held in place by a release mechanism in a loaded position which upon release forces the knife blade through the cord to release a pay load.

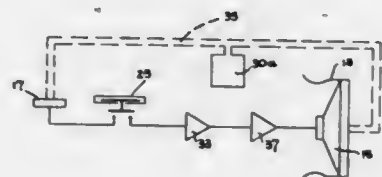
3,730,046

**ORALLY OPERATED ELECTRONIC MUSICAL INSTRUMENT**

Larry A. Spence, 6433 West 86th Place, Los Angeles, Calif.  
Filed Feb. 14, 1972, Ser. No. 225,732  
Int. Cl. G10m 3/00

U.S. Cl. 84-1.05

10 Claims



Means forming an air channel is connected between the output of a loudspeaker and the input of a microphone. The output of the microphone is amplified by means of an amplifier, the output of the amplifier being fed to the speaker, an acoustical feedback path thus being formed between the speaker and the microphone. A mouthpiece is connected in this acoustical path such that an operator can determine the frequency of the feedback signal by adjusting the size of his oral cavity, thus forming musical tones.

3,730,047

**CYMBAL HOLDER**

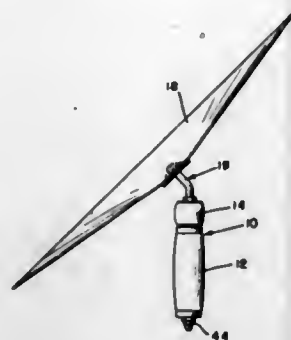
Albert R. Casavant, Box 1124, Chattanooga, Tenn.  
Filed July 20, 1972, Ser. No. 273,413  
Int. Cl. G10d 13/08

U.S. Cl. 84-402

9 Claims

A handle or holder for playing and spinning a cymbal includes a non-rotatable handgrip portion and a rotatable portion adapted to be revolved by the thumb and forefinger. The

cymbal is secured to a rod which extends through and is fixed to the handle rotatable portion and which extends through the



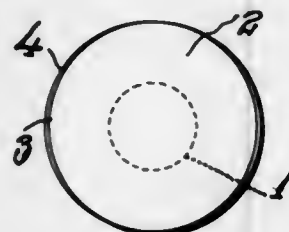
3,730,048

**SCREW WITH A HEAD LOOKING LIKE A TRUE CIRCLE**

Jujiro Okada, No. 69, Chodo-1-chome, Higashi-Osaka City, Japan  
Filed May 25, 1971, Ser. No. 146,623  
Claims priority, application Japan, June 11, 1970, 45/50925  
Int. Cl. F16b 23/00

U.S. Cl. 85-45

1 Claim



A screw with a head looking like a true circle. This appearance is achieved by forming the circumference of the top surface of a screw head into a true circle and forming the periphery of the screw head which immediately follows said true circle of the top surface into an oval. The oval consists of a short diameter being approximately the same as the diameter of the true circle of the top surface and a long diameter being slightly longer than the diameter of the top surface.

3,730,049

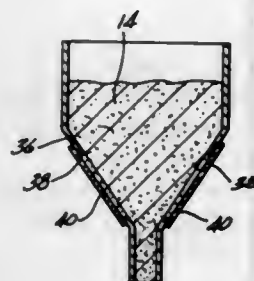
**SAFETY SYSTEM FOR EXPLOSIVE POWDER STORAGE BIN**

Eugene A. Andrew, Florissant, Mo., assignor to Olin Corporation, New Haven, Conn.

Filed June 25, 1971, Ser. No. 156,858  
Int. Cl. F42b 33/00, 37/00

U.S. Cl. 86-1

5 Claims



Prevention of deflagration of explosive powder from developing into a detonation within a storage chamber is accomplished by venting pressure from within the storage chamber so that the critical mass detonation rate of burning of the powder can never be reached.

3,730,050

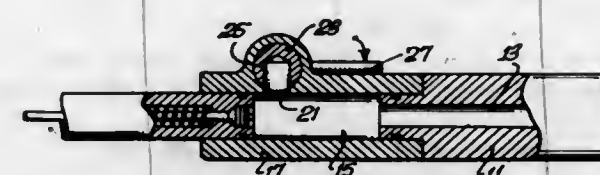
**VARIABLE VOLUME FIRING CHAMBER**

Morris Goldin, Orange, and Gerson M. Jacobson, Downey, both of Calif., assignors to Hughes Tool Co., Aircraft Division, Culver City, Calif.

Filed June 5, 1970, Ser. No. 43,735  
Int. Cl. F41f 17/00; F41c 21/00, 21/12

U.S. Cl. 89-14 R

4 Claims



Apparatus for varying the volume of a firearm combustion chamber to alter the impulse so as to allow the firearm operator to select a level of impulse appropriate to the range and mode of firearm utilization. The firing chamber volume may be increased either by placing the chamber in communication with a sub-chamber or by enlarging the chamber in an axial direction by withdrawal of a portion of the breech section.

3,730,051

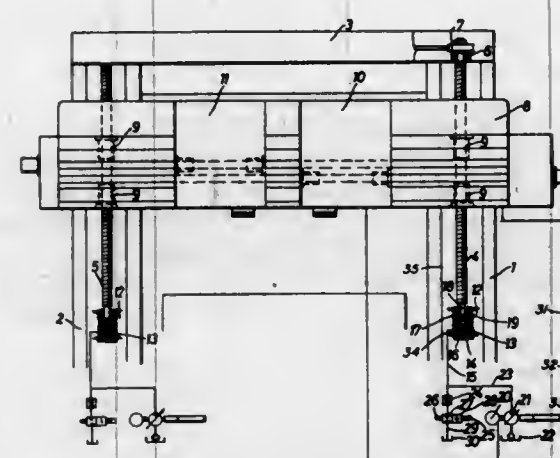
**SUPPORT ADJUSTING DEVICE**

Ernst Hatzig, Siegen, Germany, assignor to H. A. Waldrich G.m.b.H., Siegen, Germany

Filed Jan. 13, 1970, Ser. No. 2,477  
Int. Cl. B23b 97/26

U.S. Cl. 90-15

1 Claim



A device is used for correcting the bearing of transverse carriers of single post and double post machine tools with tool holders movable upon the carriers. The device is particularly characterized by electrical or hydraulic tensioning devices which engage lower ends of spindles. These tensioning devices exert a force which varies depending upon the load of the ends of spindles by the support location and amplify it to a constant total tension.

3,730,052

**CAM GENERATING DEVICE**

Paul L. Harlin, 46 Pumpkin Delight Road, Milford, Conn.  
Filed Dec. 28, 1971, Ser. No. 212,953

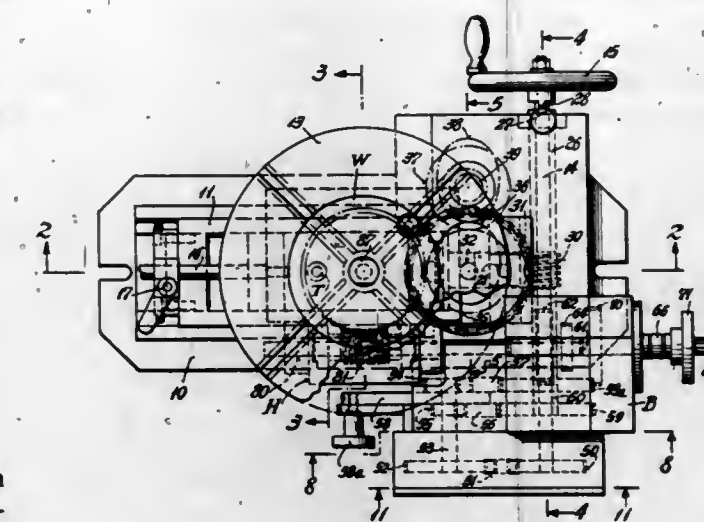
Int. Cl. B23c 1/14, 3/08

U.S. Cl. 90-20

8 Claims

Apparatus for generating cam surfaces comprising a slide movable with respect to a fixed base and having a rotatable workpiece carriage thereon and an adjustable eccentric pin

for moving the slide in a predetermined relation to the rotation of the workpiece to generate, by selective gearing, har-



monic and non-harmonic cam surfaces on the workpiece as desired.

3,730,053

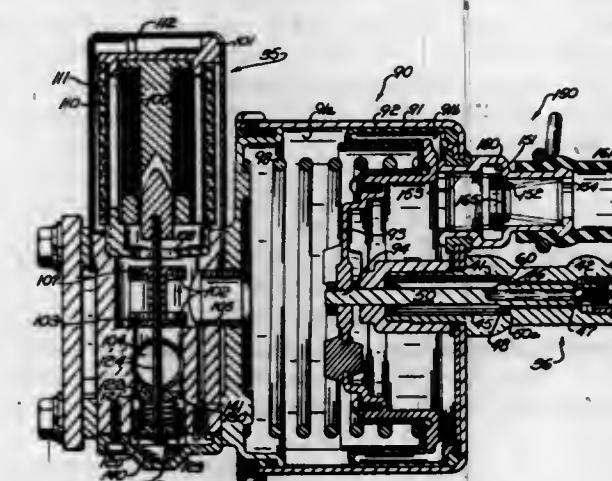
**ANTI-SKID BRAKE CONTROL AND ACTUATOR ASSEMBLY**

Claude M. Trocme, Birmingham, Mich., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio

Division of Ser. No. 805,155, March 7, 1969, Pat. No. 3,586,386. This application May 5, 1971, Ser. No. 141,060  
Int. Cl. F15b 13/04

U.S. Cl. 91-469

1 Claim



An anti-skid brake system includes a control and actuator assembly operable to relieve the pressure in at least a portion of the brake system in response to the vehicle encountering a skid condition. The control and actuator assembly includes an actuator unit having a control member movable to relieve the brake pressure and a servomotor operable to effect the movement thereof. The servomotor includes a pressure operated member having a normal position and which is movable therefrom in response to a pressure differential acting on the opposite sides thereof. The pressure operated member is connected with the control member so that these members move together. A control valve controls the pressure on one side of the pressure operated member and applies atmospheric pressure to the one side of the pressure operated member when the pressure operated member is in its normal position. The control valve is operable in response to the receipt of a skid signal to apply a vacuum to the one side of the pressure operated member. A pressure responsive valve controls the pressure on the other side of the pressure operated member and is responsive to movement of the pressure operated member.



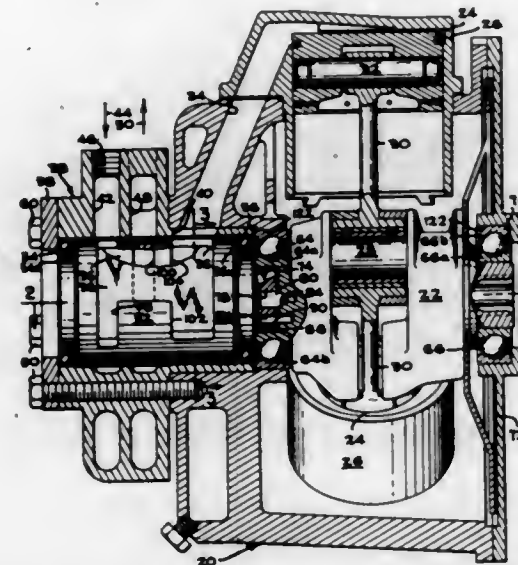
### 3,730,054 AIR MOTOR

Bryan J. Dickinson, Zenith, Wash., assignor to FMC Corporation, San Jose, Calif.

Filed June 2, 1971, Ser. No. 149,310  
Int. Cl. F01b 1/06, 13/06

U.S. Cl. 91-491

7 Claims



A driving connection between the rotary valve and crankshaft of an air motor comprising a tang on the valve and a driving groove on the crankshaft. A resiliently compressive element is provided between the valve tang and crankshaft groove to preload the valve and crankshaft outwardly against their respective supporting bearings and prevent lateral shifting of these elements due to lateral exhaust air impulses on the rotary valve. An index pin in the crankshaft groove and a corresponding pin receiving hole in the valve tang prevent 180° out of phase assembly of these elements. The pin receiving hole is sufficiently oversized to prevent any driving action by the indexing pin due to any misalignment of the valve and crankshaft axes of rotation.

### 3,730,055 HYDRAULIC DRIVE FOR A TURNING CONNECTION WITH BALLS

Wilhelm Schluter, Dortmund-Gartenstadt, Germany, assignor to Hoesch Aktiengesellschaft, Dortmund, Germany

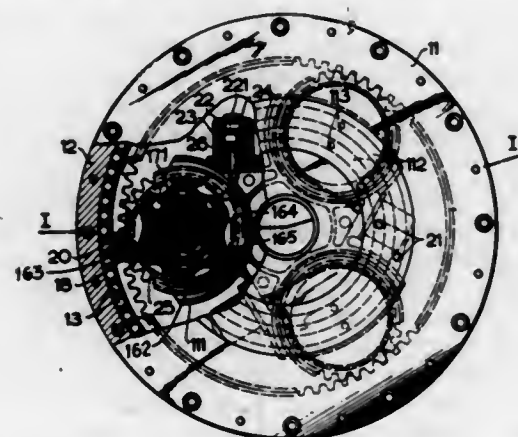
Filed Feb. 24, 1971, Ser. No. 118,278

Claims priority, application Germany, Feb. 26, 1970, P 20 08 931.0

Int. Cl. F01b 1/06, 13/06

U.S. Cl. 91-498

7 Claims



A hydraulic drive for a rotary connection for use in connection with implements having a rotatable upper part and a non-rotatable lower part, in which the rotatable housing means of radial piston motor means are arranged in a chamber defined by inner ring means adapted to be connected to the non-

rotatable lower part and by outer ring means adapted to be connected to the rotatable outer part while said housing means has outer teeth meshing with teeth of said inner ring means, and while said outer ring means comprises conduit means adapted to be connected to a source of pressure fluid and communicating with the interior of said radial piston motor means.

### 3,730,056 DOUBLE DIAPHRAGM BRAKE OPERATOR IMPROVEMENTS

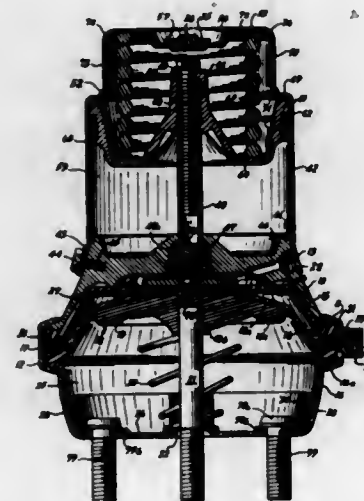
Kenneth D. Swander, Jr., Prairie Village, Kans., assignor to Certain-Teed Saint Gobain Insulation Corporation, Valley Forge, Pa.

Filed June 14, 1971, Ser. No. 148,942

Int. Cl. F01b 19/00

U.S. Cl. 92-48

9 Claims



An improved air brake diaphragm chamber, having two diaphragms placed close to each other therewithin and held in position inside the chamber by a clamp band, the outer or outboard (with respect to the axle or brake) one of said diaphragms having a separate air pressure input on the outer shell of the chamber, a perforated ring spacing said two diaphragms with an air inlet connected to said perforation for feeding air between said diaphragms and means for effectively sealing the peripheral zones of said diaphragms with respect to said ring and clamp band, particularly including means preventing extrusion of the diaphragms at the connection points of the clamp band halves.

The combination of the air brake diaphragm chamber with two diaphragms and the air feed means therebetween with, as a first option, an outboard spring brake unit of minimum size and, as a second option, an inboard spring brake power unit, in all cases access readily provided to both the power spring unit and the diaphragm chamber.

An improved air brake diaphragm chamber, having two diaphragms placed close to each other therewithin and held in position inside the chamber by a clamp band, the outer or outboard (with respect to the axle or brake) one of said diaphragms having a separate air pressure input on the outer shell of the chamber, the inboard one of said diaphragms having a central opening or perforation therethrough, the brake actuating rod in operative connection with said diaphragm and connected thereto, said brake operating rod hollow whereby fluid pressure may be input between said diaphragm through said brake operating rod, and means for effectively sealing the peripheral zones of said diaphragms with respect to said clamp band, particularly including means preventing extrusion of the diaphragms at the connection points of the clamp bands halves.

An improved air brake diaphragm chamber, having a single diaphragm therewithin held in position inside the chamber by a clamp band, and means for effectively sealing the peripheral zones of said diaphragm with respect to said clamp band, par-

ticularly including means preventing extrusion of the diaphragm at the connection points of the clamp band halves. channel and permits the introduction and removal of the spherical members.

### 3,730,057 HYDRAULIC RAM ASSEMBLY

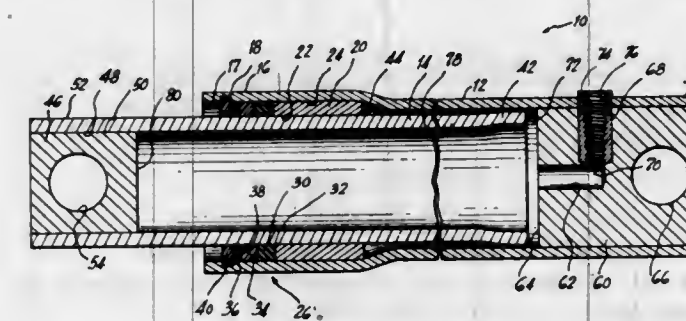
John Frederick Friden, Warren, N.J., assignor to MFG Manufacturing Co., Martinsville, N.J.

Filed May 3, 1971, Ser. No. 139,556

Int. Cl. F01b 31/00; F16j 11/02; B23p 15/00

U.S. Cl. 92-110

18 Claims



A hydraulic ram is assembled from a first tubular member having a plug inserted in fluid tight relation in one end thereof and a second tubular member, defining the actuator rod of the ram, mounted for reciprocation in the first tubular member with one end thereof adjacent the plug and the other end thereof extending beyond the open end of the first tubular member. A second plug member is inserted in the exposed end of the actuator rod in fluid tight relation therewith and seal means is mounted in the first tubular member adjacent its open end to prevent fluid loss during reciprocation of the actuator. The plug in the actuator rod defines a piston surface therein against which fluid supplied to the ram assembly, through a port in the first mentioned plug, acts to extend the actuator rod.

### 3,730,058 CYLINDER AND PISTON UNIT

Heinz Siegel, Bietigheim-Buch, and August Kraisel, Bittenfeld, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

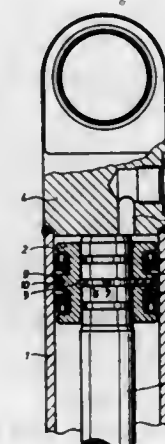
Filed May 11, 1971, Ser. No. 142,261

Claims priority, application Germany, July 11, 1970, G 70 26 240.7

U.S. Cl. 92-128

Int. Cl. F01b 29/00

7 Claims



A piston is guided for movement in a cylinder and has a piston rod which is coupled with the piston via a pair of juxtaposed grooves provided in the piston and in a portion of the piston rod to define between themselves an enclosed channel in which spherical retaining members are accommodated, with an opening being provided which communicates with this

### 3,730,059 PISTON ACTUATED CONTROL APPARATUS FOR A TYPE BUILDING OR SHAPING MACHINE

Noel Nebout, Montlucon, France, assignor to Dunlop Holdings Limited, London, England

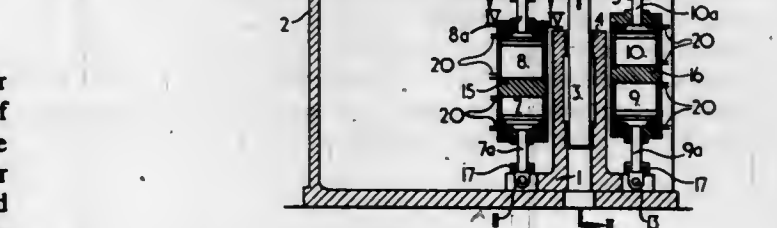
Filed March 15, 1971, Ser. No. 124,268

Claims priority, application France, March 9, 1970, 7008348

Int. Cl. F01b 9/00; F16h 21/44; B60c 25/14

U.S. Cl. 92-140

11 Claims



A pneumatically or hydraulically operated control apparatus comprising a slide, at least two piston and cylinder assemblies and a lever means. This slide transmits movements from the apparatus, imparted to it by the piston and cylinder assemblies acting on the lever means. This apparatus may be used in conjunction with a machine that has components which require controlled movement. Such a machine is a tire building or shaping machine wherein two shafts require controlled movement in opposite directions. The movements of the slide can be imparted to the shafts by various lever systems, of which the following is a specification.

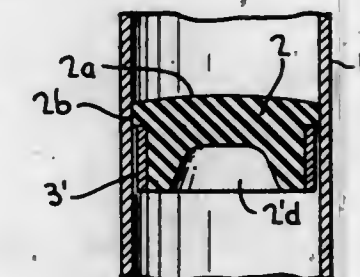
### 3,730,060 FLOATING PISTONS

Christian Bourcier DeCarbon, 64 Boulevard Maurice Barres, Neuilly-sur-Seine, France

Filed Oct. 26, 1970, Ser. No. 83,708

U.S. Cl. 92-249

2 Claims



The piston is of metal reinforced elastomeric material of substantially cup-shaped configuration having its base of a thickness resilient to ballooning or excessive flexure under pressure, and being of a diameter slightly greater than the internal diameter of the cylinder in which it moves. The base having true cylindrical marginal bearing surfaces bounded by sharply angular axial edges and constituting only a relatively small portion of the total height of the piston. The greater portion of the axial extent of the piston is comprised by an annular flange portion of only slightly less diameter than that of the



cylinder, the flange portion serving as a guiding means for installing the piston and being reinforced by a tubular metal piece which also abuts a portion of the base of the piston.

3,730,061

## AIR BEARING ANVIL

Allstair K. Bodycomb, Bale D'Urfe, Quebec, Canada, assignor to Domtar Limited, Montreal, Canada

Filed Nov. 30, 1970, Ser. No. 93,793

Int. Cl. B31b 1/28; B31c 1/00; B31b 1/14

U.S. Cl. 93-59 MT

3 Claims



The invention provides a new cutter anvil attached to a winding mandrel for the making of spirally wound tubes. The tubes wound on the mandrel are transferred onto the cutter anvil to be cut to size. The anvil contains apertures opening outwardly and arranged in a ring about its leading end, and air under pressure is blown through these apertures to support the tube placed on the anvil for cutting.

3,730,062

## PHOTO-TYPESETTING APPARATUS FOR MUSICAL NOTES

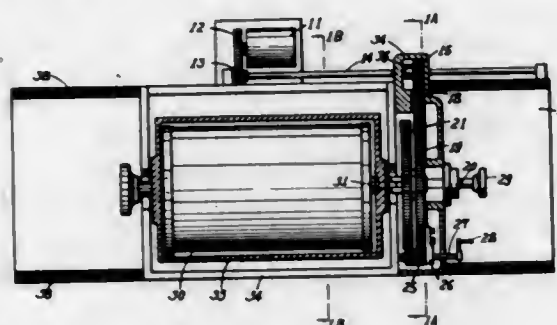
Nobuo Morisawa, Hoygo, Japan, assignor to K. K. Morisawa Shashin Shokujiki Selsakusho, Osaka, Japan

Filed Feb. 8, 1971, Ser. No. 113,196

Int. Cl. B41b 21/32

U.S. Cl. 95-4.5 R

3 Claims



A photo-typesetting apparatus for musical notes, wherein key buttons for selecting steps of an arbitrary number, a control unit and a pulse signal generating unit are connected to a pulse motor, which works cooperatively with a magazine drum of photo-typesetting machine, and by the selective operation of said key buttons, a sensitive material on the magazine drum is put in position for photo-typesetting.

3,730,063

## DUAL LIGHT-RESPONSIVE AUTOMATIC EXPOSURE CONTROL APPARATUS

Tatsuo Kobayashi, Kaizuka, and Hiroshi Ueda, Nara, both of Japan, assignors to Minolta Camera Kabushiki Kaisha

Filed May 11, 1971, Ser. No. 142,156

Claims priority, application Japan, May 11, 1970, 45/39878

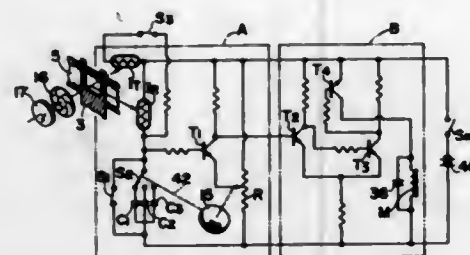
Int. Cl. G03b 7/08

U.S. Cl. 95-10 CT

11 Claims

Automatic exposure control is effected by measuring light passing through the objective lens both before and during exposure by using a combination of two light measuring elements. One light measuring element is mounted to receive light reflected from either a light shield member or the surface of the film and the other light measuring element is mounted

behind the film and is responsive to light transmitted through the film during exposure. A switch enables selection of the



one, or combination of the two, light measuring elements to account for the difference in reflection coefficients of different films.

3,730,064

## QUENCH CONTROL CALCULATOR

Dean M. Peterson, Fort Washington, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 6, 1971, Ser. No. 204,868

Int. Cl. G01J 1/52

U.S. Cl. 95-10 C

7 Claims



A first selection device selectively designates a power level to be used in a light producing unit and accordingly adjusts a first light attenuation device which is effective to attenuate the light directed toward an associated light sensing apparatus from a scene being photographed. A reference indicium is thereby established in accordance with the selected power level and with respect to a second selection device. The second selection device features two scales in a fixed relationship with respect to each other. The first scale includes indicia representative of various film speeds and the second scale includes indicia representative of the various *f* numbers of a camera lens apparatus. The second selection device is operable to align a selected film speed indicium with the reference indicium, thereby fixing the second selection device with respect to the reference indicium on the first selection device. A third selection device includes indicia representative of various camera-to-scene ranges and a corresponding pointer associated with each of the several indicia. The third selection device is operable to designate a selected range and accordingly to adjust a second light attenuation device which affects the light directed toward the light sensing apparatus from the scene being photographed. The pointer associated with the selected camera-to-scene range, points to a recommended *f* number on the second scale of the second selection device. A coupling automatically adjusts the camera lens apparatus in accordance with that recommended *f* number.

3,730,065

## DEVICE FOR USE WITH SELF-DEVELOPING FILM

Israel Nesson, Fairlawn; Robert G. Palmer, Wayne; Edwin E. Faris, Wyckoff, and Charles J. Hertling, Bloomfield, all of N.J., assignors to Berkey Photo, Inc., Paramus, N.J.

Filed Feb. 28, 1972, Ser. No. 229,942

Int. Cl. G03b 17/52

U.S. Cl. 95-13

15 Claims

A device is provided for use in a camera utilizing self-developing film. The film in question comprises a rupturable

pod of processing liquid which is sandwiched between a pair of photographic sheets. Attached to the exterior of one of the sheets and disposed adjacent the leading end thereof is an elongated removable feeder tab. The device is disposed within the camera and includes a pair of elongated spreader members which are biased towards one another to assume a substantially superposed relation and define an elongated predetermined minimum gap through which the photographic sheets and the pod, when in a collapsed state, are caused to move. As the film moves through the gap, the pod is ruptured and the processing liquid uniformly spread between the sheets. Compression means are disposed adjacent the infeed side of the gap and provide uninterrupted pressure on the opposite marginal segments of the film sheets. Compressive pressure is continuously exerted on the opposite marginal segments of the



film from a location substantially upstream of the spreader members into the gap between the spreader members and thereby confining the spread of the processing liquid to between the compressed marginal segments. Portions of the compression means extend into the gap and engage the film while the latter is moving therethrough. The device includes a guide means which is disposed adjacent the infeed side of the gap and directs the leading end of the film into the gap. The feeder tab carried by one of the photographic sheets is positioned over the guide member so as to circumvent the gap. The feeder tab projects outwardly from the camera housing and, as it is manually pulled therefrom, the feeder tab will cause the leading ends of the photographic sheets to pass through the gap and extend outwardly from the camera housing whereupon they may be grasped for manual pulling of the remainder of the film through the gap.

3,730,066

## FILM MOVEMENT PREVENTION MEANS

Helmut Ettischer; Wolfgang Ort; Horst Simon, and Kurt Steinslinger, all of 7 Stuttgart 60 Wangen, Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

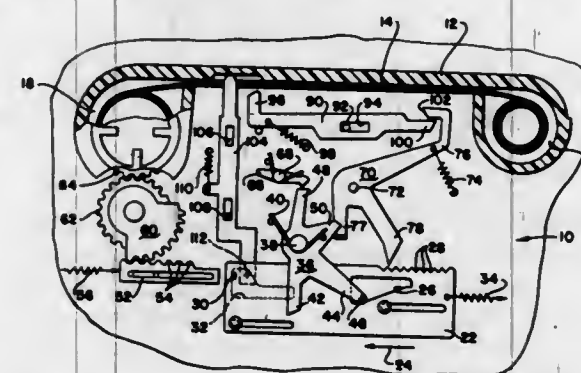
Filed June 5, 1972, Ser. No. 259,828

Claims priority, application Germany, Oct. 14, 1971, G 71 38 818.6

Int. Cl. G03b 1/42

U.S. Cl. 95-31 R

6 Claims



A camera includes transport means operable for advancing received film which is perforated at predetermined metering intervals along an exposure plane, a metering mechanism operable to disable the transport means and a film sensing pawl movable into a film perforation to operate the metering mechanism and movable from the perforation after the transport means has been disabled. A film holding member is

movable into a film perforation when the transport means has been disabled to prevent film movement along the exposure plane.

3,730,067

## RANGEFINDER MECHANISM

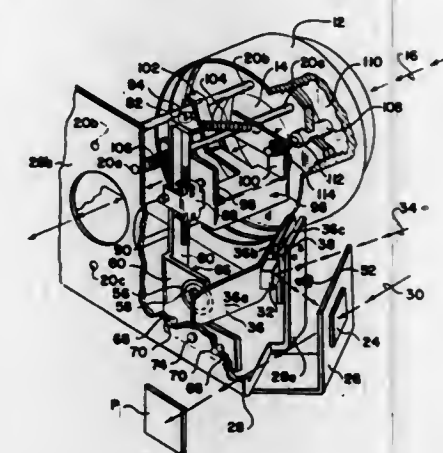
Neil G. Seely, Brockport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 2, 1971, Ser. No. 168,222

Int. Cl. G03b 17/12

U.S. Cl. 95-44 C

3 Claims



A rangefinder of the type adapted to provide two superimposed images one of which is adjustable with respect to the other by focusing a lens system of a camera, for example, includes means for adjusting the rangefinder to correctly locate elements of the rangefinder so that two images of a scene are superimposed when the lens is focused on the scene. These adjustments include adjustment of a mirror about each of two axes substantially perpendicular to each other, and adjustment of a coupling between the lens system and the rangefinder mechanism so that the rate of adjustment of the rangefinder during focusing of the lens is coordinated with movement of the lens during such focusing of the lens system.

3,730,068

## MOTOR DRIVEN CAMERA FOCUSING MECHANISM

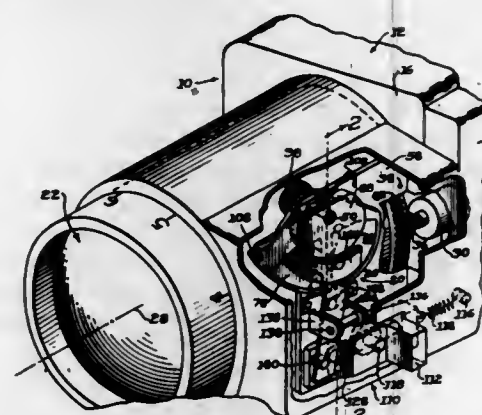
Stanley R. Freeland, Glenview, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Sept. 13, 1971, Ser. No. 179,862

Int. Cl. G03b 3/00

U.S. Cl. 95-44 R

15 Claims



An electrically conductive pendulous member is mounted on a camera for operation in response to the principle of triangulation and for selective positive displacement into any operative condition by a manually actuable control mechanism. Upon displacement of the pendulous member into engagement with a conductive portion of a carrier means, a motor of a lens focusing mechanism is energized to cause



simultaneous adjustment of the lens and the carrier means until the lens is in an "in-focus" condition. A secondary indicator circuit informs the user when a focusing operating is complete.

3,730,069

# SINGLE EXPOSED PLASTIC RELIEF IMAGE PRINTING PLATE WASHER

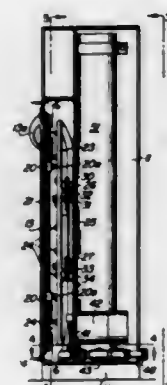
Richard D. Bunker, Salt Lake City, Utah, assignor to Dynaflex Corporation, Salt Lake City, Utah

Filed Jan. 3, 1972, Ser. No. 214,575

Int. Cl. G03d 3/02

U.S. Cl. 95-98

3 Claims



An apparatus for washing away the water soluble areas of a plastic emulsion covering a plate used in printing operations. Portions of the normally water soluble plastic emulsion become insoluble in water when exposed to actinic or ultraviolet light through a light dark master. The apparatus of the invention consists of a housing wherein water is sprayed uniformly over a printing plate by an arrangement of nozzles to remove the portions of the plastic emulsion remaining water soluble. The nozzles reciprocate to uniformly spray all areas of the emulsion coating, developing thereon, in plastic relief, a representation of the light dark master. The reciprocating nozzles also cyclically apply heated air to the developed plate. The printing plate is releasably maintained within the apparatus housing by adjustable spring clamps which secure the corners of the printing plate to a wash surface on a door of the housing.

3,730,070

# REAR WINDOW DEFROSTER

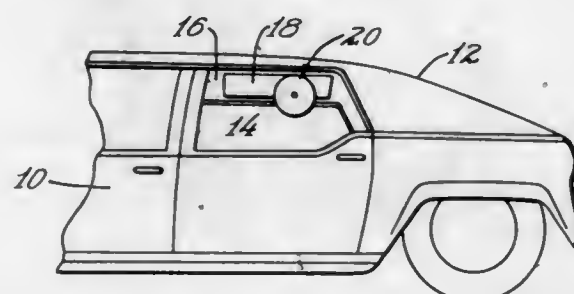
Reuben L. Pedersen, 1303 5th Avenue, Stillwater, Minn.

Filed June 4, 1971, Ser. No. 150,086

Int. Cl. B60h 1/24

U.S. Cl. 98-2.04

1 Claim



A wind driven rear window defroster adapted to be mounted in the side window space of a vehicle so as to circulate and direct warm air from the interior of the car onto the rear window for defrosting purposes, the circulating fan being driven by a wind driven fan outside the vehicle.

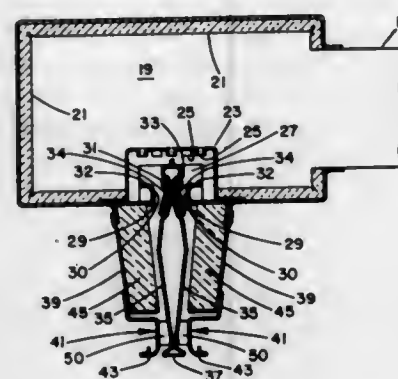
3,730,071  
AIR CONDITIONING TERMINAL  
August W. Gutheim, Chittenango, and Carl C. Herb, Camillus, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed June 25, 1971, Ser. No. 156,649

Int. Cl. F24f 13/06

U.S. Cl. 98-40 D

1 Claim



An air conditioning terminal for use in an air conditioning system for discharging conditioned air into a space which includes a diffuser spaced from opposed parallel walls; the opposed parallel walls and diffuser cooperate to define therebetween two discharge air streams. Spacers are provided between opposed surfaces of the diffuser and the parallel walls. The sides of the spacers are in intimate contact with the opposed surfaces of the diffuser and parallel walls. The spacer acts to maintain a predetermined distance between the diffuser surface and the opposed terminal wall.

3,730,072

# AIR OUTFLOW DEVICE

Lars Soderlund, and Ake Moller, both of Tomelilla, Sweden, assignors to Ar-Ventilation AB, Stockholm, Sweden

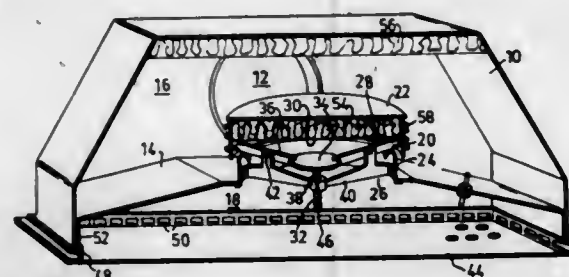
Filed June 1, 1971, Ser. No. 148,519

Claims priority, application Sweden, June 24, 1970, 8741/70

Int. Cl. F24f 13/06

U.S. Cl. 98-40 D

5 Claims



This invention refers to an air outflow device for ventilation plants for dwelling rooms, public rooms and other rooms comprising a casing with an inlet opening for pressurized air and within said casing a partition wall dividing the casing into a pressure chamber and a distribution chamber and having a slot shaped air passage opening. According to the invention, the air passage opening is formed as an air gap between an upwardly directed, tubular socket and a cap above said opening having a peripheral wall portion reaching downwards around the socket, the gap being adjustable by displacement of the cap towards and away from the partition wall for adjusting the width of the air passage opening between the socket and the cap to uniform values around its periphery so as to obtain a uniform and symmetric distribution of the air to the air distributing chamber and from this to the room.

3,730,073  
CHIMNEYS

Patrick Potter, 25 Queenwood Avenue, Hamilton, New Zealand

Filed Aug. 4, 1971, Ser. No. 168,885

Int. Cl. E04h 12/28

U.S. Cl. 98-60

11 Claims U.S. Cl. 99-310

2 Claims



A chimney comprising a corrugated outer shell, an inner shell incorporating a section having corrugations at desired spacings so as to compensate for any unequal expansion between the outer shell and the inner shell, and fiber-glass or other suitable heat insulation medium packed into the space between such shells, of which the following is a specification.

3,730,074  
GRILLE

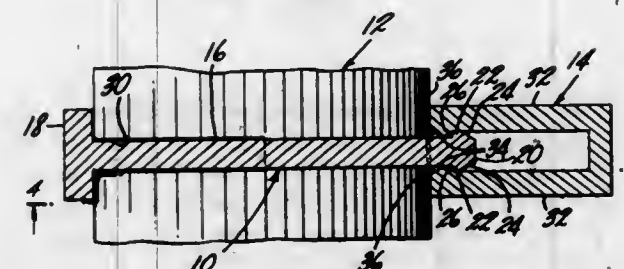
Frederick Charles Helwig, Union, N.J., assignor to Construction Specialties, Inc., Cranford, N.J.

Filed Feb. 16, 1971, Ser. No. 115,279

Int. Cl. A23c 15/02

U.S. Cl. 98-121

5 Claims



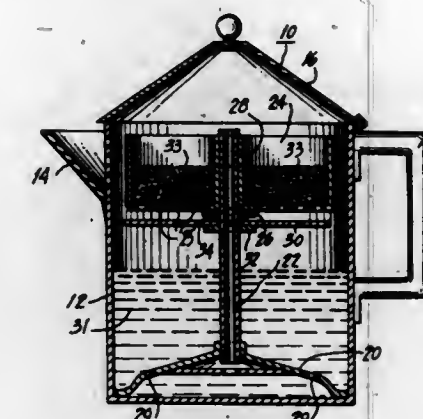
A grille comprising a plurality of substantially spaced-apart bars, each of which includes in cross-section, a web portion, a flange at one end of the web portion that has parts that project laterally, relative to the web portion, and an enlargement at the other end of the web portion that forms beads projecting out from each face of the web portion and having faces generally perpendicular to the faces of the web portion and generally facing the projecting parts of the flange. A plurality of blades extend substantially crosswise of the bars, and the blades and bars are mutually slotted and are interfitted in eggcrate fashion. Each bar receives a blade retainer that is generally U-shaped in cross-section, has resiliently deformable legs, and is provided with a bead extending inwardly from each leg that is captured by the beads on the bars. One edge of each blade engages the outwardly projecting parts of the bar flanges, and the other edges of the blades are engaged by the ends of the legs of the blade retainers.

3,730,075  
PERCOLATOR

Bruce Paul Strauss, 624 62nd St., and Michael Andrew Otavka, 8016 Highland Avenue, both of Downers Grove, Ill.

Filed Feb. 19, 1971, Ser. No. 116,919

Int. Cl. A47j 31/00



An improved coffee percolator comprising a container, a perforated coffee basket seated on a hollow stem within said container, the improvement comprising a condensation plate on said stem below and spaced from the bottom of said basket.

3,730,076  
ROASTING BAG

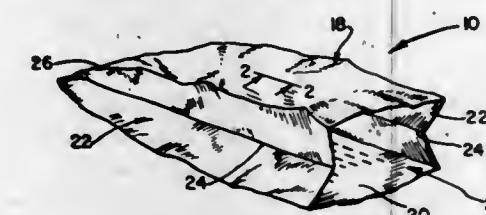
Myron M. Levin, Highland Park, Ill., assignor to E-Z Por Corporation, Niles, Ill.

Filed July 21, 1971, Ser. No. 164,780

Int. Cl. A47j 37/10, 37/01

U.S. Cl. 99-347

13 Claims



A bag for use in roasting and cooking food products, such as meat, fowl, fish and the like, which bag is formed of an inner layer of paper material and an outer layer of aluminum foil bonded to the paper material, with the side of the bag which forms the bottom when the food product is placed therein provided with slits to form vent openings for draining of the fat and condensate from the bag into a pan in which the bag and food product is placed. During roasting the fat, juices and basting material from the food product are captured within the bag and fall back on and against the food product to provide a self-basting process and the flavor of the cooked food product is greatly increased. The cooking time can be decreased, and the mess caused by normal spattering against the interior of the oven during the cooking process is eliminated.

3,730,077

# COLLAPSIBLE LAPBOARD STRUCTURE

Boynton Selden, 81 Uplands Drive, West Hartford, Conn.

Filed May 12, 1972, Ser. No. 252,620

Int. Cl. A47b 17/00

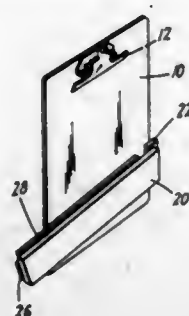
U.S. Cl. 108-43

8 Claims

A collapsible lapboard structure has a base, a spacer member hingedly joined thereto, and a support member in turn hingedly joined to the spacer member. When the structure is in its erected position the base member and support member extend perpendicularly from one side of the spacer



member, and the hinges employed cooperate therewith to maintain that relationship against downward force on the sup-



port member. The base member is adapted to rest upon a seat so as to position the support member over the lap of a person seated thereon.

3,730,078

**JUNK AUTOMOBILE CRUSHER**

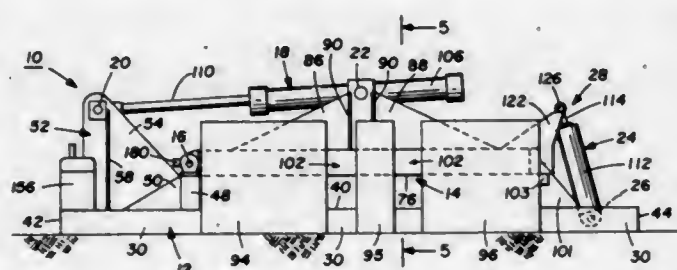
Robert L. Flanagan, Dallas, Tex., assignor to Mobil Auto Crushers Corporation of America, Oklahoma City, Okla.

Filed May 14, 1971, Ser. No. 143,352

Int. Cl. B30b 15/16

U.S. Cl. 100—48

22 Claims



An automobile crusher is disclosed which produces a package of predetermined height with parallel upper and lower faces and a limited length and width to facilitate stacking for shipping and handling. The crusher includes a base forming a bin having an open top for receiving the automobiles, and a lid pivotally connected to the upper edge of one wall of the bin. A hydraulic actuator having a cylinder pivotally connected to the lid and a rod pivotally connected to the base raises and lowers the lid with the weight of the cylinder and fluid therein assisting materially in crushing autos in the bin as the bin is lowered. A second cylinder can be latched to the free end of the lid to assist in pulling the lid down to crush the autos. The crusher has a fully automatic cycle remotely controlled by a radio located on the vehicle being used to load the crusher, thus requiring only one operator for the total operation. In one embodiment, the auto crusher is a self-propelled unit having a single integral chassis having a size and weight such as to legally travel on substantially all highways in the United States.

3,730,079

**VARIABLE NIP PRESS HAVING ROLLS MAINTAINED ON PARALLEL AXES**

Sidney E. Stirk; John P. Rich, both of Nashua, and Russell E. Holt, Candia, all of N.H., assignors to Improved Machinery Inc., Nashua, N.H.

Filed June 22, 1971, Ser. No. 155,441

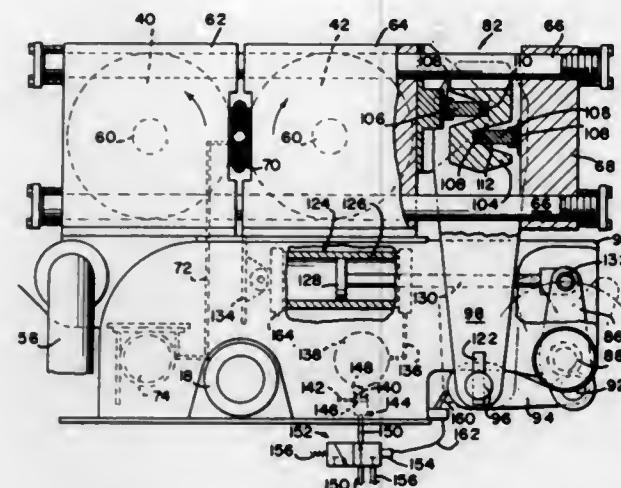
Int. Cl. B30b 9/20, 3/04

U.S. Cl. 100—121

20 Claims

A press comprising a plurality of press rolls rotatable about parallel axes, wherein one of the press rolls is laterally movable relative to the other to vary the cross-section of the therebetween nip. Pressing force is applied to the laterally

movable press roll by a plurality of separate link systems actuated by individual fluid pressure operated actuators; and the



link systems are interconnected by a torsion bar which causes the link systems to maintain the axes of the press rolls parallel.

3,730,080

**EMBOSSER USING SMALL DIAMETER EMBOSSING ROLLS**

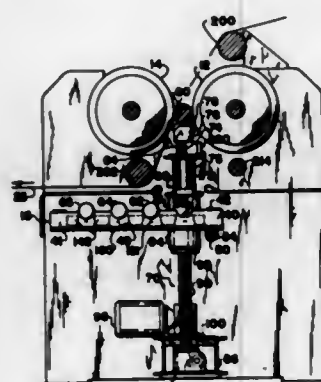
John Deligt, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed Aug. 5, 1970, Ser. No. 61,135

Int. Cl. B41f 11/00, 13/44

U.S. Cl. 101—23

15 Claims



Embossing apparatus includes a pair of backup rollers rotatable about parallel axes and mounted for back-and-forth movement relative to each other to form a variable width space therebetween. Associated with the backup rollers are back stops to set width of the space between the rollers. Apparatus is provided for pressing into the space between the backup rollers an unsecured, freely positionable embossing roller having a diameter larger than the width of the space. An embossing nip is formed between the embossing roller and at least one of the backup rollers.

3,730,081

**ROTARY HOT DIE EMBOSSER WITH TAPERED SHAFT AND INSULATED EMBOSSING WHEEL**

Gary C. Colledge, 13900 Marguesas Way, Marina Del Rey, Calif.

Filed Jan. 7, 1972, Ser. No. 216,061

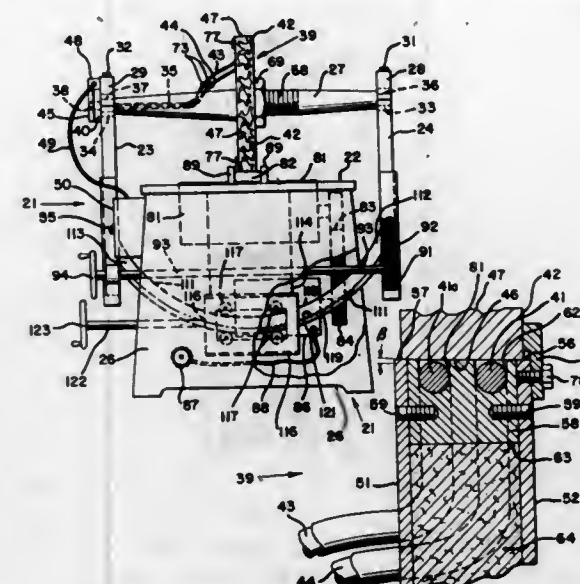
Int. Cl. B44b 5/00

U.S. Cl. 101—25

10 Claims

A high speed, high temperature embossing machine for embossing wood products and a high temperature embossing wheel therefor is disclosed. The embossing wheel is electrically heated by elements carried at the rim thereof to temperatures as high as 1,400°F., and an embossing feed rate as high as 200 feet per minute may be employed. A large diameter hol-

low wheel filled with a thermally insulating material and a tapered, elongated shaft are employed to minimize heat



transfer to the shaft bearings for high speed operation. Embossing wheel tilting and embossing wheel raising and lowering mechanisms are also disclosed.

3,730,082

**IMPACT LINE PRINTER**

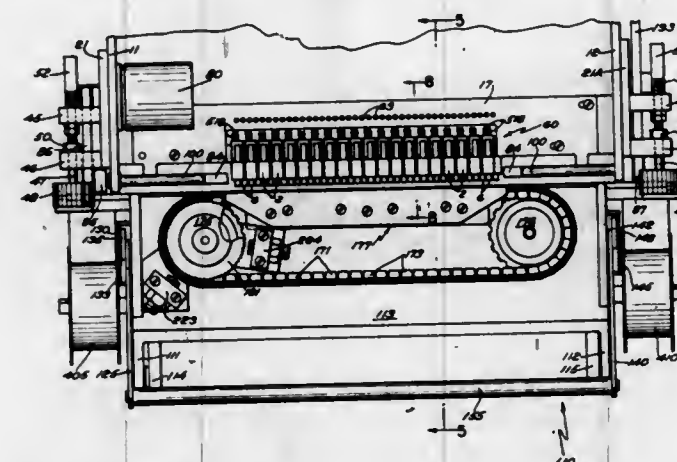
Richard Anthony Perry, Attleboro, Mass., assignor to Odec Computer Systems, Inc., East Providence, R.I.

Filed Aug. 24, 1971, Ser. No. 174,315

Int. Cl. B41j 1/30

U.S. Cl. 101—93 C

10 Claims



This disclosure relates to an impact hammer printer and the structure for adjusting the platen face of each individual hammer, individually and collectively in relation to a stationary anvil and type faces rotatively mounted in a closed loop past the platen faces of an upper and lower bank of hammers. The disclosure also includes a pivotal yoke arrangement forming part of the machine frame which carries the closed loop guide track, anvil and character carrying closed loop.

3,730,083

**PRINTING MECHANISM**

Curt Hjerpe, Molndal, Sweden, assignor to Facit AB, Atvidaberg, Sweden

Filed Dec. 16, 1970, Ser. No. 98,598

Claims priority, application Sweden, Dec. 18, 1969, 17478/69

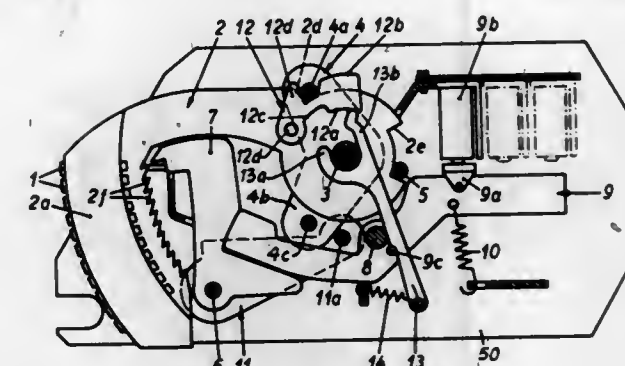
Int. Cl. B41f 5/06

U.S. Cl. 101—93 MN

9 Claims

The present invention relates to a printing mechanism for simultaneous order printing (i.e. synchronous printing in all

denominations) for calculating machines or the like or for use as output devices at data terminals or the like and provides means for maintaining a positive engagement between a drive transmitting member and setting means for type carriers by the action of a control member which will be moved out of an active position when the selected type carriers have been



3,730,084

**SELECTIVELY ACTUABLE MEANS FOR PRINTING HEADS**

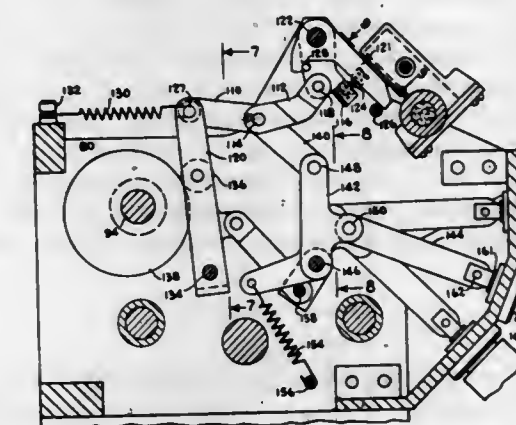
Herbert Trampusch, Riverside, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Feb. 24, 1971, Ser. No. 117,920

Int. Cl. B41j 3/00, 1/04

U.S. Cl. 101—109

4 Claims



A printing apparatus is provided including a plurality of heads positioned in linear alignment at a printing station for printing along one dimension of a rectangular array of rows and columns on a surface such as a card. Each head includes a wettable medium for transferring printing solution from a reservoir to the card. A transportable reservoir is provided containing a volatile solution of printing material and having an equal plurality of apertures for receiving the printing heads in sealing engagement. Means are provided for disengaging the reservoir and printing head, for selecting one or more of the printing heads for printing, and for forcing the head into contact with a card which has been advanced to a printing station of the apparatus.



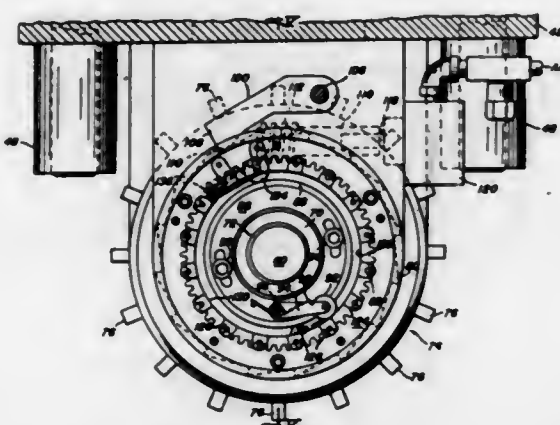
3,730,085

**SELECTIVE DRUM PRINTER WITH PAWL MEANS TO LOCK THE TYPE WHEEL IN SELECTED POSITION**

Norman A. Beck, Elllicott City, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.  
 Division of Ser. No. 6,201, Jan. 27, 1970, Pat. No. 3,633,498.  
 This application Sept. 20, 1971, Ser. No. 181,747  
 Int. Cl. B41j 7/48

U.S. Cl. 101-110

4 Claims



Apparatus for marking a plate member at a preselected location and to impress selected characters on opposite sides of the mark. A bridge member spans a layout table and is movably supported on a pair of rails secured to the table sides so that the bridge member is movable longitudinally along the layout table. A turret assembly is movably supported on the bridge member and is movable longitudinally thereon and transversely relative to the layout table. The turret assembly includes a marking head assembly that is movable vertically toward and away from the plate positioned on the layout table. The marking head assembly includes a central support member with a punch member extending downwardly therefrom and a pair of marking wheels rotatably supported on opposite sides of said support member. The marking wheels have a plurality of raised characters positioned at spaced intervals along the outer periphery. The marking wheels are rotated by means of a driven worm gear assembly and a pawl ratchet assembly. A fixed commutator wheel is associated with each marking wheel and has separate commutators for each character on the marking wheel. Separate fixed and movable commutator wheels complete an electrical circuit through a remotely closed switch circuit and the commutator for a selected numeral on the marking wheel. The circuit remotely controls the drive for rotating the marking wheel and stops the wheel when the selected numeral is in a marking position.

3,730,086

**PRINTING PRESS FILM SENSOR**

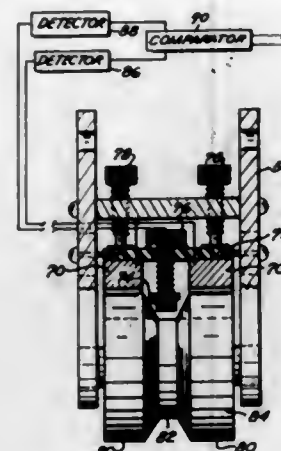
Walter E. Dauterman, Willowick, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio  
 Filed June 10, 1970, Ser. No. 45,119  
 Int. Cl. B41l 25/00; H01g 5/20; G01r 27/26

U.S. Cl. 101-148

2 Claims

An improved sensor has been provided for measuring the thickness of the film of dampening fluid on one of the rolls in the dampening mechanism of a lithographic printing press. The sensor comprises a capacitor formed between a sensor roller which runs in contact with the dampener form roll and a capacitor plate disposed concentric with the roller. The sensor roller which runs in contact with the dampener form roll has a film of dampening fluid thereon the thickness of which is dependent upon the thickness of the film of fluid on the dampener form roll. The sensor senses the change in capacitance of the capacitor which results primarily from the change in the dielectric of the space between the capacitor plate and the roller. The changes in the dielectric result from changes in the

thickness of the film of dampening fluid on the roller. A frame is provided to support the capacitor plate and the sensor roller



and the frame minimizes vibration between the roller and the capacitor plate to thereby provide an accurate sensor.

3,730,087

**DOCTOR BLADE PRESSURE/ANGLE ADJUSTING MECHANISM**

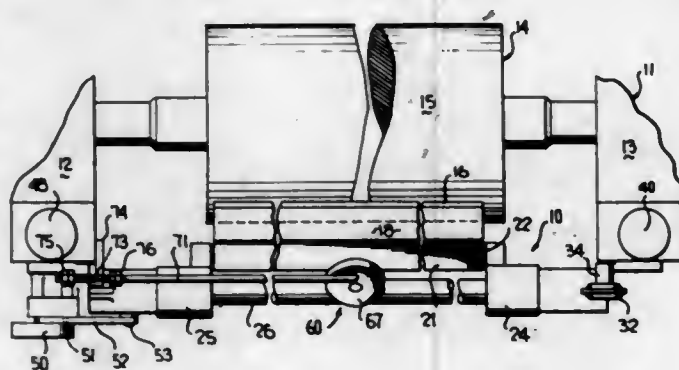
Robert F. Trant, Chicago; Kenneth W. Gray, Justice, and John W. Capron, Palos Heights, all of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Feb. 1, 1971, Ser. No. 111,201

Int. Cl. B41f 9/10

U.S. Cl. 101-169

6 Claims



This disclosure relates to a novel method of and means for automatically and repetitiously increasing and decreasing doctor blade/cylinder contact pressure and doctor blade/cylinder angle to lessen or prevent "coverage", i.e., the presence of ink haze in the nonimage area of a print.

3,730,088

**EXTREME PRESSURE PLATEN-AND-ROLLER DIE-PRESS FOR PRECISE WORKING OF WEB STRUCTURES**

Remsen V. Wood, Riderwood, Md.

Filed May 28, 1971, Ser. No. 148,028

Int. Cl. B41f 3/16, 3/22

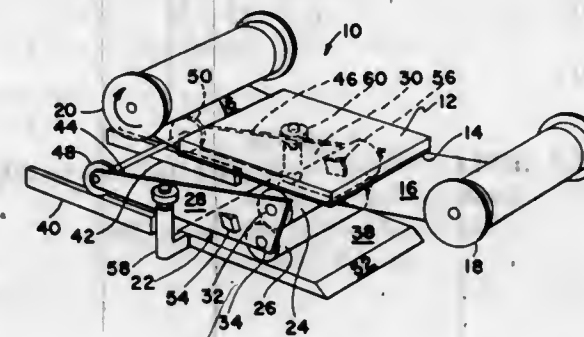
U.S. Cl. 101-269

11 Claims

A die-press for precise high pressure deformation of web structures, including in typical embodiment a downward facing die platen having a die integral with the face, a guide platen fixed in plane-parallel spacing below the die platen; twin horizontal rollers of combined diameters greater than the plane-parallel spacing, and stacked in contact in parallel nearly over-and-under relation in the space between the platens; a reciprocable carriage rotatively mounting the ends of the rollers and having an extension adapted to travel along a guide during the working stroke to define the angle of the over and under relation of the rollers and thus the roller pressure, and apparatus to position a web between the upper roller and

the die; a recess at the end of the guide platen relieves pressure as the working stroke is being completed and separates

move the blade into a closely spaced reference position with respect to the fountain roller, with the width of the gap of the fountain roller being thereafter controllable by retracting the plunger in the cartridge by energizing the motor. In the preferred embodiment a threaded adjusting sleeve is inter-



the roller from the work, and means for changing the over-and-under relation of the rollers maintains the roller and work separation on the return stroke.

3,730,089

**INK MONITORING APPARATUS**

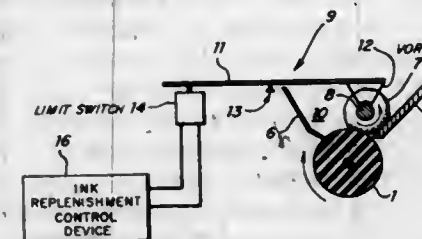
James B. McCutcheon, Canandaigua, N.Y., assignor to Itel Corporation, Lexington, Mass.

Filed June 16, 1971, Ser. No. 153,722

Int. Cl. B41f 31/06

U.S. Cl. 101-363

9 Claims



Apparatus for monitoring the supply of ink contained within the supply reservoir of a printing press. The ink within the reservoir is monitored by first forming it into a vortex and then monitoring a radial dimension of the vortex. According to the preferred embodiment, the monitoring structure includes a rod positioned within the reservoir which will assume a position substantially along the axis of the vortex due to the forces generated by the vortex. A follower assembly is carried by the rod and moves with it as the radius of the vortex changes due to the addition or withdrawal of ink from the reservoir. When the size of the vortex is reduced to a predetermined minimum, the follower assembly will actuate suitable apparatus to automatically add additional ink to the reservoir.

3,730,090

**ADJUSTING ARRANGEMENT FOR INK FOUNTAIN BLADE**

Gary R. Lamberg, and Louis S. Depa, both of Chicago, Ill., assignors to North American Rockwell Corporation, Pittsburgh, Pa.

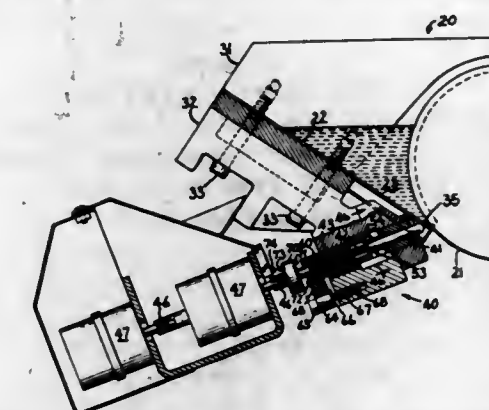
Filed Feb. 16, 1971, Ser. No. 115,287

Int. Cl. B41f 31/02

U.S. Cl. 101-365

5 Claims

An arrangement for adjusting the blade of an ink fountain in a printing press to control the thickness of the ink film fed to the ink rollers. A plurality of plungers are provided along the length of the fountain blade at regularly spaced positions. The plungers are threaded in respective cartridges with individual drive motors to vary the position of the plunger in the cartridge. The cartridges are mounted for bodily axial movement in the ink fountain frame, with a manually operated adjusting screw interposed between the cartridges and the frame for adjustment of position. Thus when the plunger occupies an extended limit position, the reference screw may be adjusted to



posed between the plunger and the cartridge and connected to the drive shaft thereby providing inner and outer threaded connections which are differentially related to produce precise gradual movement of the plunger in response to motor rotation.

3,730,091

**IMAGE TRANSFER LAYERS FOR INFRARED TRANSFER**

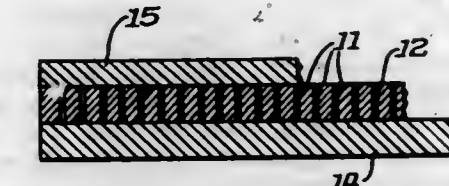
Joseph Gaynor, Arcadia, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Oct. 23, 1970, Ser. No. 83,397

Int. Cl. B41m 5/02; G01n 21/34

U.S. Cl. 101-471

11 Claims



An improved image resolution in thermo-transfer duplicating processes is accomplished by means of dispersing a plurality of thermally conductive particles in the dye-wax layer of transfer material used in such processes and applying an electrical or magnetic field to the transfer material layer sufficient to orient and align the particles parallel to the direction of the field. In this way the improved dye-wax layer of transfer material is capable of greater thermal conductivity in the direction transverse to the layer than in the lateral direction of the layer.

3,730,092

**MAGNETIC SHEET FOR IMPRESSION CYLINDER**

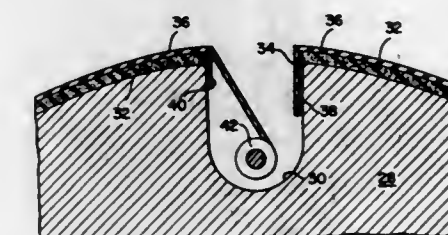
John E. Pickard, Elllicott City, and Charles H. Weber, III, Silver Spring, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed March 5, 1971, Ser. No. 121,332

Int. Cl. B41f 29/04

U.S. Cl. 101-415.1

6 Claims



The invention disclosed is directed to a laminated magnetic sheet which avoids known bolster problems and which pro-



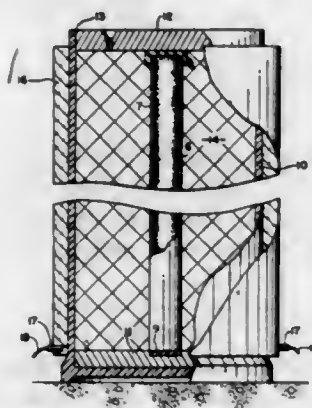
vides an equalized effective printing pressure between a printing surface and a web of paper being printed. The magnetic press sheet is formed of a flexible magnetic material, is disposed over the substrate without bolster, and includes L-shaped edge members for retaining in position against the surface of an impression cylinder by contact with a depression in the substrate.

### 3,730,093 EXPLOSIVE APPARATUS

Jerry W. Cummings, Palos Verdes Estates, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.  
Filed Dec. 27, 1966, Ser. No. 607,129  
Int. Cl. F42b 24/15

U.S. Cl. 102-6

2 Claims



In one embodiment a cylindrical mass of fuel is surrounded on the sides by a layer of high explosive for implosive dissemination of the fuel. Axially within the fuel is a frangible tube containing a powdered igniter mixture of metal and metal oxide which are exothermically reactive together. Gas voids are provided in the igniter mixture for assuring initiation of reaction therein. Means are provided for detonating the high explosive which sends an implosive shock wave through the fuel and the metal-metal oxide mixture. The mixture is thereby ignited and fragmented and the heated mixture and the fuel are radially disseminated providing ignition of the fuel as it is disseminated. The nature of the arrangement permits use for fuel of a broad variety of materials including materials known to be combustible and also a variety of materials not normally considered combustible.

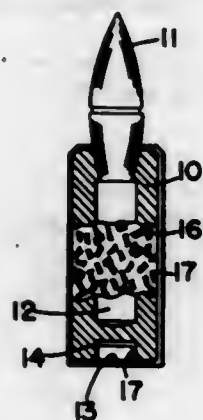
### 3,730,094 ENERGETIC PROTECTIVE COATING FOR CASELESS AMMUNITION

Joseph B. Quinlan, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Army

Filed June 12, 1970, Ser. No. 45,743  
Int. Cl. F42b 5/18

U.S. Cl. 102-38

3 Claims



Caseless ammunition comprising propellant components

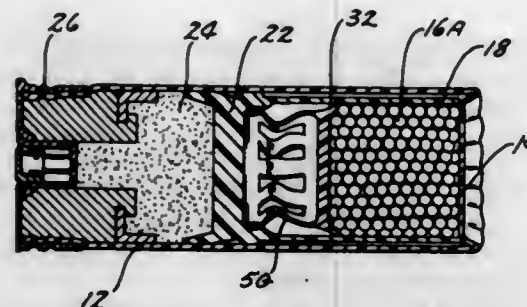
provided with an energetic thermal and moisture-resistant coating are characterized by good environmental protection. The employment of a high temperature resistant explosive as a component of the coating permits the application of relatively thick coatings to obtain the advantage of increased thermal resistance without a consumability accommodation in the ballistic cycle.

### 3,730,095 SHOT SHELL AND METHOD OF LOADING SAME

Frederick A. Lage, Gladbrook, Iowa  
Filed May 22, 1970, Ser. No. 39,588  
Int. Cl. F42b 7/08

U.S. Cl. 102-42 C

1 Claim



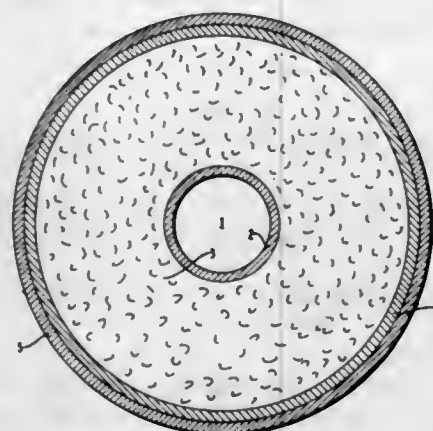
A shot shell casing includes a quantity of powder at one end and a shot sleeve is disposed in the casing on the powder and is open at one end. A plastic shot wad is positioned in the shot sleeve and includes a plurality of peripherally disposed rearwardly extending spaced apart deformable legs engaging the closed end of the shot sleeve. The powder is placed in the shot shell followed by the shot sleeve and the plastic wad in the shot sleeve. The shot is then placed in the sleeve on the plastic wad and pressure is applied compressing and permanently uniformly deforming the legs of the plastic wad to a sufficient length for closing the open end of the shot shell casing onto the shot. The legs of the shot wad are uniformly bent transversely, inwardly in a plane intermediate their ends. A ring element interconnects the free ends of the legs.

### 3,730,096 DETONATING FUSE

Josef Prier, Troisdorf, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany  
Filed Dec. 1, 1970, Ser. No. 94,086  
Int. Cl. F42b 3/10

U.S. Cl. 102-27 R

16 Claims



Detonating fuse having a core of high explosive and being enclosed by a casing or sheath, wherein at least one hollow space is arranged within the explosive core. The hollow space extends over the entire length and is provided with a lining surrounding this hollow space with respect to the explosive surrounding the same on all sides.

### 3,730,097 FUZE FOR USE IN FIREDAMP-ENDANGERED AND COAL-DUST-ENDANGERED OPERATIONS

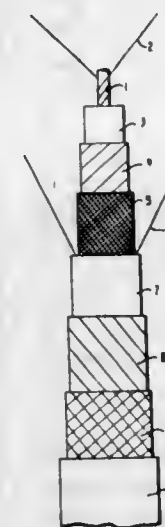
Werner Helfgen, and Wilhelm Rohde, both of 521 Troisdorf, Germany, assignors to Dynamit Nobel AG, West Germany  
Filed Oct. 28, 1971, Ser. No. 193,460

Claims priority, application Germany, Nov. 20, 1970, P 20 57 042.7

U.S. Cl. 102-27 R

Int. Cl. F42b 5/04

17 Claims



A fuze for use in firedamp and coal-dust endangered operations suitable for use in the longhole blasting technique which includes a hollow tube, an explosive core of desensitized explosive surrounding the hollow tube, a wound strip of plastic encasing the explosive core, a multiple-layer spun casing of fibers enclosing the wound plastic strip and an envelope of inert substances surrounding the multiple-layer spun casing. The envelope is, preferably, a mixture of a polymer and insert substances covered, respectively, by cellulose-base fibers, a wound strip of plastic, a multiple-layer spun envelope of fibers, and finally a waterproof outer shell of synthetic resin.

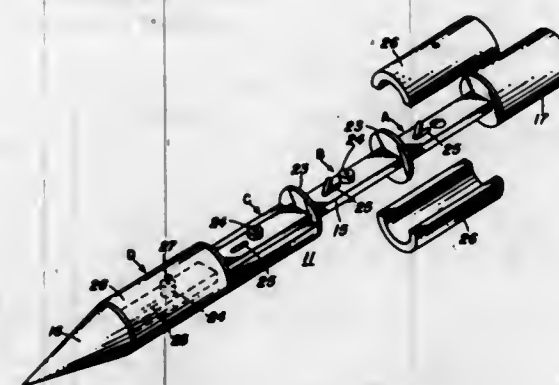
### 3,730,098 APPARATUS FOR QUICK-BLOSSOMING CHAFF EJECTION

William R. Edwards, California, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 16, 1959, Ser. No. 787,310  
Int. Cl. F42b 15/24

U.S. Cl. 102-34.4

10 Claims



1. A chaff dispersion apparatus having a substantially cylindrical rocket dispensing head adapted to be fired from an aircraft, the improvement in said dispensing head comprising a main body portion, a nose cone mounted on the forward end of said main body portion and variable firing means mounted at the rearward end thereof, a plurality of sections in said rocket head located intermediate said nose cone and said firing means, a plurality of equally spaced partitions mounted

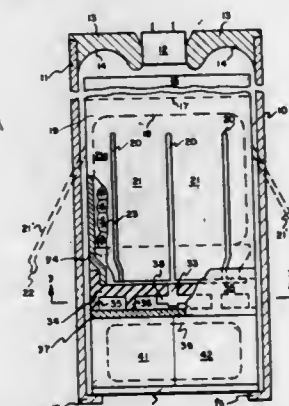
perpendicularly on said main body portion forming said sections, a frangible container enclosing each section, chaff stacked in orderly rows within said containers, an explosive charge within each container mounted on the axis of said main body portion to insure that the forces of the explosive are applied to the chaff in a radial direction and said variable firing means progressively exploding said charges after said rocket head has been fired from the aircraft whereby said frangible containers are destroyed, the chaff dispersed in a radial direction and the rocket head is left intact after each explosion to continue its flight.

### 3,730,099 CONTROLLED DESCENT SYSTEM

Lloyd W. Schopp, Akron, Ohio, assignor to The United States of America as represented by the Secretary of the Navy  
Filed Dec. 17, 1970, Ser. No. 99,185  
Int. Cl. F42b 15/12, 25/02

U.S. Cl. 102-35.6

5 Claims



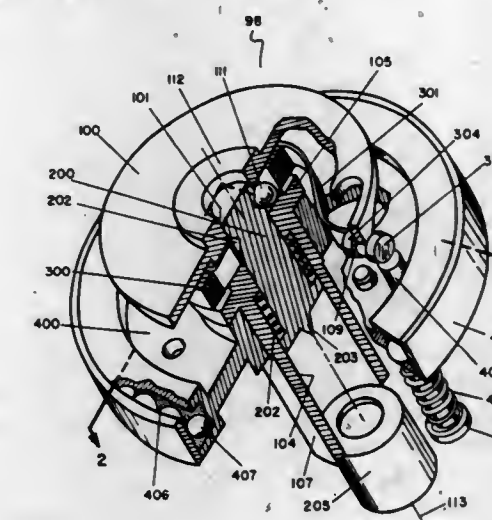
A descent retarding system for an airdropped store is provided by a multistage canister allowing timed, sequential deployment of a parachute and parawing. Following ejection of the store, split half rings and a cover are removed from one end for deployment of a deceleration parachute. After a delay provided by a mechanical or pyrotechnic timer, a retaining member is removed from a parawing compartment allowing resilient, longitudinal finger-like sections of the compartment housing to spring outwardly allowing rapid deployment of an accordion-folded parawing. The parachute is jettisoned once the parawing has inflated.

### 3,730,100 MECHANICAL ANTI-DISTURBANCE DEVICE

Harry J. Hadfield, Clifton, N.J., assignor to The United States of America as represented by the Secretary of the Army  
Filed July 12, 1971, Ser. No. 161,585  
Int. Cl. F42c 7/02

U.S. Cl. 102-70 S

1 Claim



This invention relates to a mechanical anti-disturbance device for preventing the movement of a munition after it has



been emplaced. The device uses a movable pendulous mass as a triggering means for releasing a restraining means which is fixedly holding a spring biased firing pin to a housing means when the device is in an armed state.

### 3,730,101 LOW SPIN ARMING FUZE FOR AUTOROTATING MUNITIONS

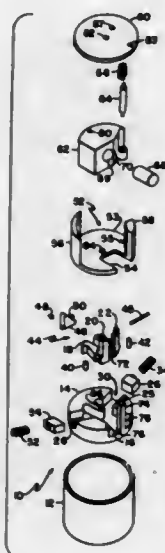
Edward G. Schultz, Jr., Richmond, Ind., assignor to Arco Corporation, Richmond, Ind.

Filed Aug. 18, 1971, Ser. No. 172,695

Int. Cl. F42c 15/22

U.S. Cl. 102-79

11 Claims



An improved low spin arming fuze providing a safer and more reliable fuze for autorotating munitions is disclosed. The spin fuze provides for the arming of the fuze during initial spin-up due to the centrifugal force provided by the rotational velocity when the munition is deployed and permits initiation of the fuze upon spin decay, as occurring at impact. The fuze may ignite either the detonator or multiple pop-up charges combined with a delayed detonation of the munition.

### 3,730,102 MATERIAL HANDLING SYSTEM

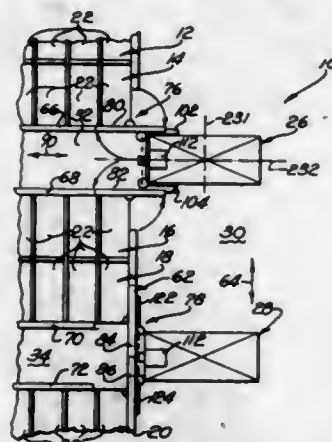
George R. Pipes, South Euclid, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 22, 1971, Ser. No. 117,321

Int. Cl. B60e 13/02

U.S. Cl. 104-48

9 Claims



An improved material handling system includes a main track for guiding movement of a vehicle to and from aisles between adjacent rows of bins. The vehicle is transferred from the main track to tracks in a selected aisle by operating transfer arms on the vehicle to pivot transfer rails forming lengths of the main track into alignment with the aisle tracks. Once the vehicle has entered the selected aisle and moved beyond the transfer rails, biasing springs pivot the transfer rails back into alignment with the main track where the

transfer rails are held in place by latch assemblies. When the vehicle starts to leave the selected aisle and is approaching the main track, the vehicle operates trip linkages to release the latch assemblies. Continued movement of the vehicle toward the main aisle operates other linkages to pivot the transfer rails back into alignment with the aisle tracks against the influence of the biasing springs.

### 3,730,103 CONVERTIBLE RAIL-HIGHWAY VEHICLE

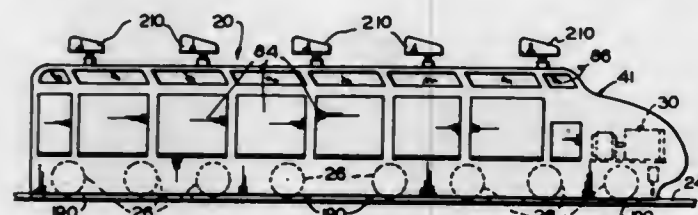
George D. Weaver, Weaver Road, Myrtle Creek, Oreg.

Filed June 22, 1971, Ser. No. 155,451

Int. Cl. B61d 15/00; B61f 9/00; B62d 61/12

U.S. Cl. 105-141

13 Claims



Grooved rail wheels are mounted on retractable frames slidable on posts of turntables rotatable by steering cylinders controlled by magnetic sensors tending to be centered on a rail. The turntables are mounted on carriages supporting a car frame and movable laterally of the car frame. Cylinders connected together in a closed circuit cause some of the carriages to be moved toward one side of the car frame when others of the carriages are moved toward the other side of the car frame, thus centering the car frame on the group of carriages. Outrigger pneumatic wheels may be retracted when the rail wheels are extended and may be extended when it is desired to travel away from the rail. The pneumatic wheels are mounted on retractable frames, carried by turntables which are steered in pairs by racks engaging pinions on the turntables, the racks being movable by pivotal longitudinal members pivoted near the center of the car to turn the wheels nearer the center of the car less than the wheels near the ends of the car in rotating the car. Actuating wires movable with the racks causes compensating movement of the pivots of the longitudinal members to lessen this differential turning of the wheels. Ice blocks carried by the cylinders may be urged into engagement with the ground or rails to provide stabilizing. A pendulum on the car acts to shift wind vanes on the top of the car to correct tilt to one side or the other.

### 3,730,104 FLUID DAMPENING SIDE BEARINGS

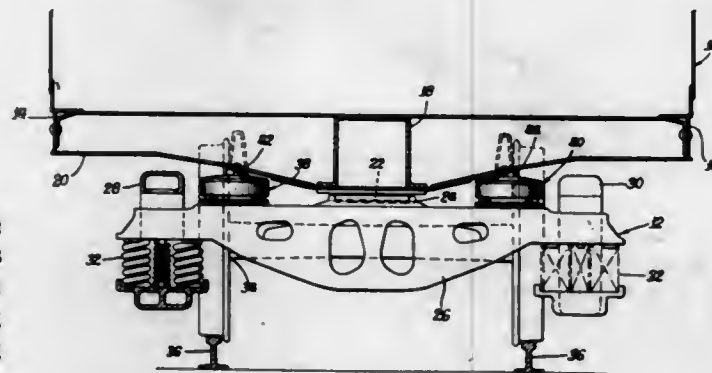
Charles N. Hood, II, Chicago, Ill., assignor to Amsted Industries, Incorporated, Chicago, Ill.

Filed April 9, 1971, Ser. No. 132,748

Int. Cl. B61f 5/06, 5/14; F16c 17/04

U.S. Cl. 105-199 CB

6 Claims



The fluid side bearing, mounted on each side of the bolster of the truck, includes a pair of concentric elastomer rings sur-

rounding a pair of interior hydraulic chambers connected by a regulating valve. The concentric rings coast with one another in stages and with the hydraulic system to dampen rocking motions of the car body relative to the truck bolster.

### 3,730,105 CONVERTIBLE RAILHIGHWAY VEHICLE

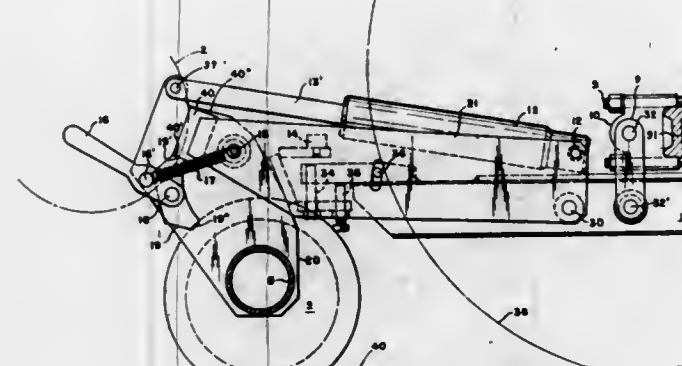
John D. Holley, Montgomery, Ala., assignor to Holley Engineering Co., Inc., Montgomery, Ala.

Filed Oct. 29, 1971, Ser. No. 193,654

Int. Cl. B61d 15/00; B61f 9/00; B62d 61/12

U.S. Cl. 105-215 C

5 Claims



A rail travel attachment for road vehicles having pneumatic tires includes a rail guide wheel adjacent each vehicle wheel for engagement with the rails of a railway. Longitudinal beams connected to the axles of the vehicle support front and rear rail guide wheels on each side of the vehicle. Hydraulically actuated jacks rotate each rail guide wheel into and out of engagement with the rails to guide the vehicle on the rails, rear pneumatic wheels of the vehicle resting on and engaging the rail. A manually actuated locking pawl associated with each of the hydraulically actuated jacks securely locks each rail guide wheel in either its rail engaging position or in its upper out-of-rail engaging position.

### 3,730,106 DOOR OPENING MECHANISM

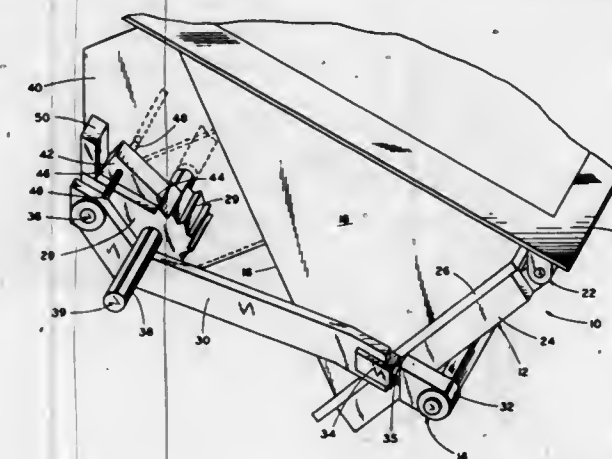
Robert S. Tamborski, Griffith, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed May 18, 1971, Ser. No. 144,479

Int. Cl. B61d 7/18

U.S. Cl. 105-253

4 Claims



A hopper discharge arrangement for emptying the contents of a hopper and including a pivoted door disposed beneath the hopper and connected to a crank and link type of linkage mechanism. The crank member has an integrally formed ratchet gear disposed on one end and a locking bar positioned adjacent the crank member to maintain the doors closed and

allow gradual stepped closing of the doors by engagement of the locking bar with a tooth of the ratchet gear. The locking bar adjacent the crank member includes a cam portion engageable with the crank to move same into the overcenter unlocked position upon unlocking rotation of the locking bar.

### 3,730,107 FOLDING BRACKET MECHANISM

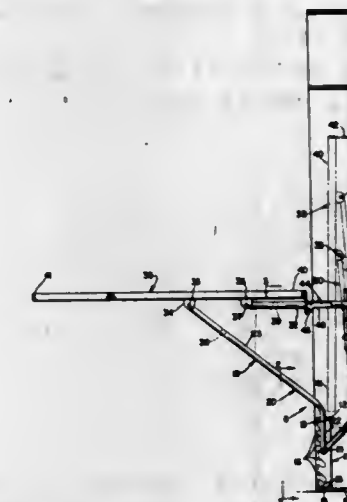
Robert L. Bergkamp, and Helen Gerber Bergkamp, both of R.R. No. 2, Cheney, Kans.

Filed Oct. 19, 1971, Ser. No. 190,619

Int. Cl. A47b 3/00

U.S. Cl. 108-39

3 Claims



A bracket mechanism including an upper brace and a lower brace for mounting a support member, such as an ironing board, desk, table, drawing board, or the like, in either a substantially horizontal operative position or a substantially upright inoperative position. The braces are mounted for swinging movement in a cabinet in which the bracket mechanism and support member are stored, in the folded positions of said parts. The cabinet also provides in part a support for the swingably mounted braces. A latch means retains the support member and braces in the operative positions of said parts and is manually releasable to enable said parts to swing to folded storage positions.

### 3,730,108 ADJUSTABLE SHELVING STRUCTURE

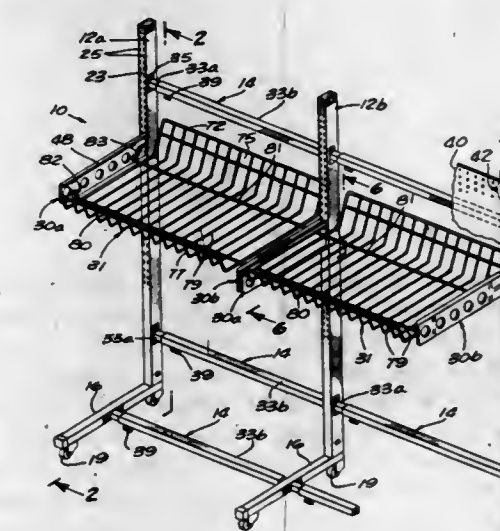
Alvin L. Stroh, 9409 South Downey Avenue, Downey, Calif.

Filed April 26, 1971, Ser. No. 137,524

Int. Cl. A47b 9/00

U.S. Cl. 108-108

7 Claims



An adjustable shelving structure is provided which includes horizontally extending brackets for supporting wire shelves on



vertical upright posts. Each of the brackets is adapted to be attached by loop elements located along either its upper or lower portions to hook on the end of the wire shelf. When the bracket is attached to the shelf by the loop elements along its lower portion, the top of the bracket extends above the bottom plane of the shelf such as to provide an end-wall therefor and when the bracket is attached to the shelf by the loop elements along its upper portion, the top of the bracket is even with the bottom plane of the shelf such as to provide an unobstructed end therefor.

3,730,109

**KNOCK-DOWN TABLE STRUCTURE**

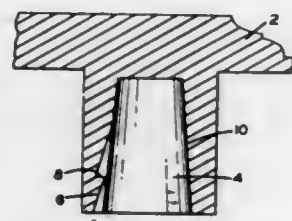
William J. Kreizel, Hewlett Harbor, and Richard T. Cluzio, Brooklyn, both of N.Y., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Jan. 4, 1971, Ser. No. 103,573

Int. Cl. A47b 3/05

U.S. Cl. 108—156

1 Claim



A table structure is formed of four legs and a table top unit, all made from molded plastic. The legs are joined to the table top through the use of a joint structure which requires no tools to assemble and is not capable of being easily disassembled. The table top is provided with socket arrangements for receiving projections on the legs and a locking structure holds the two units in an assembled position.

3,730,110

**MONEY SPRAY APPARATUS FOR THEFT IDENTIFICATION**

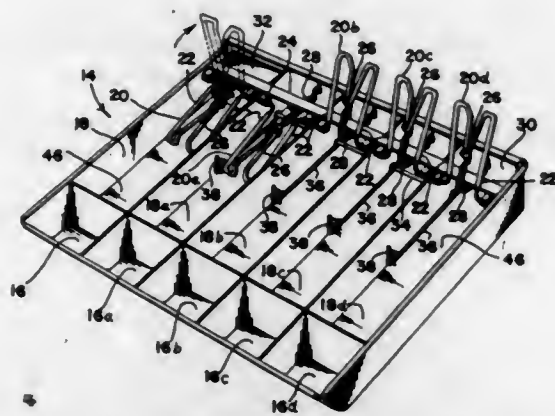
Willard L. Peters, 596 Elm Drive, Tallmadge, Ohio

Filed May 14, 1971, Ser. No. 143,463

Int. Cl. E05g 3/00

U.S. Cl. 109—25

10 Claims



A device for marking contents of a cash register drawer when unauthorized removal of such contents is attempted. An aerosol container of a dye is housed within the cash drawer tray and discharges its contents into a manifold which leads to spray nozzles in the individual compartments of the tray. An actuating lever contacts the nozzle of the aerosol container and is connected to a rod which is biased by a compression spring to move the lever, depressing the nozzle and releasing the spray. A spring clip on the rod normally holds the spring in compressed position preventing release of the spray. The spring clip is connected by a wire to the paper holding finger or fingers of one of the compartments of the cash drawer tray.

Lifting of the paper holding fingers of this compartment releases the spring clip, permitting the spring to move the rod and release the spray material.

3,730,111

**APPARATUS FOR THE IN-PLACE DESTRUCTION OF FILED DOCUMENTS**

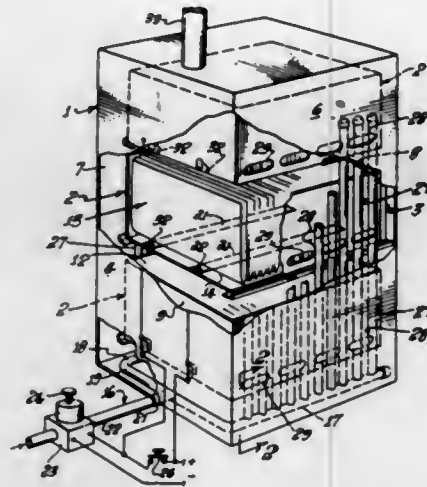
Donald R. Matthews, San Jose, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 15, 1972, Ser. No. 263,052

Int. Cl. E05g 3/00

U.S. Cl. 109—29

6 Claims



An air manifold is mounted in a file cabinet and provided with air-jet orifices arranged to direct air jets onto the bottom edge region of file folders stored in the cabinet. Means, such as a squib-activated oxidizer sheet, also are mounted in the cabinet in position to ignite the bottom edges of the folder. The system as a whole operates as a gravity-feed furnace by injecting the high velocity air jets at the bottom of the burning files and, as the bottom surfaces are consumed, the file contents fall into the region of rapid combustion.

3,730,112

**INCINERATION SYSTEMS AND METHODS**

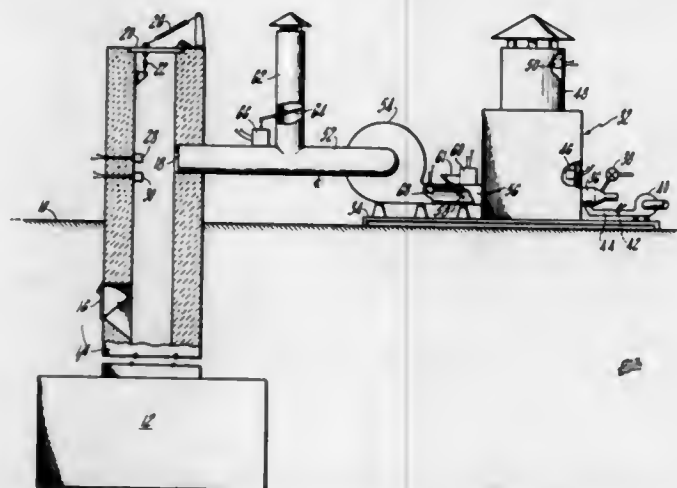
Bruce R. Hutchinson, Bloomfield, Conn.; Bruce H. Hunter, Longmeadow, Mass., and Robert N. Brooks, West Hartford, Conn., assignors to Silent Glan Corporation, Bloomfield, Conn.

Filed March 18, 1971, Ser. No. 125,752

Int. Cl. F23g 5/00

U.S. Cl. 110—8 R

23 Claims



Apparatus and control techniques for coupling afterburner-centrifugal separator devices to existing incinerators. By means of exercising control over incinerator exhaust stack draft and afterburner temperature, complete oxidation and

particulate separation can be achieved in an afterburner unit which may be coupled to an existing incinerator. The invention further encompasses automatic safety features including provision of a bypass for incinerator effluents in the case of any failures in the afterburner system.

3,730,113

**INCINERATOR DRAFT SYSTEM**

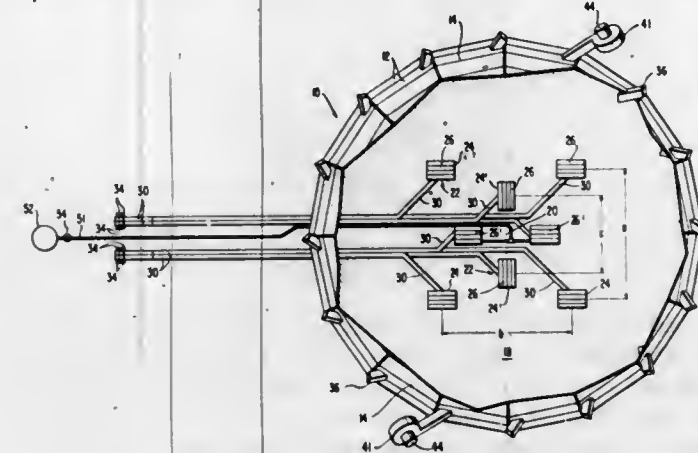
George H. Stearns, Kalspell, Mont., assignor to Rolle's Machineworks, Inc., Kalspell, Mont.

Filed July 2, 1971, Ser. No. 159,257

Int. Cl. F23g 7/00

U.S. Cl. 110.18 R

18 Claims



A draft system for an incinerator having a floor, upstanding walls therefrom, and a fuel feeding means mounted in the upper portion thereof, is presented. The system includes an underfire draft comprising a plurality of mutually spaced, symmetrically arrayed draft boxes mounted below the burner floor and supporting grates at the floor level. Each box is fed by a separately controlled source of forced air which is directed upwardly through the grate. The system also includes an overfire draft comprising a plurality of mutually spaced vents opening through the walls of the incinerator. Each vent is separately controlled and tangentially directed. The overfire system also may include a plurality of mutually spaced, tangentially directed blowers mounted in the walls of the incinerator. The vents and blowers of the overfire draft create a cyclonic circulation within the incinerator to facilitate uniform burning. At least one centrally located draft box may also be connected to a source of flammable gas for ignition of the material to be incinerated.

3,730,114

**CONTROL SYSTEM FOR A WASTE WOOD BURNER**

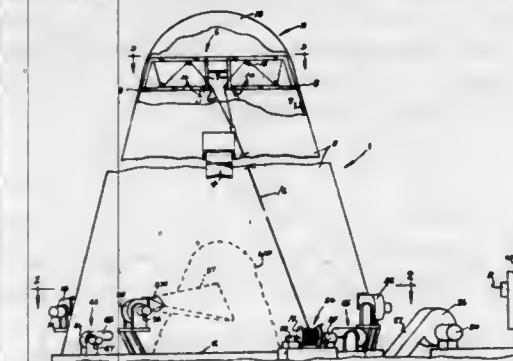
Raymond E. Stone, and Aubrey E. Wing, both of Springfield, Oreg., assignors to Industrial Construction Co., Ltd., Eugene, Oreg.

Filed Feb. 28, 1972, Ser. No. 229,971

Int. Cl. F23g 7/00

U.S. Cl. 110—18 R

8 Claims



A control system for installation on existing waste burners at mill sites for the purpose of reducing emissions from the

wood waste burned. A damper structure includes downwardly swingable doors positioned in response to the burner internal temperature. An under fire duct system supports combustion at the base of the waste pile while over fire blowers feed air about the perimeter of the pile in a cyclonic manner. Igniter units located about the burner shell retain burner temperature above a preset level by intermittent operation. Control means operates the systems components at preset temperatures to insure highly efficient combustion within the burner to reduce smoke and particulate emissions to a level acceptable to regulating authorities.

3,730,115

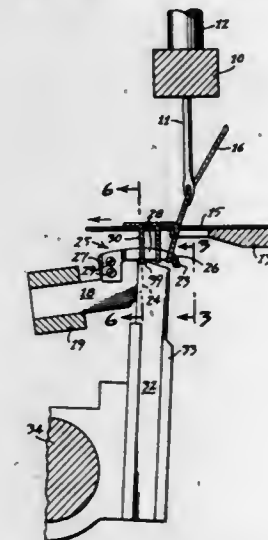
**METHOD AND APPARATUS FOR TUFTING UNIFORM CUT PILE**

William Erby Parsons, and William R. Reese, both of c/o Broad Street Machine Company, Inc. 2014 South Broad Street, Chattanooga, Tenn.

Filed May 20, 1971, Ser. No. 145,195

U.S. Cl. 112—79 R

3 Claims



A tufting looper mechanism including a looper element or hook, a spreader element fixed proximate to the bill of the hook for receiving a tufted loop thereover, in a spread position, and a knife member, and means for reciprocally moving the looper element and knife member so that the knife member moves between the hook and spreader element to cut a spread loop held by the hook and spreader element in substantially the center thereof to form cut pile yarn ends of equal height.

3,730,116

**HOLDER FOR COLLARS AND THE LIKE GARMENT PARTS**

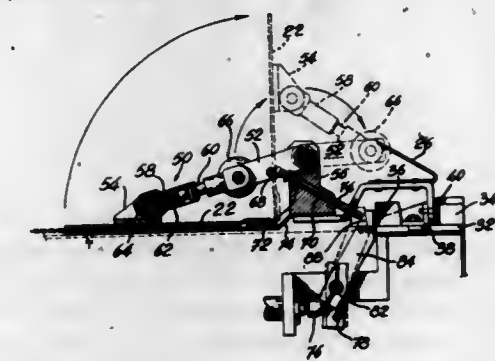
Ernst Schramayr, Dollard des Ormeaux, Quebec, Canada, assignor to Ideal Equipment Co., Ltd., Montreal, Quebec, Canada

Filed June 21, 1971, Ser. No. 154,790

Int. Cl. D05b 21/00

U.S. Cl. 112—121.15

2 Claims



A holder for collars and the like garment parts comprising a base support, a pair of fixed platens secured to the base sup-



port, a movable platen hinged upon each of the fixed platens, and means for operating the movable platens so as to permit holding of a collar between the fixed and movable platens.

3,730,117

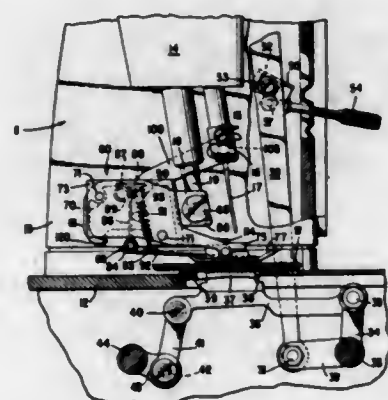
## EVEN FEEDING ATTACHMENT FOR SEWING MACHINES

Herman O. Ritter, Karlsruhe, and Karl Weber, Leopoldshafen, both of Germany, assignors to The Singer Company, New York, N.Y.

Filed March 2, 1972, Ser. No. 231,303  
Int. Cl. D05b 27/04

U.S. Cl. 112-212

4 Claims



An attachment for a sewing machine in which a work feeding foot movable with the work and a stationary presser foot are alternately pressed against the work during sewing. A leaf spring carried in the attachment is attached to the work feeding foot and between successive stitches returns the work feeding foot to a central position from which the work feeding foot may be shifted either forwardly or rearwardly to cooperate with a forward or reverse direction of work feed. The leaf spring as well as the operating mechanism of the attachment is sustained in a molded support block having integral rivet studs which can be deformed after assembly to secure the attachment parts together.

3,730,118

## LINEAR CLINCHING FOR ROUND CANS

Claude Del-Frate, Boulogne, France, assignor to ETS. J. J. Carnaud & Forges De Basse-Indre, Paris, France

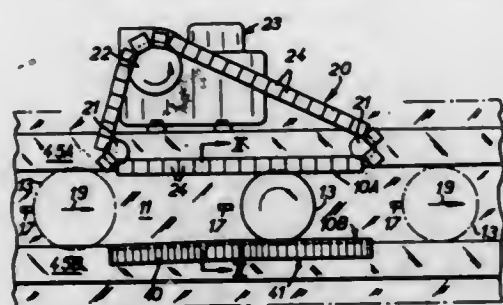
Filed Nov. 3, 1971, Ser. No. 195,259

Claims priority, application France, Nov. 16, 1970, 7040927

Int. Cl. B21d 19/12

U.S. Cl. 113-30

18 Claims



The invention relates to a device which allows continuous crimping of an end onto a can of circular section thereby providing the engagement of the end on the can along its whole periphery. This device comprises, on either side of a moving track which conveys the cans, two elongated guides of which one at least is constituted by a moving section of a chain passed in a loop on at least two pinions of which one is a drive pinion, and at least one of the guides being profiled so as at least to contribute to the desired crimping.

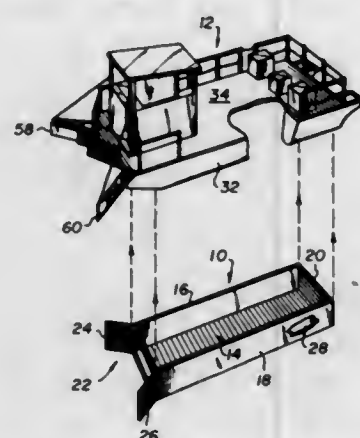
3,730,119  
FLOATING DEBRIS RECOVERY BASKET  
Allan R. Budris, Nutley, and Tadeusz A. Tokarczyk, Mount Arlington, both of N.J., assignors to Worthington Corporation, Harrison, N.J.

Filed Jan. 6, 1971, Ser. No. 104,350

Int. Cl. B63b 35/32

U.S. Cl. 114-5 R

12 Claims



A floating debris recovery basket is disclosed which is particularly useful in combination with a highly maneuverable catamaran type vessel. The basket is removably secured to the vessel and located between the twin hulls thereof. When the container-like basket is filled with debris, the vessel backs away from the basket leaving it floating for subsequent removal. Floatation of the basket is preferably accomplished by filling hollow side walls thereof with buoyant material.

3,730,120

## METHOD AND APPARATUS OF COLLECTING RAINWATER

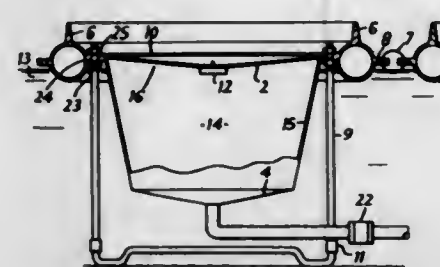
Curzon Dobell, Nassau, Bahamas, assignor to Aquavoir Holding Company S.A., Panama, Panama

Continuation-in-part of Ser. No. 827,191, May 23, 1969, abandoned. This application March 1, 1971, Ser. No. 119,884

Int. Cl. B63b 35/00

U.S. Cl. 114-0.5 R

4 Claims



Use is made of the superficial area occupied by salt water lakes and lagoons for the collection of rain water by employing a floating collecting container, which is enclosed by a deck, on to which rain falls and from which it drains into the collecting container below. The aperture or apertures in the deck is preferably provided with a simple non-return valve to reduce vapor loss and the whole apparatus is preferably composed of thin, flexible plastics sheet.

3,730,121

## ACOUSTIC TORPEDO TEST APPARATUS

Dwight L. Supernaw, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 19, 1963, Ser. No. 259,762

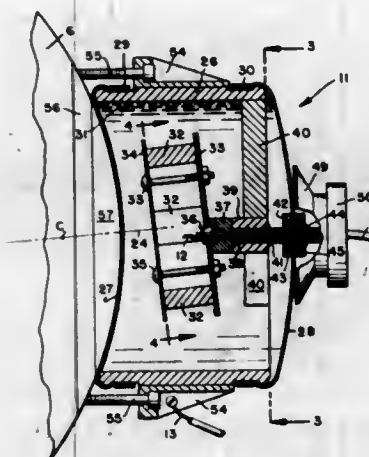
Int. Cl. F42b 19/01, 19/04

U.S. Cl. 114-20

3 Claims

2. An inverse transducer device for use in transmission of acoustic signals to the generally convexly-faced transducer of

an acoustic-homing torpedo, under test, in a manner simulating underwater target signals, said device comprising: a hermetic housing having two opposite ends thereof formed as normally planar flexible diaphragms, one said diaphragm serving as the face of said device, said housing being filled with liquid,



whereby said device is adapted to accommodate intimate face-to-face contact with said torpedo transducer, an array of electro-acoustic transducer elements supported within said housing with the acoustic axis of said array extending through said face, and said diaphragms and liquid having acoustic transmission characteristics substantially duplicating that of seawater.

3,730,122

## SALVAGE PONTOON

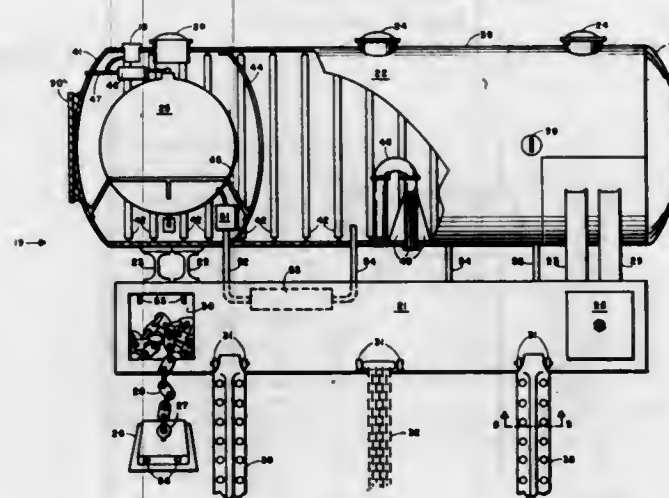
William T. Odum, Panama City; James H. Elkins, Lynn Haven, and Thomas M. Coggins, Panama City, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy

Filed May 5, 1971, Ser. No. 140,438

Int. Cl. B63c 7/08

U.S. Cl. 114-53

9 Claims



A salvage pontoon characterized by flat suction coupling plates, object attaching arms having explosive driven studs, and a cryogenic gas supply is disclosed. A ballast arrangement is disclosed to permit raising of the object and attached pontoon in controlled increments.

3,730,123

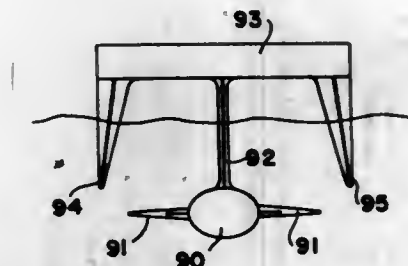
## HIGH SPEED SHIP WITH SUBMERGED HULL

Thomas G. Lang, 5354 Calle Vista, San Diego, Calif.  
Division of Ser. No. 20,204, March 17, 1970. This application Nov. 18, 1971, Ser. No. 200,252

Int. Cl. B63b 1/16

U.S. Cl. 114-66.5 H

12 Claims



A high speed ship is formed of at least one elongate hull section submerged completely beneath the water's surface of supporting a platform above the surface waves by a plurality of struts dependent from the platform to provide support and stabilization by reason of their configuration and location. High speed dynamic pitch stability is ensured by including a stabilizer member on the aft portion of the submerged hull having a horizontally oriented control surface sufficiently sized to locate the greatest composite, vertical pressure surface substantially aft of the ship's centroid. Controlling the angle of the stabilizer member in accordance with changing wave conditions and speed provides a highly stable cargo transport capability as well as a superior weapons platform.

3,730,124

## METHOD OF ADAPTING ROLLER WINGS TO OTHER SAILING CONFIGURATIONS

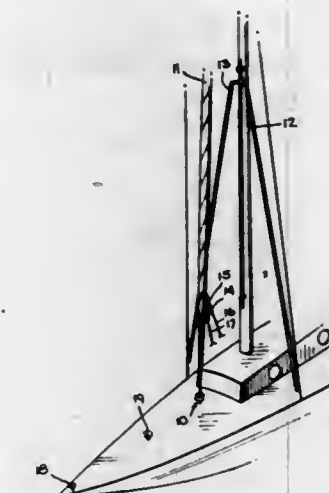
Wright Britton, New York, N.Y., assignor to Britton Yacht Systems, Inc., New York, N.Y.

Filed Nov. 2, 1971, Ser. No. 194,848

Int. Cl. B63h 9/04

U.S. Cl. 114-106

6 Claims



The method of converting sails called Roller Wings, which are mounted on a wire and attached to a furling gear and used when the only wind available is dead astern, into different sailing configurations suitable for other types of winds, by moving the furling gear to a preselected point, altering the alignment of the wings to meet the desired configuration and unfurling the wings in such a way as to achieve the new configuration.



3,730,125

**HYDRAULIC BACKSTAY TENSIONER**

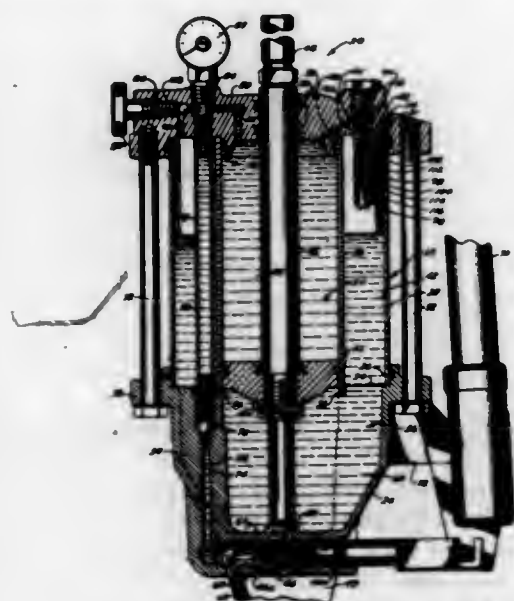
Rudolph E. Krueger, 1201 Dolphin Terrace, Corona Del Mar, Calif.

Filed May 13, 1971, Ser. No. 143,127

Int. Cl. B63h 9/04

U.S. Cl. 114-109

9 Claims



A self-contained tension adjusting device for adjusting the tension in the backstay of a sailboat includes a single housing for a pump, a hydraulic cylinder with a movable piston coupled to the backstay, and a reservoir containing hydraulic fluid. Operation of the pump forces hydraulic fluid from the reservoir to the cylinder to move the piston and adjust tension in the backstay. A bleed valve in the housing is operated to relieve tension in the backstay, and a relief valve in the housing limits the maximum tension in the backstay.

3,730,126

**METHOD AND MEANS FOR DYNAMICALLY STATIONING A FLOATING VESSEL**

Henricus J. Zunderdorp, and Augustinus J. Berkhout, both of Rijswijk, Netherlands, assignors to Shell Oil Company, New York, N.Y.

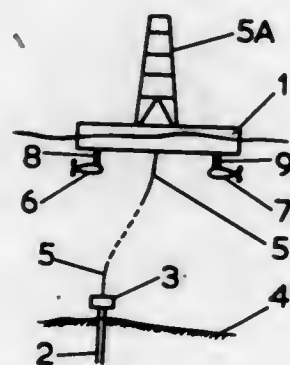
Filed July 9, 1971, Ser. No. 161,147

Claims priority, application Great Britain, Dec. 21, 1970, 60,590/70

Int. Cl. B63h 25/04

U.S. Cl. 114-144 B

11 Claims



A seagoing vessel such as an offshore oil rig is dynamically stationed by measuring the actual position of the vessel with reference to a desired position, filtering the deviation or error signal to remove higher frequency components due to wave action, and using the resultant signal to control multidirectional drive means.

3,730,127

**PROPELLER THROTTLING DEVICE FOR BOATS**

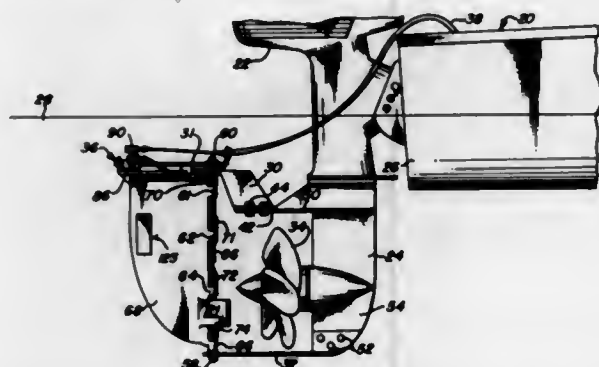
Charles A. Pedersen, Phoenix, Ariz., assignor to Rothmans of Pall Mall Canada Limited, Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 816,590, April 16, 1969, Pat. No. 3,581,699. This application May 13, 1971, Ser. No. 143,110

Int. Cl. B63h 25/48

U.S. Cl. 114-145 A

3 Claims



A propeller throttling device for boats, wherein a pair of pivoted vanes are disposed rearwardly of a propeller in the water, such that the vanes may be in a position to follow the propeller and may be parallel therewith or at substantially right angles thereto, so that a powerful propeller may be throttled in a manner to permit trolling operation of a boat at low speed; said vanes being pivoted by rectilinearly operated cross head and linkage structure controlled remotely by flexible shaft and lever mechanism located in the hull of a boat; said propeller throttling device being particularly adapted for use in connection with powerful outboard motors. In order to maintain optimum performance at high speeds, the throttling device is provided with means to permit limited degrees of pivoting motion to more accurately follow the wake during turns. Additionally, a trim tab and/or a small trim plate is provided on one of the pivoted vanes in order to counteract the effects of the propeller-created pressure spiral impinging on the vane at high speed which otherwise adversely affects the steering of the watercraft.

3,730,128

**BARGE COVER**

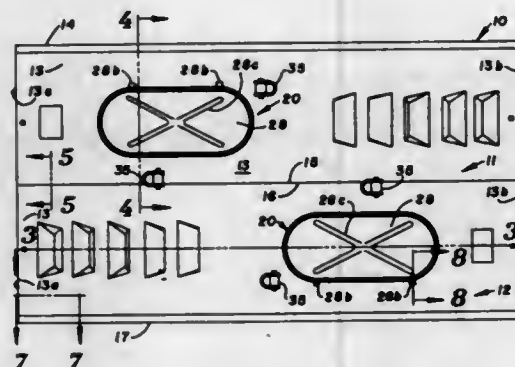
Rodney P. Burwell, Edina, Minn., assignor to Northwestern National Bank of Minneapolis, Minneapolis, Minn.

Filed Dec. 3, 1970, Ser. No. 94,857

Int. Cl. B63b 19/12

U.S. Cl. 114-201

1 Claim



A cover for barges and the like which is formed of a relatively light weight material and is in a semi-rigid form and gains the necessary rigidity from the positioning thereof on the barge combings. The cover is formed in and from mating sections which sections interlock to form a single section. The covers are arcuate in shape to increase the capacity of the barge and door openings and lifting members are formed integrally into the covers.

3,730,129

**EXTRUDED CAM CLEAT**

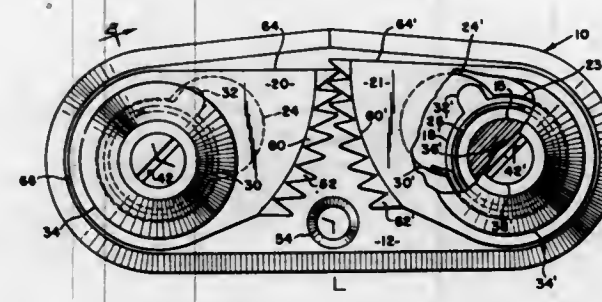
Jack A. Helms, Columbia, S.C., assignor to Seahorse Spars and Equipment, Ltd., Suffolk, England

Filed Jan. 25, 1971, Ser. No. 109,143

Int. Cl. B63b 21/04

U.S. Cl. 114-218

7 Claims



A cam cleat for releasably holding a rope line or the like against axial slippage comprised of a base plate having pivotally mounted thereon a pair of opposing cam jaws cut from extruded metal or plastic stock having an arcuate cam surface upon which is formed a plurality of wedge-shaped, rope-engaging teeth, the projecting edges of which are rounded upon a uniform and relatively small radius. An axial chamber within each jaw concentrically receives a base plate spindle and an offset chamber provides a detent for both a biasing spring and a pivot-limiting stop. Configuration of the jaw teeth is such that the rear face of each tooth is substantially perpendicular to the arcuate cam surface and a plurality of teeth on each jaw will simultaneously engage a line inserted between opposing cam surfaces. Insertion of the line is facilitated by a chamfer through the upper end of each tooth.

3,730,130

**STEERING ASSEMBLY**

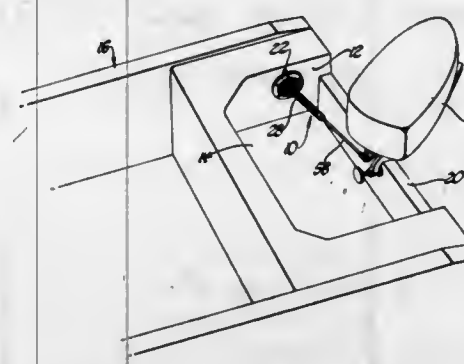
Hans Wiegand, Boyertown, Pa., assignor to Teleflex, Inc., North Wales, Pa.

Filed Feb. 19, 1971, Ser. No. 116,849

Int. Cl. B63b 21/26

U.S. Cl. 115-18 R

17 Claims



A steering assembly for securement to the wall of a boat to move the propulsion unit thereof for steering the boat. The assembly includes a two-part housing defining concave spherical surfaces. A ball having a convexly curved spherical surface extending between opposite faces is disposed in the pocket defined by the housing for swivel movement. A threaded bore extends through the ball and an elongated threaded tube extends through the bore and threadedly engages the ball. The ball has holes in one face thereof for receiving an instrument whereby the ball may be rotated to adjust the longitudinal position of the tube. A control rod is slidably supported within the tube and extends from one end thereof for attachment to the propulsion unit of the boat. The housing is circular and has holes about the periphery thereof whereby bolts extend through the holes to secure the housing to the wall of a boat.

3,730,131

**TENNIS SCORE COMPUTER**

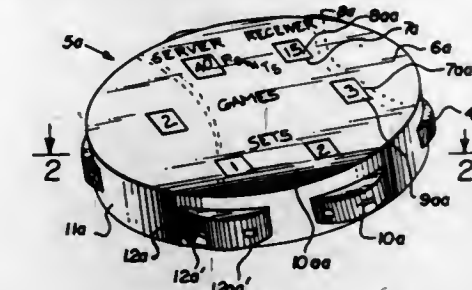
Charles P. Izzo, 72 Main Street, Ridgefield, Conn.

Filed Aug. 29, 1972, Ser. No. 284,587

Int. Cl. A63b 71/06

U.S. Cl. 116-120

7 Claims



A tennis scoring portable computer manually operated by the person holding the computer, the computer including three sets of paired wheels, the handle portion of each wheel being exposed for manual manipulation such that the wheel is rotatable manually, and an indicia carrying portion of each wheel being exposable through a window for each wheel disclosing tennis-scoring indicia, the particular indicia being viewable through the window being dependent upon the position to which the wheel is turned by manual adjustment of the handle portion, one set of wheels being paired separate wheels for indicating the respective scores of opposing players for the points of a single game, the several points listed on each wheel of the points set being love, 15, 30, 40, deuce, add, and game, a second set of paired wheels one for each of opposing players includes separate positions on each wheel for scores ranging from the number one through the number seven, and the third set of wheels each having numbers corresponding to sets for each of three different positions numbered one, two, and three, the face of the computer between opposing ones of each pair identifying each of the three sets of pairs as points, games, and sets, and a first column of one of each set being identified as one tennis player and a second column of the remaining one of each pair of the three sets being identified as the other tennis player.

3,730,132

**CONTROL AND INDICATOR MECHANISM**

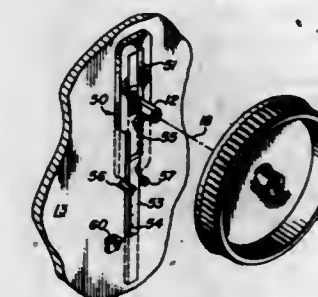
Carlton E. Brown, Tucson, Ariz., and Raymond I. Armstrong, Birmingham, Mich., assignors to Lear Siegler, Inc., Krueger Division, Tucson, Ariz.

Filed March 18, 1971, Ser. No. 125,606

Int. Cl. G09f 9/00

U.S. Cl. 116-133

3 Claims



A manually rotatable knob is mounted adjacent a stationary surface for rotation with a shaft passing through a stationary panel; the knob includes a rear surface having a spiral groove therein. An indicator is pivotally secured to the panel and is positioned between the panel and the knob and includes a follower engaging the spiral grooves of the knob. The indicator also includes an arcuate opening through which the rotatable shaft passes, together with a depending pointer extending radially from the pivot point of the indicator; rotary motion of the knob results in pivotal motion of the pointer by means of the follower traveling in the grooves of the knob.



3,730,133

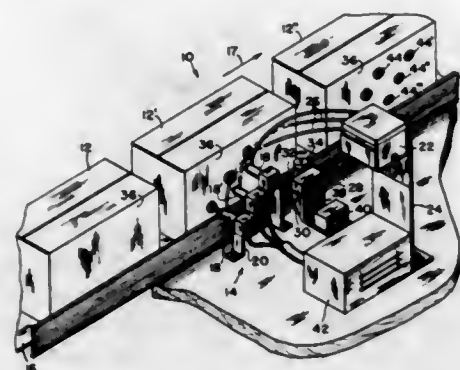
**APPARATUS FOR REMOTE MARKING OF ARTICLES OF MANUFACTURE**

Sebastiano M. Cordiano, Manville, N.J., and Paul Halpin, New York, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed March 5, 1970, Ser. No. 16,712  
Int. Cl. B05c 5/00, 11/10

U.S. Cl. 118—2

1 Claim



An apparatus for remote marking of articles of manufacture are described. A gun capable of ejecting cohesive liquid pulses onto article surfaces is shown. A marking liquid is supplied to the gun at a predetermined low pressure and momentarily allowed to pass into an orifice of selected length and diameter to form a traveling slug of liquid. The traveling slug of liquid rapidly advances along the orifice and attains a momentum sufficient to carry it across a gap, in the form of a cohesive liquid pulse, onto an article to be marked. The liquid pulse is free from atomization and retains its cohesiveness until it impacts on the surface of the article where the liquid pulse is flattened without splatter into a sharply defined generally round mark. Photoluminescent components may be employed in the marking liquid to provide automatic detection capability of the marked articles. Rapid successive firing of the gun enables the generation of patterns of marks for article serial number identification and the like.

3,730,134

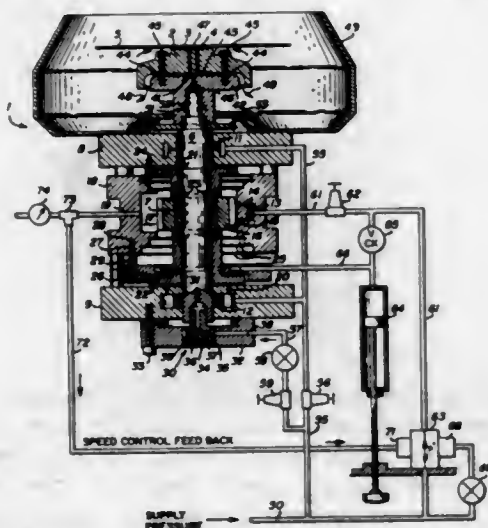
**PNEUMATIC WAFER SPINNER AND CONTROL FOR SAME**

Frank G. Kadi, 282 Walker Drive, Mountain View, Calif.  
Filed Dec. 17, 1970, Ser. No. 99,149

Int. Cl. B05c 11/10

U.S. Cl. 118—6

8 Claims U.S. Cl. 118—78



A pneumatic wafer spinner and pneumatic control for same are disclosed. The pneumatic wafer spinner includes a vacuum chuck affixed to a spindle with the vacuum supplied to the chuck from a venturi disposed in the spindle and supplied with

a flow of fluid, such as gas, under pressure. The chuck is rotated by means of a pneumatic turbine. Pneumatic bearings provide support for the spindle. Exhaust back pressure on the turbine is sensed and fed to a pilot valve for controlling the speed of the spindle and chuck. A pneumatic accumulator timer is employed for operating a pneumatic clutch for selectively braking rotation of the chuck and spindle after an elapsed time determined by the accumulator.

3,730,135

**EXTRUDING CIRCULAR LAYERS**

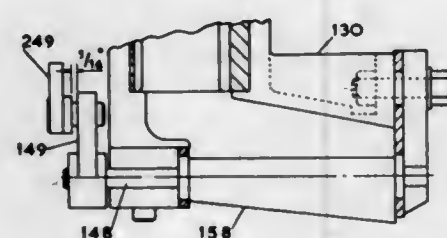
John Handley, Isleworth, England, assignor to United Biscuits Limited, Isleworth, Middlesex, England

Filed July 20, 1970, Ser. No. 56,422

Int. Cl. B05c 5/00

U.S. Cl. 118—16

2 Claims



A cake making machine slices the cake into layers, separates the layers, extrudes a filling onto the lower layer and replaces the upper layer. The extruder is a head which rotates about an axis which is normal to the demarcation plane between the layers. Its orifice is a slot extending outwardly from the axis of rotation of the extrusion head. The width of the slot varies along its length so that the thickness of the layer, extruded through the slot during the rotation of the head, is constant.

3,730,136

**CONSUMABLE ELECTRODE ARC WELDING MACHINE**

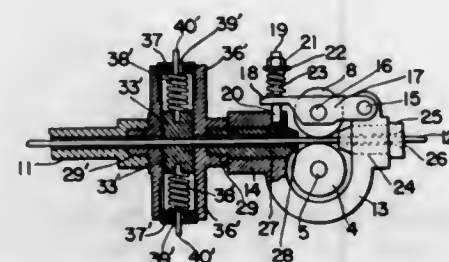
Toshihiko Okada, Osaka-fu, Japan, assignor to Osaka Transformer Co., Ltd., Osaka-shi, Osaka-fu, Japan

Filed Sept. 16, 1970, Ser. No. 72,598

Claims priority, application Japan, Sept. 16, 1969, 44/72741

Int. Cl. B05c 11/00

11 Claims



A electrode wire feeding device adapted for use in a consumable electrode arc welding machine, wherein the wire feeding device is provided with a lubricant feeder for effecting a smooth movement of such wire in a length of hollow guide tubing connecting between said feeding device and a suitable welding torch. In the lubricant feeder, a solid lubricant is employed which can be finely pulverized under friction in contact with the moving wire, whereby the frictional resistance between the wire and the hollow guide tubing can be substantially reduced.

3,730,137

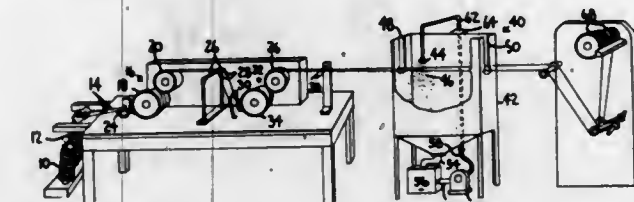
**APPARATUS FOR COATING AND IMPREGNATING TEXTURIZED YARN**

Paul Luscher, 1102 West Elm Street; Ben A. Hudson, 1102 Mark Drive, both of Shelby, N.C., and Billie W. Childers, Route 1, Box 38C, Forest City, N.C.

Division of Ser. No. 872,056, Oct. 29, 1969, Pat. No. 3,672,947. This application Aug. 2, 1971, Ser. No. 168,445  
Int. Cl. B44d 1/08; D02g 3/36

U.S. Cl. 118—325

2 Claims



An apparatus for producing a texturized, binder-containing yarn produced by applying binder material to a texturized yarn through a jet spray nozzle.

3,730,138

**THREE DIMENSIONAL AQUARIUM BACKGROUND**

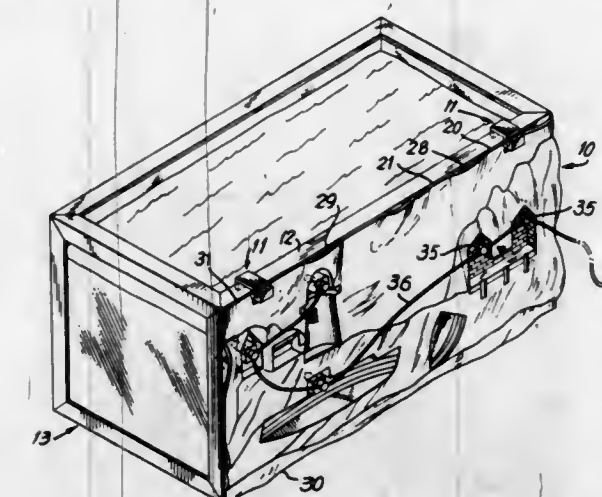
Bernard Suchowski, New York, N.Y., assignor to Sternco Industries, Inc., Harrison, N.J.

Filed Aug. 25, 1971, Ser. No. 174,782

Int. Cl. A01k 63/00

U.S. Cl. 119—5

10 Claims



A background of relief configuration suspended from the top edge of an aquarium behind its rear glass panel. The background is formed of relatively stiff material with high portions held in engagement with the outer surface of said panel, and depressed portions forming cavities, peripheral portions of the background being spaced from said panel and communicating with said cavities to provide ventilation, some depressed portions supporting electric light sockets with bulbs disposed within said cavities to illuminate the walls thereof.

3,730,139

**CONVERTIBLE BIRD HOUSE & FEEDER**

Harrington Moore, Hidden Harbor, Stuart, Fla.

Filed Feb. 9, 1972, Ser. No. 224,688

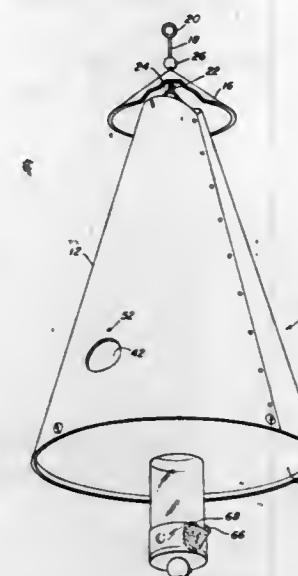
Int. Cl. A01k 31/00

U.S. Cl. 119—23

8 Claims

A conical shaped housing is provided with an internal partition dividing the housing into two chambers and formed with a central opening at its lower portion. A telescopic feeding tube is mounted to the base of the housing and in its lowered position serves as a perch and feeding station for birds when the housing is filled with seeds. The unit is converted into a bird house by emptying it of bird seed, pushing the feeding tube up-

wardly to close the partition opening and then removing cover plates from access openings formed in the sides of the housing.



A movable lid is provided at the apex of the housing to permit feed to be poured into the housing and cooperates with a cut-away portion of the housing to vent the interior of the unit.

3,730,140

**SLAT FLOOR ASSEMBLY**

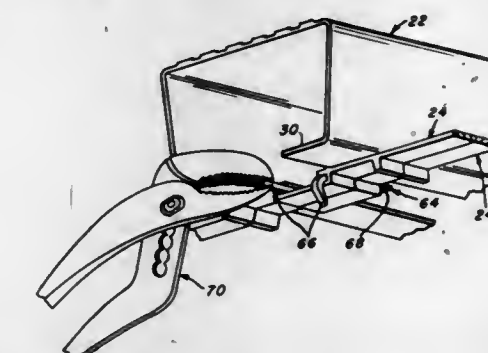
John O. Bowser, Natrona Heights, and Nicholas I. Moga, Pittsburgh, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sept. 1, 1971, Ser. No. 177,135

Int. Cl. A01k 1/00

U.S. Cl. 119—28

6 Claims



A floor assembly is provided which is formed from a plurality of downwardly-open channel members arranged in parallel spaced relation and interconnected by means of pairs of adjacent connecting straps which are moved into position from opposite directions transverse to the longitudinal axes of the channels whereby attachment ears on the straps engage over edge flanges on the channel members. The connecting straps may have aligned keyways in them for receiving locking keys which lock the straps and the channel members together to form a rigid floor assembly.

3,730,141

**PET FEEDER**

Jim L. Manning, Seaside, and Richard D. Manning, San Jose, both of Calif., assignors to John M. Klein, Winter Park, Fla., part interest

Continuation-in-part of Ser. No. 106,697, Jan. 15, 1971, abandoned. This application March 30, 1972, Ser. No. 239,472

Int. Cl. A01k 5/00, 7/00

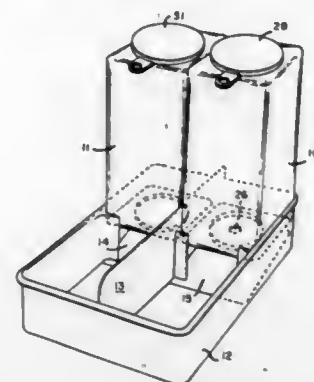
U.S. Cl. 119—51.5

2 Claims

A unitary portable pet feeder which has two storage removable containers, one of which holds a predetermined quantity of water and the other of which holds a supply of dry



pet food. The water and dry food containers feed water and dry food automatically into compartments of a tray to which



they are attached. The forward parts of the tray are open so as to be accessible to the pet. This feeder may be easily disassembled for periodic cleaning.

3,730,142

**FISH SELF-FEEDER**

James W. Kahrs, and Paul E. Osborn, both of Osage Beach, Mo., assignors to Mor-Fish-Ent, Inc., Osage Beach, Mo.

Filed April 20, 1971, Ser. No. 135,589

Int. Cl. A01k 5/02, 64/00

U.S. Cl. 119—54

8 Claims



A fish self-feeder is mounted over a body of water containing fish and has a particulate feed containing hopper consisting of a tapered receptacle containing a funnel having the spout directed through an opening in the bottom of the container. A pendulum rod hangs vertically from the center of the spout by means of a suspension pin hooked into opposed openings in the spout. A feeder plate is adjustably positioned vertically on the rod forming a spaced obstruction for feed particles falling through the spout. The lower end of the pendulum terminates in a submerged bumper head which, when disturbed by the fish, causes a relative motion between the feeder plate and funnel spout, thereby producing a partial discharge of feed into the water.

3,730,143

**HALTER FOR PIGS**

Gordon Alfred Knight, Fairwinds, Drakes Broughton, and Raymond Sheasby, Walcot Farm, Drakes Broughton, both of Pershore, England

Filed March 5, 1971, Ser. No. 121,338

Claims priority, application Great Britain, March 20, 1970, 13,662/70

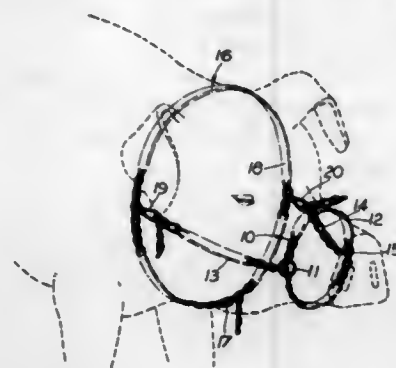
Int. Cl. A01k 25/00

U.S. Cl. 119—130

2 Claims

A halter to be worn by pigs, particularly weaning sows, to restrict or prevent fighting and aggressive biting while allow-

ing the animal to move freely and eat and drink includes a noose which can be selectively adjusted in girth when placed round the muzzle of the pig to limit opening of its jaws.



Preferably the noose is formed with a slip ring. The halter further includes a collar for the pig's neck to which the noose is secured.

3,730,144

**HOT WATER TANK**

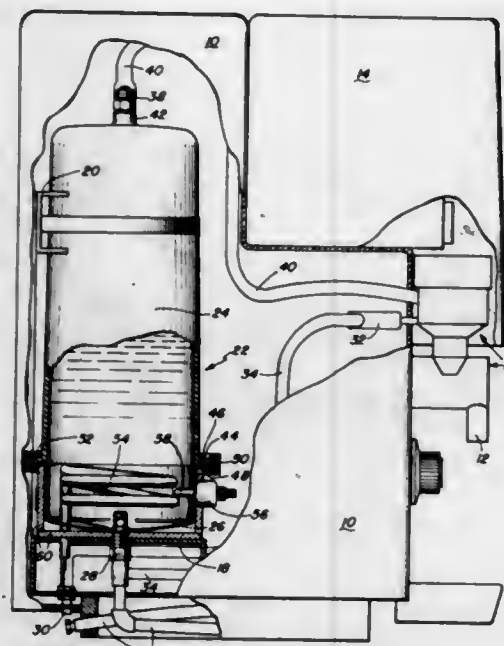
William A. Arzberger, Medfield, Mass., assignor to Jet Spray Cooler, Inc., Waltham, Mass.

Filed Feb. 17, 1972, Ser. No. 227,495

Int. Cl. F22b 5/00

U.S. Cl. 122—13 A

6 Claims



A hot beverage dispenser is provided with an improved tank for storing water and for maintaining the water at the proper hot temperature. The tank is formed in a pair of separable components including a metallic bottom section and a transparent upper plastic section. An internal heating element is disposed within the bottom section together with an adjacent thermostatic control. The bottom metal tank section is insulated.

3,730,145

**ROTARY ENGINE**

Harold H. Bennetto, 10805 Trent Way, La Mesa, Calif.

Filed April 19, 1971, Ser. No. 134,963

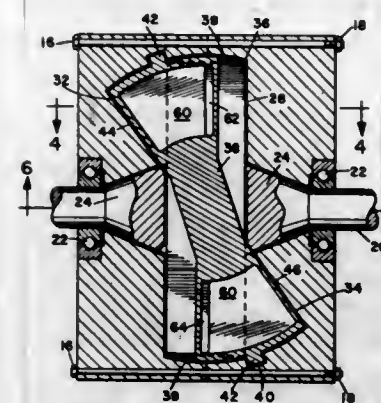
Int. Cl. F02b 53/00

U.S. Cl. 123—8.41

9 Claims

A rotary engine having a flywheel-like rotor rotating in a cylindrical chamber in a casing, the rotor having a diametrical slot in which is mounted a vane acting as a piston element. The vane moves with a rocking motion in a cylindrical chamber

inclined to and extending on opposite sides of the rotor chamber, the vane chamber having an inlet and outlet, and ignition means positioned so that intake and compression action



is taking place on one side of the rotor, while power and exhaust action is taking place on the other side. The engine is adaptable to a variety of fuels and may be ganged in multiple units.

3,730,146

**PRESSURE-INDUCTANCE TRANSDUCER**

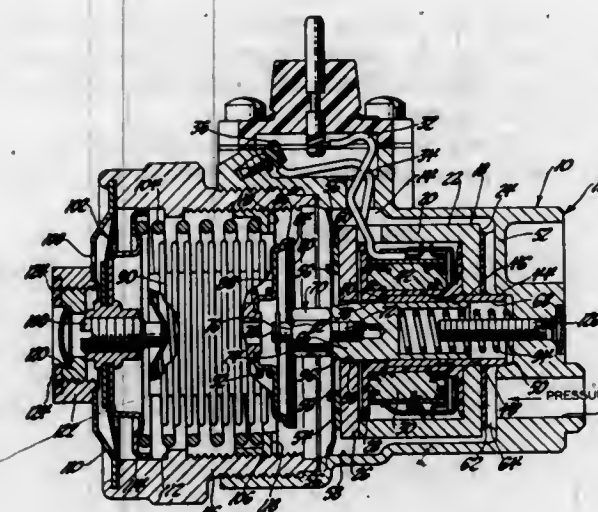
John W. Moulds, Penfield, and Edwin C. Storey, Rochester, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 29, 1971, Ser. No. 202,760

Int. Cl. F02m 51/00

U.S. Cl. 123—32 EA

6 Claims



In an electronic fuel injection system, a transducer for converting a variable pressure signal to a variable inductive signal has a coil wound on a plastic spool and surrounded by a ferrite cup and cap. A nickel plated steel sleeve snaps into the spool and supports a Teflon coated steel plunger which is tapered to provide a variable air gap with the ferrite cap. This assembly is resiliently supported in a housing and is operated through a bimetallic disc from an evacuated bellows responsive to the absolute pressure in the engine air induction passage. The bellows is positioned by a diaphragm which also is responsive to induction passage pressure to provide power enrichment. Adjustments are provided for the idle, power cut-in, and wide open throttle points and for initial calibration of the transducer.

3,730,147

**ENGINE ACCESSORY ARRANGEMENT**

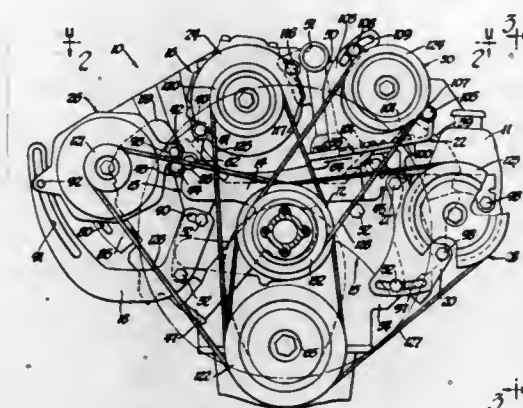
Robert M. Buchwald, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 29, 1971, Ser. No. 193,652

Int. Cl. F01p 5/10

U.S. Cl. 123—41.44

16 Claims



The illustrated unitized engine accessory drive arrangement includes an integral water pump body and water cross-over casting and one main selectively formed mounting bracket, the integral casting and the main bracket being cooperable with three smaller brackets to accommodate all of the conventional engine accessory units, as well as the various respective models available. Such an arrangement requires a total inventory of a substantially smaller number of brackets, belts, and related parts than is the case for current engines and their varied selection of accessory models. An alternate embodiment utilizes the above-described four mounting brackets in conjunction with a two-piece water pump body and integral water cross-over and timing belt or chain cover casting.

3,730,148

**ROTATING INTERNAL COMBUSTION ENGINE**

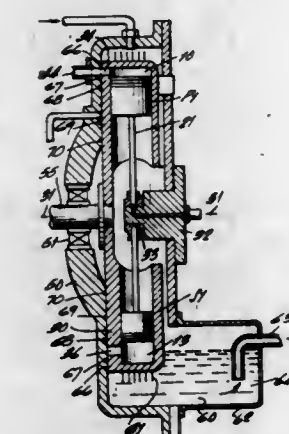
James M. Bagby, Wheaton, Ill., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Oct. 27, 1971, Ser. No. 193,104

Int. Cl. F02b 57/04

U.S. Cl. 123—43 R

5 Claims



A rotating internal combustion engine, in which each power cylinder and piston is paired with a slave cylinder and piston, said slave piston and cylinder furnishing compressed air to scavenge the power cylinder of exhaust gases and to increase the amount of air in the power cylinders for purpose of super charging said power cylinders.



3,730,149

**DRAIN RETURN FOR ENGINE**

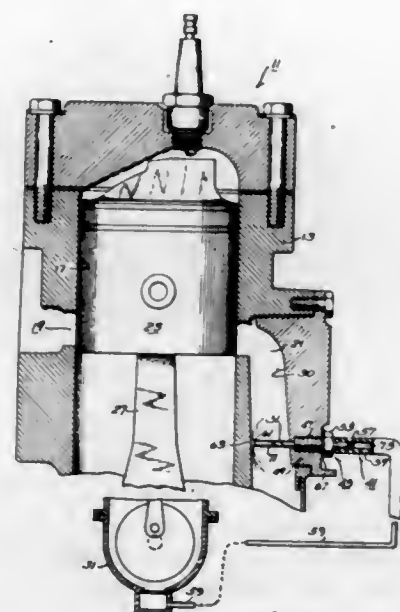
Peter W. Brown, Zion, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jan. 21, 1971, Ser. No. 108,265

Int. Cl. F02b 33/04

U.S. Cl. 123-73 R

7 Claims



Disclosed herein is a two-stroke internal combustion engine with a drain return system comprising a drain return line which is supported by wall means defining a fuel supply passage and which extends from a crankcase and includes an end part terminating in adjacently spaced opposing relation to one portion of the wall means, whereby drains exiting from the drain return line splash against the wall portion and are broken into droplets for delivery to the engine cylinder.

3,730,150

**METHOD AND APPARATUS FOR CONTROL OF VALVE OPERATION**

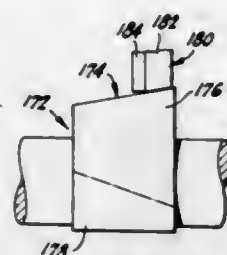
Stephen J. Codner, Jr., 4976 Derby Place, Newark, Calif.

Filed Oct. 20, 1971, Ser. No. 190,919

Int. Cl. F01I 1/34, 11/00

U.S. Cl. 123-90.18

1 Claim



An internal combustion engine with means to selectively control valve operation to achieve improved operating efficiency resulting in decreased exhaust pollution, added power and faster acceleration, easier start-up, and smoother idle. The amount of valve lift duration and overlap between the exhaust and intake valves is controlled in one embodiment by means of selectively axially shifting a camshaft formed with lobes contoured with ramp surfaces which vary in axial extent. Shifting of the cam carries the lobes into operating relationship with their associated valve operating means so that in one position a predetermined lobe ramp contour produces a relatively short overlap period for optimum engine operation at start-up, idling and low speed conditions, and at progressively axial spaced camshaft positions varied lobe ramp contours are moved into operating relationship with the cam followers to cause an increase in valve overlap for optimum operation at high speed engine conditions.

3,730,151

**TEMPERATURE-RESPONSIVE CLUTCH**

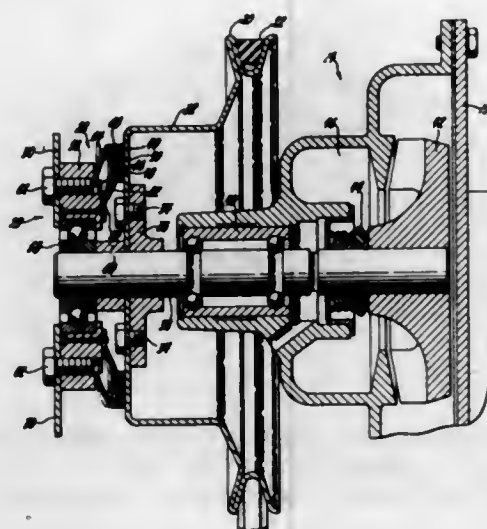
Claude A. Smith, Sandusky, and Donald L. Williams, Port Clinton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed April 19, 1971, Ser. No. 135,186

Int. Cl. F01p 7/02; F16d 11/00

U.S. Cl. 123-41.12

3 Claims



A temperature-responsive clutch including sets of two cooperating leaf springs, one set of which is steel and the other of which is nickel-titanide, or NiTi, to effectively engage and disengage clutch faces above and below a predetermined temperature. The characteristics of NiTi are utilized in the structure such that the steel leaf springs provide the disengaging force, while the NiTi leaf springs provide the engaging force, each successfully overcoming the other as required, in response to temperature changes.

3,730,152

**ROTARY INTERNAL COMBUSTION ENGINES**

Philip Conrad Vincent, 7 Kew Bridge Court W.4., London, and George Amos Hinton, Stockwell Croft, Cleeve Hill, Cheltenham, both of England

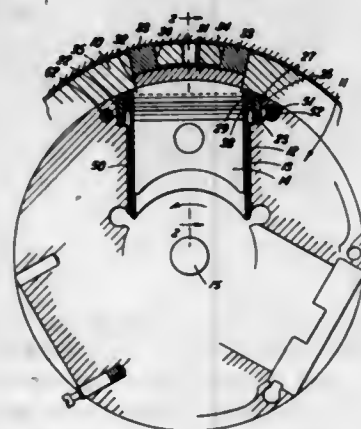
Filed Feb. 19, 1971, Ser. No. 116,955

Claims priority, application Great Britain, Feb. 19, 1970, 8,078/70

Int. Cl. F02b 57/00

U.S. Cl. 123-44 R

18 Claims



The disclosure relates to rotary internal combustion engines in which a cylinder assembly having radial cylinders rotates within an annular ported structure having inlet and outlet ports. A sealing member encircles the outer end of each cylinder and is mounted on the assembly for movement towards and away from the ported structure and means are provided for maintaining sealing members at a minimum distance away from the ported structure.

3,730,153

**CARBURETOR THROTTLE VALVE POSITIONER**

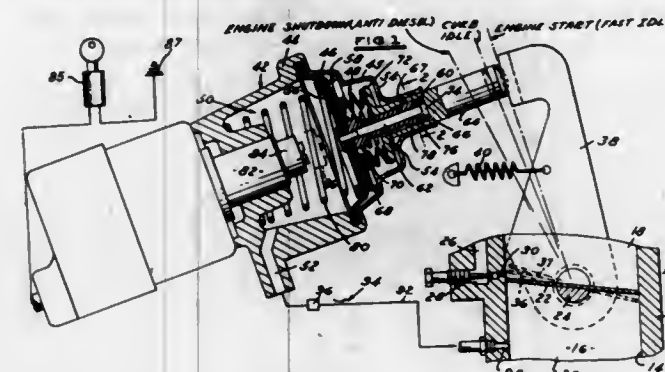
Robert S. Harrison, Detroit, and Harold E. Marcum, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed July 6, 1971, Ser. No. 159,892

Int. Cl. F02d 11/08; F02b 77/08; F02m 3/02

U.S. Cl. 123-103 R

6 Claims



A downdraft type carburetor has an idle system discharge port that is straddled by the normal idle speed and closed throttle positions of the throttle valve so as to permit idle speed fuel and air flow in one position and no flow in the other position; a third beyond normal idle, or fast idle speed position is provided for engine startup; the three positions are controlled by a servo operatively engaging the throttle valve; the servo operation is controlled by intake manifold vacuum to initially close the throttle valve upon engine shut off, with a subsequent return of the throttle valve to its fast idle position for engine restarting, or to return the throttle valve to a normal idle position upon release of the vehicle accelerator pedal during engine operation.

3,730,154

**ENGINE SPARK TIMING CONTROL**

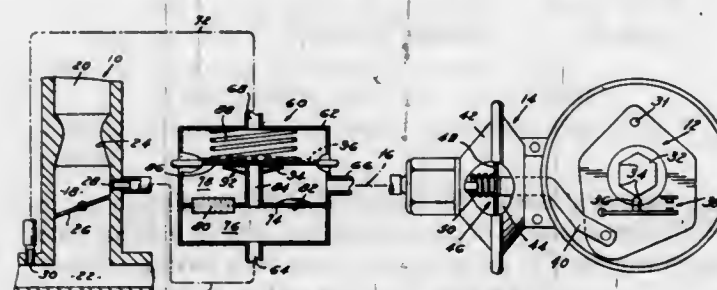
Richard D. Vartanian, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 2, 1972, Ser. No. 222,886

Int. Cl. F02p 5/06

U.S. Cl. 123-117 A

14 Claims



The ignition timing includes a distributor having a vacuum controlled servo actuator to advance the timing as a function of changes in carburetor spark port vacuum, the servo normally spring biasing the distributor towards a minimum advanced or retarded timing position; the vacuum line from the spark port including a device that is operative (1) during light vehicle accelerations to delay the spark advance by delaying vacuum application to the servo, (2) during heavy accelerations to immediately retard the ignition timing by transferring the higher spark port pressure signal directly to the servo; (3) to provide an immediate retarded ignition timing during vehicle decelerations by directly communicating spark port pressure level to the servo; (4) to provide immediate return of the timing to an advance setting after momentary decelerations by again directly connecting the spark port pressure level to the servo; and, (5) to provide normal spark advance during cold

3,730,155

**FUEL INJECTION APPARATUS FOR SPARK PLUG-IGNITED INTERNAL COMBUSTION ENGINES**

Heinrich Knapp, 725 Leonberg-silberberg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

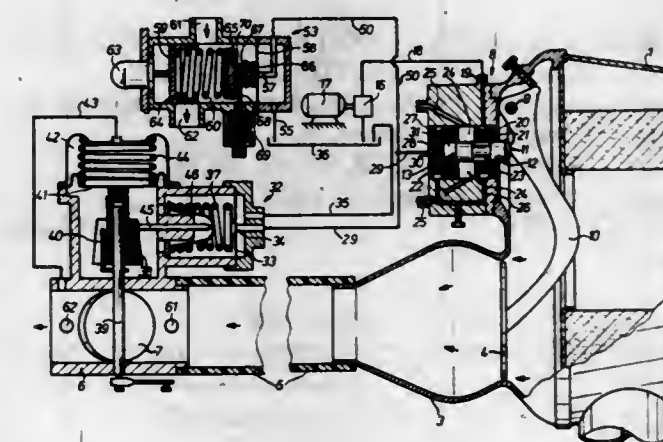
Filed Dec. 28, 1971, Ser. No. 212,955

Claims priority, application Germany, Jan. 11, 1971, P 21 00 935.8

Int. Cl. F02m 69/00

U.S. Cl. 123-119 R

5 Claims



In a fuel injection apparatus the air-fuel ratio is controlled by an air sensor which is deflected against a return force by the intake air and which, as a function of the extent of its deflection, controls the output of a fuel metering valve. To ensure a leaner fuel mixture subsequent to a cold engine start, there is provided a first temperature-dependent control element which is responsive to the water coolant temperature and, upon the increase of the latter, causes an increase in the bias of a spring augmenting, in turn, said return force to bring about a leaner fuel mixture and a second temperature-dependent control element which is responsive to a separate heater means and which, for a very short period subsequent to the starting of the cold engine, hinders said first temperature-dependent control element to increase said bias.

3,730,156

**EXHAUST GAS RECYCLING**

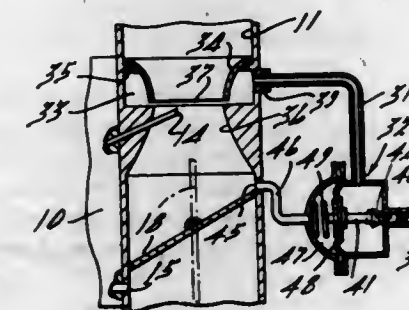
Jorma O. Sarto, Orchard Lake, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 24, 1971, Ser. No. 201,826

Int. Cl. F02m 25/06

U.S. Cl. 123-119 A

10 Claims



An automobile engine recycles a fraction of its exhaust gases by means of a restricted bypass duct discharging into the fuel-air inlet conduit at the diffuser region of the customary fuel inducing venturi restriction. The recycled exhaust gas flow is modulated by the pressure differential across a metering device.



ing restriction between the exhaust gas source and the venturi restriction. A supplemental control valve responsive to the pressure differential between the venturi restriction and a control port, which opens into the inlet conduit immediately above the leading edge of a conventional butterfly type throttle valve, is employed in the bypass duct to close or restrict the latter when the throttle valve is at either its idle or wide open position. The source of exhaust gas for recycling may comprise comparatively cool exhaust gases collected in a dead-end sound attenuating chamber of the exhaust muffler, which chamber is in communication with the hot exhaust gases in the muffler but is out of the direct exhaust flow path, such that lead contaminants in the exhaust gases cool and solidify in the chamber as minute particles that readily flow through the metering restriction in the bypass duct.

3,730,157

# CARBURETOR CONTROL SYSTEM AND METHOD FOR REGULATING AIR TO FUEL RATIO

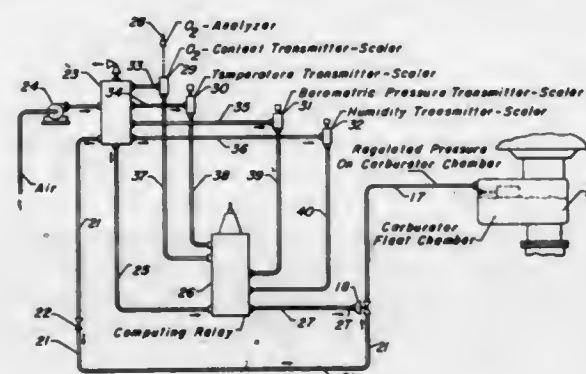
Clarence G. Gerhold, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 25, 1970, Ser. No. 40,182

Int. Cl. F02m 7/00; F02b 33/00

U.S. Cl. 123-119 R

13 Claims



As a means of providing improved control of the air-fuel ratio to an internal combustion engine for, in turn, maintaining control of the exhaust gas properties there is a regulation of fuel input responsive to a pressure exerted on the fuel in the carburetor float chamber. Sensing means are provided to be responsive to ambient conditions and/or to a given exhaust gas component. Such sensors, along with transmitter means, are integrated into the system to have fuel flow increased or decreased by pressure in the float chamber proportional to the net effect of having an increasing or decreasing quantity of O<sub>2</sub> present.

3,730,158

# CANISTER FOR EVAPORATION LOSS CONTROL

James C. St. Amand, Spencerport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed July 28, 1971, Ser. No. 166,714

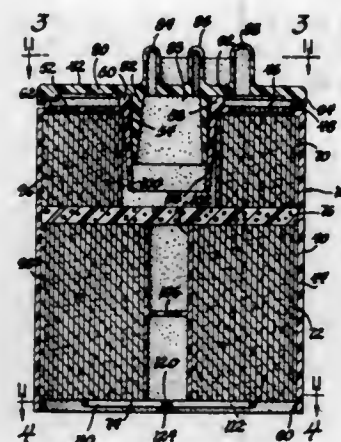
Int. Cl. F02m 25/00

U.S. Cl. 123-136

3 Claims

A canister for controlling the loss of fuel vapor from a vehicle fuel tank includes a downwardly opening adsorption chamber which is fluidly connected in an evaporative flow path between the fuel tank and the induction passage of the vehicle engine. A pair of coaxially disposed, discardable cartridges are releasably retained in the adsorption chamber, the cartridges being resiliently separated within the chamber by an intermediate vapor distributing and filtering pad. Each cartridge includes a hollow core around which an activated charcoal filled sheet is wrapped to form a filtering element conforming to the shape of the chamber. Fuel vapor from the fuel tank flows downwardly through the core of the upper or anti-surge cartridge to the distributing and filtering pad which radially spreads the flow for downward dispersion into the lower or storage cartridge. During engine operation, the stored fuel

vapor is initially drawn upwardly from the storage cartridge to the anti-surge cartridge and dispersed therewithin to prevent



surging as fuel vapor is purged from the canister to the induction passage.

3,730,159

# FUEL INJECTION DEVICE FOR INTERNAL COMBUSTION ENGINES

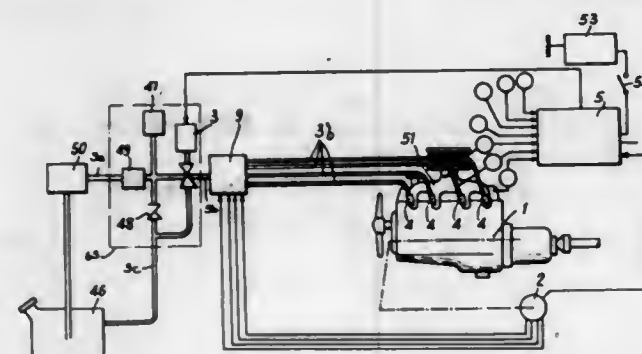
Georges Sallot, Elisabethville, France, assignor to Societe Des Procedes Modernes D'Injection Sopromi, Les Mureaux, France

Filed Dec. 17, 1971, Ser. No. 209,227

Int. Cl. F02m 39/00

U.S. Cl. 123-136

7 Claims



An improved device for controlling, either directly or indirectly, the injection of pressurized fuel into an internal combustion engine. The device comprises a body having a fuel inlet, a fuel outlet and a fuel return, as well as a valve mounted therein. The valve is actuated by an electromagnet and is adapted to establish communication between the fuel inlet and the fuel outlet when the valve is actuated. The device has a fuel accumulator comprising an opening in one side of the body and a diaphragm mounted across the opening to form an enclosed volume within the body. The enclosed volume communicates with the fuel input so that the diaphragm deflects outwardly with respect to the interior of the body in response to increases in the pressure of the pressurized fuel provided to the fuel input. The improvement comprises a pressure regulator having a regulatory valve disposed within the body and actuated by the diaphragm. The regulatory valve has an input in communication with the enclosed volume and an output in communication with the fuel return. The regulatory valve is adapted to establish communication between the enclosed volume and the fuel return when the pressure of the pressurized fuel in the enclosed volume reaches a predetermined value.

3,730,160

# ENERGIZATION OF THE COMBUSTIBLE MIXTURE IN AN INTERNAL COMBUSTION ENGINE

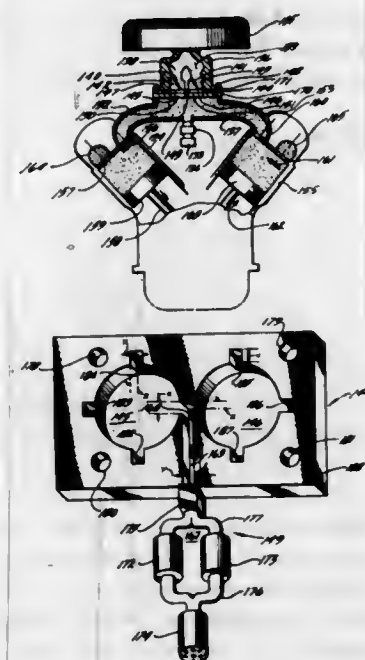
Nathaniel Hughes, Rolling Hills Estates, Calif., assignor to Energy Sciences Incorporated, El Segundo, Calif.

Continuation-in-part of Ser. No. 855,321, Sept. 4, 1969, abandoned, and a continuation-in-part of Ser. No. 13,977, Feb. 25, 1970, abandoned, and a continuation-in-part of Ser. No. 17,484, March 9, 1970, Pat. No. 3,613,722, and a continuation-in-part of Ser. No. 82,771, Oct. 21, 1970, abandoned, and a continuation-in-part of Ser. No. 111,995, Feb. 2, 1971. This application July 1, 1971, Ser. No. 158,915

Int. Cl. F02m 27/00, 27/08, 29/00

U.S. Cl. 123-142

10 Claims



Engine vacuum is used to draw a stream of air into the intake system. Some of the energy of this air stream is converted to pressure waves. The flow rate of the air stream is controlled responsive to the mode of engine operation to provide the proper amount of pressure wave energy.

3,730,161

# ROTARY VALVE

William Ronald Deane, Victoria, Australia, assignor to Harold A. Bishop, Peter J. Curran and Matthew P. Sinclair, all of Victoria, Australia, part interest to each

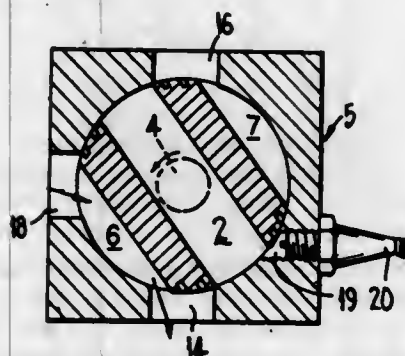
Filed May 28, 1971, Ser. No. 148,101

Claims priority, application Australia, May 29, 1970, 1358/70

Int. Cl. F011 7/10, 7/14

U.S. Cl. 123-190 D

9 Claims



A rotary valve preferably for controlling flow of fuel/air mixture to, and exhaust gases from, the cylinder of an internal combustion engine. The valve comprises a casing having a cylinder port and a diametrically opposite exhaust port. A spherical rotor is mounted to rotate within the casing and has

a diametrically extending through passage extending at right angles to the axis of rotation of the rotor, which passage aligns with the cylinder and exhaust ports during its rotation. The rotor further includes two channels on either side of the rotor which extend substantially parallel with the through passage. The casing further has an inlet port positioned, using the direction of rotation of the rotor as a datum, before the cylinder port. The lengths of the channels are greater than the distance between the inlet and the cylinder ports so at certain times during rotation of the rotor it will bridge the two ports to allow transfer of a fuel/air mixture from the inlet through the channel to the cylinder port. The outer dimension of the rotor is substantially less than the corresponding internal dimension of the casing, whilst at least one sealing ring is positioned within a groove around the rotor between each channel and the through passage, and is biased towards a position in running sealing engagement with the internal surface of the casing and is so arranged to prevent undesired transfer of fluid. The planes of the sealing rings are parallel to a plane including the axis of the through passage and the axis of rotation of the rotor. Where an ignition device is used the casing includes a port for it, positioned after the cylinder port and the channels at intervals during rotation of the rotor will allow communication between the device and the cylinder port to allow ignition of the fuel/air mixture passed to the cylinder.

3,730,162

# RECOIL STARTER

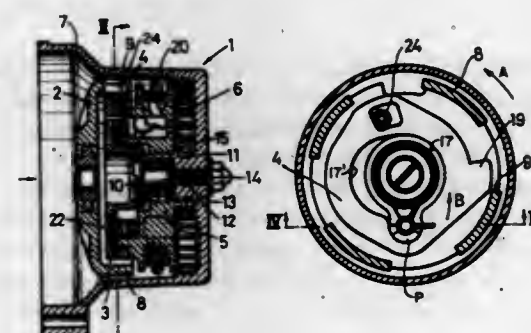
Kenaki Murase, Kawaguchi, Japan, assignor to Starting Industrial Co., Ltd., Tokyo, Japan

Filed March 4, 1971, Ser. No. 120,979

Int. Cl. F02n 3/02

U.S. Cl. 123-185 BA

3 Claims



A recoil starter wherein the driving ratchet is maintained in a retracted inoperative position during the operation of the engine.

3,730,163

# PISTON FOR INJECTION TYPE INTERNAL COMBUSTION ENGINES

Gunter Elsbett, and Ludwig Elsbett, both of Hilpaltstein, Germany, assignors to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft Werk Nürnberg, Nürnberg, Germany

Filed April 7, 1971, Ser. No. 132,094

Claims priority, application Germany, April 7, 1970, P 20 16 386.4

Int. Cl. F021 3/02, 3/14, 3/26

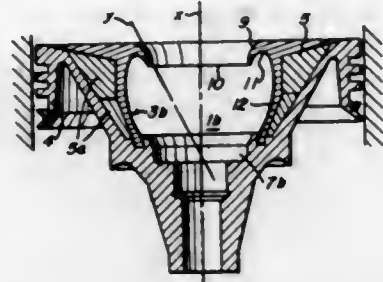
U.S. Cl. 123-193 P

11 Claims

A piston for injection type internal combustion engines, which has the bottom surface forming part of the main combustion chamber provided with a piston chamber in which an insert member defining a supplemental combustion chamber is inserted while an intermediate member is interposed



between said insert member and the piston body portion defining said piston chamber, said intermediate member hav-



ing zones of constant or different thermal conductivities according to a predetermined heat pattern.

### 3,730,164 ORTHOPEDIC SLING

Caroline M. Rash, 1200 Kenilworth Avenue, Racine, Wis.  
Filed Jan. 21, 1972, Ser. No. 219,808  
Int. Cl. A61F 5/40

U.S. Cl. 128—94

6 Claims



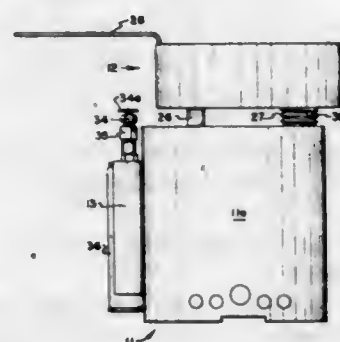
An orthopedic sling of a tape-type material having a first section disposed in a configuration of a loop for extending over a person's shoulder and for upwardly supporting an arm, and having a second section for extending from the loop and across the person's other shoulder and down to the front of his body for supporting the person's hand, and having a third section extending from the loop and down to a person's belt for anchoring this sling. The third section has a belt loop for releasably attaching to the person's belt for removal of the sling from the person's clothing or body. The lower end of the second section has a hand-supporting portion with a thumb hole for anchoring on to the person's hand.

### 3,730,165 PORTABLE LIQUID HEATER AND FOOD WARMER

Garold H. Williams, 43 West 100 South, Smithfield, Utah  
Filed June 28, 1971, Ser. No. 157,490  
Int. Cl. F23c 1/00

U.S. Cl. 126—266

1 Claim



A portable heater and food warmer unit wherein water, coffee or other liquid and food can be simultaneously heated by a

flame generated either from a gas fired burner or from a canned heat source. Surplus heat passed through a liquid heater is directed through an upstanding exhaust vent in a housing of the invention, on which a warming cup containing a food item to be heated can be positioned. The warming cup, when not in use, fits snugly over the top of the housing, and a pressurized cylinder, which may be used as a fuel source can be mounted on the side of the housing. The unit, fits in a carrying pouch which is attached to a belt worn around the hips of a camper or hiker like a conventional canteen.

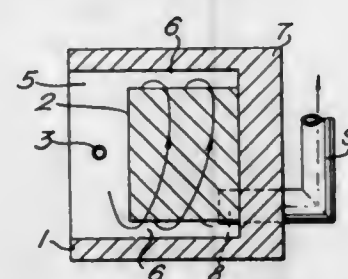
### 3,730,166 APPARATUS FOR HEATING WATER BY MEANS OF AN OILBURNER

Torleif Gran, Furuset Alle 23, Grorud, Oslo, Norway  
Filed June 16, 1971, Ser. No. 153,606

Claims priority, application Norway, June 27, 1970, 2531  
Int. Cl. F24h 1/12

U.S. Cl. 126—350 R

3 Claims



A means is illustrated and described for heating water with an oil burner, particularly for air conditioning units and the like. The combustion chamber is in contact with a water reservoir and is formed as a cylindrical body with the burner nozzle directed substantially in parallel to the end surfaces of the combustion chamber and somewhat oblique with respect to the line of connection from nozzle to cylinder axis. An annular chamber is connected to the end surface of the combustion chamber and the combustion chamber and annular chamber are formed with uniform surfaces.

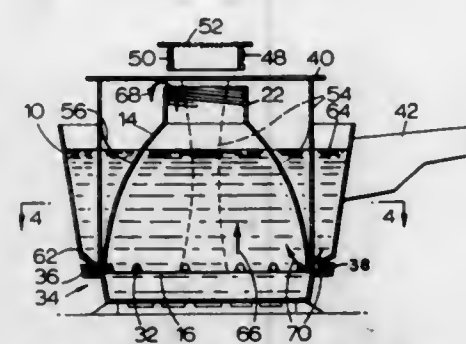
### 3,730,167 NON BOIL-OVER COOKING ASSEMBLY

Dominique Patrice Desarzens, 89 Rameau Dr., Unit 7, Willowdale, Ontario, Canada

Filed Feb. 25, 1971, Ser. No. 118,711  
Int. Cl. A47J 27/58

U.S. Cl. 126—386

7 Claims



A saucepan is combined with a generally conical safety-funnel detachably secured to the saucepan. The funnel is plastic and an annular in-step is provided at the junction of the saucepan wall and floor for supporting the perimeter of the funnel spaced above the floor and away from direct heat contact. The funnel is reversible and the small end capped to function as a separate hot liquid (or solid) heater within the outer saucepan which can at the same time be cooking something else. A ring of spaced apertures around the big funnel end provides circulating passage between the contents of the interior of the funnel and those in the surrounding saucepan.

### ERRATUM

For Class 128—94 see:  
Patent No. 3,730,164

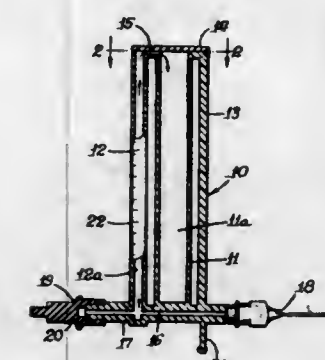
### 3,730,168 MANOMETER

Daniel M. McWhorter, Arlington Heights, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation-in-part of Ser. No. 653,548, July 14, 1967, abandoned. This application Sept. 10, 1970, Ser. No. 71,232  
Int. Cl. A61b 5/10

U.S. Cl. 128—2 F

15 Claims



A manometer for measuring liquid pressure having a channel which opens into an attaching device for connecting the channel to liquid under pressure, said attaching device including a conduit which provides a path of flow for said liquid into the channel. The conduit has a needle for introducing liquid into the conduit at one end thereof, a closure at the other end thereof which includes a valve or slit for opening said other end of the conduit to permit drainage of liquid therefrom, and an opening in said conduit through which liquid may enter the channel from the conduit. Liquid pressure is indicated by the amount of travel of the liquid in said channel.

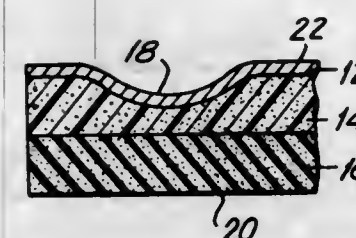
### 3,730,169 SHOE INNER SOLE AND ORTHOPEDIC SUPPORT

Theodore Fiber, 20 Rosewood Lane, Wantagh, N.Y.  
Filed March 8, 1971, Ser. No. 122,035

Int. Cl. A61b 5/10

U.S. Cl. 128—2 S

7 Claims



A shoe innersole having a laminated construction of an upper leather-like layer, a center layer formed of an open-cell polyurethane matrix filled with a combination of lattices so as to be plastically deformable, and a bottom layer of a resilient rubber material. The innersole deforms in conformance with the impression of a wearer's foot so as to concurrently soften the foot fall by supporting a larger area of the foot while providing a resilient cushioning effect. In another embodiment, the innersole incorporates an additional area which cups under and provides a minor amount of support to the arch region of the wearer's foot.

In addition, the innersole is used by an orthopedic physician to obtain a record of the actual pressure exerted by a foot in a shoe for the purpose of prescribing or diagnosing the foot problems of a patient.

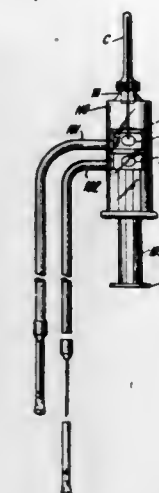
### 3,730,170 APPARATUS FOR DISTRIBUTING A SAMPLE OF BLOOD TO A PLURALITY OF CULTURES

Thomas M. Michael, 8 Carol Ann Road, Lynnfield, Mass.  
Filed April 29, 1971, Ser. No. 138,519

Int. Cl. A61b 5/14

U.S. Cl. 128—2 F

7 Claims



An apparatus for distributing a sample of blood contained in a syringe or blood collecting tube comprises a distribution housing which is divided into at least two chambers, and which includes conduit means extending from each chamber to blood culture bottles. The needle of the blood collecting tube passes through puncturable sealing means formed in the distribution housing and the partition between the chambers of said housing to enable the selective distribution of blood to the respective blood culture bottles.

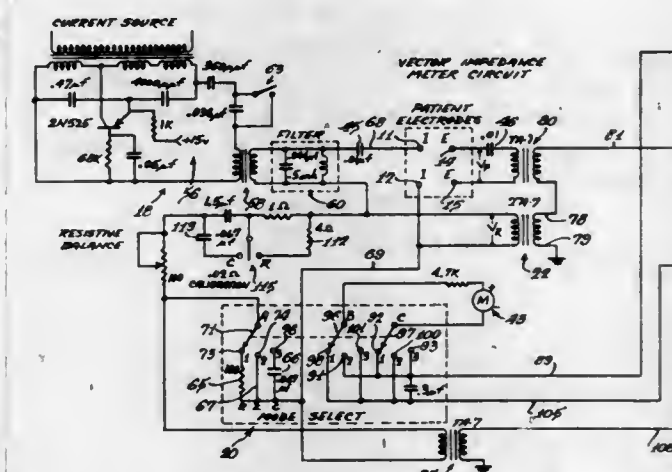
### 3,730,171 IMPEDANCE RELATED BLOOD FLOW MEASURING DEVICE

Richard Namon, P. O. Box 822, Coral Gables, Fla.  
Continuation of Ser. No. 818,307, April 22, 1969, abandoned.  
This application Sept. 23, 1971, Ser. No. 183,217

Int. Cl. A61b 5/00

U.S. Cl. 128—2.05 Z

21 Claims



A cardiac blood flow measuring method and apparatus including two current electrodes and two voltage pick-up electrodes positionable in direct contact with the subject, with a circuit for applying a high frequency, low voltage current to the current electrodes and a circuit for measuring the total impedance across the voltage pick-up electrodes by using a summing circuit for adding selectively either a resistive or a reactive voltage to the subject's total impedance voltage to determine selectively either the subject's resistive impedance or reactive impedance with the reactive impedance being employed to measure cardiac blood volume flow.



3,730,172

## SPHYGMOMANOMETER

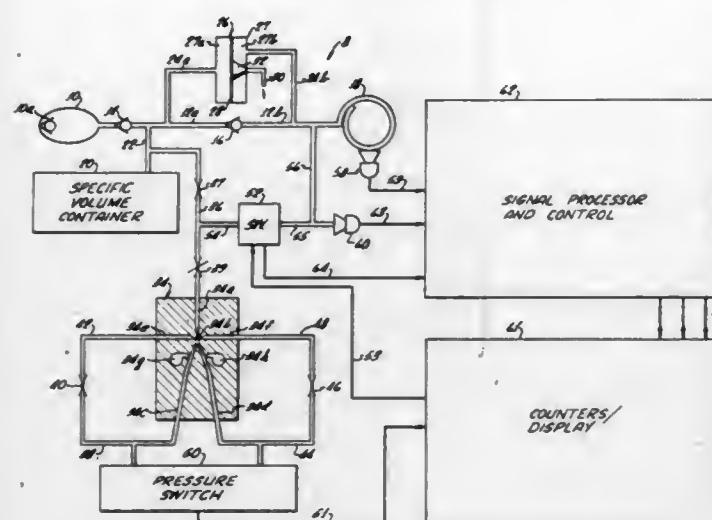
Charles L. Buddecke, Fullerton, and John Le Valley, South Pasadena, both of Calif., assignors to Accumed, Inc., Fullerton, Calif.

Filed Oct. 14, 1971, Ser. No. 189,425

Int. Cl. A61b 5/02

U.S. Cl. 128—2.05 M

31 Claims



A container of specific volume is pressurized simultaneously with the inflation of an artery occluding cuff. The container is isolated from the cuff by means of a diaphragm, which after inflation of the cuff, controls bleeding of the cuff pressure in a manner to maintain cuff pressure equal to the container pressure. A fluidic bistable oscillator or flip-flop is connected to bleed fluid from the container through alternating exhaust paths in a manner to produce oscillating mass-flow pulses. The mass-flow pulses are counted as incremental and accumulating pressure values when signals are received from a microphone detecting Korotkoff noises. The counters provide a digital display of systolic and diastolic pressures. Pulse events are utilized to reinforce the detection of Korotkoff signals, and the pulse rate per minute is recorded in a separate register.

3,730,173

## STIMULATION METHOD AND APPARATUS FOR ATTEMPTING TO RETURN A PHYSIOLOGICAL PARAMETER OF A PATIENT TO NORMAL

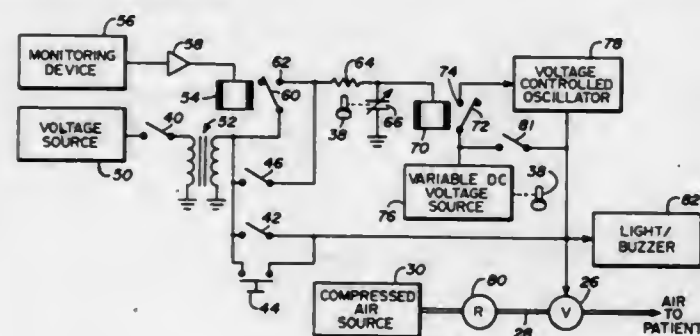
David W. Deaton, Dallas, Tex., assignor to Abidea Corporation, Dallas, Tex.

Filed Feb. 2, 1970, Ser. No. 7,792

Int. Cl. A61b 5/00

U.S. Cl. 128—2.08

8 Claims



A selected physiological parameter of a patient, such as the respiration or heart beat of the patient, is monitored. When certain variations in the monitored parameter are detected, a stream of pressurized fluid, such as air, is directed against the patient's body to provide cutaneous stimulation in an effort to return the monitored parameter to normal.

3,730,174

## EXERCISER FOR PARAPLEGIC PATIENTS

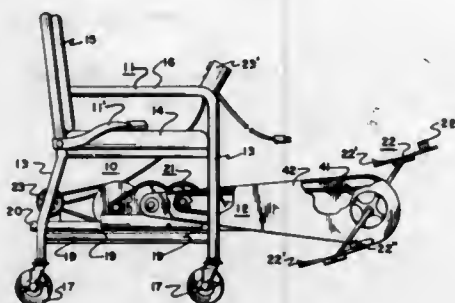
George L. Madison, Route 2, Weiser, Idaho

Filed Nov. 19, 1971, Ser. No. 203,097

Int. Cl. A61h 1/02

U.S. Cl. 128—25 R

1 Claim



An exercising chair having a plurality of suitable legs, a pair of arms, a seat, and a back; a frame including a pair of rectilinear bars fastened at each side of the chair to the legs distally below the chair seat, a pair of transverse bars disposed distally from one another and fastened to the rectilinear bars, and a centrally disposed beam fastened to the transverse bars, the beam running under the chair seat and projecting distally forwardly of the chair; a drive train including an electric motor fastened to the beam, a suitable control means operable to selectively control the motor, and gears and drive means operable to reduce speed of output rotation of the motor and to reduce the load on the motor; and a pair of pedals driven by the drive train, the pedals being disposed on the forwardmost terminal end of the beam.

3,730,175

## ENDOSCOPE

Masaharu Fukami, Tokyo, and Takeshi Okada, Hachioji-shi, Tokyo, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 869,070, Oct. 24, 1969,

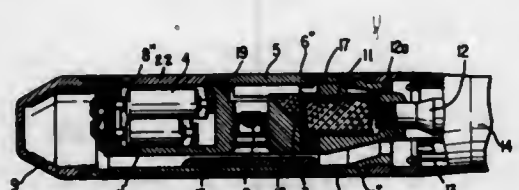
abandoned. This application March 24, 1971, Ser. No.

127,536

Int. Cl. A61b 1/06

U.S. Cl. 128—6

7 Claims



Endoscope having a distal end portion connected through an elongated tube to a control housing so as to be inserted into a hollow portion of a living body for the inspection thereof. The distal end portion is provided with at least a light transmitting window such as a photographing or viewing window through which the light from an object is introduced into the distal end portion so that an image of the object is formed by an objective lens therein so as to be photographed or viewed. A plastic layer is fluidtightly provided on at least the area including the photographing or viewing window by the heat shrinkage or injection moulding of the plastic layer and an opening is formed in the plastic layer, the radially inwardly offset peripheral edge portion of which is snugly fitted in the light transmitting window, while a shoulder portion is formed in the inside of the inwardly offset peripheral edge portion along therewith. A transparent plate such as a glass plate is fitted in the shoulder portion with its peripheral edge portion firmly bonded to the shoulder portion. Alternatively, the plastic layer is made of a transparent material and the portion of the layer covering the photographing or viewing window is

thickened so as to firmly fit in the window thereby providing a fluidtight transparent window.

3,730,176

## DEVICE FOR PREVENTING CONTAMINATION IN HYDROTHERAPY TREATMENT SYSTEM

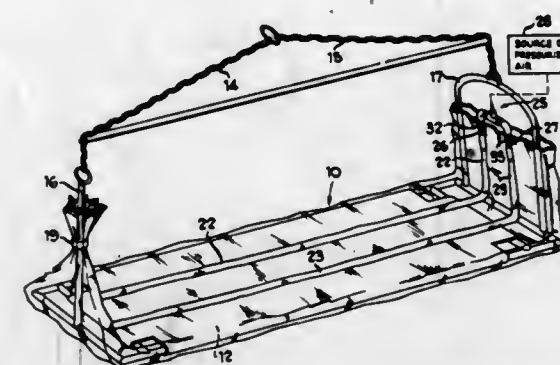
Robert C. Miller, Elgin, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 28, 1971, Ser. No. 213,142

Int. Cl. A61b 9/00

U.S. Cl. 128—66

8 Claims



A hoist-controlled litter or plinth, which supports a patient partially immersed in agitated water in a hydrotherapy tank, is covered with a disposable flexible, water-tight sleeve, made of plastic film, in order to completely isolate the litter from any contact with the water. The water-tight barrier established by the sleeve prevents the transmission of bacteria between the litter and the water in the tank and this in turn prevents the various patients using the litter from cross-infecting each other. Apertured conduits or air tubes may be attached to or integrally formed in the flexible plastic sleeve to facilitate the injection of pressurized air into the water to effect the required water agitation. The particular locations of the openings in the air tubes may be customized to the specific needs of each patient, thereby providing agitation only adjacent those localized areas of the patient's body necessitating hydrotherapy treatment.

3,730,177

## SPREADING BANDAGE FOR CHILDREN HAVING DISLOCATED HIP BONES

Oskar Thum, Fibiger Str. 81, Hamburg, Germany

Filed June 2, 1971, Ser. No. 149,282

Int. Cl. A61f 3/00

U.S. Cl. 128—80 A

10 Claims



A spreading bandage for patients, especially children, having dislocated hip bones. A rigid U-shaped supporting member is fastened to the back of the patient and has a pair of pivotable thigh supporting members mounted thereon. The thigh supporting members are disposed perpendicular to the body supporting member, and are forced apart outwardly by tension belts or springs mounted thereon. The force exerted by the springs and belts maintain the thighs of the patient in a spread-apart position to cause proper relocation of the hip bones in the body of the patient.

3,730,178

## DEEP-SEA DIVE SUIT AND LIFE SUPPORT SYSTEM

Fred E. Moreland, 726 W. Lexington Avenue, Elkhart, Ind.

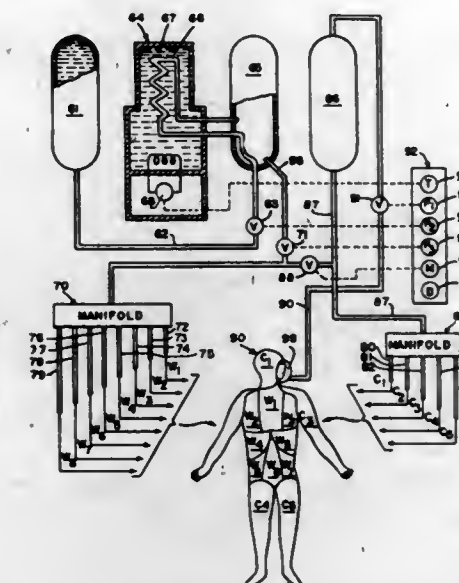
Division of Ser. No. 22,266, March 24, 1970, Pat. No.

3,648,289. This application Sept. 22, 1971, Ser. No. 182,609

Int. Cl. A62b 7/00

U.S. Cl. 128—142.5

1 Claim



Present invention relates to a deep-sea dive suit and self contained underwater breathing and heating apparatus therefor. The improved suit is laminated in six layers which form a passageway for the circulation of an oxygen-gas mixture that transmits heat from the warmer parts of the body to its extremities. The oxygen-gas mixture is generated from a supply of a cryogenic oxygen containing liquid stored in a back pack reservoir. The cryogenic liquid is heated, converted to a gas, circulated through the suit and finally conditioned for breathing by the diver.

3,730,179

## COMBINATION RESUSCITATING, ASPIRATING AND GASTRIC DRAINING APPARATUS

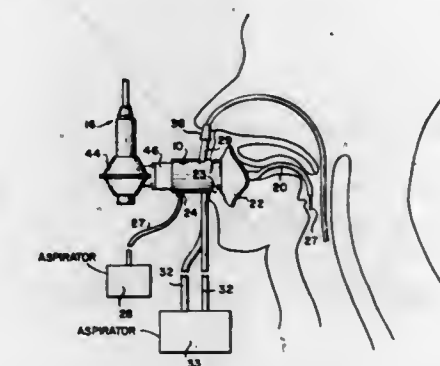
Arthur G. Williams, 516 19th Ave., N.E., Saint Petersburg, Fla.

Filed Oct. 30, 1970, Ser. No. 85,433

Int. Cl. A61m 16/00

U.S. Cl. 128—145.5

10 Claims



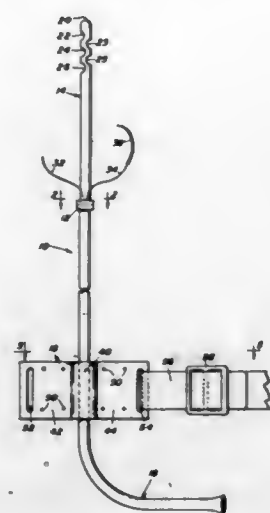
This invention is a combination resuscitating, aspirating and gastric draining apparatus of unitary construction which includes a tubular body, a portion of which is adapted for insertion into the mouth. A resuscitating supply source is detachably engaged with the tubular body. Nasal pharyngeal catheter tubes extend transversely through the tubular body for insertion into the nostrils for gastric draining. An oropharyngeal catheter tube extends longitudinally through the tubular body, for insertion down the throat. An aspirating source is operatively engaged with the nasal pharyngeal and oropharyngeal tubes.







use device. The catheter also carries a fixation band spaced from the securing collar, the band being attached to the



catheter to provide further anchoring means for securing the catheter.

3,730,188

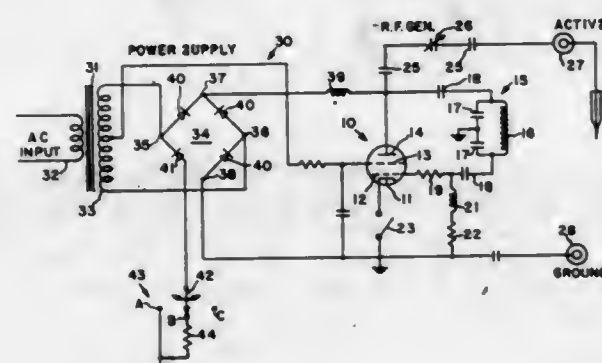
**ELECTROSURGICAL APPARATUS FOR DENTAL USE**  
Irving A. Ellman, 558 Willow Avenue, Cedarhurst, N.Y.

Filed March 24, 1971, Ser. No. 127,727

Int. Cl. A61b 17/38; A61n 3/02

U.S. Cl. 128—303.14

9 Claims



Electrosurgical apparatus for dental use employing an electronic radio-frequency oscillator is described. The radio-frequency oscillator or R.F. generator is powered by an electronic power supply constructed to selectively deliver full-wave rectified voltage and current for excellent cutting with minimal hemostasis, half-wave rectified voltage and current providing moderate cutting with maximum hemostasis, and voltage and current between the full-wave rectified and half-wave rectified condition for combined good cutting and good hemostasis. A further variation makes selectively available filtered or unfiltered rectified voltage and current for further control over cutting and hemostasis.

3,730,189

**TOBACCO PRODUCT**

Wilmer A. Rhode, Lake City, Fla., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Jan. 4, 1972, Ser. No. 215,398

Int. Cl. A24b 15/00

U.S. Cl. 131—17 R

3 Claims

Addition of 2-hydroxy-3,5,5-trimethyl-2 cyclohexen-1,4-dione to tobacco in quantities of 0.0005 to 0.1 percent by weight for improving the flavor and aroma thereof.

3,730,190  
**AFRO PIC AND HIGH SPEED COLD AIR BLOWER COMBINATION**

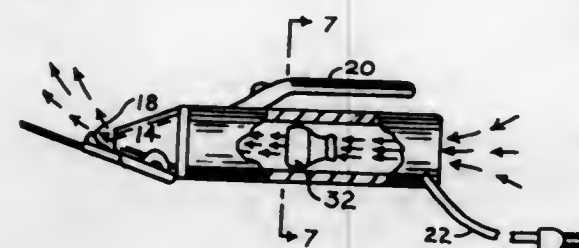
John E. Ford, 134-49 166th Place, Bldg. 19C, Apt. 132, Jamaica, N.Y.

Filed Dec. 2, 1971, Ser. No. 204,156

Int. Cl. A45d 24/00

U.S. Cl. 132—11

5 Claims



An "Afro Pic" and high speed cold air blower combination comprising a hollow blower housing and an "Afro Pic" detachably secured to the air outlet end head of the housing. The "Afro Pic" is provided with an air deflector, so that while the pic itself is used, the deflected air "fluffs" the hair. The pic is rotatable to a desired angle to make it convenient to manipulate the hair on the side of the head. The device may have a self-contained power supply built in the housing.

3,730,191

**FINGER MASK AND APPARATUS FOR POLISHING FINGERNAILS**

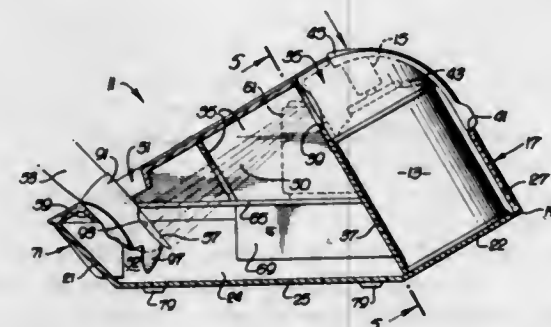
William A. Doornbos, Fountain Valley, Calif., assignor to Richard W. Beall, Jr., Torrance, Calif., a part interest

Filed July 27, 1971, Ser. No. 166,344

Int. Cl. A45d 29/05

U.S. Cl. 132—73.6

11 Claims



A housing defines a chamber in which the tip of a finger may be positioned and a compartment for holding an aerosol can. Structure is included defining a nail polish delivery path for confining nail polish sprayed from an aerosol can mounted in the compartment, thereby to direct sprayed nail polish to the chamber to spray a fingernail positioned therein. A dryer is mounted in the housing for drying sprayed fingernails and a mask made of an elastic flexible material is provided for stretching around and masking a finger tip from sprayed nail polish while exposing the fingernail.

3,730,192

**METHOD FOR INHIBITING STAINING OF ELECTRODEPOSITED COATINGS FORMED IN A CYANIDE CONTAINING BATH**

Lloyd O. Gilbert, 824 E. Central Pk., Davenport, Iowa, and John S. Finney, 1441 Bennett, Warren Woods, Mo.

Filed Jan. 25, 1971, Ser. No. 109,658

Int. Cl. C23b 1/24; C23g 1/26

U.S. Cl. 134—2

7 Claims

A method for inhibiting the staining of electrodeposited coatings which have been formed in a cyanide containing bath comprising the contacting of the coated objects with an aqueous solution of an aldose sugar.

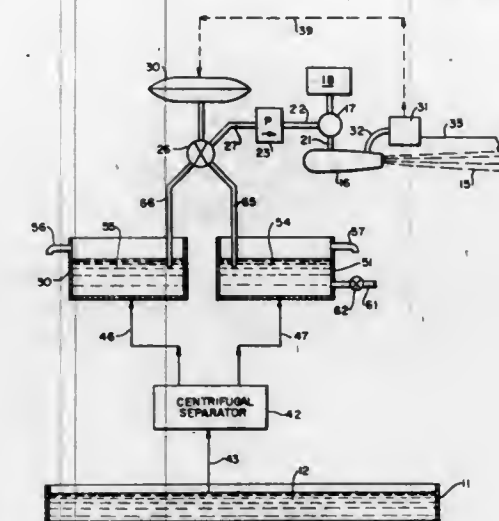
3,730,193  
**METHOD AND APPARATUS FOR PREVENTING ELECTROSTATIC FIELDS IN LARGE TANKS**  
Fontaine C. Armistead, Darien, Conn., assignor to Texaco Development Corporation, New York, N.Y.

Filed April 12, 1971, Ser. No. 133,064

Int. Cl. B08b 3/02, 9/08

U.S. Cl. 134—10

13 Claims



In mammoth oil tanker cleaning operations, a procedure and apparatus to control and prevent formation of electrostatic charges in a tank. There is an electrostatic voltmeter to measure the field near the nozzle of a cleaning jet. The jet fluid is made up of a mixture of clean sea water with oily water, and the relative amount of each fluid in the mixture is controlled so as to produce a spray that has a neutral charge.

3,730,194

**METHODS OF AND COMPOSITIONS FOR STRIPPING RUBBER ARTICLES ADHERED TO A SUBSTRATE**  
Marshall M. Shoner, 12244 S. Truro, Hawthorne, Calif.

Continuation-in-part of Ser. No. 791,787, Jan. 16, 1969, abandoned. This application Jan. 24, 1972, Ser. No. 220,481

Int. Cl. C11d 7/50, 7/08; B08b 3/08

U.S. Cl. 134—41

8 Claims

Rubber articles adhered to a metal or plastic object by a commercial bonding agent can be removed by immersion in stripping solutions. For nitrile rubber articles, the solution consists of between 15 ml and 20 ml of hydrofluoric acid and between 150 ml and 170 ml of nitric acid in a gallon of acetone. For silicone rubber articles, the solution consists of hydrofluoric acid, sulfuric acid, in a ratio of 6:5, in acetone with a total of from 45 ml to 65 ml of combined HF and H<sub>2</sub>SO<sub>4</sub> for each gallon of acetone. These solutions attack the bond between the rubber and bonding agent. Effective stripping is achieved by immersing the object in the solution at room temperature for a few hours or less. The solutions will not damage an anodized surface.

3,730,195

**APPARATUS FOR CLEANING PAINT ROLLER COVERS**  
Robert De Witt Kay, 4893 Purdy Lane, West Palm Beach, Fla.

Filed April 15, 1971, Ser. No. 136,278

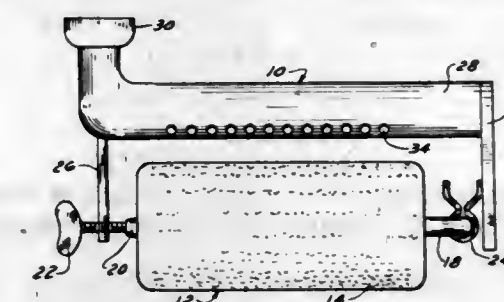
Int. Cl. B08b 3/02

U.S. Cl. 134—138

2 Claims

An apparatus and method for cleaning a paint roller cover in which a paint thinning fluid spray is directed at an angle to the paint roller and roller cover surface causing them to

rotate. Paint residue on the roller cover surface is removed by



the cleansing action of the fluid and the centrifugal force on the roller surface.

3,730,196

**STORABLE VEHICLE CANOPY**

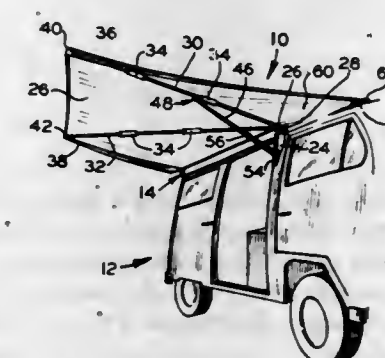
Charles L. Borskey, P.O. Box 26, Andrews, Ind.

Filed July 16, 1971, Ser. No. 163,278

Int. Cl. E04f 10/06

U.S. Cl. 135—5 A

6 Claims



A canopy structure for a vehicle which is readily storable on the vehicle and may be readily removed from its stored position to a position of use.

3,730,197

**BAG WITH COLLAPSIBLE UMBRELLA**

Helen P. Lunney, Brooklyn, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Feb. 14, 1972, Ser. No. 225,868

Int. Cl. A45b 25/24

U.S. Cl. 135—16

1 Claim



A shopping bag having a handle and adapted to be carried with or without use of the handle contains detachably an im-



verted collapsible telescopic umbrella. The handle of the umbrella is detachably held at the bottom of the bag and the umbrella can be extended and opened for use by pulling the umbrella upward by seizing it at its top.

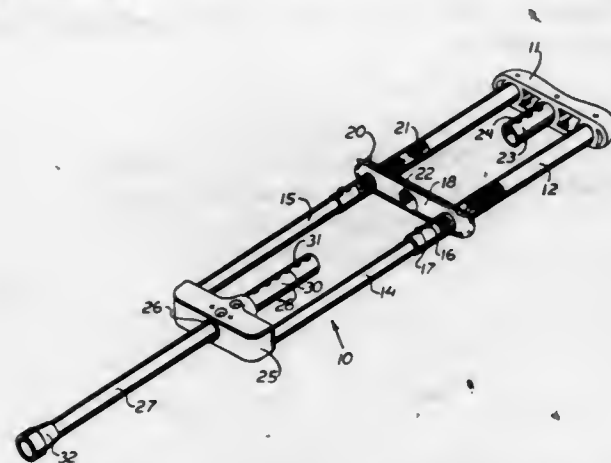
### 3,730,198 COLLAPSIBLE CRUTCH

Thomas W. Johnston, Winter Park, and Jack M. Pipplin, Sanford, both of Fla., assignors to Unlimited Development, Inc., Orlando, Fla.

Filed March 1, 1972, Ser. No. 230,730  
Int. Cl. A61h 3/02

U.S. Cl. 135-50

8 Claims



A collapsible crutch apparatus having a telescoping frame and a telescoping leg, both being adapted to telescope the crutch into a collapsed position for locking in a collapsed position for storage in a container. The frame and the leg can be telescoped from a collapsed position to a desired length and locked in position with a quick connecting lock. The dual collapsing system allows the crutch to be transported and stored in a relatively small storage container and then to be quickly expanded for use.

### 3,730,199 UMBRELLA AND SHEATH

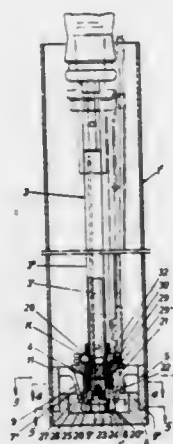
Klaus Thur, Solingen, Germany, assignor to Telesco Brophy Limited, East Montreal, Quebec, Canada

Filed Feb. 11, 1972, Ser. No. 225,555  
Claims priority, application Germany, Oct. 13, 1971, P 21 50 937.5

Int. Cl. A45b 25/00

U.S. Cl. 135-20 R

4 Claims



A collapsible umbrella in combination with a rigid wall sheath, a resilient clip within the sheath adapted to grip the cap of the umbrella when the umbrella is collapsed and in the sheath, the cap includes a split annular flexible head for engagement with the clip and the sheath and a movable core is provided within the cap for engagement in the head. The core

is movable from a position within the head upon a full extension of the telescopic stick, thereby releasing the head from engagement with the resilient clip within the sheath.

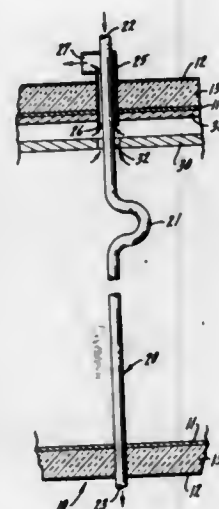
### 3,730,200 GAS VENT

Ronald G. Deeks, Oakville, Ontario, Canada, assignor to Procor Limited, Chicago, Ill.

Filed April 1, 1971, Ser. No. 130,423  
Int. Cl. F16l 53/00

U.S. Cl. 137-1

2 Claims



A method and apparatus for venting hydrogen sulphide gas from a vessel or tank car containing hot molten sulphur therein, wherein a layer of sulphur crust has formed on the upper surface thereof and conventional venting arrangements are non-functional due to blocking by solidified sulphur. A hot fluid is passed through a conduit so as to melt a hole in the sulphur crust around the outer periphery of the conduit and thus permit trapped hydrogen sulphide gas from the area below the crust to pass upward therethrough. The hydrogen sulphide gas is then vented from the area above the crust to the outside of the vessel.

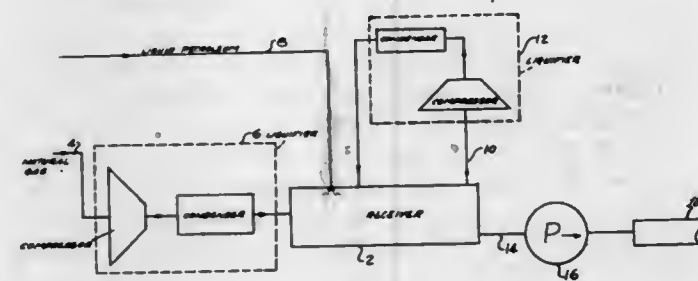
### 3,730,201 TRANSMISSION OF MIXED PETROLEUM PRODUCTS THROUGH A FROZEN MEDIUM

Kenneth W. Lefever, Waterford, Va.

Filed March 16, 1971, Ser. No. 124,987  
Int. Cl. F17d 1/16

U.S. Cl. 137-13

4 Claims



A method of transmitting a petroleum product through a frozen medium which is structurally unstable at temperatures at or above freezing. A fluid which is normally gaseous at ambient temperatures is liquified and mixed with the petroleum product to be transmitted. The mixture is then transmitted through a pipeline supported by the frozen medium and the fluid is maintained in a liquid state throughout the length of the pipeline.

### 3,730,202 METHOD OF CONTROLLING AN INTERFACE BETWEEN TWO FLUIDS

Gerhard H. Wolf, 23 Ungererstr. 248, Munich, Germany

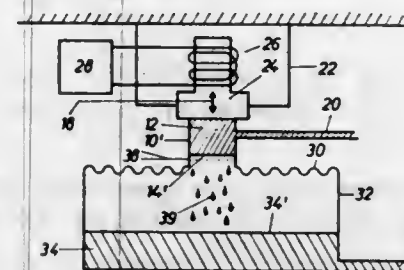
Filed Aug. 31, 1970, Ser. No. 68,231

Claims priority, application Germany, Nov. 12, 1969, P 19 56 938.1

Int. Cl. F17d 1/16

U.S. Cl. 137-13

10 Claims



An interface between two fluids of different densities in the presence of an acceleration,  $g$ , tending to distort said interface, is controlled by oscillating the system of fluids in a direction essentially normal to the interface. The parameters of oscillation are such that

$$\frac{b_m}{g} \geq -\frac{\sqrt{8} \pi f}{\Omega_0}$$

wherein

$b_m$  is the maximum acceleration of the interface due to the oscillation

$f$  is the oscillation frequency

$\Omega_0$  is the slowest eigenmode of the system of fluids.

The interface may be a lower surface of a body of liquid, the other fluid being a gas, and the parameters of the oscillation may be controlled such that rain-like droplets are expelled from the otherwise stabilized surface.

### 3,730,203 REDUCING PRESSURE ON LIQUIDS

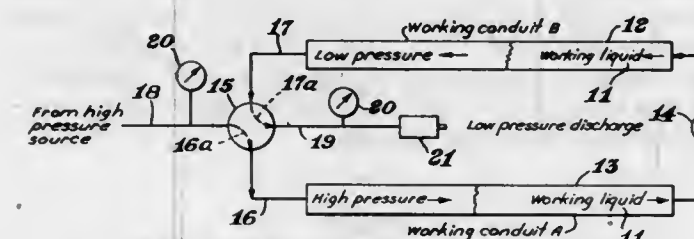
Melvin F. Katzer, Danville, and Willis G. Routson, Walnut Creek, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 869,531, Oct. 27, 1969, abandoned. This application Oct. 4, 1971, Ser. No. 186,478

Int. Cl. F17d 3/00

U.S. Cl. 137-14

11 Claims



A liquid which is detrimentally affected by shear, or which cannot be flowed through conventional pressure reducing devices, is reversibly worked against a second body of liquid on which work is done to reduce the pressure on the first liquid. Illustratively, liquid on which pressure is to be reduced is alternately flowed into each of two working conduits in liquid communication at one end through a liquid pressure reducing means. As liquid is introduced into one working conduit, corresponding volumes of liquid are flowed through the pressure reducing means and removed from the second working conduit. The total amount of liquid introduced into a

working conduit at one time, however, is approximately equal to or less than the volume of a working conduit. As a consequence, the pressure reducing means always operates on a body of working liquid that recycles from one working conduit to the other, and this body of liquid absorbs the shear stresses associated with pressure reduction. A method and apparatus for the practice thereof are each provided.

### 3,730,204 TEMPERATURE RESPONSIVE SAFETY VALVE STEMS

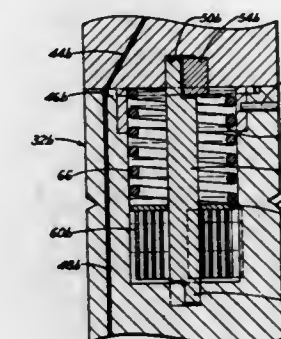
James S. Bissett, Bethel Park, Pa., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Sept. 23, 1971, Ser. No. 183,136

Int. Cl. F16k 17/38

U.S. Cl. 137-68

13 Claims



The invention provides a safety valve stem structure for valves having a valve stem and requiring either rotational motion or translational motion to operate the active valve member. A cavity is formed within the stem and a weakened portion is formed in the stem near the cavity. The cavity is filled with a liquid which expands upon exposure to excessive heat and breaks the stem at the weakened portion. After breakage, the expanding liquid, sometimes with a spring assist, closes the valve member.

### 3,730,205 FUSIBLE SAFETY DEVICE

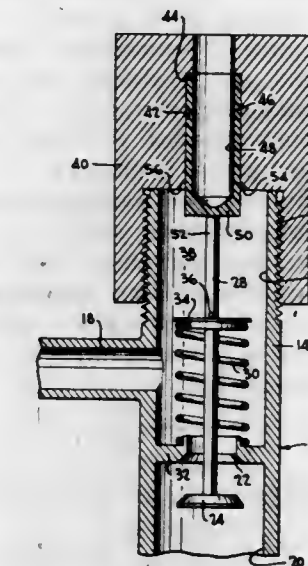
Bobby E. Gulmbellot, 312 Briar Grove, Gretna, La.

Filed Aug. 11, 1971, Ser. No. 170,866

Int. Cl. F16k 17/38

U.S. Cl. 137-73

7 Claims



A fusible safety device for use with a spring-loaded safety valve having an elongated valve stem mounted on a shiftable valve plug. The safety device comprises a hollow body adapted to be mounted on the casing of the valve. A fusible plug is mounted within the hollow body in a position to contact the valve stem and maintain the valve plug in a port clearing position. The fusible plug has an internal cavity extending



longitudinally from one end thereof and terminating at a location spaced from the other end to present an end wall which contacts the valve stem. The fusible plug is constructed of a material which is capable of softening at an elevated temperature or in the presence of crude oil.

3,730,206

# FLUSHING VALVE ARRANGEMENT FOR REVERSIBLE HYDROSTATIC GEAR MECHANISMS

Tomas Sirek, Hausen, Germany, assignor to Constantin Rauch, Upm, Donau Lstrasse, Germany

Filed Dec. 1, 1971, Ser. No. 203,522

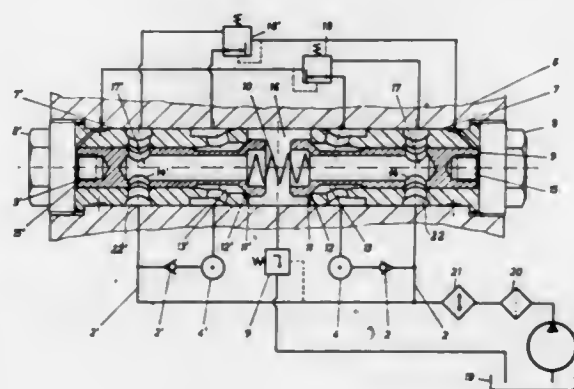
Claims priority, application Germany, Dec. 17, 1970, P 20 62 308.9

Int. Cl. F16d 31/00

U.S. Cl. 137—87

5 Claims

tion non-return valves which act in opposite directions to each other and between which a compensating pipe branches off.



A flushing valve arrangement for reversible hydrostatic gear mechanisms with a closed circuit and a feed pump which communicates through non-return valves with each of two main lines of the circuit and with a pressure relief valve connected to a storage container. Its inlet can, through a flushing reciprocating valve and as a function of the pressure in the relevant high pressure line, communicate with whichever main line is carrying the low pressure. The flushing reciprocating valve comprises two coaxially and mirror-symmetrically disposed valve bodies enclosing a common valve space which communicates with said pressure relief valve, said valve bodies having within them displaceable and likewise mirror-symmetrically disposed piston slides reciprocally braced through a spring between said slides. Each piston slide has an inner valve space communicating with the common valve space and with the feed pump. Each valve body with its associated piston slide by means of a sealing piston face and a valve seat forms an annular space which can be closed off from the common valve space and which communicates at any time with one of the main lines. Each main line is connected through a control valve to a control space on the outer end face of the other piston slide which forms an annular space connected to the other main line.

3,730,207

# VALVE ARRANGEMENT FOR HYDRAULIC STEERING SYSTEMS

Thorkild Christensen, Nordborg, Denmark, assignor to Danfoss AIS, Nordborg, Denmark

Filed Oct. 4, 1971, Ser. No. 186,104

Claims priority, application Germany, Oct. 2, 1970, P 20 48 421.3

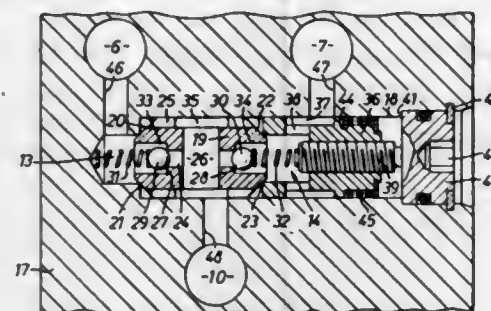
Int. Cl. F15b 11/08

U.S. Cl. 137—106

6 Claims

The invention relates to a valve arrangement for hydraulic steering systems in which the two pipes supplying a working

motor are connected to a control means and to each other by way of a manually operable short-circuiting valve and two suc-



3,730,208

# MULTIPLE OUTLET FLUID DISTRIBUTION APPARATUS

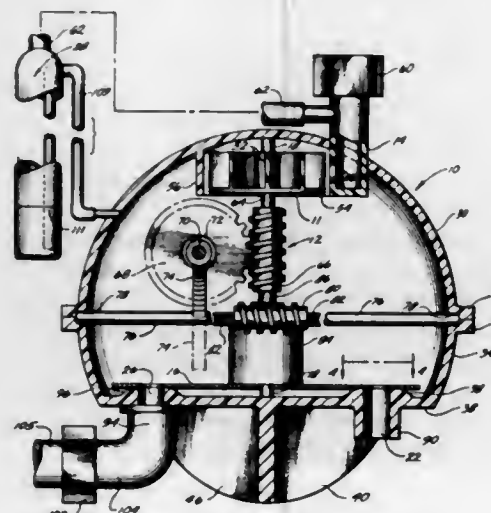
David E. Lewis, 509 Olympia Way, Orange, Calif.

Filed April 29, 1971, Ser. No. 138,674

Int. Cl. F16k 11/02

U.S. Cl. 137—119

14 Claims



A flexible disc-like valve member is rotatably mounted within a shell to selectively seal fluid outlets from the shell and to selectively open the outlets through an arc-shaped slot in the valve. The shell includes a hemispherical portion, a spherical zone section joining the hemispherical portion at the latter's equator, and a circular plate-like bottom closing the spherical zone. Radially extending reinforcing ribs extend out to the limits of the sphere from the bottom to give the entire shell the integrity of a sphere. An impeller driven gear train drives the flexible disc. Each of the outlets is long and thin and is bounded by a raised ramp-like protrusion which is feathered such that along a common line from the center of the disc larger radii encounter the ramp first.

3,730,209

# VENT FOR LIQUID DRAINAGE SYSTEM

William J. Binard, and John F. Dye, both of Barrington, Ill., assignors to The Kendall Company, Boston, Mass.

Filed June 2, 1971, Ser. No. 149,315

Int. Cl. F16k 45/00

U.S. Cl. 137—217

24 Claims

A vent for a liquid drainage system having a drainage lumen, including an air chamber, a one-way valve connected to the chamber, and a passageway connected between the chamber and drainage lumen. The valve opens to permit the passage of air into the drainage lumen, and closes to prevent passage of fluid from the chamber. The liquid, which drains in the lumen past the passageway, refluxes into the passageway

responsive to a positive pressure condition in the lumen relative to the pressure in the chamber, and the refluxing liquid flow forces air from the passageway into the chamber to close the valve. Air is confined in the chamber by the closed valve,



and the liquid flow compresses the confined air in the chamber to develop a resistive pressure in the chamber which prevents the liquid from entering the chamber and contacting the valve.

3,730,210

# MIXING VALVE ASSEMBLY

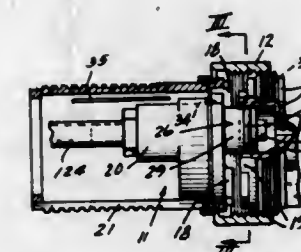
Marvin E. Heyne, Anoka, Minn., assignor to The Cornellus Company, Anoka, Minn.

Filed Nov. 16, 1971, Ser. No. 199,164

Int. Cl. F16k 19/00

U.S. Cl. 137—329.1

7 Claims



A mixing valve assembly includes a mounting sleeve, a first valve body with a pair of fluid passages leading to a single spout under the control of a single actuator, the first valve body being keyed to the mounting sleeve and held thereon by a threaded locking ring, and a second valve body with a pair of fluid passages each having a self-closing valve normally held open by the first valve body, there being telescopic fluid connections that are slidably detachable that form part of said valve bodies whereby the first valve body may be quickly demounted for service without use of tooling.

3,730,211

# SPRINKLER IRRIGATION SYSTEMS

Robert James de Laine, 1 Montrose Court, Murrumbidgee, and William Richard Clifford Geary, Flat 4, 18 Kensington Road, South Yarra, Victoria, both of Australia

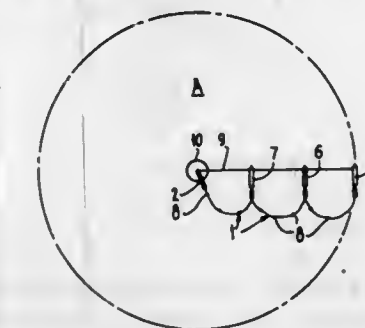
Filed April 21, 1971, Ser. No. 135,863

Claims priority, application Australia, April 22, 1970, 0982/70; Dec. 21, 1970, 3551/70

Int. Cl. B05b 9/02; E01h 3/02

U.S. Cl. 137—344

12 Claims



This specification discloses a sprinkler irrigation system comprising a sprayline swivelly secured to a central water hydrant, a plurality of hydraulic towing devices connected to

said sprayline and driven by the water therein, said towing devices being interconnected by a tie line swivelly secured to the hydrant and constraining the towing devices to move in a circular path. The outermost towing device controls the rate of movement of the whole system through control means connected to each intermediate towing device and operated by changes in the angular position of the tie line relative to the intermediate towing device.

3,730,212

# TRAILER WATER FILLING SYSTEM

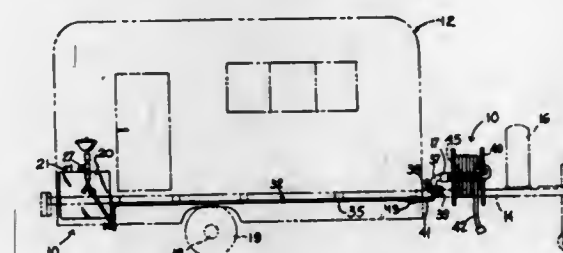
Leon E. Walch, 15660 Crescent Wood, East Detroit, Mich.

Filed May 24, 1971, Ser. No. 146,316

Int. Cl. B65h 75/40

U.S. Cl. 137—355.12

1 Claim



A trailer water filling system is disclosed for use with a trailer having a water storage tank for supplying fresh water and having a towing tongue by which said trailer is towed, said water filling system comprising first metal water piping constructed to be permanently fitted to said trailer and to extend thereon from the outlet of said water storage tank to the front of said trailer at the tongue thereof, support means constructed to be made fast to said tongue for supporting the front end of said first metal water piping hose reel assembly constructed to be removable and portable in respect to said trailer and including second metal water piping rotatably supporting said hose reel, said second metal water piping supported at said tongue on said first metal water piping, and a rotating seal union joining the inner end of said second metal water piping and the outer end of said first metal water piping, and a flexible hose carried in coiled form on said reel having its inner end connected to the outer end of said second metal piping.

3,730,213

# METER SETTER

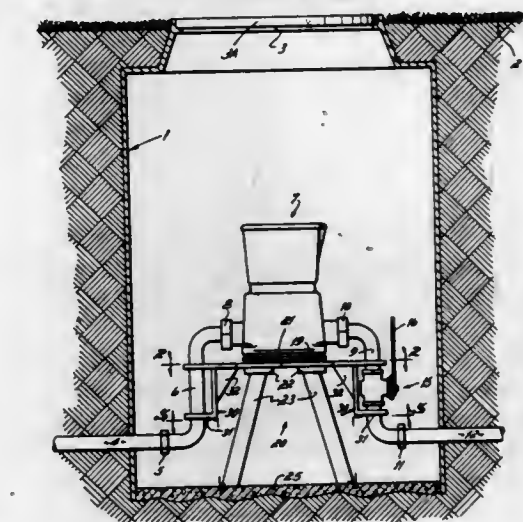
Robert E. Bates, 3608 Placid Place East, Owensboro, Ky.

Filed May 22, 1972, Ser. No. 255,809

Int. Cl. F16l 55/00

U.S. Cl. 137—364

7 Claims



A device for supporting and positioning a water meter to facilitate its connection in an underground water line. The device includes a meter platform supported on legs, and has



pipe positioning means at opposite sides of the platform for positioning vertical pipes to be connected to the inlet and outlet sides of the meter. The positioning means preferably include snap-in connections for the pipes, and permit each pipe to be shifted in a vertical direction to accommodate meters and installations of different dimensions.

3,730,214

**ROTARY VALVE PRESSURE REGULATING SYSTEM**

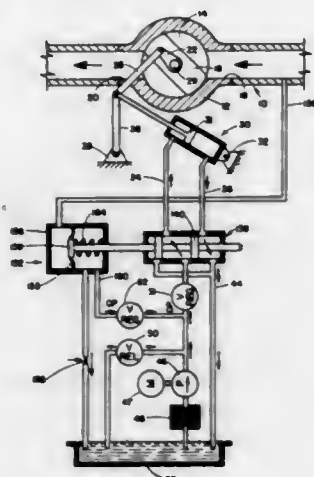
Richard S. Brumm, Orinda, Calif., assignor to Walworth Company, Bala Cynwyd, Pa.

Filed Sept. 24, 1971, Ser. No. 183,373

Int. Cl. F16k 31/12

U.S. Cl. 137—487

3 Claims



A pressure reducing regulating system including a rotatable control valve operated by a hydraulic cylinder. An infinite positioning four-way valve selectively connects opposite sides of the cylinder to a fluid source and is operated by a pressure-responsive member. The fluid pressure being controlled biases the pressure-responsive member against a fixed force, whereby the four-way valve is moved an amount proportionate to the extent to which the controlled pressure deviates from a predetermined level. The fixed force biasing the pressure-responsive member may be a fluid at a predetermined pressure, augmented by a spring force.

3,730,215

**DIAPHRAGM CONTROLLED AIR RELIEF VALVE**

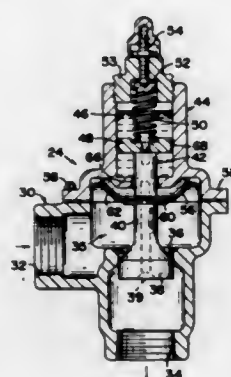
William J. Conery, and Donald A. Kaessen, both of Ashland, Ohio, assignors to Hydr-O-Matic Pump Company, Hayesville, Ohio

Filed April 8, 1971, Ser. No. 132,422

Int. Cl. G05d 16/00

U.S. Cl. 137—494

3 Claims



A valve for venting of air from the pumping chamber of a liquid pumping system. The valve assembly includes a valve casing having a through chamber with a valve seat and a valve head which is normally maintained on the downstream side of

the valve seat in spaced relation therefrom and which is connected to a valve stem extending through the valve seat. A flexible diaphragm is attached to the valve stem on the upstream side of the valve seat. Under low pressure, low volume flow or no flow conditions the valve remains in open position. As the flow rate increases, increased pressure on the diaphragm forces the valve stem in the upstream direction, bringing the valve head into closing contact with the valve seat.

3,730,216

**FUEL TANK INSERT FOR ADMITTING PRESELECTED PUMP NOZZLES**

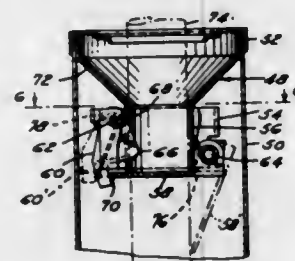
Lawrence E. Arnett, Wayne, and Paul J. Billock, Westland, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed April 6, 1972, Ser. No. 241,621

Int. Cl. F16k 45/00

U.S. Cl. 137—588

7 Claims



An insert to be positioned within the fuel tank inlet pipe of an automotive vehicle to prevent filling the tank with improper fuels. The insert would permit entry of and delivery from a pump nozzle spout of a predetermined diameter of less, to be used with non-leaded fuels and would preclude entry of and delivery from a larger diameter pump nozzle spout, to be used with leaded fuels. The insert includes a hinged gate having a latch which can be tripped by the smaller diameter nozzle but not by the larger diameter nozzle.

3,730,217  
**CHECK VALVE**

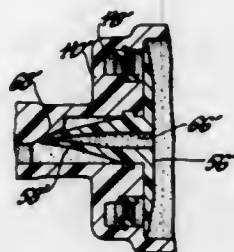
Loren R. Gate, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 19, 1971, Ser. No. 144,893

Int. Cl. F16k 15/14; F04b 21/02

U.S. Cl. 137—512.4

2 Claims



A check valve having an elastic member that provides sealing between a passage that leads to a chamber and a passage that leads from the chamber and further operates to provide check valve operation for directing flow from one of these passages to the chamber and also cooperates with additional check valve structure to direct flow from the chamber to the other passage.

3,730,218

**NON-RETURN VALVES**

Sverker Rydberg, Mantorp, Sweden, assignor to System Research Inc., New York, N.Y.

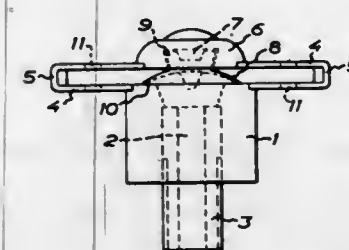
Filed June 26, 1970, Ser. No. 50,277

Claims priority, application France, July 2, 1969, 6922367

Int. Cl. F16k 15/14

U.S. Cl. 137—525

5 Claims



A non-return valve with closure means comprising two movable valve members, one of which is a diaphragm adapted to open rapidly at extremely slight pressures and to seal rapidly at back pressures, while the other valve member is a cover adapted to protect the diaphragm at relatively high back pressures in order to assure sealing engagement also at such conditions.

3,730,219

**CONTROL VALVE MEANS FOR FLUID MOTORS**

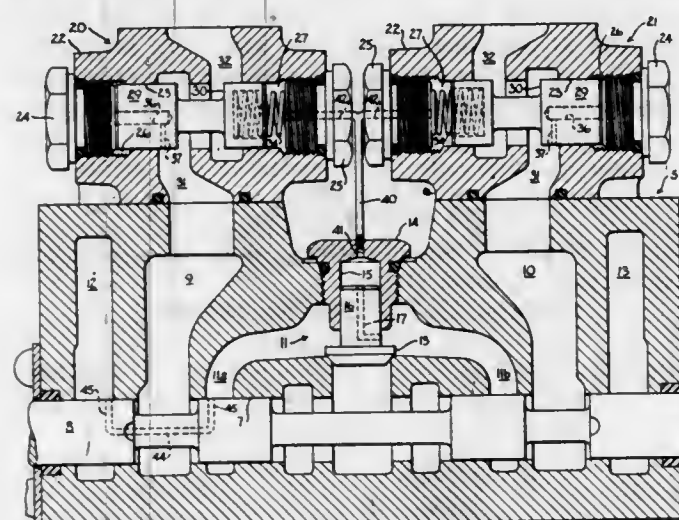
Francis H. Tenns, Oconomowoc, Wis., assignor to Hydraulic Industries, Inc., Hartland, Wis.

Filed May 20, 1971, Ser. No. 145,137

Int. Cl. F16k 11/00

U.S. Cl. 137—596

14 Claims



A pressure reducing valve mechanism maintains pressure in one of the service passages of a control valve at a desirably low value except at times when the control valve element is actuated to a position effecting flow of pressurized supply fluid to said service passage for delivery to a motor governed by the control valve.

3,730,220

**SELECTOR VALVES**

Kenneth Raymond Boydell, Bredons Hardwicke, Tewkesbury, England, assignor to Dowty Technical Developments Limited, Brockhampton, Cheltenham, England

Filed April 8, 1971, Ser. No. 132,479

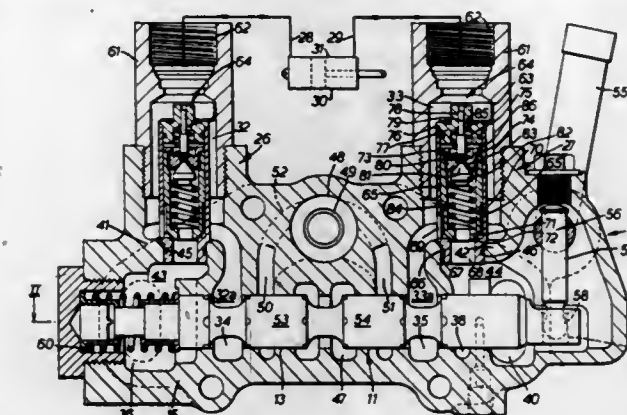
Claims priority, application Great Britain, April 24, 1970, 19692/70

Int. Cl. F16k 31/36, 31/12, 17/26, 17/32

U.S. Cl. 137—596.2

10 Claims

A selector valve has a service passage, the fluid flow through which from an inlet connection of the valve to a service-line connection thereof is controlled by a movable valve element, a service-line relief valve assembly being provided substantially wholly within, and arranged lengthwise of, said service passage by which that passage can be placed in com-



munication with an exhaust port of the valve when the fluid pressure in the passage exceeds a predetermined value.

3,730,221

**HYDRAULIC COUPLER WITH PRESSURE RELIEF MECHANISM**

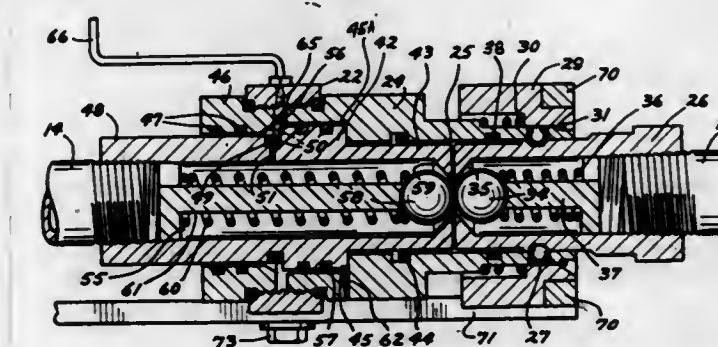
Albam M. Vlk, New Brighton, Minn., assignor to Dempco, Inc., Minneapolis, Minn.

Filed July 9, 1971, Ser. No. 161,154

Int. Cl. F16l 29/00

U.S. Cl. 137—614

18 Claims



A hydraulic coupler having two portions for hydraulic lines used, for example, in agricultural applications, which has an actuating device to open check valves to permit flow of fluid under pressure through said lines in response to pressure signals, for example a pressure signal in one line. The device also can be actuated to close the check valves to prevent flow through the coupler. The device is operable to permit the coupling or uncoupling of the two portions of the coupler without actuation against a high pressure.

3,730,222

**SINGLE LEVER MIXING VALVE**

Alfred M. Moen, 25 Lakeview Drive, Grafton, Ohio

Filed May 27, 1971, Ser. No. 147,359

Int. Cl. F16k 11/02

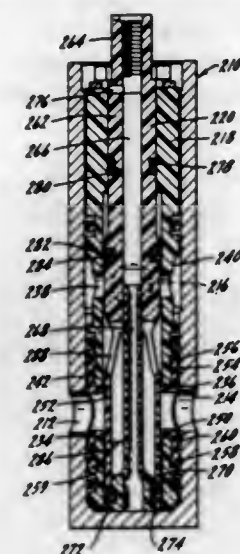
U.S. Cl. 137—625.17

17 Claims

A mixing valve for use in a faucet includes a sleeve which may be formed of plastic and a stem positioned within the sleeve and reciprocal and rotatable relative thereto. The sleeve has hot and cold water inlet ports and at least one outlet port. The stem has inlet and outlet openings such that movement of the stem is effective to control the volume and temperature of water discharged from the sleeve. The stem has an air passage connecting its opposite ends. There is a generally cylindrical seal enclosing the sleeve adjacent its inlet ports and



effective to form a seal between the exterior of the sleeve, the exterior of the stem within the sleeve and the interior of the



housing enclosing the stem and sleeve. The valve includes means for preventing water hammer.

3,730,223

## HIGH PRESSURE FLUID CONTROL VALVE

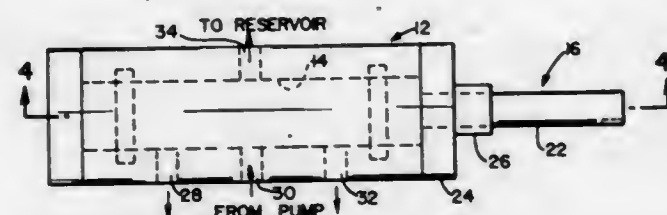
Robert L. Reece, Route 1, Box 130 East, Brentwood, Calif.

Filed June 1, 1971, Ser. No. 148,488

Int. Cl. F16k 11/00

U.S. Cl. 137—625.23

4 Claims



A fluid control valve for operating a hydraulic or pneumatic ram or other equipment. The valve is provided with an annular body in which a cylindrical rotor is rotatably mounted. Both the body and rotor are provided with a plurality of ports and passages so as to cause hydraulic fluid to be selectively directed in a plurality of directions.

3,730,224

## OUTLET VALVE FOR LIQUID SUPPLY RECEPTACLE

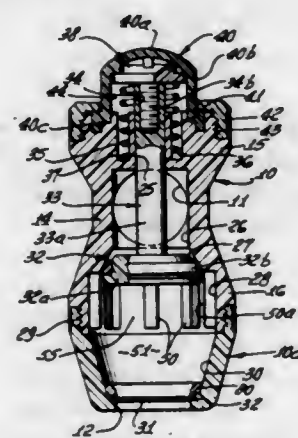
Orford W. Prisk, San Gabriel, Calif., assignor to Martin Weber, Alhambra, Calif.

Filed Dec. 23, 1970, Ser. No. 101,042

Int. Cl. F16k 1/32; F15d 1/10

U.S. Cl. 137—625.33

8 Claims



A valve assembly includes:

a. a valve body having a side inlet and a bottom outlet, there

being a downwardly facing annular seat in the body through which fluid passes in flowing to the outlet,

b. a stopper upwardly engagable against the seat and a stem carrying the stopper and projecting upwardly in the body,

c. yieldable means urging the stem upwardly, and

d. a device sealing off over the body proximate the stem upper terminal and having a flexible upper portion exposed upwardly and projecting over the stem upper terminal, whereby said terminal may be depressed through said device to urge the stem and stopper downwardly for opening the valve.

3,730,225

## SWITCHING MECHANISM FOR NEBULIZER-HUMIDIFIERS

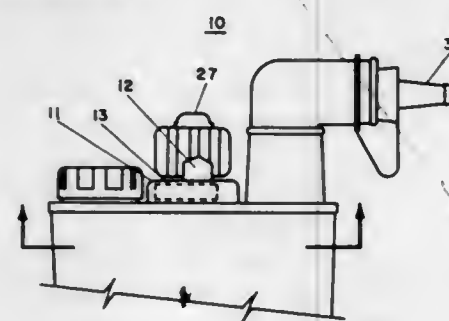
William R. King, Denver, Colo., assignor to Sandoz-Wander, Inc., Hanover, N.J.

Filed June 11, 1971, Ser. No. 152,352

Int. Cl. F16k 11/02

U.S. Cl. 137—625.48

2 Claims



An improved switching mechanism for nebulizer-humidifier comprising in combination a switch button, a switch cover, and a switch body. The switch body having on the bottom thereof and at opposing sides, seals which are adopted to cover alternatively mist or bubble gas channels, in response to the lateral movement of the switch button by an operator.

3,730,226

## AIR RELAY VALVE

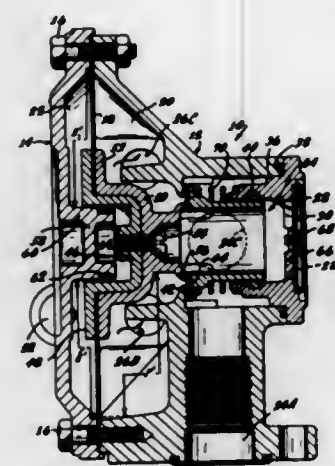
Thomas W. Nelson, Wilsonville, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Filed Oct. 13, 1971, Ser. No. 188,806

Int. Cl. B60t 13/24

U.S. Cl. 137—627.5

2 Claims



An air relay valve including an enclosed housing separated into an air supply chamber and a control chamber by a flexible diaphragm. Air pressure introduced into the control chamber flexes the diaphragm into the air supply chamber. This opens the air supply chamber to an air pressure source with ports directing the air pressure from the air supply chamber into air lines that activate, e.g., air brakes. The relay valve is further

designed whereby the inlet from the air pressure source is kept open until the pressure on both sides of the diaphragm are equalized causing return of the diaphragm and automatic closing of the air pressure source. The present invention is characterized in providing a diaphragm wherein the two sides have equal surface areas exposed to the air pressure so that automatic shut off occurs at the point when the p.s.i. of the air in the air lines substantially equals the p.s.i. of the air in the control chamber with exhausting of the air pressure occurring through an exhaust port in direct communication with the air supply chamber. A further improvement is the inclusion of a dampening chamber to dampen vibration of the diaphragm assembly.

3,730,227

## ORIFICE STRUCTURE

John A. Roberts, North Chelmsford; Peter R. Roberts, Groton, and Lee B. Danzey, Arlington, all of Mass., assignors to Brunswick Corporation, Skokie, Ill.

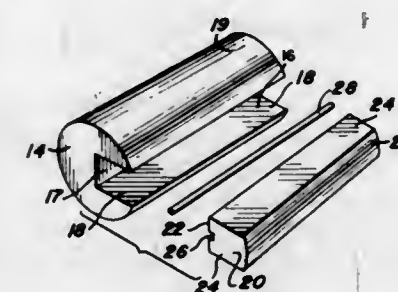
Division of Ser. No. 823,823, May 12, 1969, Pat. No.

3,591,915. This application June 28, 1971, Ser. No. 157,640

Int. Cl. F15d 1/00

U.S. Cl. 138—40

23 Claims



An orifice structure has one or more passages capable of controlling the amount of fluid that flows therethrough with the passage having an effective diameter ranging from 5 mils to 1 micron. The thickness of the orifice structure is at least 10 times greater than the effective passage diameter and the wall thickness of the structure is at least 5 times greater than the effective passage diameter.

3,730,228

## HOSE-CASE ASSEMBLY

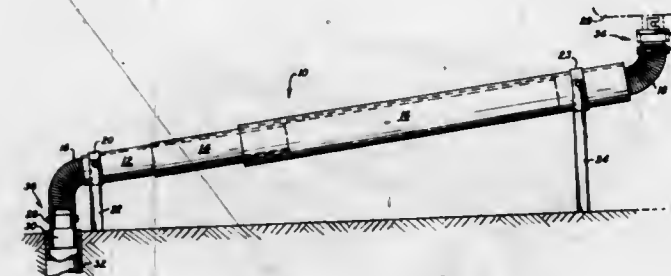
Paul H. Gibbs, Sr., 201 Wenda Way, El Paso, Tex.

Filed Jan. 5, 1972, Ser. No. 215,463

Int. Cl. F16l 7/00, 9/22, 57/00

U.S. Cl. 138—106

6 Claims



A hose case for supporting and enveloping a flexible hose that is capable of longitudinal extension and contraction in any position of extension and contraction of the hose. The case is formed of a plurality of telescoping tubular sections, through which the hose extends, that can be relatively extended and contracted in correlation with the extension and contraction of the hose.

3,730,229

## TUBING UNIT WITH HELICALLY CORRUGATED TUBE AND METHOD FOR MAKING SAME

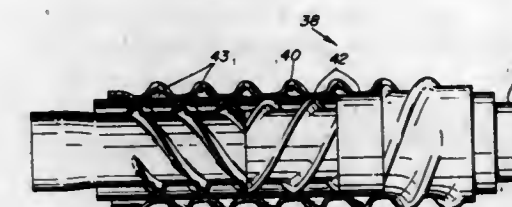
Mario L. D'Onofrio, Hartford, Conn., assignor to Turbotec, Incorporated, South Windsor, Conn.

Filed March 11, 1971, Ser. No. 123,150

Int. Cl. F16l 9/18

U.S. Cl. 138—114

2 Claims



A tubing unit useful, for example, as part of a heat exchanger includes a first tube containing a second helically corrugated tube having on its outer surface helical ridges which engage the inner wall of the first tube to mechanically lock the two tubes in assembly and to form one or more helical passageways between the first and second tubes. The first tube may be of a substantially straight cylindrical shape or may include helical grooves on its inner surface for receiving and mating with the radial outer end portions of the helical ridges on the outer surface of the second tube. A third tube may surround the first tube and include helical corrugations with inwardly extending ridges engaging the outer surface of the first tube to form another set of helical passageways between the first tube and the third tube. In the making of the tubing unit, the second tube is assembled over a mandrel and within the first tube and then twisted to form the helical corrugations therein, the mandrel limiting the inward growth of the inwardly extending ridges and the first tube limiting the outward growth of the outwardly extending ridges. In cases where a third tube is used, such third tube is placed over the second tube and twisted to form helical corrugations therein, the outer surface of the first tube limiting the radial inward growth of the inwardly extending ridges thereof.

3,730,230

## APPARATUS FOR CONTROLLING THE PICK COUNT PER INCH OF A LOOM

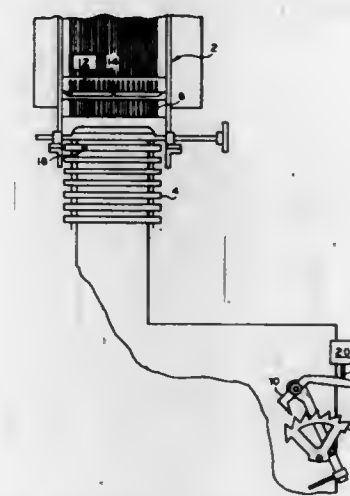
Rudolf Kodis, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 16, 1970, Ser. No. 89,899

Int. Cl. D03c 19/00; D03d 49/20

U.S. Cl. 139—24

6 Claims



A switch is associated with at least one pegging element mounted on the dobby chain of a conventional dobby loom and is connected to a plunger positioned adjacent the pick pawl of the take-up ratchet wheel of the loom for actuating the



plunger and increasing the pick count per inch of the cloth in response to closing of the switch by the pegging element through an indexing element of the loom.

3,730,231

# WEDGE COUPLING DEVICE BETWEEN A DRIVING SHAFT AND A CONNECTING ROD

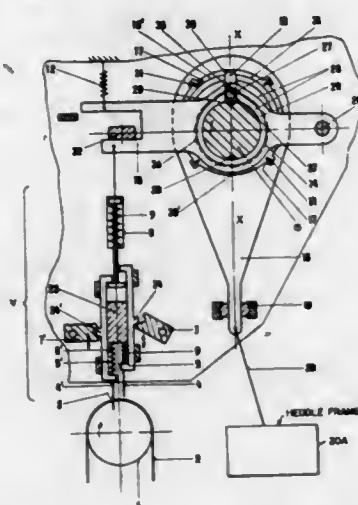
Ernst Hoenig, Horgen-Zurich, Switzerland, assignor to Staubli Ltd., Horgen-Zurich, Switzerland

Filed May 26, 1971, Ser. No. 146,875

Claims priority, application Switzerland, May 29, 1970, 8034/70

Int. Cl. D03c 1/00

U.S. Cl. 139-66



Dobby, in which the movement of the heald shafts is effected through a connecting rod 18, which connecting rod embraces an eccentric ring 28 on the driving shaft 15. Release of the movement is brought about by a coupling wedge 13, which is supported in the eccentric ring and for control purposes connects with the drive shaft of the connecting ring. The patternlike control of the wedge is effected by an arm 10 which is tiltable in a plane which is radial of the driving shaft. The arm has an opening 14 embracing the shaft, the offset collar 34 of which engages a groove 27 of the wedge.

3,730,232

# DOBBY WITH A DEVICE FOR MOVING ALL HEALD FRAME INTO THE SAME POSITION

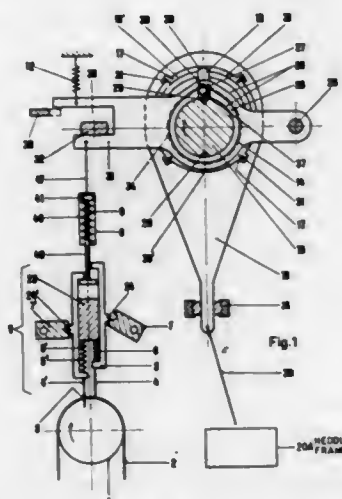
Walter Kleiner, Wädenswil, Switzerland, assignor to Staubli Ltd., Horgen-Zurich, Switzerland

Filed May 26, 1971, Ser. No. 146,867

Claims priority, application Switzerland, May 29, 1970, 8035/70

Int. Cl. D03c 1/00, 15/00

U.S. Cl. 139-66



Dobby with a device for moving all heald frame of a Jacquard loom to the same height, for example the central

position or the upper shed position, which machine has a wedge type coupling wherein the wedge is to be controlled according to a preselected pattern. An adjusting cam 32, 39 is arranged in the control mechanism for the wedge 13, which adjusting cam limits movement of the control arm 10. In order that this does not result in an overloading of any part of the machine, a compensating spring 9 is also arranged in the control mechanism.

3,730,233

# LOOM TAKE UP MOTION

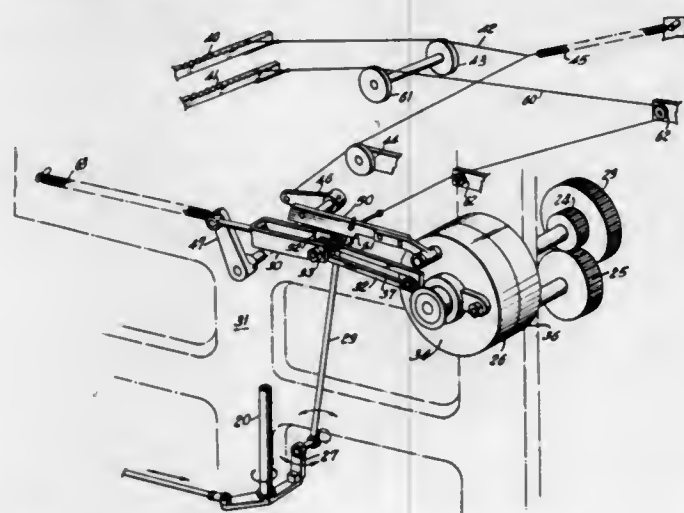
Richard E. Goff, Barrington, and Antonio Schiappa, Pawtucket, both of R.I., assignors to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 823,661, May 12, 1969, Pat. No. 3,685,549. This application June 25, 1971, Ser. No. 143,689

Int. Cl. D03d 49/20

U.S. Cl. 139-309

2 Claims



A strip of narrow woven fabric having elastic sections and non-elastic sections predeterminedly spaced along the length of the fabric. The fabric is continuously woven with areas having less picks per inch than other areas so that the areas containing the fewer picks are elastic and the other areas are non-elastic with spaced areas woven to provide smooth cutting areas for manufacturing a plurality of strips of narrow material.

3,730,234

# TERMINAL PIN STRAIGHTENING MACHINE

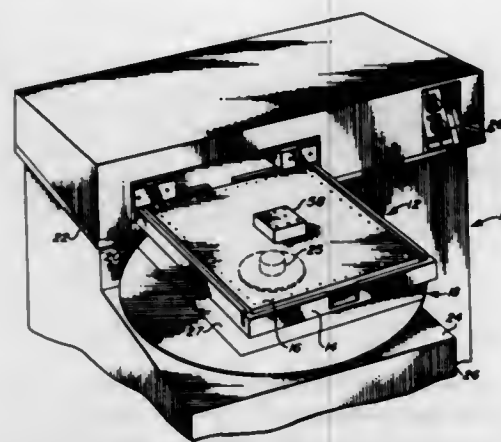
Patrick George Hesselmann, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 7, 1972, Ser. No. 216,150

Int. Cl. B21f 1/02

U.S. Cl. 140-147

16 Claims



A novel machine and method for simultaneously straightening a field of terminal pins inserted into a circuit panel assembly.

3,730,235

# APPARATUS FOR FILLING CONTAINERS

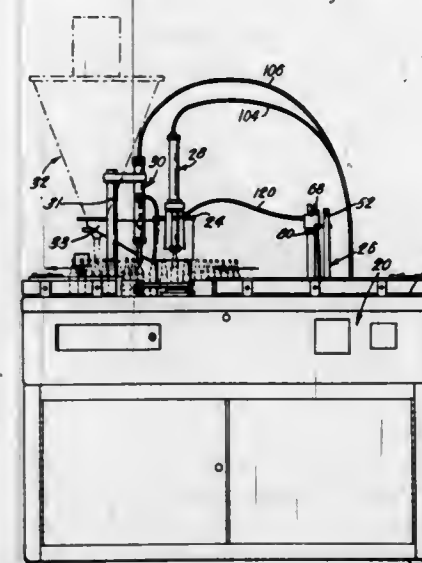
Roy D. Lewis, Montreal, Quebec, Canada, assignor to G. Diehl Mateur Co., Strafford, Pa.

Division of Ser. No. 823,348, May 9, 1969, abandoned. This application Dec. 30, 1970, Ser. No. 102,857

Int. Cl. B65b 43/50

U.S. Cl. 141-172

4 Claims



A machine for automatically filling containers such as ampoules and the like having a circular indexing table for moving the containers through a filling station. A liquid filling device having a discharge nozzle, an adjustable volume metering chamber and a valve controlling the filling of the chamber and the discharging of the liquid to the container through the nozzle. A powder filling device having a reservoir and a nozzle, the powder filling device and the liquid filling nozzle being rotatably mounted for alternative use at the filling station.

3,730,236

# APPARATUS FOR ROUTING RECESSES IN DOORS AND THE LIKE

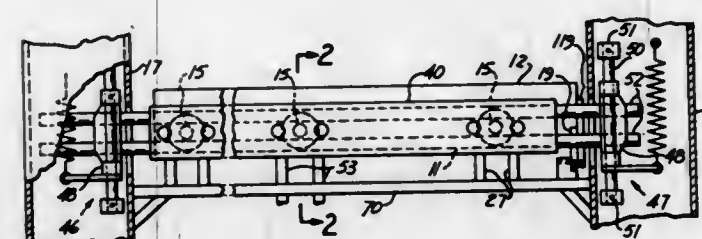
Donald V. Frydenberg, Arlington, Tex., assignor to Clary Corporation, San Gabriel, Calif.

Filed May 3, 1971, Ser. No. 139,730

Int. Cl. B27f 5/02

U.S. Cl. 144-27

9 Claims



An apparatus for accurately and concurrently routing recesses in both doors and associated door jambs to receive hinges of different sizes. The apparatus automatically follows a templet device which can be readily adjusted to form recesses for different size hinges.

3,730,237

# SCREW-SUPPORTING ATTACHMENT FOR THE SHANK OF A SCREW DRIVER TOOL

William M. Hanzlik, Route 3, Brewster, N.Y.

Filed July 23, 1971, Ser. No. 165,467

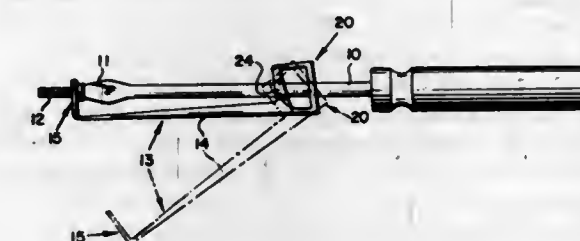
Int. Cl. B25b 15/02, 23/08

U.S. Cl. 145-52

2 Claims

This attachment has its end remote from its screw-supporting yoke formed of a pair of resilient wings embracing the

shank of the tool and so formed that the attachment is not only longitudinally slidably mounted on the shank but is also readi-



ly tiltable through an angle which displaces the yoke clear of the screw merely by pressing a finger of the hand holding the tool against the rear extremity of the attachment.

3,730,238

# FRICTION TYPE SCREWDRIVER

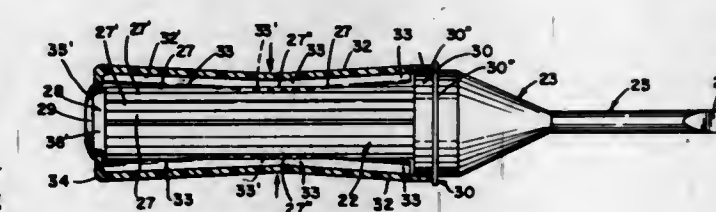
Richard G. Butler, Box No. 391, Gimli, Manitoba, Canada

Filed Sept. 21, 1971, Ser. No. 182,321

Int. Cl. B25g 1/00

U.S. Cl. 145-76

1 Claim



The invention comprises a screwdriver having an inner handle fixed to the working end of the screwdriver. A resilient sleeve is rotatably mounted about the inner handle, and is compressible radially by the operator against the inner handle to frictionally engage the inner handle. The operator will compress the resilient sleeve against the inner handle and turn resilient sleeve to turn the inner handle and working end of the screwdriver through the frictional engagement between the sleeve and the inner handle. Thereafter he will release the compression of the resilient sleeve and rotate the sleeve relative to the inner handle and working the end of the screwdriver back to its original position.

3,730,239

# CIRCULAR SAW WITH IMPROVED MOVABLE GUARD CONSTRUCTION

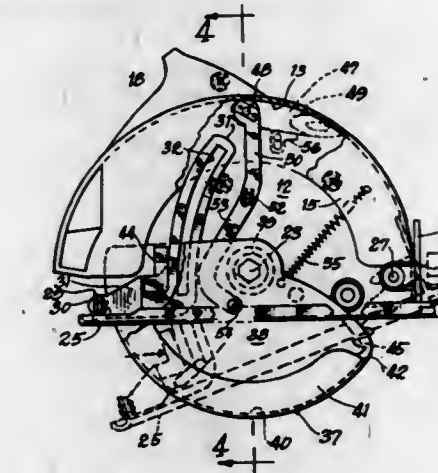
Frank A. Kaman, Prospect Heights, and Harold McConaughay, Batavia, both of Ill., assignors to Skil Corporation, Chicago, Ill.

Filed Dec. 10, 1971, Ser. No. 206,639

Int. Cl. B27g 19/04

U.S. Cl. 143-159 H

5 Claims



The adjustably mounted base plate carries a first abutment formation adjacent the trailing end of the slot which is formed



therein to receive the circular saw blade. The lower blade guard has a second abutment formation thereon adjacent its work-engaging forward end. The second abutment formation is brought into abutting engagement with the first abutment formation upon movement of the lower blade guard toward its open position whereby the lower blade guard exposes only the blade teeth which extend through the slot in the base plate irrespective of the angular disposition of the latter. A manually operated retracting mechanism for the lower blade guard includes linkage operated by a handle mounted on the side of the fixed blade guard which is adjacent the tool motor.

3,730,240

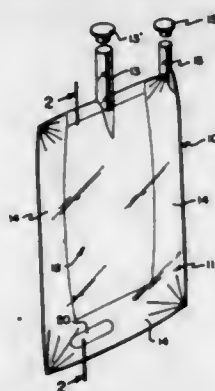
**INFLATABLE INSULATION FOR PACKAGING**  
Michael C. Presnick, c/o Metatronics Manufacturing Corp.,  
111 Bloomingdale Road, Hicksville, N.Y.

Filed March 16, 1971, Ser. No. 124,717

Int. Cl. F28b 7/00

U.S. Cl. 150-2.5

3 Claims



The invention disclosed herein relates to the use of dead air spaces to provide insulation for packaged materials. In one form of the invention, a nested pair of thermoplastic bags define an inflatable chamber therebetween, which chamber, upon being filled with air, provides a dead air space between the ambient atmosphere and the inner bag. The air space provides thermal insulation for the packaged material within the inner bag. In another form of the invention, a series of inflatable bi-walls, which are articulated to one another for subsequent formation into a rectangular parallelepiped shape, are disposed as a liner within a conventional corrugated paper-board container. When inflated, the bi-walls will insulate the packaged contents of the container. The bi-walls of the inflatable insulation used in either of the embodiments of the invention are fabricated from inexpensive, flexible but substantially non-elastic, thermoplastic film material which may be fabricated by conventional techniques and which may be readily heat sealed into any of the desired configurations.

3,730,241

**BOWLING BALL, BAG AND SHOE RACK**

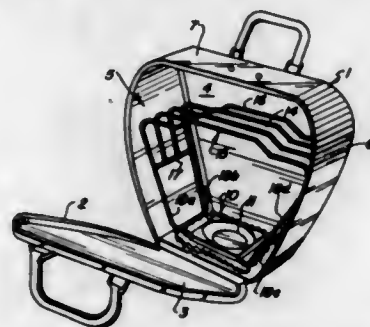
Robert Richardson, Eminence, Ky., assignor to Brunswick Corporation, Skokie, Ill.

Filed Aug. 11, 1971, Ser. No. 170,942

Int. Cl. B65d 65/02; A45c 3/00, 13/00

U.S. Cl. 150-52 A

4 Claims



The invention is a side opening bowling ball bag with removable shoe rack. The bottom of the bag is a molded

plastic element forming a ball retaining cup and a series of horizontal sockets. The legs of the shoe rack terminate in feet which removably engage the sockets in the bag bottom and are urged into the sockets by the spring action of the rack structure.

3,730,242

**ONE-BOLT MOUNT**

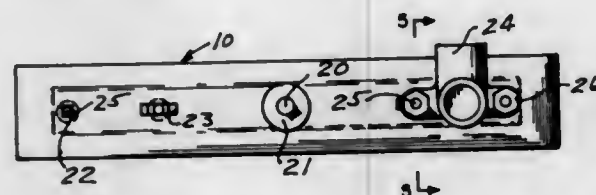
Warren R. Dale, Wever, Iowa

Filed Dec. 13, 1971, Ser. No. 207,062

Int. Cl. F16b 39/00; F16l 3/22

U.S. Cl. 151-41.7

1 Claim



A plumbing accessory for mounting ells or the like to a wall in the form of a metal strip having a center hole receiving an anchoring fastener and having pairs of additional holes providing adjustable mounting means for the ells or the like.

3,730,243

**FRICTION LOCKS**

Howard John Leonard Smith, Badshot Lea, Farnham, England, assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

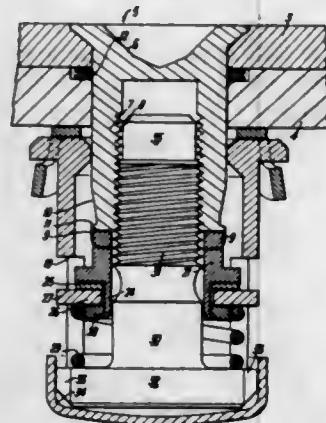
Filed Aug. 26, 1971, Ser. No. 175,152

Claims priority, application Great Britain, Sept. 3, 1970, 42,283/70

Int. Cl. F16b 39/28

U.S. Cl. 151-41.5

10 Claims



A fastener comprises a stud having a shank with a screw threaded bore and a receptacle assembly including an externally screw threaded pin over which the stud may be screwed. The receptacle assembly also includes an axially slotted barrel containing a friction clutch which comprises a non-rotatable part in the form of a washer with projections extending into the slots of the barrel and a rotatable part including two members between which the washer is trapped together with a spring washer for providing frictional engagement between the rotatable and non-rotatable parts. The end of the stud has four recesses which co-operate with a pair of projections on the rotatable part of the clutch. As the stud is screwed over the pin the recess in the stud end engage the projections on the rotatable part of the clutch and further turning of the stud is then opposed by the frictional torque provided by the clutch. A light spring is provided within the barrel for urging the clutch into engagement with the stud end.

3,730,244

**COMPRESSIBLE VEHICLE TIRE**

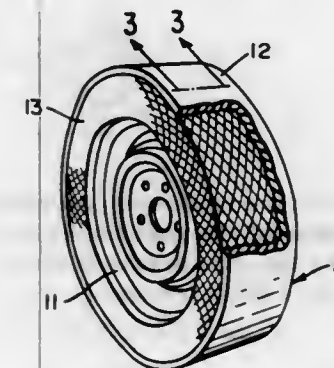
William Campbell Rees, Winchester, Mass., assignor to W. R. Grace &amp; Co., Cambridge, Mass.

Continuation-in-part of Ser. No. 71,801, Sept. 14, 1970, which is a continuation-in-part of Ser. No. 725,577, April 17, 1968, Pat. No. 3,568,286, which is a continuation-in-part of Ser. No. 588,174, Oct. 20, 1966, abandoned. This application May 11, 1971, Ser. No. 142,273

Int. Cl. B60c 7/60

U.S. Cl. 152-323

12 Claims



A compressible vehicle tire is disclosed wherein elastomer-coated filaments (e.g., synthetic rubber coated glass filaments) are wound on a core at an angle to the core and apart from one another and are joined at the cross-over points by the elastomer. The filaments are wound in such a manner that void spaces are defined by the filaments resulting in a porous, compressible structure. The outer surface may be covered with a layer of conventional tread compound.

3,730,245

**PNEUMATIC TIRE FOR HIGH-SPEED MOTORCYCLE**

Sigeru Kusunoki; Yoshitsugu Murakami, both of Kodaira; Yutaka Tashiro, Kuroiso; and Kazuki Tabata, Okita, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

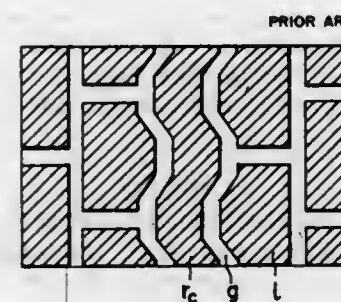
Filed March 10, 1971, Ser. No. 122,959

Claims priority, application Japan, March 18, 1970, 45/22467

Int. Cl. B60c 11/04

U.S. Cl. 152-352

7 Claims



A pneumatic tire for motorcycles, which provides a wide effective contact area with the road surface regardless of whether the motorcycle is in vertical or inclined posture. The tire includes a tread having a central groove extending along the tire equator, a pair of central ribs circumferentially extending along opposite sides of the central groove, and a plurality of independent blocks disposed on shoulder portions of the tread.

3,730,246

**PNEUMATIC TIRE**

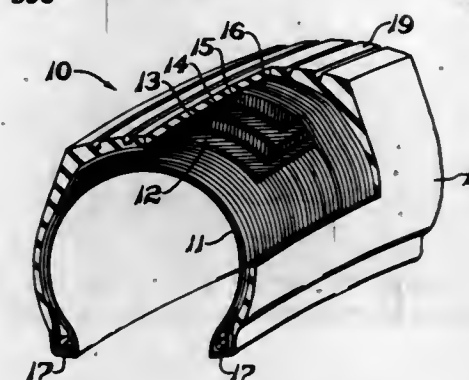
James Sidles, West Richfield, Ohio; Dennis P. Skala, Fairview, Pa., and Leonard Skolnik, Cleveland, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Division of Ser. No. 713,373, March 15, 1968, Pat. No. 3,560,286. This application Oct. 29, 1970, Ser. No. 84,970

Int. Cl. B60c 9/20

U.S. Cl. 152-356

4 Claims



A pneumatic tire comprising a carcass of radially disposed plies of inextensible reinforcing cords, surmounted by a restricting band of circumferentially disposed plies of reinforcing cords of predetermined stretchability intermediate the radially disposed plies, the tire being formed in flat band form on a conventional building drum.

3,730,247

**REPAIR PATCHES AND METHODS**

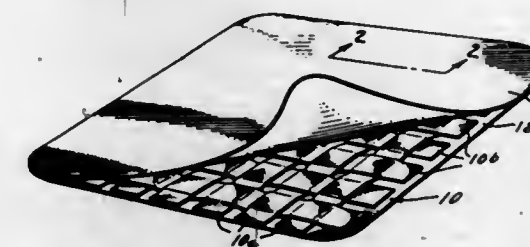
John D. White, 239 South Irwindale Avenue, Azusa, Calif.

Continuation-in-part of Ser. No. 845,204, July 28, 1969, abandoned. This application May 24, 1971, Ser. No. 146,265

Int. Cl. B60c 21/02

U.S. Cl. 152-367

26 Claims



An inflatable structure, such as an automobile tire or a rubber boat, or a patch for use in the repair of pneumatic devices, has first and second groups of elastic strips woven as strips in intertwining relationship.

A method of repairing a damaged portion of a radial ply tire uses a tire patch having a first group of elastic strips and a second group of elastic strips extending at right angles to the strips in the first group. These strips in the first group are oriented in parallel to the radial plies when the repair patch is applied to the damaged portion. In this manner, the strips in the second group are oriented at right angles to the radial plies. The strips in the first and second groups are preferably woven as strips in intertwining relationship.

3,730,248

**RIM FOR MOUNTING PNEUMATIC TIRES ON WHEELS**

George David Beharrell, 153 Darridge Road, Solihull, and George Edward Adams, 18 Villiers Road, Kenilworth, both of England

Division of Ser. No. 595,746, Nov. 21, 1966, Pat. No. 3,588,981. This application Nov. 20, 1970, Ser. No. 91,265

Int. Cl. B60c 5/16

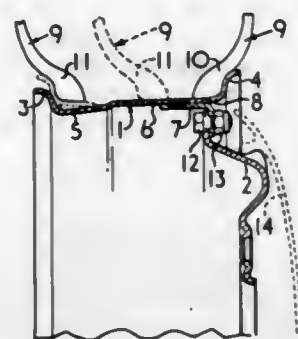
U.S. Cl. 152-379

2 Claims

A pneumatic tire and rim assembly is comprised of a one piece rim having an inwardly depressed well portion with a tire



bead-retaining flange which is depressed inwardly to permit the pneumatic tire to pass over the depressed flange. After the tire is positioned the inwardly depressed well portion is ex-



panded radially outwardly to bring the tire bead-retaining flange into supporting relation with the bead of the pneumatic tire.

3,730,249

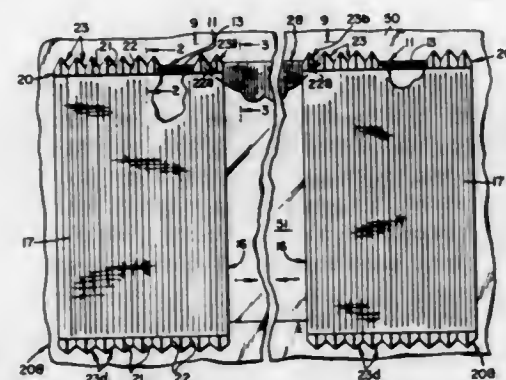
## DRAPERY INSTALLATIONS

Morris Hess, 436 Fort Washington Avenue, New York, N.Y.

Filed Jan. 24, 1972, Ser. No. 220,186

Int. Cl. A47h 1/00

U.S. Cl. 160—126



In common drapery installations consisting of two panels slidably suspended from a support rod and adapted to be moved together or apart, when they are separated the position of the support rod between the panels is exposed to view. This invention provides an intermediate and also slidably suspended fabric vertically dimensioned to conceal the support rod when the panels are spaced apart and provides accordion-pleated strips forming the upper edges of the panels in the outline of upward projections, with the juxtaposed end projections of the two strips extending outward at an angle to the rod in the form of flaps. When the panels are brought together the intermediate fabric is collapsed and concealed between the said two flaps and the portions of the panels immediately below the flaps.

3,730,250

## METHOD OF MAKING A SAND MOLD

Harrison E. Fellows, Clearwater Lake, Wis.

Division of Ser. No. 790,072, Jan. 9, 1969, Pat. No. 3,589,431.

This application Jan. 28, 1971, Ser. No. 110,654

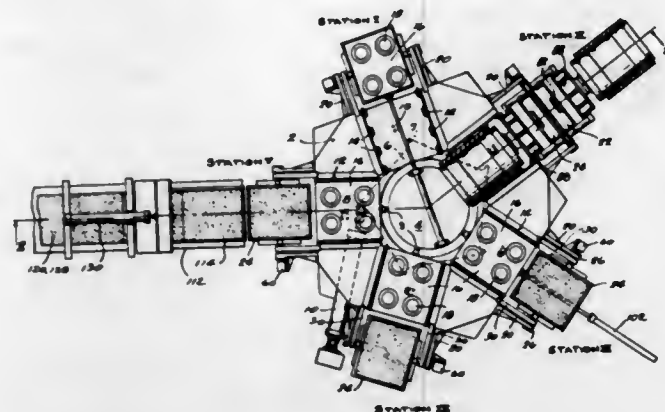
Int. Cl. B22c 15/22

U.S. Cl. 164—22

6 Claims

Bottomless cope and drag boxes mounted on a turntable are cleaned, assembled upon a pattern plate, turned on edge and clamped between closure platens and filled with molding sand. The platens are then advanced into the boxes to compress the sand against the patterns to form molds. Upon withdrawal of the platens, a sprue hole is made, the assembly is rotated to horizontal, and the boxes and contained molds are separated from the pattern plate, which is then withdrawn. After inser-

tion of cores, if any, the boxes and molds are re-closed. An elevator rises through a withdrawal yoke into engagement with the mold whereupon a complementary platen opposing



the elevator forces the sand mold downwardly from the boxes and into the plane of the yoke to the level of a withdrawal table onto which the yoke draws the mold, leaving the boxes empty for repetition of the process.

3,730,251

## METHOD OF CONTINUOUS CASTING

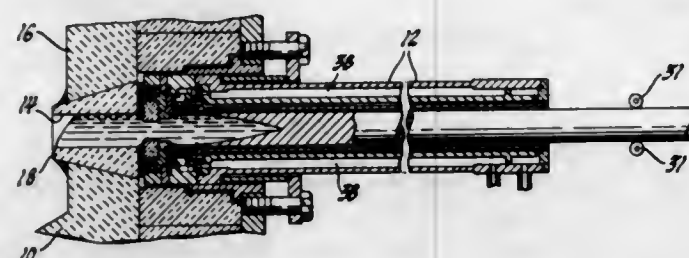
Fred J. Webber, Orchard Lake, and Robert G. Williams, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 827,673, May 26, 1969, abandoned. This application June 21, 1971, Ser. No. 155,263

Int. Cl. B22d 11/02

U.S. Cl. 164—82

6 Claims



Method involves continuously but incrementally passing molten metal directly from a holding vessel progressively through an open-ended mold containing three consecutive zones. The first zone immediately adjacent the holding vessel conveys the molten metal to the second zone without significant solidification due to its low heat transfer capacity. A thin skin of metal forms progressively in the second zone due to its relatively high heat transfer capacity. This thin skin is then transferred as a segment into the third zone in which the molten metal solidifies sufficiently to form a self-sustaining rod.

3,730,252

## PROCESS FOR POURING LIQUID METLS FROM METALLURGICAL VESSELS

Emil Schnurrenberger, Steinhausen, Zurich, Switzerland, assignor to Interstop AG, Zug, Switzerland

Filed Dec. 30, 1971, Ser. No. 214,165

Claims priority, application Germany, Jan. 8, 1971, P 21 00 632.6

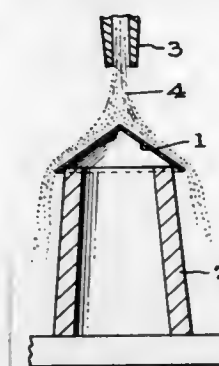
Int. Cl. B22d 7/12

U.S. Cl. 164—134

7 Claims

A process and apparatus for pouring a liquid melt from a metallurgical vessel such as a ladle wherein the pouring-out opening is provided with a solidification-preventing, loose filler, before the vessel is filled with the liquid melt. The pouring-in opening of the container prior to pouring which receives the liquid melt is covered with a protective screen

inclined in relation to the axis of the pouring jet. The screen consists of a material that cannot be inflamed by the filler but is inflammable by the melt. The protective screen between the pouring-out opening of the vessel and the pouring-in opening of the container to receive the liquid melt may be paper, card-



board or a readily inflammable synthetic resin. The screen may have a thickness of about 1—2 mm and a smooth surface on the side which faces the outflowing melt. The screen may be a conically shaped protective screen or a roof-shaped protective screen.

3,730,253

## PATTERN DEVICE FOR FOUNDRY MOLDS

Erwin Buhrer, Vogelingasschen 40, Schaffhausen, and Franz Keller, Neuhausen am Rheinfall, both of Switzerland, assignors to said Buhrer, by said Keller

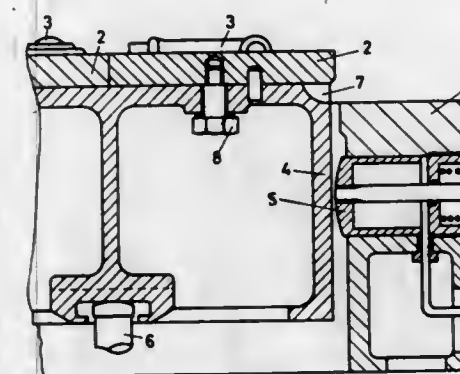
Filed April 27, 1971, Ser. No. 137,828

Claims priority, application Switzerland, May 15, 1970, 7332/70

Int. Cl. B22c 7/04

U.S. Cl. 164—241

4 Claims



Disclosed is a device for replacing patterns for molds disposed on a replaceable pattern supporting unit. The pattern unit is centered by a centering frame and supported on a lifting member. The lifting member is connectable to the bottom of the pattern supporting unit by a turnable locking flange biased downwardly by a spring or hydraulically. At the lowered position of the unit, the flange locks this unit to the pattern table and during the lift of the unit the flange becomes released.

3,730,254

## ROLLER PAIR TYPE CONTINUOUS CASTING APPARATUS

Philippe Namy, Saint-Etienne, France, assignor to Creusot-Loire, Paris (Seine), France

Filed Dec. 18, 1970, Ser. No. 99,426

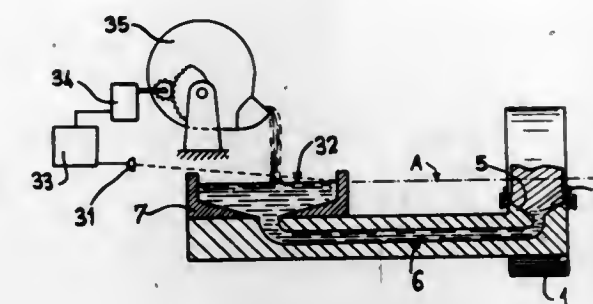
Int. Cl. B22d 11/06

U.S. Cl. 164—268

5 Claims

In the continuous casting of a metallic band or strip, more particularly of steel, by injecting the molten metal between

two cooled cylinders which are rotated in such manner that the facing portions of their peripheries move in unison in the direction of injection, the cast strip is maintained on the periphery of one of the cylinders until it is substantially fully solidified. The pressure head at the outlet of the injection nozzle corresponds to a level of molten metal situated above the nip of the cylinders. The inner side of the lateral cheeks which



prevent the molten metal from flowing laterally is heated to prevent substantial solidification of the edges of the strip before same has passed through the nip. The cast strip is cooled on the cylinder on which it is maintained, as for instance by a water spray. The other cylinder is continuously lubricated to prevent sticking of the cast strip thereon. In a modification the horizontal axes of the cylinders are in a non horizontal plane, the cast strip being maintained against the lower cylinder.

3,730,255

## CONTINUOUS CASTING MACHINE

Georg Bollig, Buederich; Josef Zeller, Weesen, and Willi Simons, Duesseldorf, all of Germany, assignors to Schloemann Aktiengesellschaft, Duesseldorf, Germany

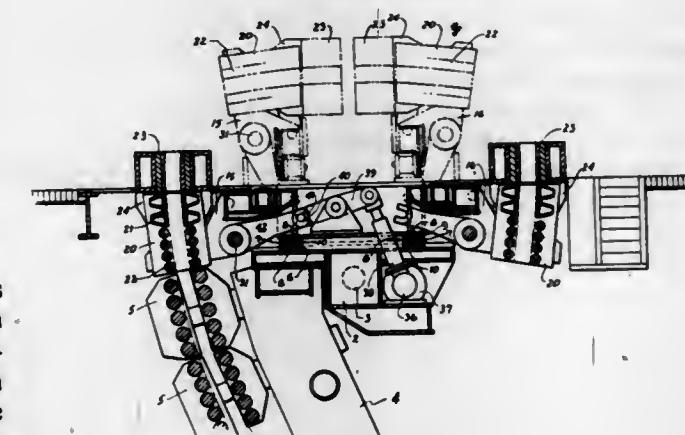
Filed Dec. 14, 1971, Ser. No. 207,929

Claims priority, application Germany, Dec. 14, 1970, P 20 61 436.2

Int. Cl. B22d 11/08

U.S. Cl. 164—274

6 Claims



In a continuous casting machine two molds, each having the first section of the apron of a secondary cooling zone connected thereto to form a unit, are mounted on a turntable which is rotatable on a vertical axis. Each of said units is mounted to swing on said turntable on a horizontal axis. Thus, while one of said units is in casting position, and while casting continues, the other unit may be repaired or exchanged for a unit of different casting cross-section. To shift from one unit to another, both units are swung upwardly on their horizontal axes, and the turntable is then rotated on its vertical axis to bring the selected unit to proper position to allow the unit to be swung down to casting position.

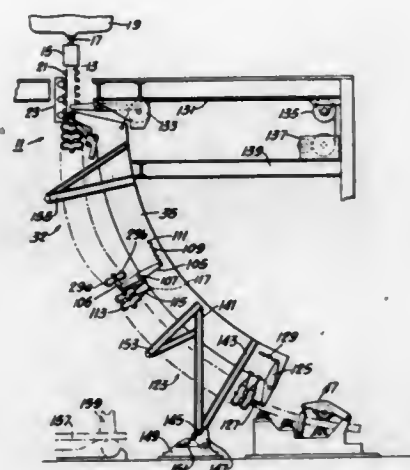


3,730,256

**APPARATUS FOR BENDING CONTINUOUS CAST SLABS**  
Kurt Reinfeld, and Emmanuel V. Gouye, both of Pittsburgh, Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.  
Division of Ser. No. 837,851, June 30, 1969, Pat. No. 3,590,908. This application Jan. 7, 1971, Ser. No. 104,817  
Int. Cl. B22d 11/12

U.S. Cl. 164—282

8 Claims



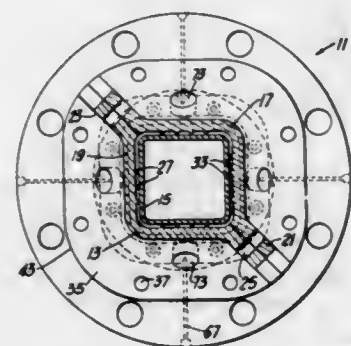
A slab emerging from a casting mold is supported by an articulated roller chain resiliently biased and mounted to a frame. Groups of rollers comprising such chain are mounted to equalizing brackets, and one group of rollers is secured to a piston-cylinder assembly. When the piston cylinder assembly is actuated, the rollers connected thereto exert a bending force on the slab which curves and is supported by the articulated roller chain.

3,730,257

**CONTINUOUS CASTING SLEEVE MOLD**  
Theodor H. W. Haussner, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.  
Filed June 24, 1971, Ser. No. 156,325  
Int. Cl. B22d 11/02

U.S. Cl. 164—283

2 Claims



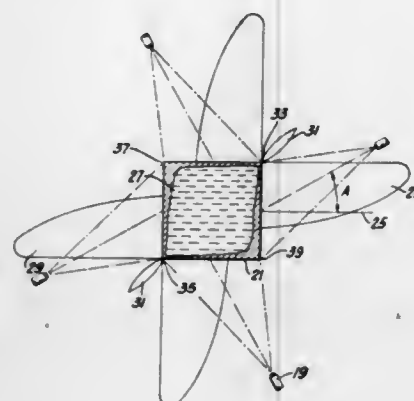
The jacket of the mold is comprised of two cast iron halves, each of which has from two to four or more longitudinally extending ridges which contact and support a copper mold sleeve. The ridges maintain the sleeve in spaced relation to the jacket and thereby form cooling water flow passages.

3,730,258

**SPRAY COOLING FOR CONTINUOUS CAST STRAND**  
Rufus Easton, Pittsburgh, Pa., assignor to Kopper Company, Inc., Pittsburgh, Pa.  
Continuation-in-part of Ser. No. 868,093, Oct. 21, 1969, abandoned. This application May 27, 1971, Ser. No. 147,331  
Int. Cl. B22d 11/12

U.S. Cl. 164—283

6 Claims



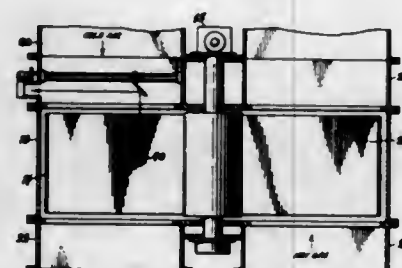
A plurality of nozzles, lying in spaced apart planes normal to the longitudinal axis of the cast strand, are disposed obliquely to the faces of the cast strand and in zones outside of the regions in which the liquid metal issuing from a breakout flows.

3,730,259

**HOT-SPOT DETECTOR FOR HEAT EXCHANGER**  
Donald F. Wixson, Wellsville, and George K. Ostrander, Angelica, both of N.Y., assignors to The Air Preheater Company, Inc., Wellsville, N.Y.  
Filed March 2, 1972, Ser. No. 231,273  
Int. Cl. F28d 17/00, 19/00

U.S. Cl. 165—5

14 Claims



A "hot-spot" detecting arrangement for a heat exchanger that receives a flow of hot exhaust gases containing unburned products of combustion. The arrangement detects "hot-spots" or developing fires in deposits of said unburned products of combustion before high temperature is allowed to damage the integrity of the heat exchanger.

3,730,260

**HEAT EXCHANGER APPARATUS FOR HYDRAULIC SYSTEM**

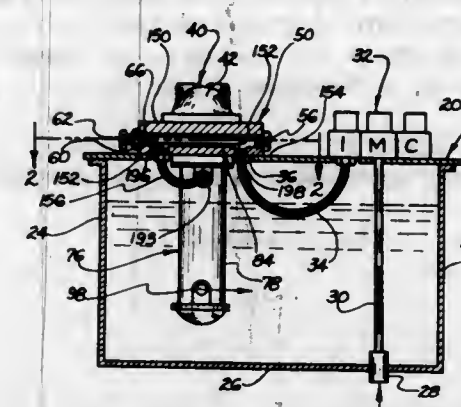
Robert E. Raymond, Zanesville, Ohio, assignor to International Basic Economy Corporation, New York, N.Y.  
Filed March 18, 1971, Ser. No. 125,527  
Int. Cl. F25b 29/00

U.S. Cl. 165—27

6 Claims

An improved heat exchanger apparatus adapted to be removably mounted on a reservoir means and extended through an opening in the wall thereof so as to be disposed in the bath of fluid therein. The heat exchanger apparatus is

further characterized by an integral water flow control valve and temperature probe which are uniquely mounted within



the module so as to provide a unique modular cooling unit with all of the element thereof packaged within a single removable heat exchanger unit.

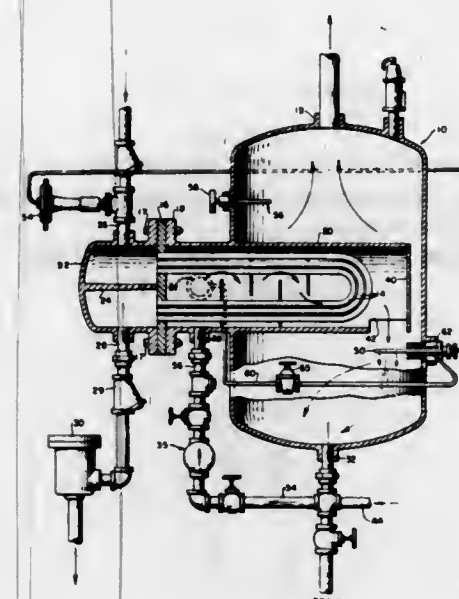
3,730,261

**WATER HEATING SYSTEM**

John A. Clark, Jr., East Stroudsburg, Pa., assignor to The Patterson-Kelley Co., Inc., East Stroudsburg, Pa.  
Filed April 26, 1971, Ser. No. 137,127  
Int. Cl. B60h 1/00

U.S. Cl. 165—39

3 Claims



This invention relates to an industrial water heater of the so-called "instantaneous" type, featuring in functional combination; a single, compactly-sized, water storage tank; a heating tube bundle extending into the tank and enclosed within a novel water flow control shroud; the shroud being in communication with the discharge of a water circulating pump operating continuously to draw water from the tank and to circulate it through the shroud. The shroud is closed at its outer end and at its inner end except for a downwardly directed discharge opening. A circulating water temperature sensing bulb is disposed immediately adjacent to and in line with the flow of water from the shroud discharge, and is operable to regulate the rate of heat energy flow through the tube bundle so as to attain an improved water temperature change response, and constant maintenance of a desired storage water temperature condition.

By virtue of the arrangement of the invention the heated water delivered from the shroud is directed downwardly into a water temperature "blending" section of the tank wherein it participates in a kinetic-convection temperature blending

process before it rises to the upper section of the tank wherefrom it is immediately available for withdrawal through the service outlet from the tank. The invention also contemplates employment of an improved heat supply requirement anticipating arrangement, whereby an improved sensitivity of automatic operational control is achieved.

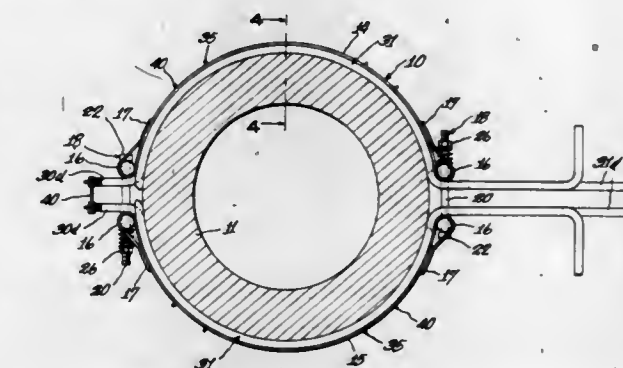
3,730,262

**HEATING AND COOLING UNITS**

Lester D. Drugmand, Pittsburgh, Pa., assignor to Emerson Electric Co., Saint Louis, Mo.  
Filed Aug. 6, 1971, Ser. No. 169,728  
Int. Cl. F28f 7/00

U.S. Cl. 165—46

7 Claims



A heating and cooling unit comprising a flexible metal band formed in halves connected end-to-end around an object. The band carries a sheathed electric heating element and a metal cooling tube so that the object may be either heated or cooled. The heating element and cooling tube are pressed into direct engagement with the peripheral surface of the object when the band is positioned around the latter.

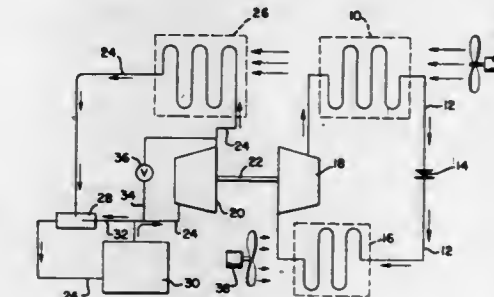
3,730,263

**HEAT PUMP**

James H. Anderson, 1615 Hileck Lane, York, Pa.  
Division of Ser. No. 703,156, Feb. 5, 1968, Pat. No. 3,519,066.  
This application Nov. 26, 1969, Ser. No. 877,553  
Int. Cl. F28d 28/00

U.S. Cl. 165—86

5 Claims



A heat pump having a closed cycle refrigeration system including a condenser, evaporator and compressor and a vaporized fluid power system for driving the compressor including a boiler and condenser. The condensers are arranged in such a manner that heat is transferred to the ambient when the apparatus is utilized to cool a conditioned zone and heat is transferred to the conditioned zone when the apparatus is utilized to heat a conditioned zone. The evaporator simultaneously removes heat from the conditioned zone during cooling thereof and removes heat from the ambient during heating of the conditioned zone. A fluid bypass system is provided to supply heat directly from the boiler to the condenser of the vaporized fluid power system during extreme, low ambient temperature conditions when the conditioned zone is being heated.



3,730,264

**FRONTAL HEAT EXCHANGER FOR RACKS OF HEAT DISSIPATING APPARATUS**

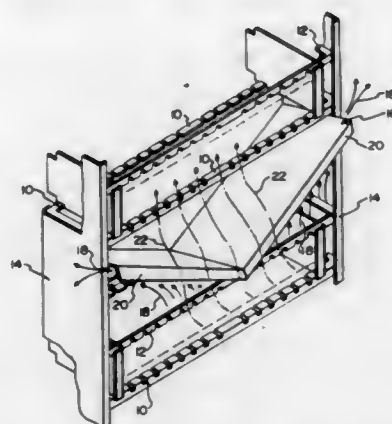
Konstanty E. Krylow, Elmhurst, and William A. Reimer, Wheaton, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 1, 1971, Ser. No. 185,651

Int. Cl. H02b 1/00

U.S. Cl. 165—128

4 Claims



A frontal heat exchanger for electronic systems is provided by a V-shaped, inclined deflector disposed between vertically adjacent arrays of heat dissipating apparatus. Heated air moving upward by convection is directed from the electronic system while cool air is drawn into the system over the upper surface of the deflector.

3,730,265

**SHUT-DOWN SYSTEM FOR HEAT STORAGE EXCHANGE APPARATUS**

Willis Thompson Lawrence, Winchester, Mass., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

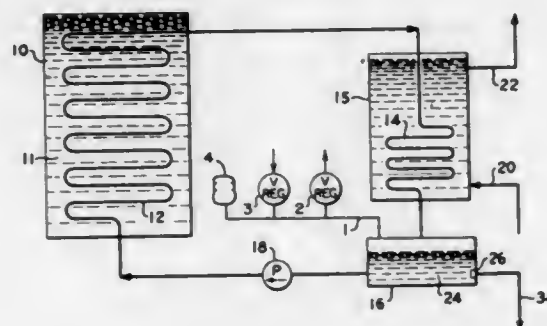
Continuation of Ser. No. 822,117, May 6, 1969, abandoned.

This application Oct. 15, 1970, Ser. No. 81,124

Int. Cl. F28f 1/9

U.S. Cl. 165—134

6 Claims



A rapidly corrodible metal drain plug disposed in the condensate return line of a heat storage-exchange system effectively evacuates alkaline heat transfer fluid, thereby preventing the transfer of heat from an alkaline heat storage composition when leakage between the storage composition and heat transfer fluid has occurred. The corrodible plug may be disposed in a condensate return line, condensate reservoir or the condensate pump and may be made of aluminum, zinc, tin, titanium or tantalum. A pressure regulating sub-system is provided upstream of the corrodible metal drain plug to adjust the pressure in the condensate return line to substantially atmospheric pressure, thereby eliminating the reduced pressure always found at the exhaust side of the condenser and thus permitting rapid and positive evacuation of the system.

3,730,266

**PROCESS AND APPARATUS FOR THE UNIFORM DISTRIBUTION OF COOLANT TO HEATING SURFACES IN A METAL-COOLED REACTOR OR EVAPORATOR**

Heinz Kottowski, Ramco, and Gunther Gram, Casciago, both of Italy, assignors to European Atomic Energy Community (Euratom)

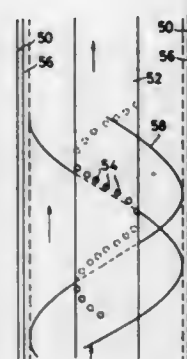
Filed Oct. 27, 1969, Ser. No. 869,776

Claims priority, application Germany, Nov. 6, 1968, P 18 07 986.2

Int. Cl. F22b 1/02

U.S. Cl. 165—186

6 Claims



A heat exchange apparatus for a nuclear reactor utilizing a liquid metal coolant. The metal moves through ducts having perforations or a porous area through which it can penetrate. Means are provided for producing a flow of the vapor of the liquid metal to distribute it evenly over the surface to be cooled after the vapor has emerged from the perforations or porous area.

3,730,267

**SUBSEA WELL STAGE CEMENTING SYSTEM**

Lyle B. Scott, Los Angeles, Calif., assignor to Byron Jackson Inc., Long Beach, Calif.

Filed March 25, 1971, Ser. No. 127,982

Int. Cl. E21b 33/13

U.S. Cl. 166—5

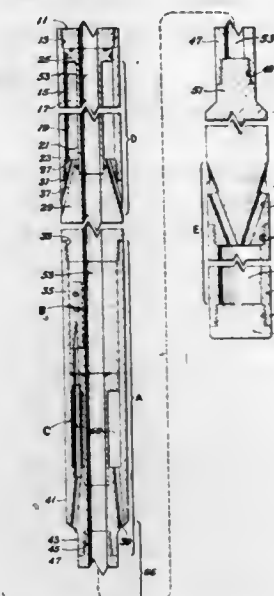
11 Claims



A system for cementing plural cement stages in subsea wells having a well casing string connected to drill pipe and suspended from a casing hanger in a well bore below a subsea well head, the casing including a float collar; a lower first stage cementing plug releasably mounted above the float collar and below a stage cementing valve collar incorporated in the casing string, and an upper second stage cementing plug releasably mounted within the casing string above the stage cementing valve collar with actuating members of successively

larger diameters which are adapted to pass through the drill pipe into the casing string and to successively: (a) release the first stage cementing plug, (b) close off the casing string below the stage cementing valve collar and open the cementing ports of the collar, and (c) release the second stage cementing plug which is adapted to close the cementing ports of the collar. Further cement staging may be provided with the casing string above the foregoing and below the casing hanger by providing appropriate additional components of the kind disclosed.

tuned to the operating frequency of the oscillator unit. The coupling device communicates through suitable exit ports



3,730,268

**APPARATUS AND METHOD FOR FILTERING WELL FLUIDS**

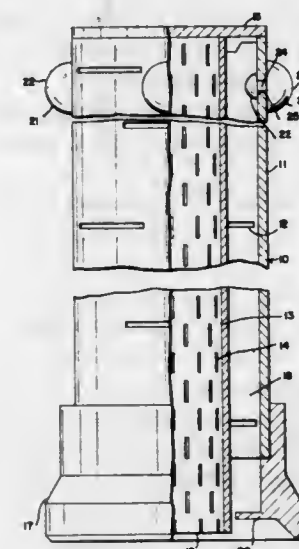
Floyd D. Burnside, Littleton, Colo., assignor to Shell Oil Company, New York, N.Y.

Filed June 8, 1971, Ser. No. 151,029

Int. Cl. E21b 21/00, 37/02

U.S. Cl. 166—177

7 Claims



Apparatus and method for filtering well fluids standing in the casing of a well borehole by extending a screen filter down the well borehole, the filter having apertures therein of a sufficient size to pass well fluids therethrough while excluding particles of a predetermined size. The filter is closed at the top and open at the bottom and is extended into contact with the well fluids thus forcing the fluids up through the filter and out into the well borehole above the filter while trapping the particles therein.

with fluid in a selected region such as in a mineral bearing formation to be stimulated. Acoustic and/or mechanical filters isolate the treated region from other regions in the well bore.

3,730,270

**SHALE OIL RECOVERY FROM FRACTURED OIL SHALE**

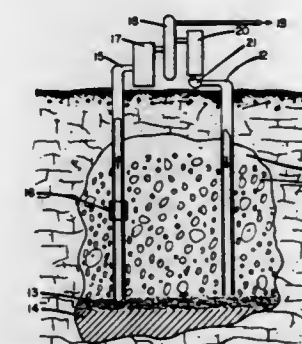
Victor D. Allred, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed March 23, 1971, Ser. No. 127,266

Int. Cl. E21b 43/24

U.S. Cl. 166—247

9 Claims



Shale oil is recovered from vertically fractured oil shale formations by injecting hot solvent into the bottom of the fractured zone, removing shale oil from a point above the point of injection, then incrementally raising the recovery point to maintain the recovery point above the level of the silt sedimented within the fracture chimney.

3,730,271

**METHOD OF SELECTIVELY PLUGGING A FORMATION WITH A POLYMERIC ELASTOMER LATEX-BRINE MIXTURE**

James W. Gall, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 111,150, Jan. 29, 1971, abandoned. This application Nov. 19, 1971, Ser. No. 200,570

Int. Cl. E21b 33/138; E02d 3/14

U.S. Cl. 166—294

10 Claims

A method for selectively plugging a soil or a first interval of a porous subterranean formation and controlling the occurrence of said plugging by injecting into the formation a mixture containing brine, a volume of surfactant, a volume of sodium hypochlorite and a polymeric elastomer latex having a definite particle size.

3,730,269

**WELL BORE ACOUSTIC APPARATUS**

Edward M. Galle, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 52,484, July 6, 1970, abandoned, which is a division of Ser. No. 658,513, Aug. 4, 1967, Pat. No. 3,520,362. This application Nov. 22, 1971, Ser. No. 200,913

Int. Cl. E21b 43/16, 21/00

U.S. Cl. 166—177

22 Claims

Following is disclosed well bore acoustical apparatus for generating large pressure variations in an isolated zone such as in the bore of a mineral producing well. The apparatus typically includes an oscillator unit and acoustic coupling device



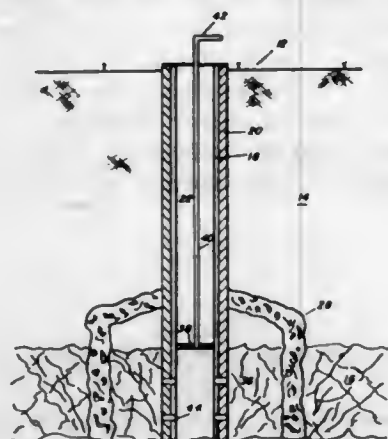
### 3,730,272 PLUGGING SOLUTION PRECIPITATION TIME CONTROL

Edwin A. Richardson, Houston, and Ronald F. Scheuerman, Beilair, both of Tex., assignors to Shell Oil Company, New York, N.Y.

Filed May 17, 1971, Ser. No. 144,260  
Int. Cl. E21b 33/13, 43/25

U.S. Cl. 166—294 6 Claims  
The precipitation time of a plug forming aqueous solution of both a polyvalent metal that precipitates as a gelatinous metal hydroxide and a reactant that raises the pH to cause the precipitation, is controlled, at least in part, by a reaction between nitrite ions and urea.

beginning at the open hole section of the production borehole between the casing shoe and the bridge plug. The offset holes

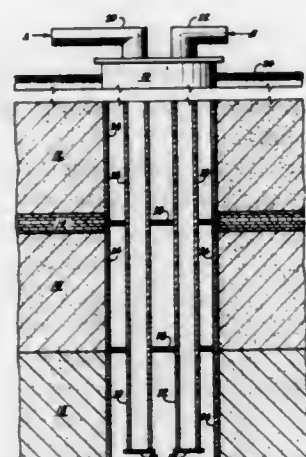


### 3,730,273 IMPROVED TECHNIQUE FOR INJECTING FLUIDS INTO SUBTERRANEAN FORMATIONS

James W. Wilson, Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed April 30, 1971, Ser. No. 138,946  
Int. Cl. E21b 43/16, 43/25, 43/27

U.S. Cl. 166—269 20 Claims



A method for simultaneously injecting a plurality of fluid mixtures into a like plurality of vertically disposed subterranean strata penetrated by at least one injection well is disclosed. In the process, controlled quantities of at least two injection fluids are injected into the well bore at elevations adjacent each of the vertically disposed strata and the fluids are allowed to mix in the well bore at each elevation. A property promoting additive is incorporated within one of the injection fluids so that the resulting fluid mixtures contain the desired concentration of the additive. The mixtures are thereafter forced into the adjacent subterranean strata.

are loaded with explosive, plugged off, gravel packed and detonated in order to stimulate the well bore and surrounding formation.

### 3,730,275 METHOD USING LOW FRICTION LOSS LIQUID COMPOSITION HAVING RESISTANCE TO SHEAR DEGRADATION

Gifford G. McClaffin, and Dennis J. Royer, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Feb. 16, 1971, Ser. No. 115,867  
Int. Cl. E21b 43/26; F15d 1/02

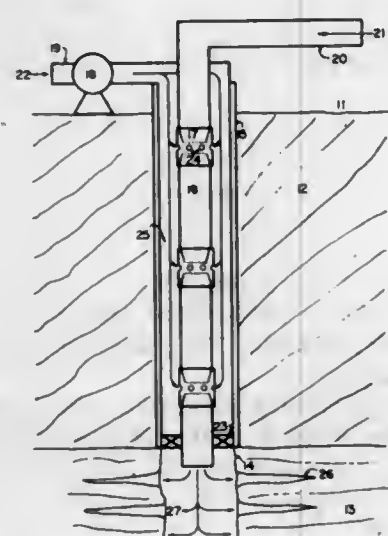
U.S. Cl. 166—308 5 Claims  
A method of reducing the shear degradation when pumping through conduits, such as well tubing during hydraulic fracturing operations and pipelines, a liquid containing a friction loss reducing additive comprising adding to the liquid the friction loss reducing additive at least partially in chunk or granular form so that the additive is present at least partially in chunk or granular form when the mixture is passed through the pump.

### 3,730,276 METHOD OF INCREASING PRODUCTIVITY AND THE INJECTIVITY OF OIL WELLS

Karl M. Land, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed Feb. 8, 1971, Ser. No. 113,475  
Int. Cl. E21b 43/00, 43/26

U.S. Cl. 166—314 4 Claims



During injection into an injection tubing string or production from a production tubing string contained within an oil

### 3,730,274 METHOD OF OFFSET EXPLOSIVE STIMULATION

Larry P. Brown, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed Dec. 30, 1971, Ser. No. 214,053  
Int. Cl. E21b 43/26

U.S. Cl. 166—299 3 Claims  
A production borehole is drilled to total depth into and through a producing formation and casing is set to an intermediate depth. A bridge plug is set below the casing shoe into the open hole section above the producing formation and one or more offset wells are drilled into the producing formation

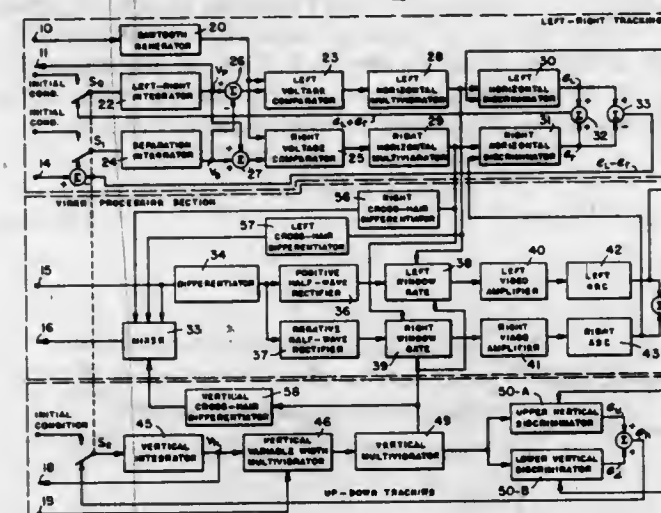
well, the tubing string is fitted with tubing joints or other couplings means which may be activated to allow the introduction therethrough of a friction reducing fluid, for example a polymer. The friction reducing fluid may be introduced at various lengths along the tubing string to reduce the opposing friction head of the fluid injected into or produced from the well. In particular, the invention is utilized when producing viscous crudes or for the reduction of friction losses when injecting treating fluids.

### 3,730,277 TARGET CENTER TELEVISION TRACKING SYSTEM

Joseph S. Brugler, Stanford, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 25, 1968, Ser. No. 703,228  
Int. Cl. H04n 3/22

U.S. Cl. 178—6.8 7 Claims



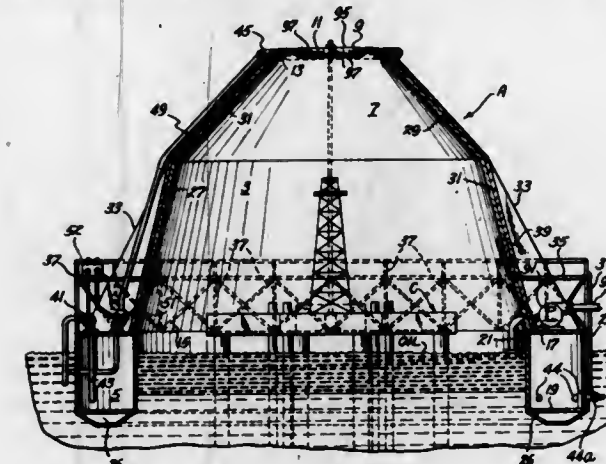
A target adaptive television contrast tracker for missile application wherein the adaptive feature comprises two independent linearly weighed tracking gates, one of which keeps account of positive target edge information, and the second keeps account of negative target edge information. The separation of the gates is arranged to coincide with the separation of the target edges, and the means raster position of the gates coincides with the center of the target.

### 3,730,278 SAFETY ENCLOSURE FOR OFF-SHORE OIL RIGS

Lawrence F. Roy, 27 Rambler Road, Southampton, Pa.

Filed Feb. 17, 1972, Ser. No. 227,053  
Int. Cl. A62c 3/00

U.S. Cl. 169—2 R 16 Claims



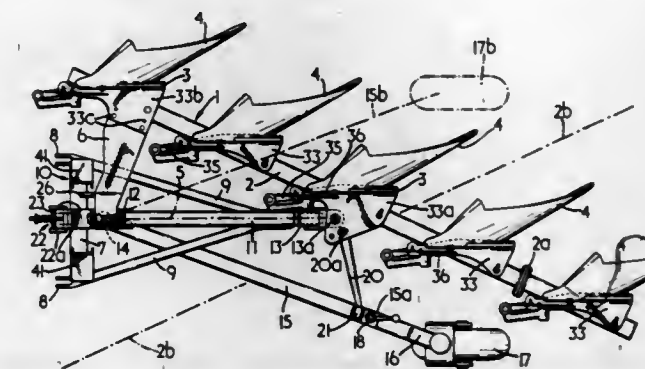
The floatable safety enclosure is formed by a plurality of upwardly extending, floatable wall sections which are adapted to be floated into position around an off-shore oil or gas well platform and secured together to form a continuous, dome-like wall around the platform.

### 3,730,279 REVERSIBLE PLOUGH SUPPORT MEANS WITH ALTERNATELY LATERALLY SWINGING WHEEL SUPPORT ARM

Charles Vernon Roger Dowdeswell, Lower Radbourne Farm, Southam, England

Filed Feb. 9, 1971, Ser. No. 113,942  
Int. Cl. A01b 3/42

U.S. Cl. 172—212 4 Claims



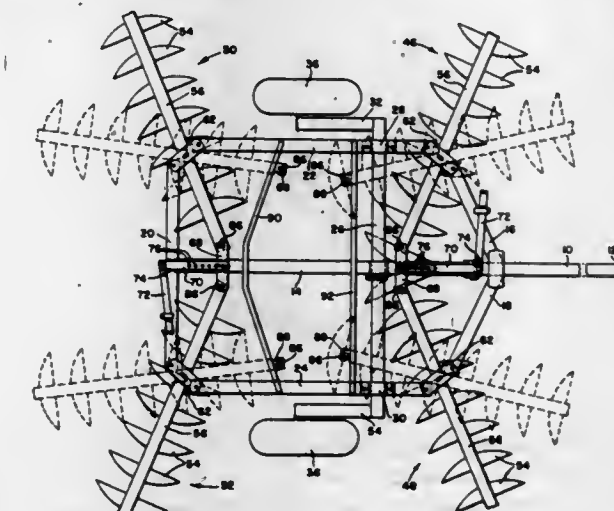
Support means for a reversible plough comprising a support structure for connection to a tractor, which structure has a rearwardly extending beam on which a plough frame including a plough share carrying boom is pivotally mounted about a longitudinal turning axis and such that the boom is inclined to the beam, an arm being provided pivotally connected about a vertical axis to the support structure and extending rearwardly and longitudinally along with the boom and pivotally connected by a link at its rear part to a central region of the boom, the arm also carrying at its rear end a tail wheel support having a castor action whereby, as the plough frame is turned over by ram operation for plough reversal, opposite lateral swinging movement is imparted to the arm for providing corresponding tail wheel support of the boom alongside the latter in accordance with the operative position to which the plough frame is turned.

### 3,730,280 IMPLEMENT FRAME

George Frederick Oelachlaeger, Rock Island, Ill., assignor to Deere & Company, Moline, Ill.

Filed Oct. 30, 1970, Ser. No. 85,585  
Int. Cl. A01b 21/08

U.S. Cl. 172—581 4 Claims



An implement frame having a plurality of individual tool gang subframes pivotally mounted medially on a main frame for horizontal swinging movement between an angled position for normal operational purposes, and a generally fore-and-aft position for transport purposes.

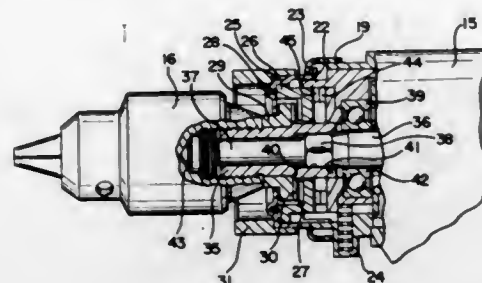


3,730,281

**DRILL HAMMER-DRILL MECHANISM FOR POWER TOC**

John W. Wood, Baltimore, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.  
Filed June 7, 1971, Ser. No. 150,339  
Int. Cl. B25d 11/10; E21c 11/12  
U.S. Cl. 173-48

13 Claims



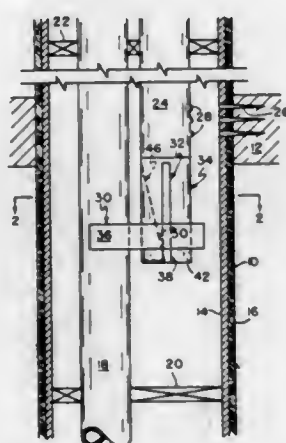
A drill-hammer-drill arrangement is provided for a portable power tool wherein the hammering teeth are located immediately adjacent the chuck portion of the tool and wherein one set of hammering teeth are carried by the shaft which drives the chuck. A spring is provided which biases the chuck and the rotational hammer teeth forwardly relative to the tool during hammering while another spring biases the stationary teeth toward the tool. In the hammer position, operator bias overcomes the spring force to engage the teeth and relative rotation causes hammering. In shifting into the drill position, a cam surface forces the chuck and the shaft on which the hammer teeth are mounted toward the tool until the shaft engages the forward bearing on the output spindle of the tool. Thus the forward bearing takes the thrust applied against the tool by the operator during drilling and eliminates the need for an independent thrust bearing.

3,730,282

**MECHANICALLY ORIENTED PERFORATING SYSTEM**

Ronald W. Chapman, Metairie, La., assignor to Shell Oil Company, New York, N.Y.  
Filed March 11, 1971, Ser. No. 123,344  
Int. Cl. E21b 43/119  
U.S. Cl. 175-4.51

17 Claims



There is disclosed an apparatus for mechanically orienting a through-tubing perforating gun in a multiple completion well for perforating an upper formation without damage to other tubing strings in the well. The apparatus comprises an inclined plane in the tubing string and an inclined plane on the perforating gun to rotate the perforating gun about the long axis thereof. The gun carried orienting plane is positioned below the perforating elements and an end of tubing locator is positioned adjacent the bottom of the orienting plane. Suitable electrical controls are provided to prevent firing of the per-

forating gun until the orienting surfaces are parallel and until the end of tubing locator sensibly engages the bottom of the tubing.

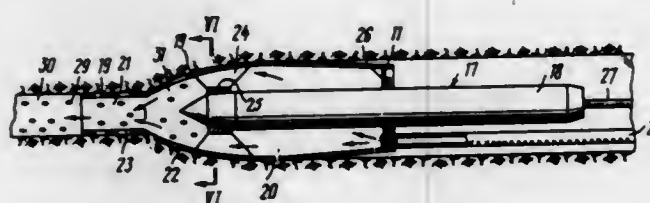
3,730,283

**METHOD OF REAMING GROUND THROUGH HOLES AND DEVICE FOR EFFECTING SAME**

Alexandr Dmitriyevich Kostylev, ulitsa Derzhavina, 19, kv. 44; Konstantin Stepanovich Gurkov, ulitsa Derzhavina, 19, kv. 28; Khaim Berkovich Tkach, ulitsa Kashurnikova, 34, kv. 3; Nikolai Grigorovich Nazarov, ulitsa Gogolya, 3, kv. 10; Petr Eduardovich Malbert, ulitsa Kotovskogo, 8, kv. 7; Nikolai Sergeevich Lavrov, ulitsa Demyana Bednogo, 70, kv. 62; Jury Innokentievich Alkasarov, ulitsa Sennaya, 36, kv. 36; Nikolai Leonidovich Legechev, ulitsa Vatutina, 14, kv. 17, all of Novosibirsk; Alexandr Isovich Golbinshteyn, Leningradsky prospekt, 109, kv. 24, Moscow; Alexandr Mironovich Reinsburg, ulitsa Mendeleeva, 5/7, kv. 12, Odessa; Mikhail Vladimirovich Borshteyn, ulitsa Pushkina, 15, kv. 10, Odessa; Dmitry Pavlovich Mikushin, ulitsa Pervomaiskaya, 6, kv. 6, Novosibirsk; Alexei Danilovich Terskov, ul. Bljukhera, 21, kv. 74, Novosibirsk, and Leonid Stepanovich Belov, ulitsa Ordzhonikidze, 49, kv. 89, Novosibirsk, all of U.S.S.R.  
Filed Nov. 17, 1970, Ser. No. 90,267  
Int. Cl. E21c 3/00

U.S. Cl. 175-53

5 Claims



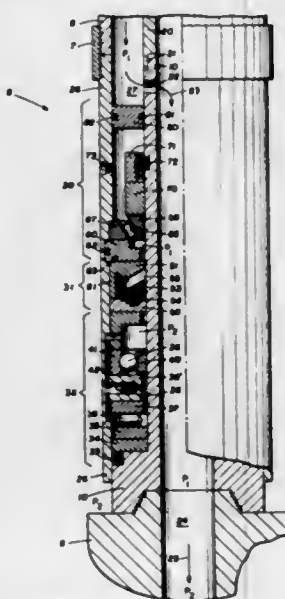
A method of reaming through holes by destroying the soil layers adjacent to the hole, and a device for effecting this method, in which the reamer is provided with means used for destroying in the hole the adjacent layers of the soil.

3,730,284

**DRILLING TOOL AND BEARING SYSTEM**

John H. Striegler, Richardson, Tex., assignor to Atlantic Richfield Company, New York, N.Y.  
Filed July 1, 1971, Ser. No. 158,713  
Int. Cl. E21b 3/08  
U.S. Cl. 175-92

9 Claims



A bearing system in an annulus between a shaft and a housing comprising a seal means in the annulus and bearing means

on either side of the seal means, one of the bearing means having a piston means associated therewith to provide a lubricant reservoir which is sealed from external pressures and which will vary in volume depending upon the amount of lubricant present. A downhole drilling tool employing the above bearing system together with a downhole motor operably connected to the shaft of the bearing system, the other end of the shaft being adapted to carry a drilling bit.

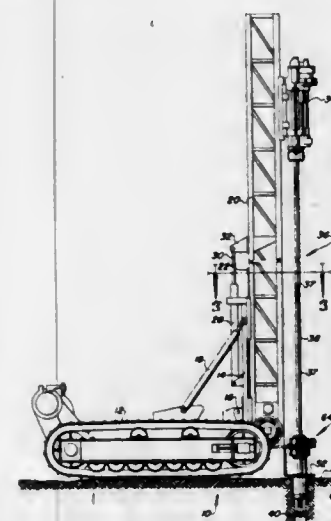
3,730,285

**ROCK DRILL BIT GUIDE AND MAST STABILIZER**

Floyd R. Anderson, 2200 Maine St., Quincy, Ill., and Donald N. Sullivan, Lakewood, Colo., assignors to Gardner-Denver Company, Quincy, Ill.  
Filed Oct. 8, 1971, Ser. No. 187,703  
Int. Cl. E21b 15/00; E21c 11/00

U.S. Cl. 175-220

3 Claims



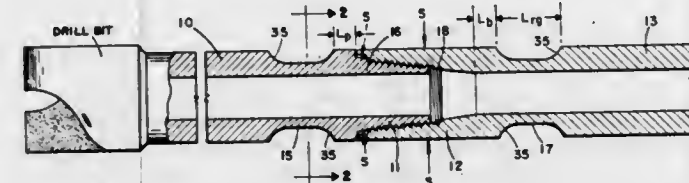
A rock drill bit guide comprising a cylindrical tubular element attached to the lower end of a drill mast and aligned with the central longitudinal axis of the drill string. The guide serves to pilot a rock drill bit during collaring of the drill hole. The bit guide also may be forced to penetrate the earth formation being drilled to act as a stabilizer or anchor for the drill mast.

3,730,286

**APPARATUS FOR IMPROVING ROTARY DRILLING OPERATIONS**

Peter D. Weiner, Bryan, Tex., assignor to Esso Production Research Company, Houston, Tex.  
Continuation of Ser. No. 52,404, July 6, 1970, abandoned.  
This application June 29, 1972, Ser. No. 267,713  
Int. Cl. E21b 17/00; E21c 15/00  
U.S. Cl. 175-320

18 Claims



Apparatus for drilling a well bore using a rotary drill string provided with a drill collar and a drill bit on the lower end of the drill string. The drill collar has a reduced diameter annular groove formed on its exterior surface adjacent the threads on either or both the pin end and box end thereof. The amount of the reduction in diameter of each groove is such as to reduce the Moment of Inertia from about 50 to 80 percent of the original cross-section of the drill collar. The length of each groove is selected so as to minimize the stress concentration

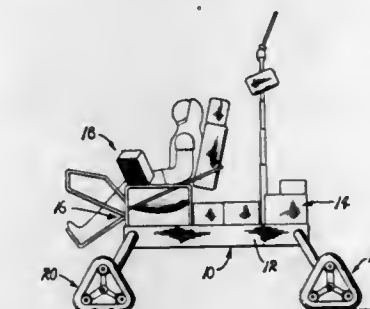
3,730,287

**VEHICLE FOR USE IN PLANETARY EXPLORATION**

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Edward Hryniewicz, Sherman Oaks, Calif.  
Filed May 17, 1971, Ser. No. 144,139  
Int. Cl. B62d 11/04

U.S. Cl. 180-6.5

9 Claims



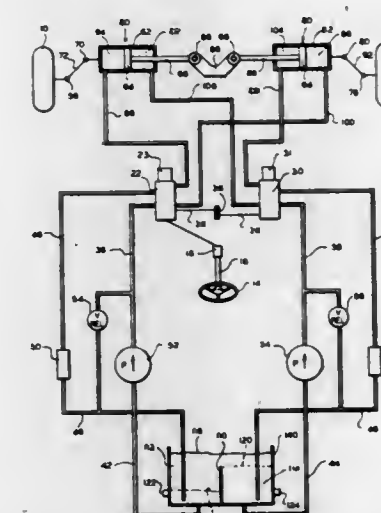
A self-propelled vehicle particularly suited for use in traversing hostile terrain. The vehicle is characterized by a plurality of mutually independently operable propulsion units, each including an extended leg coupled with the frame of the vehicle for rotation about an axis transversely related thereto and supported by a steerable pedestal having operational attributes of both a wheel and an endless track and employable for propelling the vehicle along a given surface, through a selectively operable power train functioning to drive the leg in rotation about its axis and/or activating the pedestal in a wheel-driven and/or track-laying mode of operation.

3,730,288

**DUAL STEERING SYSTEM**

Harold F. Dean, Woking, England, assignor to Clark Equipment Company  
Filed Dec. 9, 1970, Ser. No. 96,557  
Int. Cl. B62d 5/06  
U.S. Cl. 180-79.2 R

5 Claims



A dual fluid steering system utilizing two pumps to supply fluid to actuators which turn the wheels for steering. The control valves and other portions of the system are arranged so that each of the pumps supplies fluid to both of the actuators during normal operation whereby if one of the pumps fails, the other pump can continue to be utilized to operate both actuators and turn both of the wheels with reduced force under emergency conditions resulting from the failure of one pump.



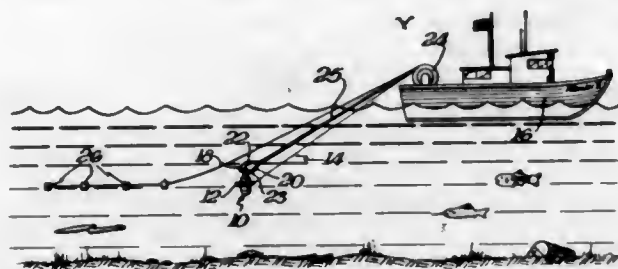
3,730,289

## SEISMOGRAPHIC DEVICE

Philip Barnard, IV, 1062 Dunvegan Drive, West Chester, Pa.  
Filed Sept. 18, 1970, Ser. No. 73,436  
Int. Cl. G01v 1/06

U.S. Cl. 181-0.5 NC

14 Claims



An underwater seismographic device for surveying or prospecting without the use of bubble formation comprises a vessel having a constricted orifice with an area of about 5 percent to about 20 percent of the maximum cross-sectional area of the vessel. The combustion gases escape through the orifice and the shock wave used for seismographic prospecting passes through the wall of the vessel.

3,730,290

## STETHOSCOPE

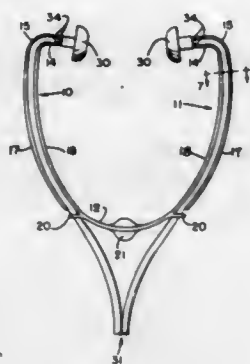
Thomas Albert Scanlon, Barrington, R.I., assignor to Avid Corporation, East Providence, R.I.

Filed Aug. 18, 1972, Ser. No. 281,956

Int. Cl. A61b 7/02

U.S. Cl. 181-24

4 Claims



This specification discloses a stethoscope comprising a frame including a pair of arms extending from a medial spring section. The arms are of plastic and are of an open "U" channel construction in cross section. Opposite ends of the arms are smooth curved to form short sections facing each other. A stiffening button is located at the mid-section of the medial spring section. Sound tubes are positioned in the open "U" channels. Ends of the tubes extend beyond the short sections to accommodate ear pieces. The opposite ends of tubes exit from the open "U" channels to meet so as to form a cable. There are no sharp bends nor abrupt turns in the tubes from the point of entry into the open "U" channels to the ear pieces.

The present invention relates to stethoscopes of the type commonly employed by air line passengers for use with entertaining sound apparatus and is concerned primarily with a stethoscope which may be comfortably applied to and suspended from the ear canals of an air line passenger and which includes sound tubes that are free of sharp and abrupt turns whereby stereophonic high fidelity sound frequency is maintained from the original source of the sound.

3,730,291

## SOUND SOURCE CABINETS

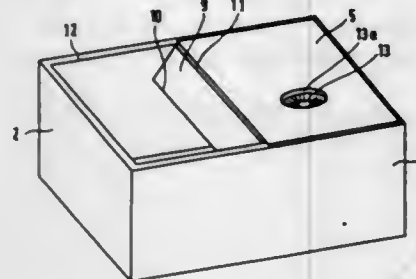
Helmuth Goeckel, Liebenau-Weser, Germany, assignor to Neckermann Versand KGaA, Frankfurt/Main, Germany  
Filed Aug. 4, 1971, Ser. No. 168,977

Claims priority, application Germany, Aug. 18, 1970, P 20 41 012.2

Int. Cl. G10k 13/00; H04r 1/28

U.S. Cl. 181-31 B

18 Claims



A sound source cabinet which may contain a loudspeaker as sound source is constructed so that the cabinet defines an ever-growing horn which extends from a pressure chamber located at the rear of the sound source to an aperture defined by walls of the cabinet. At least a portion of the horn is in the form of a spiral which extends about the pressure chamber and has non-absorbing rigid walls which may be for example, plywood boards or synthetic plastics components.

3,730,292

## SOUND SUPPRESSION SYSTEM

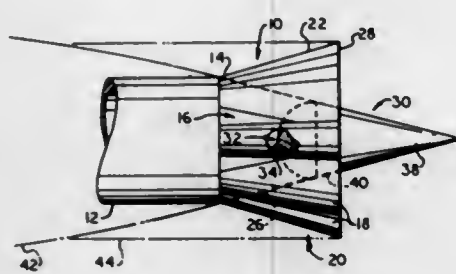
Howard R. MacDonald, San Diego, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Filed Jan. 22, 1971, Ser. No. 108,918

Int. Cl. B64d 33/06

U.S. Cl. 181-33 HC

8 Claims



System includes a nozzle located aft of the tail pipe and connected thereto to define a discharge zone and surround and direct the flow of the gaseous stream. Nozzle is corrugated fore and aft to define peripherally spaced lobes to divide the gaseous stream and flow passage valleys between the lobes for free stream air. Concave valleys converge rearwardly and terminate outward of engine axis. A center body is located coaxially with engine and with its forward portion extending forward into the aft portion of the nozzle. The dome-shaped nose faces directly into the axial flow of the central portion of the gaseous stream and has sound absorbing surface to absorb sound waves in the gaseous stream. All or part of inner walls of lobes may be similarly treated to increase sound absorption. Location of nose is such that sound waves reflected by nose and lobes will strike opposing surfaces to further increase sound absorption. With or without sound absorbing surfaces, nose and following portion of center body may be tailored to cooperate with lobes to define convergent nozzle profile or convergent-divergent nozzle profile without requiring surfaces of double curvature in lobes.

3,730,293

## EXHAUST PIPE WITH COMBINED BENDABLE PARTITION

Thomas R. Cassel, 226 Shirley, Birmingham, Mich.  
Filed May 12, 1972, Ser. No. 254,355

Int. Cl. F01n 1/02, 7/18

U.S. Cl. 181-36 B

10 Claims



An improved exhaust pipe partition structure is disclosed for use in forming sound attenuating and thermal insulating devices inside the pipe. The partition is of sheetlike construction and extends from wall to wall of the pipe to separate the space inside the pipe into a through passage for conducting the exhaust gases and a chamber which is closed at least at one end to inhibit the flow of gas therethrough. In the improved construction the partition is held in position inside the pipe by two oppositely disposed rows of indentations in the walls of the pipe. The sheet is comprised of a plurality of longitudinally disposed zones and alternate zones are more easily yieldable to forces tending to bend the partition in its own plane so that the pipe, with the partition in place, may be bent in any direction without undue distortion of the pipe or the partition.

3,730,294

## FOLDABLE, READILY-TRANSPORTABLE SEAT

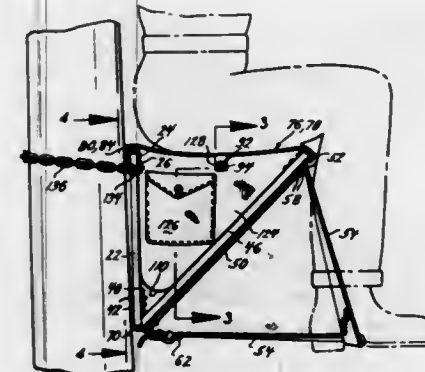
James A. Thurmond, 1305 Honeywood Drive, Crestwood, Mo.

Filed Nov. 19, 1971, Ser. No. 200,381

Int. Cl. A45f 4/02

U.S. Cl. 182-20

16 Claims



A seat includes two sub-frames which are hinged together to enable that seat to be folded to fit into a small space. Straps are secured to one of those sub-frames to pass forwardly along the front of the upper portion of the body of a user to make that seat readily transportable; and those straps can depend downwardly from that one sub-frame to act as stirrups for the feet of that user when that seat is being used to support that user. A sturdy section of flexible material extends between the upper ends of the sub-frames of the seat to constitute the supporting surface of that seat; and also to serve as a closure for a receptacle which is located between those sub-frames and which can be used to store objects while that seat is being transported or is being used to support the user.

3,730,295

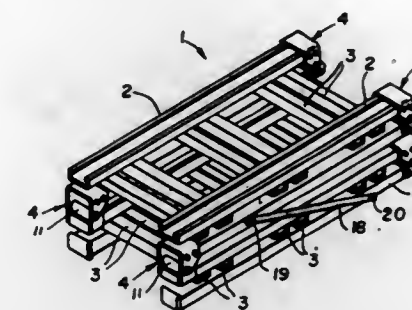
## FOLDABLE EXTENSION LADDER

Samuel H. Deese, 1005 Brown St., Bel Vernon, Pa.  
Filed June 10, 1971, Ser. No. 151,684

Int. Cl. E06c 1/383

U.S. Cl. 182-163

3 Claims



This invention relates to a foldable extension ladder of channel shaped or tubular metal comprising a plurality of side rail sections hinged together at their end portions so that when the ladder is assembled into operating position, the end of one side rail section will project into a sleeve portion of the hinge connected to an adjoining side rail section so as to be reinforced and guided thereby. The rungs have end portions pivoted to struck out portions of the side rail sections, which end portions project into the hollow side rail sections so as to be directly supported by the main panels of such side rail sections.

3,730,296

## INTERLOCK SAFETY DEVICE FOR MACHINERY

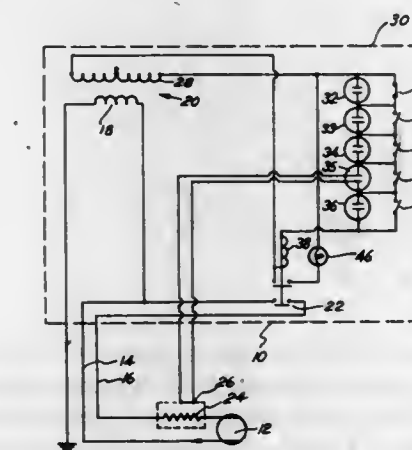
Wilfred J. Huigens, Clarinda, Iowa, assignor to Lisle Corporation, Clarinda, Iowa

Filed Feb. 23, 1972, Ser. No. 228,692

Int. Cl. F16p 3/08; G08b 21/00

U.S. Cl. 192-134

2 Claims



A control box interposed between the power source for a machine and a machine prevents the delivery of power to the machine until all machinery guards associated with the machine are in a closed circuit position. The control box includes a series of standard sockets, one socket associated with each machinery guard. The control device operates to open a circuit breaker in the power supply line whenever the machinery guards are open or opened.



3,730,297

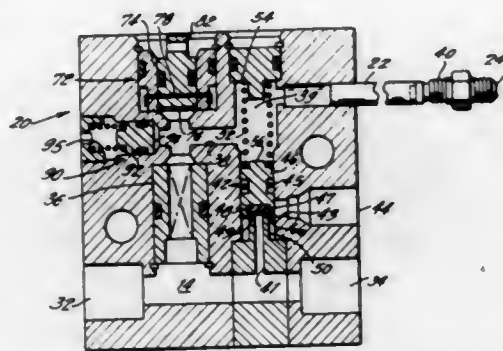
## LIQUID SYSTEM FUNCTION INDICATOR

Francis E. Colgan, Midland Park, and Paul H. Reeve, River Vale, both of N.J., assignors to Auto Research Corporation, Boonton, N.J.

Filed July 28, 1971, Ser. No. 166,721  
Int. Cl. F16n 29/04

U.S. Cl. 184-6.4

20 Claims



In a constant volume liquid distribution system, a means to determine which liquid outlet means in a series of outlet means connected with a main pressure line is not receiving its proportional share of liquid. This is accomplished by monitoring the relationship of a primary and a secondary pressure within some acceptable limits to detect any malfunction in the system. Each outlet means includes a branch pressure line connected with the main line and passing through a proportioning block. Each block includes a pressure responsive valve means that monitors the aforementioned pressure relationship and operates as a result of varying pressures within the block due to malfunctions anywhere between the main line and the outlet from the respective outlet means. Valve operation causes a malfunction indicator for the same block to operate. Each block includes appropriate pressure and flow control fittings for apportioning liquid among the outlet means.

3,730,298

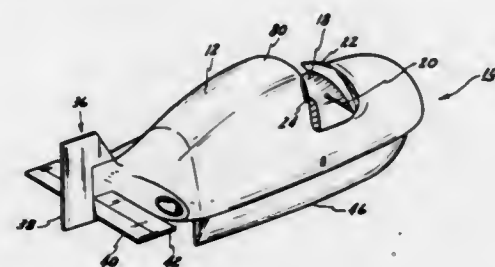
## SURFACE EFFECT VEHICLE

Arthur C. Schouw, Ewart, Mich., assignor to Commute Air, Inc., Pontiac, Mich.

Filed March 2, 1971, Ser. No. 120,096  
Int. Cl. B60v 1/12

U.S. Cl. 180-126

9 Claims



A surface effect vehicle having an outer hull and an inner hull secured to a bottom wall which, in turn, has a plurality of longitudinal and transverse openings that are adapted to exhaust pressurized air from a chamber, defined by the inner hull, downwardly from the vehicle at a rate which is sufficient to generate a force to lift the vehicle vertically. A rotatably mounted fan, carried within the inner hull and driven by a conventional engine, is adapted to draw air in through the outer hull and direct pressurized air through the openings. Longitudinal and transverse flaps respectively, pivotally mounted adjacent the bottom wall longitudinal and transverse openings, are adapted to be selectively manipulated to control the direction of the flow of pressurized air exhausted through the openings to selectively drive the vehicle forwardly or rearwardly.

3,730,299

## ELEVATOR CONTROL SYSTEM

Isao Inuzuka; Kikuo Watanabe; Takeo Yuminaka; Tatsuo Iwasaka, all of Katsuta, and Toshio Ochi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

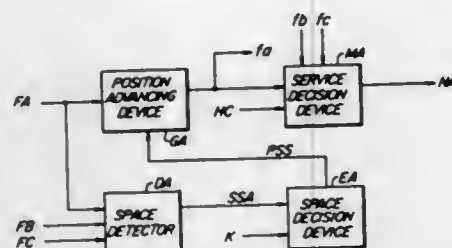
Filed Oct. 20, 1970, Ser. No. 82,476

Claims priority, application Japan, Oct. 24, 1969, 44/84719; Dec. 8, 1969, 44/97882; Dec. 8, 1969, 44/97883

Int. Cl. B66b 1/20

U.S. Cl. 187-29 R

12 Claims



In a plurality of elevator cars serving a plurality of floor landings, an elevator control system in which the response of a preceding car to hall calls from predetermined forward floors is limited when the space between said preceding car and a succeeding car is shortened.

3,730,300

## MOTOR VEHICLE

Hans O. Scherenberg, Stuttgart 71, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

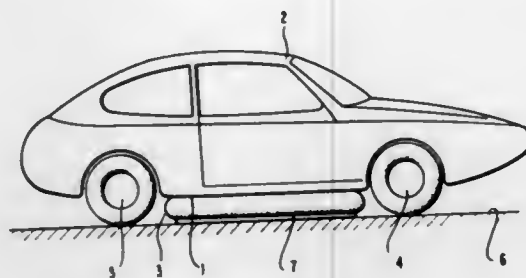
Filed April 27, 1971, Ser. No. 137,796

Claims priority, application Germany, April 28, 1970, P 20 679.5

Int. Cl. B60t 1/14

U.S. Cl. 188-5

23 Claims



A motor vehicle, especially a passenger motor vehicle in which an inflatable cushion is arranged at the bottom side of the vehicle as emergency brake which in the inflated condition is pressed with a brake surface against the road surface.

3,730,301

## TEMPERATURE RESPONSIVE PUMP DRIVE MECHANISM

Burnette Heck, Bloomfield Hills, and Donald W. Reynolds, Detroit, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 15, 1971, Ser. No. 180,806

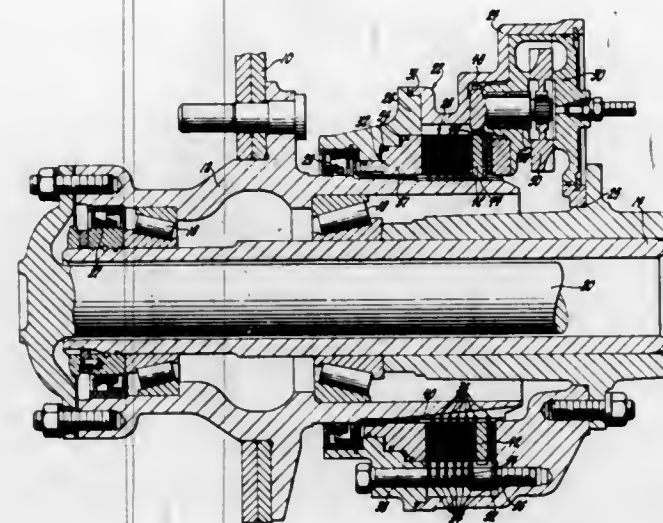
Int. Cl. F16d 65/84

U.S. Cl. 188-71.6

1 Claim

A liquid cooled disk brake includes a series of friction disks splined to the rotating wheel hub and interleaved rotationally stationary friction disks splined to the brake housing, one of the stationary disks being replaced by a gear rotatable with respect to both the brake housing and the hub and positioned between two of the rotating disks for rotation therewith to

drive a brake coolant circulating pump when the disk pack is compressed for braking the rotation of the wheel. A temperature responsive bimetallic clip engages the two stationary disks adjacent the two rotating disks juxtaposed to the pump



drive disk and forces the rotating disks into clutching engagement with the pump drive disk to drive the coolant pump irrespective of disk pack actuation when the temperature exceeds a predetermined level.

3,730,302

## DISC BRAKE INCLUDING VIBRATION DAMPENING MEANS

Tokuo Ogawa, 1-82, Umetsu-cho, Tsushima-shi; Tatsumi Sakano, 9-117-2, Nakamura-cho, Nakamura-ku, Nagoya-shi, and Shigeyoshi Okamura, 15-7, Choshida, Nagakuwa, Nagakute-mura, Aichi-gun, all of Japan

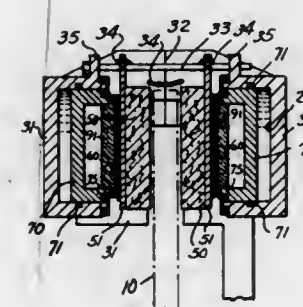
Division of Ser. No. 33,707, May 1, 1970, Pat. No. 3,684,061.

This application May 19, 1972, Ser. No. 254,946

Int. Cl. F16d 65/02

U.S. Cl. 188-73.5

10 Claims



A disc brake of simple construction wherein an intermediate member such as a metal powder sintered product retaining lubricating material such as oils and fats is provided between the pad and the piston, and a protecting cover is fitted over said intermediate member to prevent the leakage of said lubricating material and to retain the lubricating material for a long time. The protecting cover slides with the pad, or piston, relative to the porous intermediate member during braking, while the intermediate member reduces the frictional force between opposed surfaces of the pad and the piston thus preventing brake squeal.

3,730,303

## PARKING BRAKE, SPRING APPLIED, HYDRAULIC RELEASED

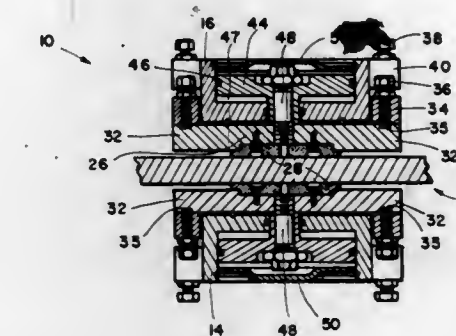
Carl E. Bricker, Cuyahoga Falls, and Kenneth P. Hilleagass, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 4, 1971, Ser. No. 103,732

Int. Cl. F16d 65/24

U.S. Cl. 188-170

9 Claims



An emergency or parking brake for a motorized wheel vehicle. Friction pads are carried in aligned relationship on opposite sides of a rotating disc. The pads are mounted on plates and a pair of U-shaped springs engage the edges of the plates to force the plates and pads into clamping relation with the disc. The mounting plates are also connected to pistons. When hydraulic pressure is present the pistons counter the spring forces and hold the friction pads away from the discs.

3,730,304

## FABRICATED RING FOR A BRAKE DISK

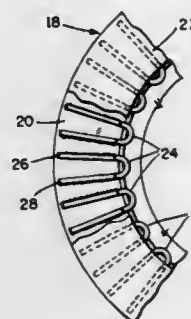
Edwin K. Buyze, Philadelphia, Pa., assignor to The Budd Company, Philadelphia, Pa.

Filed May 26, 1971, Ser. No. 146,937

Int. Cl. F16d 65/12

U.S. Cl. 188-218 XL

3 Claims



A lighter, less expensive and more easily assembled brake ring for a vehicle disk brake system having a pair of brake plates held in spaced relationship by a plurality of rib structures.

3,730,305

## SHOCK ABSORBER PISTON

Norman G. Fouts, Belleville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed April 16, 1971, Ser. No. 134,570

Int. Cl. F16f 9/32

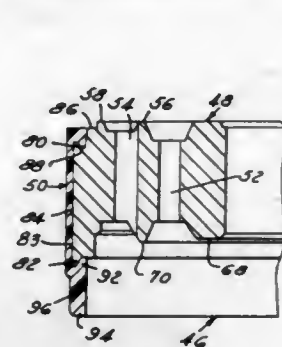
U.S. Cl. 188-322

6 Claims

A telescopic hydraulic shock absorber for a motor vehicle has a piston of composite construction. The composite piston



includes a metal core that is ported to provide jounce and rebound flow passages and a plastic peripheral surface that is pressure tank formed of a pair of identical castings each lined with a removable sealing member, and a flexible diaphragm of



in slidable engagement with the pressure tube of the shock absorber.

3,730,306

## DISC BRAKE CALIPER AND CIRCUIT SYSTEM

Heinrich Bernhard Rath, Birmingham, England, assignor to Girling Limited, Tyseley, Birmingham, England  
Division of Ser. No. 808,066, March 18, 1969, abandoned.

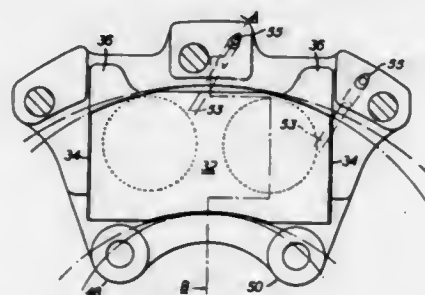
This application Feb. 25, 1971, Ser. No. 118,961

Claims priority, application Great Britain, April 6, 1968, 16,635/68

Int. Cl. B60t 11/16

U.S. Cl. 188—345

3 Claims



A vehicle disc brake comprising a caliper structure formed in two opposed halves a bridge portion straddling the disc and having a central bridge section and two side bridge sections, each of which defines with said central section a pad inspection window in said bridge portion. Two side-by-side pistons and cylinders in each caliper half are each aligned with an opposed cylinder in the other caliper half. Passage means interconnect two cylinders of each opposed pair, one said passage means extending through the central bridge section and the other passage means extending through one of the side bridge sections.

3,730,307

## HYDRAULIC BRAKE SYSTEM BLEEDER

Wallace F. Mitchell, Arlington Heights, Ill., assignor to Amco Tools Inc., Chicago, Ill.

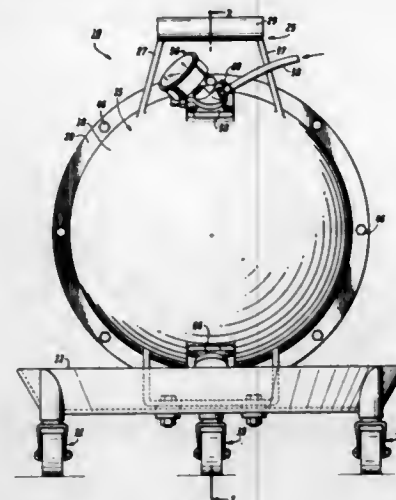
Filed Oct. 4, 1971, Ser. No. 186,320

Int. Cl. B60t 17/00

U.S. Cl. 188—352

6 Claims

A portable, pressurizable brake bleeder includes a spherical



hemispherical shape dividing the tank into a brake fluid reservoir and an air chamber.

3,730,308

## LUGGAGE CONSTRUCTION

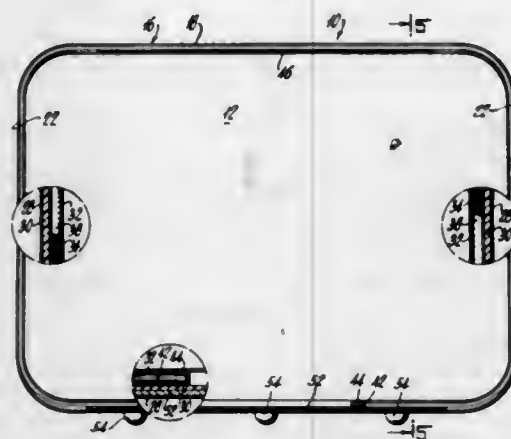
Joseph Y. Pelavin, North Bergen, N.J., assignor to Lark Luggage Corporation, New York, N.Y.

Filed June 14, 1971, Ser. No. 152,847

Int. Cl. A45c 3/00

U.S. Cl. 190—41 R

14 Claims



A luggage construction having a coil spring of predetermined length loosely mounted on at least one flexible wall thereof so that longitudinal displacement of at least one end of said coil spring is permitted in response to certain deformations of said luggage wall. Said coil spring may extend longitudinally around portions of the peripheral wall defining the top, bottom and ends of the piece of luggage. Said flexible wall may include at least two layers secured together by stitching without the use of adhesives. One of said layers may be a non-woven fabric impregnated with an elastomeric polymer.

3,730,309

## SUITCASE

Klaus Hamann, 8191 Hohenrain, and Jurgen Hamann, 8033 Krailling, both of Germany, assignors to Rox-Lederwarenfabriken Hamann KG, Munich, Germany

Filed July 19, 1971, Ser. No. 164,156

Claims priority, application Germany, July 30, 1970, G 70 28 787.5

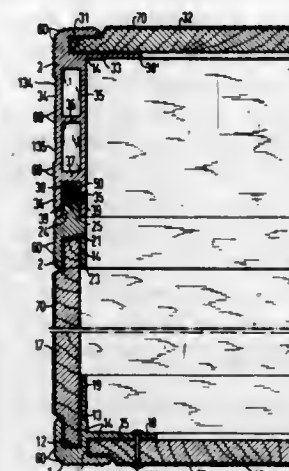
Int. Cl. A45c 13/04

U.S. Cl. 190—49

8 Claims

A suitcase essentially consisting of frames of extruded light metal and planar panels of rigid wood is assembled by edges of

the panel members being adhesively fastened in elongated grooves of the frames, one side wall of each groove being provided with integral, longitudinal ribs. The ribs mechanically



interlock with the adhesive layer and prevent the adhesive from being released from the frame under unfavorable conditions.

3,730,310

## CURRENT CONDUCTOR RAIL

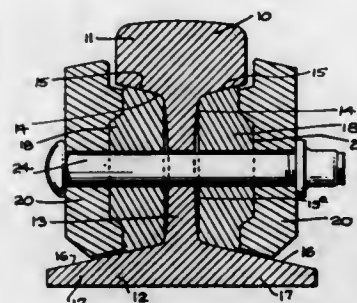
Arthur James Springer, Lynchburg, Va., assignor to H. K. Porter Company, Inc., Lynchburg, Va.

Filed Sept. 30, 1971, Ser. No. 185,100

Int. Cl. B60m 1/30

U.S. Cl. 191—29 DM

6 Claims



An electrical current conductor rail in the form of a high strength beam of ferrous metal of "H" or "I" transverse cross-section providing longitudinally extending outwardly presenting channels on opposite sides of the beam, one or both of which channels have rigidly secured therein a non-ferrous metal extrusion of high electrical conductivity coextensive in length with that of the beam. The extrusion is provided along its full length with an outwardly presenting protuberance serving as a key for coaction with a complementally shaped splice plate for end to end coupling of a pair of such rails. Additionally the body of each extrusion is so shaped relatively to its supporting beam that when secured to the latter the central portion thereof coextensive with said protuberance may be sprung toward the central web of the beam to insure maximum electrical contact between the engaging surfaces of the beam and its extrusion.

3,730,311

## COLLECTOR SLED AND MOUNTING STRUCTURE THEREFOR FOR HIGH SPEED, TRACK MOUNTED ELECTRIC VEHICLE

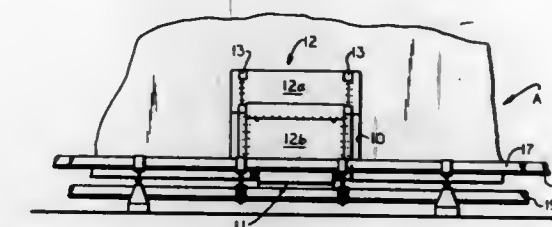
Richard L. Maison, San Diego, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed March 10, 1971, Ser. No. 122,729

Int. Cl. B60l 5/38

U.S. Cl. 191—49

10 Claims



A collector sled for a high speed, track mounted, electrically propelled vehicle is of a size to fit slidably within the space defined by three electrically charged rails mounted alongside a track for such vehicle. The sled is provided with three sets of collector brushes which are spring biased into wiping electrical contact, one set with each of the rails.

The sled is towed on the outer end of an articulated, spring balanced, two part support, extensibly mounted in a sled-receiving recess provided in a side of a vehicle. The sled is stowable in the recess, and in stowed position a portion of the sled support structure closes off the recess. A closure panel is hingedly mounted on an edge of the recess and swings out to close the recess when the sled is deployed. This closure panel also swings inwardly to admit the sled and its support for stowing.

3,730,312

## METHOD AND APPARATUS FOR TRANSFERRING ELECTRICAL ENERGY TO HIGH SPEED APPARATUS

Roland E. Leger, 80 Boulevard Magenta, Paris, France

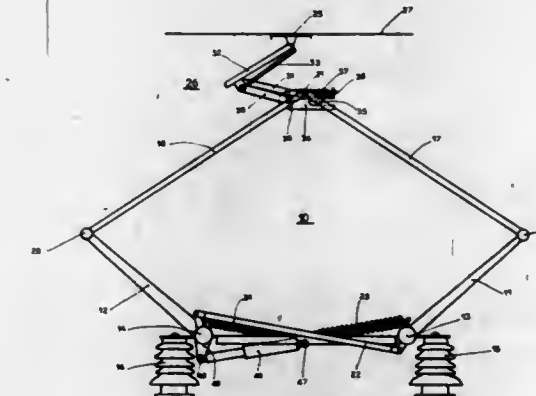
Filed July 28, 1970, Ser. No. 58,971

Claims priority, application France, July 31, 1969, 6926435

Int. Cl. B60l 5/24

U.S. Cl. 191—66

20 Claims



An electrical pickup to be carried by a high speed vehicle for transferring energy from a catenary system to the vehicle. The apparatus includes two separate structures which separately accommodate high frequency, low amplitude displacements and low frequency, high amplitude displacements between the high speed vehicle and a moving bow which is carried by the vehicle and slides on the catenary.



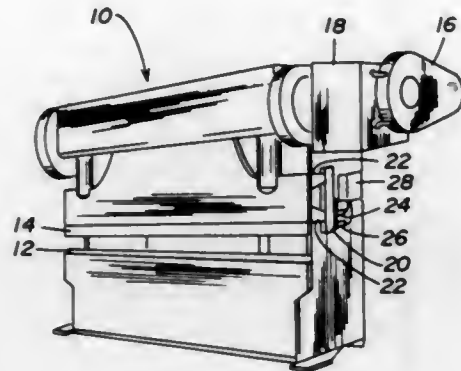
3,730,313

**CONTROL SYSTEM FOR A PLURAL SPEED PRESS**  
Kurt K. Luenser, De Soto, Tex., assignor to Verson Allsteel Press Company, Dallas, Tex.

Filed May 3, 1971, Ser. No. 139,729  
Int. Cl. F16d 67/04; F16p 3/00

U.S. Cl. 192-12 C

15 Claims



The specification discloses a control system for a press machine having fast and slow speed clutches and a brake. Three fluid valves are selectively operable to direct pressurized fluid to either the brake or fast and slow speed clutches. A first switch is operable by the press ram when the press machine is operating at a fast speed in order to switch the fluid valves to engage the brake and to disengage both the fast and slow speed clutches. A second switch is operable after the first switch in order to switch two of the valves to disengage the brake and to engage the slow speed clutch. Switches are provided to detect the operational states of the fluid valves in order to detect malfunctions thereof.

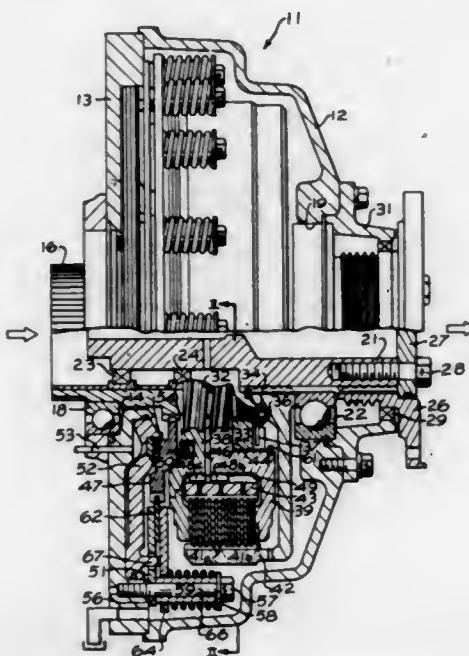
3,730,314

**TRANSMISSION OUTPUT CLUTCH WITH CONDITIONAL OVERRUNNING CAPABILITY**  
Charles H. Herr, and Alexander C. McIntosh, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 3, 1971, Ser. No. 177,670  
Int. Cl. F16d 67/04

U.S. Cl. 192-18 A

5 Claims



A clutch for use at the output end of a vehicle transmission in which gears are braked to a stop to facilitate shifting trans-

mits drive in either direction except when a shift is being made at which time an overrunning action is provided. A pair of annular pressure plates engage helical splines on the shaft which connects to the transmission and a series of clutch discs are disposed between the two pressure plates with alternate ones being coupled to the output shaft whereby rotation in either direction normally urges the pressure plates together to compress the clutch discs and transmit drive. To provide the alternate overrunning mode, a fluid pressure controlled piston is shifted to enable one of the pressure plates to travel axially along the helical splines a greater distance than the other clutch plate can travel whereby disc compression occurs only in response to rotation in one particular angular direction. Pressure on the discs is controlled and torque is transmitted thereto by a gear splined to alternate ones of the discs and which is engaged with both of the pressure plates by teeth having sufficient backlash to accommodate to the differential axial movements of the plates. Means are also provided for braking the input shaft during the overrunning mode of operation.

3,730,315

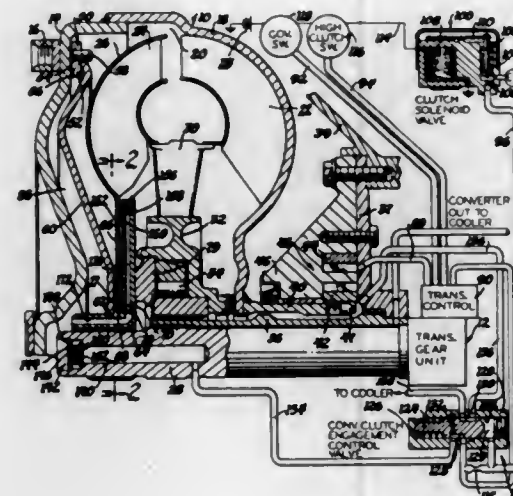
**HYDRODYNAMIC DEVICE WITH SLIPPING MECHANICAL CLUTCH**

Robert E. Annis, Howell, and Forrest R. Cheek, Detroit, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed July 30, 1971, Ser. No. 167,655  
Int. Cl. F16d 47/06

U.S. Cl. 192-3.3

4 Claims



A hydrodynamic device having an impeller, a turbine and a clutch for providing a slipping mechanical drive between the turbine and impeller in addition to the normal hydraulic drive therebetween wherein the clutch is engaged with fluid pressure derived from the pressure within the hydrodynamic device and is controlled by a valve operated by thrust on the turbine to maintain a constant speed differential between the turbine and impeller regardless of input torque.

3,730,316

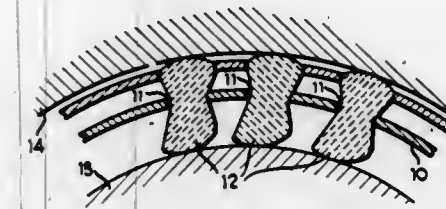
**ONE-WAY CLUTCH**

George A. Zimmer, Ithaca, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed April 30, 1971, Ser. No. 139,073  
Int. Cl. F16d 41/07, 13/60

U.S. Cl. 192-41 A

8 Claims



A one-way overrunning clutch or freewheel provided with clamping components, known as sprags, cams and the like, made of ceramic material, such as a high alumina ceramic.

3,730,317

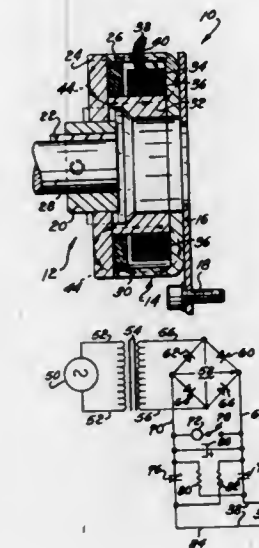
**ELECTROMAGNETIC COUPLING WITH PERMANENT MAGNETS**

Ralph L. Jaeschke, Kenosha, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed July 21, 1971, Ser. No. 164,722  
Int. Cl. F16d 27/06

U.S. Cl. 192-84 R

10 Claims



A magnetic coupling comprises an armature assembly having an armature plate formed of a material which is readily magnetizable to a first polarity and a second polarity opposite from the first polarity, a pole assembly, a coil energizable to magnetize the armature plate to its first polarity and to its second polarity, a power supply for energizing the coil and means for energizing the coil to a first polarity upon deenergization of the power supply. Energization of the coil to the first polarity effects magnetization of the armature plate to its first polarity to effect engagement of the armature plate and friction material disposed on the pole assembly. Energization of the coil to a second polarity is operable to effect deengagement of the armature plate and the friction material of the pole assembly. The means for energizing the coil to its first polarity upon deenergization of the power supply includes an energy storage means which provides a fail-safe mode of operation to insure that the armature plate engages with the friction material of the pole assembly upon deenergization of the coil by the power supply.

3,730,318

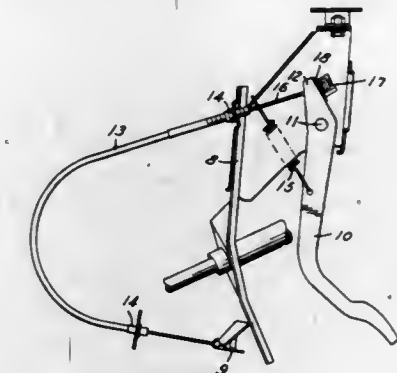
**DEVICE FOR CONNECTING A CABLE TO A LEVER**  
John W. A. Camp, Colchester, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed March 29, 1971, Ser. No. 128,790  
Claims priority, application Great Britain, April 11, 1970, 17,332/70

U.S. Cl. 192-99 S

Int. Cl. F16d 19/00

9 Claims



A device for connecting a cable to a lever comprising a retaining member having an arcuate bearing surface and a cable having a flat head connected to its end. The flat head on the end of the cable is rockable on the arcuate retaining member surface whereby the cable end pivots with respect to the lever as the lever is pivoted.

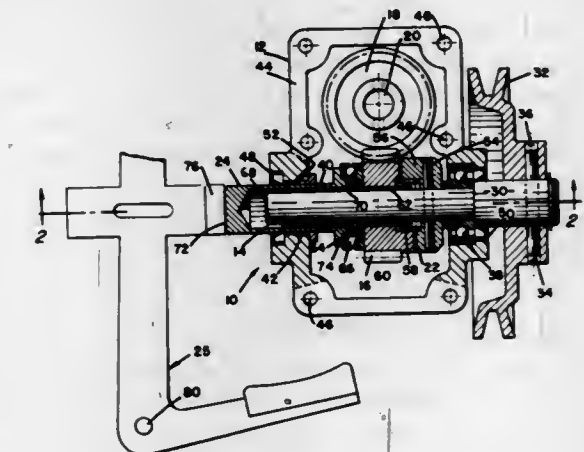
3,730,319

**GEAR BOX AND CLUTCH ASSEMBLY**  
Hendrick Van der Aa, Pierre Fonds, Canada, assignor to Arlen Mills Inc., Montreal, Quebec, Canada

Filed Feb. 23, 1971, Ser. No. 117,887  
Claims priority, application Canada, June 11, 1970, 085,233  
Int. Cl. F16d 19/00

U.S. Cl. 192-95

4 Claims



A gear box and clutch assembly is described for selectively transmitting a torque from a source of power to a main shaft of a braiding machine. The gear box contains a pulley shaft which supports a driving gear and a clutch mechanism, and a driven gear is supported on the main shaft in engagement with the driving gear. This driving gear is movable relative to the pulley shaft to engage the clutch mechanism thus enabling the braiding machine to be drivingly coupled to the source of power. An actuator device is provided which is movable coaxially of the pulley shaft in order to bring the driving gear into engagement with the clutch mechanism. This actuator device preferably comprises a cylindrical body member that has a blind borehole coaxially of the same. The borehole is adapted to rotatably support one end of the pulley shaft and is of a depth sufficient to accommodate the movement of the actuator.



tor device which effects engagement of the driving gear and clutch mechanism. It is also preferable that the actuator device be provided with a thrust bearing thereon which engages one face of the driving gear at several points concentrically thereof, in order to uniformly restrain a load on this gear. In this way, elimination of an eccentrically applied load to the driving gear is achieved. As a result excessive wear and premature failure of the driving gear can be successfully avoided. Although specifically described with reference to a braiding machine, the present gearbox and clutch assembly could be used elsewhere as well.

3,730,320

**HIGH TEMPERATURE BRAKE DISC**

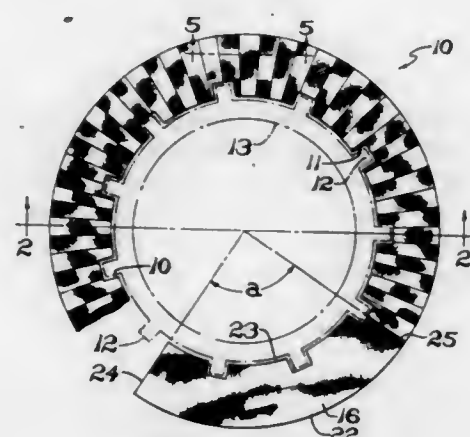
Herman Freeder, and Homer E. Wilt, both of Akron, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed May 12, 1971, Ser. No. 142,621

Int. Cl. F16d 11/00

U.S. Cl. 192—107 M

4 Claims



An annular disc for brakes or clutches in which segmented strips of resin impregnated carbon or graphite cloth are assembled in a partially overlapping relationship with opposite ends of each strip at opposite faces of the disc. The disc is formed and cured under high temperature and pressure to bond the strips together and then pyrolyzed to produce a carbon or graphite char bond matrix for resisting high temperatures of operation and providing a friction surface composed of the graphite or carbon cloth of the strips and the carbon or graphite binding material between strips.

**ERRATUM**

For Class 192—134 see:  
Patent No. 3,730,296

3,730,321

**COIN OPERATED IRONING BOARD WITH SAFETY AND RETURN FEATURES**

Minnie Izetta Akin, Levelland, Tex., assignor to Penny Enterprises, Ltd., Levelland, Tex.

Filed Jan. 21, 1971, Ser. No. 108,423

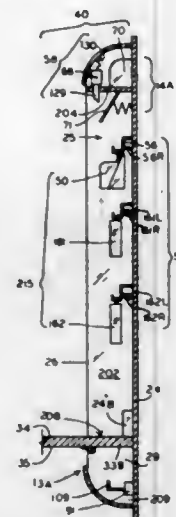
Int. Cl. G07f 5/10

U.S. Cl. 194—9 T

8 Claims

Apparatus and process providing one or more electrically powered implements on a short term rental basis for use in a limited area by retaining such implement or implements in an enclosure therefor, opening the enclosure and providing power to actuate the implements on insertion of a coin into a coin collector assembly and then permitting use of one or more said implements for a predetermined time and, after

such use of one or more of said implements, discontinuing power connection to the implements, and, after the imple-



3,730,322

**CHANGEABLE TYPE HEADS AND CHANGEABLE KEY CAPS**

Lloyd E. Hare, West Hartford, Conn., assignor to Litton Business Systems, Inc., New York, N.Y.

Filed March 24, 1970, Ser. No. 22,177

Int. Cl. B41j 1/04

U.S. Cl. 197—36

1 Claim



Type elements bearing special types thereon are constructed for snap-on application onto a type lever in a manner so that any such type head, when applied, becomes solidly secure on the type lever, except in a direction counter to that in which centrifugal force tends to have a throw-off effect thereon. Flexibly displaceable means allow the type heads to be readily moved into and out of applied position. In conformance with the applicable type heads, there are character bearing caps adapted to be snapped onto and off type keys.

3,730,323

**REPEAT SPACING MECHANISM FOR TYPEWRITERS**

Tomoyoshi Watanabe, Hekikai-gun, Aichi-ken, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Mitsuho-ku, Nagoya-shi, Japan

Filed Aug. 4, 1970, Ser. No. 60,912

Claims priority, application Japan, Aug. 4, 1969, 44/61917

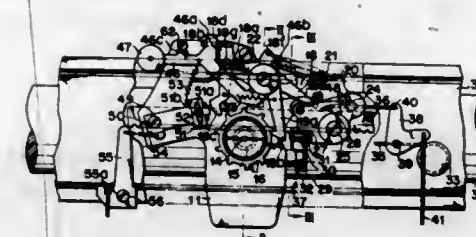
Int. Cl. B41j 19/00

U.S. Cl. 197—82

2 Claims

A repeat spacing mechanism for typewriters, particularly manual typewriters, comprising an escapement mechanism in-

cluding an escapement wheel and a pair of pawls cooperating therewith; and a repeat spacing key connected through a spring to a rockable lever having a weight attached to its free end and normally biased to an inoperable position to release



the escapement mechanism, whereby, upon depression of the repeat spacing key, the lever is moved to an operable position by the spring to actuate the escapement mechanism, causing a carriage to perform a repeat spacing movement at a speed predetermined by the weight.

3,730,324

**BOTTLE ESCAPEMENT DEVICE**

Burton Robert Garrett, 131-12 232 St., Laurelton, N.Y.

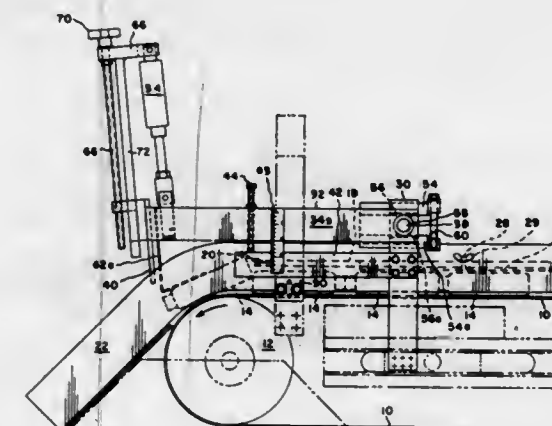
Continuation of Ser. No. 116,689, Feb. 9, 1971, abandoned.

This application June 18, 1971, Ser. No. 154,349

Int. Cl. B65g 47/00

U.S. Cl. 198—24

9 Claims



A bottle escapement features a conveyor belt that carries the bottles until they hit a stop plate carried by an outer U-shaped bracket. At a selected time, a pneumatic cylinder is actuated to depress a kicker plate mounted on an inner U-shaped bracket to force a bottle below the stop plate and then down an output chute.

3,730,325

**APPARATUS FOR EJECTING MISALIGNED ARTICLES**

Robert C. Goodwin, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Jan. 24, 1972, Ser. No. 220,032

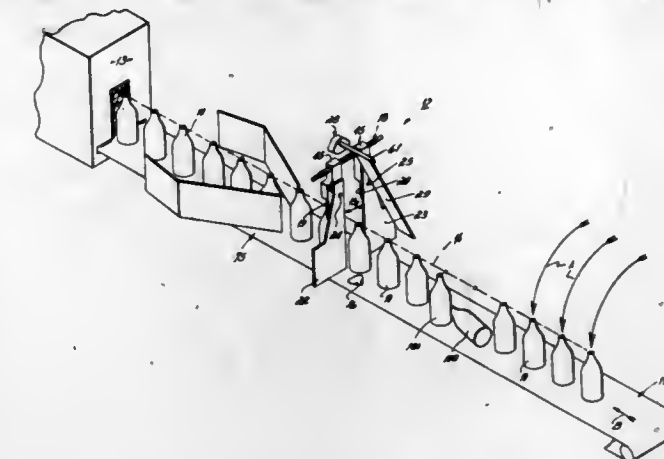
Int. Cl. B65g 47/24; B07c 5/34

U.S. Cl. 198—33 R

16 Claims

Apparatus for sensing and removing articles which are not within a predetermined zone of alignment on a conveyor. A

pair of spaced gates present a doorway between them that defines the alignment zone. Each gate is mounted for swinging



3,730,326

**BAKERY PRODUCT TURN OVER APPARATUS**

Frank M. Irving, Jr., York; Albert S. Schmidt, Sr., Wormleysburg; Ronald G. Andrus, Wrightsville, and Herbert J. P. Beckius, York, all of Pa., assignors to Alto Company, York, Pa.

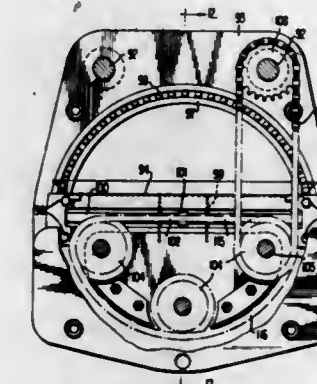
Division of Ser. No. 732,179, May 27, 1968, Pat. No.

3,596,747. This application Aug. 2, 1971, Ser. No. 168,046

Int. Cl. B65g 7/00

U.S. Cl. 198—33 AD

3 Claims



Bakery product units are received from a depanner and/or slicer at a marshaling station in two discrete rows. Product units from the two rows are then released in a controlled manner and are advanced in timed relation with or without inversion of the units in one or both rows. The product units in one row move gradually into superposed relation with corresponding product units of the second row and each superposed pair of product units is then engaged and advanced in unison until stacked registering relationship of each superposed pair is attained.

3,730,327

**MERCHANDISING AID**

Edgar M. Lieberman, Kansas City, Mo., assignor to Mar-Con, Inc., North Kansas City, Mo.

Filed Sept. 30, 1971, Ser. No. 185,153

Int. Cl. B65g 43/08

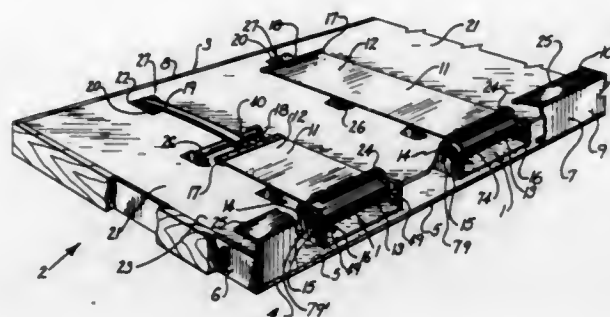
U.S. Cl. 198—37

14 Claims

A merchandising aid for use on or as a shelf for storing and displaying articles of merchandise and moving same forward to an advanced position as the articles are removed therefrom



including a support with an article conveyor thereon having an upper run for support of articles. A power means is operatively connected to the conveyor for moving same and articles to advance same toward the customer position. A retarder means



is connected relative to the conveyor and operable to limit the rate of travel thereof and an abutment member is engaged by an article when in advanced position to operate a brake means to stop the movement of the conveyor.

### 3,730,328 CONVEYOR SYSTEM

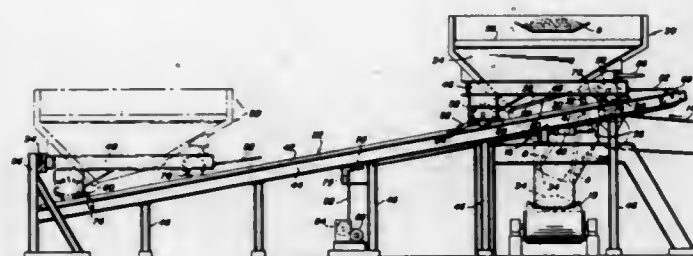
Richard F. Heier, Jr., Lansing, Ill., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 10, 1971, Ser. No. 206,763

Int. Cl. B65g 47/42

U.S. Cl. 198-44

9 Claims



A conveyor system for handling granular material includes a first conveyor, and a hopper adjacent the discharge end of the first conveyor for receiving the material from the first conveyor and delivering it to a second conveyor. The top surface of the hopper slopes downwardly away from the first conveyor and a hopper extension having its bottom also sloping downwardly away from the first conveyor is mounted on a track sloping downwardly from the first conveyor. The top of the hopper extension is substantially larger than the top of the hopper.

### 3,730,329 ROLLER TABLE

Clifford Sturdy, Chesterfield; Harold Hooke, Hathersage, and Geoffrey Douglas Hill, Sheffield, all of England, assignors to Davy and United Engineering Company Limited, Sheffield, Yorkshire, England

Filed June 3, 1971, Ser. No. 149,597

Claims priority, application Great Britain, June 11, 1970, 28,265/70

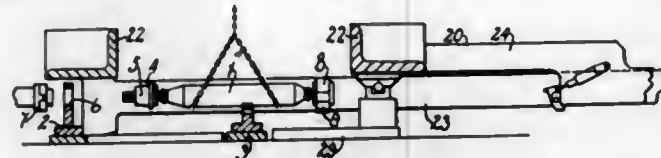
Int. Cl. B65g 13/02

U.S. Cl. 198-127 R

6 Claims

A roller table has first and second spaced apart elongate side members and a plurality of rollers carried by the side members. Each roller has bearing assemblies adjacent its ends and one of the bearing assemblies on each roller is in the form of a housing which is slideably mounted in a side member. The

housing is slideable parallel to the longitudinal axis of the roller to allow the roller to be removed from the side member.



Removable means are provided for preventing movement of the housing relative to the side member until this movement is required.

### 3,730,330 SENSOR LOCKING ACCUMULATOR

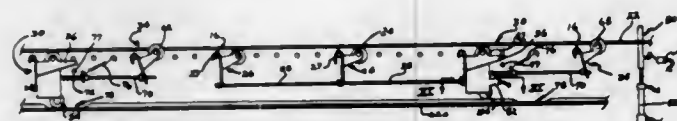
Maynard J. De Good, Grand Rapids, Mich., assignor to Rapistan Incorporated, Grand Rapids, Mich.

Filed Aug. 6, 1971, Ser. No. 169,777

Int. Cl. B65g 13/02

U.S. Cl. 198-127 R

11 Claims



In accumulating conveyors of the type in which the application and release of the propelling force is effected through changes in the vertical position of the propelling member, a sensor responsive to the pressure of an article conditions an actuator which in turn is connected to the propelling member support mechanisms. The propelling member has a ribbed portion along its length, which rib is provided with a series of camming surfaces to operate the actuator when conditioned by the sensor. The actuator, when operated changes the position of the propelling member.

### 3,730,331 CONVEYOR DEVICE

Nathaniel D. Goldberg, Chicago, Ill., assignor to Fenco, Inc., Chicago, Ill.

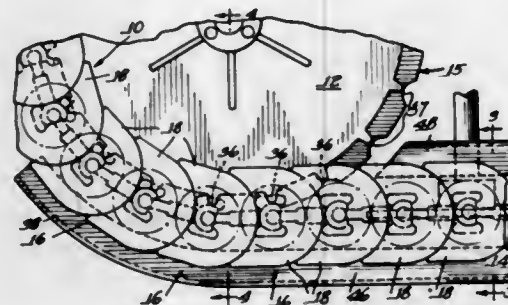
Continuation of Ser. No. 75,349, Sept. 25, 1970, abandoned.

This application Jan. 10, 1972, Ser. No. 216,477

Int. Cl. B65g 15/00

U.S. Cl. 198-189

7 Claims



The present invention relates generally to improvements in conveyor devices and more particularly to chain type conveyor mechanisms adapted to convey articles along paths which are both straight and curved. The embodiment of the invention disclosed herein contemplates link means or members having upwardly facing surface sections for supporting an article to be conveyed. Each link includes universal type coupling means for connecting a link member to an adjacent

complementary link member and also means for accommodating the periphery of complementary sprockets. The axis of one sprocket is substantially vertical and the axis of the other is substantially horizontal. The upper side of the sprockets rotatable about the vertical axis are positioned beneath the upwardly facing surface sections so as to counteract tendencies for said sections to tilt as they move along the aforesaid curved path.

### 3,730,332 SCREW CONVEYOR COUPLING

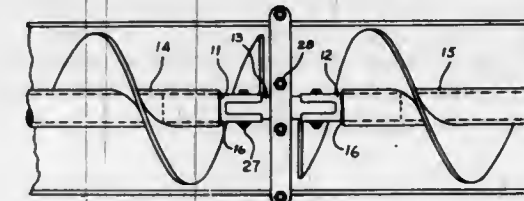
Robert O. Benzon, 102 E. South Street, and Richard K. Dybdal, 402 W. Center Street, both of Cambridge, Ill.

Filed July 15, 1971, Ser. No. 162,907

Int. Cl. B65g 33/32; E21b 17/02

U.S. Cl. 198-213

1 Claim



A pair of interlocking coupling faces permits removal of a central bearing portion of a coupling in a direction perpendicular to the axis of conveyor screws. Each of two similar cylindrical end pieces of the coupling is secured within one of the adjacent ends of hollow conveyor screw shafts, and the outer ends of the end pieces have deep, wide slots that receive mating tongues of the ends of the central bearing portion. The bifurcated ends of the end pieces and the tongues are long enough to have bolts pass through them, but the bolts need merely to resist lateral displacement of the central portion because the driving torque is transmitted by the tongues.

### 3,730,333 DOUBLE-COMB-SHAPED TRANSFER APPARATUS

Ikuo Wakabayashi, and Osamu Nagata, both of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

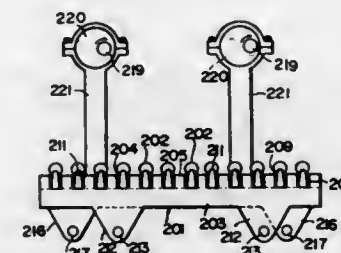
Filed April 21, 1971, Ser. No. 135,910

Claims priority, application Japan, Sept. 21, 1970, 45/82185; Sept. 21, 1970, 45/82186

Int. Cl. B65g 25/04

U.S. Cl. 198-219

7 Claims



Transfer apparatus for continuously transferring an elongated article comprises a central segment having two spaced apart parallel rows of comb-shaped projections of uniform pitch, outer segments on both sides of the central segment and having similar projections, the projections of the central and outer segments receiving the article in the notches formed between their projections and a crank mechanism for imparting a circular motion to the outer segments, the crank mechanism having a predetermined eccentricity related to the pitch of the projections.

### 3,730,334 ENVELOPE FOR PHOTSENSITIVE MATERIAL

Akira Tsuji, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

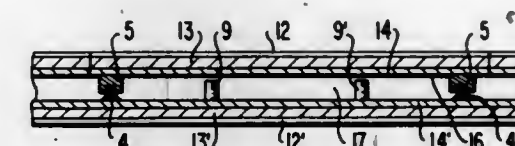
Filed Dec. 29, 1971, Ser. No. 213,539

Claims priority, application Japan, Dec. 29, 1970, 45/121439

Int. Cl. B65d 27/06, 85/00

U.S. Cl. 206-1 R

3 Claims



An envelope for storing, handling and mailing of photographic film is formed from two sheets of material sealed together along three sides. The inner surface is provided with a moisture barrier layer having plastic fasteners define a substantially rectangular volume in the envelope for the reception of the film. One sealed edge of the envelope may be removed along a perforated line to enable the plastic fasteners to be separated for removal of the film.

### 3,730,335 CARTON

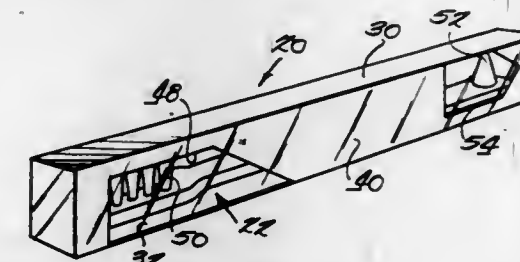
Emanuel B. Tarrson, 400 East Randolph Street, Chicago, Ill.

Filed Oct. 30, 1970, Ser. No. 85,424

Int. Cl. B65d 5/44, 25/54

U.S. Cl. 206-45.31

8 Claims



A carton for containing an article with an elongated member, the carton comprising a pair of side panels, a rear panel connected to the side panels, and a face panel connected to the side panels and having a cut-out portion therein, which is folded inwardly of said carton and frictionally engages the rear panel to form a barrier. The cut-out portion is spaced from one of the side panels so as to create an opening in the barrier through which the elongated member of the article may be inserted and retained in place. The carton is also provided with means for closing openings at the opposite ends of the carton.

### 3,730,336 PACKAGED LIQUID CONTAINERS

Alter Feldman, 36 Shevat Zion St., Tel-Aviv, Israel

Filed Feb. 16, 1970, Ser. No. 11,552

Int. Cl. B65d 83/00

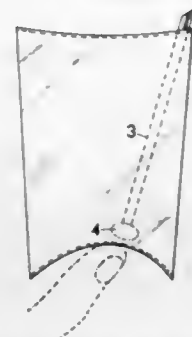
U.S. Cl. 206-47 B

6 Claims

A packaged liquid container comprises a closed flexible plastic bag, a liquid within the closed bag, and an emptying tube completely disposed within the closed bag and having an end able to pierce the wall of the bag from the inside, for emptying the liquid from the bag. In one disclosed form, particularly for containing beverages, the emptying tube is a drinking tube, preferably in the form of a drinking straw removably at-



tached to a bead. The bead may be formed with one or more recesses and projections enabling a plurality of them, after their respective bags have been emptied and the beads



removed, to be assembled together for amusement purposes. In other disclosed forms, useful for liquids to be poured out of the container, the emptying device is a funnel or a bullet-shaped pouring spout.

3,730,337

## ASPRIN-CAPRI OR TAB-CAPRI

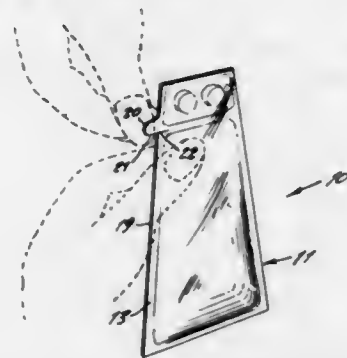
Melvin White, 3305 Grape St., Denver, Colo.

Filed Nov. 4, 1970, Ser. No. 86,718

Int. Cl. B65d 81/32, 85/56, 75/42

U.S. Cl. 206—47 B

—1 Claim



A disposable container containing a medication and a quantity of water so to wash down the medication when a person is attempting to swallow the medication, and the container enclosing the medication and the water in separated compartments from each other.

3,730,338

## STERILE SHIELDED CONTAINER

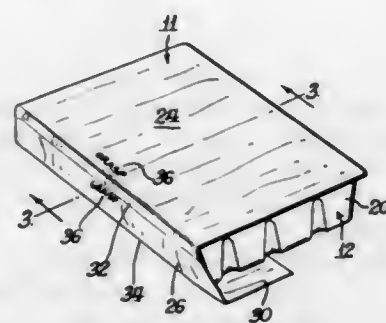
Sheldon R. Chesky, Rolling Meadows, Ill., assignor to The Kendall Company, Boston, Mass.

Filed March 4, 1971, Ser. No. 121,080

Int. Cl. A61b 19/02; A61i 15/00

U.S. Cl. 206—63.2 R

13 Claims



A shield for a hollow sterile tray to retain sterile articles therein, with the tray including, a top for access to the articles,

a bottom, and at least one side wall connecting the top and the bottom. The shield includes a flexible sheet which covers at least a portion of the tray top and one side wall, and the sheet is sufficiently large to prevent contamination of the tray or articles during grasping of the shield by a user's hands.

3,730,339

## COLOR FORMATION INHIBITION FOR STORING ETHYLTHIOETHANOL IN IRON CONTAINING VESSELS

Paul F. Warner, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 8, 1970, Ser. No. 79,326

Int. Cl. B65b 29/00; C07c 149/02

U.S. Cl. 206—84

5 Claims

Amines, e. g., monoethanolamine and diisopropanolamine have been found to stabilize color formation when ethylthioethanol is stored in iron containing vessels such as carbon steel tanks or drums. The action of the inhibitor is specific for the compound ethylthioethanol.

3,730,340

## DEVICE FOR TRANSPORTING AND STORING YARN BOBBINS HAVING BOBBIN TUBES

Edeltraud Neubert, nee Preischl, Hauser near 25, 8971

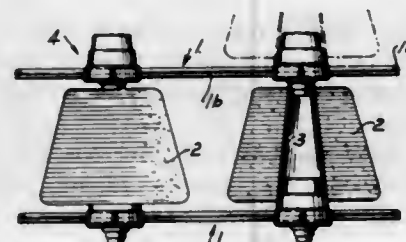
Burgberg/Allgau, Germany

Filed Dec. 10, 1970, Ser. No. 96,703

Int. Cl. B65d 71/00

U.S. Cl. 206—65 Y

12 Claims



An improvement in a device for transporting and storing yarn bobbin tubes arranged on a substantially horizontal pallet. A number of holding elements are mounted on the pallet which have top and bottom protuberances and depressions for centering and supporting the lower and upper end of the bobbin tubes so that a number of pallets having intermediately mounted yarn bobbin can be stacked one upon the other. Each holding element is composed of two holding element parts made of an injectable or pressable plastic material and arranged one above the pallet and one below the pallet. One holding element part is made of a resilient plastic material and has a substantially cylindrical, radially and resiliently compressible shank provided with an inner lock thereon. The other holding element part has a cylindrical opening thereon to receive the shank, the diameter of the opening is less than the maximum diameter of the shank so that the two holding element parts can be pressed together, the shank having the radial compression factor passing through the opening and snapping into engagement with the other holding element part through the aforesaid inner lock.

3,730,341

## FLOTATION OF COARSE PARTICLES

Michel Mames, Ensisheim, and Robert Berthou, Wittelsheim, both of France, assignors to Mines De Potasse D'Alsace, Mulhouse, France

Continuation of Ser. No. 640,670, May 23, 1967, abandoned.

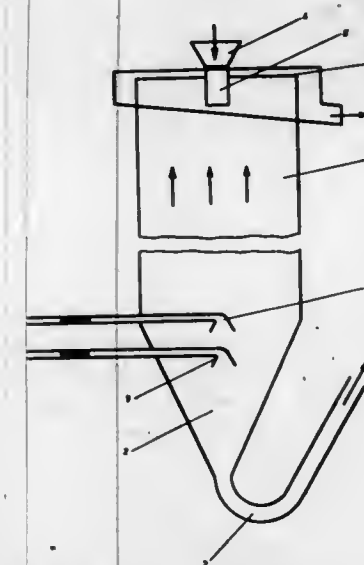
This application Nov. 6, 1970, Ser. No. 87,611

Claims priority, application France, May 24, 1966, 66/62664

Int. Cl. B03d 1/02

U.S. Cl. 209—164

20 Claims



Flotation of coarse particles of ore, particularly sylvinite ore, by passing concentrated conditioned pulp (about 60-70 percent solids) to top of cell just below overflow level, and passing a mixture of air and liquid into bottom of cell to float coarse particles, there being minimal turbulence but sufficient air bubbles for efficient flotation. Suitable apparatus is also provided comprising the flotation of coarse particles, said apparatus comprising a vertical tank, said tank being provided with discharge means, means for the overflow of floated particles suspended in carrier fluid, pulp feeding means at the upper portion of said tank terminating at a level below said means for the overflow, and at the lower portion of said tank means, fixed means for introducing a carrier fluid, and adjacent to said fixed means, fixed dispersing means for the introduction of a supplementary quantity of carrier fluid, said vertical tank further comprising velocity regulating means disposed in said tank for increasing the velocity of said carrier fluid after it is introduced into said tank, and then decreasing the velocity of said carrier fluid prior to reaching said overflow means.

3,730,342

## MICROSCOPICALLY INSPECTING AND SORTING ARTICLES

James John Egan, Allentown; Millard Edward Kimmel, Emmaus; Ronald Irwin Strohl, Walnutport, and William Robert Wanesky, Wescoversville, all of Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Feb. 24, 1971, Ser. No. 117,929

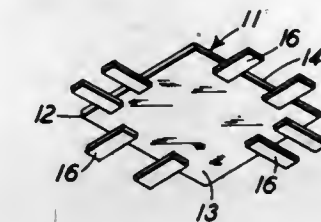
Int. Cl. B07c 7/00

U.S. Cl. 209—122

14 Claims

Microscopically inspecting and sorting articles such as beam-lead integrated circuits is carried out by positioning an array of articles on a transparent substrate in the field of a dual-objective microscope. The top and bottom sides of the articles are individually inspected with the upper and lower objective lenses of the microscope to determine whether these sides have various defects. A vacuum pickup needle is moved from a cut out portion of a disposal tube to and over each arti-

cle having a defect to pick it up and hold it. The needle is then withdrawn to move it back into the cut out portion and to move the article into the opening of the tube. The article is then released from the needle and deposited in the opening of the tube; whereupon, a vacuum which has been applied to the tube draws the article into a filter jar. Also, the bottom sides of



the articles are inspected for the defect of foreign particles and a determination is made as to whether the particles are associated with the articles or the substrate. If associated with the articles, they are deposited in the opening of the tube. Thus, only articles having nondefective sides are left remaining on the substrate.

3,730,343

## METHOD AND APPARATUS FOR SEPARATING WATER FROM A MIXTURE OF A GRANULAR MATERIAL AND WATER

Kurt Pause, and Heinrich Buzga, both of Grevenbroich, Germany, assignors to Maschinenfabrik Busckau R. Wolf AG, Munich, Germany

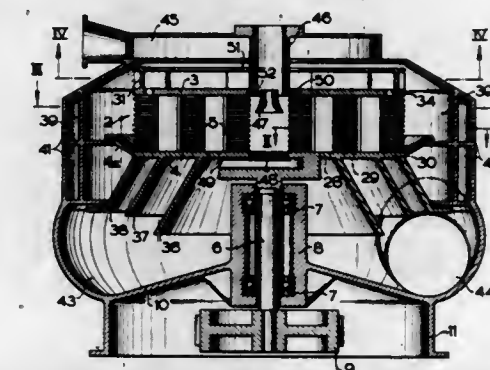
Filed March 2, 1971, Ser. No. 120,174

Claims priority, application Germany, March 4, 1970, P 20 10 128.4

Int. Cl. B01d 33/02

U.S. Cl. 210—68

22 Claims



Water is separated from a mixture of a granular material with water by first separating by a screen all water which is not retained by the granular material, and flows through the screen by the action of gravity. At the same time, the granular material and the retained water is supplied to zigzag-shaped radial channels of a centrifuge where slanted screens separate retained water from the granular material. Water still adhering to the granular material is evaporated by streams of air blowing into the outer end of the zigzag-shaped channels, and into a discharge duct for transporting the granular material to an outlet while evaporating still adhering water.

3,730,344

## APPARATUS FOR CONTINUOUS RENDERING OF FAT-CONTAINING MATERIALS

Gene C. Mason, Piqua, Ohio, assignor to The French Oil Mill Machinery Company, Piqua, Ohio

Division of Ser. No. 712,265, March 11, 1968, Pat. No.

3,632,615. This application March 27, 1970, Ser. No. 23,196

Int. Cl. B01d 29/00

U.S. Cl. 210—152

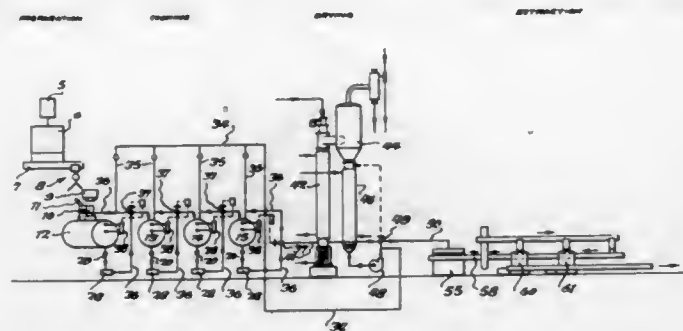
4 Claims

This apparatus relates to continuous rendering of fat-containing material by passing the material in succession through



a series of cookers in such a manner that the material can be pumped from one cooker to another by maintaining the material in fluid form and by maintaining the material in the

are included for controlling the vertical and angular position of the unit in the water. The skimming unit has forward and aft edges lying in the same horizontal plane and maintained at substantially the same height in the water to prevent creation



cooker at a desired level. The cooked material is then passed through other apparatus and finally discharged in the form of liquid fat and solids including crackling cake. This replaces the batch cookers commonly used in rendering plants.

3,730,345

# COMPRESSION FILTER PRESS PROVIDED WITH EXPANSIBLE AND CONTRACTIBLE CONNECTING TUBES IN SLURRY PASSAGES

Mikio Suzuki, Honda, Japan, assignor to NGK Insulators Ltd., Nagoya, Japan

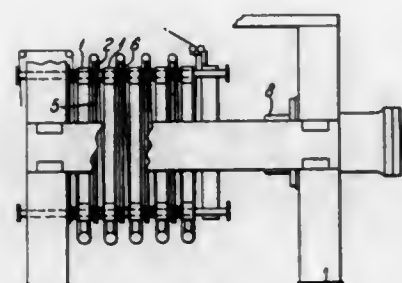
Filed April 12, 1971, Ser. No. 133,003

Claims priority, application Japan, Sept. 22, 1970, 45/82522

Int. Cl. B01d 25/12

U.S. Cl. 210-231

7 Claims



A compression filter press comprising filter frames and filter plates alternately arranged in succession around which an endless filter cloth extends and further comprising expansible and contractible connecting tubes in slurry passages. The expansible and contractible tubes connect the slurry passages between adjacent filter frames to provide an absolutely slurry leak-tight construction.

3,730,346

# SKIMMING SYSTEM

Cecil H. Prewitt, Olympia, Wash., assignor to Cortland Skinner; Cecil K. Glaze and Cecil H. Prewitt, all of Olympia, Wash.

Filed March 1, 1971, Ser. No. 122,600

Int. Cl. E02b 15/04

U.S. Cl. 210-242

7 Claims

A system for skimming floating fluids, such as oil and small pumpable debris, from the surface of a body of water includes an elongated sink-like or trough-like skimming unit adapted to be propelled through the water, with means for drawing fluid from the unit and conducting it to a separator for separating the floatable matter from the water. The elongated skimming unit extends laterally of the path along which the unit is propelled through the water and adjustable floatation means

of a bow wave pushing the oil away from the unit and to permit the oil or other floatable fluid to be drawn into the trough across both the forward and aft edges. Flotation and propulsion adjustment means maintain the optimum position of the unit in the water during use.

3,730,347

# DRY CLEANING SOLVENT FILTER

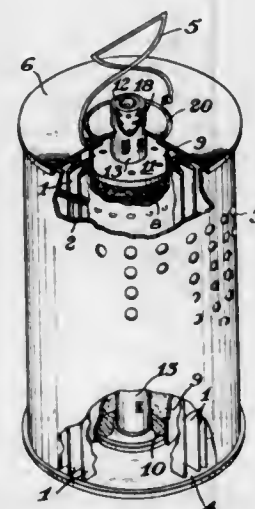
John J. Glampalm, Jr., Midland, and William G. Oldford, Lexington, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 22, 1971, Ser. No. 200,844

Int. Cl. B01d 27/02, 27/04

U.S. Cl. 210-266

4 Claims



An improved dry cleaning solvent filter cartridge comprising for the greater part conventional filter cartridge configuration and construction, i.e., an outer tubular element of accordion plaited filter paper and an inner tubular bed of activated charcoal all enclosed in a perforated outer cylindrical metal shell with a perforated concentric center tube serving as the filtered solvent outlet, contains a perforated unidirectional lockable annular metal retainer on the top of the charcoal bed and a cooperating locking section in either or both tubular walls of the charcoal bed, said retainer locking in place when pressed down on the bed by engagement between one or both of its inner and outer peripheral edges and inward projections on the corresponding wall or walls holding the charcoal bed.

3,730,348

# FILTER SCREEN

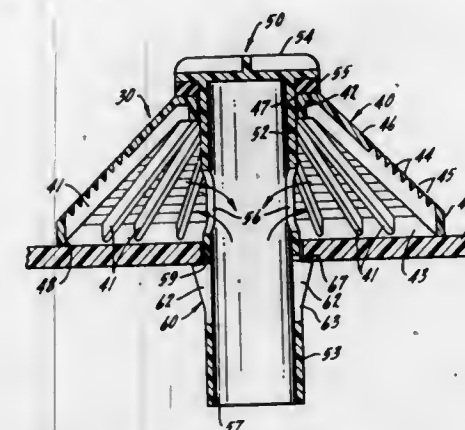
Frank G. Weis, Kansas City, Mo., and Marvin E. Wood, Lenexa, Kans., assignors to Ecodyne Corporation, Chicago, Ill.

Filed April 19, 1971, Ser. No. 135,263

Int. Cl. B01d 29/08

U.S. Cl. 210-274

6 Claims



A filter strainer assembly for use in filtering apparatus having retaining lug means integral with a central portion thereof for holding the strainer assembly securely to a filter bed supporting plate. The strainer assembly includes a vertical center section, passing through the plate, having a passageway through a side portion thereof positioned above the plate and retaining lug means positioned below the plate. A resilient washer, which is in compression when the lug means is in its strainer securing position, is provided to compensate for material elongation. A passageway in the central section below the plate is formed by the lug means to permit gas accumulated under the plate to pass through the strainer.

3,730,349

# ION EXCHANGE FILTER PARTICULARLY A MINIATURE FILTER

Willy Herrmann, Strombergstrasse 21, Ludwigsburg, Germany

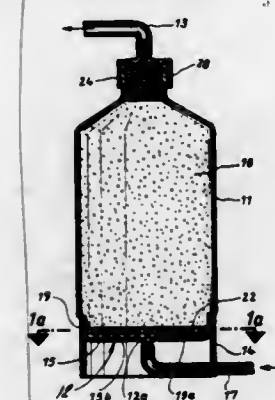
Filed April 8, 1971, Ser. No. 132,275

Claims priority, application Germany, April 29, 1970, P 20 20 929.4; Aug. 14, 1970, G 70 30 537.2

Int. Cl. B01d 27/02

U.S. Cl. 210-281

9 Claims



The filter includes a container filled with ion exchange material and has an upper opening, with the liquid to be treated flowing longitudinally upwardly through the container from a bottom inlet. The container has a bottom wall and sidewalls extending upwardly from the bottom wall and with upper ends converging inwardly to the upper opening. At least one plate, having lateral dimensions substantially equal to the inner lateral dimensions of the container adjacent the bottom wall, is positioned on the bottom wall and has openings for the passage of liquid to be treated. The plate is formed of material which is sufficiently flexible to provide for the plate to be inserted through the upper opening into the container. In one

embodiment of the invention, a single flexible plate has elevations on its surface toward the bottom wall, spacing the plate from the bottom wall. In another embodiment of the invention, a second plate of sponge-like material is positioned on top of the first plate. In a third embodiment of the invention, only a plate of sponge-like material is used and the inner surface of the bottom wall is formed with a series of concentric discontinuous annular ribs.

3,730,350

# PLATE DIALYZER

Josef Hoeltzenbein, 44 Muenster/Westphalia, Germany, assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Continuation of Ser. No. 880,324, Nov. 26, 1969, abandoned.

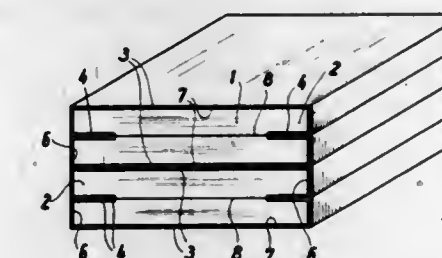
This application July 12, 1971, Ser. No. 161,818

Claims priority, application Germany, July 26, 1969, P 19 38 008.6; Dec. 7, 1968, 6,810,380; Dec. 27, 1968, 6,813,222; Jan. 27, 1969, 6,902,959

Int. Cl. B01d 31/00

U.S. Cl. 210-321

18 Claims



A plate dialyzer is provided with plates and membranes located therebetween. The membranes extend along the front sides of the plates and are bent around the ends of the plates. The ends of the membranes are tightly clamped between two adjacent plates. The plates have channels used for supplying or removing at least one of the dialysis liquids.

3,730,351

# DISPOSABLE BLOOD DIALYSER UNIT

Mario Nino Veronesi, Mirandola, Italy, assignor to Sterilplast S.p.A., Mirandola, Italy

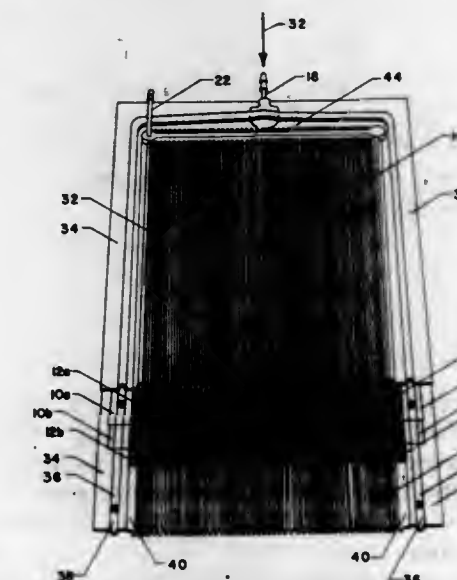
Continuation-in-part of Ser. No. 20,305, March 17, 1970, abandoned. This application July 1, 1971, Ser. No. 158,730

Claims priority, application Italy, March 27, 1969, 31044 A/69

Int. Cl. B02d 31/00

U.S. Cl. 210-321

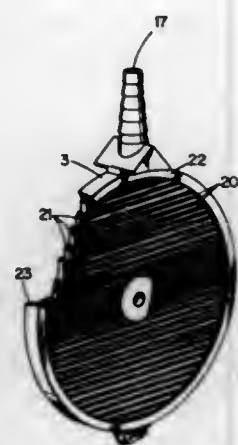
1 Claim



The invention concerns an improved dialyser unit of flat rectangular construction, comprising a flat membrane en-



velope provided with a blood inlet at one end and a blood outlet at the other end, membrane support material covering the two outer surfaces of the membrane envelope and being made up of an inner series of coplanar parallel strands against the outer surfaces of the membrane envelope and an outer series of coplanar parallel strands crossing the inner series of the side outwardly of the membrane envelope, spacer elements arranged across the free outer series of coplanar parallel strands of the membrane support material, and a housing having a dialysate inlet and outlet, defining a dialysate flow passage with the spacer elements and outer surfaces of the membrane envelope, the inner series of coplanar parallel strands of the membrane support material against the one outer surface of the membrane envelope being arranged at an angle relative to the inner series of coplanar parallel strands against the other outer surface of the membrane envelope.



3,730,352

## FILTRATION APPARATUS

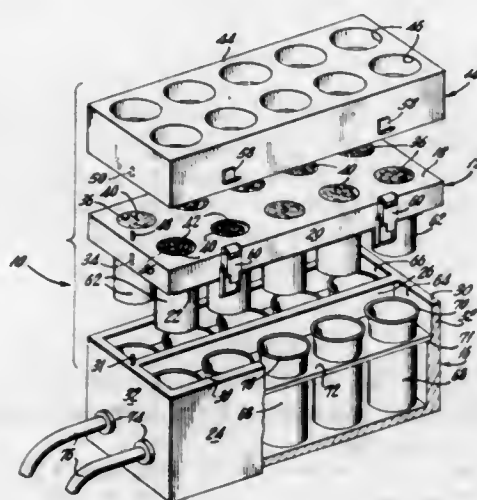
Stanley N. Cohen, Menlo Park, Calif., and Myron Tannenbaum, East Brunswick, N.J., assignors to New Brunswick Scientific Co., Inc., New Brunswick, N.J.

Filed Dec. 6, 1971, Ser. No. 205,776

Int. Cl. B01d 29/04

U.S. Cl. 210—332

9 Claims



A filtration apparatus for simultaneously performing a plurality of filtering operations. A plurality of filters are respectively situated beneath a plurality of reservoir cavities for supplying liquid to be filtered to the filters to pass therethrough, and a plurality of collection vials are respectively situated beneath the filters for receiving the filtrate therefrom. The entire apparatus can be inverted as a unit. A plurality of seals respectively seal the reservoir cavities with respect to the filters in such a way that during the washing operations washing liquid can wash the margins of the filters.

3,730,353

## FILTER SUPPORT AND FILTER UNIT CONSTRUCTION

Ben Trasen, Wellesley, and Donald B. Rising, Stow, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed Dec. 28, 1970, Ser. No. 101,850

Int. Cl. B01d 35/02

U.S. Cl. 210—455

3 Claims

A filter support with two opposing surfaces having perforations in the central portion and a flat surface surrounding the central portion. The perforations permit passage of fluid between the support surfaces. An inlet and outlet means are

attached to the peripheral surface of the holder and the outlet is in fluid communication with the perforations in both sup-

port surfaces. A filter unit is formed by sealing a cover and a filter membrane to each flat surface.

3,730,354

## FOLDING BOOT-DRYING RACK

Benjamin Bronstein, McLaren, British Columbia, Canada

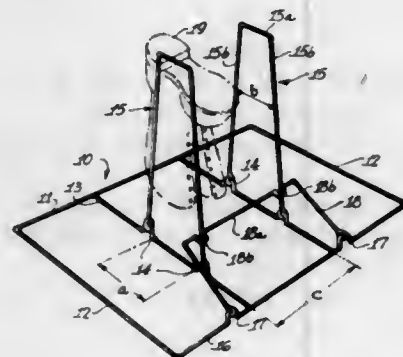
Filed Nov. 5, 1971, Ser. No. 196,055

Claims priority, application Canada, May 17, 1971, 113,164

Int. Cl. A47f 7/08

U.S. Cl. 211—38

3 Claims



A folding boot-drying rack has a frame, open to permit the passage of air therethrough. Pivotably attached to the frame are boot supporting members, which when not in use are folded against the frame. A second member is pivotably attached to the frame and supports the boot supporting members in an upright, boot-supporting position.

3,730,355

## UNITARY HANGER FOR DISPLAYING ARTICLES

Burton G. Feldman, 175 E. Delaware St., Apt. 6403, Chicago, Ill.

Filed June 9, 1971, Ser. No. 151,429

Int. Cl. A47f 5/01, 1/00, 7/00

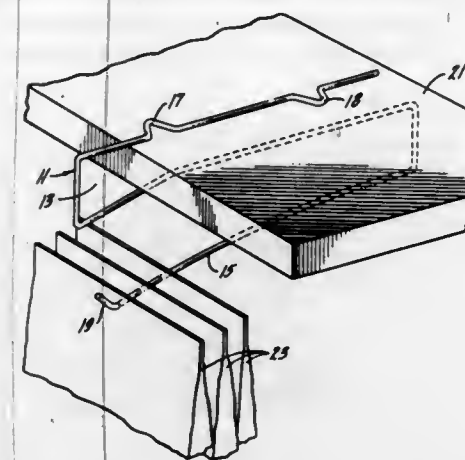
U.S. Cl. 211—59

1 Claim

A unitary hanger for retaining articles to be displayed comprising a generally S-shaped, resilient rod having an upper jaw and a lower arm. The upper jaw generates a closing pressure for grasping a shelf or other support beam. The upper jaw also has stabilizing tabs for engaging the support beam and holding

the hanger stationary. The lower arm deflects downward under the weight of the articles disposed on the arm causing

items to maintain their consistent positioning, and guides to accurately deposit the items on the pallet. The loading means may move laterally, transversely, vertically and rotatably



the articles to move forwardly on the arm. An upwardly extending tip on the end of the lower arm retains the articles in place on the lower arm.

3,730,356

## ARTICLE PRESENTING APPARATUS

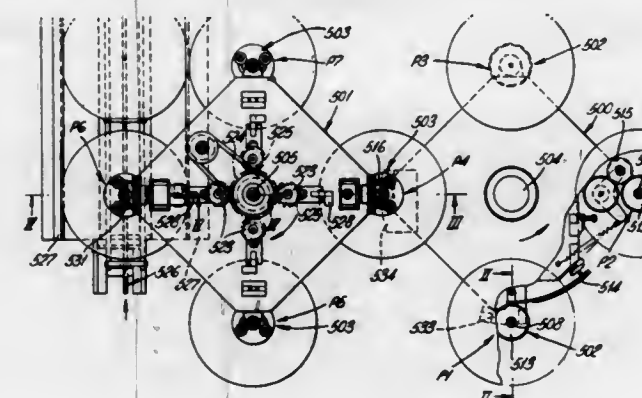
Walter Howard Bossons, c/o Thrissell Works, Eaton Road, Bristol; David George Parker, 21, Westhall Road, Warrington, and George Davey Burcher, c/o Molins Limited, Haw Lane, High Wycombe, all of England

Filed May 5, 1971, Ser. No. 140,508

Int. Cl. B65g 29/00

U.S. Cl. 214—1 BC

11 Claims



Records are presented to inspection devices by feeding each record in turn to one of four members which supports the record from below so that its upper surface may be inspected, the members being carried on a first head intermittently rotatable in 90° steps. After three such steps from the feeding position the record is transferred to one of four further members which supports the record from above so that its lower surface may be inspected, the further members being carried on a second head driven in synchronism with the first head. After two 90° steps of the second head the record is released from the further member.

3,730,357

## AUTOMATIC STACKING APPARATUS

Thomas Beaty, Jr., 20180 Whipple Drive, Northville, Mich., and Asib S. Samander, 25802 Jeanette, Roseville, Mich.

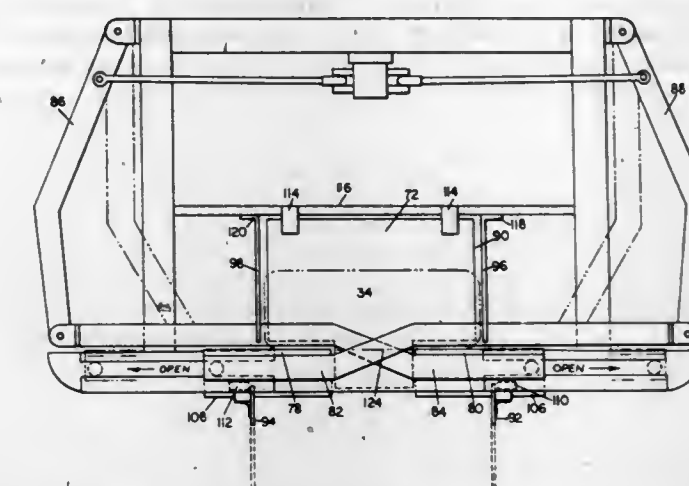
Continuation-in-part of Ser. No. 101,529, Dec. 28, 1970. This application May 12, 1971, Ser. No. 142,545

Int. Cl. B65g 57/06

U.S. Cl. 214—6 DK

8 Claims

A method and apparatus for automatically loading items onto a pallet. The loading means has a pocket to contain the



enabling a variety of loading configurations. The entire operation may be hydraulic, or pneumatic, and may be controlled by a program, such as by the use of a program tape, or cards, or by a conventional relay control panel.

3,730,358

## CONTAINER RANDOM ACCESS STORAGE SYSTEM

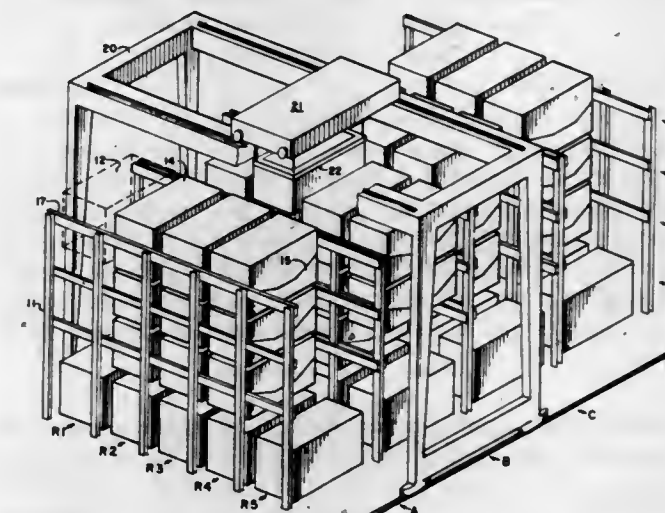
Sukeo Oji, 709 Wellesley Avenue, Berkeley, Calif.

Filed March 19, 1971, Ser. No. 126,228

Int. Cl. B65g 1/06

U.S. Cl. 214—16.4 A

2 Claims



A three-dimensional multi-tier, open frame, structure defining spaces or cells for receiving modular shipping containers is arranged with a movable cradle in each cell for holding the container. Each cradle can be moved horizontally one cell width so that a particular container stored within the structure is accessible to a crane from above.

3,730,359

## FREIGHT AIRCRAFT LOADING AND UNLOADING PLANT

Leif Andersson, Gothenburg, Sweden, assignor to Siccot Ltd., Zug, Switzerland

Filed May 20, 1971, Ser. No. 145,339

Claims priority, application Germany, May 27, 1970, P 20 26 974.3

Int. Cl. B65g 67/00

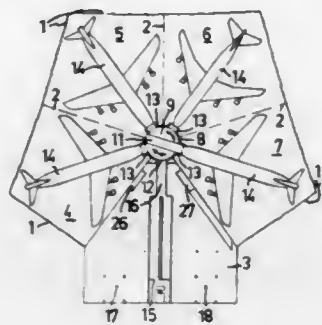
U.S. Cl. 214—38 D

16 Claims

A freight aircraft loading and unloading plant has a pentagonal ground contour confining four spaces for the aircrafts



and one space for a freight transport system. The ground contour of the individual spaces has been generated by dividing the regular pentagon into five similar sections by partition lines running from the middle of each side of the pentagon towards the center thereof. A cargo distributor including a turntable is mounted in the center and comprises also freight transfer stations. Aircraft are received in four of the spaces



standing on a middle line therein with their noses towards the center and each in position for one of the freight transfer stations. The fifth section includes a transport arrangement for the cargo which passes on conveyor means to the transfer stations and is distributed therefrom to the correct aircraft by the turntable as the aircraft is loaded. Unloading takes place in the opposite direction. The plant is adapted to serve aircraft built for nose loading as well as for loading through the side of the hull.

3,730,360

**UNIT TRAIN AUTOMATIC UNLOADING SYSTEM**  
Herman A. Aquino, Hobart, Ind., and Willis H. Knippel, Palos Park, Ill., assignors to Pullman Incorporated, Chicago, Ill.  
Filed May 21, 1971, Ser. No. 145,676  
Int. Cl. B65g 67/24

U.S. Cl. 214-63

23 Claims



An automatic control system for regulating the opening and closing of railway hopper car discharge doors and including an electrical and a hydraulic system which senses the approach of a unit train to actuate trackside cam and sensing means to discharge the load, such as, coal into below track pits. Pit sensors sense the height of the coal in each successive pit and signal the electrical and hydraulic control system to prevent discharge of coal into a full pit. Safety control means are included in the system to prevent the door opening cam track means from being raised under the locomotive and from being raised under the caboose. The speed sensor in the control circuit will determine if the train is approaching at too high velocity, and will lower the cam devices and the sensing devices away from trackside so as not to be damaged by the approaching overspeed train.

3,730,361

**VEHICLE RAMP**

Orren E. Haynes, Forest Park, Ga., assignor to Robert L. Zink, Norwalk, Conn.

Filed July 28, 1971, Ser. No. 176,355

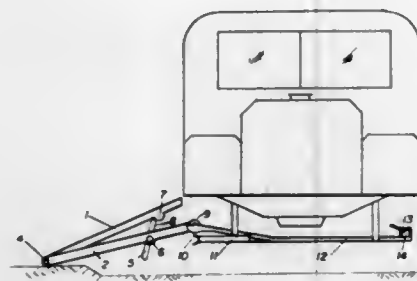
Int. Cl. B65g 67/02

U.S. Cl. 214-85

2 Claims

A ramp normally stored on a carrier beneath a surface, the ramp and carrier being brought out along a track fixed

beneath the surface into an extended position, the ramp end being then raised to the level of the surface by a strut attached to the carrier creating a triangular truss supported at one end by the track and at the other end by the level being connected with the surface by the ramp. The two ends of the carrier may travel on different tracks, allowing the ramp and carrier, when



collapsed together, to follow the configuration of the underside of the surface while returning to the storage position.

By way of an example, a gangway beneath a vehicle which is extended into place, the gangway floor then being raised to the level of the floor of the vehicle while being supported by the framework structure beneath the floor.

3,730,362

**ANTI-LOWERING DEVICE FOR A LOADER BOOM**

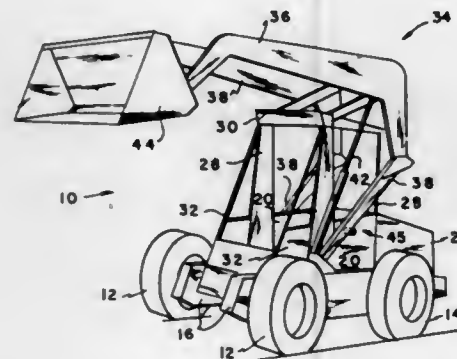
Joseph C. Hurlburt, Leola, and John L. Stohler, Ephrata, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Sept. 9, 1971, Ser. No. 178,972

Int. Cl. E02f 3/00

U.S. Cl. 214-140

1 Claim



A pair of locking pins each disposed at a predetermined height adjacent a respective side wall of a loader and operative to be selectively moved outwardly therefrom such that the outer portions thereof project through the vertical planes of a pair of boom arms, thereby prohibiting the boom arms from lowering beyond the predetermined height.

3,730,363

**CUTTING HEAD FOR COMMINUTING MACHINES**

Josef Karpf, Socking-Jungholz, Germany, assignor to G. W. Steffens, Remscheid, Germany

Filed June 2, 1971, Ser. No. 149,254

Claims priority, application Germany, June 4, 1970, P 20 27 429.7

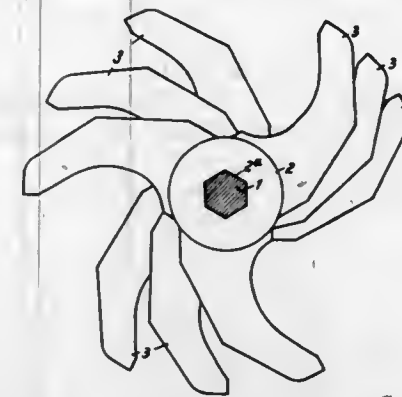
Int. Cl. B02c 18/00

U.S. Cl. 241-282.1

12 Claims

A cutting head for comminuting machines, particularly meat cutting machines, includes rotatable angularly displaced

knives which are secured to a knife support or driving disk by means of cooperating, or engaging, sets of teeth precluding



displacement of the knife in a direction longitudinally thereof relative to their support.

3,730,364

**APPARATUS FOR CHARGING SAMPLES TO ANALYZING APPARATUS**

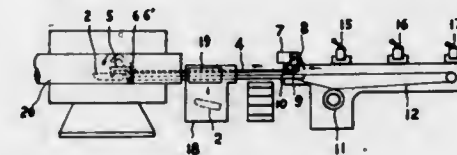
Toshimi Nakamura, and Hiroyuki Koide, both of Kitakyushu, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed May 5, 1971, Ser. No. 140,347

Int. Cl. G01n 31/08

U.S. Cl. 214-302

13 Claims



An apparatus for charging samples to an analyzing apparatus in a prescribed time sequence having a conveyor for sequentially moving a series of tray receivers into a charging position relative to the analyzing apparatus, a reciprocable charging rod for moving a tray containing a sample from its respective tray receiver on the conveyor into the analyzing apparatus and having a hook thereon for removing the tray from the analyzing apparatus following analysis, and a device for unloading the residue of the analysis from the tray into a collecting box.

3,730,365

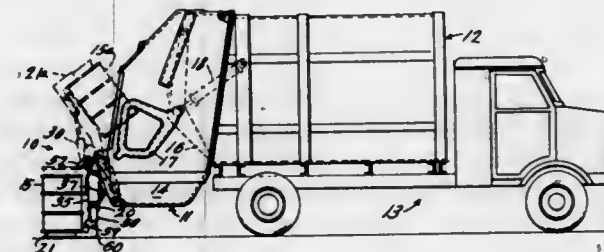
**APPARATUS FOR DUMPING HEAVY CONTAINERS**  
William A. Herpich, Gallon, Ohio; George W. Palmer, and Ray E. Bartholomew, both of Durant, Okla., assignors to Peabody Gallon Corporation, Gallon, Ohio

Filed May 5, 1971, Ser. No. 140,496

Int. Cl. B65f 3/02

U.S. Cl. 214-302

11 Claims



An apparatus for dumping containers of various types such as barrels, open top carts, rectangular boxes, and the like into

a walled receiver. The apparatus is mountable on fixed supports or on a vehicle such as a conventional rear loading refuse truck. The apparatus has an "L" shaped container carrier. A quadrant is pivotally mounted on the fixed support or truck body at approximately the level of the top of the receiver wall. The container carrier is pivotally mounted at its upper end on the same axis as but separate from the quadrant. A first extensible cylinder means is connected between the quadrant and a lower portion of the vertical arm of the container carrier. A second cylinder means is connected between a lower part of the receiver and the quadrant. The pivotal connections of the cylinders to the quadrant are spaced radially from the quadrant pivot and circumferentially from each other. The vertical arm of the container carrier telescopes to accept containers of different heights and the container carrier has container latching means.

3,730,366

**CONTAINER LIFT**

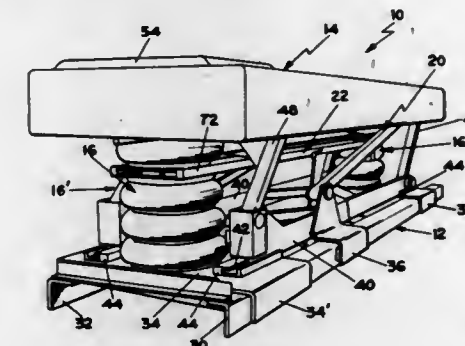
Howard P. Berends, Fruitport, Mich., assignor to Holland Hitch Company, Holland, Mich.

Filed Jan. 4, 1971, Ser. No. 103,576

Int. Cl. B60p 1/02

U.S. Cl. 214-512

6 Claims



A vehicular haulage apparatus having an elevator load platform vertically shiftable on a wheeled support frame by a plurality of fore to aft spaced inflatable, deflatable bellows units, the bellows units being joined at the vertically intermediate portions thereof by distortion preventing tie means. A parallelogram linkage as well as stabilizer and position controlling linkage, joins the load platform with the underlying frame. The tie means is interrelated with the stabilizer linkage.

3,730,367

**MOBILE REFUSE RETRIEVER**

Thomas E. Heffington, 4605 Valerie, Bellaire, Tex.

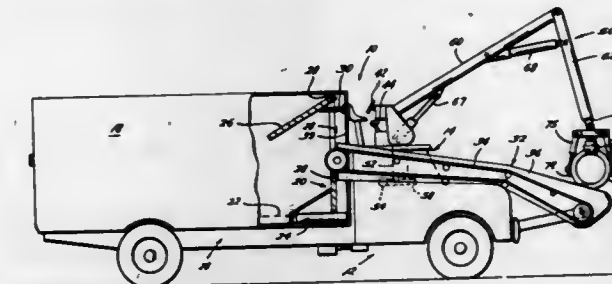
Continuation of Ser. No. 828,832, May 29, 1969, abandoned.

This application Sept. 21, 1970, Ser. No. 74,189

Int. Cl. B60p 1/50

U.S. Cl. 214-518

12 Claims



The present invention is directed to a mobile refuse retriever which is to be used to pick up and carry away objects such as bar garbage bags, bundles of trash, limbs, rubbish, and the like. The present invention utilizes on a motorized vehicle a hydraulic crane having a cage on its free end to grasp or scoop the refuse. The crane then deposits the refuse on the receiving end of a conveyor carried by the vehicle. Also car-



ried by the vehicle is a packer body having a packer plate with a normally closed door therein. The discharge end of the conveyor deposits the refuse through this door and onto the operative side of the packer plate.

3,730,368

## LIGHT GUIDED CENTER LIFT

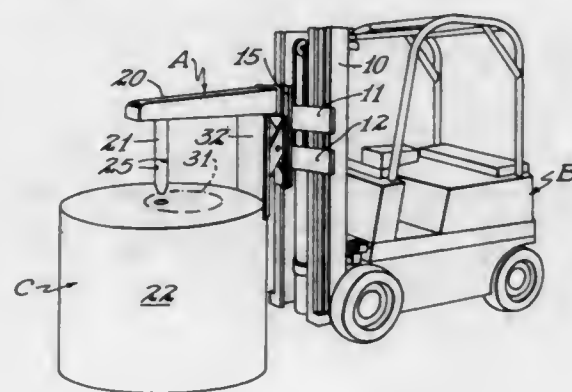
Herbert Francis Dalglish, 284 Cherokee Avenue, St. Paul, Minn.

Filed Jan. 6, 1972, Ser. No. 215,754

Int. Cl. B66c 1/54

U.S. Cl. 214-653

10 Claims U.S. Cl. 215-9



Apparatus for lifting rolls of material comprising a probe with expansible jaws for engaging the center of a roll of material or any other object having a hollow core in combination with a flood light for illuminating the flat top of a roll of material. A photo cell positioned in the tip of the probe senses the lack of reflected light from the roll when positioned directly over the hole and triggers a relay which sounds a horn, lights a light or otherwise makes known to the operator that the probe is in position to be lowered into the hole.

3,730,369

## THRUST IMPARTING JOINT CONNECTION

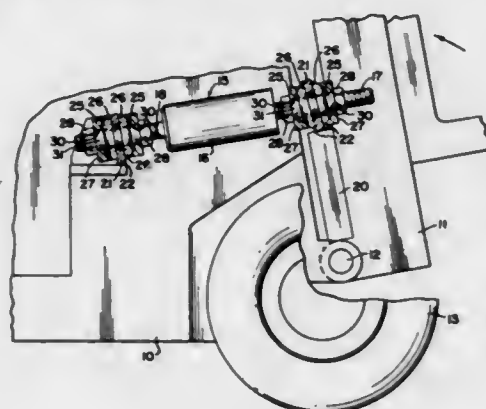
Derek K. Keene, and Edward W. Miller, both of Philadelphia, Pa., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 7, 1971, Ser. No. 141,321

Int. Cl. B66f 9/08

U.S. Cl. 214-674

4 Claims U.S. Cl. 215-9



The joint connection through which a piston rod of a hydraulic ram imparts thrust to a movable part of an industrial truck, such as a pivoting mast, is formed through assembly about the thrust end of the piston rod, of a plate welded or otherwise fixed to the mast, and traversed by the piston rod, a pair of washers having each a flat surface whereby to slide on the plate, and an opposed spherical surface, together with a pair of cones having tapered surfaces applied to the said spherical surfaces. These cones are also mounted on the piston rod, and means are provided for holding the cones and washers assembled relatively to the rod and the plate in an ad-

justed position on the length of the rod. The washers slide relatively to the plate and pivot relatively to the cones for contributing universal movement between the piston of the cylinder and the plate fixed to the mast.

3,730,370

## CHILDPROOF CLOSURE AND CONTAINER

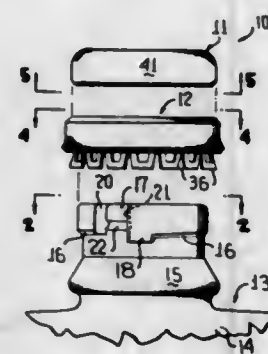
Frank H. Lecinski, Harwood Heights, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Jan. 24, 1972, Ser. No. 220,310

Int. Cl. B65d 55/02

10 Claims U.S. Cl. 215-9

20 Claims



This disclosure relates to a childproof closure and container which includes three components, namely, a container, a closure and a novel fitment including an annular wall adapted to exteriorly telescopically embrace a peripheral skirt of the closure when the same is seated upon the container finish, means in the form of projecting fingers are formed inboard of the annular wall and are received in outwardly opening recesses of the container finish thereby limiting relative rotation between the fitment and the closure while providing recesses into which project locking lugs of the closure whereby the fitment must be slid axially downwardly prior to the removal of the closure from the container thereby rendering the combination childproof.

3,730,371

## SAFETY CLOSURE

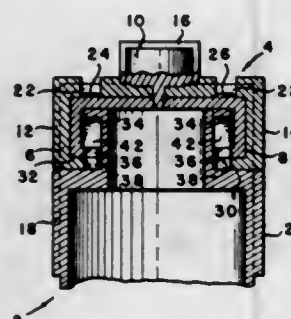
Edward J. Corcoran, P.O. Box 3395, Lantana, Fla.

Filed Feb. 22, 1972, Ser. No. 227,903

Int. Cl. B65d 55/02

14 Claims U.S. Cl. 215-9

14 Claims



The safety cap closure is adapted to lock to a container and prevent small children from readily gaining access to harmful substances within the container, while at the same time, being easily and rapidly removable by adults with impaired vision. The safety cap closure includes two relatively rotatable cap sections, both of which must be moved to a predetermined position to unlock the cap closure. Surface discontinuities located on the cap sections and the container are alignable by means of the tactual sense to enable rapid release of the safety cap closure without the use of the visual senses.

3,730,372

## PLASTIC CONTAINER

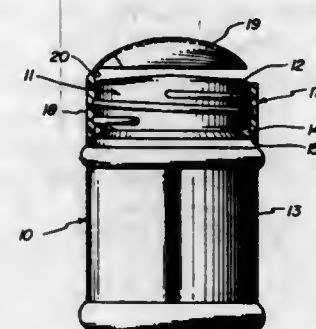
Henry Komendowski, Evanston, Ill., assignor to Automatic Liquid Packaging Inc., Elk Grove Village, Ill.

Filed Nov. 19, 1971, Ser. No. 200,489

Int. Cl. B65d 17/02

U.S. Cl. 215-32

19 Claims



A plastic container with an integral cover has a cap screw threaded to the cover. Manipulation of the cap causes the cover to be severed from the container body. The cap has an attached implement, such as a spoon, fork or knife for removing a product from the container.

3,730,373

## BAND-TYPE ELECTRIC HEATERS

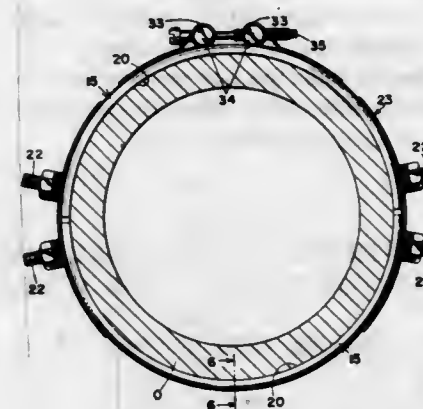
Lloyd S. Kozbek, Pittsburgh, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Filed March 30, 1972, Ser. No. 239,593

Int. Cl. H05b 3/58

U.S. Cl. 219-535

3 Claims



A band-type electric heater adapted to be secured around the periphery of a cylindrical object to be heated, comprising an elongated metal-sheathed electric heater bent longitudinally to arcuate shape so that an inner surface follows the curvature of the object, and a flexible metal clamping band adapted to encompass the object and overlies the outer surface of the heater, and having means to draw it tightly around the object and thereby press the heater inner surface against the periphery of the object. The band has embossments which engage the heater outer surface and limit surface-to-surface contact between the band and the heater, to thereby reduce the amount of heat conducted to the band, and to also reduce frictional contact between the band and the heater to permit the two to move relatively and adjust to conform to good heating relationship with the object at the time the band is drawn tightly around the object.

3,730,374

## INSULATED CONTAINER

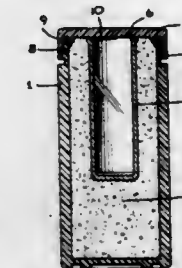
Eugene A. Picciano, West Caldwell, Francis C. Clark, Madison, and Frank J. Neggers, Hopatcong, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed June 1, 1971, Ser. No. 148,553

Int. Cl. B65d 25/18

U.S. Cl. 220-9 F

4 Claims



A dual container suitable for protecting the contents from changes in environmental conditions comprises the combination of an outer container having a screw thread neck, with a smaller inner container, the area between the inner and outer containers forming an insulating zone and the inner and outer containers being concentrically positioned. A support means maintains the inner container in the desired position within the outer container. In the insulating zone air may provide the required insulation or it may be filled with an insulating substance which can also act as the support means. The screw on cap provided is designed to form a moisture impermeable seal over the mouth of the inner container.

3,730,375

## FLUID CONTAINMENT SYSTEM

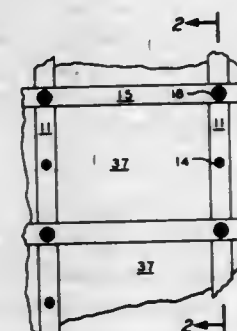
Edwin E. Reed, and E. Kleinmann, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 27, 1971, Ser. No. 212,119

Int. Cl. B65d 25/18, 7/22, 25/00

U.S. Cl. 220-9 LG

8 Claims



A fluid container comprises spaced horizontal and vertical elongated support members, intermediate wall, outer membrane, inner wall and inner membrane.

3,730,376

## TAMPERPROOF AND REUSABLE STERILE CLOSURE ASSEMBLY

Joseph T. Wood, Northbrook, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed March 3, 1971, Ser. No. 120,439

Int. Cl. B65d 17/06

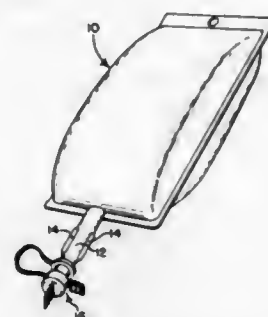
U.S. Cl. 220-27

8 Claims

A tamperproof and reusable sterile closure assembly for a container is provided including a tubular neck element which is attached to the container and a closure device having overcap and stopper portions which are adapted to be telescopically associated relative to the tubular neck element. The overcap portion of the closure device is initially frangibly connected to the tubular neck element in surrounding relation-



ship to the stopper portion of the closure device. When the closure device is frangibly disconnected from the tubular neck



element, the stopper portion of the closure device is capable of being positioned within the tubular neck element in slidable and sealed relationship therewith.

3,730,377

## PULL TAB END FOR CAN

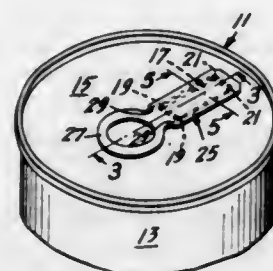
Richard Joseph Brincks, Wheeling, Ill., assignor to American Can Company, Greenwich, Conn.

Filed March 13, 1972, Ser. No. 234,065

Int. Cl. B65d 17/24

U.S. Cl. 220-27

10 Claims



A pull tab can end which exposes substantially no raw edge to create a hazard to the user. The end has an orifice whose periphery is defined by a raw edge turned upward. A membrane lies over the raw edge and covers the orifice. When the end is opened, there remains a portion of the membrane on the end which surrounds the exposed raw edge, thus preventing the user from cutting himself.

3,730,378

## STORAGE UNIT WITH HINGED TOP AND FRONT

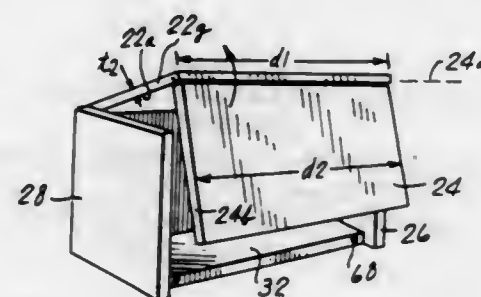
Don C. Albinson, Coopersburg, and William I. Stephens, Telford, both of Pa., assignors to Knoll International Inc., New York, N.Y.

Filed June 15, 1971, Ser. No. 153,352

Int. Cl. B65d 51/18

U.S. Cl. 220-29

13 Claims



A storage unit formed from a top panel and a front panel. The front panel is pivotally mounted about an axis at the top thereof to the top panel. The top panel includes a space therein to receive the front panel when the latter is pivoted

from a normal perpendicular relationship with the top panel about the axis to a parallel relationship with the top panel. The top panel is pivotally attached to a back panel. Stop means are employed to limit the pivotal movement of each panel.

3,730,379

## EASY OPENING CAN END WITH NONREMOVABLE TAB

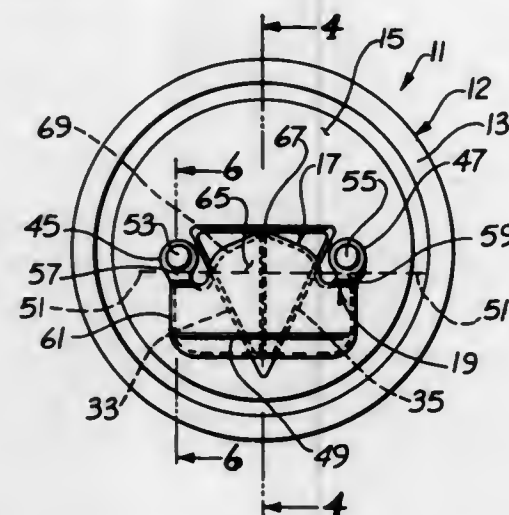
Omar L. Brown, Dayton, Ohio, assignor to Eral C. Frazee, Dayton, Ohio

Filed May 10, 1971, Ser. No. 141,509

Int. Cl. B65d 17/00

U.S. Cl. 220-48

14 Claims



An easy opening container wall comprising a container wall of sheet material, a line of weakness in said container wall at least partially defining a tear portion, a tab having an attachment portion joined to a lever portion for pivotal movement of the lever portion relative to the attachment portion. The lever portion has a rupturing section and the attachment portion is attached to the container wall outside of the tear portion on opposite sides thereof with the rupturing section overlying a region of the tear portion. Pivotal movement of the lever portion causes the rupturing section to bear on the tear portion and rupture the line of weakness. Further pivotal movement of the tab folds the tear portion inwardly to form an opening in the container wall without removing the tab or the tear portion from the container wall.

3,730,380

## CAN END WITH INSEPARABLE TEAR STRIP AND LATCH MEANS FOR HOLDING TEAR STRIP AGAINST CAN WALL

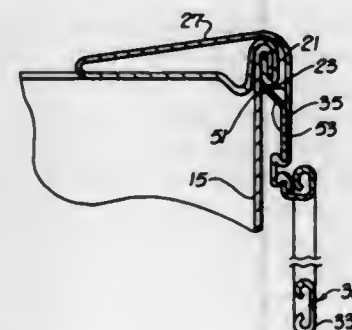
Francis M. Silver, Dayton, Ohio, assignor to Eral C. Frazee, Dayton, Ohio

Filed Jan. 17, 1972, Ser. No. 218,319

Int. Cl. B65d 17/24

U.S. Cl. 220-54

9 Claims



A container comprising a container body and a can end of sheet material attached to the container body. The can end

has a line of weakness therein defining a tear portion partially removable from the can end to form an opening in the can end. A tab is attached to the tear portion to partially remove the tear portion from the can end and for peeling the tear portion back away from the opening. Cooperating members are provided on the tab and the container for retaining the tab and tear strip in the peeled back condition.

3,730,381

## CAN END OPENING MEANS

Jozef Tadeusz Franek, Chorley Wood, and Peter Rhodes, Watford, both of England, assignors to The Metal Box Company Limited, London, England

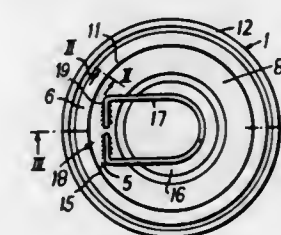
Filed Feb. 28, 1972, Ser. No. 229,849

Claims priority, application Great Britain, March 2, 1971, 5,773/71

Int. Cl. B65d 17/24

U.S. Cl. 220-54

8 Claims



In a can end comprising an end closure member having a line of weakening which defines a removable panel and which carries a pull tab for removal of the panel, the pull tab is a rigid member attached rigidly to the removable panel. The can is opened by rocking the pull tab back and forth so as to deform the material of the panel adjacent to the pull tab and partly bonded by a portion of the line of weakening. This causes strain reversal and consequent fatigue failure in the said portion of the line of weakening.

3,730,382

## PLASTIC PAIL WITH INTEGRAL HANDLE AND PLUG-TYPE PLASTIC COVER

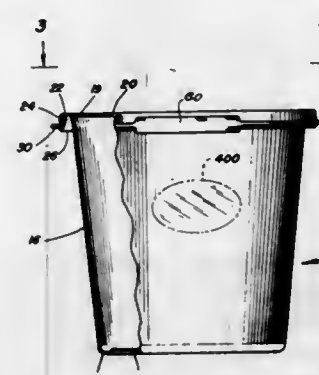
Raymond A. Heisler, 657 Dakota Trail, Franklin Lakes, N.J.

Filed March 9, 1971, Ser. No. 122,303

Int. Cl. B65d 43/10

U.S. Cl. 220-60 R

12 Claims



A molded one-piece plastic pail of tapered configuration has a handle molded integrally with a top outwardly extending rim. This handle, as molded, lies in a plane normal to the axis of the container and at a determined distance down from the top of the outer rim. A plurality of intermediate gate portions is provided between the handle and the rim during molding and is left connected to the handle and rim so as to maintain the handle in a determined spaced condition and position during the time the container is being shipped, filled and stored. The cover is formed to provide a plug fit with the open end of the container. The inner upper edge of the container's open end has a retaining ledge formed so as to engage a molded

notch formed at the upper end of the plug seal portion of the cover. This provides an upper seal of the plug seal of the cover. At the lower end of the plug seal portion the cover has an interference fit with a tapered portion of the container to form a lower fluid tight seal. From the plug seal the cover is formed with an outwardly extending portion that terminates at a downturned annular flange which is sized so as to snugly engage an outer annular flanged edge provided by the container rim. In its mounted condition the downturned annular flange portion of the cover is slid over the outer edge of the container to provide a tension member by which the retaining ledge of the container is maintained in engagement with the notch in the cover. This sealing condition is maintained until the annular flange of the cover is displaced from the container rim and then from the plug seal of the container. The container sidewalls are formed with a taper disposed to slide one within the other and to provide a determined clearance in a non-locking condition as the outer rim of one container is caused to rest upon the outer rim of a succeeding lower container. In a stacked and stored condition the sidewalls of the container are disposed in a determined spaced relationship permitting ready separation or unstacking of the containers. A pry slot is provided between cover and outer rim of the container. A self-sealing plug is provided in those covers for containers which are to have tinting colors added at the point of sale. In an alternate embodiment the upper rim of the container is provided with an outwardly extending upper bead. The cover is complementarily formed to provide a mating receiving groove to engage and retain this bead in its outer, downwardly turned flange portion. The upper outwardly extending ring portion of the cover in its mounted condition is stretched outwardly to bring the mating receiving groove of the cover over and onto the outer bead of the container rim.

3,730,383

## CONTAINER BODY AND A METHOD OF FORMING THE SAME

Lloyd G. Dunn, Lower Burrell; James R. Morran, New Kensington, and Donald L. Peters, Delmont, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 856,331, Sept. 9, 1969. This application

July 29, 1971, Ser. No. 167,204

Int. Cl. B65d 7/42

U.S. Cl. 220-66

3 Claims



An aluminum container body and a method of forming the same by ironing the side wall of a drawn cup to thin and lengthen it, and reforming the bottom end wall of the ironed cup to form therein an upwardly domed central portion connected through a substantially vertical wall section and an outwardly and upwardly tapered shoulder into the side wall of the can body. The ironed can body may have a protective coating applied to its inner surfaces and cured thereon prior to reforming the end wall.



3,730,384

## TANK CONTAINERS

Hans Joachim Ramme, Gebr. Grimm Str. 5, Flechtendorf, Germany

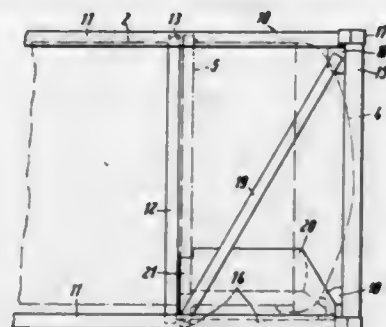
Filed July 20, 1970, Ser. No. 56,387

Claims priority, application Germany, July 22, 1969, P 19 37 192.7

Int. Cl. B65d 7/14, 7/44

U.S. Cl. 220-71

12 Claims



This invention relates to a tank container comprising a receptacle with a cylindrical middle portion provided with domed covers and run-off fittings, and a frame or cradle the corners of which are provided with purpose-made container corner fittings.

3,730,385

## NESTABLE CONTAINER

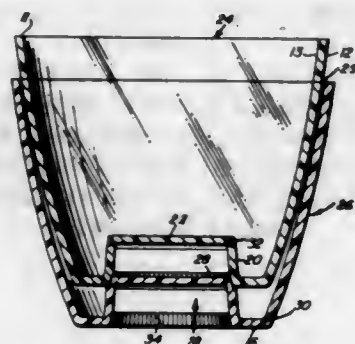
Karl H. Rost, Siegburg, Germany, assignor to Roslin Corp., Palm Beach, Fla.

Filed Feb. 16, 1971, Ser. No. 115,440

Int. Cl. B65d 21/02

U.S. Cl. 220-97 C

2 Claims



A container having means to prevent binding and rotation and provide positive engagement with adjacent nested containers. The bottom section of each container includes an upwardly offset center portion having teeth spaced around the top circumference inside each container. A corresponding set of teeth is provided around the bottom circumference of the center portion on the outer surface. When stacked, or nested, the bottom teeth of each container engage the top teeth of the container immediately below providing positive engagement without binding or rotation.

3,730,386

## ARTICLE ARRANGING AND COUNTING MACHINE

Claude E. Monces, Durham, N.C., assignor to Wright Machinery Company, Inc., Durham, N.C.

Filed May 10, 1971, Ser. No. 141,690

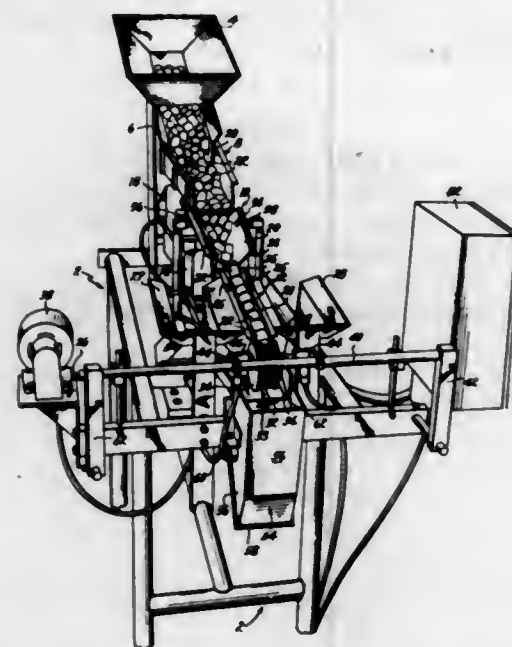
Int. Cl. B65g 23/74

U.S. Cl. 221-7

8 Claims

A cascade of vibratory conveyors receive discrete fragile articles in bulk and by operating successive conveyors at higher rates the articles are delivered in a single row to a rotary brush

which accelerates successive articles to provide spaces between them. The spaced articles are photoelectrically counted and dropped onto a bottom closure in a receiver. After a predetermined count a partition is interposed in the



receiver to temporarily intercept and hold further articles, while feeding and counting continues, until the articles on the closure have been discharged and the closure returned to closed position. A portion of one of the conveyors is so narrow it can hold only a single row of articles.

3,730,387

## PILL DISPENSING DEVICE HAVING PLURAL CUT-OFF TRAP CHAMBER

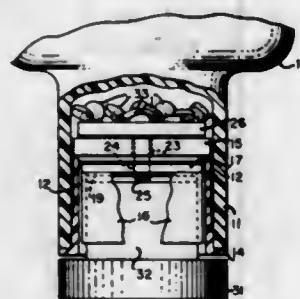
John A. McConnell, 5680 Robertson Avenue, and Everett W. Williamson, 36338 Concord Place, both of Newark, Calif.

Filed July 12, 1971, Ser. No. 161,742

Int. Cl. B65d 83/04

U.S. Cl. 221-265

4 Claims



A pill dispensing device positioned in the neck of the pill container and operable by the container cap. The device is provided with a hollow rotatable member positioned in the container neck and rotatable by turning the cap. The rotatable member is provided with an end wall having a hole therethrough. A fixed member is supported adjacent said end wall and on the outside thereof, and a rotatable disc is supported by said rotatable member on the outside of said fixed member. The fixed member and the rotatable disc both have holes therethrough and the hole in the disc is adapted to receive a pill from the supply in the container when the container is inverted. The pill is transferred from the hole in the disc into the hole in the fixed member and from the latter hole into the hole in the rotatable end wall of the hollow member when the cap is turned. The pill may be removed from the hollow member after the cap is removed from the container, and the cap must be placed back upon the container before the device can be used to dispense another pill.

3,730,388

## MATERIAL MEASURING AND DISPENSING APPARATUS

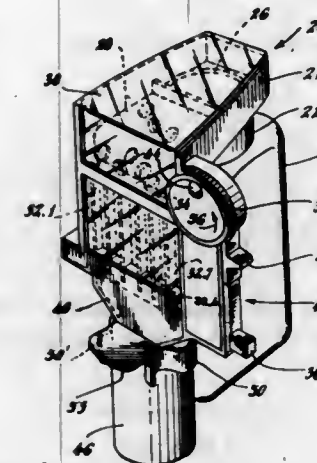
Louis Bender, Scotch Plains, N.J., assignor to Brenner &amp; Bender Inc., Warren Township, N.J.

Filed Feb. 10, 1972, Ser. No. 225,074

Int. Cl. B65g 59/00

U.S. Cl. 221-68

28 Claims



An apparatus for dispensing materials such as pills, coffee, sugar and the like is described wherein precise desired quantities may be dialed into the apparatus and quickly and accurately dispensed. In a preferred embodiment for a pill counter and dispenser, a plurality of channels are provided with a flexible channel selector located to fill selected channels with pills to be dispensed. The channels each contain a predetermined number of pills so that, upon actuation of a pill gate, the desired quantity of pills is dispensed. A unit pill dispensing feature is included to enable the dispensing of any desired quantity of pills within a practical range. An interlock operable between the pill gate and the channel selector protects against the spillage of pills. Several embodiments are shown to provide pill counters capable of dispensing a variety of pill shapes such as large tablets and capsules. Pill counters for either mounting on bottles or for mounting on a surface in a self-contained manner are described.

3,730,389

## SYRINGE

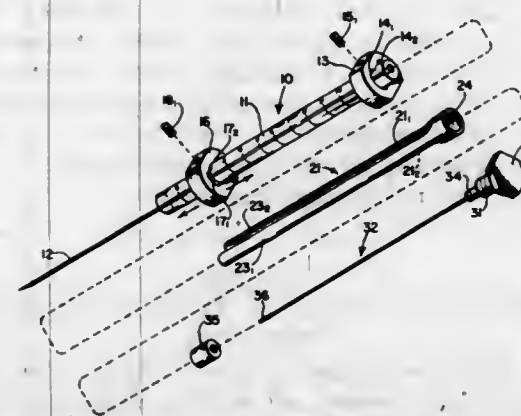
Rano J. Harris, Sr., and Rano J. Harris, Jr., both of Baton Rouge, La., assignor to Precision Sampling Corporation, Baton Rouge, La.

Filed June 22, 1971, Ser. No. 155,570

Int. Cl. B67d 5/22

U.S. Cl. 222-31

12 Claims



An improved syringe for dispensing accurately measured quantities of fluid specimens. It comprises a unique plunger and plunger guide assembly, adapted for engagement with a pair of ferrules fitted upon a syringe barrel, in addition to the usual combination of a barrel and a hollow or tubular needle mounted on the forward end of the barrel such that the axial

opening of the barrel and the needle opening are communicated to provide a continuous bore. A pair of ferrules, each provided with a plurality of openings (preferably two) of equal number, are fitted upon the barrel, one to the rear and one to the front of the barrel. The openings of the ferrules are aligned. The forward ferrule is adjustably movable upon the barrel, while the other is fixed. The rearward ferrule is provided with openings which subtend a larger arc distance than those of the forward ferrule. The plunger guide, a sub-component of a plunger assembly, comprising a plunger and a plunger guide, is mounted upon the barrel for slidable engagement therewith, via projections corresponding to the number of openings within the ferrules, which are extended through the openings of the rearward ferrule. In one position the terminal ends of members located on the plunger guide will impinge on the front ferrule, this corresponding with a pre-selected setting of the volume of a fluid specimen to be delivered, and in another position the entire plunger assembly can be partially rotated upon the barrel and within the openings of the rear ferrule so that the members of the plunger guide can pass through the openings of the forward ferrule such that the plunger can then be pushed forward to deliver the fluid specimen through the needle.

3,730,390

## AEROSOL GUN

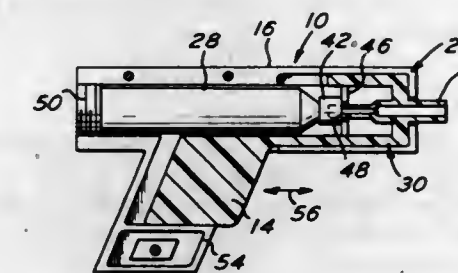
Robert G. Adrian, and Claire M. Adrian, both of Camden, N.J., assignors to Tear Gas Products Corp., Pennsauken, N.J.

Filed June 23, 1971, Ser. No. 155,989

Int. Cl. B67d 5/54

U.S. Cl. 222-79

2 Claims



An aerosol gun which utilizes a replaceable cartridge or canister. The gun is constructed of two half sections and a reciprocally mounted trigger means. Aerosol gun may be advantageously used as a defensive weapon by using an aerosol cartridge containing tear gas.

3,730,391

## OPEN CYLINDRICAL CAN CONTENTS EJECTING DEVICE

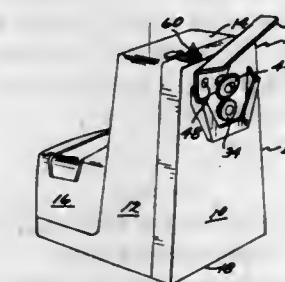
Richard M. O'Bannon, 188 Coral View, Monterey Park, Calif.

Filed Dec. 30, 1971, Ser. No. 214,041

Int. Cl. B67b 7/38

U.S. Cl. 222-82

6 Claims



A device for ejecting the dimensionally stable contents of an opened cylindrical can as an integral unit, and one that is particularly adapted to be included as a part of an electrically operated can opener, with both the device and the can opener being powered by the same electric motor.



3,730,392

**COUPLER-ASPIRATOR-VALVE ASSEMBLY**

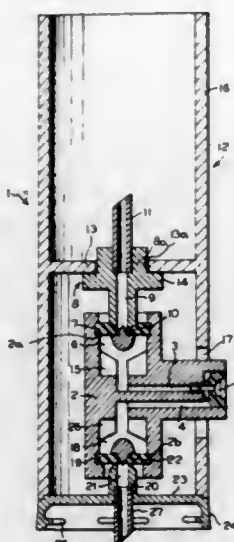
Jean Marand, Norwalk, Conn., assignor to Ciba-Geigy Corporation

Filed Aug. 3, 1970, Ser. No. 60,687

Int. Cl. B67b 7/24; B67d 5/54

U.S. Cl. 222-82

17 Claims



A coupler-aspirator-valve assembly includes a coupler-aspirator having two flow passages joining in a nozzle. Each flow passage communicates with a chamber. One of the chambers houses a valve stem which couples to a valveless propellant cartridge. The other of the chambers houses a product container valve stem which couples to a valveless product container assembly.

3,730,393

**FLEXIBLE CYLINDER FOR COLLAPSIBLE SQUEEZE TUBE**

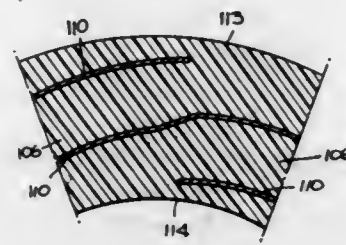
William Ledewitz, Woodbridge, Conn., and Robert W. Twigg, Rockford, Ill., assignors to Polytube Inc., New Haven, Conn.

Continuation-in-part of Ser. No. 853,858, Aug. 28, 1969, abandoned. This application Aug. 20, 1970, Ser. No. 65,415

Int. Cl. B65d 35/10

U.S. Cl. 222-106

3 Claims



A flexible cylinder which is adapted to be used as the body of a squeeze tube is disclosed. The cylinder has a gas-pocket free multi-ply wall including spaced metal foil plies. Along each radial section of the cylinder the wall comprises, in sequence, an inner plastic ply, a metal foil ply, a plastic ply, a metal foil ply, and an outer plastic ply.

3,730,394

**PUTTY MIXING CONTAINER FOR CAULKING GUN-TYPE DISPENSER**

Kenneth W. Woodson, 251 Ocean View, Newport Beach, Calif.

Filed Sept. 28, 1970, Ser. No. 76,087

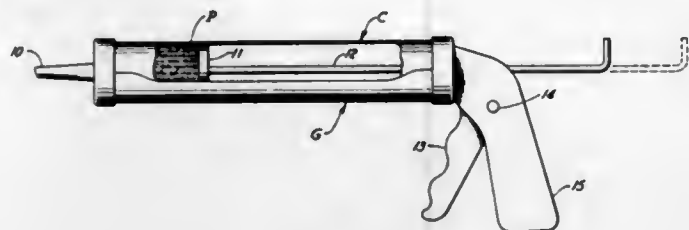
Int. Cl. B29b 1/04

U.S. Cl. 222-137

33 Claims

A putty mixing container of the disposable type in which an epoxy putty and a catalyst are separated from one another on

opposite sides of a mixer by a removable barrier. The putty and catalyst are mixed by rotation of the mixer after removal of the barrier. The mixer is removable from the container to



allow dispensing of the mixed material or the mixer is of deformable construction to enable dispensing of the mixed material.

3,730,395

**SEED AND FERTILIZER SPREADER**

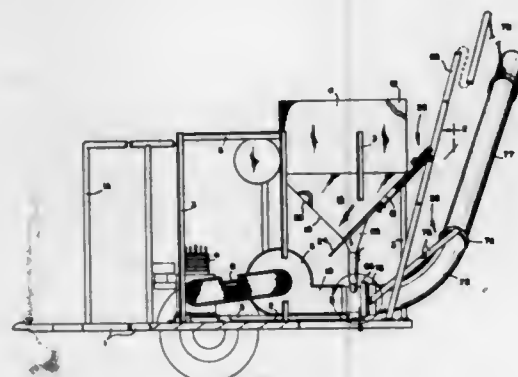
Donald R. Gallogly, Route 2, Box 232, and William E. Wheeler, 610 3rd Avenue, both of Sweet Home, Oreg.

Filed July 21, 1971, Ser. No. 164,614

Int. Cl. B67d 5/60

U.S. Cl. 222-145

1 Claim



A machine is disclosed for travel along a linear course while simultaneously projecting seed and fertilizer for deposit along an area adjacent said course. A blower provides an airflow which passes through a mixing chamber whereat baffles, spaced in the direction of airflow, produce an area of reduced pressure. The seed and fertilizer are introduced into said chamber between the spaced apart baffles for unobstructed entry into the airflow. A discharge conduit assembly moves vertically during machine operation to spread the discharged material. Operator controlled means works in conjunction with flow regulating means to precisely regulate the flow of seed and fertilizer to the mixing chamber.

3,730,396

**MOBILE PARTICULATE MATERIAL CARRIER AND DISPENSER**

William H. Harper, Dallas; Charles R. Peace, Mesquite, and Jake B. Keller, Desoto, all of Tex., assignors to A.M.H. Equipment, Inc., Dallas, Tex.

Filed May 28, 1971, Ser. No. 147,993

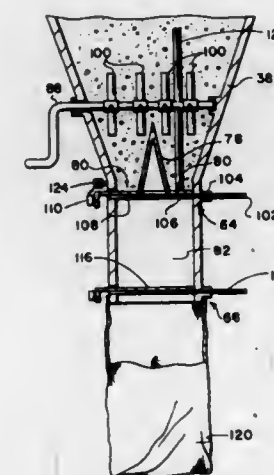
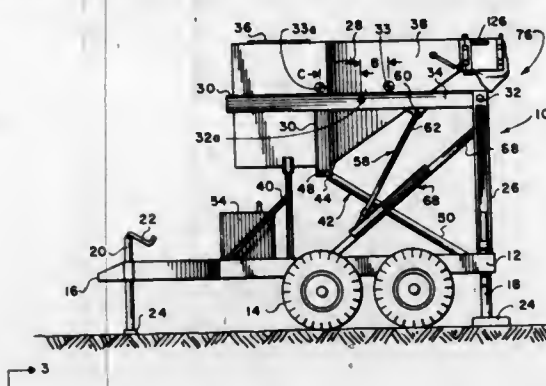
Int. Cl. B67d 5/64

U.S. Cl. 222-166

1 Claim

A bulk material dispenser having a receptacle rotatably supported on a wheeled frame with an access opening in the receptacle for filling the receptacle with particulate material.

A hydraulic pump connected to a double acting telescoping hydraulic piston cylinder assembly pivotally mounted between the frame and the receptacle for rotating the receptacle between a first loading position and a second dispensing position.



tion. A dispensing opening in said receptacle for controlling the discharge of material from said receptacle. Baffles and material agitators in said receptacle to assist the dispensing of the particulate material.

3,730,397

**GRANULE APPLICATOR**

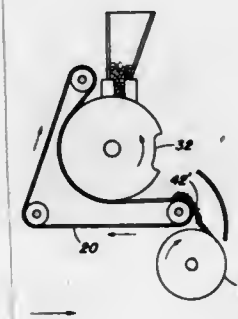
Bruno E. Magnus, Dunellen, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Oct. 2, 1970, Ser. No. 77,561

Int. Cl. G01f 11/24

U.S. Cl. 222-254

1 Claim



Granules are placed in a hopper having a resilient seal surrounding a bottom outlet under which rotates the periphery of a roll having a cavity for receiving a preselected quantity of such granules each time the cavity passes under such outlet. The cavity roll in turn drives a belt carried by idler rolls located so that the belt contacts the cavity roll directly after the periphery of such roll leaves the hopper outlet seal, and such contact continues until the belt reaches the bottom of the roll, where a horizontal reach of the belt carries the granules

to a discharge station above a distribution roll. From such distribution roll the granules fall under a gate onto a sheet of roofing material which moves horizontally thereunder.

3,730,398

**LIQUID DISPENSING APPARATUS**

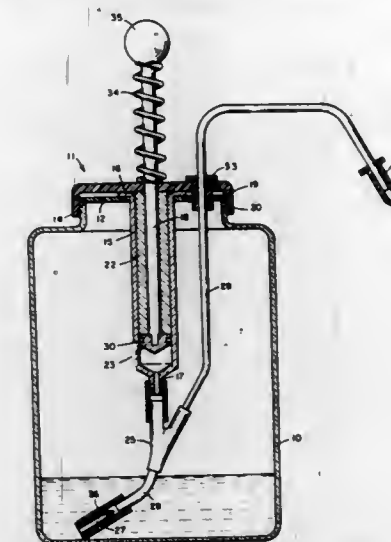
George G. Goda, 390 First Avenue, New York, N.Y.

Filed June 14, 1971, Ser. No. 152,637

Int. Cl. G01f 11/06

U.S. Cl. 222-309

12 Claims



A combination syringe and cap assembly which is utilized for dispensing predetermined amounts of liquid from a source bottle. The assembly is of compact and concise construction and can be manufactured inexpensively.

3,730,399

**NON-SPILL DRINKING CUP TOP**

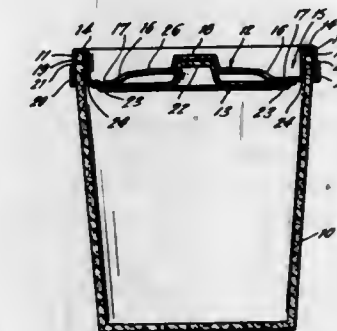
James W. Dibrell, Malibu; James Pennington, Los Angeles, and Frank C. Schutz, Downey, all of Calif., assignors to Nospital Limited, Los Angeles, Calif.

Filed Feb. 22, 1972, Ser. No. 227,993

Int. Cl. B67d 3/00

U.S. Cl. 222-482

3 Claims



A non-spill drinking cup cover is formed of two sections joined at their center. The outer cover section can be secured to the outer periphery of a drinking cup in a conventional manner. The outer cover section further contains an annular well which in turn has a plurality of openings and at least one annular reinforcing rib means. The inner closure section nests within the central portion of the cover section and additionally contains at least one annular reinforcing rib means near the periphery thereof. The closure section is stressed such that the periphery thereof is normally biased toward contact with the bottom of the annular well of the cover section along a closed line such that all openings of the cover section are between the line of contact and the central portion of the cover section so as to form a fluid-tight seal. The cover section is more elastic than the closure section so that upon application of pressure,



the cover section will undergo elastic deformation so as to open the contact between the cover section and closure section and allow fluid to flow through the holes into the annular well. The user may then drink from any annular position on the rim of the outer annular well.

### 3,730,400 PRESSURE PACKAGES

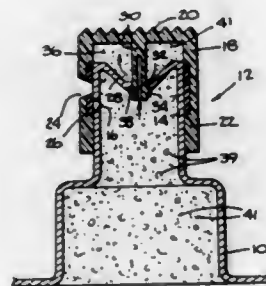
Kenneth G. Klema, Racine, Wis., assignor to S. C. Johnson & Son, Racine, Wis.

Filed March 2, 1972, Ser. No. 231,301

Int. Cl. B65d 5/72

U.S. Cl. 222-497

8 Claims



This invention relates to a pressurized package of the class embodying a container for receiving a product, and propellant means in the container for discharging the product therefrom, said container having discharge means characterized by a cap mounted on said container for opening or closing an exit opening in the container depending upon the relative position of the cap, and a pressure chamber interposed between the cap and the container for returning the cap to its closed position with respect to the exit opening.

### 3,730,401 APPARATUS FOR SUPPORTING AND OPERATING A SLIDABLE GATE AND EXTENDED TUBE NOZZLE ON A BOTTOM-POUR VESSEL

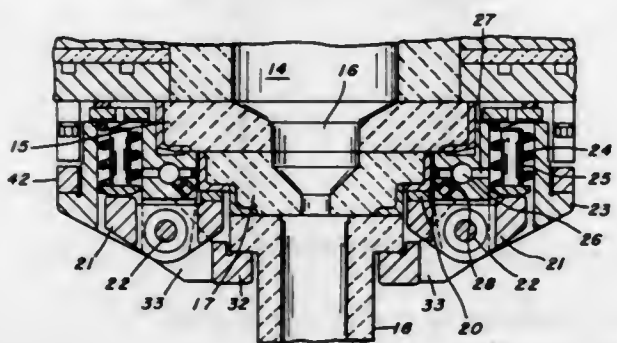
Charles H. Bode, Jr., Upper St. Clair Township, Allegheny, Cty., Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed March 22, 1972, Ser. No. 236,921

Int. Cl. B22d 37/00

U.S. Cl. 222-512

12 Claims



A bottom-pour teeming vessel for pouring molten metal into a mold is provided with a slidable gate for controlling the flow of metal and a nozzle extension tube fixed below the gate. A nozzle plate is secured to the vessel bottom and the gate is urged thereagainst by spaced rails mounted on spring-loaded rocker arms on opposite sides of the nozzle. The tube is urged against the underside of the gate by a separate set of spaced rails mounted on spring-loaded rocker arms. The gate and tube are free to slide relative to each other. Means are provided for changing the gate and tube simultaneously or either one separately without disturbing the other.

### 3,730,402 HOPPER CRAFT

Cornells Van der Gaag, Delft, Netherlands, assignor to N.V. Industriële Handelscombinatie Holland, Rotterdam, Netherlands

Filed June 10, 1971, Ser. No. 151,738

Claims priority, application Netherlands, June 10, 1970, 7008447

Int. Cl. F16k 51/00

U.S. Cl. 222-561

6 Claims



A hopper craft has a cargo space and a plurality of discharge openings in the bottom of the cargo space each of which is opened and closed by a vertically movable valve. Bulkheads extend across the cargo space between the discharge openings; and each valve has an upright plate that is perpendicular to and guided in the bulkheads. On one side of the upright plates, the bulkheads have passages therethrough for pumping out the cargo instead of discharging the cargo by moving the valves vertically. Vertically swinging plates are pivoted to the side wall of the cargo space on the same side as those through passages. In their upwardly swung positions, the latter plates cooperate with the first-mentioned plates to close off the through passages when carrying a cargo that is to be pumped. The vertically swinging plates can then be swung down when the cargo is to be pumped. If the cargo is to be discharged through the valves, however, then the vertically swinging plates are maintained in their down position during loading so that all the cargo space is available.

### 3,730,403 MILK KETTLE FOR DOMESTIC USE

Aldo Piagnoli, Via Nino Bixio, 4/15 A sc. D, 16128 Genova, Italy

Filed June 16, 1970, Ser. No. 46,752

Claims priority, application Italy, June 16, 1969, 7105 A/69

Int. Cl. D65d 25/44

U.S. Cl. 222-572

5 Claims



A kettle for heating and boiling milk, and consisting of a substantially conventional vessel having side and bottom walls, and further provided with a partition wall parallel to and spaced from the said bottom wall at a level generally of the order of one tenth of the overall height of the vessel, said partition wall being apertured at a position formed adjacently to a brief arc of the side wall, the area of the thus formed passage being generally from two to five percent of the area of said partition wall, the kettle being designed to effectively prevent boiling over of the milk.

### 3,730,404 APPARATUS FOR FORMING FABRIC BLANKS

Ernst Schramm, 4 Place Dubois, Dollard des Ormeaux, Quebec, and Wolfgang Geisinger, 180 Paradis Street, Rosemere, Quebec, both of Canada

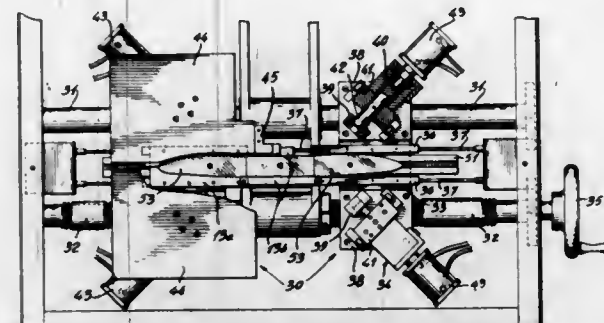
Substitute for Ser. No. 841,884, July 15, 1969. This

application Aug. 3, 1970, Ser. No. 60,420

Int. Cl. A41h 33/00

U.S. Cl. 223-38

4 Claims



A nest plate assembly for an apparatus for forming fabric blanks comprising a nest plate having two end portions and a removable intermediate portion which may be made in various lengths for forming blanks of various sizes. The nest plate is supported by a carriage assembly including two separate supporting structures holding the end portions of the nest plate, and means are provided for moving the supporting structures for sliding the two end portions of the nest plate towards or away from each other for positioning a predetermined intermediate portion of the nest plate between the end portions thereof. The nest plate has a cavity shaped in accordance with the finished blank and a punch assembly is provided for inserting a somewhat larger blank into the cavity of the nest plate. The punch assembly comprises four punch sections overlapping each other and arranged to form a four corner punch assembly. A head structure is provided for supporting the punch assembly and includes two separate plates slidably mounted towards or away from each other. To each one of such plates are attached two punch sections for permitting adjustment of the length of the punch assembly to suit the length of the nest plate assembly. Screw means are secured to the head structure and connected to the plates for easily adjusting the length of the punch assembly.

### 3,730,405 HOSIERY INSPECTION APPARATUS

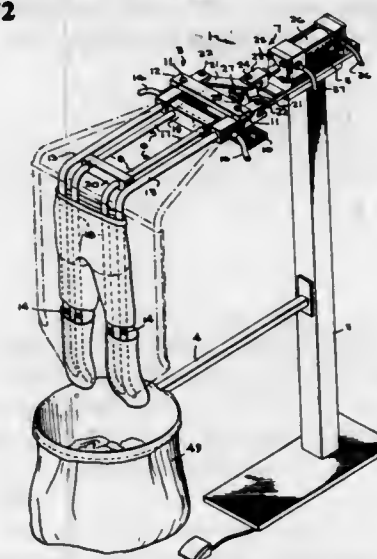
Melvin H. Ezell, 813 Romany Road, Charlotte, N.C., and Troy B. Talley, Route 4, Concord, N.C.

Filed June 22, 1971, Ser. No. 155,578

Int. Cl. D06c 15/00

U.S. Cl. 223-72

17 Claims



Apparatus for holding tubular garments during inspection which includes pairs of garment-holding elements having

downturned ends which are inserted into the garments, the outer holding elements of each pair being pivotally mounted upon a support for horizontal movement, and pneumatic means for moving the pivoted elements about their pivots to a diverging relation to spread and hold the garments and to a substantially parallel relation to release the garments. A garment packaging receptacle is held below the garment being inspected, and a burst of air through the pivoted holding elements into the garment positively ejects the garment from the holders. The air release is under control of the means for moving the holding elements toward one another.

### 3,730,406 GARMENT-EXPOSING TROUSER HANGER

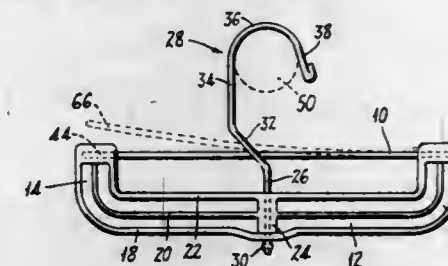
John J. Sullivan, 3920 Granby St., Norfolk, Va.

Filed Sept. 3, 1970, Ser. No. 69,259

Int. Cl. A47j 51/097

U.S. Cl. 223-95

5 Claims



A trouser hanger adapted to support without slippage a folded pair of trousers from a clothes bar or rail, in side-by-side relation to a plurality of other similarly supported trousers, all in such a manner that the uppermost or folded portion of the trousers is visible from a viewpoint in front of and above the supporting clothes bar or rail, thereby to apprise a user of the color and nature of the fabric of the trousers. The device comprises a pair of substantially parallel, spaced horizontal bars disposed one above the other with a hook member attached to the center of the lower bar and extending upward past the upper bar and having a curved upper terminus adapted to be placed over the garment rail. The bars are mounted or secured to each other at their ends, in such a manner that one end of the upper bar can be temporarily separated from the lower bar for the purpose of sliding a folded pair of trousers on the upper bar to be supported thereby and to hang pendent therefrom past the lower bar. Due to the support of the trousers by the upper of the two bars, the fold of the trousers will be visible when the hanger is disposed on a garment rail alongside of a plurality of similar hangers and supported trousers, from a vantage point at the front of and above the rail. Thus, an instant determination of the color and fabric of the garment is had, without moving or shifting any of the hangers or garments. Non-slip means are provided on one bar, for clamping the supported trousers in cooperation with the other bar so as to prevent slippage of the trousers.

### 3,730,407 COMBINATION PACK AND COT

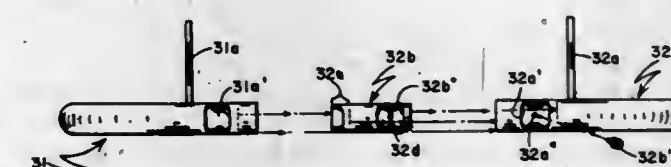
Winfield P. Russell, 27 Pine Grove St., Needham Heights, Mass.

Filed July 23, 1971, Ser. No. 165,665

Int. Cl. A45f 3/10

U.S. Cl. 224-9

6 Claims



A combination pack and cot is provided by using a pack frame comprising detachable U-shaped members which serve



as the legs of the cot by supporting rods fitting into notches. The pack canvas can also serve as the cot webbing.

3,730,408

## THERMALLY DIRECTED GLASS CUTTING

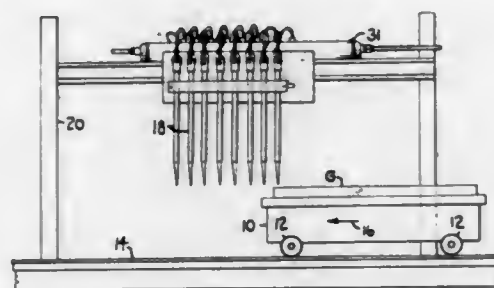
John R. Dahlberg, Jeannette; James L. Oravitz, Jr., Cheswick, and Edmund R. Michalik, West Mifflin, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 15, 1970, Ser. No. 72,354

Int. Cl. B26f 3/06

U.S. Cl. 225-2

7 Claims



This invention relates to a method and apparatus for cutting glass wherein glass is thermally scored along an intended path of cut, using a non-radiant, surface heating means. A fracture is then directed along the intended path by applying a bending moment about the thermal score.

3,730,409

## DISPENSING APPARATUS

Ferruccio Ratti, Milan, Italy, assignor to Steiner Company Lausanne S.A., Lausanne, Switzerland

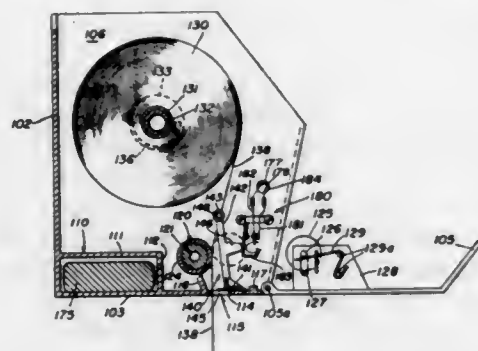
Filed March 22, 1971, Ser. No. 126,533

Claims priority, application Italy, March 28, 1970, 22653 A/70

Int. Cl. B26f 3/02

U.S. Cl. 225-14

20 Claims



A dispenser comprises a cabinet having a supply roll of paper towel therein and an electric motor-driven dispensing roll frictionally engaging the towel web for advancing it through a dispensing opening past a movable cutter, the cutter being biased to a normal rest position and being movable to a severing position in response to the manual cutting action by a user, a control circuit including a normally closed start switch and a normally open ready switch connected in a series between the motor and an associated power source and a normally open stop switch in parallel with the ready switch, and program apparatus coupled to the cutter and the motor and the control circuit and responsive to movement of the cutter to its severing position for opening the start switch and closing the ready switch, movement of the cutter back to its normal rest position reclosing the start switch to energize the motor, the program apparatus being responsive to operation of the motor for sequentially closing the stop switch then reopening the ready switch and then reopening the stop switch to de-energize the motor.

3,730,410

## WAFER BREAKER

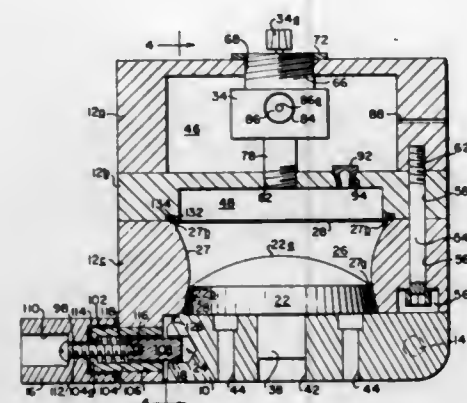
Thomas L. Altshuler, Delta Sigma Laboratory, 110 Hillcrest Road, Concord, Mass.

Filed June 16, 1971, Ser. No. 153,766

Int. Cl. B26f 3/00

U.S. Cl. 225-96.5

9 Claims



A wafer breaker has a housing with upper and lower sections hinged together so that the upper section can swing down on top of the lower section. The lower section carries a removable platen having a rounded top surface on which a flat scribed wafer is placed. The top housing section contains a pressure chamber having a flexible and resilient wall which is positioned directly above the platen when the top section is in its closed position. Adjustment of a valve in the top section to a first operative position causes air under pressure to enter the pressure chamber and push the flexible wall against the wafer on the rounded platen thereby fracturing the wafer along the scribed lines. Following this, the valve is turned to a second position which slowly exhausts the air from the pressure chamber so that the wall resumes its unstressed state relatively slowly, thereby minimizing turbulence in the chamber containing the fractured wafer so that the resulting chips are not scattered.

3,730,411

## SEVERING APPARATUS FOR SEVERING LENGTHS OF TUBE FROM A CONTINUOUSLY FED FLATTENED TUBULAR WEB

Friedrich Franz Brockmuller, 454 Lengerich of Westphalia, Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

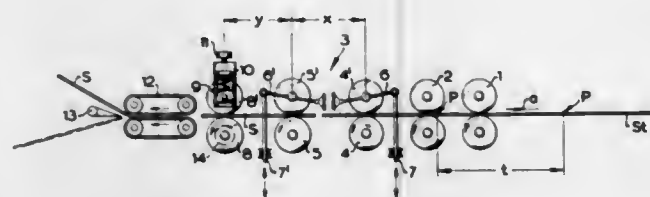
Filed Jan. 21, 1971, Ser. No. 108,483

Claims priority, application Germany, Jan. 30, 1970, P 20 04 348.5

Int. Cl. B26d 7/14

U.S. Cl. 225-100

5 Claims



The invention relates to a severing apparatus for severing lengths of tube from a continuously fed flattened tubular web which is provided with transverse scorelines such as perforations at intervals along its length.

3,730,412

## MACHINE FOR CUTTING TEETH ON SELECTOR COMBS FOR DRUMS AND OTHERS FOR KNITTING MACHINES

Jose Maria Dalmau Guell, San Bruno 103, Badalona, Spain

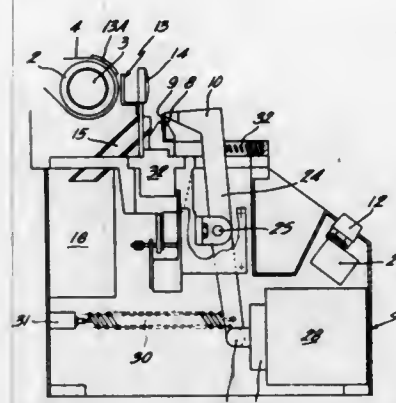
Filed May 13, 1971, Ser. No. 142,981

Claims priority, application Spain, May 16, 1970, 379,719

Int. Cl. B26f 3/00

U.S. Cl. 225-103

5 Claims



Apparatus for preparing pattern control elements for knitting machines by removing portions thereof which correspond to predetermined indications on a program, such as by removing teeth from a selector comb in a sequence indicated on a prepared program card.

3,730,413

## INTERLACING JET

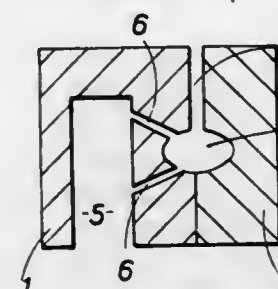
Peter McDermott, and Colin Campbell, both of Harrogate, Yorkshire, England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 10, 1971, Ser. No. 141,714

Int. Cl. B65h 17/32

U.S. Cl. 226-97

3 Claims



Apparatus for intermingling filaments in a yarn, the apparatus having a control passageway therethrough, a slot parallel thereto opening into the passageway and two ducts opening into the passageway, the ducts being on one side of a plane through the center of the slot and having axes converging through the plane to a region within the passageway and beyond its center line.

3,730,414

## FASTENER APPLYING DEVICE

Carl T. Becht, Cincinnati, Ohio, assignor to Senco Products Inc., Cincinnati, Ohio

Filed Aug. 25, 1971, Ser. No. 174,677

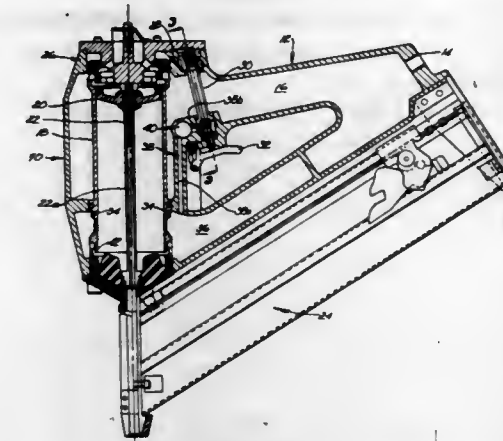
Int. Cl. B25c 1/04

U.S. Cl. 227-130

14 Claims

Valving structure for a fastener applying device including a manually responsive member which is effective to initiate a working cycle by causing the main valve to open, and a pneumatically actuated member, effective after the main valve has opened to cause the main valve to close automatically and to

maintain it closed even though the manually responsive member remains actuated. A passage including a check valve



receives fluid under pressure and communicates with the pneumatically actuated member.

3,730,415

## COMPOSITE FOR EXPLOSIVE BONDING

Ulf Richter, 5909 Wasserscheide, Germany, assignor to Dynamit Nobel AG, Troisdorf, Germany

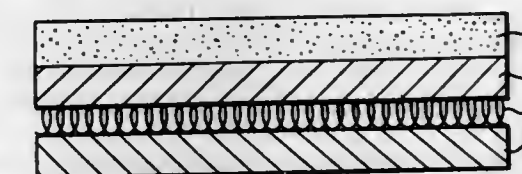
Division of Ser. No. 1,333, Jan. 8, 1970, Pat. No. 3,672,033.

This application Dec. 10, 1971, Ser. No. 206,821

Int. Cl. B23k 21/00; B23p 3/02

U.S. Cl. 228-3

5 Claims



The present disclosure is directed to a laminated metallic composite and to a process for the production of said composites which comprises placing metallic spacers between the metal sheets to be bonded, said spacers being wound in a spiral shape from a wire with the axis of the spirals oriented substantially parallel with respect to the metal sheets, applying a layer of explosive to the upper sheet of metal and detonating said explosive to produce impingement and welding of the upper sheet with the remaining sheets.

3,730,416

## SELF-LOCKING, DOUBLE WALL CONTAINER

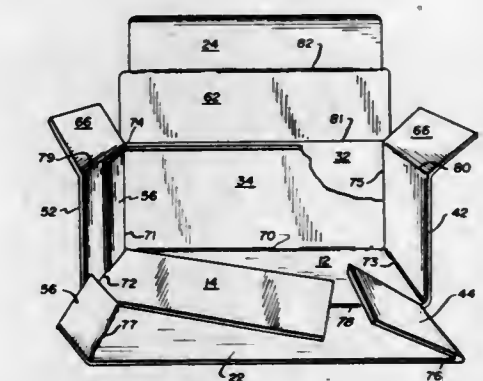
William M. Pilz, III, West Chicago, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Feb. 9, 1972, Ser. No. 224,846

Int. Cl. B65d 5/02

U.S. Cl. 229-16 A

3 Claims



A container formed from a unitary blank of foldable paper-board having six sides each of which is double-ply in thickness,



and which is completely self-locking so as to be free from a manufacturer's joint.

3,730,417

**COMBINED SHIPPING PALLET/CONTAINER**

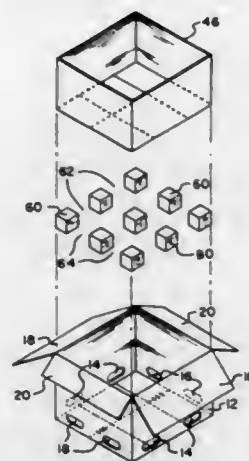
De Wayne L. Lawson, Mentor, Ky., assignor to Olinkraft, Inc., West Monroe, La.

Filed Oct. 4, 1971, Ser. No. 185,960

Int. Cl. B65d 13/00

U.S. Cl. 229—23 R

5 Claims



A combined shipping pallet/container for use in conjunction with a forklift truck and which comprises an outer paperboard container having a plurality of fork receiving openings contained in the lower portion thereof. The outer container has a plurality of spacers fixed to the bottom of the container with the spacers defining a plurality of channels for receiving the forks of the forklift truck. Contained within the outer container and resting on top of the plurality of spacers is an inner container for receiving the contents of the combination pallet/container.

The combined pallet/container is adaptable for four-way entry of the forklift truck and the containers are designed for quick and easy stacking within a standard automotive truck or railroad car. The pallet/container may be shipped broken down as a storable package which may then be stored at the user's warehouse until the containers are set up for use in the user's business after which they can be again broken down and returned or stored for later re-use.

3,730,418

**LIVING MATERIALS SHIPPING SYSTEM**

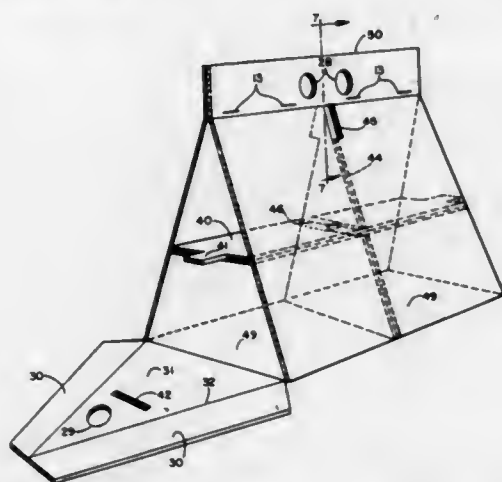
William C. Spencer, Matalda, Pa., assignor to American Science and Engineering, Inc., Cambridge, Mass.

Filed April 12, 1971, Ser. No. 133,203

Int. Cl. B65d 5/48

U.S. Cl. 229—27 R

2 Claims



A disposable shipping system for living materials, such as small animals, includes a number of individual compartments placed in multiples of two or more in a carrying case that may be transported without injuring the animals.

3,730,419

**CARRY-OUT TRAY**

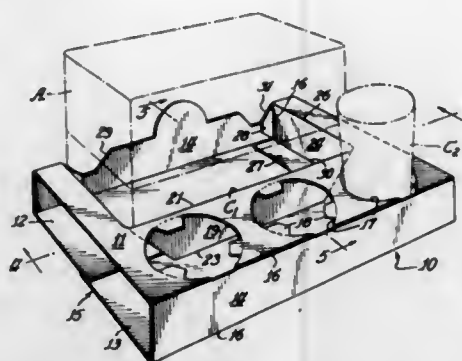
David L. Botterman, and Philip W. Lewis, both of Greensboro, N.C., assignors to Container Corporation of America, Chicago, Ill.

Filed July 14, 1971, Ser. No. 162,534

Int. Cl. B65d 5/48

U.S. Cl. 229—28

1 Claim



A collapsible compartmented tubular carry-out tray is formed from a cut and scored blank of paperboard and comprises spaced and parallel top and bottom panels hingedly connected to spaced parallel side wall panels to define a tube. Prior to forming of the blank into a tube, the top panel is provided with apertures adapted to receive cups or the like and a single larger aperture for a larger sized article. The formation of said aperture is concomitant with the formation of partition structure extending between the top and bottom panels to give stiffness to the tube in both lateral and longitudinal directions.

The partition structure includes a panel member connected to the top panel along a first fold line parallel to the longitudinal axis of the tube. The panel member has a glue flap foldably connected thereto and glued to the bottom panel. The partition structure also includes a second pair of panel members extending perpendicularly to the axis of the tube and perpendicular to the first panel member, this second pair of panel members having flaps lying along the bottom panel and including means for locking the ends of such flaps to the bottom panel. A gusset fold is provided at an end of the second pair of panel members, the gusset fold being folded from a top panel and urging the distal end of each of the second pair of panel members into the locking aperture.

3,730,420

**EGG CARTON**

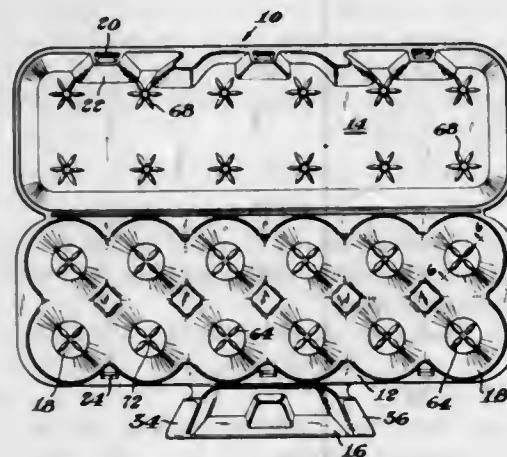
Francis L. Burkett, Breckenridge, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 873,175, Nov. 3, 1969. This application Sept. 27, 1971, Ser. No. 184,166

Int. Cl. B65d 85/32

U.S. Cl. 229—44 R

16 Claims



An egg carton formed from foam plastic sheet material, the carton having an improved highly effective latch construction

for securing the carton's lid closed with its tray portion. The tray carries a latching flap which folds over the front face of the cover after the lid is closed upon the tray. The flap carries laterally projecting ears which snap into recessed pockets in the lid's front face. The carton carries rosette-type cushions shaped to cradle the eggs so as to reduce significantly egg movement when the carton is handled.

3,730,421

**PACKAGE CLOSURE AND OPENING APPLIANCES**

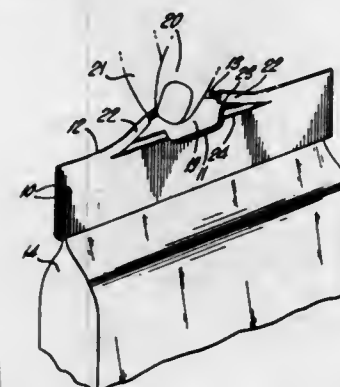
Alexander J. Stanley, Milltown, N.J., assignor to Nabisco, Inc., New York, N.Y.

Filed May 17, 1971, Ser. No. 143,951

Int. Cl. B65d 33/00

U.S. Cl. 229—66 R

1 Claim



A strip of thin sheet closure material of length sufficient to encompass the flattened mouth portion of a packaging container has formed therein a longitudinal hinge break line comprising a crease or serration. A narrow and thin opening tape is firmly bonded to the strip on one side of the break line and with its sharp inner edge closely adjacent the said line. The break facilitates accurate folding of the closure strip over and sealing it to the sides of the container mouth portion, while during subsequent opening the sharp edged tape readily ruptures the closure strip along the break line, at the same time removing a narrow ribbon of the closure material on one side of the opening.

3,730,422

**CONTINUOUS FLOW CENTRIFUGE WITH MEANS FOR REDUCING PRESSURE DROP**

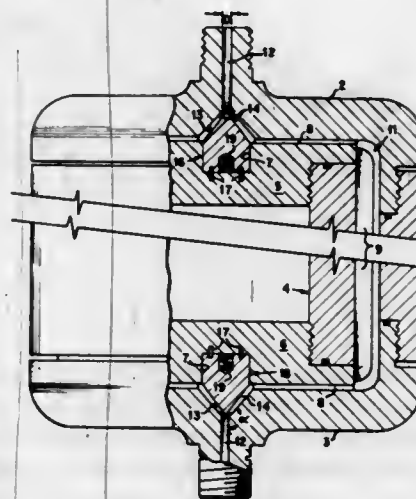
Nakwon Cho, Knoxville, Tenn., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed May 25, 1971, Ser. No. 146,758

Int. Cl. B04b 1/00

U.S. Cl. 233—16

8 Claims



An intermediate speed, continuous flow, high capacity liquid centrifuge assembly characterized by a low pressure

drop in the process liquid is described. The elongated, vertically oriented rotor contains a central, generally cylindrical core having radially projecting vanes defining a segmented annular cavity between the core and rotor wall. Hollow shafts support the rotor while providing axial inlet and outlet passageways for continuous flow of process liquid through the rotor during operation. Improved design of flow passages from the axial inlet passageway to respective sectors in the segmented annular cavity and from those sectors to the axial outlet passageway provides a significant reduction in pressure drops through the centrifuge.

3,730,423

**MINERAL DRESSING CENTRIFUGE**

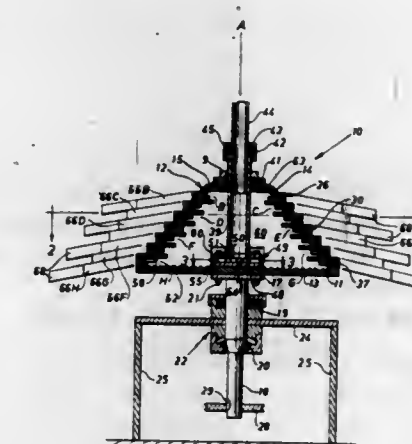
Gordon Raymond Coulson, 309-38 Avenue S.A., Calgary, Alberta, Canada

Filed May 22, 1970, Ser. No. 39,730

Int. Cl. B04b 1/00

U.S. Cl. 233—38

9 Claims



A method of mineral dressing and a mineral dressing centrifuge especially suited to the separation and beneficiation of fine metal values such as gold particles from suspensions of mixtures of said metal values and a gangue in a liquid medium. A suspension of the particulate mineral mixture in a suitable liquid medium is introduced generally axially into a rotating centrifuge and separated into its components by the settling rates of the components in the liquid medium under the influence of centrifugal forces. The components are separately discharged in liquid streams issuing from a plurality of discharge outlets and are separately collected. The centrifuge is of general frusto-conical configuration having an axial feed inlet for introducing the suspension into the larger end of the centrifuge and a plurality of axially and circumferentially spaced discharge outlets.

3,730,424

**PUNCH AND PRINT DATA CARD RECORDER**

George Hamlin Leonard, and Raymond J. Enyeart, both of c/o Varifab, Inc., 1700 E. Putnam Avenue, Greenwich, Conn. Division of Ser. No. 33,800, May 1, 1970, Pat. No. 3,682,093. This application Sept. 13, 1971, Ser. No. 180,032

Int. Cl. G06k 1/20, 1/08

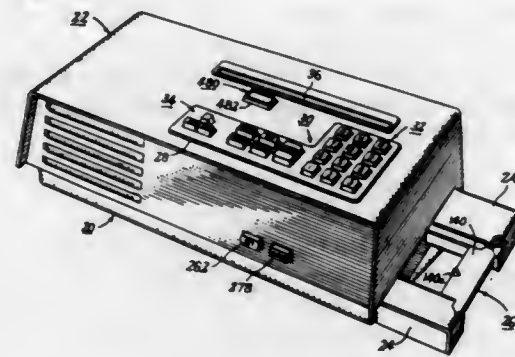
U.S. Cl. 234—130

10 Claims

The disclosed data recorder includes a control cam operating to impart oscillating motions to separate punch and print actuators. The punch actuator reciprocates a punch bail to depress individual punches selected by data entry solenoids through punch interposers, thereby to perforate a data card. A step cam oscillated by the print actuator operates against print interposers coupled to the solenoids to angularly orient a print wheel, thus to imprint on the data card the data characters



punched into the card. The data card is carried by a tray which is indexed through successive data entry positions in coordina-



tion with the control cam by tray stepping control apparatus. A replaceable ink cartridge supplies ink to the print wheel.

3,730,425

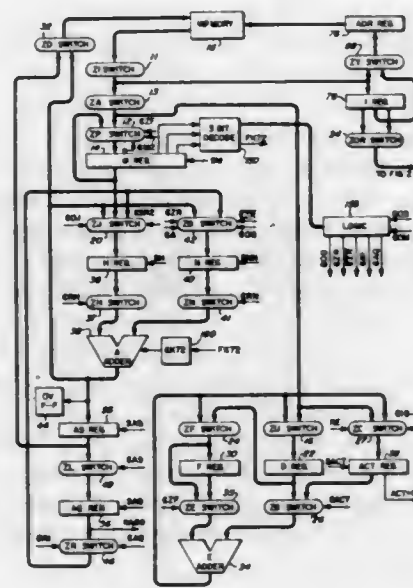
**BINARY TWO'S COMPLEMENT MULTIPLIER  
PROCESSING TWO MULTIPLIER BITS PER CYCLE**  
Jerry L. Kindell, Phoenix, and Leonard G. Trubisky, Scottsdale, both of Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed May 3, 1971, Ser. No. 139,487

Int. Cl. G06F 7/52

U.S. Cl. 235-164

4 Claims



Multiplication apparatus is described which operates on 2's complement operands by a series of partial product formation cycles and generates the product of the operands in an accumulator register. For each cycle, a pair of the  $n$  multiplier bits is processed, right to left. On the basis of each bit pair configuration and the next multiplier bit, the accumulated partial product is shifted 2 bits right and a selected multiple (0,  $\frac{1}{2}$  or 1) of the multiplicand is added to or subtracted from the partial product accumulator register. Special initialization logic is restricted to loading the multiplier into an operand register, shifted one bit to the left, with a zero fill in the least significant bit position, and no special logic is required for correct termination after  $n/2$  cycles, regardless of operand sign combinations.

3,730,426

**THERMOSTATIC VALVE**

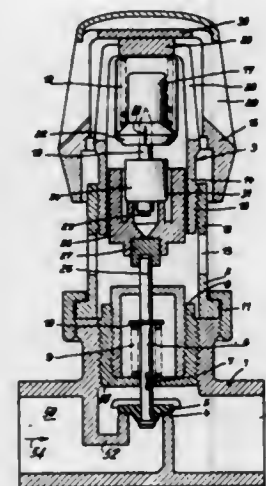
Heinz-Werner Brankmann, Mosbach/Baden, Germany, assignor to Brankmann Armatures AG, Rothrist, Switzerland  
Filed Nov. 5, 1970, Ser. No. 87,242

Claims priority, application Germany, Nov. 13, 1969, P 19 56 991.6

Int. Cl. G05d 22/00

U.S. Cl. 236-44 C

1 Claim



A thermostatic valve includes a temperature responsive movable member and a humidity responsive movable member connected to a movable valve.

3,730,427

**TIME SCHEDULE CONTROLLER AND PARTS AND SYSTEM THEREFOR**

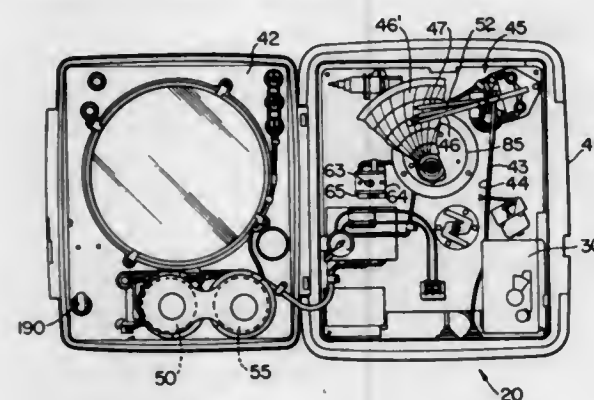
George T. Hardin, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 8, 1971, Ser. No. 187,641

Int. Cl. G05b 19/04, 11/50

U.S. Cl. 236-46

10 Claims



A time schedule controller wherein the high limit index and the set point index respectively have members movable therewith and alignable in relation to each other only when the set point index reaches the setting of the high limit index. An actuator for terminating the operation of the set point index in the rate of rise thereof is only actuated when the alignable members of the high limit index and the set point index that are operatively associated therewith are in their aligned relation thereof.

3,730,428

**CONDITION RESPONSIVE PARAMETER CONTROL MEANS**

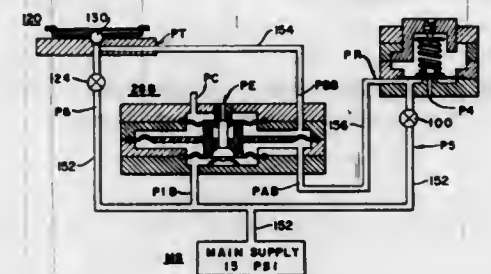
Kenneth G. Kreuter, and Klaus P. Mueller, both of Goshen, Ind., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 884,947, Dec. 15, 1969, Pat. No. 3,575,343, which is a division of Ser. No. 594,851, Nov. 16, 1966. This application Jan. 22, 1971, Ser. No. 109,015

Int. Cl. G05b 11/50; G05d 23/275

U.S. Cl. 236-87

7 Claims



A unitary, multiple diaphragm structure is provided which includes integral valve means and flow passages, the structure being substantially entirely composed of a flexible resilient material. Additional rigid inserts are integrally molded into the basic structure to provide additional valving and seating arrangements for desired functional adaptability. The diaphragm structure is combined with hollow housing structures comprised of stacked plates or the like for mounting the peripheral portions of the multiple diaphragms of the unitary structure. Selective porting and pressure connections in the housing structures effect a family of differential pressure responsive modules or devices such as relays, comparators, and the like. A simplified temperature to pressure transducer is provided in which a compound bimetal spring selectively retains a spherical valve in an exhaust port to provide a modulated pressure output as a function of temperature changes. The transducer and family of differential pressure responsive modules are combined to provide a plurality of parameter control systems having a wide variety of operating modes. Several of the systems are convertible from one operating mode to another by merely changing the supply pressure magnitudes. The transducer is characterized by the fact that it requires no changeover adjustment to adapt it to the multiple modes of the systems.

3,730,429

**FLUID DISTRIBUTION CONTROL DEVICE**

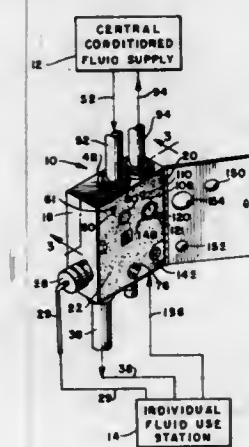
Horace G. Minto, Tampa, Fla., assignor to Bay Mechanical Company, Tampa, Fla.

Filed May 27, 1971, Ser. No. 147,500

Int. Cl. G05d 23/00

U.S. Cl. 236-94

7 Claims



A device for directing conditioned fluid from a central conditioning station to an individual use station and directing the

return of the fluid to the central conditioning station. A single, multi-purpose unit is contained within the device to provide a compact distribution control and information center to be installed within a conditioned fluid supply and use system.

3,730,430  
**THERMOVALVE**

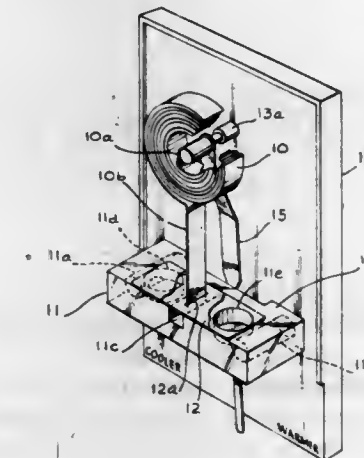
Gene W. Osheroff, Las Vegas, Nev., assignor to Fluidtech Corporation, Inglewood, Calif.

Filed July 6, 1971, Ser. No. 159,626

Int. Cl. G05d 23/08

U.S. Cl. 236-101

7 Claims



The present invention provides a thermostatically-controlled valve that is very sensitive and, therefore, very responsive to changing temperature conditions. The device comprises a coiled bi-metal strip fixed at one end and whose other end is coupled to a flat plate. The plate rests on a member containing a pair of orifices that are covered or uncovered by the plate as it moves horizontally under the rotational motion of the bi-metal strip. The sensitivity of the device is due to the fact that the plate barely loads the coil.

3,730,431

**METHOD AND APPARATUS FOR HERBICIDE APPLICATION IN ROW CROPS**

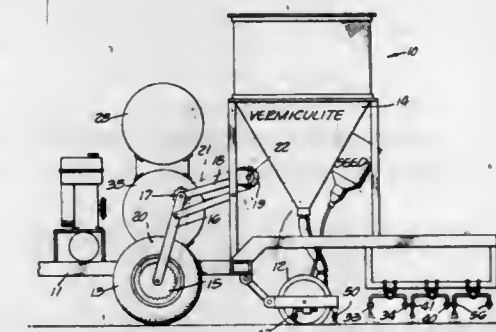
David M. Williams, Salinas, Calif., assignor to Bruce Church, Inc., Salinas, Calif.

Filed May 10, 1971, Ser. No. 141,709

Int. Cl. B05b 17/00; B44d 1/08

U.S. Cl. 239-1

6 Claims



A wheeled chassis including dispensing equipment for row planting is also provided with three sets of herbicide dispensers: one for applying a herbicide between rows; a second for synchronous herbicide application in the rows between planting sites; and a third for synchronous application of a different herbicide onto the planting sites.



3,730,432

## FOG DISPERSING COMPOUND

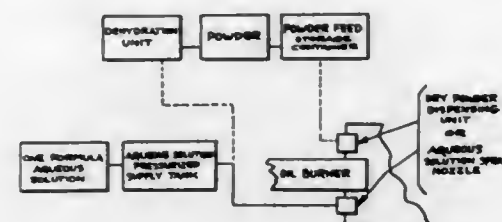
Clifton L. Bennett, 3404 Goldfinch, San Diego, Calif.

Filed Sept. 20, 1971, Ser. No. 181,701

Int. Cl. A01g 15/00

U.S. Cl. 239-2 R

2 Claims



A process and equipment for dispelling fog from the atmosphere in order to improve visibility, the process consisting of discharging a compound into the fog that develop heat within the fog air mass so as to cause a convection current thus lifting the fog.

3,730,433

## IMPROVEMENTS IN AND RELATING TO THE COATING OF ARTICLES

James A. Scharfenberger, Indianapolis, Ind., assignor to Ransburg Electro-Coating Corp., Indianapolis, Ind.

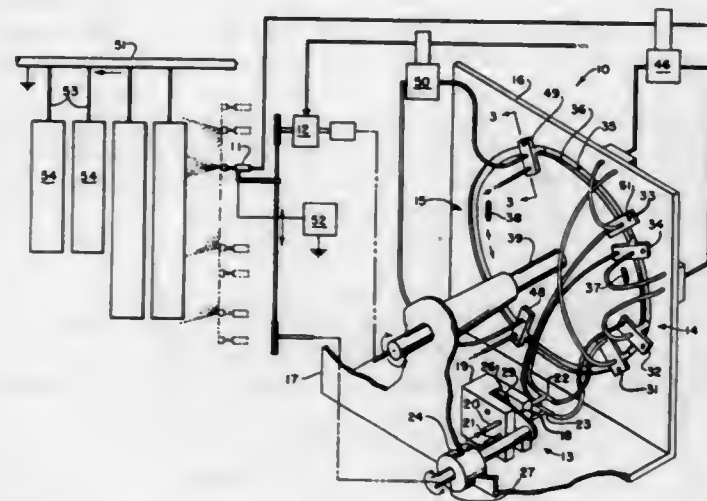
Continuation of Ser. No. 879,440, Nov. 24, 1969, abandoned.

This application June 14, 1971, Ser. No. 153,019

Int. Cl. B05b 5/00; F23d 11/28

U.S. Cl. 239-15

11 Claims



A fluidic apparatus for and a method of controlling the spray emission time and the direction of movement of a reciprocating spray emitting device of a spray coating system.

3,730,434

## SPACE VOLATILIZING DEVICE

Walter H. Engel, 87 Southport Woods Drive, Southport, Conn.

Filed June 21, 1972, Ser. No. 264,863

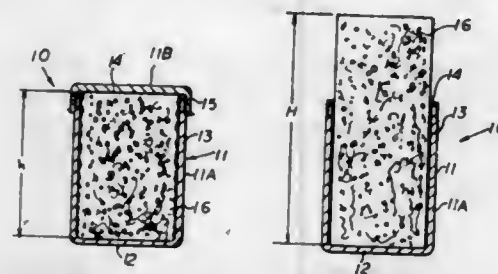
Int. Cl. A24f 25/00

U.S. Cl. 239-47

7 Claims

This disclosure is directed to a volatilizing device for disseminating a volatile substance as a dry matter to the surrounding atmosphere in a controlled manner. The device includes a container which when closed contains a readily compressible shape of foamed urethane which has been impregnated with an aqueous emulsion of a volatile substance with the help of a surfactant in a manner whereby the volatile matter is gradually released when exposed to the atmosphere. The impregnated foam is rendered self-expandable to extend beyond the container opening when the cover is removed. The

volatile matter which can be readily impregnated into the foamed urethane includes a fragrance producing volatile, or a



medicinal producing volatile, or an insecticidal producing volatile or an anti-microbial producing volatile.

3,730,435

## TOWABLE DRIVE TOWER FOR CENTER PIVOT IRRIGATION SYSTEMS

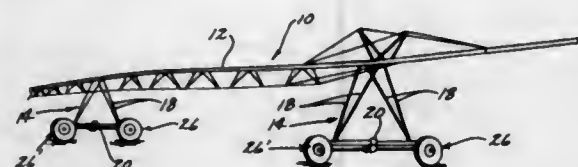
Arthur L. Zimmerer; Bernard J. Zimmerer, and Paul B. Zimmerer, all of Lindsay, Nebr., assignors to Lindsay Manufacturing Co., Lindsay, Nebr.

Filed June 3, 1971, Ser. No. 149,457

Int. Cl. A01g 25/02; B05b 3/18

U.S. Cl. 239-213

8 Claims



A towable drive tower for center pivot irrigation systems is disclosed herein which permits the system to be towed from one field location to another. A pair of gear boxes are selectively pivotally secured to opposite ends of the drive frame of each of the towers in the system. Each of the gear boxes has a drive wheel mounted on the output shaft thereof which may be selectively changed from a direct connection to a free-wheeling connection to permit the entire system, including the center pivot, to be towed longitudinally. A power means is connected to the input shafts of the gear boxes for driving the drive wheels. The gear boxes and wheels connected thereto may be pivoted 90° from their normal operating position to a towable position. The drive wheels are then disengaged from their driving connection with the gear boxes. Each of the gear cases have an extended hub which supports the outer end of the output shaft.

3,730,436

## SYNCHRONIZED EXHAUST NOZZLE ACTUATING SYSTEM

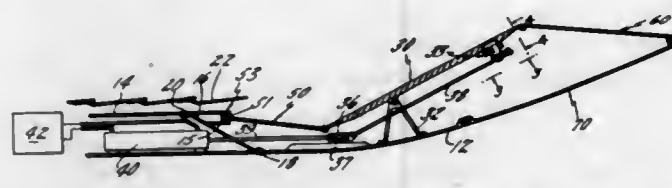
William M. Madden, Palm Springs, and Richard E. Teagle, North Palm Beach, both of Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 20, 1971, Ser. No. 209,664

Int. Cl. B64c 15/08

U.S. Cl. 239-265.39

8 Claims



A nozzle is formed on the exhaust end of a turbojet engine having four sets of flaps. One set of main flaps is pivotally located downstream of an exhaust opening, with a second set

of balance flaps pivotally connected between said main flaps and their rear end of the exhaust opening. A third set of diverging flaps are pivotally mounted to the main flaps and extend downstream thereof with the downstream end of said diverging flaps being pivotally connected at their rearward end to a fourth set of external flaps which are pivotally mounted at their forward end to the outer housing of the engine. The nozzle actuating system comprises an actuating device on each flap having a pair of output actuating arms means thereon along with an input actuating arm means. The input actuating arm means is controlled by a cylinder and piston unit so that all of the input arm means are moved together. The output actuating arm means are each connected to the adjacent edge of an adjacent flap. This arrangement extends from flap to flap around the entire circumference of the nozzle providing a variable hoop arrangement.

3,730,437

## EJECTION DEVICE FOR MULTIPLE-PRODUCT DISPENSERS

Felix Rousselot, Vienne, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

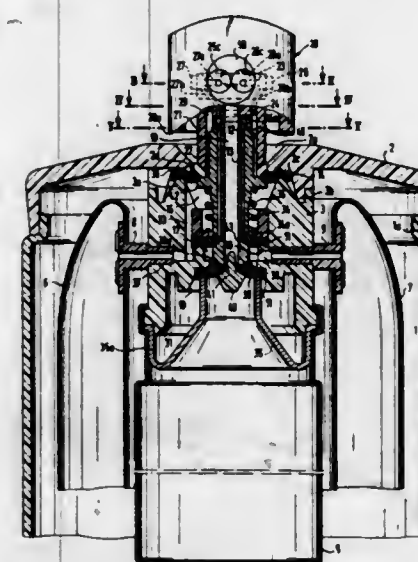
Filed June 17, 1971, Ser. No. 153,948

Claims priority, application Germany, June 19, 1970, P 20 30 419.2

Int. Cl. B05b 7/28, 11/00

U.S. Cl. 239-306

8 Claims



An ejection device for producing a mixed spray of a product consisting of at least two fluid product components through aspiration and ejection by a gaseous propellant. An ejector housing has a manifold chamber therein and nozzle means therein. The nozzle means has at least two aspirating Venturi-type nozzle elements, one for aspirating each of the fluid products. Each nozzle has a convergent chamber having a narrower and opposite this a wider open end, which latter is in free communication with the manifold chamber, a divergent chamber having a narrower and opposite this a wider open end, and a neck portion connecting the narrower end of the convergent chamber and the narrower end of the divergent chamber with each other. The nozzle elements each have a product inlet between the two chambers. A mixing recess, open to the outside, is provided in a wall of the housing, into which recess the under open ends of the divergent chambers of all of the nozzle elements open. At least one duct means is provided in the housing, opening at one end in a wall of the housing spaced from the mixing recess and communicating at its other end with the manifold chamber, for the free flow of propellant gas therethrough into the convergent chambers of all of the nozzle elements. Separate conduit means is provided in the housing, one for each of the nozzle elements, each of which conduit means opens at one end in a wall of said housing spaced from the opening of the mixing recess and from the opening or openings of the duct means, and each of which

conduit means is, at its other end, in communication with the product inlet of the neck portion of a different one of the nozzle elements.

3,730,438

## FUEL BURNER NOZZLE

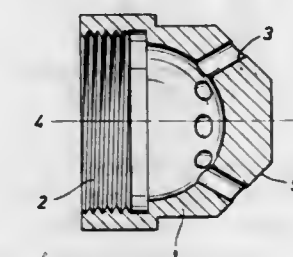
Frank C. Howe, R7 Box 545, Bakerfield, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed June 3, 1971, Ser. No. 149,679

Int. Cl. B05b 1/34

U.S. Cl. 239-490

6 Claims



In a pressure atomized oil burner having air louvers to swirl primary air, a long narrow flame is produced without reducing heat release by using a nozzle tip having cylindrical ducts drilled at a compound angle in the direction of the air swirl in addition to the main cone angle.

3,730,439

## SINGLE NOZZLE FLUID DEVICE

Richard G. Parkison, 309 Monahan Drive, Louisville, Jefferson, Ky.

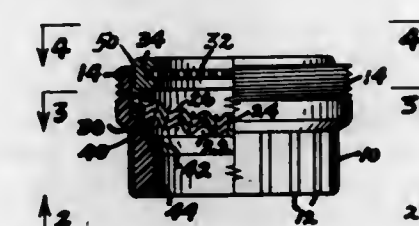
Continuation of Ser. No. 735,138, June 6, 1967, abandoned.

This application Sept. 20, 1971, Ser. No. 182,263

Int. Cl. B05b 1/14

U.S. Cl. 239-590.3

15 Claims



This invention relates to a fluid flow device for a spout or a spout-end which is designed to produce a single laminar flow stream that is substantially splash-less at normal fluid flow rates. The device embodies a plurality of screens which are intimately in contact with each other and arranged to be spherical or conical in shape, together with a strainer which is positioned up-stream of the screens. The housing for the screens and the strainer is so shaped that the fluid passing the screens is pointed-toward the center or axis of the device.

3,730,440

## LAMINAR-FLOW SPOUT-END DEVICES

Richard G. Parkison, Louisville, Ky., assignor to American Standard Inc., New York, N.Y.

Continuation of Ser. No. 734,994, June 6, 1968, abandoned.

This application Sept. 20, 1971, Ser. No. 182,121

Int. Cl. B05b 1/22

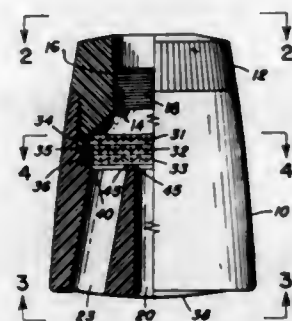
U.S. Cl. 239-590.5

10 Claims

This invention comprises a fluid flow device for producing a coordinated stream of fluid from a spout. The exiting stream will be substantially free of splashes when the exiting stream is flowing at normal velocities. The fluid flow device includes a body having a plurality of independent nozzles, which may be



seven in number, for example. In a preferred embodiment, one of the nozzle sections will be centrally disposed with its axis coinciding with the axis of the device, while the remaining nozzle sections will be spaced equally from the central nozzle



section and peripherally arranged about the central section and pitched at substantially the same relative angle with respect to the central section. The diameters of all of the nozzle sections will be uniform and the lengths of all of the nozzle sections will be substantially the same.

#### ERRATUM

For Class 241—282.1 see:  
Patent No. 3,730,363

3,730,441

#### FORAGE HARVESTER

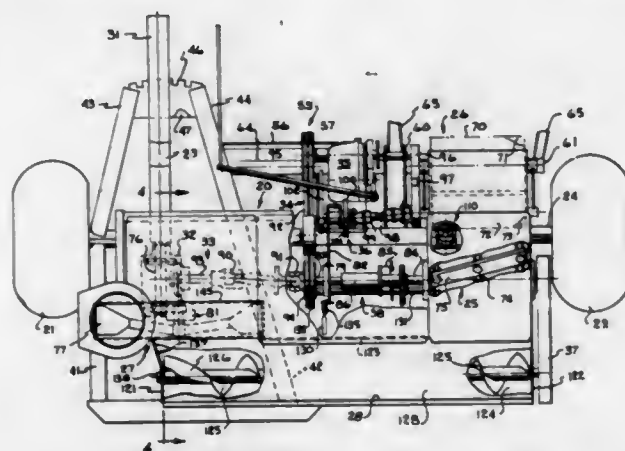
Thomas W. Waldrop; Robert A. Wagstaff, both of New Holland, and Joseph K. Weimader, Akron, all of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed April 29, 1971, Ser. No. 138,540

Int. Cl. B02c 18/06

U.S. Cl. 241—60

11 Claims



A forage harvester extending transversely to the forward direction of travel has a feed roll mechanism and cutterhead at the outboard end and a forage blower at the inboard end. A transverse auger delivers silage from the cutterhead to the blower. The feed roll mechanism feeds harvested crops received from a forwardly mounted pickup or row crop attachment to the cutterhead. The cutterhead has a rotating reel with blades to chop the harvested crop into silage. The transversely positioned forage blower is in substantial alignment with a rear connection for a forage wagon and a forward tractor hitch to set the position of an adjustable discharge spout on the forage blower to impel silage generally longitudinally into a trailing forage wagon. The fan of the blower is mounted on a rearwardly extending gearbox shaft coupled to the main input drive shaft which extends forwardly along the tractor hitch to the tractor power take-off. The feed roll mechanism and cutterhead are driven from the gearbox by a generally transversely extending drive which includes a reversing drive for rotating the reel in reverse on sharpening of the blades.

3,730,442

#### GRINDING APPARATUS

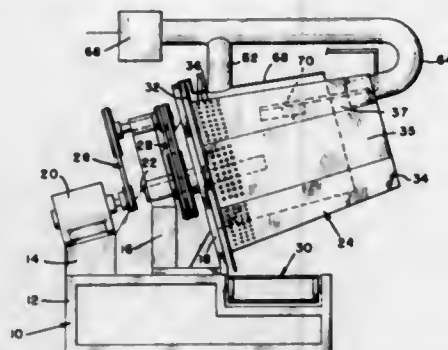
Clarence P. Harris, 328 Fountain Place, Burlington, N.C.

Filed Nov. 29, 1971, Ser. No. 202,826

Int. Cl. B02c 17/02, 17/10

U.S. Cl. 241—60

10 Claims



A driven drum having an octagonal shape is provided for grinding material placed therein. Aside portion of the drum is provided with openings therein and a closure plate slidable relative thereto normally closes the openings. The closure plate is provided with openings which may be aligned with the openings in the side portions by a cam arrangement to permit material within the drum to fall through the aligned openings upon rotation of the drum. The drum may be provided with exhaust means, heater means and means for facilitating grinding of the material within the drum.

3,730,443

#### FIELD CRUSHER FOR GRAPES

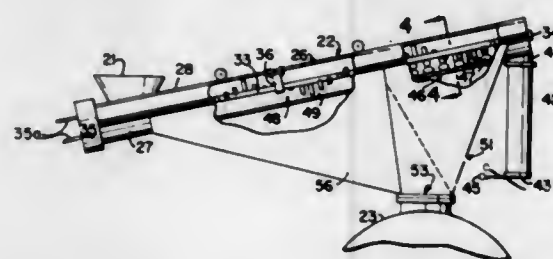
Wallace J. S. Johnson, Berkeley, Calif., assignor to Up-Right, Inc., Berkeley, Calif.

Filed Sept. 24, 1971, Ser. No. 183,333

Int. Cl. A01f 35/22; A47j 19/02

U.S. Cl. 241—82.1

8 Claims



An elongated tube in which an axially disposed shaft with helically arranged radial rods thereon rotates to convey harvested grapes through the tube, the rods acting to crush and remove stems from the grapes as they are so conveyed. The crushed grapes discharge from the tube through a flexible conduit into a tank filled with an inert, non-oxidizing gas to displace the gas upwardly into and through the tube, the gas filling the tube and exiting therefrom at the point where the grapes enter the tube so that the grapes are protected from oxidizing air after they enter the tube.

3,730,444

#### DOUBLE-CUT REVERSIBLE PLATE

William Clifford Pattillo, Stone Mountain, Ga., assignor to Southern Saw Service, Inc., Atlanta, Ga.

Filed April 28, 1971, Ser. No. 138,187

Int. Cl. B02c 18/36

U.S. Cl. 241—82.5

7 Claims

A plate means having a pair of cutting surfaces with a plurality of apertures extending therethrough defining material extruding passageways. Means is provided for supporting the cutting surfaces adjacent a rotary blade means wherein the rotary blade means and the plate means are operable for

chopping material urged against the plate by a screw conveyor. The plate means includes a removable insert member adapted to be axially displaced relative to an opening formed in the plate. The insert member is detailed to be inserted in a selected one of two directions in the plate and includes an axi-

ally extending gripping surface. The insert member and the plate means are operatively associated with each other whereby the plate means is reversibly operable to present a selected one of the cutting surfaces adjacent the rotary blade means.



3,730,445

#### METHOD OF IMPROVING THE GRINDABILITY OF ALUMINA-SILICA ORES

Thomas E. Lee, and Frederick W. Frey, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 74,169, Sept. 21, 1970. This application March 24, 1972, Ser. No. 237,994

Int. Cl. B02c 23/00

U.S. Cl. 241—23

10 Claims

A method of improving the grindability or grinding characteristics of aluminous clays or alumina-silica ores containing iron species by thermally treating the clays or ores at relatively high temperature in an air or oxidative atmosphere and subsequently grinding ore to a predetermined particle size, whereby the amount of fines produced on grinding are substantially less than the amount of fines produced upon grinding a comparable non-calcined ore.

3,730,446

#### PULVERIZING APPARATUS

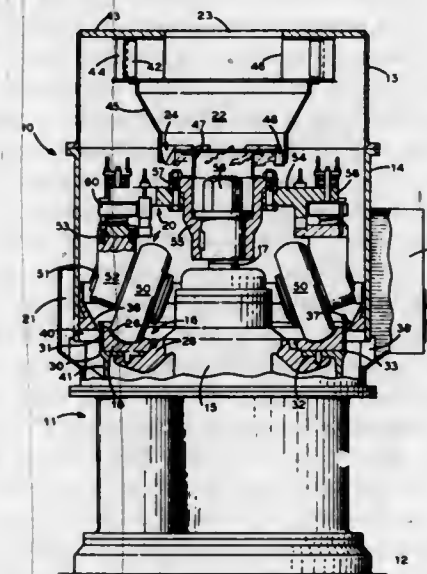
Robert R. Piepho, Wadsworth, Medina County, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Oct. 21, 1971, Ser. No. 191,263

Int. Cl. B02c 4/02

U.S. Cl. 241—110

6 Claims



A pulverizer of the type having a rotating lower ring engaged by a plurality of roller elements engaging a wear surface

on the face of the ring, and the roller elements are rotated as a unit in the opposite direction to that of the ring about a common axis of rotation. Each roller element is supported by a driven ring with the assembly resiliently driven from a drive ring.

3,730,447

#### APPARATUS FOR USE IN CONNECTION WITH SPOOLING AND TWISTING MACHINES FOR PLACING A THREAD RESERVE ONTO THE WINDING BOBBIN

Gustav Franzen, Neersen near Krefeld; Klaus Nlmtz, and Horst Rieflers, both of Krefeld, all of Germany, assignors to Palitex Project Company GmbH, Krefeld, Germany

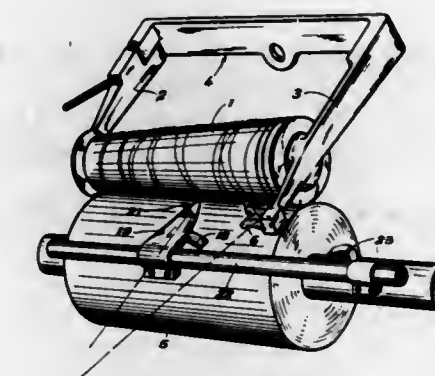
Continuation of Ser. No. 674,533, Oct. 11, 1967, abandoned.

This application Sept. 30, 1970, Ser. No. 77,024

Int. Cl. B65h 54/34

U.S. Cl. 242—18 PW

13 Claims



The present invention concerns an apparatus for spooling and twisting machines for placing a thread reserve onto the winding-up bobbin of the spooling section with separate traverse thread guide. This apparatus moves the thread stepwise in the direction toward the center of the bobbin sleeve and finally conveys the thread to the traverse thread guide. The apparatus according to the invention is characterized primarily in that a guiding plate is arranged on one of the legs of the bobbin carrier or directly on the machine frame which guiding plate is provided with tooth-shaped cam means while the traverse thread guide has associated therewith at least one lifter member which during the reversing phase of the traverse thread guide catches below the thread and lifts the same and during the return movement in the direction toward the bobbin center conveys the thread to the next tooth space until the thread is freed from the guiding plate and is caught by the self-threading traverse thread guide.

3,730,448

#### WINDING MACHINES WITH PIVOTABLE RAIL-GUIDED TOGGLE TRAVERSING ROD GUIDES

Heinz Schippers; Erich Lenk, and Herbert Streppel, all of Remscheid, Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed March 30, 1970, Ser. No. 23,567

Claims priority, application Germany, April 1, 1969, P 19 16 580.1

Int. Cl. B65h 54/32

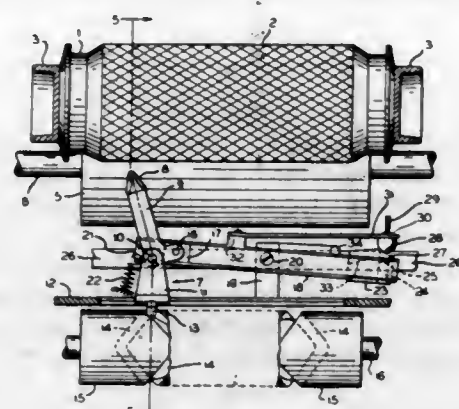
U.S. Cl. 242—43.1

6 Claims

Winding machine for yarns, tapes, etc. with a traversing yarn guide embodying a toggle lever having one arm slidably guided in a pivotable guide rail, the pivotal position of which is variable in response to increasing winding package diameter and/or periodic rhythmic impulses of a reciprocating nature



and disengageable clutch means connecting said guide rail and adjusting members movable in response to increasing package



diameter, whereby flat-ended packages or conical-ended packages may be formed.

3,730,449

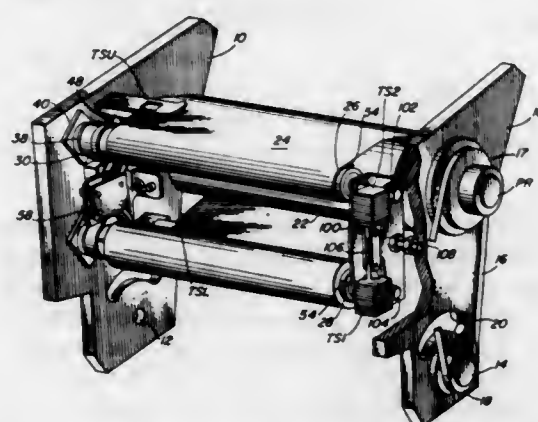
### RIBBON REWINDING APPARATUS ESPECIALLY FOR HIGH SPEED PRINTERS

Wallace J. Satas, Hudson, and Joseph Koukel, Lynnfield, both of Mass., assignors to Data Printer Corporation, Cambridge, Mass.

Filed Sept. 10, 1970, Ser. No. 71,068  
Int. Cl. B65h 25/26

U.S. Cl. 242-57.1

19 Claims



Ribbon rewinding apparatus includes a pair of reels between which the ribbon is serially wound, reversible intermittent reel-driving means, and reel-positioning means for guiding the ribbon as it is wound. Separate sensors detect the ribbon edge position adjacent to each reel for controlling the reel-positioning means. Other sensors detect the completion of the winding on either reel, and serve both to reverse the direction of winding, and to select one of the edge-sensors, which is adjacent to the reel that is winding the ribbon at any given time, to control the guiding function. A control circuit includes means for registering momentary actuations of the sensors to control the guiding and feeding operations. Signal generators also act through register means in the control circuit to discontinue ribbon feeding during halts in the operation of an associated printing machine, but permit the intermittent drive to complete a full cycle before disengagement occurs.

3,730,450

### ARRANGEMENT FOR WINDING OF WEBS

Dietrich Hank, Leipzig, Germany, assignor to VEB Polygraph Leipzig, Leipzig, Germany

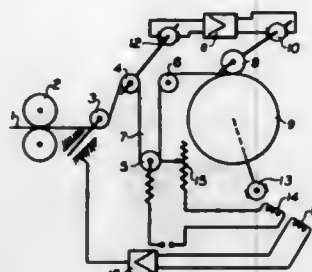
Filed July 24, 1969, Ser. No. 844,569  
Int. Cl. B65h 17/12, 25/22

U.S. Cl. 242-66

3 Claims

An arrangement of winding up webs having a predetermined web tension, which comprises a compensating roller

movably arranged in a loop formed by the web, the movement of the compensating roller being utilized to regulate the winding speed. A draw-in roller is arranged in front of the loop of the web, the latter being loaded down by the compensating



3,730,451

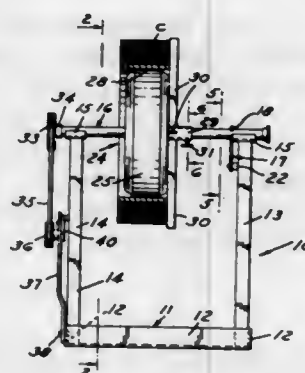
### INFLATABLE METAL COIL HOLDER

Michael D. Iddings, Petersburg, Mich., assignor to Delta Manufacturing, Inc., Detroit, Mich.

Filed July 8, 1971, Ser. No. 160,791  
Int. Cl. B65h 75/24, 75/02

U.S. Cl. 242-68

15 Claims



The holder features a center core or mandrel unit for mounting a pre-wound coil of strip metal stock, which unit is essentially comprised of a conventional pneumatic rubber automobile tire conventionally mounted to a hub disc. The tire and disc are carried for rotation by a horizontal shaft, which is in turn releasably borne for rotation on upwardly concave journaling saddles atop a pair of spaced rigid support posts or frame standards of a welded angle iron base. A spoke carrying coil end gauge and guide sleeve has an adjustably clamped mount on the mandrel shaft; and one end of the latter is releasably held down on an adjacent journal saddle by an adjustable hook type device. At its opposite end, and outboard of the other journal saddle, the shaft fixedly carries a belt pulley of a control unit by which rotation of the mandrel and coil is appropriately restrained manually as desired, and the tension of the withdrawn coil material controlled accordingly. Said control unit includes a second pulley about which the belt is also trained, which second pulley has a rotative pivot on a belt tensioning arm; and the latter is itself pivoted on a fixed base of the coil holder. A manually operable control lever pivotally mounted on an adjacent frame upright carries a control lug which is slidably guided on the pivoted pulley carrying belt tensioning arm, thus to vary the position of the latter, the tension on the belt and the resistance to rotation of the first pulley and the mandrel or core.

3,730,452

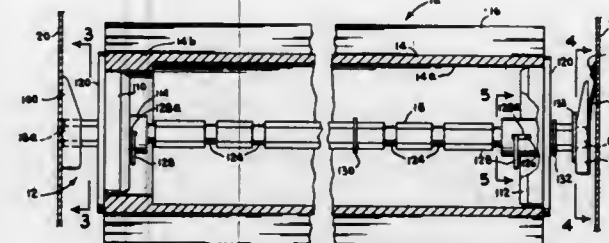
### ELECTROPHOTOGRAPHIC COPY PAPER SUPPLY ROLL AND MOUNTING ASSEMBLY THEREFOR

Herman Schwartz, Wayne, N.J., assignor to Pitney Bowes-Sage, Inc., Hawthorne, N.J.

Filed April 12, 1971, Ser. No. 133,235  
Int. Cl. B65h 19/02

U.S. Cl. 242-68.4

2 Claims



A mounting assembly for an electrophotographic copy paper supply roll employed in an electrostatic copier includes a spindle removably mounted against rotation by a pair of end brackets secured to the copier frame. The core of the supply roll has a stepped bore and is mounted for rotation on a pair of different diameter hubs adjustably axially keyed on the spindle for varying supply roll widths. The assembly insures proper orientation of the photoconductive coating on the copy paper relative to the copier while maintaining the supply roll centrally positioned in relation to the optical axis thereof.

3,730,453

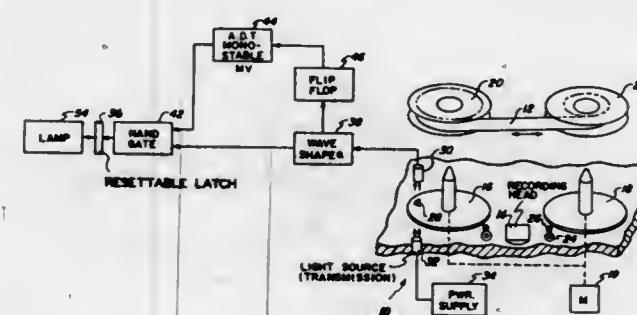
### EARLY END OF TAPE DETECTION

Stuart E. Hotchkiss, Williamson; Bruce H. Smith, Rochester, and Paul L. Steffo, Jr., East Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 21, 1970, Ser. No. 74,084  
Int. Cl. G11b 15/54; B65h 25/32

U.S. Cl. 242-191

9 Claims



Apparatus for indicating a predetermined position on a recording medium such as a magnetic tape. Such a predetermined position is representative of the amount of usable recording medium remaining on a supply reel from which the tape is spooled. The apparatus is characterized by the provision of a photodetector for generating a series of pulses, the frequency of which varies in accordance with the change in angular velocity of the supply reel. The period between successive pulses generated by the photodetector is compared to the operating time of a one-shot multivibrator and when the former is equal to or less than the latter an output signal is derived which can be used to alert an operator that a predetermined quantity of tape remains or actuate control circuitry.

3,730,454

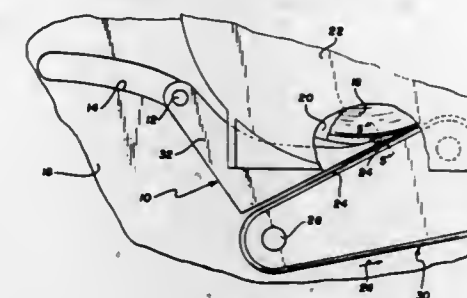
### STRIPPER MECHANISM

Morris E. Brown, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 16, 1971, Ser. No. 153,656  
Int. Cl. G03b 1/30, 1/42

U.S. Cl. 242-192

3 Claims



A stripper mechanism which is adapted to cooperate with a supply roll of strip material rotatably supported adjacent the mechanism to separate a leading end of the strip material from the supply roll includes a body portion and a tooth portion. The tooth portion is mounted on the body portion for limited rotation about an axis perpendicular to the axis of rotation of the roll. The body portion of the stripper member is supported for movement from a first location whereat the tooth portion is out of engagement with the roll to a second location whereat the tooth portion is in engagement with the outermost convolution of the strip material on the roll. Being free to rotate relative to the body portion, the tooth portion aligns itself with the plane of the strip material forming the outermost convolution of the roll regardless of the angular build-up of film caused by a single stripe of magnetic material on the film surface, thereby insuring positive, smooth pick-up of the free end of the strip material during film feeding operation.

3,730,455

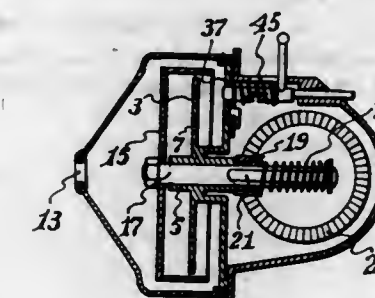
### FISHING REEL WITH DEPTH MEMORY

Joseph C. Murphy, 5817 East 57th Street, Tulsa, Okla.

Filed Dec. 29, 1971, Ser. No. 213,311  
Int. Cl. A01k 89/00

U.S. Cl. 242-84.1 L

10 Claims



A fishing reel has a line lock which, when set, permits a certain length of line to be reeled in and then that same length to be unreeling again, so that the angler can return his lure to the same depth. The lock is in the form of a pin extensible over the periphery of the spool and over which the line is rewound. The rewound line can unwind, but further unwinding is prevented by the pin. The pin has a notch which engages with fixed structure in the extended pin position. A coil compression spring urges the pin to retracted position, and this same spring is anchored at one end in such a way to serve as a leaf spring to urge the notch in the pin about the fixed structure. The notch is so positioned that, when a cast is made to a relatively great distance, the weight of the cast lure will be sufficient to raise the pin against the action of the spring until the notch is disengaged, whereupon the same spring retracts the pin and the lock is thus automatically released.



3,730,456

## AIRCRAFT WITH LIFT ENGINES

Alfred Arthur Morgan, St. Albans, England, assignor to Hawker Siddeley Aviation Limited, Kingston-Upon-Thames, Surrey, England

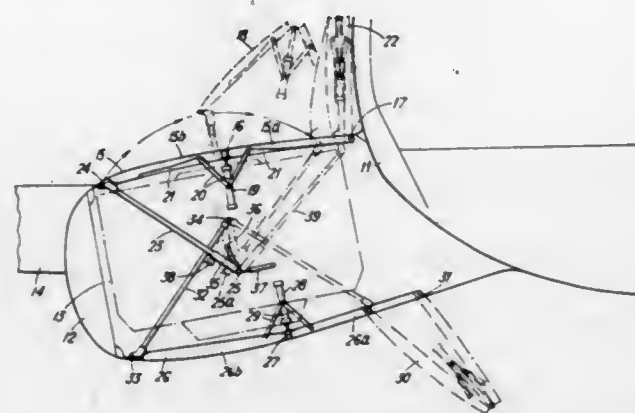
Filed April 14, 1971, Ser. No. 133,964

Claims priority, application Great Britain, April 14, 1970, 17,803/70

Int. Cl. B64c 29/00, 1/14

U.S. Cl. 244—12 B

7 Claims



A VSTOL aircraft with lift engines disposed in rows along either side of the fuselage in sponsons, the sponsons having top intake doors and bottom efflux doors which doors comprise mutually articulated inboard and outboard sections so as to fold inward toward the fuselage when opened. Opening and closing movements of the doors are controlled by radius rods pivotally connected to the outer edges of the outboard door sections, the radius rods of the upper doors having the opposite ends carried on swinging links so that the center of movement of the radius rods changes during opening in order to avoid full opening of the doors being prevented by the fuselage side wall.

3,730,457

## NUTATION DAMPER

Donald D. Williams, deceased, late of Inglewood, Calif. (by Gloria M. Williams, widow), assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 534,251, March 14, 1966, abandoned, which is a continuation of Ser. No. 22,733, April 18, 1960, abandoned. This application June 29, 1970, Ser. No. 56,034

Int. Cl. B64c 17/00; G01c 19/04

U.S. Cl. 244—15 A

7 Claims



A viscous nutation damper for a spin stabilized satellite said damper comprising a sealed arcuate tube disposed near the periphery of the spinning satellite. Said tube is oriented generally parallel to the spin axis and is concave toward the spin axis. A viscous fluid and spherical steel ball are sealed within the tube.

3,730,458

## JET-CONTROLLED AIRCRAFT WITH TRIM AND CONTROL FINS

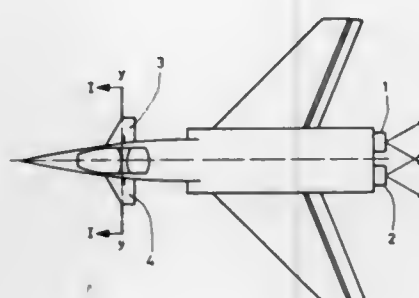
Erich J. Haberkorn, Riemerling, Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Postfach, Germany

Filed Oct. 15, 1970, Ser. No. 81,033

Int. Cl. B64c 9/34

U.S. Cl. 244—43

2 Claims



Control means for jet aircraft. In jet aircraft where the thrust jet is directly utilized for producing control moments, control fins are provided on the fuselage which are extended during takeoff and landings and also to some extent during subsonic flight but which are folded into the fuselage during normal flight. When so retracted, said stabilizing fins are received into suitable recesses in the fuselage to blend smoothly therewith.

3,730,459

## AIRPLANE WITH FLOATING WING AND REVERSE PROPELLER THRUST

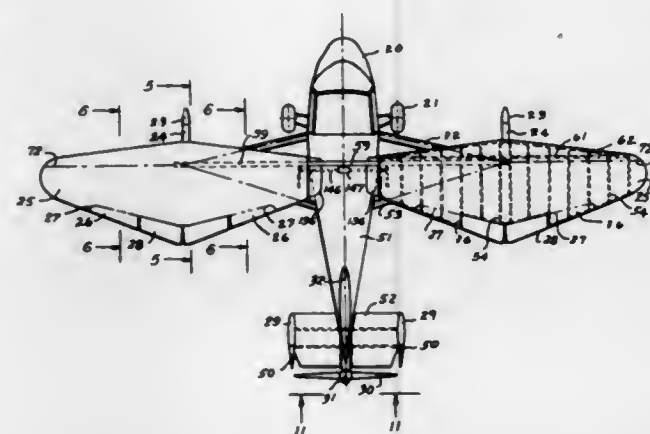
Daniel R. Zuck, 14273 Beaver St., San Fernando, Calif. Substitute for Ser. No. 659,278, July 20, 1967, abandoned.

This application Sept. 18, 1969, Ser. No. 860,170

Int. Cl. B64c 3/42

U.S. Cl. 244—48

15 Claims



This invention relates to aircraft, to the improvement in floating wing aircraft, to the improvement in the stability of floating wing aircraft at very low and negative lift angles of attack, to the improvement in aircraft having floating wings with non-stalling characteristics, and to aircraft with non-stalling characteristics employing the engine power to create a large variable aerodynamic drag force to vary and to precisely control the angle of descent of the aircraft and during landing of the aircraft.

3,730,460

## JET-PROPELLED AIRCRAFT WITH MEANS FOR THRUST DEFLECTION

Andreas Mederer, Marktschwaben, Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Germany

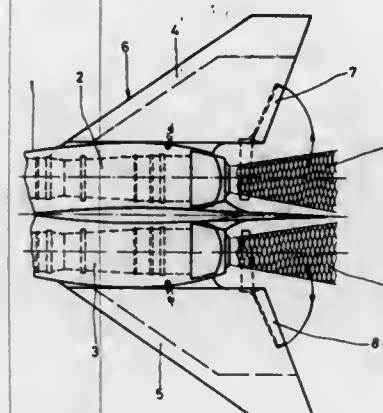
Filed Jan. 22, 1971, Ser. No. 108,809

Claims priority, application Germany, Feb. 13, 1970, P 20 06 596.7

Int. Cl. B64c 9/34

U.S. Cl. 244—53 R

7 Claims



Jet aircraft having means for deflecting the thrust thereof for control purposes. Deflecting means are normally received into a suitable recess in structure adjacent the jet stream such as the horizontal stabilizer, the vertical stabilizer or the fuselage rearward of the jet output. Same are then actuated by any conventional means to extend the deflectors into the jet stream during slow speed operation of the aircraft and retracting same to permit during high speed operation of the aircraft all control functions to originate with the stabilizers, elevators and rudder. A further feature of the invention contemplates mounting the deflectors in a component movable with respect to the jet output, such as the elevators, with the elevators normally located below the jet output whereby the deflectors can be extended without entry into the jet stream at substantially level flight but will move gradually into the jet stream as said elevators are lifted during a landing operation.

3,730,461

## STABILITY AUGMENTATION SYSTEM FOR LIGHT AIRCRAFT PROVIDING PILOT ASSIST AND TURN

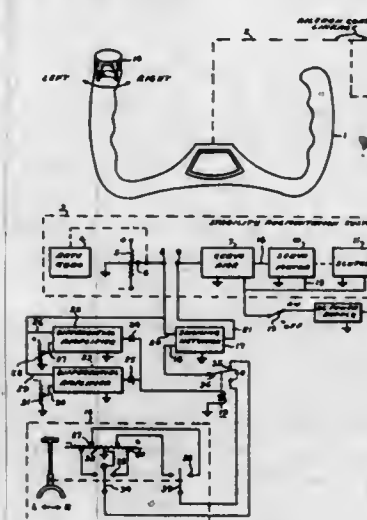
Siegfried Knemeyer, 1410 Meadow Lane, P.O. Box 123, Yellow Springs, Ohio

Filed May 5, 1971, Ser. No. 140,403

Int. Cl. B64c 13/18, 13/44

U.S. Cl. 244—77 E

6 Claims



A small aircraft with a conventional stability augmentation system for automatically maintaining a wings level constant

heading attitude is provided with a switch on the control wheel which is spring biased to a central neutral position and which is actuated by the pilot to the right or left of neutral and held in the actuated position to make a right or left turn. When actuated, the switch introduces an offset signal into the stability augmentation system causing the system to produce and stabilize on a turn rate determined by the magnitude of the offset signal. The actuated switch also sets up an additional signal of opposite sense to the offset signal which is substituted for the offset signal whenever the turn rate exceeds a preset maximum, as may occur if the pilot for any reason increases the turn rate above the stabilized rate by applying sufficient force to the wheel to overpower the stability augmentation system. The opposing signal causes the stability augmentation system to warn the pilot of the excessive rate by exerting a powerful backward force on the ailerons, and on the control wheel in opposition to the pilot's force, tending to reduce the bank angle and thereby the turn rate below the preset maximum. When the switch is released to its neutral position the stability augmentation system returns the aircraft to a wings level attitude.

3,730,462

## ENGINE MOUNT ASSEMBLY

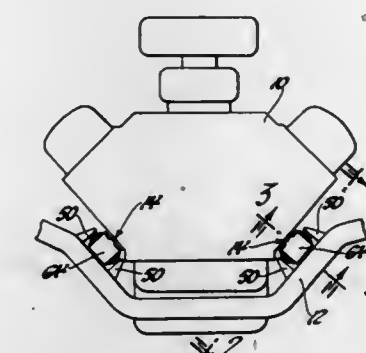
Melvin E. Dick, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed April 26, 1972, Ser. No. 247,637

Int. Cl. F16f 15/00

U.S. Cl. 248—10

5 Claims



An engine mount assembly for resiliently supporting an engine on a frame of a motor vehicle comprises inner and outer bushings between which resilient material is secured to control relative movement of the bushings in all directions. Brackets connect the bushings to the engine and the frame and also permit angular adjustment thereof. The outer bushing has a configuration such that the angular adjustment effects a change in the radial spring rate provided by the mount.

3,730,463

## SHOCK ABSORBING MOUNTINGS FOR APPARATUS

Robert Richard, Zurich, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed April 20, 1971, Ser. No. 135,664

Claims priority, application Switzerland, May 6, 1970, 6791/70

Int. Cl. E04h 9/02

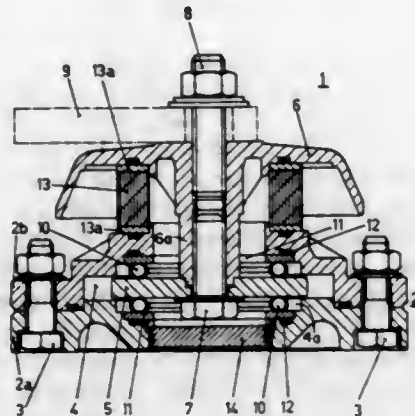
U.S. Cl. 248—22

3 Claims

A damping arrangement for preventing mechanical shocks from being transmitted to the supporting foot portions of apparatus mounted on a foundation located at any area of the earth's surface susceptible to earthquakes includes a two-part resilient mounting. The lower part of the mounting is rigidly fixed to the foundation and the upper part, to which the foot portion of the apparatus is attached, is connected with the lower part by means of a self-centering annular rubber body



and a support plate which is guided for movement in any horizontal direction on the lower part by means of a low-fric-



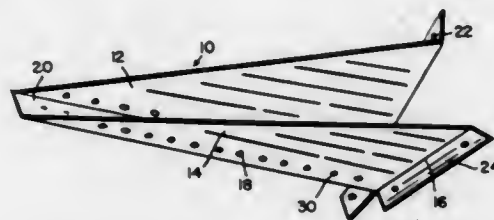
tion type bearing placed therebetween in the form of a floating ring-shaped ball bearing retainer.

### 3,730,464 SHEET METAL BRACKET

Larry A. Kelly, Portugal Cove Road, P.O. Box 9004, Postal Station B, Saint John's, Newfoundland, Canada  
Filed Jan. 25, 1971, Ser. No. 109,494  
Int. Cl. F16m 13/00

U.S. Cl. 248-57

2 Claims



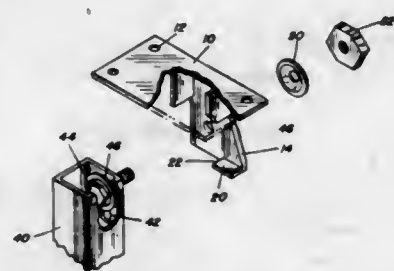
A sheet metal bracket having a pair of triangular shaped plates supports an outlet box, switch box and the like on ceiling or floor joists or sidewall studding. The flexibility of the sheet metal of the cantilever supported bracket permits the plate member to assume various angular positions with respect to its mounting on the joists or studding. A plurality of longitudinally spaced apertures on the bracket permit various mounting locations and the optional use of non-metallic and conduit type wiring. A modified support uses two telescoping interlocking engaging brackets to provide a rigid support between two laterally spaced joists or studding.

### 3,730,465 FOLDING LEG AND BRACKET

Allen C. Gonzalez, 16 Strong Place, Brooklyn, N.Y.  
Filed Nov. 12, 1971, Ser. No. 198,243  
Int. Cl. F16m 11/38

U.S. Cl. 248-188.6

7 Claims



A one-piece bracket, preferably made as a stamping from a piece of sheet metal, is formed so as to have wing members providing two planes of support. These wing members provide

retaining guides in which the end of a leg member may be slid in and out of engagement with the retaining guide portions of the bracket. These guide portions establish retaining means so that the leg may be positively mounted selectively in one of two positions usually at ninety degrees to each other. The bracket is preferably used with a square or rectangular metal tube leg member but may be configured to accommodate other tube configurations or solid members where two planes of contact are formed to complement rib configurations.

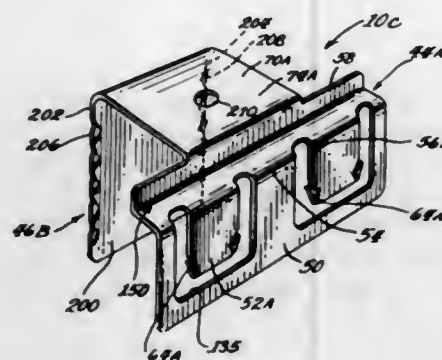
### 3,730,466 DEVICE FOR ATTACHING ELECTRICAL BOXES TO METAL STUDDING

Wesley W. Swanquist, Oswego, Ill., assignor to All-Steel Equipment Inc., Aurora, Ill.  
Division of Ser. No. 38,319, May 18, 1970, Pat. No. 3,684,230, which is a continuation-in-part of Ser. No. 771,408, Oct. 29, 1968, abandoned. This application Dec. 8, 1971, Ser. No. 206,102

Int. Cl. H02g 3/08

U.S. Cl. 248-216

2 Claims



The disclosure relates to a device for attaching switch boxes and the like to metal studding, for use on studding of the channel and stressed wire types, which is in the form of a mounting device including a clip portion in which the box is secured and a stud engaging portion that includes a planar flange defining an abutment portion adjacent its projecting end that is adapted to engage against one of two opposite surfaces of the stud, with the flange carrying a pair of spring arms that project outwardly therefrom and diverge outwardly thereof that each include a finger engaging portion at the projecting end thereof and an abutment forming toothed projection at right angles thereto that are spring biased against the other surface of the stud to clamp the stud portion bearing such surfaces between the flange abutment portion and the abutment forming projections. An alternate form of the device is disclosed that is arranged specifically for use on nailable steel studding.

### 3,730,467 MEANS FOR REMOVABLE ATTACHMENT OF A LOAD SUPPORTING ASSEMBLY TO A SURFACE

Leslie G. Dutchburn, 7 Devere Gardens, Toronto, Ontario, Canada

Filed Nov. 15, 1971, Ser. No. 198,635

Int. Cl. F16m 13/00

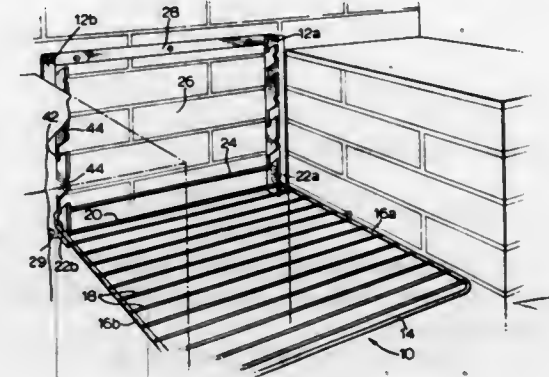
U.S. Cl. 248-243

4 Claims

The horizontal position of a load supporting assembly such as a grill or a firebox may be selectively adjusted by means of a pair of brackets provided with a number of elongated notches spaced along their lengths. Each bracket is also provided with an indentation between each adjacent pair of notches. The load supporting assembly has a pair of spaced apart transverse bars extending along one side thereof and the indentation and a part of the notch are shaped to conform to the outside walls of the bars. The brackets are spaced apart on a surface such as an inner wall of a fireplace and the load supporting assembly is connected thereto by moving one bar into notches at the same

elevation of the brackets. The assembly is allowed to rotate under its own weight about the bar so that the other bar moves

ing engagement with a screw threaded vertical shaft. A U-shaped wall which receives the drapery rod has a stem de-



into contact with the indentations immediately beneath the notches.

### 3,730,468 FURNITURE SUPPORTING SYSTEM

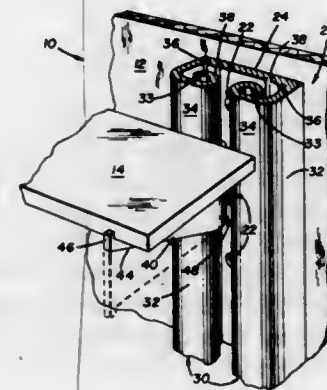
David L. Magnusen, Lake Forest, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Dec. 20, 1971, Ser. No. 209,792

Int. Cl. A47g 29/02

U.S. Cl. 248-246

27 Claims



Bracket members and standards for hanging furniture elements from walls, the members and standards interengaging each other to permit the bracket members to be slid into an infinite number of vertical positions. Retention of the bracket members at any desired position is accomplished by loading the bracket member with a furniture element, the resultant binding between the bracket and standard being sufficient without the use of fasteners to retain said desired position. The bracket members are interchangeable between different modes of mounting the standards.

### 3,730,469 ADJUSTABLE DRAPERY SUPPORT WITH TWO MEANS OF VERTICAL ADJUSTMENT

George Edward Shields, 4 Allyn Drive, Port Richey, Fla.

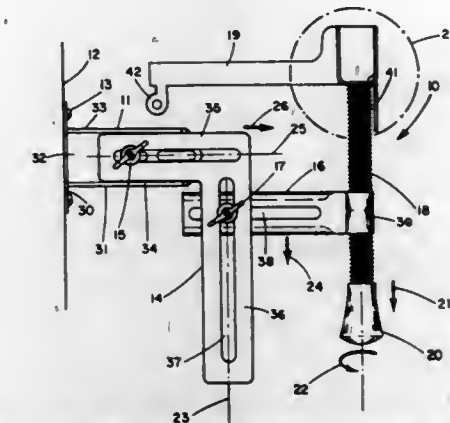
Filed Dec. 10, 1971, Ser. No. 206,776

Int. Cl. A47h 1/124

U.S. Cl. 248-265

2 Claims

A fixture for supporting draperies which allows for horizontal and vertical adjustment of the draperies. A wall bracket mountable to a wall has a horizontally extending plate member which adjustably receives a horizontal leg of an intermediate plate. The intermediate plate has a vertically extending leg with a vertically extending slot. An outer plate has a horizontally extending slot through which in conjunction with the vertical slot of the intermediate member a fastening device extends securing the outer plate to the intermediate plate. The intermediate plate is adjustable along the length of the vertical leg and has an outer threaded cylindrical end which is in mesh-



pending therefrom which is freely received in the hollow top end of the screw threaded shaft.

### 3,730,470 DEMOUNTABLE OPTICAL TOOLING SCALE FIXTURE

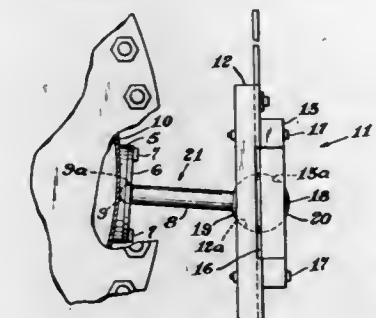
John S. Mitchell, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 22, 1971, Ser. No. 182,769

Int. Cl. G01c 15/12

U.S. Cl. 248-274

12 Claims



A demountable optical tooling scale fixture wherein a tooling ball is demountably attached by a connecting member and plate to a reference point on a surface to be measured and is positioned within and rotatably gripped by two plates set in a face-to-face relationship to each other; said plates are designed to receive optical tooling scales directly or by means of adaptors. In each case, the optical tooling scale will be positioned in a known spatial and angular relationship to the ball which in turn is held at a known distance from the point of mounting on the surface to be measured.

### 3,730,471 LANTERN HOLDER

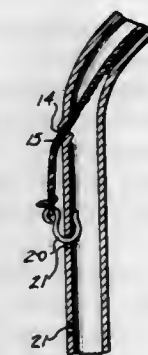
Haze D. Edwards, 1175 Pinehurst Drive, Smyrna, Ga., and William L. Peck, 1194 Danner Street S.E., Atlanta, Ga.

Filed Nov. 13, 1970, Ser. No. 89,284

Int. Cl. F16m 13/00

U.S. Cl. 248-274

1 Claim



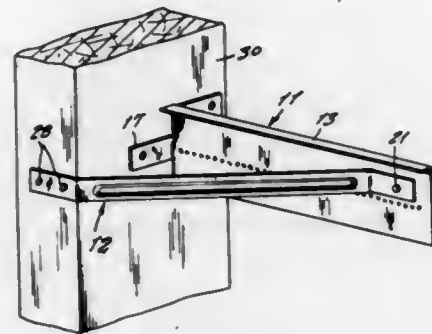
A device for supporting a lantern at any desired height from the water in order to attract fish by the light. The light consists



of a tubular member which is mountable within the oar lock of the boat.

### 3,730,472 QUICK MOUNT

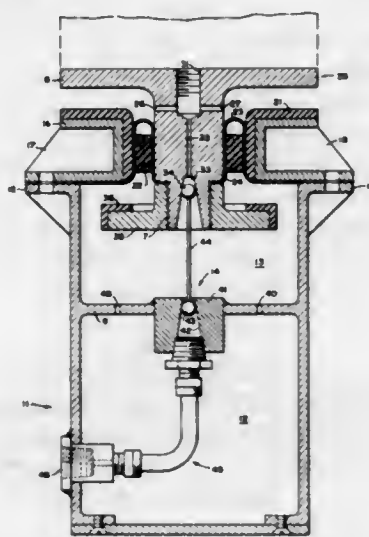
Warren R. Dale, Wever, Iowa  
Filed July 21, 1971, Ser. No. 164,696  
Int. Cl. F16L 3/22  
U.S. Cl. 248—300



A holder that is readily attachable to a building construction and which is adaptable for mounting plumbing pipes or electrical components, the device consisting of two sheet metal straps that may be variously bent and variously attachable together or used alone to form a rigid holder.

### 3,730,473

**PNEUMATIC SELF-POSITIONING SHOCK AND VIBRATION ISOLATION STABILIZING ABSORBER**  
Jerome S. Pepl, Chelmsford, Mass., assignor to Barry Wright Corporation, Watertown, Mass.  
Continuation of Ser. No. 21,144, March 19, 1970, abandoned.  
This application March 3, 1972, Ser. No. 231,494  
Int. Cl. F16F 9/04, 9/34, 15/02  
U.S. Cl. 248—358 R



An isolation system including three discrete pneumatically controlled, self-positioning, shock and vibration isolators, each isolator including a chamber for air under pressure which acts as the isolator or load supporting chamber and provides an outlet to ambient, controlled by a position control valve. One wall of this chamber is formed with a tapered inlet opening to provide a valve seat for accommodating a ball inlet valve attached to a plunger of a height control valve. The other end of the plunger contains another ball serving as an air outlet valve, that is adapted to be seated in a tapered opening in the isolated body mounting. When the isolated body mounting moves inwardly into the chamber it presses on the upper ball to produce a force transmitted by the height control valve plunger upon the lower ball that opens the inlet valve to cause

an increase of pressure in the chamber which serves to raise the isolated body mounting platform. When the platform rises, the outlet valve is opened by withdrawal of the outlet valve seat to reduce the pressure, and, in turn, causes the platform to again be urged inwardly into the chamber.

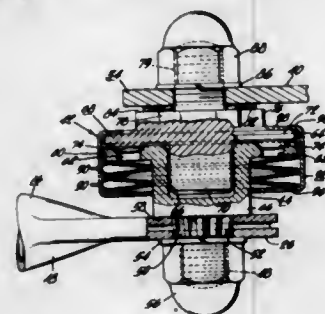
According to another aspect of the invention, there is a bias chamber for providing a downward force against the support piston and providing supply air to the height control valve, the pressure in the bias chamber being greater than the pressure in the load carrying chamber.

1 Claim

### 3,730,474

#### MIRROR POSITIONING DEVICE

William H. Bowers, Holicong, Pa., assignor to Delbar Products, Inc., Perkaskie, Pa.  
Filed May 14, 1971, Ser. No. 143,554  
Int. Cl. B60r 1/06  
U.S. Cl. 248—478



14 Claims

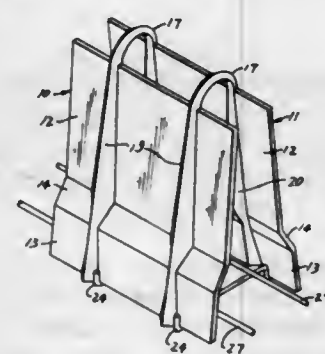
A positioning device for external truck type rear view mirrors which holds the mirror bracket in a normal outwardly extending operating position, but upon application of a predetermined force to the bracket, permits the pivoting of the bracket inwardly toward the vehicle. The device includes upper and lower detent elements attached to the mirror bracket arms which are axially aligned in rotatable relation by the cooperation of a cylindrical portion of one element with an axial bore of the other element. The detent elements are maintained in spring biased relation by a plurality of spring washers held in compression by a cover formed around the detent portions of the elements.

### 3,730,475

#### FORM FOR CASTING CONCRETE BUILDING FOUNDATION

Laurence M. Werfel, 12 Avon Lane, East Hills, N.Y., and Harvey A. Berg, P.O. Box 186, Shore Drive, Blooming Grove, N.Y.  
Filed Sept. 23, 1970, Ser. No. 74,757  
Int. Cl. B28b 7/22  
U.S. Cl. 249—13

1 Claim



A form unit comprising two spaced apart and opposed downwardly diverging walls interconnected at their top and bottom edges, but unconnected at their end edges so that the unit is open-ended and a plurality of such form units may be arranged end-to-end to produce a form of any desired length.

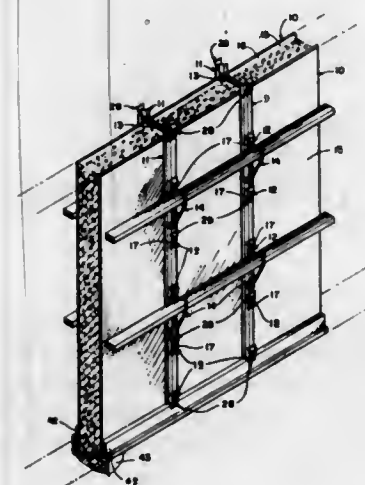
The unit has a relatively wide footing-producing lower region, and each wall has a strengthening rib which may continue into a handle serving as the top connection between the walls. The bottom connection is removable, so that it remains in the hardened concrete when the form is lifted off, and may serve to support reinforcing rods.

### 3,730,476

#### UNITIZED METAL-STUD CONCRETE FORM STRUCTURE

Harry A. Prichard, Jr., 29621 20th Avenue South, Federalway, Wash.  
Filed March 1, 1971, Ser. No. 119,530  
Int. Cl. E04g 9/00  
U.S. Cl. 249—191

4 Claims



A unitized, reusable form for generally vertical planar concrete surfaces of some areal extent including plural form panels and metallic supporting studs having particular associated fastening devices. The particularly configured studs are provided with spaced holes to accept ordinary headed snap ties of commerce which are releasably maintained by fastening wedges communicating between snap tie and stud. A particular spreader structure for the form top provides a snap tie with depending U-shaped body to provide great rigidity in the assembled form. Particular waler brackets are supported in the stud holes.

### 3,730,477

#### BRACKET SUPPORT UNIT FOR INTEGRAL WALL CONSTRUCTION

John R. Wavrunck, Arlington Heights, Ill., assignor to Capitol Hardware Manufacturing Company, Inc., Chicago, Ill.  
Filed Nov. 1, 1971, Ser. No. 194,360  
Int. Cl. A47g 29/02; A47L 5/08  
U.S. Cl. 248—243

7 Claims



A bracket support unit to be mounted at any one of a number of selected elevations between a pair of closely spaced

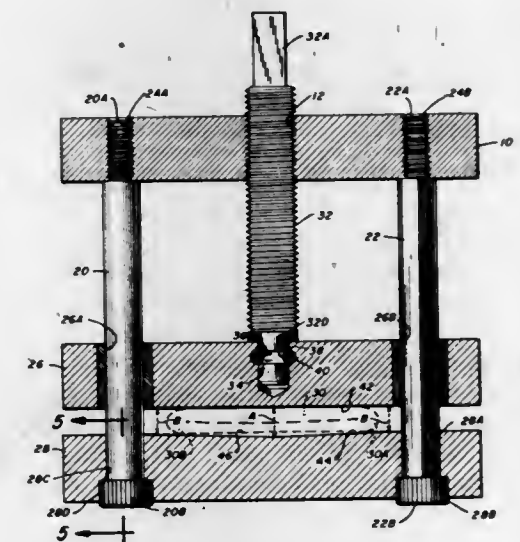
apart vertical wall-forming support studs and fastened thereto by laterally directed power driven fasteners. The bracket support unit preferably includes a heavy gauge elongated extruded member of aluminum or the like which forms a housing and snugly fits between the closely spaced apart support studs. Laterally extending oppositely directed stop flanges are formed at the forward end of the extruded member to overlie the forward ends of the studs. The extruded housing has a narrow channel therein which receives an elongated slotted bar made of steel or the like, the slots of which are adapted to receive the teeth of a bracket at any one of a number of points therealong. The bar has spaced notches formed along the longitudinal side edges thereof which receive punched or stamped projections formed on the extruded housing to fix the position of the bar in the channel.

### 3,730,478

#### TOOL FOR SQUEEZING OFF FLEXIBLE PIPE

Donald J. Burke, and Judson C. Cole, both of Tulsa, Okla., assignors to Continental Industries, Inc., Tulsa, Okla.  
Filed Jan. 18, 1971, Ser. No. 107,074  
Int. Cl. F16k 7/06  
U.S. Cl. 251—8

4 Claims



A tool for squeezing off flexible pipe having a clamp with first and second clamp bars adaptable to receive flexible pipe therebetween, the bars having opposed flat pipe contacting surfaces configured such that the distance between the contacting surfaces is greater intermediate the length of the bars than near the ends, and means to force the clamp bars towards each other.

### 3,730,479

#### ADJUSTABLE FLUID RESTRICTOR

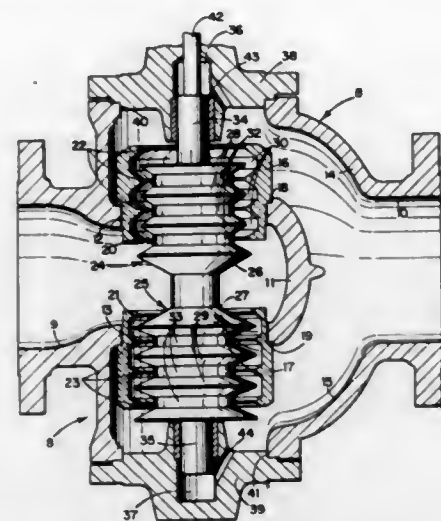
Hans D. Baumann, Foxboro, Mass., assignor to Masonellan International, Inc., Norwood, Mass.  
Filed July 6, 1971, Ser. No. 159,745  
Claims priority, application France, July 6, 1970, 7025031  
Int. Cl. F16k 47/00  
U.S. Cl. 251—121

12 Claims

The present invention constitutes an adjustable fluid restrictor providing throttling means to reduce pressure of liquid or gaseous media through a process of adiabatic flow with friction in contrast to conventional orifice type throttling devices which utilize rapid acceleration and deceleration as primary means of energy conversion. Said adjustable fluid restrictor



containing labyrinth-type restrictions which are adjusted by conventional actuating means and provide constant enthalpy



pressure reduction at substantially constant velocity regardless of variations in flow area.

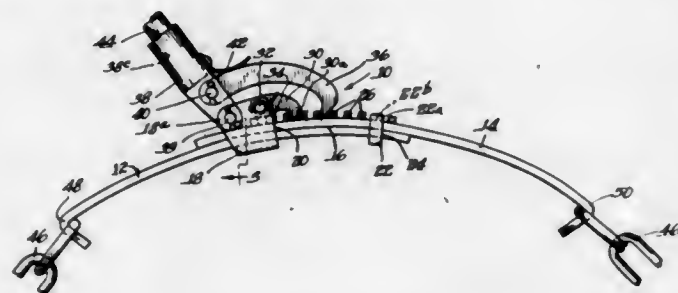
3,730,480

## LOAD BINDER

Robert D. Moyer, R. R. 1, Box 33, Star City, Ind.  
Filed Oct. 12, 1971, Ser. No. 188,155  
Int. Cl. B66f 1/04

U.S. Cl. 254-71

4 Claims



A load binder is formed by a pair of arcuately shaped leaf spring members slidably held together by U-shaped clamps. Teeth are formed on one of the leaf spring members and the other of such leaf spring members includes a holding pawl and loading pawl arrangement connected to the U-shaped clamp thereof. The holding pawl is pivotally secured to the clamp and urged into engagement with the teeth by a spring to prevent separating of the leaf spring members during the tensioning thereof. The holding pawl is then manipulated by a handle, which is removable, to draw together the leaf springs and apply tension through suitable flexible means such as a chain or cable to bind together a plurality of items. Tensioning forces of the load binder are obtained by relative movement of the leaf spring members with respect to one another to shorten their effective length and by the spring tension produced thereby as a result of straightening of these elements.

3,730,481

## AIR LIFT JACK

Martin A. Ekenen, 29581 Puritan Avenue, Livonia, Mich., and Stanley Dupras, 15383 West Blue Skies Court, Livonia, Mich.

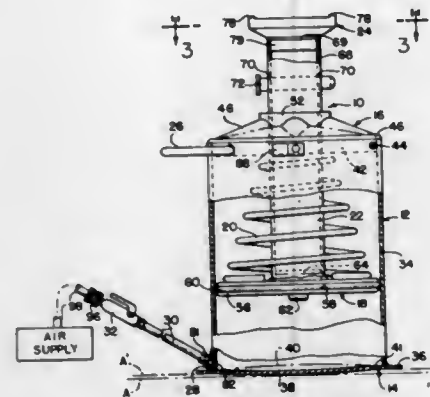
Filed May 19, 1971, Ser. No. 144,778  
Int. Cl. B66f 3/24

U.S. Cl. 254-93 R

10 Claims

A lift jack is powered by compressed air and is sealed against the admission of dirt and water into the air cylinder. The air cylinder is provided with a bottom wall or base having

a normally convex curvature that becomes concave, in an "oil can" effect, when the jack is placed under load and compressed air applied to the piston within the air cylinder. Convex curvature of the bottom wall allows the relatively heavy lift jack to be moved along on a floor plane more easily and with less effort, and with no damage to the floor surface. An extensible member, adapted to be pin-connected to the main lift cylinder, is also provided to increase the lift height of the



jack. The upper surface of the air cylinder is arranged with radial corrugations, to provide great strength and rigidity and to eliminate material deflection of the lift cylinder in load lifting operation. A lift handle is fixedly secured to the main cylinder of the jack for easier portability and in such attitude that the entire unit is carried in a more balanced manner, without injury to the person carrying the jack or damage to the jack.

3,730,482

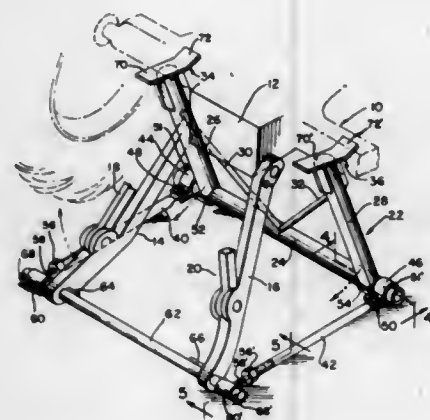
## TRACTOR JACK

Raymond E. Park, McLean, Ill., and Thomas A. Escoubas, P. O. Box 77, Arlington, Ill.

Filed Dec. 9, 1969, Ser. No. 883,391  
Int. Cl. B66f 3/00

U.S. Cl. 254-124

6 Claims



A device for jacking the rear wheel assemblies of a tractor in the form of an attachment to be operated by the conventional three-point hitch assembly mounted on the tractor. The jack attachment is in the form of a stand, comprising interconnected uprights which are of sufficient length to raise the tractor from the ground surface with the upper end of the uprights supporting the rear axle assembly of the tractor. A shaft is carried by the hitch arms of the three-point hitch assembly and lift arms are pivotally attached at their forward ends to the stand and receive opposite ends of the shaft at their rearward ends. The lift arms are adjustable in length and may be swung into and out of engagement with the shaft so that the proper length of the lift arms may be achieved to accommodate for the jacking action.

3,730,483

## ASSEMBLY FOR PULLING A LINE

E. Strohm Newell, San Diego, Calif., assignor to Milprint, Inc., Milwaukee, Wis.

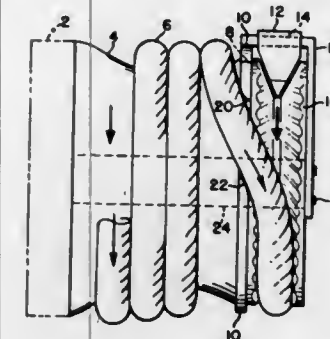
Continuation of Ser. No. 105,161, Jan. 11, 1971, abandoned.

This application July 15, 1971, Ser. No. 165,763

Int. Cl. B66d 1/30

U.S. Cl. 254-150

9 Claims



The assembly comprises a rotatably mounted capstan member, a pulley member having an annular groove and a line guide means including a gate portion to direct the movement of the line from the capstan member onto the pulley member. The pulley member is mounted to rotate with the capstan member. The line guide means is disposed in fixed relationship with respect to the capstan and pulley members. The assembly of this invention may be used in combination with a power source to form a line pulling device.

3,730,484

## DEVICE FOR PRECISION POSITIONING OF OBJECTS

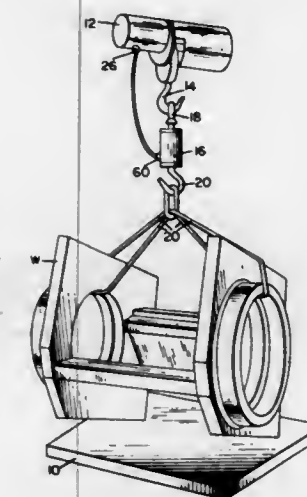
Roslyn H. Fairbanks, Holden, Mass., assignor to Inter Continental Corporation, West Boylston, Mass.

Filed Jan. 11, 1971, Ser. No. 105,489

Int. Cl. B66d 1/00

U.S. Cl. 254-167

4 Claims



A hydraulically operated link for a hoist comprising a cylinder, a piston therein, a piston rod, a load applying tension to the piston rod and to the opposite end of the cylinder, and a remote control the control being easily operated for allowing flow of fluid to move the piston in the cylinder under conditions of stress; a gauge showing the present pressure, and a pressure operated safety shutoff device for the hoist.

3,730,485

## ASHLESS ANTI-RUST ADDITIVES

Aart Strang, and Bernard R. Talens, both of Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed Aug. 28, 1970, Ser. No. 68,039

Claims priority, application Great Britain, Sept. 10, 1969, 44,633/69

Int. Cl. C10m 1/20, 1/38

U.S. Cl. 252-57

4 Claims

Para hydrocarbyl-substituted phenol or thiophenol dicarboxylic acids as anti-rust and anti-corrosion additives to liquid hydrocarbon fuels and lubricants.

3,730,486

## HEAT EXCHANGING MIXER-REACTOR FOR HIGH VISCOSITY SUBSTANCES

Isao Hayashi, and Kenichiro Kondo, both of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Chuyoda-Ku, Tokyo, Japan

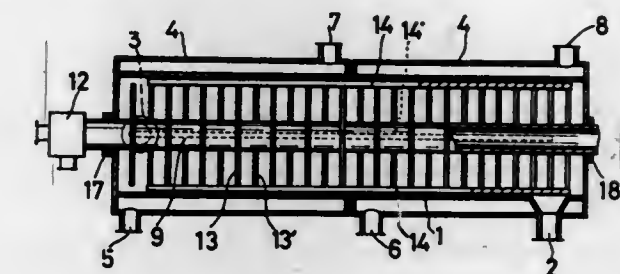
Filed April 19, 1971, Ser. No. 135,117

Claims priority, application Japan, April 27, 1970, 35685

Int. Cl. B01f 7/10, 15/06

U.S. Cl. 259-6

4 Claims



A heat exchanging mixer-reactor for high viscosity substances having two rotating shafts, each carrying a plurality of closely spaced agitating discs, arranged inside an inner casing through which the high viscosity substance is passed via oppositely located inlet and outlet openings; a jacket for the circulation of a heating or cooling medium formed by an outer casing surrounding the inner casing; wherein the agitating discs of one shaft overlap those of the other shaft and rotate in opposite directions, carrying on their periphery wiper fingers whose movements are coordinated with radial cutouts in the discs on the other shaft to avoid interference.

3,730,487

## APPARATUS FOR THE CONTINUOUS MIXING OF GRANULAR MATERIALS

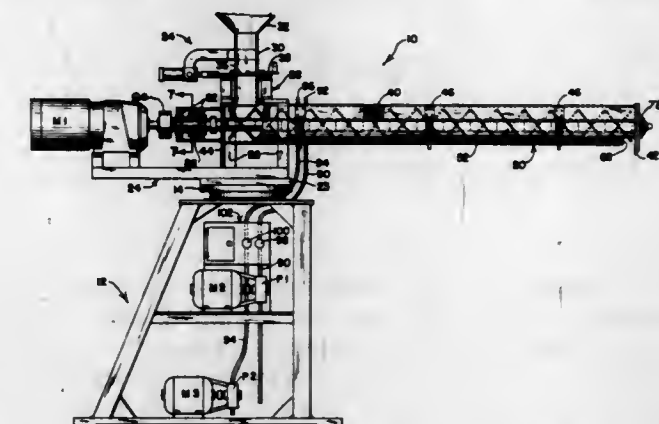
Robert S. Lund, Elmhurst, Ill., assignor to Pettibone Corporation, Chicago, Ill.

Filed Aug. 26, 1971, Ser. No. 175,047

Int. Cl. B01f 7/04

U.S. Cl. 259-6

9 Claims



A mixing apparatus adapted for use with granular or semi-solid material and embodying a mixer trough within which are



disposed two parallel companion shafts each of which has mounted thereon a linearly straight row of flat slanting parallel mixing blades, the two rows of blades functioning when the shafts are rotated in opposite directions to propel the material forwardly while at the same time exerting thereon a slicing action whereby progressively diminishing masses of the material are tossed from side to side and are repeatedly sliced into smaller increments as they progress along the trough.

Such construction of the vibrating board can avoid an erosion on the board, eliminated a breakdown of the tremblers and ensure a reliable transmission of an ultrasonic-wave to the liquid, and thus prolongs the durable years of the vibrating board.

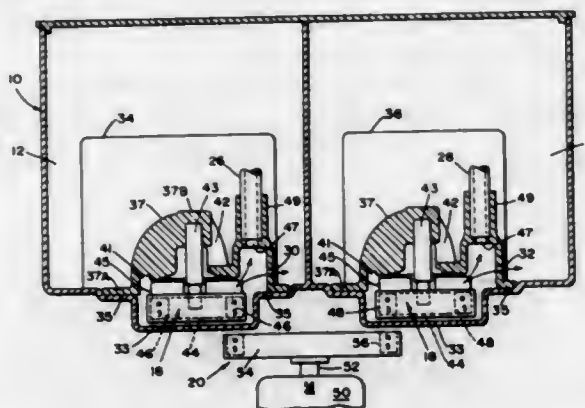
### 3,730,488 MAGNETIC DRIVE COUPLING FOR BEVERAGE DISPENSER

John A. Gardner, Jr., Tewksbury, Mass., assignor to Jet Spray Cooler, Inc., Waltham, Mass.

Filed May 18, 1972, Ser. No. 254,510  
Int. Cl. H02k 7/00

U.S. Cl. 259-67

16 Claims



A two-compartment beverage dispenser having a single drive motor and associated drive magnet disposed external of the compartments and a pair of separated driven magnets responsive to rotation of the drive magnet, disposed one in each compartment and each having an impeller associated therewith. The drive magnet is magnetized in one sense, the driven magnets are magnetized in the opposite sense, and the number of pole faces of the drive and driven magnets may be preselected to provide the desired impeller drive speed.

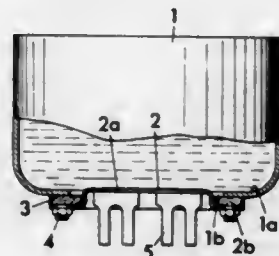
### 3,730,489 HARD CHROME PLATED VIBRATING BOARD OF AN ULTRASONIC-WAVE WASHER

Katsumi Morita, Higashikatsushika-gun, Japan, assignor to Hakamada Kinzoku Kogyo Kabushiki Kaisha, Edogawa-ku, Tokyo, Japan

Filed March 20, 1972, Ser. No. 236,070  
Int. Cl. B01f 11/02

U.S. Cl. 259-72

4 Claims



A vibrating board for an ultrasonic-wave washer fitted to an opening formed in the bottom of a washing tank to form a vibrating bottom of said tank with a plurality of tremblers fixed thereto at its under surface of the board which contacts a washing liquid in said tank is plated with a hard chrome. Moreover, at least four corners of the vibrating board are formed thinner than the substantial central area of the board to which the tremblers are attached from the below.

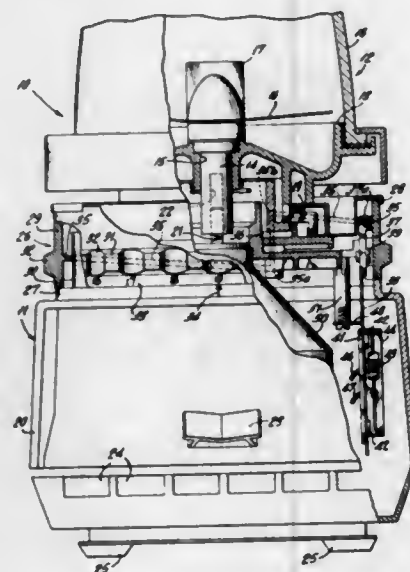
### 3,730,490 MOTOR SPEED CONTROL MECHANISM FOR DOMESTIC BLENDER

Gustave A. Oberg, Wilmington, Del., assignors to Ronson Corporation, Woodbridge, N.J.

Filed Jan. 11, 1972, Ser. No. 217,019  
Int. Cl. B01f 7/16; B02c 18/12

U.S. Cl. 259-108

6 Claims



A speed control member which is linked to a ring on a blender such that rotation of the ring on the blender effects a change of speed of the blender motor. Indicia is imprinted on the blender which indicates to the user the speed chosen for a particular location of the ring.

### 3,730,491 SUSPENSION DISPERSING APPARATUS

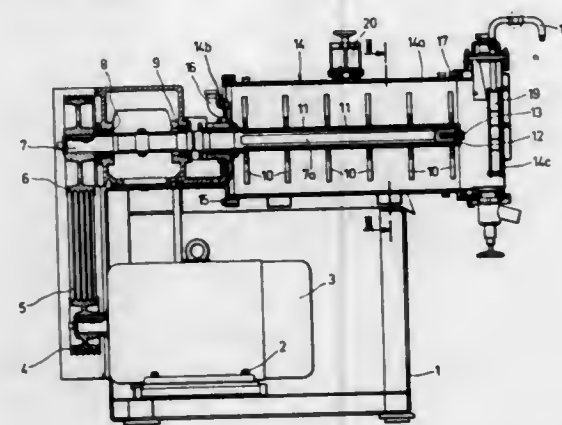
Kaspar Kuster, 4000 Basel, Switzerland, assignor to Willy A. Bachofen, Basel, Switzerland

Filed June 7, 1971, Ser. No. 150,696  
Claims priority, application Switzerland, June 9, 1970, 8684/70

Int. Cl. B01f 7/02

U.S. Cl. 259-109

5 Claims



Apparatus for finely dispersing the components of suspensions, having a suspension-receiving container with an end wall incorporating a stuffing box by means of which a shaft is journaled in the end wall for driving an agitator, and an elastic connection between the end wall and the remainder of the container.

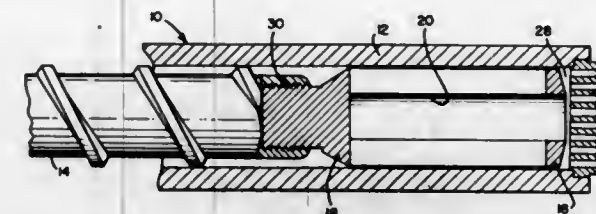
### 3,730,492 MIXING OF THERMOPLASTIC MATERIALS

Bruce H. Maddock, Fanwood, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 17, 1971, Ser. No. 154,011  
Int. Cl. B29f 3/00

U.S. Cl. 259-193

4 Claims



Apparatus is disclosed for heating thermoplastic material to a flowable condition, longitudinally advancing the heated material under pressure toward the discharge end of the apparatus with a rotating extrusion screw having a mixer head at the downstream end thereof; dividing said heated material into a plurality of streams and passing said streams through a plurality of longitudinal mixing passages; passing the plurality of individual streams of the partially fluxed melt through high shear zones between said mixer head and the barrel of said extrusion apparatus; and passing the fluxed melt into the interior of the mixer head and therethrough to the discharge end of said mixer head.

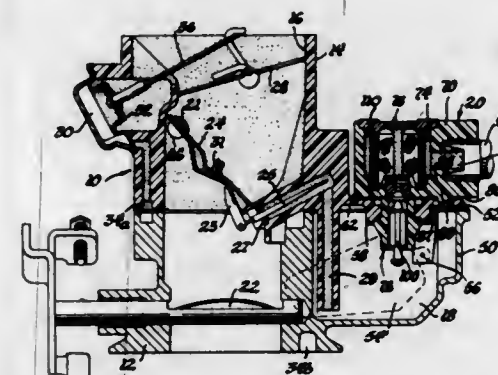
### 3,730,493 FUEL FITTING

Charles F. Elam, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed July 9, 1971, Ser. No. 161,130  
Int. Cl. F02m 19/06

U.S. Cl. 261-4

4 Claims



A fuel inlet fitting for an internal combustion engine carburetor has a depending hollow post with exterior lugs for cooperating with interior lugs depending about an inlet opening in the roof of the float bowl of the carburetor to draw and seal the fitting against the roof. A float valve is translatable in an outlet port through the post and is retained therein by an annular lip. The fitting and float bowl roof have detent means to lock the fitting in a fixed position with respect to the float bowl.

### 3,730,494 METHOD AND APPARATUS FOR INTIMATELY CONTACTING A GAS AND A LIQUID

Jacques Sterlini, Paris 18<sup>e</sup> (Seine), France, assignor to Societe Anonyme Compagnie Electro-Mecanique, Paris, France

Filed Aug. 22, 1972, Ser. No. 282,865

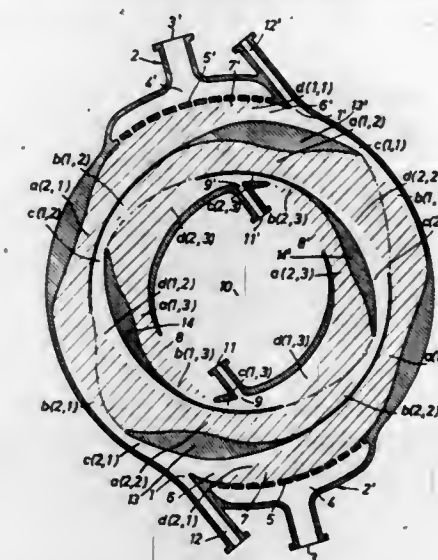
Claims priority, application France, Sept. 3, 1971, 7131931  
Int. Cl. B01f 3/04

U.S. Cl. 261-21

21 Claims

Apparatus is described for intimately contacting a gas with a liquid comprising a plurality of liquid/gas contacting means

formed by walls defining a plurality of channels extending in the same direction about a central axis of the apparatus, each of said channels providing successively a divergent zone in which an opening is provided in the outer wall of the channel, an expansion nozzle, a convergent zone in which an opening is provided in the inner wall of the channel, and an enclosed divergent zone, said channels being interconnected with one



another both end to end and by the openings in the inner and outer walls respectively of radially adjacent channels being made coincident, the openings in the outer walls of the radially outermost channels being in communication with means for connection to a source of pressurized gas, and the openings in the inner walls of the radially innermost channels being in communication with a gas outlet.

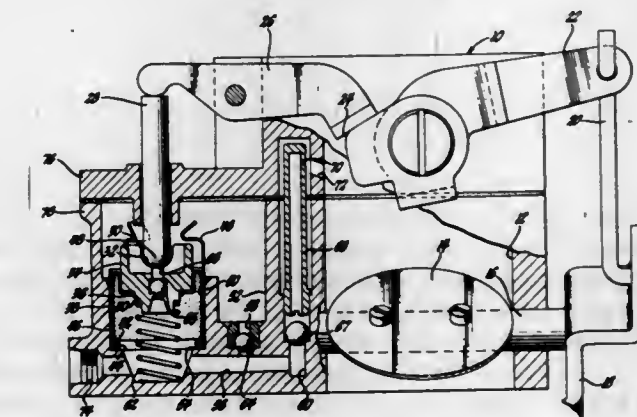
### 3,730,495 CARBURETOR ACCELERATOR PUMP

Charles F. Elam, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed July 15, 1971, Ser. No. 162,928  
Int. Cl. F02m 7/08

U.S. Cl. 261-34 A

2 Claims



An easily serviceable carburetor accelerator pump unit incorporates a shield rolled over the outer rim of a rolling diaphragm and having a plurality of inwardly extending members to limit upward travel of a plunger head carried by the diaphragm.



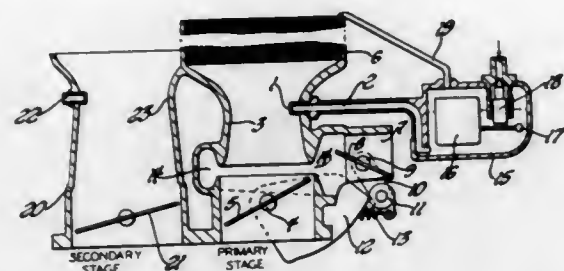
3,730,496

**CARBURETOR FOR AUTOMOTIVE ENGINES WITH A METERING SUCTION PARTLY DERIVED FROM A LAMINAR AIR FLOW MATRIX**  
 Henri Morgenroth, 3090 Hidden Valley Lane, Santa Barbara, Calif.

Filed July 1, 1968, Ser. No. 741,572  
 Int. Cl. F02m 7/04

U.S. Cl. 261-23 A

25 Claims



The carburetor produces increased fuel-air ratio towards the reduced airflow end of the family of constant-throttle variable-R.P.M. curves (FIG. 7 curves *i j k*). This is obtained by augmentation of the Venturi suction by means of a Laminar Flow Matrix, which produces a nearly linear relationship between airflow and metering suction. In order to maintain the correct roadload curve despite this low-end increase of the metering signal, a bypass throttle, controlled by the main throttle, resets the fuel-air ratio to the correct value (FIG. 6). The schedule of bypass throttle opening relative to main throttle opening determines the roadload curve.

3,730,497

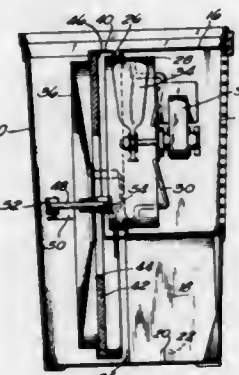
PORTABLE HUMIDIFIER

Arthur J. Schmitt, and Lloyd H. Spaeth, both of West Bend, Wis., assignors to The West Bend Company, West Bend, Wis.

Filed Feb. 3, 1971, Ser. No. 112,253  
 Int. Cl. B01f 3/04

U.S. Cl. 261-24

3 Claims



A lightweight inexpensive portable humidifier has an air coupling drive between a motor driven fan and a louvered wheel carrying a filter. A fan housing directs the flow of air from the fan to a restricted area of the filter and louvered wheel. Part of the air goes through the filter and then to the blades or louvers of the wheel and part of the air flows directly against such blades. As the wheel rotates the filter passes through a supply of water in a casing having a water storage reservoir and as the air goes through the filter moisture is evaporated into the air. The fan, fan housing, driving motor, saddle block bearings for the shaft of the wheel and float arm are all mounted on a chassis to form a unit which is self-supporting in the water containing casing and is removable therefrom to operate, without the wheel, externally of such casing. When water falls below a low point the float arm operates a brake to stop the wheel from rotating without stopping the fan.

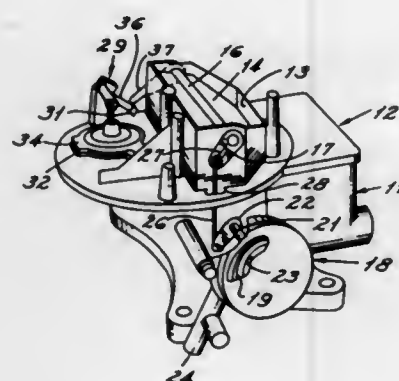
3,730,498

**CONTROL MEANS FOR CARBURETOR AUTOMATIC CHOKE**

Timothy R. Keenon, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.  
 Filed Dec. 28, 1970, Ser. No. 101,568  
 Int. Cl. F02m 1/10

U.S. Cl. 261-39 B

5 Claims



A control means for a carburetor automatic choke in which the bimetal input to the choke plate pivot shaft is varied by a lost motion variable radius connection. The control means includes linkage having a pair of pivot arms interconnected by a link. One end of the link is slidably received in a radially directed slot formed in one of the arms so that lost motion movement of the link within the slot varies the effective radial length of the arm.

3,730,499

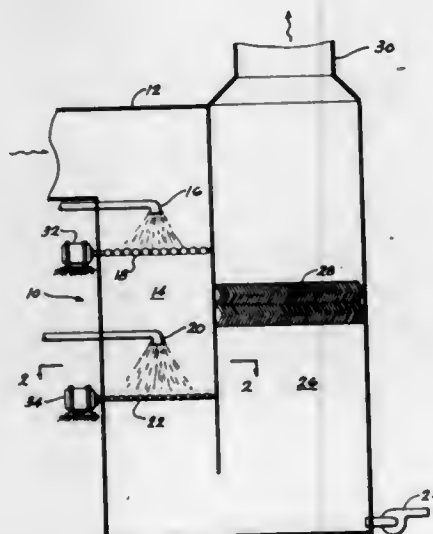
DAMPER-ROD SCRUBBER

James Jonakin, Simsbury, Conn., assignor to Combustion Engineering Inc., Windsor, Conn.

Filed July 21, 1971, Ser. No. 164,762  
 Int. Cl. B01f 3/04

U.S. Cl. 261-109

4 Claims



A wet scrubber having spray means for spraying a liquid into a passageway, and a rod scrubber positioned downstream of the spray means by which impurities can be removed from the gas stream. The rods of the scrubber are rotatably mounted, so that they can be rotated to a position parallel to the gas flow when it is desired. The rods are removably attached, so that they can be readily replaced if the need arises.

3,730,500

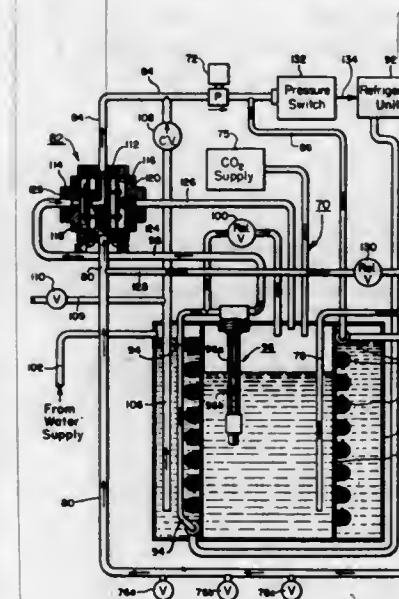
**LIQUID LEVEL CONTROL SYSTEM AND CARBONATOR**

George B. Richards, Lake Forest, Ill., assignor to Fluid Device Corporation, Highland Park, Ill.

Continuation-in-part of Ser. No. 724,385, April 26, 1968, abandoned. This application June 19, 1969, Ser. No. 840,119  
 Int. Cl. B01f 3/04; B67d 5/62

U.S. Cl. 261-140

38 Claims



A flow regulator is disclosed for controlling liquid flow, for example, from a supply source to a receiving tank according to the liquid level in the tank. Specifically, a fluid interaction device communicating with the receiving tank causes a fluid pressure signal to be developed in response to departure of the liquid in the tank from a predetermined level. A differential pressure responsive valve adjusts liquid flow from the supply source to the receiving tank in response to the fluid pressure signal. Several embodiments and other features including a digital fluid amplifier for liquid level sensing are disclosed.

A beverage dispensing system incorporating the aforesaid flow regulator is also disclosed. A cold carbonated liquid is continually circulated past dispensers from a pressurized chill tank having a carbon dioxide atmosphere. The flow regulator admits further liquid to the system from a supply source whenever liquid is tapped from the system by the dispensers. Other features including pressure sensing for temperature control are disclosed.

3,730,501

**APPARATUS FOR TREATMENT OF METAL PRODUCTS**

Andre Guesnier; Roland Tricot, and Michel Lacoude, all of 73 Albertville, France, assignors to Ugine Aciars, Paris, France  
 Continuation-in-part of Ser. No. 748,291, July 29, 1968, abandoned. This application Dec. 16, 1970, Ser. No. 98,673  
 Claims priority, application France, Aug. 1, 1967, 67116523

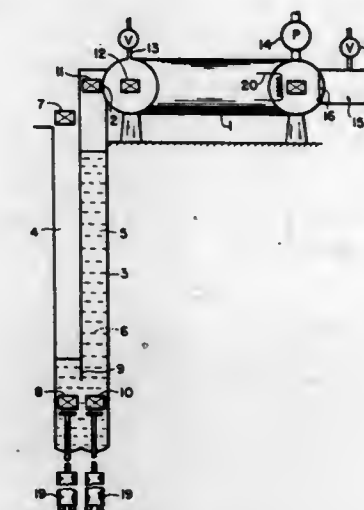
Int. Cl. C21d 1/62

U.S. Cl. 266-4 A

5 Claims

Apparatus for heat treating and descaling metal without harmful superficial decarburization of the shapes. The apparatus comprises a furnace chamber wherein reducing at-

mospheres, temperatures between 700° and 1,200° C and vacuums between 100 and 0.01 torr may be maintained. A



barometric lock enables steel shapes to be introduced and removed from the furnace chamber without disturbing the vacuum.

3,730,502

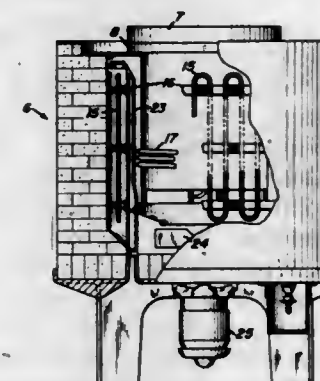
**APPARATUS FOR VACUUM BRAZING-GAS QUENCHING NON-FERROUS AND FERROUS ALLOYS**

Paul K. Shutt, Jr., Aberdeen; Francis B. Gurtner, Baltimore, and Frank T. Kirk, Forest Hill, all of Md., assignors to The United States of America as represented by the Secretary of the Army

Division of Ser. No. 816,697, April 16, 1969, Pat. No. 3,608,187. This application May 21, 1971, Ser. No. 145,661  
 Int. Cl. C21d 1/00

U.S. Cl. 266-5 R

5 Claims



The invention relates to an apparatus for joining metal parts together through the utilization of a vacuum brazing - gas quenching technique.

3,730,503

**APPARATUS AND METHOD FOR AGGLOMERATING AND HARDENING METAL OXIDE PELLETS**

Carl A. Holley, Glenahaw, Pa., assignor to International Minerals & Chemical Corporation

Division of Ser. No. 12,275, Feb. 18, 1970, Pat. No. 3,682,619.  
 This application Dec. 15, 1971, Ser. No. 208,496  
 Int. Cl. F27b 21/00

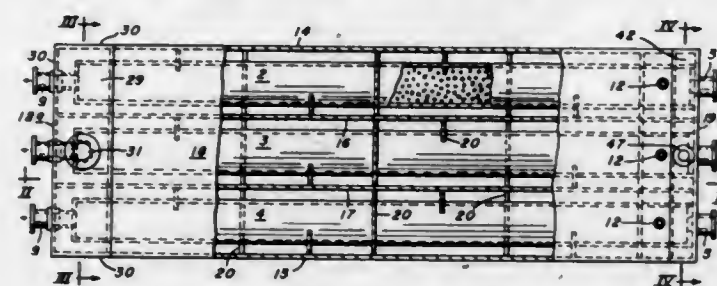
U.S. Cl. 266-20

7 Claims

An apparatus and process are provided for agglomerating and hardening moist green pellets of a metal oxide containing a cementitious binder, the hardened pellets being formed by a semi-continuous process using heat and pressure to cure the pellets. Moist green pellets containing a cementitious binder are introduced into the upper portion of a preheated inclined pressure vessel, the pellets rolling down the bottom wall of the



inclined pressure vessel and the pellet surface dried. The vessel, after filling, is sealed to the atmosphere and the pellets are heated to the desired curing temperature by passing hot gases around the outside of the pressure vessel. Following a sufficient heating and curing time, the pressurized atmosphere, containing steam produced from the moisture in the pellets, is exhausted and the pellets are discharged out of an opening in the lower end of the inclined pressure vessel. Use of a plurality of such pressure vessels provides a semi-continuous process wherein while one pressure vessel is being filled with pellets, a second vessel contains pellets that are being heated to the desired curing temperature and a further pressure vessel



which contains pellets that have been heated to the desired temperature is held at the curing temperature to harden the pellets therein. The pressure vessels are contained within heating jackets which are interconnected to a manifold system for circulating hot gases first through the jacket of the vessel which contains the pellets that are to be heated, then through the jacket of the vessel which contains the pellets which are being held at curing temperature, and then, while a portion of the spent gases are recycled, the remainder is fed to the jacket which surrounds the pressure vessel that is being filled with pellets, preheating the vessel and the pellets prior to being exhausted to the atmosphere.

3,730,504

## WORKPIECE SCARFING DEVICE

Artur Lvovich Dalker, ulitsa B. Khmel'nitskogo, 27, kv. 14; Alexandr Nikolaevich Morozov, prospekt Lenina, 74, kv. 25; Anatoly Ivanovich Vels, ulitsa Vorovskogo 9, kv. 77; Boris Grigorievich Kuchtaev, ulitsa Degtyareva, 37, kv. 8; Nikolai Mikhailovich Novoselov, ulitsa Degtyareva, 89, kv. 58; Viktor Nikolaevich Zhuraviev, ulitsa Kalinina, 19, kv. 107; Alexei Fedorovich Zinoviev, ulitsa B. Khmel'nitskogo, 9, kv. 85, all of Chelyabinsk; Ivan Ivanovich Alifiev, ulitsa Kalinina, 3, kv. 66, Magnitogorsk; Viktor Ivanovich Nikitin, ulitsa P. Kalmykova, 16, kv. 58, Chelyabinsk; Alexei Il'ich Kochergin, Teatralny pereulok, 4, kv. 24, Chelyabinsk; Vladimir Filippovich Matashkov, ulitsa Ya. Gasheka, 18, kv. 13, Chelyabinsk; Nikolai Ivanovich Karelin, ulitsa Lipetskaya, 23, kv. 16, Chelyabinsk; Jury Venediktovich Volkhe-mat'ev, ulitsa I Spudnika, 27, kv. 55, Chelyabinsk; Veniamin Fedorovich Zaluzhentshev, ulitsa Degtyareva, 37, kv. 6, Chelyabinsk, and Gennady Yakovlevich Morozov, ulitsa Kommunisticheskaya, 6a, kv. 67, Chelyabinsk, all of U.S.S.R.

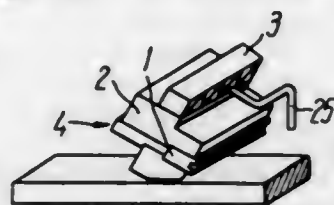
Filed Nov. 3, 1971, Ser. No. 195,195

Claims priority, application U.S.S.R., Aug. 21, 1968, 1265222

Int. Cl. B23k 7/06

U.S. Cl. 266-23 H

3 Claims



A device made up of a set of blocks. Each block comprises a gas-cutting unit with an upper portion against which butts a

gas-distributing unit, incorporating an oxygen and combustible gas chambers fitted with cut-off diaphragm valves.

Mounted on a cover of the gas-distributing unit is a gas-regulating unit intended for actuating each valve individually.

3,730,505

## DOUBLE DELIVERY LANCE FOR REFINING THE STEEL IN THE CONVERTER PROCESSES

Aldo Ramacciotti, Rome; Alberto Praltoni, and Bruno Imberti, both of Genova, all of Italy, assignors to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed June 1, 1971, Ser. No. 148,520

Claims priority, application Italy, July 1, 1970, 51838 A/70

Int. Cl. C21c 7/00

U.S. Cl. 266-34 L

7 Claims



Double-delivery refining lance comprising: a main conduit, in a central location with its axis coinciding with the lance axis, diverging into a set of nozzles; a secondary outer annular conduit disposed concentrically about the main conduit diverging in its turn into a set of nozzles, as well as annular conduits, disposed concentrically about the above mentioned main and secondary conduits for cooling fluid input and output respectively. The discharging nozzles of the main conduit diverge conically with respect to the lance axis downwardly by an acute angle and are arranged symmetrically; also the discharging nozzles of the secondary circuit are downwardly inclined with respect to the lance axis by an acute angle not necessarily coinciding with the former and symmetrically arranged; the inclination of the discharging nozzles of the main conduit and respectively of the secondary conduit, and their respective locations, longitudinally and radially with respect to the lance axis, are such as to make the lance particularly useful in converters rotating around a vertical axis.

3,730,506

## MIXER LADLE STRUCTURE

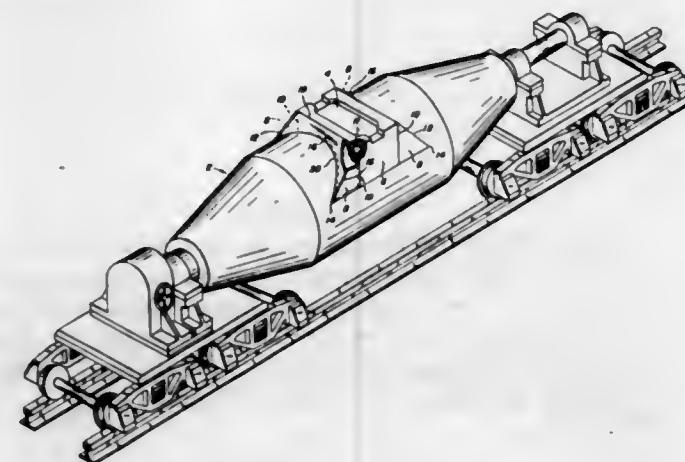
Richard J. McAfee, Forest Hills Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 20, 1971, Ser. No. 210,000

Int. Cl. F27d 15/00

U.S. Cl. 266-39

1 Claim



Improved structure includes a substantially rectangular spout box made of refractory lined plates having extended side

plates at each end extending longitudinally of the ladle body from opposite sides of the spout box, and gusset plates connected with and extending between the side plates transversely of the ladle body on opposite sides of the spout box.

3,730,507

## BORON NITRIDE BASE EVAPORATION VESSEL HAVING A SURFACE COATING OF TITANIUM-SILICON THEREON

Lionel C. Montgomery, North Olmsted, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

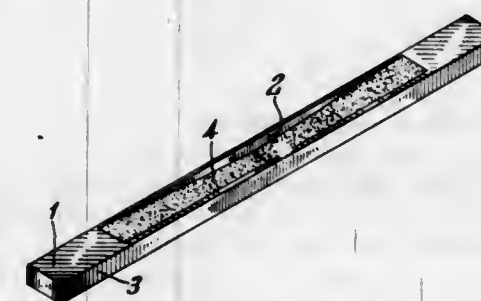
Continuation of Ser. No. 742,446, July 3, 1968, abandoned.

This application Jan. 18, 1971, Ser. No. 107,542

Int. Cl. C23c 13/12

U.S. Cl. 266-39

10 Claims



A boron nitride containing evaporation vessel which is readily wetted by molten metals and accordingly ideally suited for use in a vacuum metallizing system is provided by coating at least a portion of the evaporation surface of the vessel with a titanium-silicon base alloy.

3,730,508

## VARIABLE OFFSET SPRING MOUNTING BLOCK FOR LOAD-BEARING VEHICLES

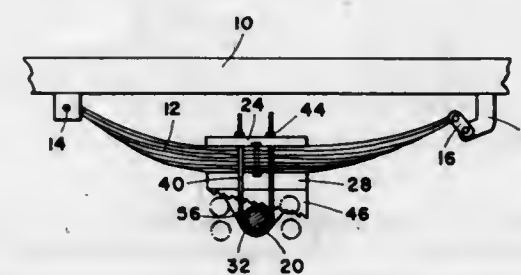
Daniel Marian, 3924 Cascade Drive, Youngstown, Ohio, and Michael Ramon, 53 Broadway St., Youngstown, Ohio

Filed March 19, 1971, Ser. No. 126,120

Int. Cl. F16f 1/22

U.S. Cl. 267-52

3 Claims



A suspension arrangement in which the axis may be shifted fore or aft of the center of the spring assembly. A carrier member is mounted on the spring assembly. The carrier member mates with an axle mounting block secured to the axle. The mating surfaces of the carrier and the axle mounting members are keyed so that the axle mounting member may be shifted forward or aft to any one of several discrete positions on the carrier member.

3,730,509

## COMPOSITE SPRING ELEMENT FOR USE AS A MOTOR MOUNT

Raoul Jörn, Post Wasserburg a.B., Hengnau, Germany

Filed April 12, 1971, Ser. No. 132,981

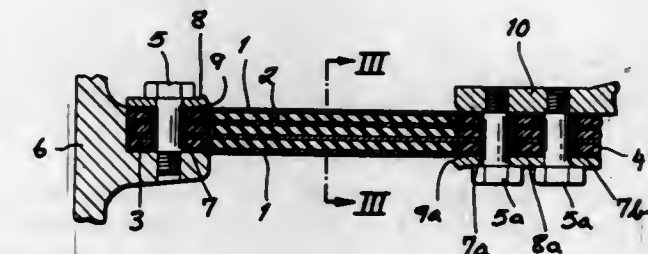
Int. Cl. F16f 3/10

U.S. Cl. 267-152

14 Claims

A spring element includes a plurality of flat leaf springs which are parallel to each other and have a supported side and

a deflectable load-engaging side, and a body of elastomeric material between the springs and bonded to at least one of them while being at least engageable with the other spring after some deflection of the element. The spring element can be elongated and bolted at one end to the load and at the other end to the support so that the springs, which are of some very rigid material such as steel, serve to support the load and the elastomeric body damps vibration. The springs can be bolted



at one end and can also be of differing lengths, with the longest spring formed at its free end with an eye adapted to receive a bolt or pin on a load. The springs can also be annular with a plurality of inwardly extending tabs bent away from the plane of the outer periphery. The elastomeric body is a soft rubber or rubber mixture capable of withstanding heat and resistant to destruction by oil. Use of these elements for supporting an internal-combustion engine on a motor-vehicle frame is envisaged.

3,730,510

## LOCKING DEVICE FOR THE CLAMPS OF A TUBE SPLICER

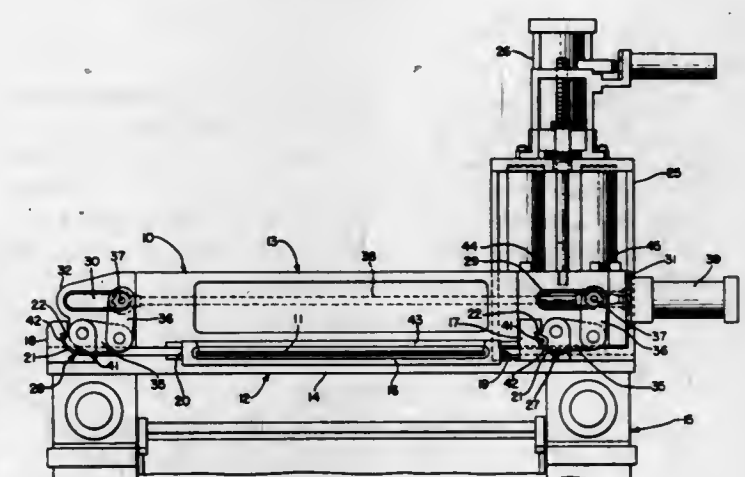
Max D. Brinkley, North Canton, and Glenn D. Kerr, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 29, 1971, Ser. No. 202,907

Int. Cl. B23g 3/06

U.S. Cl. 269-25

15 Claims



A machine having a pair of clamps for holding opposing ends of an innertube firmly in position for cutting and subsequent movement into compressive, splicing engagement. Each clamp has a movable jaw cantilevered over a fixed jaw and a latching mechanism for locking the jaws together to eliminate any movement of the clamps, especially the free cantilevered ends of the movable jaws.



3,730,511

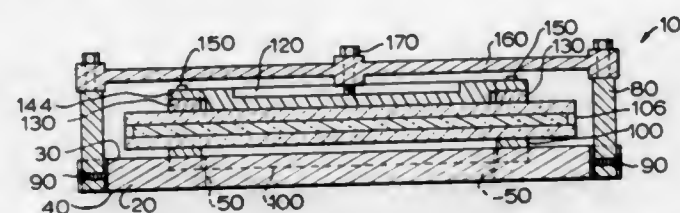
**CLAMP FOR USE IN ASSEMBLING DISPLAY DEVICE**  
Bernard Caras, Princeton, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed March 12, 1971, Ser. No. 123,593

Int. Cl. B32b 31/20; B25b 5/10

U.S. Cl. 269-152

9 Claims



The clamp includes essentially two rectangular metal frames between which the various glass plates to be assembled are held with the frames applying pressure to the edges of the plates. The metal plates are pressed against the glass plates with resilient members which provide a spring-like effect.

3,730,512

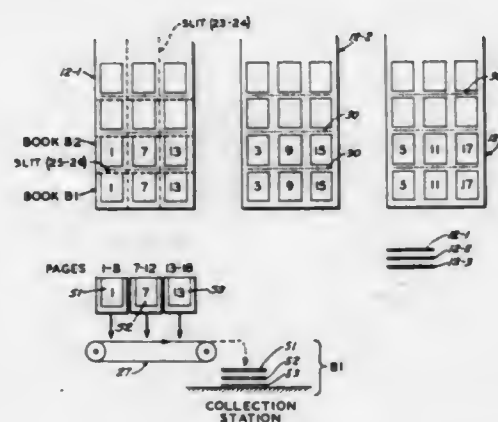
**METHOD AND APPARATUS FOR MAKING BOOKS**  
Joseph V. Bellanca, Tallahassee, Fla., assignor to McCain Manufacturing Corp., Chicago, Ill.

Continuation-in-part of Ser. No. 856,676, Sept. 10, 1969, abandoned. This application July 26, 1971, Ser. No. 165,484

Int. Cl. B42c 19/00; B42b 1/02

U.S. Cl. 11-1 R

14 Claims



The pages of a book are joined by glue located inward much farther from the back of the book than heretofore, accomplished by applying beads of glue of liberal width to preprinted webs fed from rolls, registering and juxtaposing the webs, cutting the webs along the beads of glue to expose glue edges and assembling cut sections into book form with the glue edges constituting the back of the book.

3,730,513

**AUTOMATIC FEEDER, APPLICABLE TO COLLAR PLASTICIZING MACHINES AND RELATED FUNCTIONAL METHOD**

Serafino Colombini, 38 Via Matteotti, Pero, Italy

Filed Aug. 3, 1970, Ser. No. 60,471

Claims priority, application Italy, Aug. 2, 1969, 20506 A/69

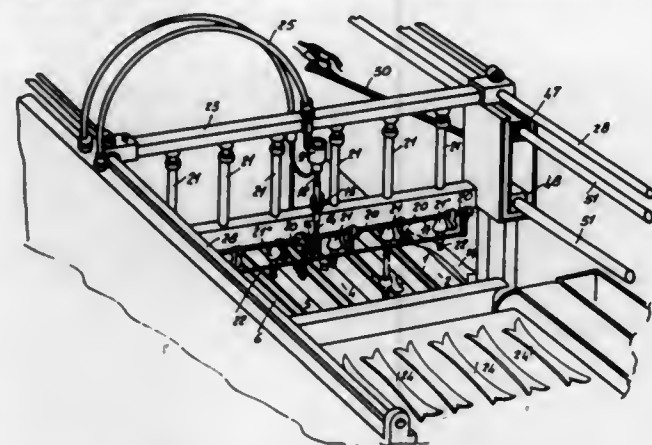
Int. Cl. B65h 3/00, 5/10

U.S. Cl. 271-9

6 Claims

A new automatic feeder for collar plasticizing machines, includes a loader, subdivided into a plurality of compartments where the collars are piled, a movable frame capable of alternating rectilinear motion along side slides and supporting pneumatic cylinders which are provided at the lower end with bellows suckers for sucking in the collars onto the conveyor

belt into the plasticizing machine. An electromagnet imparts an alternating oscillatory motion to lamellar members which act as locking members for the tubular members and causes the lamellar members to release the tubular members so that



the tubular members and the bellows suckers drop by gravity. After the collars have been sucked in, the tubular members have reached their upper position, and in a subsequent stage, the lamellar members return to their locking position, because the electromagnet is no longer energized.

3,730,514

**APPARATUS FOR THE SEPARATE DISCHARGE OF FLAT ITEMS FROM A STACK**

Gisbert Burkhardt, Reichenau-Mittelzell, Germany, assignor to TELEFUNKEN Patentverwertungsgesellschaft mbH, Ulm/Danube, Germany

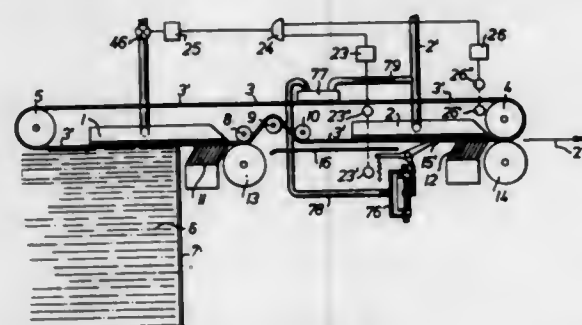
Filed Dec. 15, 1971, Ser. No. 208,312

Claims priority, application Germany, Dec. 24, 1970, P 20 63 874.8; Dec. 24, 1970, P 70 47 771.3

Int. Cl. B65h 3/12, 3/46

U.S. Cl. 271-11

5 Claims



Apparatus for separating and individually discharging relatively flat items from a stack includes first and second separators operatively connected by a suction conveyor belt with a plurality of groups of suction openings. In the area of the second separator an abutment member is positioned to be movable to temporarily block the conveying path before each arrival of an item from the first separator. The movement of the abutment member is effected through a pneumatic setting device that can be selectively connected with a source of sub-atmospheric pressure by a valve associated with the groups of suction openings in suction conveyor belt.

3,730,515

**APPARATUS FOR FEEDING SHEETS OF PAPER**

Helmut Splies, Haydnstrasse 17a, 8906 Gersthofen, Germany

Filed Feb. 11, 1971, Ser. No. 114,623

Claims priority, application Germany, March 5, 1970, P 20 10 467.0

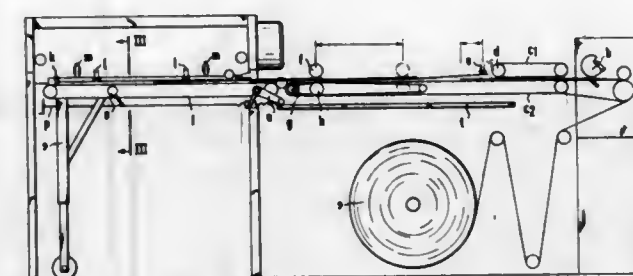
Int. Cl. B65h 5/24

U.S. Cl. 271-46

1 Claim

Apparatus for feeding sheets cut from a continuous web of paper in an underlapping sequence or array comprising a

group of suction cups, suction rollers or the like, which are adapted to be moved back and forth parallel to the line of travel of the sheets and attach themselves to the trailing edges



of successive sheets after they are freed from conveying means to lift the edges of these sheets, retard their forward movement, and stretch the sheets in such a manner that the leading edge of the next sheet is moved below the raised edge.

3,730,516

**PACK ADVANCER**

Maurice Debray, 90 Laurier Street, Valleyfield, Quebec, Canada

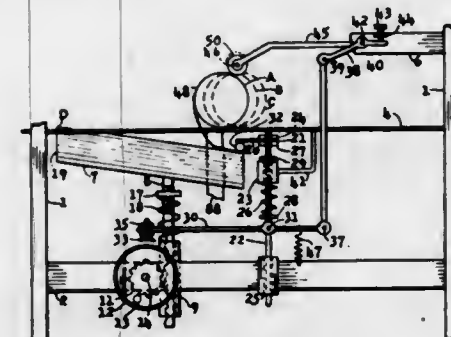
Continuation of Ser. No. 541,941, April 8, 1966, abandoned.

This application Jan. 5, 1970, Ser. No. 779

Int. Cl. B65h 1/12

U.S. Cl. 271-62 R

5 Claims



A vertically movable platform supports a pack of sheets and is urged upwardly to bring the uppermost sheet against a detent which is normally held at a fixed level above the platform. The detent is then raised above its normal fixed level to release the uppermost sheet for feeding, and the platform is held against rising while the detent is in its raised position. A sheet demand responsive mechanism actuates the detent and the platform holding means in a coordinated manner.

3,730,517

**SHEET CONVEYOR APPARATUS AND METHOD**  
Robert K. Norton, Twinsburg, Ohio, assignor to Harris-Inter-type Corporation, Cleveland, Ohio

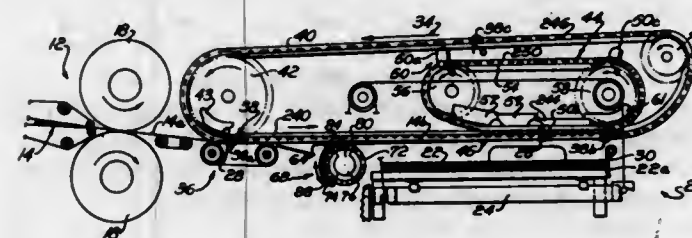
Continuation of Ser. No. 792,693, Jan. 21, 1969, abandoned.

This application May 3, 1971, Ser. No. 139,917

Int. Cl. B65h 29/04

U.S. Cl. 271-76

37 Claims



An improved sheet slowdown method and apparatus includes gripping a leading end portion of a sheet with clamp as-

semblies of a main conveyor and transporting the sheet along a horizontal path to a transfer station which is located directly above a pile of sheets. At the transfer station, the leading end portion of the sheet is engaged by clamp assemblies of a slowdown conveyor which is operating at the same speed as the main conveyor. The clamp assemblies of the main conveyor are then released and the speed of operation of the slowdown conveyor is reduced to decelerate the sheet before it is released at a receiving station where the leading end portion of the sheet engages a stop member to position the sheet relative to the pile of sheets. This reduction in the speed of operation of the slowdown conveyor may be provided by actuating a differential gear mechanism to provide relative rotation between an input member connected to a constant speed source of power and an output member which is drivingly connected to the slowdown conveyor.

3,730,518

**CHILDREN'S TOY WITH RESILIENT BALL SUPPORTING RESILIENT OBSTACLES**

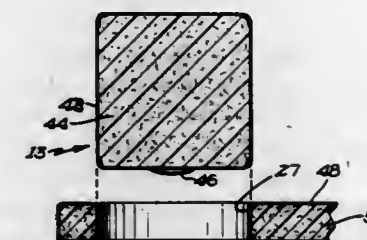
Joseph E. Drapcho, Minneapolis, Minn., assignor to The Minneapolis Society of Fine Arts, Minneapolis, Minn.

Filed April 8, 1971, Ser. No. 132,447

Int. Cl. A63g 31/00

U.S. Cl. 272-1 R

10 Claims



A children's amusement toy of a resilient base member removably supporting several resilient upstanding members is disclosed. The base member is of a length and width sufficient to permit several children to simultaneously run and play thereon. The upstanding members, certain of which are at least twenty-four inches high, are mounted in supportive depressions in the base to provide spaced resilient obstacles and play toys for the amusement of children.

3,730,519

**COLLAPSIBLE BRIDGE GAME**

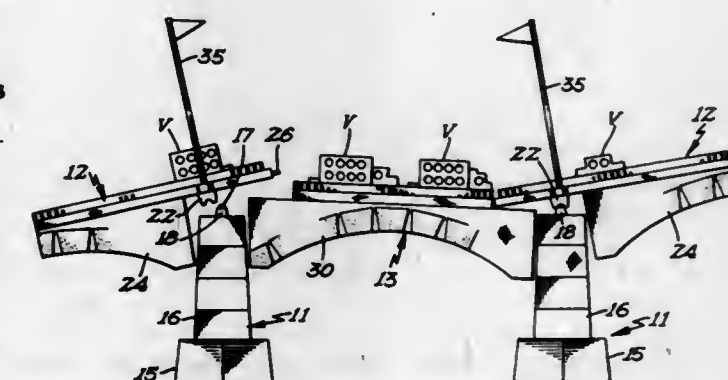
William L. Garrity, 4717 Townes Road, Edina, Minn., and Rimvydas Anthony Tveras, 5030 Marine Drive, Apt. 2712, Chicago, Ill.

Filed Dec. 29, 1971, Ser. No. 213,499

Int. Cl. A63f 9/00

U.S. Cl. 273-1 R

7 Claims



Game apparatus in the form of a collapsible bridge. Two end-span deck sections are supported on spaced piers and a mid-span deck section is supported between the end-span

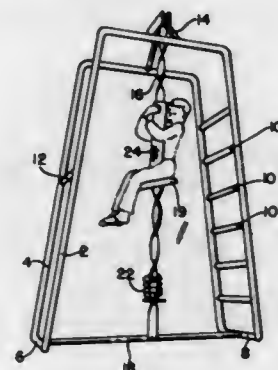


deck sections to form a continuous bridge deck over the piers. Under dead load conditions and with live loading on the main portion of the end-span deck sections, the bridge is stable. As live load accumulates on the mid-span deck section, the bridge collapses.

### 3,730,520 PLAYGROUND TOY

Douglas P. Willis, 1201 East Market Street, Aberdeen, Wash.  
Filed May 1, 1972, Ser. No. 248,888  
Int. Cl. A63g 21/00

U.S. Cl. 272-1 R



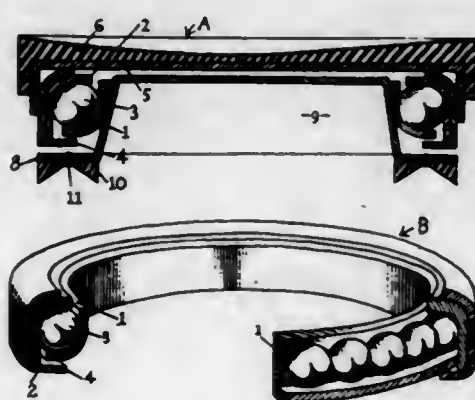
A toy adapted for use on a playground or similar area including a relatively vertical upstanding framework having a spiral ribbon-like band suspended therefrom. A child supporting platform having a groove to interact with the ribbon is threaded upon the ribbon and includes as an integral part thereof an upstanding flexible tube which surrounds the ribbon. The rider of the platform can grasp the tube for stabilization and use it as a braking means by simply squeezing the tube about the ribbon-like band. For playground use a shock absorbing resilient means may be located at the bottom of the ribbon to halt the descent. In one embodiment, the band may be positioned over the corner of a swimming pool. In another embodiment, a ladder is provided so that the child may climb to the top of the framework.

### 3,730,521 AMUSEMENT SPINNING DEVICE

Donald L. Sellman, Box 127, Stanley, Kans.  
Continuation-in-part of Ser. No. 743,091, July 8, 1968, abandoned. This application Feb. 4, 1971, Ser. No. 112,592  
Int. Cl. A63b 23/04

U.S. Cl. 272-57 A

2 Claims



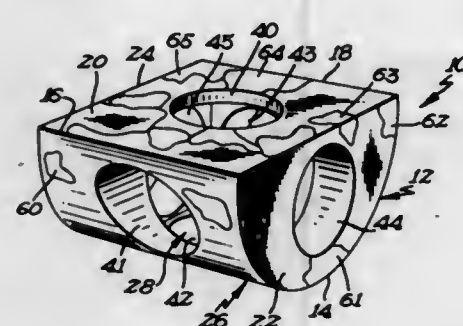
An Amusement Spinning Device that consists of a base plate having an outer edge which has on the bottom side three or more anti-slip supporting lugs and a cup shaped shoulder near the outer edge and on the top side of said base plate that supports an annular type axial thrust ball bearing assembly at the outer boundary of the device. Also there is an inverted cup

shaped top plate that is tightly fitted over the ball bearing assembly annular band and covers the top side of the ball bearing assembly and forms a support for an anti-slip top cap. This device is very small in size and for one foot operation.

3,730,522  
CHILDREN'S ROCKING AND CLIMBING TOY  
Sandra K. Paczkowski, Montreal, Canada, assignor to The Minneapolis Society of Fine Arts, Minneapolis, Minn.  
Filed April 19, 1971, Ser. No. 135,072  
Int. Cl. A63g 31/00

7 Claims U.S. Cl. 272-60

10 Claims

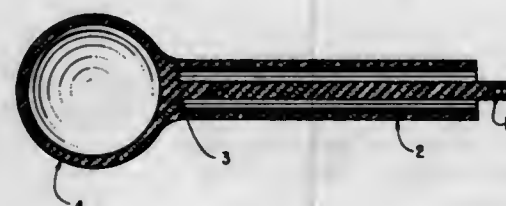


A children's amusement toy of a curved outer surface intersecting two parallel sides and a flat surface to form a solid body is disclosed. The body has a hollow center formed therein of a different configuration than the outer surface with a tunnel extending from the center to each side in a mutually perpendicular arrangement to allow children to rock within and upon the toy, climb through and upon the toy, and climb through and over the toy. The solid body is made to present a pleasing appearance through use of transparent surface material and a filling of multicolored foam material.

3,730,523  
GOLF CART HANDLE ATTACHMENT FOR GRIP, WRIST AND FOREARM EXERCISE  
Allen A. McRae, 18110 Shawnee Trail, Tualatin, Oreg.  
Filed Aug. 20, 1971, Ser. No. 173,370  
Int. Cl. A63b 23/00, 21/30

U.S. Cl. 272-67

1 Claim



An exercising device made out of a single moulded piece of plastic for exercising the grip, wrist, the forearm of a golfer. One end of the device is a soft, squeezable knob. The other end is a tubular chamber moulded onto one surface of the knob and provided with a plastic rod positioned in the chamber and extending from the knob end of the chamber out beyond the opposite end of the chamber. The portion of the rod outside the chamber has a hole therethrough. By sliding the chamber over a hollow golf cart handle with the rod being positioned inside the handle and fixedly bolting the portion of the rod with the hole therethrough to the handle, one may obtain exercise by twisting the knob and chamber against the resistance to twisting of the rod and by squeezing the knob.

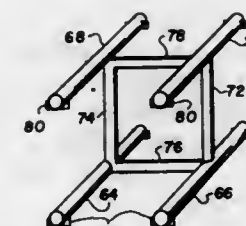
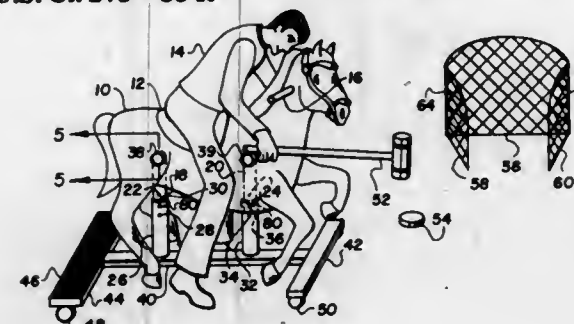
### ERRATUM

For Class 273-1 R see:  
Patent No. 3,730,519

3,730,524  
MULTI-GAME SYSTEM  
Martin Green, 243 Franklin Turnpike, Mahwah, N.J.  
Filed April 7, 1971, Ser. No. 131,983  
Int. Cl. A63f 7/06

U.S. Cl. 273-85 R

5 Claims



A game system for children for simulating polo, hockey, soccer and other games by means of hobby horses and auxiliary devices. Stability of the hobby horse structure is obtained by a wide base construction of the supporting frame. Additional safety factors are incorporated into the game system by having the hooves of the hobby horse turned inwardly; elimination of sharp edges; utilization of light-weight construction material; and supporting T-sections within the horse for structural strength. Maneuverability of the hobby horse is achieved by means of swivelable casters and by means of greater leg room for the game participants. The height of the hobby horses are adjustable by means of telescopic support posts. The game system also provides for vertical and horizontal stacking of the hobby horses for storage in a small area. A pair of hollow posts extend laterally through front and rear sections of the hobby horse body and engage the supporting T-sections. A stacking rack comprising horizontal posts attached to a frame is provided. The horizontal posts fit into the hollow posts to support the hobby horses.

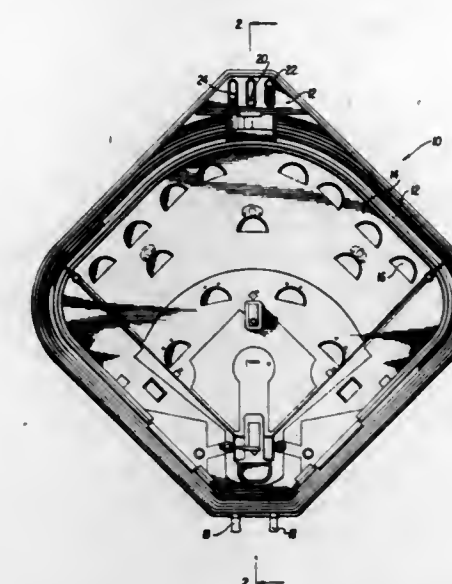
3,730,525  
BASEBALL GAME WITH BALL DEFLECTING PITCHER MECHANISM  
Takatora Maeda, Setagaya-ku, Tokyo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan  
Filed Nov. 5, 1971, Ser. No. 196,102  
Int. Cl. A63f 7/06

U.S. Cl. 273-89

2 Claims

A baseball amusement device featuring a bat rotatable by one player either from the right or left hand positions and a pitching mechanism operable by the other player for projecting the ball at varying speed with varying curvature and to drop below the swinging bat, if desired. The pitching mechanism is provided with a rotatable magnet which causes the ball to deviate from a straight line path after it is projected such that the direction of travel of the ball may be controlled

permitting straight and curved balls. A trapdoor, mounted within the playing surface immediately preceding the bat,

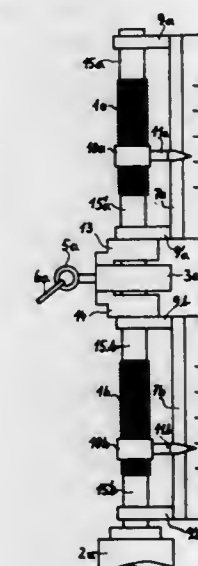


makes it possible for the pitcher to simulate a sinking pitch by causing the ball to pass below the plane of the swinging bat.

3,730,526  
TETHERBALL GAME WITH SCORE COUNTER  
Franz Litzka, 859 Marktreidwitz, Germany  
Filed March 16, 1970, Ser. No. 19,847  
Int. Cl. A63f 7/02

U.S. Cl. 273-95 A

4 Claims



A tetherball game wherein a ball is suspended on a flexible tether from the upper end of an upright has a counter or indicator atop the upright which is connected to the tether and indicates the score. This counter consists basically of a threaded member which is screwed relative to another threaded member to indicate the score on a linear scale. The tether is rotationally coupled to a scale which in turn is rotationally coupled to a nut bearing a pointer and threaded on a spindle, so that rotation of the scale displaces the nut up or down on the spindle. Alternatively the tether is coupled to the spindle to rotate this relative to a nonrotatable scale, with a nonrotatable nut again serving as pointer. Two scales are preferably provided, each connected through a unidirectional clutch to the tether so that each indicates the points made by one player.



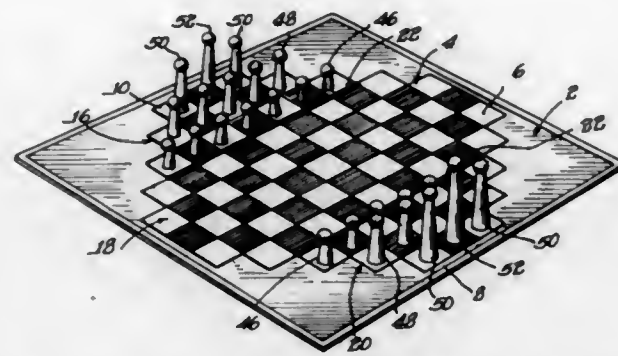
3,730,527

**BOARD GAME APPARATUS**Charles R. Nelson, 6925 Oak Lawn Court, Oak Lawn, Ill.  
Filed April 12, 1971, Ser. No. 133,222

Int. Cl. A63I 3/00

U.S. Cl. 273-131 KN

1 Claim



A game comprises a checkerboard playing surface with three defined regions, namely, a central region and two starting regions, one on each side of the central region. Each starting region consists of three rows containing three, five and seven playing squares, respectively, the rows increasing in length inwardly of the board. The central region consists of five rows, the three central rows having eleven squares and each outer row having nine squares. Groups of objects, one for each player, are disposed in their respective starting regions completely filling the squares thereof. The objects include identifiable sub-groups and a unique object, all of which may be moved across the playing surface in prescribed ways according to the rules of the game and for the purpose of moving the unique object from its starting region to the starting region of the opponent.

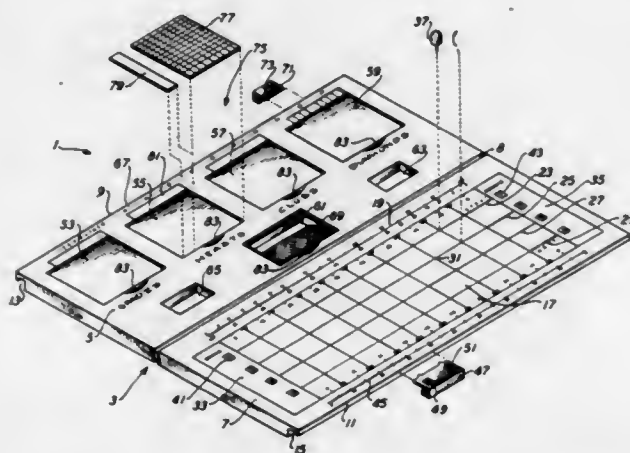
3,730,528

**FOOTBALL BOARD GAME APPARATUS**Henry R. Corrado, 56-69 136th St., Flushing, N.Y.  
Filed Feb. 16, 1971, Ser. No. 115,321

Int. Cl. A63I 3/00

U.S. Cl. 273-134 AD

8 Claims



A simulated football game centered upon a game board provided with a simulated playing field, a recessed well for receiving and storing ordinary playing cards therein, and a series of four, changeable play selection matrices for correlating the numerical and suit values of chance picked playing cards with selected football plays to thereby yield the result of the selected play in yards gained, lost, or so forth. The matrices are formed by a series of four recesses in the board. A single play selection line bounds the recesses, and different separately changeable play result-carrying sub-matrices and card value-carrying column elements are insertable into the recesses.

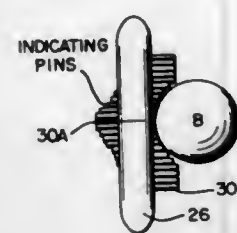
3,730,529

**STROKE INDICATING GOLF CLUB**Donald E. Donofrio, 304 N. York Road, Willow Grove, Pa.  
Filed Dec. 10, 1971, Ser. No. 206,649

Int. Cl. A63b 69/36

U.S. Cl. 273-186 A

6 Claims



A stroke indicating golf club operable for visually presenting the area of contact of the club head with the golf ball. The club is usable additionally for normal golfing. A plurality of pins extend fore and aft through the club head and are physically displaceable by ball contact to assume and retain a contact impression of the golf ball and the club head. The pins are repositionable for subsequent club strokes.

3,730,530

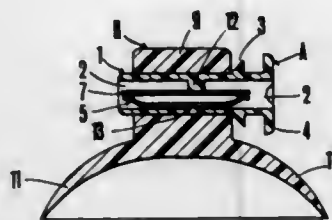
**GOLF SWING TRAINING ATTACHMENT**Toshio Oka, No. 12, 2-chome, Kitahorie-dori, Nishi-ku, Osaka-shi, and Zenzaburo Kawanishi, No. 146, 4-chome, Tsukamoto-cho, Higashiyodogawa-ku, Osaka-shi, both of Japan  
Filed March 13, 1972, Ser. No. 234,082

Claims priority, application Japan, Dec. 7, 1971, 46/117311

Int. Cl. A63b 69/36

U.S. Cl. 273-186 A

6 Claims



This invention relates to a golf swing training attachment which is attached for use to a golf club, said attachment comprising a whistle and a fixing member, said fixing member comprising a suction disk and a whistle retaining member, said whistle comprising a vibration plate, a vibration plate receiving tray and a cylindrical member for retaining said plate and tray. The suction disk may be provided with an arrow or line which designates the direction in which the attachment is to be fixed to the club head.

3,730,531

**GOLF SWING PRACTICE DEVICE**Frank J. Zega, 130 Eastfield Drive, Fairfield, Conn.  
Filed March 13, 1972, Ser. No. 234,264

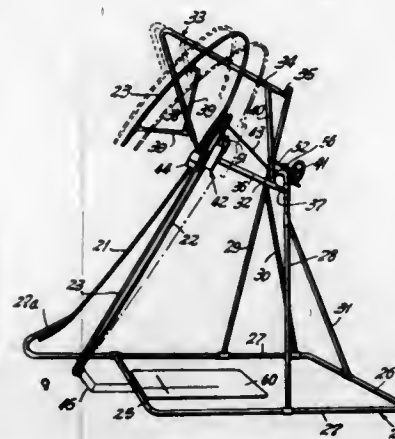
Int. Cl. A63b 69/36

U.S. Cl. 273-191 A

9 Claims

A mechanical instruction apparatus for guiding a golf club during a practice swing. The apparatus has a minimum amount of supporting structure for a pair of closely-spaced, curved rails adapted to loosely receive and guide the lower shaft portion of a golf club and for a guide rail adapted to guide the club on the follow-through, and an improved carriage for supporting the upper portions of the rails and adjusting the height and angle of said rails to accommodate students of different height. The upper sections of the rails are adapted

to be shifted automatically during the practice swing to a new position out of the path of the follow-through of the practice



swing, thus enabling the completion of a proper swing, and a flexible bumper is provided to engage and limit shifting movement of the upper sections.

3,730,532

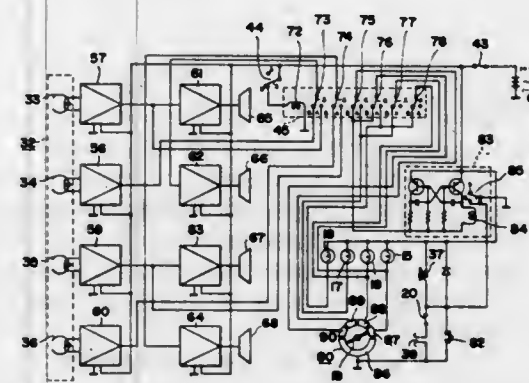
**COMBINATION FOUR-CHANNEL TWO-CHANNEL STEREOPHONIC ENDLESS CARTRIDGE TAPE PLAYER**Mitsugu Miyamoto, Arigesaki, Matsumoto, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan  
Filed June 7, 1971, Ser. No. 150,539

Claims priority, application Japan, June 9, 1970, 45/50102

Int. Cl. G11b 21/12, 15/12, 21/08

U.S. Cl. 274-4 G

4 Claims



A tape player adapted to play both a conventional two-channel stereophonic cartridge tape and a four-channel stereophonic cartridge tape developed recently. The tape player is capable of sensing whether the tape inserted in the player is a two-channel tape or four-channel tape and is capable of switching reproducing circuits between two-channel and four-channel stereophonic systems in accordance with the type of cartridge tape inserted in the player. The tape player is also capable of indicating whether the stereophonic recording being played back is of the two-channel system or four-channel system and at the same time indicating the program of the recording.

3,730,533

**MAGNETIC TAPE CARTRIDGE REMOVING APPARATUS**

Itsuki Ban, 829, Higashi-Oizumimachi, Nerima-ku, Tokyo, Japan

Filed Sept. 28, 1970, Ser. No. 75,875

Claims priority, application Japan, Sept. 26, 1969, 44/76236

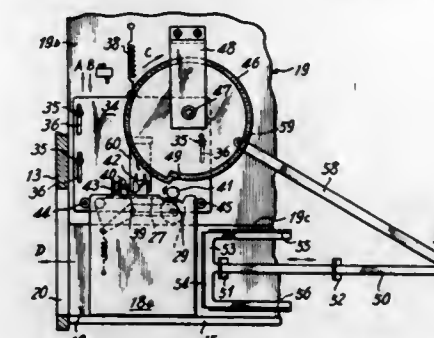
Int. Cl. G11b 15/26, 23/12

U.S. Cl. 274-4 F

3 Claims

In a tape player utilizing a plurality of magnetic tape cartridges for playing a vertical stack of a plurality of cartridges

from the lowermost to the uppermost in succession in a bottomless enclosure, a magnetic tape cartridge removing apparatus comprises a player cabinet, a platform provided in the cabinet to allow the lowermost cartridge to rest thereon, a movable deck to which a capstan and a magnetic head and the like are mounted for playing the cartridge resting on the plat-



form and in the play position, deck driving means for reciprocally moving the movable deck between the positions to engage the cartridge in the play position and to disengage the same, and a pushing member for pressedly moving the cartridge in the play position from the play position during the time that the deck is moved from the reproducing position by rotational force of the capstan.

3,730,534

**ENDLESS MAGNETIC TAPE CARTRIDGE REMOVING APPARATUS**

Itsuki Ban, 829, Higashi-Oizumimachi, Nerima-ku, Tokyo, Japan

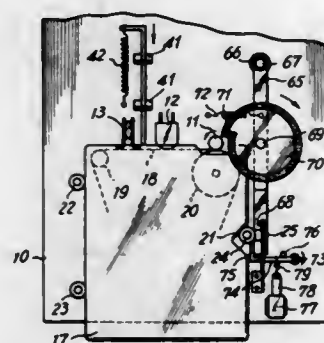
Filed June 16, 1970, Ser. No. 46,703

Claims priority, application Japan, June 18, 1969, 44/57040; June 23, 1969, 44/48941; May 11, 1970, 45/45027

Int. Cl. G11b 5/00

U.S. Cl. 274-4 B

4 Claims



An endless magnetic tape cartridge removing apparatus for a tape cartridge player which comprises a retention member engageable with a notch of the cartridge and bring the latter into a predetermined operative position, a displaceable member holding the retention member, a device for moving the displaceable member to the position where the retention member is escaped from the notch of the cartridge, and a pushing device for moving the cartridge away from the operative position whereby the cartridge is removed from the operative position by the pushing device when the retention member is escaped from the notch.

3,730,535

**CARTRIDGE LOCKING MECHANISM**

William B. Huber, Park Forest, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed April 23, 1971, Ser. No. 136,923

Int. Cl. G11b 25/06, 5/00

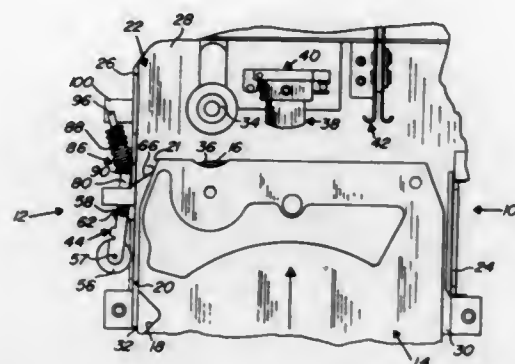
U.S. Cl. 274-4 B

13 Claims

A cartridge locking mechanism for a tape player includes a roller arm mounted for pivotal movement on a first mounting



post and a bistable spring arrangement coupled between the roller arm and a second mounting post to operate the roller arm between two stable positions and to retain the mechanism in a mounted condition. A leaf spring connected to the roller arm extends into a cartridge receiving tunnel of the tape



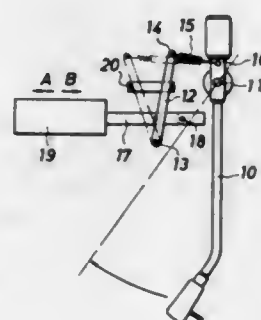
3,730,536

# PICKUP ARM DEVICE FOR CANCELING BIASING FORCES OF STYLUS

Yoshiyuki Yuki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Dec. 28, 1971, Ser. No. 213,024  
Int. Cl. G11d 3/12, 3/28

U.S. Cl. 274-23 R



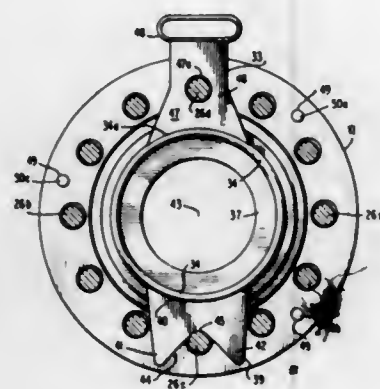
A mechanism for cancelling a force resulting from a rotating disk record and acting on a pickup arm stylus, during sound reproduction, in a direction from the peripheral portion of the record toward the center thereof comprises a coiled spring imparting a counterbalancing force to the stylus to cancel the former force. The mechanism of the invention further includes a pivoted lever permitting the spring force to act on the arm during sound reproduction and releasing the counterbalancing force thereof until the start, and right after the end, of record playing, whereby the stylus can be set down into the lead-in groove of the disk record or lifted up from the final portion of the record groove in the right vertical direction.

# 3,730,537 METHOD AND APPARATUS UTILIZING HANDLED SEAL FOR SUBMERGIBLE COUPLING

Delbert R. Ward, and William R. Rochelle, both of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.  
Division of Ser. No. 824,959, May 15, 1969, Pat. No. 3,620,554. This application July 20, 1971, Ser. No. 164,359  
Int. Cl. F16j 23/00; F16j 9/00

U.S. Cl. 277-1

10 Claims



Seal method and apparatus for use in a submerged coupling and including a generally annular seal operable to be interposed between two conduit couplings. A bifurcated alignment web connected with the seal is operable to engage a stud bolt of the conduit couplings and to responsively position the seal in generally longitudinal alignment with, and interposed between, the conduit couplings. A handle connected with the seal projects generally outwardly of the conduit couplings when the alignment web is so engaged, and carries an alignment locking aperture engageable by another bolt to impede skewing or canting of the aligned seal.

3,730,538

# RUBBING SEAL FOR A ROTARY REGENERATIVE HEAT EXCHANGER

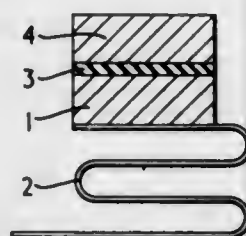
Calvin Eric Silverstone, and Alan John Surrall, both of Solihull, England, assignors to Leyland Gas Turbines Limited, Solihull, England

Filed June 1, 1971, Ser. No. 148,529  
Claims priority, application Great Britain, June 26, 1970, 31,069/70

Int. Cl. F16j 15/16

U.S. Cl. 277-96 R

2 Claims



A rubbing seal for engagement with a hot face of a matrix of a rotary regenerative heat exchanger. The seal comprises a ferritic steel base member, a rubbing surface layer including nickel oxide and an intermediate bonding layer of a nickel aluminum compound between the base member and the rubbing surface layer.

3,730,539

# CHUCK OF HIGH-LOW OPERATION

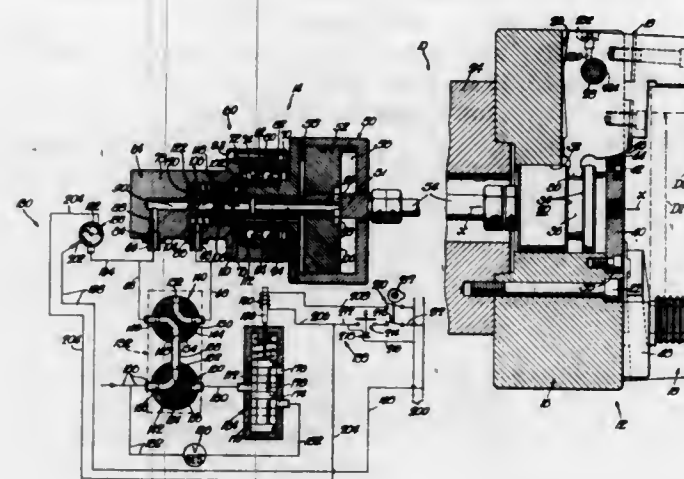
Linwood B. Swanson, 81 Centerwood Rd., Newington, Conn., assignor to Cushman Industries, Incorporated, Hartford, Conn.

Filed March 4, 1971, Ser. No. 120,820

Int. Cl. B23b 31/18, 31/30

U.S. Cl. 279-4

4 Claims



A chuck and an actuating device therefor, of which the chuck features rocker jaws with follower ends, and an axially movable jaw actuator having spaced faces in planes normal to the chuck axis with which the follower ends of the jaws are in line contact, and the actuating device provides a cylinder with a piston therein connected with the jaw actuator, and fluid-pressure distributing and control means sequentially operable to admit fluid of a given high pressure to the chuck-closing cylinder end and vent the chuck-opening cylinder end for exertion of a heavy work grip by the jaws, then to bleed fluid from the chuck-closing cylinder end until the pressure of the fluid therein reaches a given low level and hold it at this level for exertion of a lighter work grip by the jaws, and finally to admit fluid pressure into the chuck-opening cylinder end and vent the chuck-closing cylinder end to open the chuck.

3,730,541

# FLUID PRESSURE BRAKE SYSTEM

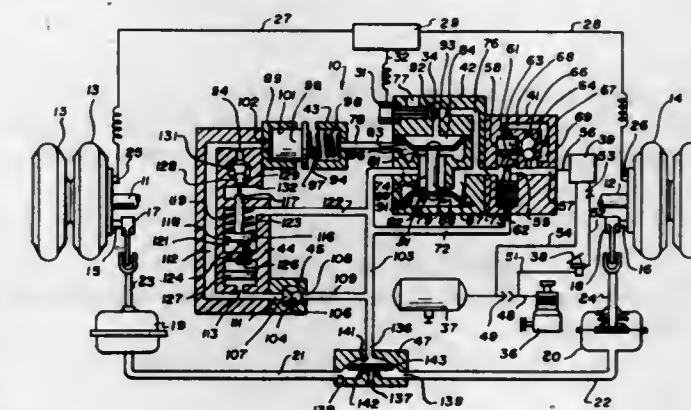
John W. Bush, Mt. Clemens, and Andrew E. Cunningham, Detroit, both of Mich., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed June 2, 1972, Ser. No. 259,054

Int. Cl. B60t 8/06

U.S. Cl. 303-21 F

3 Claims



A fluid pressure brake system includes wheel slip control means which provides for reducing the braking pressure in steps in order to conserve fluid while alleviating a locked wheel condition.

3,730,542

# CONVERTIBLE TRAILER

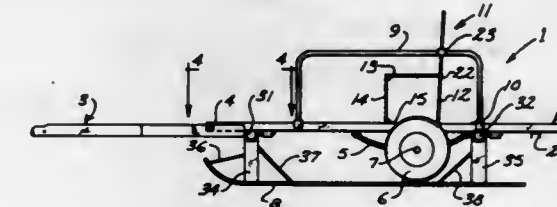
Charlie F. Chadwick, R.R. No. 1, Minot, N. Dak.

Filed May 20, 1970, Ser. No. 39,037

Int. Cl. B62b 13/18

U.S. Cl. 280-9

11 Claims



3,730,540

# TOOL HOLDER WITH SPRING OPERATED NUT

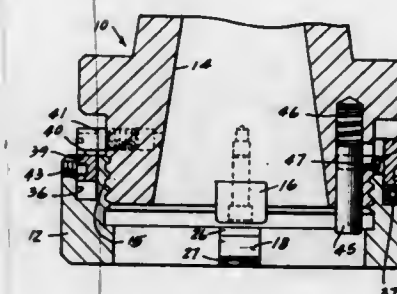
John L. King, Jr., and Roland G. Koch, both of Frankenmuth, Mich., assignors to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Sept. 9, 1971, Ser. No. 178,920

Int. Cl. B23b 31/04

U.S. Cl. 279-91

16 Claims



A tool holder includes a hollow supporting member on which there is threaded a locking ring which is urged to its

A snowmobile trailer convertible to a sled which can be towed by the snowmobile. The trailer includes skis which are retractable for highway travel of the trailer. A unique lock mechanism locks the skis in position and also provides the proper form of connection between the draw bar and frame of the trailer to facilitate loading and to assure that the trailer is used properly.



3,730,543

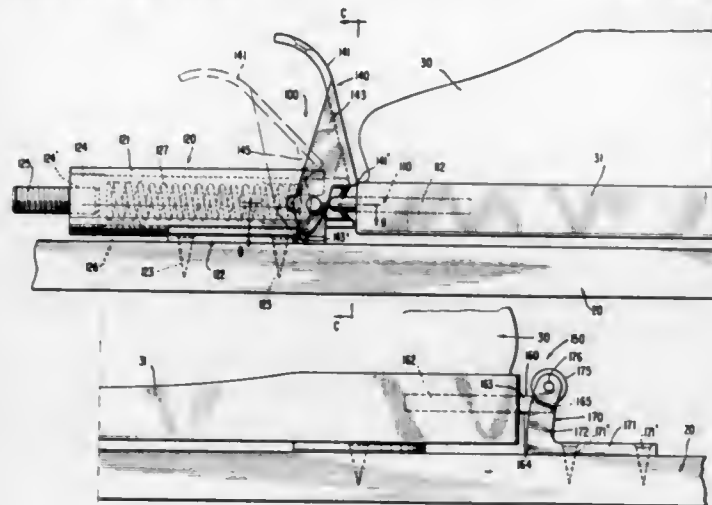
## SAFETY SKI BINDING

James Mitchell Edmund, 6404 Ridge Drive, Washington, D.C.  
Filed Jan. 8, 1971, Ser. No. 105,005

Int. Cl. A63c 9/00

U.S. Cl. 280—11.35 T

22 Claims



A safety ski binding in which the bottom of the ski boot is held out of contact with the top of the ski to thereby eliminate the influence of frictional forces on the safety release feature.

3,730,544

## COLLAPSIBLE SKI POLE

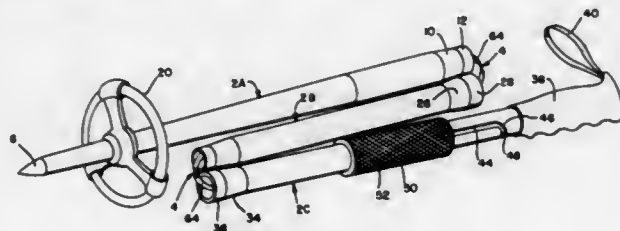
Joseph Hyman, Newton Center, Mass., assignor to Hycor, Inc., Woburn, Mass.

Filed April 1, 1971, Ser. No. 130,161

Int. Cl. A63c 11/22

U.S. Cl. 280—11.37 L

12 Claims



A collapsible ski pole comprising a plurality of interconnected tubular members held together by a flexible cord under tension, and means for releasing the tension on the cord to permit the tubular sections to be disconnected one from the other and arranged in a compact bundle.

3,730,545

## TRACTOR WEIGHTS

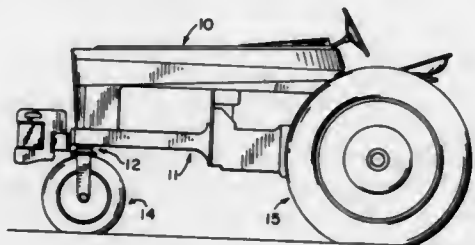
Aldo Allori, Brookfield, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Aug. 30, 1971, Ser. No. 175,894

Int. Cl. B60r 27/00

U.S. Cl. 280—150 E

7 Claims



A counterweight assembly is adopted to be secured to a tractor such that the counterweights will not jar against one

another. Each weight is provided with an L-shaped aperture in which is extended a corresponding L-shaped member. A bolt extends through each end of the L-shaped member and through an eccentric washer into the mounting bracket. The washer at each end is rotated on its bolt against the adjacent weight, forcing the weights together.

3,730,546

## BOBSKI

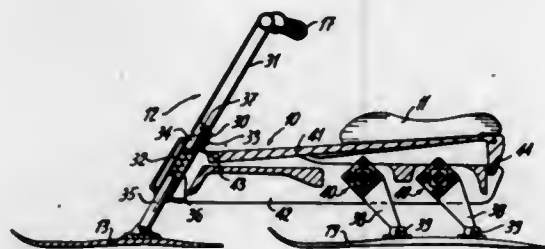
Jean-Yves Evequoz, Route de la Dixence 17, Sion, Switzerland  
Filed Nov. 2, 1970, Ser. No. 85,972

Claims priority, application Switzerland, Nov. 1, 1969, 16307/69; June 15, 1970, 16307/69

Int. Cl. B62b 13/04

U.S. Cl. 280—16

1 Claim



A bobski comprising at least a front ski, a rear ski, a steering column, a handle bar connected to the said steering column, a frame for connecting the steering column to the rear ski, and a resilient suspension device for connecting the frame to the rear ski.

3,730,547

## SHEET TRUCK AND THE LIKE

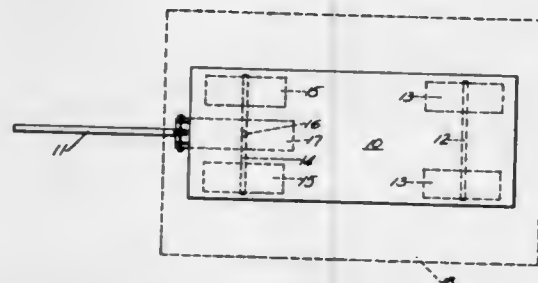
John E. Young, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed May 28, 1971, Ser. No. 147,770

Int. Cl. B60p 9/00

U.S. Cl. 280—116

5 Claims



This application discloses an improved truck for moving sheets of steel, coils of steel and the like, from place to place in a plant. The truck is basically a fifth wheel steering, four wheeled truck. An outrigger or skid is secured to the front axle assembly at right angles to the axle and has a length substantially equal to the track of the front wheels of the truck. When the tongue of the truck is moved to turn the front wheels to a position in which the axle is parallel to the centerline of the truck, the outrigger occupies substantially the position of the wheels when the tongue is straight forward. The outrigger is positioned, say, a half inch above floor level so that its stabilizing effect comes into play upon a very slight tilt of the truck.

3,730,548

## VEHICLE AIR-SPRING

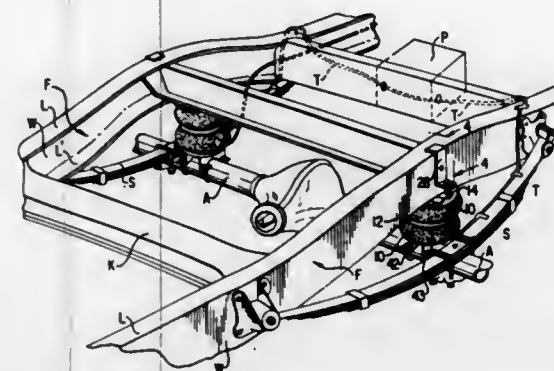
Ellis B. Thaxton, Arlington, Tex., assignor to Ride-Rite Corp., Arlington, Tex.

Filed June 24, 1971, Ser. No. 156,189

Int. Cl. B60g 11/46

U.S. Cl. 280—124 F

3 Claims



An air-spring assembly for mounting in a vehicle as a part of the vehicle suspension and including a pressure-inflatable elastomeric body having rigid end plates by which it is mounted between a chassis member and an axle member of the vehicle, the upper end plate carrying an inverted U-bracket which bears against the bottom of the frame member which extends longitudinally of the vehicle and is clamped thereto by bolted straps, and the lower end plate carrying a saddle plate straddling and secured to the axle member which extends transversely of the vehicle.

3,730,549

## DROP-AXLE SUSPENSION SYSTEM

Stephen Turner, Jr., Berlin Center, Ohio, assignor to Charles E. Wern, Jr.; David S. Dennison, Jr. and Stephen Turner, Jr., all of Warren, Ohio

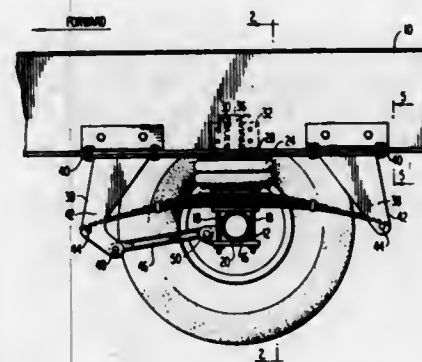
Division of Ser. No. 12,050, Feb. 17, 1970. This application

July 6, 1971, Ser. No. 160,125

Int. Cl. B60g 11/46

U.S. Cl. 280—124 F

5 Claims



There is provided in auxiliary axle suspension system for wheeled vehicles an improvement for insuring the safety of said suspension when under heavy load, particularly about 6,000 lbs. per axle or greater, which comprises an axle having mounted at its outer extremities two wheels on either side thereof for carrying such a heavy load along the path of travel of the vehicle. Inwardly of each pair of wheels and immediately adjacent to each respective pair of wheels there is provided a leaf spring of a plurality of leaves and means for connecting the leaf spring at about its respective ends to the longitudinal I-beam frame members of the vehicle and extending longitudinally on either side thereof. Each leaf spring has its intermediate portion overlying and being secured by bolt means to the axle such that the leaf springs are normally biased upwardly to raise the axle and the wheels mounted thereon above the surface along which the vehicle travels. Juxtaposition between each leaf spring and its respective frame

member is at least one vertically flexible pneumatic chamber which may be expanded or contracted vertically by applying pneumatic pressure thereto to thereby bias the axle downwardly against the force exerted by the springs to lower the wheels mounted thereon into contact with the vehicle travel surface. Torque arms are provided which extend in the forward direction of the vehicle and are connected between the bolt means for connecting the axle to the frame member and the means for connecting each respective leaf spring at about their ends to the vehicle. In addition, the leaf springs are not secured to the means which connect them at about their ends to the frame member of the vehicle, but rather, are connected in a manner which allows them to slide longitudinally therewithin. Upon braking under heavy load, the leaf springs are protected from undue torque forces by the torque arms and the slidable nature of the leaf spring connection.

3,730,550

## AIR-SPRING ASSEMBLY FOR VEHICLES

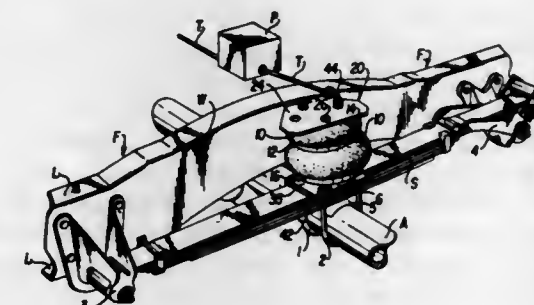
Ellis B. Thaxton, Arlington, Tex., assignor to Ride-Rite Corp., Arlington, Tex.

Filed June 24, 1971, Ser. No. 156,188

Int. Cl. B60g 11/46

U.S. Cl. 280—124 F

2 Claims



An air-spring assembly for mounting in a vehicle as a part of the vehicle suspension and including a pressure-inflatable elastomeric body having rigid end plates by which it is mounted between a chassis member and an axle member of the vehicle, the upper end plate carrying an inverted L-shaped bracket which is secured to the side of a frame member which extends longitudinally of the vehicle, and the lower end plate carrying an inverted U-bracket secured to the U-bolt and clamping plate assembly of the leaf spring mounted on the axle member of the vehicle.

3,730,551

## IRREVERSIBLE ENERGY ABSORBING AIR BAG SYSTEM

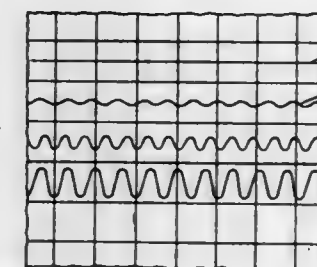
John J. Sack, Bloomfield Hills, Mich., and Steven Acs, Sarnia, Ontario, Canada, assignors to Allied Chemical Corporation, New York, N.Y.

Filed Jan. 11, 1971, Ser. No. 105,294

Int. Cl. B60r 21/10

U.S. Cl. 280—150 AB

2 Claims



This invention relates to energy absorption in a passenger restraint system as a result of the use of an expansible pas-



senger restraint bag. More specifically, this invention relates to the introduction of an expansible energy absorbing bag which will not return to its original size upon expansion and which is utilized to restrain forward motion of a passenger within a motor vehicle.

3,730,552

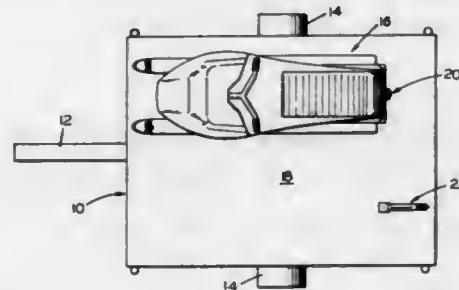
## LOAD ANCHORING DEVICE

Russell C. Clark, R.F.D. No. 1, Higganum, Conn.  
Filed Dec. 23, 1971, Ser. No. 211,317

Int. Cl. B60p 7/00

U.S. Cl. 280—179 R

14 Claims



Apparatus for anchoring a load to the platform of a transporting mechanism including hinge means having its base affixed to the platform and having a backplate which may be pivoted into load engaging position perpendicular to the platform surface. The hinge means backplate is provided with a series of slots and a spring loaded pin oriented transversely thereto in a bore which intersects the slots whereby an apertured flange extending from a load may be passed through a backplate slot located at the appropriate elevation and the flange aperture will be engaged by the pin.

3,730,553

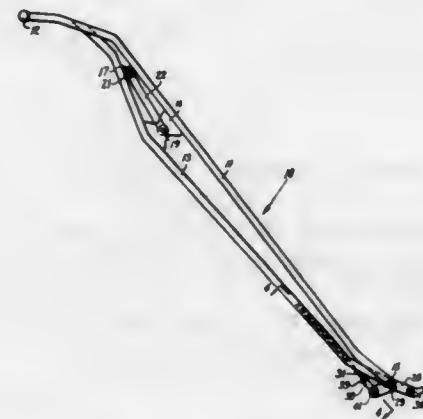
## FRONT FORK ASSEMBLY FOR TWO WHEEL VEHICLES

John W. Harman, 501 Elefa Street, Roseville, Calif.  
Filed Nov. 17, 1971, Ser. No. 199,642

Int. Cl. B62k 21/02

U.S. Cl. 280—277

5 Claims



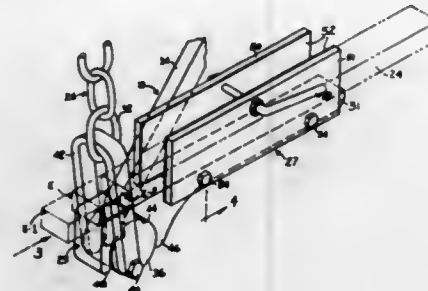
A front fork assembly for two wheel vehicles such as motorcycles and bicycles which includes a pair of tubular trusses arranged in spaced parallel relation and joined by a handle bar on the upper end thereof. The truss members are joined adjacent their upper end by a triple clamp assembly for connecting the forks to the frame of the two wheel vehicle. A forwardly extending transversely pivoted wheel support member is pivotally mounted on the lower end of each of said forks and joined by an axle for supporting the front wheel. A sprung support is adjustably secured to the rear end of the wheel support member with the spring located within the tubular truss member.

3,730,554  
VEHICLE TRAILER SWAY CONTROL SYSTEM  
Eldon John Saunders, 13420 Frazho, Warren, Mich.  
Filed March 17, 1971, Ser. No. 125,296

Int. Cl. B62d 53/00

U.S. Cl. 280—406 A

8 Claims



Improvement in a vehicle trailer sway control system is disclosed for use with weight-equalizing hitches of the type having a pair of weight-equalizing bars and a pair of lifting means for respectively lifting the free ends of said bars, said lifting means respectively supporting a pair of laterally and outwardly projecting ledges from the trailer tongue, said ledges being supported in respective hanging positions on opposite sides of said trailer tongue, said improvement consisting of a pair of friction brake means constructed as removeable attachments for existing weight-equalizing hitches of said type by comprising, respectively, a pair of elongate supporting members having respective open-ended cavities therein engageable with said ledges, respectively, for rendering said friction brake means capable of being placed over and lowered upon said ledges, respectively, said elongate supporting members, when engaged on said ledges, respectively, being held fast in respect thereto and being disposed beneath said equalizing bars, respectively, and in weight-supporting relationship thereto, each said elongate supporting member carrying thereon brake shoe means moveable in respect thereto and force-applying means operative upon said brake shoe means for applying braking pressure against the respective equalizing bar to resist trailer sway.

3,730,555

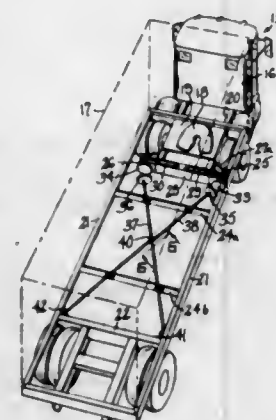
## PIVOT LIMITING ASSEMBLY

Anthony T. Keller, 10 Hilton Dr., West Haven, Conn.  
Continuation-in-part of Ser. No. 39,062, May 20, 1970,  
abandoned. This application April 9, 1971, Ser. No. 132,793

Int. Cl. B62d 53/06

U.S. Cl. 280—432

15 Claims



This disclosure relates to apparatus for use in combination with a towing vehicle and a towed vehicle pivotally connected in tandem. A pivot limiting assembly comprising a first pair of stop blocks is resiliently mounted one on each of the towing vehicles, and a second pair of stop blocks is supported one on

each side of the forward portion of the towed vehicle and positioned to contact one of the first pair of stop blocks when the angle of pivot between the vehicles has reached a predetermined limit. The support members together with the stop blocks thereon are movable out of the line of contact with the second pair of stop blocks whereby the angle of pivot may exceed a predetermined limit.

3,730,556

## CAMPER HITCH EXTENSION

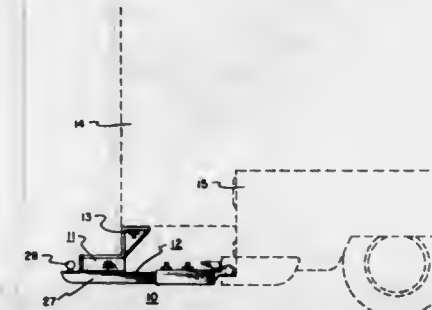
Tony M. Aldape, and Frank Aldape, both of 4121 Hill Road,  
Boise, Idaho

Filed Sept. 23, 1971, Ser. No. 182,998

Int. Cl. B60d 1/06

U.S. Cl. 280—500

4 Claims



A trailer hitch extension for truck-mounted campers having rearward portions cantilevered with respect to the truck, comprising: a step-bracket member having a forwardly disposed bracket plate operable to mount the hitch extension to the lowermost rearward terminal end of the camper and a rearwardly disposed step portion operable to provide a step-like means to the camper, both suitably disposed respectively from an upstanding riser wall of the step-bracket member; and a drawbar assembly pivotally dependingly carried by the step-bracket member and being provided with a ball hitch coupler at the forwardmost terminal end of the drawbar operable to detachably fasten said drawbar to a commonly known ball-hitch disposed at the midpoint of the rearwardmost terminal end of the truck, a carrier means disposed at a point midway on the lowermost terminal edge of the step portion of the step-bracket member operable to permit articulation of the drawbar laterally and vertically, and a ball hitch platform disposed at the rearwardmost terminal end of the drawbar.

3,730,557

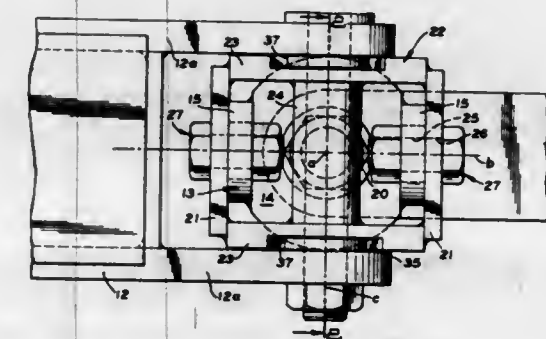
## UNIVERSAL JOINT TRAILER HITCH WITH COUPLING PIN SOCKET ALIGNING AND BEARING MEANS

Rodney S. Cox, 919 Harvey Dr. P.O. Box 1026, Marion, Ohio  
Filed Sept. 7, 1971, Ser. No. 178,036

Int. Cl. B60d 1/00

U.S. Cl. 280—504

5 Claims



A trailer hitch for connecting a draft member on a towing vehicle to a draft member on a trailer to be towed. The hitch

3,730,558

## TRAILER HITCH SAFETY DEVICE

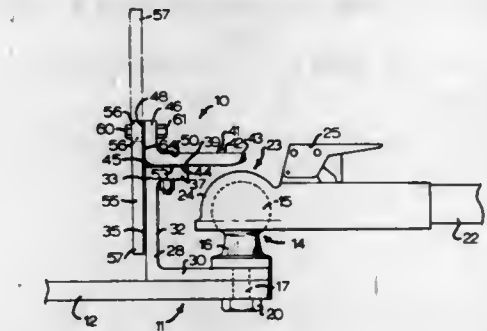
Carl R. Litzenger, Eadicott, Wash.

Filed Feb. 28, 1972, Ser. No. 229,647

Int. Cl. B60d 1/06

U.S. Cl. 280—511

7 Claims



A safety device for preventing the inadvertent disengagement of the socket from the ball in a ball and socket type trailer hitch. The safety device has an upright standard affixed to the hitch with a stop mounted on the standard for pivotable movement to a position directly over the ball and socket to prevent their disengagement. The standard and stop have vertical surfaces that are aligned with each other when the stop extends directly over the socket. A vertically oriented lever is pivotally mounted on the stop for engaging the vertical surfaces to prevent the stop from being pivoted.

3,730,559

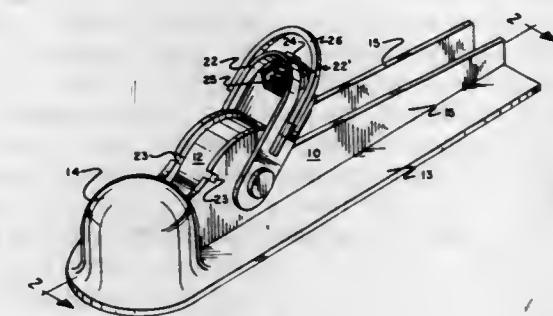
## TRAILER HITCHING COUPLER

James D. Ray, Route 5, Box 208, Nampa, Idaho  
Filed Dec. 20, 1971, Ser. No. 209,769

Int. Cl. B60d 1/06

U.S. Cl. 280—513

1 Claim



The trailer hitching coupler of this invention includes a body having a horizontally disposed body plate, a dome fastened on the lower side of the forwardmost terminal end of the body plate to operably engage a hitching ball, and a pair of parallelly upstandingly disposed cam-supporting walls fastened to the uppermost terminal side of the body plate from the rearwardmost terminal side of the dome to the rearwardmost terminal end of the body plate. The coupler also includes a cam assembly carried between the cam-supporting walls distally from the rearwardmost terminal end of the dome. The cam assembly includes an eccentric-type cam having portions of its cam axis projecting through each of the cam-supporting walls, a cam follower having a centrally



disposed hole which is operable to ride about the outer circumference of the cam, and an actuator arm fastened to the outwardly projecting portions of the cam axis. The actuator arm is provided with locking means operable to lock the cam assembly when the assembly is in engagement with the hitching ball.

3,730,560

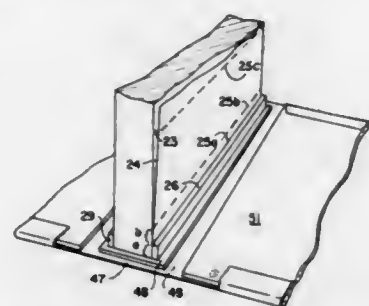
# METHOD OF FORMING AND CASING BOOKS AND PRODUCT THEREOF

William H. Abildgaard, Los Altos Hills, and Charles T. Grosz, III, Palo Alto, both of Calif., assignors to Abildgaard Laboratories, Inc., Mountain View, Calif.  
Continuation-in-part of Ser. No. 799,045, March 13, 1969, Pat. No. 3,596,929, and a continuation-in-part of Ser. No. 872,134, Oct. 29, 1969. This application Oct. 8, 1970, Ser. No. 79,086

Int. Cl. B42d 1/00, 3/00; B42c 15/00

U.S. Cl. 281-21

7 Claims



An uncased book is first prepared. The outside end papers on each of the top and bottom of the book consists of a sheet of paper, flexible plastic, cloth, or the like, coated with pressure-sensitive adhesive with the sensitive surface outermost and protected by a protective release covering scored in at least two lines adjacent to the inner edge. Spaced holes are punched, drilled or otherwise formed adjacent to the inside margin of each sheet of the book, including the end papers. A first narrow strip of plastic having projecting studs spaced the same as the holes and a second narrow strip formed with corresponding holes are provided. The studs are inserted through the holes in the end-papers, sheets and second strip and the strips forced toward each other, compressing the sheets therebetween. The excess stud lengths are cut off and heads similar to rivet heads formed, securing the uncased book in assembled condition. A case is provided similar to conventional book cases. Initially such case has a central spine strip of double-face, pressure-sensitive material, one face adhered to the cover, the other covered by a detachable protective release strip. To assemble the book to the case, the first step is to remove the protective release strip from the spine strip, then to press the spine of the uncased book so that it adheres to the middle of the spine strip and to bend the excess width of the spine strip around the outside of the plastic strips. Next a narrow band of protective release cover is removed to expose about three-eighths inch of each end leaf immediately outside the plastic strips. The case is then creased to form spine beads and creases between the beads and the boards of the case. Finally, the remainder of the protective release covers are removed, causing the end leaves to be secured to the insides of the covers of the case.

3,730,561

# SWIVEL-TYPE CARRIER FOR AUTOMATIC AIR HOSE CONNECTOR

Fred Temple, Pittsburgh, and William H. Reno, Monroeville, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed April 17, 1972, Ser. No. 244,391

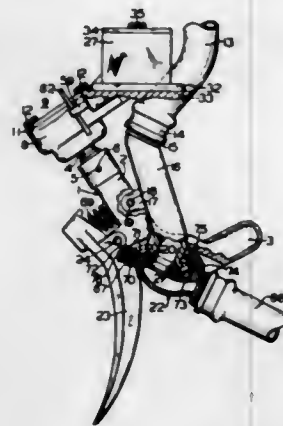
Int. Cl. F16I 55/00

U.S. Cl. 285-12

15 Claims

This invention relates to a swivel-type carrier for rockably supporting an automatic-type air hose connector on and

beneath the car coupler of a railway vehicle. The carrier comprises two members, one end of a first member having a resilient connection with the car coupler and the other end constituting a hollow cylinder that is rigidly connected to one end of a sleeve disposed therein. The second member of the carrier is in the form of an off-set arm one end of which has the automatic-type air hose connector removably secured thereto. The other end of this second member constitutes a second hollow cylinder rockably mounted on the other end of the sleeve, while a manually operable lock carried thereby is



disengaged from a locking member secured to the lower end of this sleeve, to a position in which manual coupling between the automatic-type air hose connector and a standard manual-type air hose coupling carried in the end of the air hose provided at the adjacent end of another car may be effected. The construction and arrangement of the elements comprising the swivel-type carrier and lock therefor are such that, upon movement of the other railway car away from the one car, subsequent to uncoupling the couplers between these two cars, far enough to cause disengagement between the automatic-type air hose connector on the one car and the standard manual-type air hose coupling on the other car, the automatic-type air hose connector on the one car is automatically returned to and locked in the position for automatic coupling with a like automatic-type air hose connector carried at the adjacent end of a third car that may be coupled to the one car.

3,730,562

# PIPE JOINT CONNECTING SMOOTH-ENDED PLASTIC PIPES FOR UNDERWATER USE

Pierre Vlazzi, Bormes Les Mimosas, France, assignor to Societe Internationale D'Application De Procédes Industriels (S.I.A.P.I.), Panama, Panama

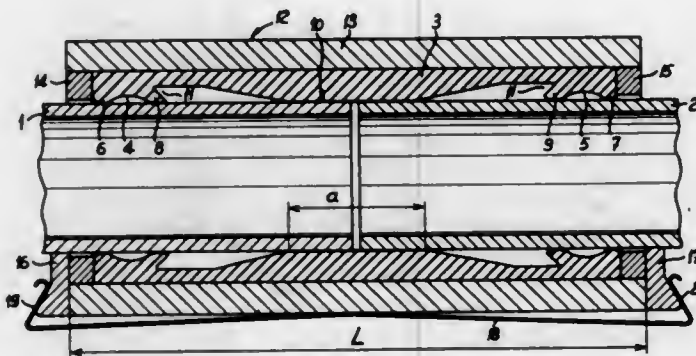
Filed Nov. 22, 1971, Ser. No. 201,066

Claims priority, application Switzerland, Dec. 22, 1970, 19,025; June 9, 1971, 8,420

Int. Cl. F16I 17/00

U.S. Cl. 285-110

5 Claims



A pipe joint connecting smooth-ended plastic pipes for underwater use, comprises a sleeve of resilient material fitted on

the adjacent smooth ends of two plastic pipes. The sleeve has, at each of its ends, a circular throat having, in longitudinal section, a concave portion bounded by two lips, the edges of the lips being disposed on circles of smaller diameter than the outside diameter of the pipes in the undeformed condition of the lips, the lips being in contact with and resiliently deformed by the outer surface of the pipes. The sleeve has at its central zone a portion of a thickness greater than the thickness of the sleeve adjacent the lips, this thickened portion having an inner cylindrical surface of circular cross section having a diameter corresponding to the outside diameter of the pipes and contacting the outer surface of the pipes on either side of the zone in which the pipes most closely approach each other. The resilient sleeve is housed in a casing, and readily detachable coupling means releasably retain the pipe ends in the sleeve, these coupling means comprising abutments secured to each pipe and in contact with opposite ends of the casing. The distance separating the frontal face of each abutment and the end of the corresponding pipe is less than half the length of the casing but greater than half the length of the casing diminished by half the length of the central thickened portion of the sleeve. The coupling means further comprise members detachably bearing against and interconnecting surfaces of the abutments on the pipes which are remote from the casing.

3,730,563

# LIP SEAL FITTING

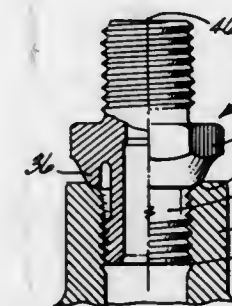
Francis J. Hanback, Palos Verdes, and Norman F. Robinson, Manhattan Beach, both of Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Feb. 22, 1971, Ser. No. 117,656

Int. Cl. F16I 55/00

U.S. Cl. 285-114

1 Claim



A fitting for establishing a sealed connection with a boss, which fitting includes a semi-flexible cantilevered sealing lip about the periphery thereof, an undersized threaded portion which aligns and pulls the sealing lip against a chamfered boss surface when the fitting is tightened thereto and a relieved portion between the threaded portion and the lip to enable predetermined stretching and yielding to protect the boss from over-torquing of the fitting and overpressures which may be applied thereto.

3,730,564

# TAPERED COMPRESSION END FITTING

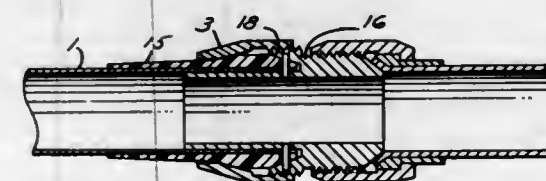
Wilfred H. Bachle, Long Beach; Gilbert Segovia, Santa Ana, and H. Andre Parker-Jones, Newport Beach, all of Calif., assignors to Philco-Ford Corporation, Philadelphia, Pa.

Filed Nov. 15, 1971, Ser. No. 198,658

Int. Cl. F16I 33/20

U.S. Cl. 285-115

1 Claim



This invention describes a unique end fitting for use with a single or multi-layer, braid-covered cast membrane tube of the

type used in reverse osmosis fluid separation systems and the like. It can be used as a coupling between dissimilar tubing or two tubes of like characteristics.

3,730,565

# QUICK CONNECT-DISCONNECT COUPLER

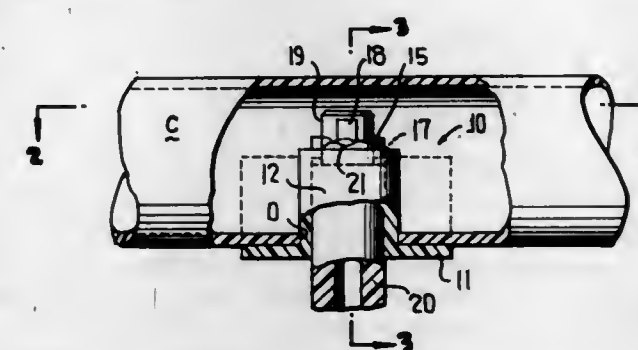
Frederick W. Stendler, Jr., Lancaster, Pa., assignor to The Val-lorbs Jewel Company, Lancaster, Pa.

Filed Feb. 29, 1972, Ser. No. 230,387

Int. Cl. F16I 41/00

U.S. Cl. 285-158

9 Claims



This disclosure relates to a coupler which can be quickly connected and disconnected, the coupler being defined by male and female elements adapted to be joined together by relative and successive axial and rotational movement, the female element and male element in the assembled position thereof having opposing annular shoulders between which is received a gasket, and cooperative means for axially moving the shoulders toward each other upon relative rotation of the male and female elements whereby the gasket is compressed to form a seal between the elements. Movement is imparted to the shoulders by a radially directed lug of the male element which functions as a cam follower by moving along an annular end surface of the female element which in addition to being inclined circumferentially has a plurality of lands and valleys with the latter interlocking with the lug to selectively vary the distance between the shoulders and thus the degree which the gasket may be compressed.

3,730,566

# DUCT CONNECTOR

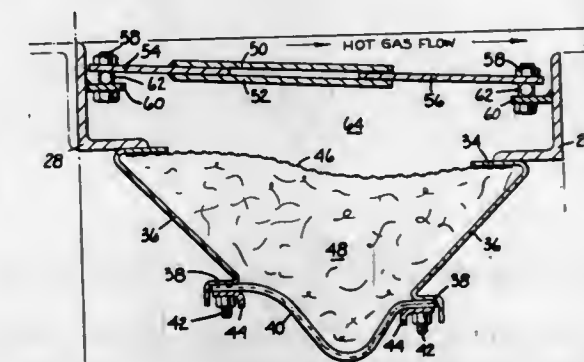
John Kazmierski, Jr., Ringoes; Benjamin Lawson, Jr., Somerset; Craig Edward Thornton, Flemington, and Gerard Louis Verrelli, Jr., Manville, all of N.J., assignors to Johns-Manville Corporation, New York, N.Y.

Filed May 3, 1971, Ser. No. 139,325

Int. Cl. F16I 27/02

U.S. Cl. 285-229

6 Claims



A duct connector for connecting and accommodating relating movement (expansion, contraction and misalignment between openings of ducts carrying solid-laden corrosive hot gases. The passage through the expansion joint is lined with plates capable of relative sliding and tilting movement in three dimensions in a manner to maintain a shield against the gases passing therethrough.



### 3,730,567 COUPLING SLEEVE

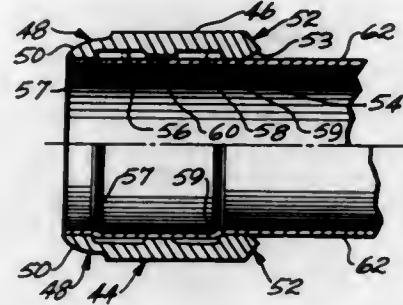
Frank R. Webster, Tarzana, Calif., assignor to Axial Corporation, Burbank, Calif.

Filed July 8, 1970, Ser. No. 53,196

Int. Cl. F16l 13/14

U.S. Cl. 285—382.4

11 Claims



A coupling sleeve for swaged attachment to tubing. The sleeve is a cylindrical body having a pair of annular grooves of a predetermined depth provided in the inner peripheral wall with the grooves being separated by an annular ring or land raised from the floor of the grooves. The width of the annular ring in the axial direction is such that tubing swaged into the grooves tends to assume a separate bend adjacent each land edge and to remain essentially flat in the area intermediate the two edges. The inner diameter of the cylindrical body in the area of the annular ring is arranged such that it is less than the inner diameter of the body in the area of the annular grooves and greater than the inner diameter of the cylindrical body in the area remote from the grooves thereby resulting in a two stage application of force to the tube walls during the swaged attachment operation. In certain embodiments a raised portion intermediate the sleeve ends provides oppositely facing abutment surfaces on the exterior of sleeve.

### 3,730,568 CONNECTOR

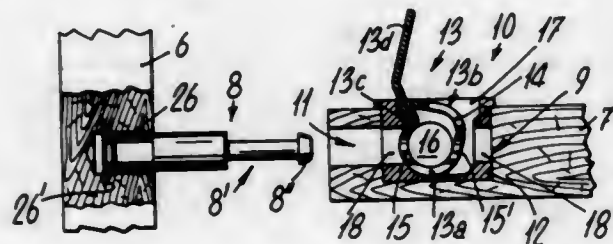
Fiorello Giovannetti, Via Marciano, 4, Milan, Italy

Filed March 15, 1971, Ser. No. 124,014

Int. Cl. F16b 21/02

U.S. Cl. 287—20.927

6 Claims



A device for releasably clamping two elements together, one element being provided with a headed bolt means and the other with a transverse sleeve-like cam through with the bolt means extend.

### 3,730,569 ADJUSTABLE MOUNTING FOR SHAFT-SUPPORTED ELEMENTS

Raimund Feinler, Spaichingen, Germany, assignor to Firma Maschinen-Konstruktions-Gesellschaft mit beschränkter Haftung, Spaichingen, Germany

Filed Sept. 2, 1971, Ser. No. 177,324

Claims priority, application Germany, Sept. 7, 1970, P 20 44 238.0

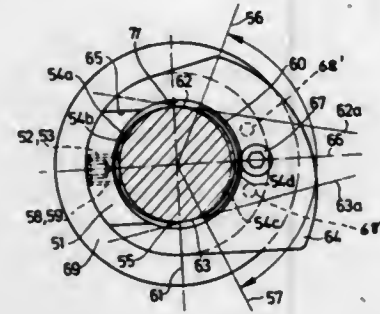
Int. Cl. F16d 1/06

U.S. Cl. 287—52.08

2 Claims

A torque-transmitting element, such as a chuck, cam or abutment, to be adjustably mounted on a rotating or fixed

shaft has an axial bore of the same diameter as the shaft but with a sectoral zone of larger radius extending over an arc between 90° and 150°. Opposite that zone, a radial bore



threaded to receive a setscrew lies in the plane bisecting the arc whereby a tightening of the setscrew wedges the shaft between two arcuate bore portions flanking the sectoral zone.

### 3,730,570 DRUMSTICK

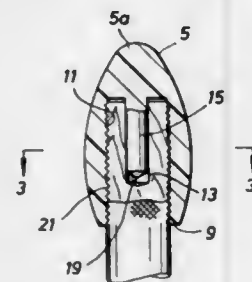
I. H. Brochstein, 5230 Loch Lomand, Houston, Tex.

Filed May 6, 1971, Ser. No. 140,826

Int. Cl. F16d 1/06

U.S. Cl. 287—53 R

6 Claims



An improved drumstick and end tip therefor which is affixed to the reduced end of the stick. The reduced end is characterized by an axially elongate bore which is adapted to receive an extending arm of the tip. The tip is of substantially frusto-oval configuration and is characterized by an axial bore of diameter sufficient to fit over the reduced end of the stick. At the base of the bore internally of the tip is the longitudinally extending arm of a length slightly less than the bore in the end of the stick. Affixation of the tip to the stick requires insertion of the stick into the tip bore and concomitant insertion of the arm into the stick bore thereby markedly enhancing frictional engagement between the tip and stick.

### 3,730,571 KNOB FASTENER

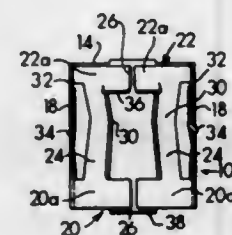
Harold S. Van Buren, Jr., Lexington, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed Feb. 28, 1972, Ser. No. 229,730

Int. Cl. F16d 1/06

U.S. Cl. 287—53 H

7 Claims



A fastener for releasably coupling a shaft end to a knob, handle or the like cooperating member, and wherein, the

fastener has a hollow housing portion for receiving the shaft and a pair of bandlike means thereon connected by a depressed resilient web providing a leaf spring connection with the body.

### 3,730,572 SHORING STRUCTURE

Clayton R. Ballou, 136 Baltrusal Place, San Ramon, Calif.

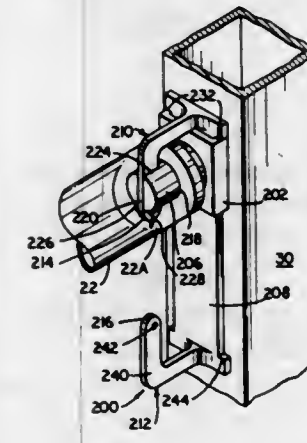
Division of Ser. No. 846,759, Aug. 1, 1969, Pat. No. 3,676,972.

This application May 20, 1971, Ser. No. 145,980

Int. Cl. E04g 7/22

U.S. Cl. 287—53.5

3 Claims



Disclosed herein are shoring structures having bases and telescoping members, each shoring structure being fabricated of square tubing. In one embodiment of the structure, square tubing of the telescoping member telescopes inside and along square tubing of the base. In a second embodiment, square tubing of the telescoping member telescopes outside and along square tubing of the base member. In yet another embodiment both inner and outer square tubing of the telescoping member telescopes along square tubing of the base.

Lock means are associated with the bases and telescoping members to lock thereto cross bracing between base members, telescoping members, etc. Such lock means include a slidable member which is slidable to a position holding the end portion of a cross brace, and to a position freeing the end portion of the cross brace.

### 3,730,573

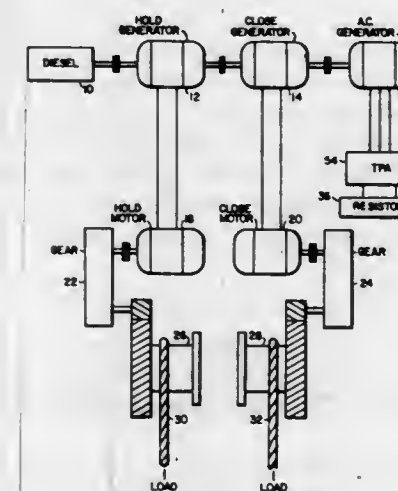
SYSTEM FOR REGENERATIVE LOAD ABSORPTION

Alvin M. F. Vance, Williamsville, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 7, 1972, Ser. No. 224,203

Int. Cl. B60l 7/04

U.S. Cl. 290—17



A system for regenerative load absorption is provided for an arrangement in which a prime mover drives a plurality of d.c.

generators arranged on a common shaft, and cooperating to energize a plurality of d.c. motors. An a.c. generator is also coupled to the common shaft. A thyristor power amplifier is connected to the a.c. generator and to a dissipative load, the power amplifier transferring power from the a.c. generator to the dissipative load in response to trigger signals which are supplied from a gating amplifier. Regenerative sensing apparatus is coupled to the gating amplifier and to the d.c. generators-d.c. motors to provide signals of one polarity when the net d.c. generator power requirements are for motoring, and signals of another polarity when the net d.c. generator power requirements are for generating, the gating amplifier delivering the trigger signals to the thyristor power amplifier only upon receipt of signals of the one polarity during motoring.

### 3,730,574

LATCH BOLT RETRACTOR MECHANISM

George Z. Zawadzki, Indianapolis, Ind., assignor to Von Duprin, Inc., Indianapolis, Ind.

Filed April 19, 1971, Ser. No. 135,028

Int. Cl. E05c 9/02

U.S. Cl. 292—92

23 Claims



A panic exit latch and actuator assembly comprising a rectilinearly moveable actuator element arranged in a housing means to traverse a door, a panic bar traversing the door and supported for rectilinear movement outwardly and inwardly relative to the housing means, and toggle-like linkage means providing an operative connection between the panic bar and the actuator element to move the actuator element from its latch-projected position to its latch-retracted position in response to movement of the panic bar inwardly. The connection between the actuator element and the latch bolt includes a lever member mounted for pivotal movement about a vertical axis, the lever member providing first and second rigid arms. First linkage means provides a connection between the actuator element and the first arm and second linkage means provides a connection between the latch bolt and the said second arm.

### 3,730,575 CLOSURE LATCH

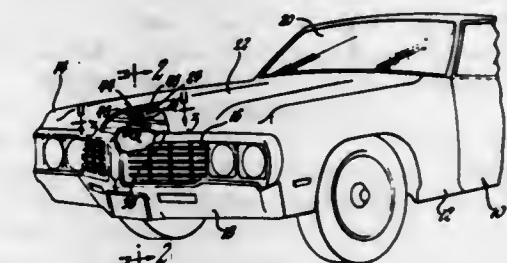
Alfonas Ariauskas, Troy, and Lloyd W. Rogers, Jr., East Detroit, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed June 3, 1971, Ser. No. 149,569

Int. Cl. E05c 3/26

U.S. Cl. 292—216

4 Claims

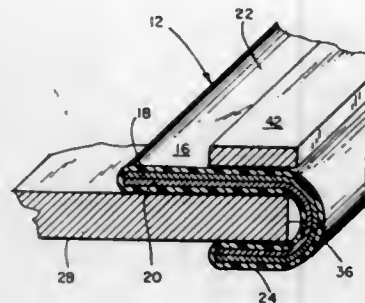


A closure latch for releasably securing a vehicle closure in a closed position and adapted for operation by a remote actua-



tor operatively connected to the latch, the latch including a lock bolt rotatable between latched and unlatched positions corresponding to the open and closed positions of the closure, a detent lever operatively connected to the remote actuator and rotatable thereby between a retracted position engaging a detent shoulder on the bolt and an extended position releasing the shoulder, a cam on the bolt, and a follower on the detent lever. After the detent lever is actuated to release the bolt, movement of the latter toward the unlatched position thereof initiates engagement between the cam and the follower which thereafter cooperate to positively restore the detent lever and connected remote actuator to their original positions in response to further movement of the bolt toward the unlatched position.

constituted of magnetically responsive material for responding to a magnetic force or magnetic forces of a magnetic field pro-



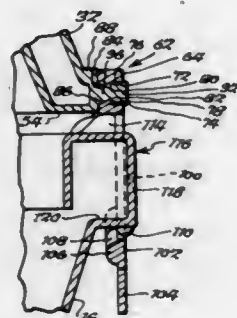
3,730,576

## PLASTIC CONTAINER AND LATCH

Peter T. Schurman, Woodbridge, Conn., assignor to The Plastic Forming Company, Inc., Woodbridge, Conn.  
Filed Feb. 3, 1971, Ser. No. 112,354  
Int. Cl. E05c 19/08

U.S. Cl. 292-246

8 Claims



A plastic container having a body and a cover and provided with a detachable latch for locking the cover to the body in a closed position. A brace member is provided for reinforcing a shelf formed by a segmental portion of the inner shell of the container body.

3,730,577

## MAGNETO-RESPONSIVE COMPOSITE MOLDING

Victor Shanok, and Jesse P. Shanok, both of Brooklyn, N.Y., assignors to Glass Laboratories Company, Brooklyn, N.Y.  
Filed March 17, 1971, Ser. No. 125,195  
Int. Cl. E05c 19/16

U.S. Cl. 292-251.5

9 Claims

A magneto-responsive composite molding comprising an elongate casing adapted for operative association with a closure such as a door edge. The casing includes a pair of opposing faces one of which is adapted to contact and be concealed by the a closure or door edge and the other of which is adapted to be exposed relative to the closure or door edge. The composite molding furthermore includes at least one metallic strip which is encapsulated within the casing between the pair of opposing faces of the latter. The metallic strip is

vided by a magnetic element mounted in the door frame across which the door edge may be swung.

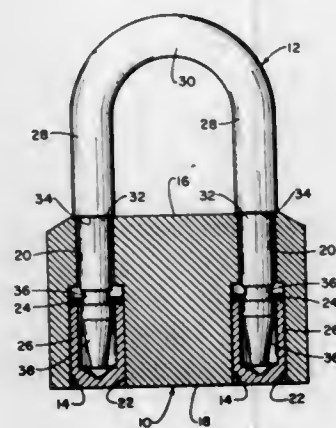
3,730,578

## SINGLE ENGAGEMENT PERMANENTLY SECURED KEYLESS LOCK

John R. Gerlach, Monterey Park, Calif., assignor to Emhart Corporation, Bloomfield, Conn.  
Continuation-in-part of Ser. No. 185,667, Oct. 1, 1971, abandoned. This application June 29, 1972, Ser. No. 267,517  
Int. Cl. E05c 19/18

U.S. Cl. 292-318

13 Claims



A shackle has at least one lower end portion received downwardly in a body opening permanently engaged within the body by a split ring within the body expanding and then contracting into an annular groove of the shackle. The split ring is located within the body by a downwardly closed sleeve press fit upwardly into the body opening from a lower end thereof thereby preventing access to the split ring. An annular shoulder on the shackle locates the shackle within the body for such engagement. The shackle may be U-shaped for reception in two body openings or singular ended for one body opening.

3,730,579

## SPATULA

Norman M. Mock, 1934 James Downey Road, Independence, Mo.

Filed July 8, 1971, Ser. No. 160,839

Int. Cl. A47j 43/28

U.S. Cl. 294-8

7 Claims

A spatula including a normally planar blade with a handle affixed to one end thereof, said blade being divided transver-

sely into a plurality of sections, each section being pivoted to each contiguous section for upward movement normal to the



plane of the blade, but restrained against downward pivotal movement.

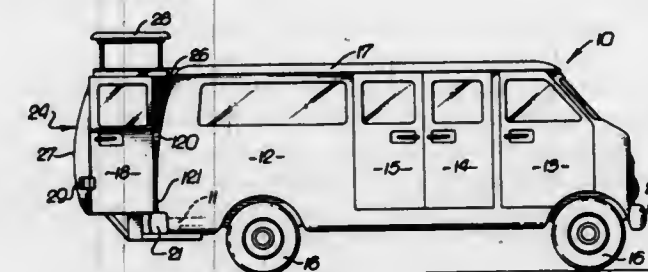
3,730,580

## VAN CONVERSION TO CAMPER VEHICLE

John S. Page, Jr., 2842 5th Street, Boulder, Colo.  
Filed Aug. 13, 1971, Ser. No. 171,637  
Int. Cl. B60p 3/34

U.S. Cl. 296-23 R

11 Claims



Apparatus to rearwardly extend the interior of a van body having a support frame, a rear door frame and rear doors hinged to the body to open rearwardly away from the door frame, includes:

- a forwardly opening enclosure including a deck, side walls, rear wall and roof, the enclosure sized to extend directly at the rear of the van body when said doors are opened rearwardly from the door frame, and
- a lower support for the enclosure located for attachment to rearward extent of the van body support frame.

A stove and/or sink may be carried in the enclosure to be accessible from the van body interior, and the enclosure roof may be mounted for optional movement between raised and lowered positions.

3,730,581

## VEHICLE POCKET ARRANGEMENT

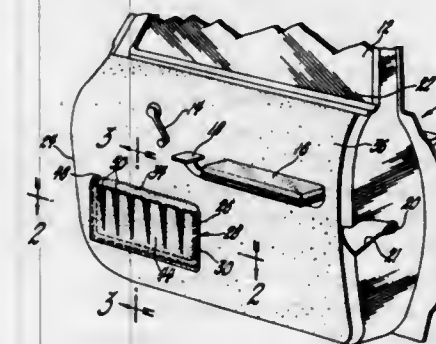
Charles F. Parkinson, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 28, 1971, Ser. No. 157,382

Int. Cl. B60r 7/04

U.S. Cl. 296-37 R

2 Claims



A vehicle pocket arrangement for storing small items includes a downwardly depending flap covered with trim materi-

al and integral with a filler board of a vehicle body door trim panel. The flap is defined by a generally U-shaped aperture in the trim panel. A filler board member slightly larger than the depending flap has trim material secured to the lateral and lower edge portions thereof to provide a pocket panel having a generally upwardly opening pocket. The pocket panel is positioned to the rear of the trim panel and then moved upwardly to insert the flap within the pocket. The filler board member is thus located to the rear of the trim panel and overlying the U-shaped aperture. The filler board member is taped to the rear of the trim panel.

3,730,582

## VEHICLE MODIFICATION FRONT END PORTION OF AN AUTOMOBILE

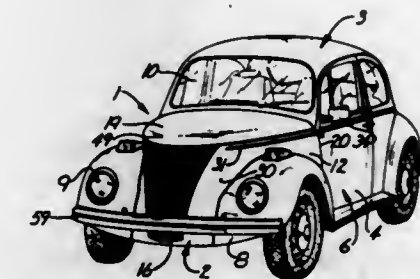
Gordon V. Liefing, Kansas City, Mo., assignor to Liefing Industries, Incorporated, Kansas City, Mo.

Filed Sept. 13, 1971, Ser. No. 179,812

Int. Cl. B62d 25/08, 65/00

U.S. Cl. 296-28 R

4 Claims



A modification for a front-end portion of a mobile vehicle, such as a 1970 and earlier "Volkswagen," and having a body with at least one door for each side thereof, front fenders, a windshield and a hood extending outwardly and downwardly in an arcuate path from adjacent a lower edge of the windshield wherein the modification includes a side panel for a forward portion of each side of the body and extending forwardly from adjacent the door in the respective side of the body and having a lower edge portion positioned between the body and a respective front fender and a front panel mounted on forward ends of the side panels and a hood member to replace the original hood and extending outwardly and generally horizontally from adjacent the lower edge of the windshield whereby the side panels and the hood member cooperate to enclose a space substantially larger than a space enclosed by the fenders and the original hood. The side panels each have an arcuate trough-shaped portion extending generally upwardly and rearwardly and outwardly from a front end thereof to direct wind upwardly and over and around the mobile vehicle.

3,730,583

## PASSENGER COMPARTMENT

Denny D. Colovas, John S. Logan, and Richard R. Skruch, all of Dearborn, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 21, 1971, Ser. No. 145,681

Int. Cl. B60n 1/00

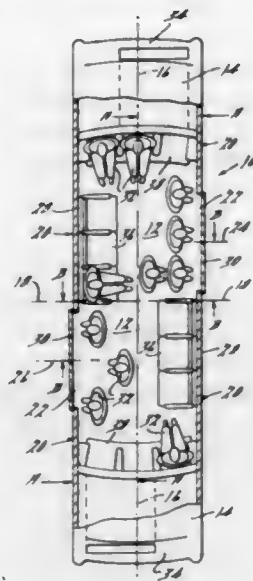
U.S. Cl. 296-64

5 Claims

An improved passenger compartment for a transportation vehicle having floor and ceiling structures is disclosed. A first pair of side walls are provided which are spaced equally from a first axis passing along the length of the passenger compartment. Each of the first side walls has an extensive and identical opening therethrough. The center of the opening in one of the first side walls is spaced a fixed distance on one side of a second axis passing across the width of the passenger compartment in a directing perpendicular to the first axis. The center



of the opening in the other of the first side walls is spaced the same fixed distance on the other side of the second axis. A second pair of walls are provided for the vehicle. The walls of



3,730,584

**FOLDABLE CHAIR FRAME ASSEMBLY**

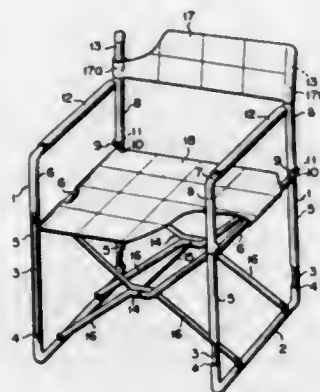
Suekichi Uchida, Niwa-gun, Akhi-ken, Japan, assignor to Uchida Sharyo Co., Ltd., Nagoya-shi, Japan

Filed Jan. 18, 1972, Ser. No. 218,705

Claims priority, application Japan, Jan. 21, 1971, 46/1746

Int. Cl. A47c 4/48

U.S. Cl. 297-45



A foldable chair frame assembly comprising a pair of vertically extendable side frame members and a pair of connection member assemblies connecting said side frame members so as to cause them to approach each other when the chair is folded up and, when one sits on the chair, expanding in the form of the letter X, thereby reinforcing side frame members against the load applied thereon by the sitter.

3,730,585

**ROCKER RECLINER CHAIR**

Walter Clark Rogers, Jr., and Frank D. Hoffman, Jr., both of High Point, N.C., assignors to Royal Development Company, Inc., High Point, N.C.

Filed Oct. 19, 1970, Ser. No. 81,957

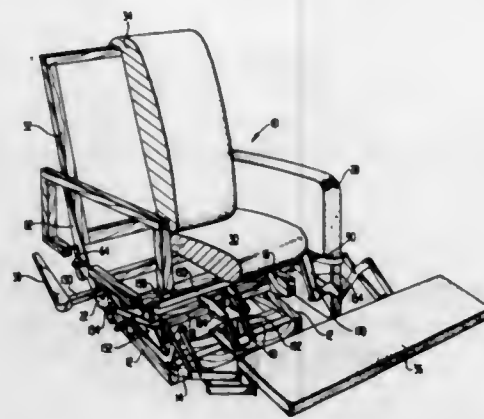
Int. Cl. A47c 1/02, 3/02

U.S. Cl. 297-85

23 Claims

A rocker-recliner chair having a base, a rocking frame mounted on the base for rocking movement; a seat frame with linkage suspending it from the rocking frame for movement

between a lower position and a forwardly raised position; a backrest with linkage connected to the seat frame to pivot relative thereto between a normal upright position and inclined reclined positions, the backrest linkage also serving to actuate the seat frame linkage to swing the seat frame upwardly and forwardly when the backrest is moved into reclining positions, and a footrest with linkage mounting it to the seat frame to be operable by a handle, between a retracted



position and a single extended position. A locking linkage is provided between the footrest linkage, seat frame and rocking frame for preventing reclining movement when the footrest is retracted and also for preventing return of the footrest to retracted position when the backrest is in reclining position. A lock mechanism is also provided at the front of the chair for preventing rocking when the footrest is extended. The locking mechanism is connected to the footrest linkage to be operated thereby upon extension and retraction of the footrest.

3,730,586

**DECELERATING APPARATUS**

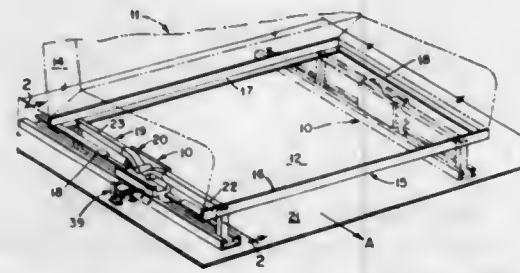
Walter S. Eggert, Jr., Huntingdon Valley, Pa., assignor to The Budd Company, Philadelphia, Pa.

Filed Nov. 24, 1971, Ser. No. 201,729

Int. Cl. B60r 21/10

U.S. Cl. 297-216

4 Claims



Apparatus for absorbing energy between a seat and a vehicle having a rod aligned along the axis of deceleration which is associated with bending roller means. The rod is deformed along its length such that it has different moduli of bending. A section of its length having a first modulus of bending is normally associated with the bending roller means such that upon the vehicle being subjected to a crash impact the rod absorbs kinetic energy at a first rate which eliminates high frictional starting forces. The rod includes a second length of different bending modulus from the first length which upon continued relative movement of the seat with respect to the vehicle is advanced into the bending roller means to absorb kinetic energy at a second rate. The energy absorbing rod is of the same area in cross-section throughout its length such that either length is capable of absorbing maximum loads in tension upon impact of the vehicle.

3,730,587

**EXERCISING APPARATUS FOR SMALL CHILDREN**

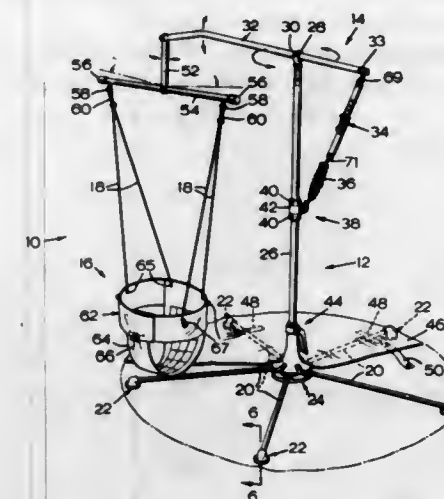
Samuel Dawson Bloxham, 50 Khartoum Avenue, and Robert Laird Haigh, 3 Bauty Place, both of Scarborough, Ontario, Canada

Filed May 22, 1970, Ser. No. 39,926

Int. Cl. A47b 13/10

U.S. Cl. 297-274

6 Claims



A collapsible and portable device for supporting part of the weight of a child to permit the child to jump up and down and to walk about a central upright column. The device includes a collapsible stand for positioning on a floor and a cantilever and resilient suspension mechanism coupled to the stand such that the mechanism may be rotated about the column. A seat is releasably coupled to the suspension mechanism so that when the child is placed in the seat, a proportion of the child's weight is supported by the device and the child is free to jump up and down and to move in a circle about the column.

3,730,588

**SEAT, COUCH OR BED, PROVIDED WITH AT LEAST ONE VACUUM CUSHION**

Francois Marie Joseph Braun, Kraainem, Belgium, assignor to Societe anonyme belge d'Exploitation de la Navigation aeriennne (Sabena) Brussels, Belgium

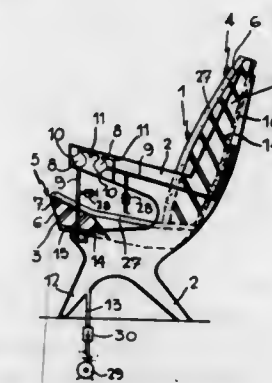
Filed June 22, 1971, Ser. No. 155,535

Claims priority, application Belgium, June 23, 1970, 9719

Int. Cl. A47c 27/08, 27/14

U.S. Cl. 297-284

13 Claims



This invention relates to a seat, couch or bed, provided with at least one vacuum cushion comprising an air-tight flexible envelope containing a coherent porous mass or resiliently compressible intercommunicating open cellular material, having an inherent rigidity capable of substantially supporting the weight of an occupant without collapsing, a vacuum source, pipes for connecting the interior of this envelope with said vacuum source and with an ambient environment, at least one valve for selectively opening or for shutting off these communications with the envelope, in order to control the thickness

of the cushion independently of the occupant's weight, and for the purpose of directing the compression of the porous mass in the direction of its thickness and facilitating the evacuation of the air contained in the cells of the porous mass when the envelope is in communication with the vacuum source, an additional air-permeable layer which allows, whatever stress is exerted on this additional layer, the circulation of air through same, between the porous layer and the pipe of the valve communicating with the vacuum source, this pipe discharging into this additional layer, said additional layer being provided in the envelop on that face of the porous mass opposite the face on which the occupant's weight is applied.

3,730,589

**HEAD OR BACK SUPPORT FOR WHEELCHAIR**

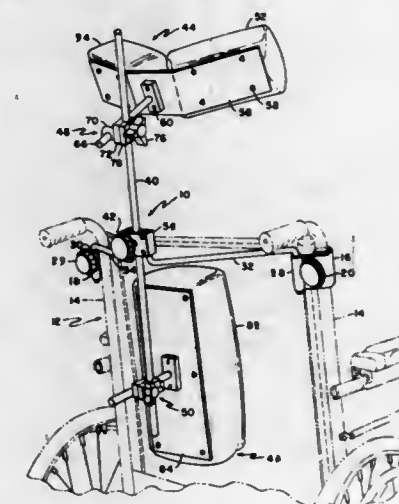
Buddy F. Lane, Richmond, Ind., assignor to Avco Corporation, Richmond, Ind.

Filed Dec. 9, 1971, Ser. No. 206,268

Int. Cl. A47c 7/36

U.S. Cl. 297-391

5 Claims



An adjustable head or back support for universal use on wheelchairs is disclosed. The support permits individual adjustment of the head and back supports which can be adjusted to provide for support desired by the individual patient. The horizontal mounting arms are pivotally connected with the coupling bracket so as to automatically compensate for various wheelchair widths. The head and back supports are adjustable in the horizontal, vertical and angular directions to provide the necessary support for the occupant of the wheelchair.

3,730,590

**SHOWER CHAIR**

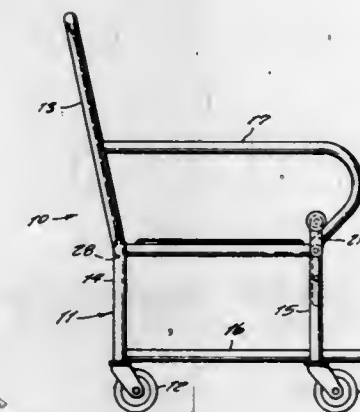
Darel E. Harris, 1713 Tyler St., Conway, Ark.

Filed July 28, 1971, Ser. No. 166,742

Int. Cl. A47c 7/00, 7/20

U.S. Cl. 297-445

1 Claim



A chair for supporting an infirm or metal patient while being showered and dried, the chair consisting of a frame



mounted upon rollable casters, the chair back rest having only two narrow slats therein, and the chair including an upwardly pivotable unit so to keep the patient's legs apart during washing and drying operation.

3,730,591

**TRUCK OR TRAILER WITH Laterally TILTABLE DUMP BODY WITH HINGED SIDE PANELS HYDRAULICALLY OPERATED FROM CLOSED TO OPEN POSITION**

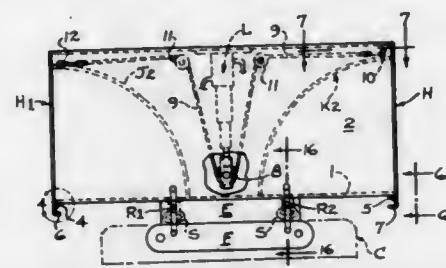
Juniper Griffis, Bowie, Tex., assignor to Harold E. Lyst, Bowie, Tex., a part interest

Filed Aug. 24, 1971, Ser. No. 174,372

Int. Cl. B60p 1/28

U.S. Cl. 298—17.6

4 Claims



A truck or trailer with hydraulically actuated and laterally tiltable dump body with hinged side panels hydraulically swingable into open and closed position and having the hydraulic controls in the cab of the truck. Novel manually controlled locking means is used for securing the side panels from accidentally swinging laterally into open position. The hydraulically actuated means for tilting the body laterally in either direction from a horizontal position can incline the body at an angle of substantially 45° and the side panels can be swung into a position substantially paralleling the floor of the body.

3,730,592

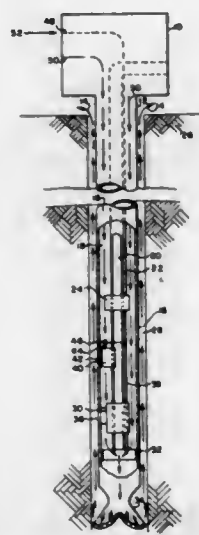
**METHOD OF SUBTERRANEAN DRILLING AND MINING**  
William Z. Wenneborg, Pocatello, Idaho; Philip R. Bunnelle, Santa Clara, Calif., and Bobby R. Payne, Charleston, W. Va., assignors to FMC Corporation, New York, N.Y.

Filed June 1, 1971, Ser. No. 148,527

Int. Cl. E21c 43/00

U.S. Cl. 299—17

9 Claims



A method is provided for drilling into and mining a subterranean deposit of granular ore. The method incorporates a drilling function, a mining function and a novel change in function between drilling and mining by imposition of a hydraulic actuating force originating from the ground surface. The method is capable of mining a granular ore deposit located in proximity with or below an aquifer without substantially removing water from the aquifer.

An embodiment of the method permits the change in function between drilling and mining to be repeated as often as necessary to mine several layers of granular ore having intervening layers of overburden.

3,730,593

**CONTINUOUS MINING MACHINE**

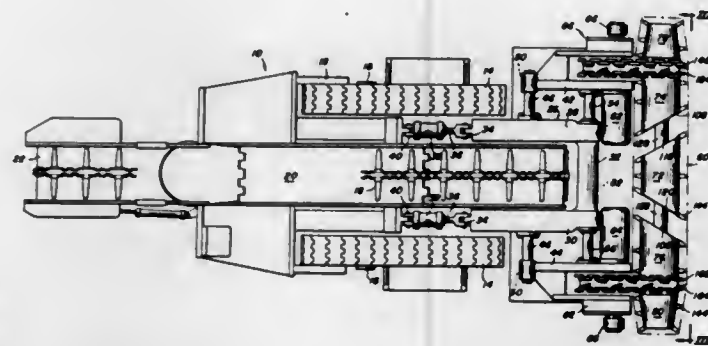
Jerry Karlovsky, Jr., Nashville, Ill., assignor to National Mine Service Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 19,854, March 16, 1970, abandoned. This application June 21, 1971, Ser. No. 155,177

Int. Cl. E21c 27/24

U.S. Cl. 299—76

18 Claims



A continuous mining machine has a self-propelled body portion with a conveyor extending longitudinally thereon to transport material dislodged by a forwardly extending drum member toward the rear of the mining machine. A gathering device is positioned below the drum member and has gathering arms to move the dislodged material onto the conveyor. A boom member is pivotally connected to the mining machine body portion and extends forwardly therefrom. A drum member having peripherally extending cutting elements is rotatably secured to the boom member and extends transversely in front of the mining machine. In one embodiment the drum member has a center section, a pair of intermediate sections positioned on the outboard sides of the center section, and a pair of end sections extending outwardly from the intermediate sections. Axial shaft members are secured at one end to the drum member center section and are telescopically positioned in a tubular member secured to the end sections. Another embodiment has a pair of intermediate sections positioned adjacent each other and a pair of end sections extending outwardly from the intermediate sections. An axial shaft member telescopically supports the intermediate sections. The boom member has a pair of arm members arranged to move laterally and extend the drum member to a dimension greater than the width of the mining machine. In one embodiment the center section and intermediate sections have opposed end walls that are nonperpendicular to the longitudinal axis of the drum member so that the drum member in its extended position has portions of the center section and the intermediate sections in overlapping relation. In the other embodiment the intermediate sections have opposed walls nonperpendicular to the longitudinal axis so that the drum member in its extended position has portions of the intermediate sections in overlapping relation. With this arrangement, the cutter elements on the sections of the drum member in an extended position of the drum member dislodge material along the entire length of the extended drum member. A further embodiment of the drum member includes an axial, mating tongue and groove arrangement between the ends of the center section and intermediate sections. The drum member sections in an extended position have the cutter elements on the tongue portions of the center section and intermediate sections in overlapping relation so that the extended drum member dislodges material along its length. A pair of motors are provided to drive the drum member through the telescopic shafting.

3,730,594

**WHEEL AND TIRE ASSEMBLY FOR TOY VEHICLES**

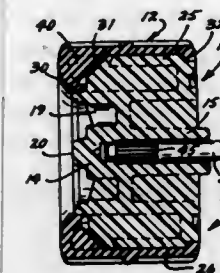
Theodore H. Zbikowski, Mound, Minn., assignor to Tonka Corporation, Mound, Minn.

Filed April 26, 1971, Ser. No. 137,493

Int. Cl. B60b 5/02

U.S. Cl. 301—63 PW

4 Claims



A wheel and tire assembly for toy vehicles wherein a generally cylindrical wheel of rigid material has a reduced portion projecting concentrically from the outer side thereof and a peripheral groove adjacent the inner side thereof and a tire of resilient material encircling the wheel and having an outer side wall tightly encircling the reduced portion and an annular bead on the inner side of the tire seated in said peripheral groove to prohibit outward axial removal of the tire from the wheel.

3,730,595

**LINEAR CARRIER SENDER AND RECEIVER**

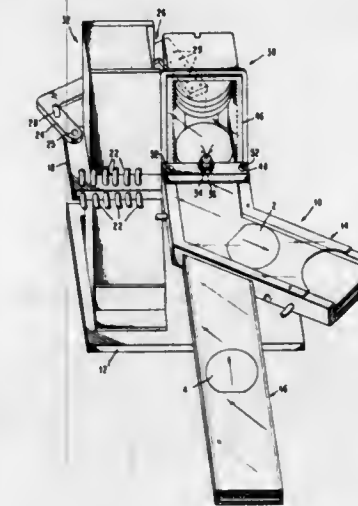
Carl Yakubowski, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 30, 1971, Ser. No. 203,374

Int. Cl. B65g 51/02

U.S. Cl. 302—2 R

4 Claims



A wafer transfer and handling apparatus having an indexable carrier for transferring wafers to and from work stations. A wafer on an air slide enters the wafer carrier with the aid of a directional air jet force supplied by the wafer mechanism. A photocell detects a wafer entering the carrier and activates an air cylinder to move from left to right, thereby permitting an escapement rack to index in a vertical direction. The index rack is adapted for vertical movement, the rack having laterally extending, horizontally disposed, interleaving indexing elements which are spaced apart for cooperation with an escapement pin that slides back and forth across the rack to permit indexing of the rack from one interleaved indexing element to the next. The indexing is repeated until the wafer carrier is full or empty whereupon a limit switch is activated to indicate this to an operator. The carrier is adapted for loading or unloading wafers.

910 O.G.—8

**ERRATUM**

For Class 303—21 F see:  
Patent No. 3,730,541

3,730,596

**BRAKE CONTROL SYSTEM AND VEHICLE HAVING SAME**

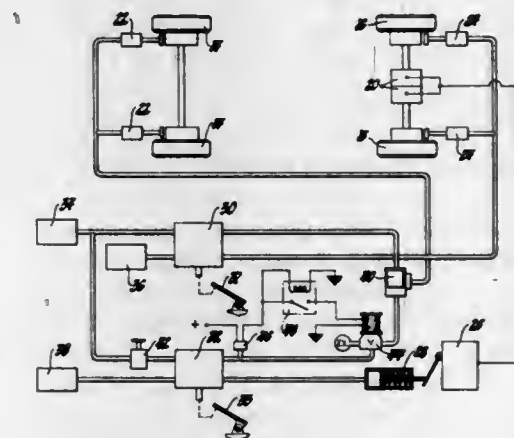
Gerardus L. Felix, and Frank C. Bennett, both of London, Ontario, Canada, assignors to General Motors Corporation, Detroit, Mich.

Filed April 21, 1971, Ser. No. 136,089

Int. Cl. B60t 13/74

U.S. Cl. 303—3

4 Claims



A brake control system applied in a preferred embodiment to a heavy hauling vehicle having a combination of four-wheel friction brakes and dynamic brakes acting only on the rear wheels through direct connected electric traction motors. The friction brakes are air operated and may be applied by the vehicle operator at any time. However, the dynamic brakes are intended to be used as the primary braking system and are separately controlled by the vehicle operator by air actuated means of the brake control system. Because actuation of the dynamic brake involves a substantial time delay before effective dynamic braking may be obtained, the brake control is arranged so that upon operation of the dynamic brake pedal by the operator the air operated friction brakes are immediately applied to the front wheels of the vehicle to establish a controllable braking effect which continues for a predetermined period, preferably equal to the time required for effective dynamic braking of the rear wheels to be established. The system permits a full application of the friction brakes on all four wheels at any time, either separately from or in conjunction with utilization of the rear wheel dynamic braking.

3,730,597

**VARIABLE LOAD BRAKE CONTROL APPARATUS**  
Lynn I. Pickert, Watertown, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed July 16, 1971, Ser. No. 163,229

Int. Cl. B60t 8/18

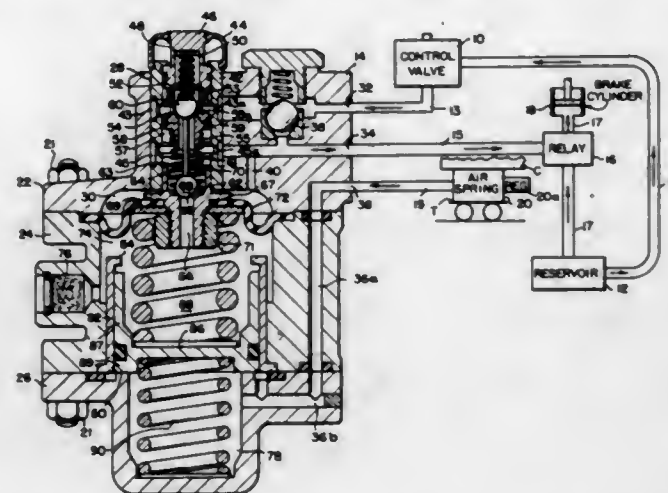
U.S. Cl. 303—22 A

7 Claims

Variable load fluid brake control apparatus is provided for an air spring vehicle having a supply valve for controlling air



pressure to the brakes, a control piston for controlling operation of the supply valve, and a compensating piston biased by



opposing springs and fluid pressure related to the air spring for acting upon the control piston for governing operation of the supply valve.

3,730,598

#### SELF-ALIGNING BEARING WITH MULTIPLE ASSEMBLY SEQUENCE

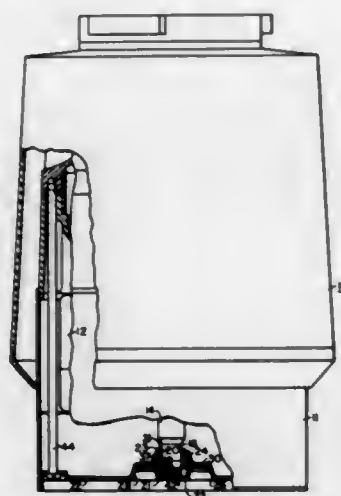
Jack E. Bebinger, Columbus, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 8, 1971, Ser. No. 151,052

Int. Cl. F16c 13/06

U.S. Cl. 308—132

7 Claims



The invention provides a self-aligning bearing, shaft and end bell in which the end bell includes a formed, partially spherical bearing surface that takes the angular thrust forces from the shaft. An end cap is rigidly mounted in a formed retaining pocket in the end bell to maintain a lubricating disk for the end of the shaft and the bearing. The assemblage requires only a minimum number of parts and is sufficiently flexible in design to permit an assembly of it by at least two different methods.

3,730,599

#### BEARING ASSEMBLY FOR SPINNING ROTORS

Rudolf Fingerle, Esslingen-Zollberg, Germany, assignor to SKF Kugellagerfabriken GmbH, Schwinfurt, Germany

Filed March 30, 1971, Ser. No. 129,365

Claims priority, application Japan, April 2, 1970, 45/31048

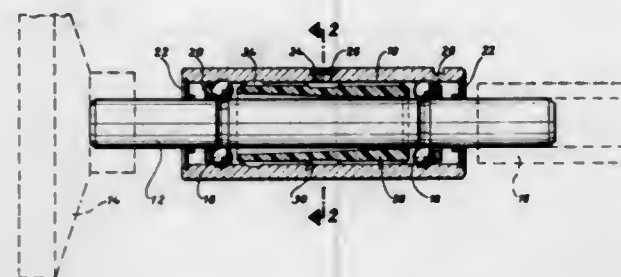
Int. Cl. F16c 33/78

U.S. Cl. 308—187

12 Claims

A bearing assembly comprising a hollow cylindrical housing in which a shaft is axially arranged. The shaft and housing are

enclosed at each end. A radial opening is provided in the housing forming an inlet port for lubricant. The opening is covered



by an elastomeric sealing member penetrable by a lubricating tool.

3,730,600

#### COLLAPSIBLE SHIM FOR PRELOADED BEARING AND METHOD OF MAKING SAME

William G. Degnan, Huntington, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 9, 1972, Ser. No. 224,739

Int. Cl. F16c 33/00

U.S. Cl. 308—244

9 Claims



An antifriction bearing capable of being preloaded comprises a plurality of stacked bearing units each including an inner race mounted on a shaft and an outer race supported in a housing and a clamping device which provides retention of the bearing assembly with any desired internal load in the separate bearing units. A resin impregnated fiberglass shim is located between the clamping device and an adjacent bearing race which collapses upon the increased heat and load resulting from a lubrication failure. Collapse of the shim reduces the internal load on the bearing. The shim is supported between two plates, one of which has a recess partly receiving the shim. Means is also provided for preventing outward collapse of the shim when this would be undesirable.

3,730,601

#### FURNITURE WITH ASSEMBLY-DISASSEMBLY FEATURE

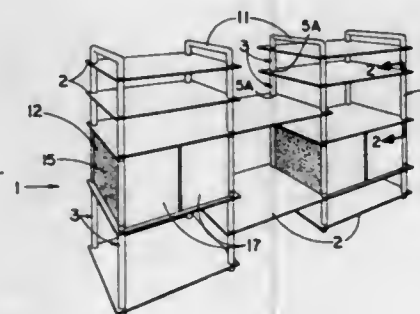
Ernest Luther Misenheimer, III, Drexel, N.C., assignor to U.S. Plywood-Champion Paper Inc., Hamilton, Ohio

Filed Aug. 26, 1971, Ser. No. 175,242

Int. Cl. A47b 87/00

U.S. Cl. 312—108

9 Claims



Furniture is provided with a telescoping joint that secures and spaces shelves and other elements. A stud has a tight fit in

a hole drilled at each corner of a rectangular shelf. A spacer member of tubular shape slips over the stud and extends vertically to the next stud joining to it in a similar telescoping fit. The stud can be of wound paper core material while the spacer may be of plastic pipe. No fasteners are required because of the snug fit between the elements.

3,730,602

#### CARTRIDGE PARTICULARLY SUITABLE FOR DISC RECORD MEMBER

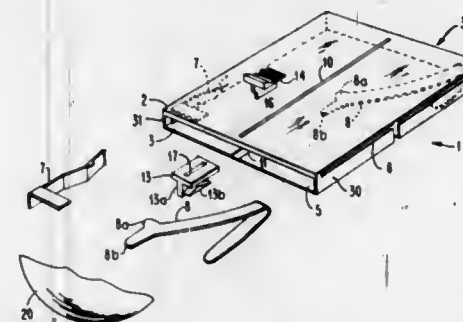
Jesse L. Campbell, Lexington, Ky.; Walter F. Klein, and Denis E. Lowry, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1971, Ser. No. 209,667

Int. Cl. A47b 81/00

U.S. Cl. 312—10

6 Claims



The present case is directed to a cartridge suitable for a disc recording member, as an example. In a preferred embodiment, provision is made for feeding discs into the cartridge from the side and ejecting discs from the front of the cartridge. The cartridge has a manual kicker for ejection of discs by the operator. Usually, discs are placed in the cartridge one at a time but facilities are included that enable entry of a plurality of discs through the eject opening by use of an incline member cooperating with a retaining spring.

3,730,603

#### REFRIGERATED DISPLAY CASE FOR FLOWERS AND THE LIKE

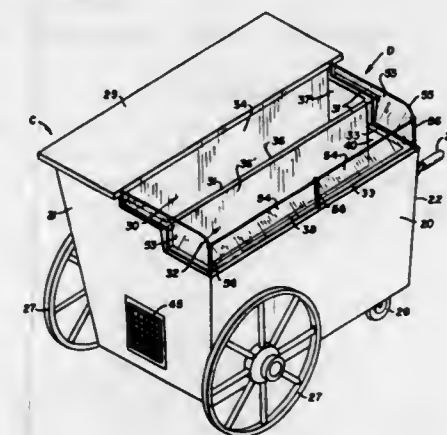
Peter Looms, Denver, Colo., assignor to Flowers a la Carte, Inc., Denver, Colo.

Filed March 24, 1971, Ser. No. 127,497

Int. Cl. A47l 3/04

U.S. Cl. 312—116

7 Claims



The invention is an open-top, refrigerated display case which may be mounted on a cart, booth or the like. The display case includes a plurality of elongated bins placed side by side in a stepped array from an upper bin at the rear of the case to a lower bin at the front of the case. The bins are thus advantageously arranged to provide a best possible display of merchandise within them. At the same time, the stepped arrangement permits a slow flow of refrigerated air as from back of the case, from the upper bin, and forwardly into the lower bin with the cool air cascading over merchandise especially within the lower bin.

3,730,604

#### TELEPHONE STAND

Perfecto Viera, 98-20 62nd Drive, Rego Park, N.Y.

Filed Jan. 26, 1972, Ser. No. 220,853

Int. Cl. H04m 1/04; A47b 88/04

U.S. Cl. 312—319

1 Claim



The application for patent discloses a telephone stand adapted to support a conventional telephone on a spring pressed tray. The stand provides a drawer or a like member adapted to store writing utensils being spring biased to open automatically when released as a consequence of lifting the receiver from the telephone. Preferably, a second drawer or like member is also provided by the stand which is manually releasable to open position if needed.

3,730,605

#### INTERCHANGEABLE SIDE PANEL AND THE LIKE FOR MODULAR FURNITURE

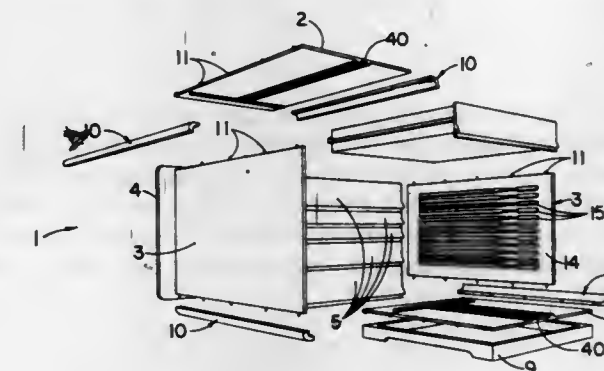
Robert Lewis Eckard, Hickory, N.C., assignor to U.S. Plywood-Champion Papers Inc., Hamilton, Ohio

Filed Nov. 22, 1971, Ser. No. 200,930

Int. Cl. A47b 43/00, 88/00; A47l 3/14

U.S. Cl. 312—257

12 Claims



Modular furniture has a vertical side panel with a plurality of drawer runners so spaced and designed that drawers of different depths may interchangeably be supported by the panel when incorporated in a cabinet. Further, the panel does not come in right and lefthand members when applied to the outside of a cabinet but instead is interchangeably used on either side of the cabinet.

3,730,606

#### METHOD FOR FABRICATING A GAS LASER TUBE

Karl Gerhard Hernqvist, Princeton, and Donald Chester Pultorak, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 8, 1970, Ser. No. 35,691

Int. Cl. H01j 9/18

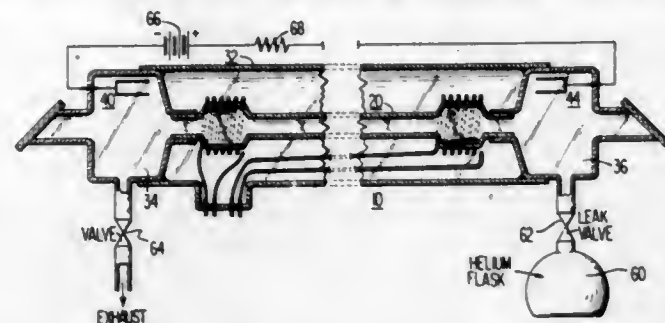
U.S. Cl. 316—19

4 Claims

The process of manufacturing a vapor-type gas laser tube, such as a He-Cd or He-Zn for example, is considerably simplified by inserting the active material to be vaporized within the evaporator before the tube is put together. This means that baking of the tube, after it is put together, must be done at a



lower temperature than is usual in order to avoid evaporation of the active material during baking. However, flushing the tube cavity with an inert gas, such as helium, after baking at



or preferably between one prism and one or more associated gas mediums. A system wherein a screen is formed of prisms, an appropriate electrolyte and electrodes which are selectively and sequentially electrically energized and swept to reproduce an image on the screen.

### 3,730,609 THERMALLY COMPENSATED ULTRASONIC LIGHT MODULATOR

Kouichi Minemura, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Feb. 28, 1972, Ser. No. 229,814

Claims priority, application Japan, March 10, 1971, 46/13212

Int. Cl. G02f 1/28; H01s 3/00

U.S. Cl. 350—161

2 Claims

this lower temperature, results in the removal of unwanted residual impurities being just as great as conventional baking at higher temperature.

### 3,730,607 INDICATOR SCREEN WITH CONTROLLED VOLTAGE TO MATRIX CROSSPOINTS THEREOF

Josef Grabmaier, Unterhaching; Hans Krueger, Munich, and Ulrich Wolff, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

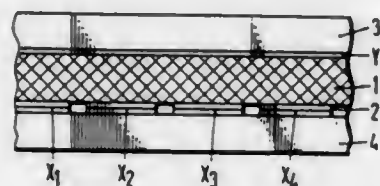
Filed July 12, 1971, Ser. No. 161,776

Claims priority, application Germany, July 23, 1970, P 20 36 665.8

Int. Cl. G02f 1/34

U.S. Cl. 350—160 LC

6 Claims



This invention provides an indicator screen comprised of two vertically superimposed systems of parallel transparent conductor paths, a nematic liquid crystalline layer positioned between the two conductor systems, and an interrupted barrier-free layer of a non-linear resistor material arranged between one of the conductor systems and the liquid crystalline layer.

### 3,730,608 ELECTROLYTIC LIGHT MODULATION SYSTEMS

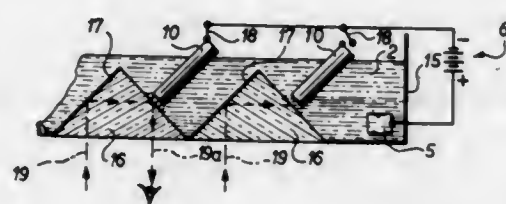
Adrien Castegnier, 10,050 Place Guillaumone, Chambon, Quebec, Canada

Filed Sept. 30, 1971, Ser. No. 185,176

Int. Cl. G02f 1/34

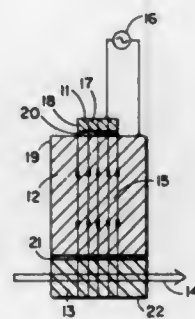
U.S. Cl. 350—160 R

14 Claims



Systems to modulate beams of light, including monochromatic and laser beams, by the use of an electrolyte chemically constituted to generate a gas medium against an electrode, thereby forming mediums having a different index of refraction than the electrolyte and thence producing reflecting interfaces between either the electrolyte and the gas mediums,

To produce on a screen an image of a diffraction grating pattern provided on a surface in which grating portions extending in one direction are represented bright and grating



An ultrasonic light modulator includes a transducer for generating an ultrasonic wave, a medium through which the wave generated by the transducer is propagated, an acoustooptical effect member attached to the medium, and a means for directing a light beam onto the member. The transducer, medium, and member are selected so that one has a temperature coefficient of resonant frequency different from the other two. The lengths of the transducer, medium, and member measured in the direction of the ultrasonic resonance are selected so that the overall temperature coefficient of the modulator is substantially zero.

### 3,730,610 DIRECTION-SENSITIVE PROJECTION SYSTEMS FOR LIGHT-DIFFRACTION GRATINGS

Paul Hans Linsberger, Altringham, England, assignor to Plessey Handel Und Investments A.G., Zug, Switzerland

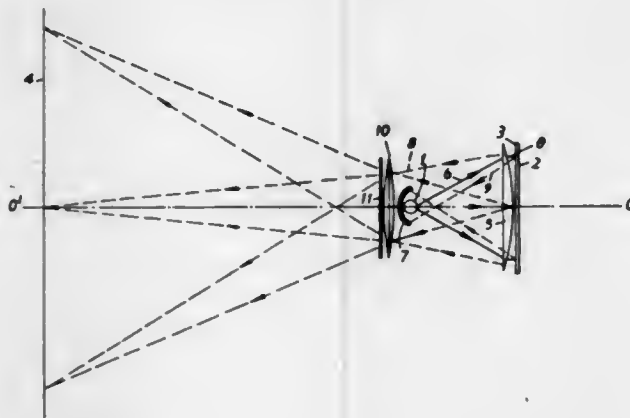
Filed Nov. 5, 1971, Ser. No. 196,068

Claims priority, application Great Britain, Dec. 24, 1970, 61,346/70

Int. Cl. G02b 27/38

U.S. Cl. 350—162 SF

6 Claims



portions extending at right angles thereto are represented dark, the grating pattern is illuminated by a tubular lamp extending in the direction of the first mentioned grating portions through an autocollimator lens, the direct-reflected rays being intercepted by a lamp shield while the light diffracted by grating portions extending in the first-mentioned direction by-passes the shield to reach a projection lens to form a projected image on the screen, a lens mask being provided which intercepts light deflected in the longitudinal direction of the lamp.

3,730,611

Patent Not Issued For This Number

### 3,730,612 BACK-OF-THE-HEAD VIEWING SYSTEM

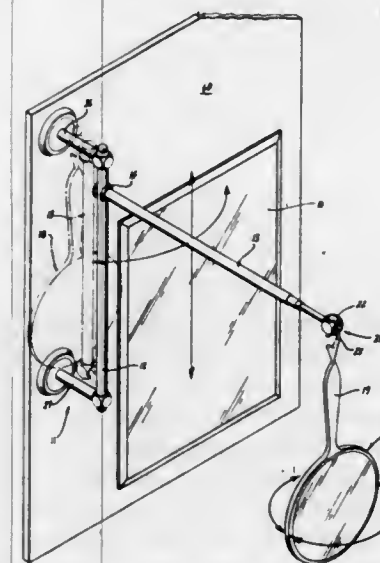
Norma Z. Arroyo, 400 Liberty St., San Francisco, Calif., and Norman T. Seaton, 240 Tunnel Rd., Berkeley, Calif.

Filed April 19, 1971, Ser. No. 134,954

Int. Cl. G02b 5/08

U.S. Cl. 350—305

3 Claims



A mirror mounting unit designed to function along side an existing mirror to provide a back-of-the-head viewing system. The unit is composed of a bracket having a vertical bar upon which is slideably and rotatably mounted an extendable arm having on one end thereof one portion of a ball and socket retainer and a hand mirror with handle, having on one end of the handle the other portion of the retainer, such that the mirror may be rotatably suspended thereby.

### 3,730,613 INFORMATION RECORDING AND REPLAY METHODS AND APPARATUS

Joseph J. Neff, Pasadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Nov. 16, 1970, Ser. No. 89,995

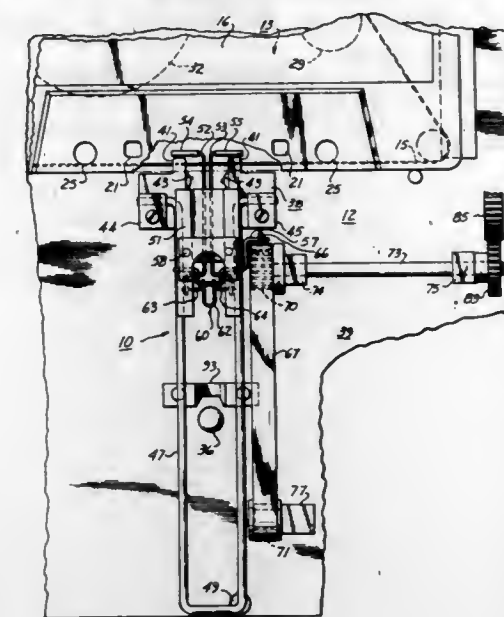
Int. Cl. B65h 17/00; G03b 1/18

U.S. Cl. 352—72

50 Claims

Methods and apparatus for performing a function (such as recording or playback) relative to an elongate information carrier located in a casing include the provision of a capstan at a distance from the casing and an extraction of a length of the information carrier out of the casing in a direction away from

the casing by finger means. A portion of the extracted information carrier is placed onto the capstan with the finger



means and the capstan is employed to advance the information carrier. The desired function is then performed relative to the information carrier.

### 3,730,614 AN OVERLAP CONTROL DEVICE FOR A MOTION PICTURE CAMERA

Hiroshi Hirata, Sakai-shi, Osaka-fu, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

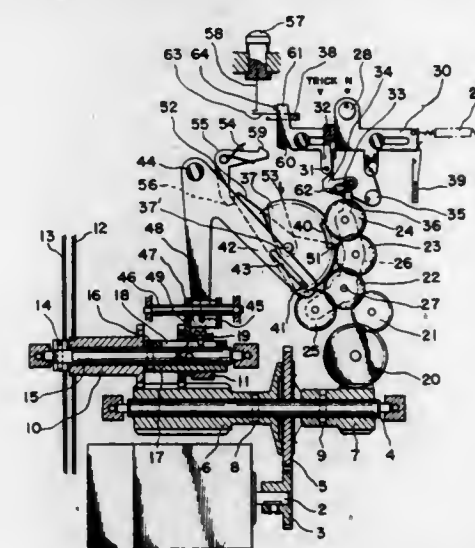
Filed July 23, 1970, Ser. No. 57,537

Claims priority, application Japan, July 31, 1969, 44/60013

Int. Cl. G03b 21/36

U.S. Cl. 352—91

2 Claims



An overlap photographic control device uses a manually operated change-over member to effect either normal or overlap photographic operation in accordance with the position of the change-over member. A switch operated by the change-over member drives the camera motor in a reverse direction to rewind the film and the switch is retained by a lock member until a clutch, associated with the change-over member, drives a control gear to close the aperture. After the shutter is driven to a position to block light rays the control gear is disengaged from the clutch and the sector gear actuates the switch lock member to enable the switch to change the direction of the motor. The change-over operation member is released and allowed to return to its normal photographic position. Automatic control of fade in and fade out photography is thereby obtained.



3,730,615

**IMAGE DISPLAY FROM CONTINUOUSLY MOVING IMAGE CARRIER**

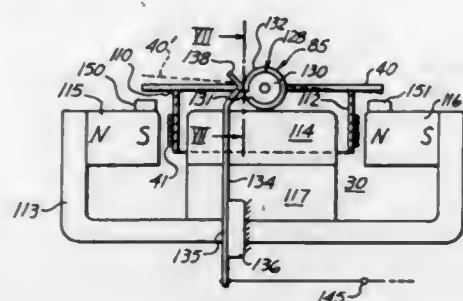
James G. Woodler, Chicago, Ill., assignor to Bell &amp; Howell Company, Chicago, Ill.

Filed Jan. 11, 1971, Ser. No. 105,515

Int. Cl. G03b 41/10

U.S. Cl. 352-109

8 Claims



An apparatus for displaying images of a succession of recordings from a continuously moving carrier operates with an optical compensator of a type being repeatedly advanced and being reset between successive advancements. Each image is displayed by the way of the compensator and the compensator is advanced during the display of each image to compensate for the continuous carrier movement and for sensed movements in the projected images. Resetting of the compensator is initiated by an electrical signal generating device which is coupled to the compensator drive for providing a reset signal upon attainment by the compensator of the predetermined state of advancement.

3,730,616

**CINEMATOGRAPHIC APPARATUS**

Engelbert Fflesser, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

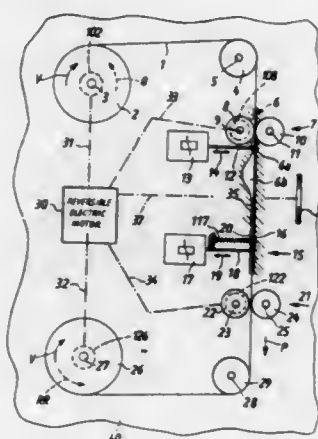
Filed Sept. 23, 1971, Ser. No. 182,980

Claims priority, application Germany, Sept. 25, 1970, P 20 47 351.2

Int. Cl. G03b 1/00

U.S. Cl. 352-166

16 Claims



A motion picture projector wherein the supply and takeup reels are rotatable in either direction by way of friction clutches and wherein the film is moved stepwise past the gate by two transporting devices which employ friction wheels and pressing rollers serving to bias the film against the respective friction wheels. The friction wheels are driven by way of friction clutches from a separate motor or from the motor which serves to drive the supply and takeup reels. An electromagnetically operated arresting device is located between the gate and one of the transporting devices to hold the film against lengthwise movement by the one transporting device when the other transporting device is free to move the film past the gate, and an electromagnetically operated blocking device is mounted between the gate and the other transporting device

to hold the film against movement past the gate when the image of a film frame is being projected and while the arresting device is inoperative to thus permit the film to form a loop upstream of the gate.

3,730,617

**MOTION PICTURE CAMERA FOR USE IN DAYLIGHT AND ARTIFICIAL LIGHT**

Siegfried Werz, Munich, and Johann Zanner, Unterhaching, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

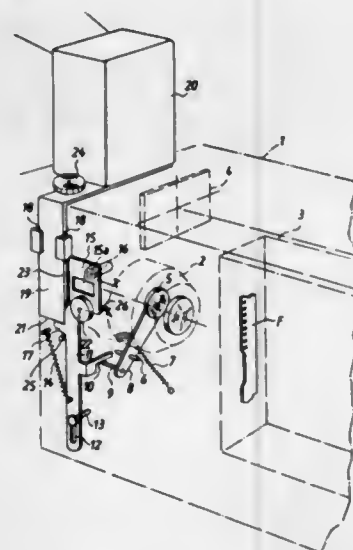
Filed Aug. 25, 1971, Ser. No. 174,639

Claims priority, application Germany, Aug. 27, 1970, G 70 31 983.4

Int. Cl. G03b 11/00

U.S. Cl. 352-244

13 Claims



A motion picture camera with a conversion filter which is automatically moved out of registry with the picture taking lens in response to attachment of a source of artificial light. A knob which is connected with the mechanism that moves the filter in response to attachment of a light source to the housing of the camera can be actuated by hand to return the filter into registry with the lens while the light source remains attached to the housing to thus enable the user to make one or more exposures without artificial illumination of the subject while the source remains attached to the housing. The knob can also return the filter to a position out of registry with the lens while the light source remains attached to the housing.

3,730,618

**AUDIO AND AUDIOVISUAL APPARATUS WITH PINCERS-LIKE ROTATING ARM**

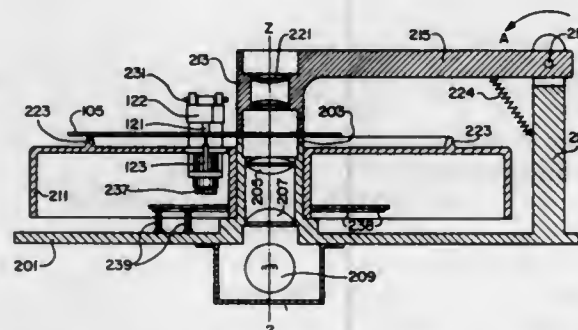
Panayotis C. Dimitracopoulos, P. O. Box 458, Outremont, Montreal, Quebec, Canada

Filed March 2, 1970, Ser. No. 15,739

Int. Cl. G11b 17/06; G03b 31/06

U.S. Cl. 353-19

26 Claims



An audio apparatus comprising a rotating information-scanning arm, having the general shape of a two-pronged

3,730,621

**CONTROL OF ELECTROSTATIC DEFORMATION OF THERMOPLASTIC FILM**

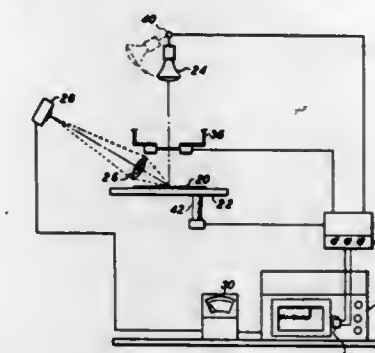
William A. Sullivan, Jr., Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 777,959, Oct. 17, 1968, abandoned, which is a continuation of Ser. No. 506,646, Nov. 8, 1965, abandoned. This application Jan. 27, 1971, Ser. No. 110,214

Int. Cl. G03g 15/00

U.S. Cl. 355-9

6 Claims



Apparatus for producing images by electrostatic deformation has a light source for both exposing the deformable member to an image and heating the deformable member to the point where it is deformed by the electrostatic charges. A photocell receives rays passing from the light source through the deformable member or reflected from the deformable member and generates an electrical signal to terminate the heating of the film at the appropriate time.

3,730,622

**MICROFILM VIEWER-PRINTER**

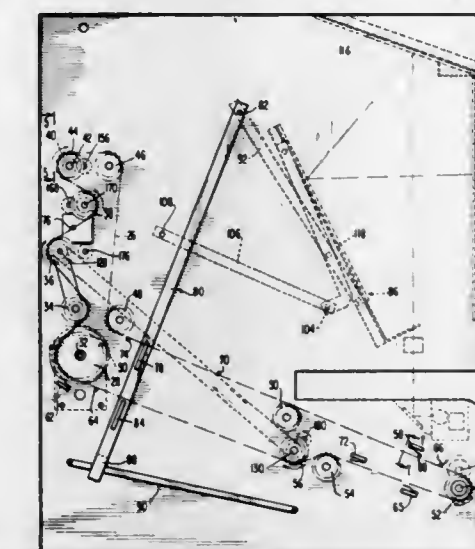
Lawrence M. Freeman, and Francis T. Arnold, both of Atlanta, Ga., assignors to Mikro Information Systems, Inc., Atlanta, Ga.

Filed May 24, 1971, Ser. No. 146,114

Int. Cl. G03b 27/70

U.S. Cl. 355-14

34 Claims



In a viewer-printer, a chain is provided which is driven by the motor's sprocket wheel. The chain drives other sprocket wheels in the viewer printer to effectuate feeding and delivery of the copy paper. Along a portion of the chain, normally a single chain, is a dual link chain constituting two such chains integrally mounted together. The additional portion drives rollers which feed paper about to be copied. Cams are provided along the chain to throw switches. The placement of the switches along the chain control the machines timing. A lug on the chain engages the mirror to move it from a viewing position to an exposing position and returning to the viewing position.

3,730,619

**APPARATUS FOR INFORMATION RETRIEVAL**

Sakae Fujimoto, Chofu-shi, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

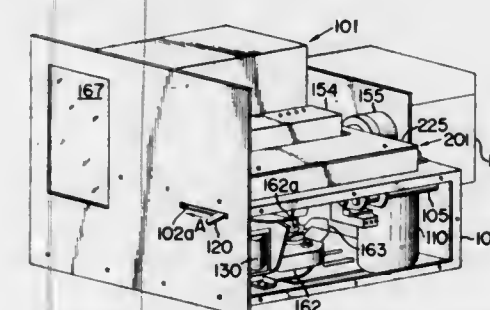
Filed Feb. 17, 1970, Ser. No. 12,089

Claims priority, application Japan, Feb. 20, 1969, 44/12843

Int. Cl. G03b 23/12, 21/28

U.S. Cl. 353-26

8 Claims



A method and apparatus for information retrieval wherein an endless film recording informations thereupon is advanced and the counting is started upon detection of the zero (reference) position of said film and when the counting reaches a predetermined value, the film is automatically stopped.

3,730,620

**FOCUSING METHOD**

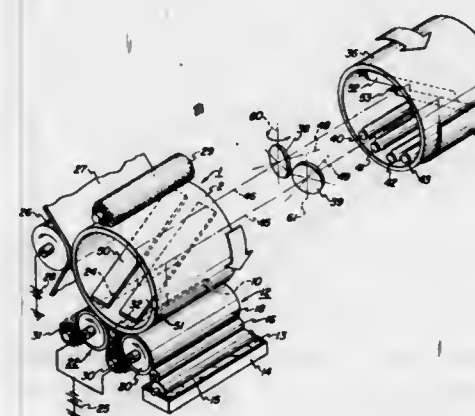
Earl V. Jackson, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 29, 1970, Ser. No. 102,460

Int. Cl. G03g 15/04

U.S. Cl. 355-8

3 Claims



A method for presenting focused images at a predetermined magnification in an optical system having narrow format and fixed object and image planes. The lens with a nominal focal length suitable for the system is manipulated according to the invention by rotating it to change the total conjugate of the optical system while maintaining a fixed physical distance along the principal ray of the imaging system between the object and image planes.



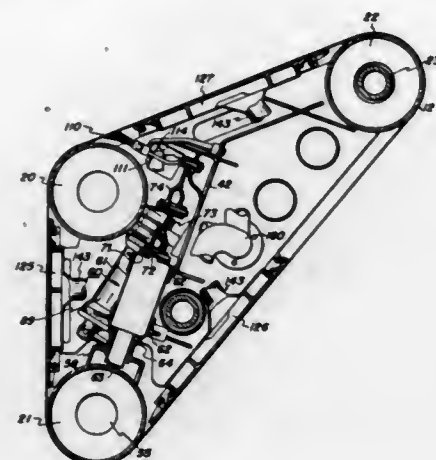
3,730,623

**VACUUM HOLDDOWN DEVICE FOR MOVING BELTS**  
William E. Jordan, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 29, 1970, Ser. No. 102,312  
Int. Cl. G03g 15/00

U.S. Cl. 355-16

1 Claim



A vacuum holddown device for use in an apparatus employing flexible web material in a flattened condition. A perforated plenum plate is joined to a manifold connectable to a vacuum producing means. A plurality of ribs are formed on the plate between it and the manifold. When the space between the plenum plate and manifold is evacuated the latter is forced against the ribs.

3,730,624

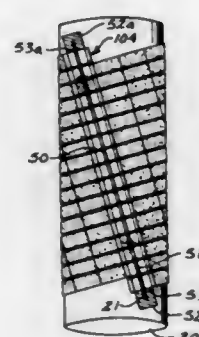
**METHOD OF MAKING A MATRIX OF PHOTOGRAPHS FROM A FILM STRIP**

Julian Silver, White Plains, N.Y., assignor to U. S. Dynamics Inc., Elmsford, N.Y.

Filed April 26, 1971, Ser. No. 137,270  
Int. Cl. G03b 27/02

U.S. Cl. 355-132

18 Claims



A method of making a rectangular matrix from a film strip having photographic frames with image areas includes the steps of exposing a series of image areas on frames of a film strip, leaving blank frames at predetermined locations on the film strip, processing the film strip to produce image transparencies thereon, winding the film strip around a cylinder to form adjacent convolutions with the blank areas aligned, securing the blank areas together, and cutting the film strip on the cylinder through all of the blank areas at an angle approximately of 90° with respect to the longitudinal axis of the film strip thereby to produce a rectangular matrix of photographic frames with image areas thereon, termed as a fiche. The resulting matrix, plus an indicia bearing document, may be photographed to produce a photographic transparency or fiche copy.

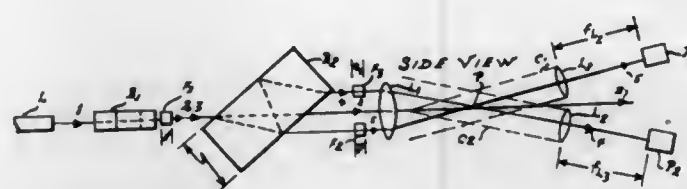
3,730,625

**LASER VELOCIMETER EMPLOYING REFERENCE BEAM DETECTION**

Donald B. Brayton, Tullahoma, Tenn., assignor to The United States of America as represented by the Air Force  
Filed Feb. 26, 1971, Ser. No. 119,322

Int. Cl. G01p 3/36  
U.S. Cl. 356-28

3 Claims



A doppler shift laser velocimeter is disclosed that employs a self-aligning optical system capable of determining one or more velocity components of a moving substance. The beam from a plane polarized laser source is automatically split into two or more plane polarized parallel beams by one or more parallel surface glass blocks. These beams are then directed onto a focusing element which automatically focuses them to a common point P in space. One or more velocity components of a moving substance are detected by placing photodetectors in the paths of one or more of the beams after they have traversed through or reflected from the moving substance near the common point P. Means are connected to the outputs of the photodetectors for determining the frequencies of the electrical signals. These frequencies are proportional to the specific velocity components of the moving substance.

3,730,626

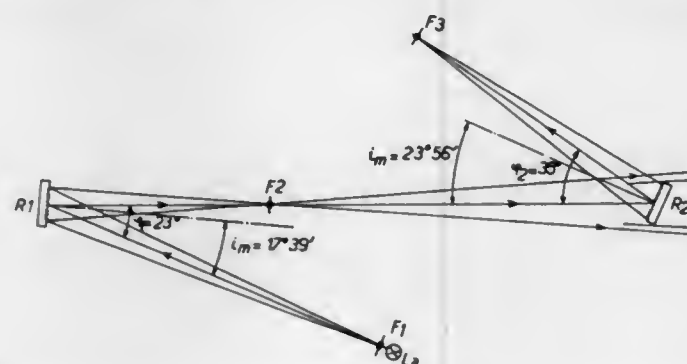
**MONOCHROMATORS WITH CONCAVE SPHERICAL GRATINGS**

Paul E. Cruveiller, Marseille, and Michel Duban, Gemenos, both of France, assignors to Centre National d'Etudes Spatiales, Paris, France

Filed Feb. 11, 1972, Ser. No. 225,501  
Claims priority, application France, Feb. 11, 1971, 04612  
Int. Cl. G01j 3/12; G01n 21/34

U.S. Cl. 356-101

5 Claims



This invention relates to a monochromator with a rotating concave spherical grating in which the source-to-grating distance L is equal to

$$[2R \sin \phi \cos i_m] / 2 \sin \phi - (k\lambda_m/a) \cos r_m$$

Where  $\phi$  is the angle of deviation of the beam, R is the radius of curvature of the grating,  $\lambda_m$  is the mean working wavelength,  $i_m$  and  $r_m$  are the angles of incidence and of diffraction for  $\lambda_m$ , a is the pitch of the grating and k is the order of the operative procedure, the angle  $\phi$  being less than 40° but at least equal to  $k\lambda_m/a$ . The monochromators can be used for studying photomultipliers.

3,730,627

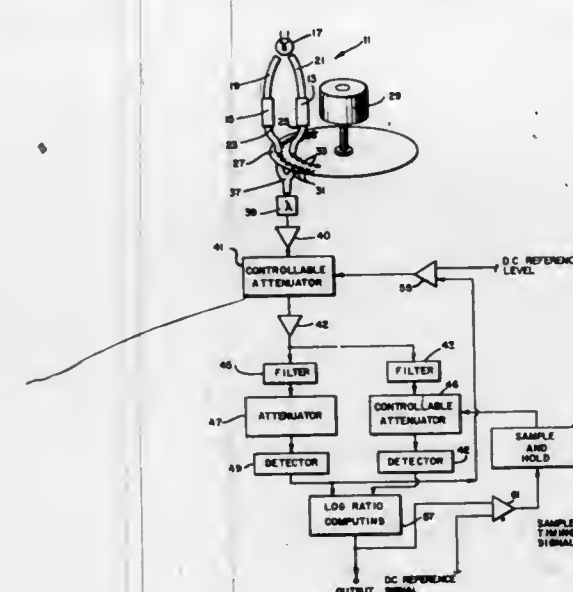
**SIGNAL PROCESSOR**

Robert L. Kent, Andover, Mass., assignor to Damon Corporation, Needham Heights, Mass.

Filed Sept. 22, 1971, Ser. No. 182,785  
Int. Cl. G01n 21/22

U.S. Cl. 356-205

6 Claims



The absorbance measuring signal processor disclosed herein operates to generate a signal representing the absorbance of an unknown sample in relation to the absorbance of a previously measured standard sample. In measuring the absorbance of each sample, standard or unknown, the apparatus generates a signal corresponding to the log ratio of two signals, representing, respectively, the optical transmission of the sample channel and the optical transmission of a reference channel. The use of the ratio of the two transmission characteristics compensates for source and detector sensitivity variations while the logarithmic characteristic provides a signal which corresponds with the absorption characteristic.

In accordance with the invention, a controlled attenuation factor is applied to one of the transmission signals and this attenuation factor is adjusted, during measurement of the standard sample, so as to produce an absorbance output signal of predetermined level. A signal level representing this particular attenuation factor is sampled and stored and this same attenuation factor is then applied during the measurement of subsequent unknown samples. Accordingly, the absorbance-representing output signals obtained with unknown samples vary in relation to the predetermined standard absorbance output signal level as their absorbances vary in relation to the absorbance of the standard sample.

3,730,628

**ELECTRONIC DISTANCE MEASURING METHOD AND APPARATUS**

John R. Wolcott, and MacDonald J. Wiggins, both of Orlando, Fla., assignors to Martin Marietta Corporation, New York, N.Y.

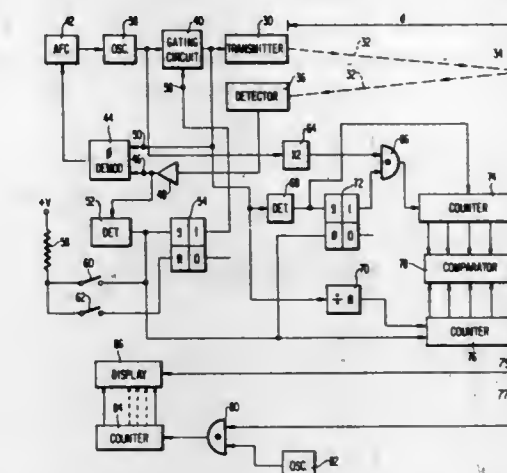
Filed Dec. 16, 1970, Ser. No. 98,778  
Int. Cl. G01c 3/08; G01s 9/23

U.S. Cl. 356-5

25 Claims

An electronic distance measuring device and method for determining the distance between two locations utilizing electromagnetic or light wave energy. The wave energy is transmitted from one location to the other and is reflected back toward the transmitting location. The reflected energy is detected and compared in phase with the transmitted energy, and the phase relationship between the transmitted and detected energy varied until a predetermined phase relationship

exists. The predetermined phase relationship is selected so that the wave energy along the path between the transmitter, reflector and detector contains an integral number of



wavelengths of wave energy. A time gate related to the propagation of the wave energy along this path is generated and distance is displayed digitally in response to the time gate and a highly stable reference frequency signal.

3,730,629

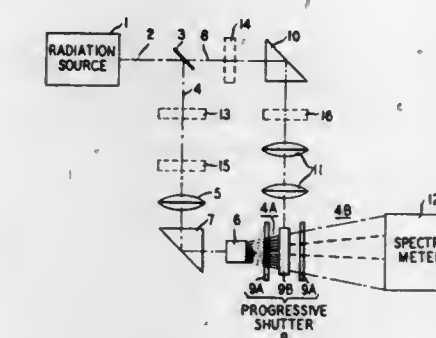
**TIME RESOLVED SPECTROMETER**

Peter Michael Rentzepl, Millington, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 24, 1970, Ser. No. 101,208  
Int. Cl. G01j 3/02, 3/42

U.S. Cl. 356-74

6 Claims



Apparatus arrangements for yielding either absorption or emission spectral data with superimposed time resolution are described. Such apparatus may serve in the manner of any of the various spectrometer designs and may yield information of the variety, bandwidth, accuracy and precision characterized by conventional instruments. In a particular embodiment, time resolution, which may range over a scale of from a few hundred picoseconds or more, is evidenced in terms of relative displacement of portions of the spectra. Displacement proportional to time in such embodiment results from the progressive opening of a electrooptic shutter under the influence of a traveling light pulse.

3,730,630

**OBSERVING DEVICE FOR HEATED SAMPLE CELLS**

Wolfgang Witte, 777 Ueberlingen, Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Bodensee, Germany

Filed Dec. 21, 1970, Ser. No. 100,170  
Int. Cl. G01j 3/02

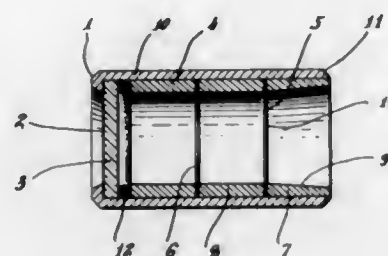
U.S. Cl. 356-74

3 Claims

An opening in the housing surrounding a graphite tube sample cell of the type used for heating an atomic absorption sam-



ple may be used for introducing the sample and later (when the graphite cell is heated during sample measurement) must be closed to avoid escaping of the non-oxidizing gas introduced within the housing for protection of the graphite cell. It has already been proposed to construct such a closing device so as to allow observation of the graphite cell but existing devices do not allow observation of the graphite cell during sample measurement when it is red-hot. An improved



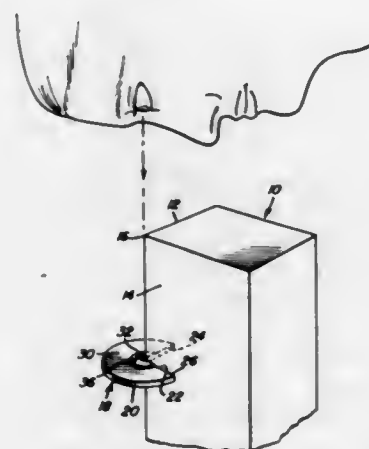
combined observing and closure device utilizing the known principles of a pin-hole camera includes an apertured stop (preferably a field stop) and a ground-glass screen for receiving the image, all in a supporting tubular member which may be utilized as the closure. Preferably the parts of the device nearest the graphite tube cell (e.g., one surface of the apertured stop and its supporting structure) are made specularly reflecting.

### 3,730,631 ANGLE GAUGE

George W. Streander, Alamogordo, N. Mex., assignor to Design Systems, Inc., Alamogordo, N. Mex.  
Filed Sept. 20, 1971, Ser. No. 181,861  
Int. Cl. G01b 1/00

U.S. Cl. 356—150

6 Claims

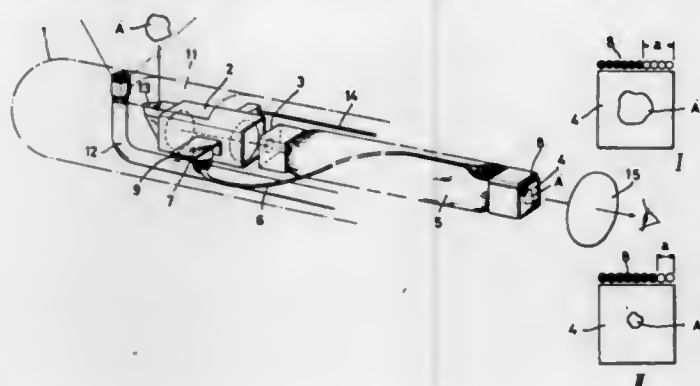


A corner angle testing body including a panel member having a notch formed therein defined by a pair of relatively angular plane surfaces defining a desired included angle therebetween. The panel member further includes an enlargement of the apex portion of the notch adjacent and extending about the point of intersection of the plane surfaces defining the notch and one side of the panel member is provided with a plane partial annular light-reflective surface extending about and concentric with the point of intersection of the plane surfaces defining the notch and the light-reflective surface is disposed normal to the notch-defining plane surfaces or edges.

3,730,632  
**ENDOSCOPE PROVIDING AN IMAGE OF AN OBSERVED OBJECT AND A SCALE BY WHICH THE TRUE SIZE OF THE OBJECT CAN BE DETERMINED FROM THE IMAGE**  
Toshio Chikama, Tokyo, Japan, assignor to Kabushiki Kaisha Machida Selsakusho, Tokyo, Japan  
Filed June 25, 1971, Ser. No. 156,701  
Claims priority, application Japan, June 26, 1970, 45/55190  
Int. Cl. G01b 11/00

U.S. Cl. 356—156

10 Claims

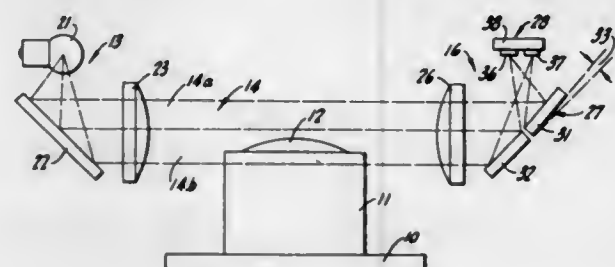


An endoscope is provided with apparatus for indicating the actual size of an observed object, the apparatus comprising a scale indicating portion in which the length of a bright or shaded portion is varied by movement of a shading plate in correspondence with relative movement effected between an object lens housing and an image conducting member to form a sharp image on an image viewing surface of the image conducting member. The indicating portion is adjacent the image viewing surface and the length of the bright or shaded portion represents a predetermined dimension, e.g., 10 mm and by comparing the size of the actual image of the object to the length of the bright or shaded portion, the actual size of the object can be determined.

3,730,633  
**PHOTOMETRIC DETECTOR AND MEASURING SYSTEM**  
William S. Kennedy, San Jose, Calif., assignor to Aerotherm Corporation, Mountain View, Calif.  
Filed Dec. 31, 1970, Ser. No. 103,065  
Int. Cl. G01b 11/00

U.S. Cl. 356—156

1 Claim



Photometric system in which a portion of a columnized beam of light is interrupted by objects in a predetermined region, while another portion of the beam passes uninterrupted to a receiving station. The two portions of the beam are separated at the receiving station, and their intensities are compared to determine the presence of objects and the extent to which they are present in the region.

### 3,730,634 APPARATUS FOR CUTTING AND DRILLING SHEET MATERIAL

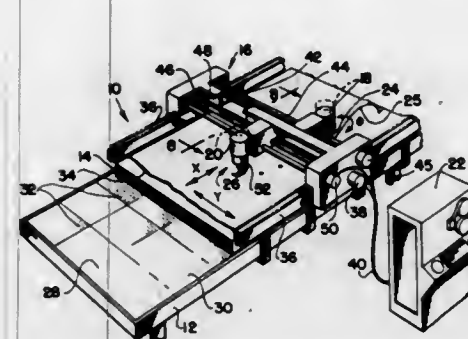
Helmut Joseph Gerber, and David R. Pearl, both of West Hartford, Conn., assignors to Gerber Garment Technology, Inc., East Hartford, Conn.

Continuation-in-part of Ser. No. 1,412, Jan. 8, 1970. This application Nov. 27, 1970, Ser. No. 92,983

Int. Cl. 408 88; B27c 9/00

U.S. Cl. 408—22

17 Claims



Apparatus for cutting and drilling layouts of sheet material and including a table for supporting a layout, a main carriage supported for movement in one coordinate direction relative to the table, and cutting and drilling heads supported on the carriage for movement therewith and relative thereto and to each other in at least one other coordinate direction. The main carriage and the cutting and drilling heads move in response to positioning signals supplied by a numerically controlled or computerized controller. A movable cutting tool or blade driven by the cutting head is adapted to advance in cutting engagement with the layout to form a cut therein. A trepanning or drilling tool carried by the drilling head removes material from the layout at selected points to form openings therethrough. The shape of the drilling tool is such that the drilling operation is performed with a minimum of applied pressure, so that substantially no compressive force is applied to the layout by the drilling tool to cause movement of upper layers of the layout relative to the cutting tool.

### 3,730,635 DRILL PRESS

Roderich Orendl, Rosnetstrasse 50, Reutlingen-Sondelfingen, Germany

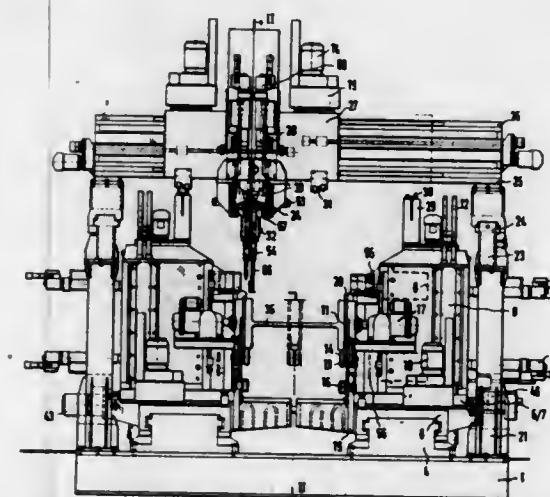
Filed Oct. 2, 1970, Ser. No. 77,661

Claims priority, application Japan, Oct. 6, 1969, 44/79912

Int. Cl. B23b 39/18, 41/00

U.S. Cl. 408—46

6 Claims



The drilling of holes in three different planes and thus into three different surfaces of a workpiece, especially extra heavy workpieces, is accomplished by the present numerically controlled drill press by means of mirror-symmetrical housings

each carrying a rotational set of horizontal boring quills and long chuck jaws facing each other as well as an overhead vertical set of boring quills. The drill bits of the horizontal boring quills extend in their operational position through said long chuck jaws, whereby even I-beams may be drilled through three surfaces simultaneously.

### 3,730,636 BORING HEAD

Sutemaru Mizoguchi, No. 1738, Oh-aza, Kitahara, Ikoma-cho, Ikoma-gun, Nara, Japan

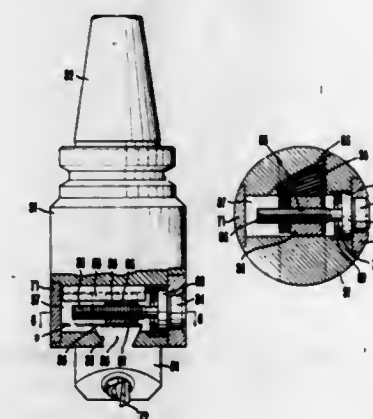
Filed Dec. 1, 1970, Ser. No. 93,932

Claims priority, application Japan, Dec. 10, 1969, 44/99618

Int. Cl. B23b 43/00, 51/00

U.S. Cl. 408—169

1 Claim



A boring head has a boring head body having a shank on the upper part thereof, and bit mounting means is slidably fitted into a transverse channel formed on the underside of the body. A bit is secured to the bit mounting means. In one embodiment, a bolt is loosely fitted into a transverse hole formed through the mounting means, one end thereof being loosely fitted through a hole formed on one side of the concave channel of the body. The other end of the bolt is screwed into a threaded hole formed on the other side of said concave channel. Wedge members are provided in concavities above the transverse channel which are moved by bolts therethrough to wedge the mounting means downwardly while it is loosely held by the bolt through the transverse hole, after which the bolt is tightened to secure the mounting means. In a second embodiment, the mounting means has a helical rack gear thereon meshing with a sliding member in a transverse hole above the transverse channel, and a bolt threaded through the sliding member moves the sliding member when the bolt is rotated, thereby moving the mounting means.

### 3,730,637 TOOL HOLDER LOCKING DEVICE FOR ROTATING SPINDLES

Vito Cellini, 281 Brinsmade Ave., Bronx, N.Y.

Filed Oct. 30, 1970, Ser. No. 85,439

Int. Cl. B23b 39/00

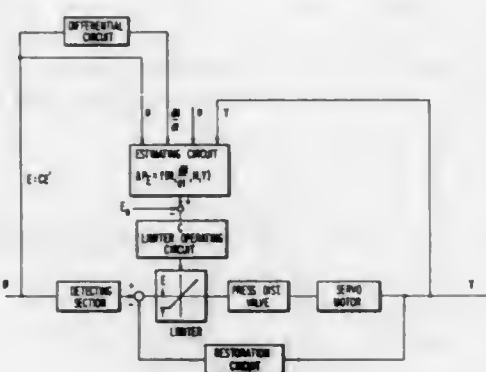
U.S. Cl. 408—239

9 Claims

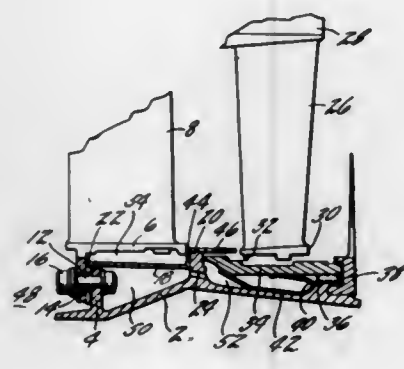
A locking device for releasably securing a work tool holder to a rotating spindle. This locking device is centrally mounted within the rotating spindle to rotate therewith and includes a bushing with a lock shank extending downwardly with radially extending projection adapted to engage with projections on the inner end of the tool holder. Cam slot means are provided upon the lock member to effect a turning of the lock member for engagement of the projections of the lock member with the projections of the tool holder, an operating rod extends upwardly from the lock member within the spindle and spring biasing means urging the upward movement of the operating member, the operating member is confined against rotation while being depressed and has pin projections entering the



## 11 Claims



### 6 Claims

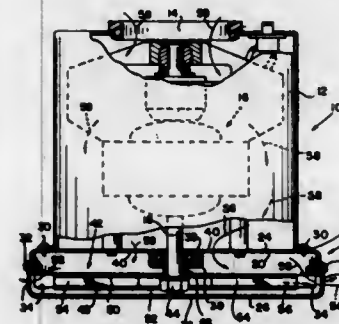


237

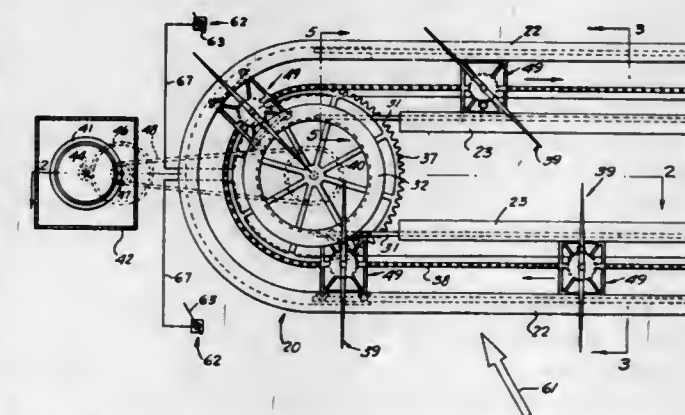
## 9 Claims



## 14 Claims



### 8 Claims

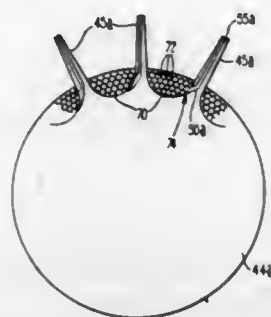


### 5 Claims

An industrial gas turbine engine comprises a multi-stage axial compressor, combustion equipment, a multi-stage compressor driving turbine, a power turbine and an exhaust duct, the compressor driving turbine being provided with cooling means to cool the blades of said turbine. The cooling means comprises a flow of cool air from the compressor which flows onto the surface of each turbine rotor blade through slots in the rotor rim. The cool air also flows over the surface of the turbine rotor between adjacent blades and the space between adjacent blades is filled with a honeycomb material, the cells of which constitute ducts for the flow of cooling air. The stator



vanes of the compressor driving turbine are cooled both by air from the compressor and heat exchange means which com-



prises in a closed sodium filled loop, a pump, a coil in the cool air delivered by the compressor, a coil in each stator vane and a coil in the exhaust duct.

#### ERRATUM

For Class 417—424 see:  
Patent No. 3,730,642

3,730,645

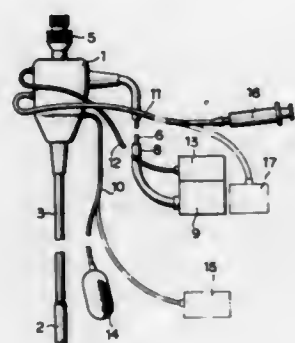
#### AIR SUPPLYING DEVICE FOR AN ENDOSCOPE

Fukami Mashakaru, No. 2461, Kammeguro, 5-chome; Masaaki Sato, No. 13, Teradacho, and Toshiyuki Mori, No. 500, Akatsutsumicho, 2-chome, all of Tokyo, Japan  
Division of Ser. No. 760,151, Sept. 17, 1968, abandoned. This application Sept. 25, 1970, Ser. No. 75,597  
Claims priority, application Japan, Sept. 21, 1967, 42/80171; Feb. 1, 1968, 43/6414

Int. Cl. F04b 49/00

U.S. Cl. 417—12

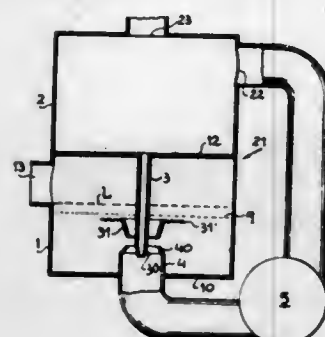
3 Claims



An air supplying device for use with an endoscope for supplying desired quantity of air into a hollow portion of a living body into which the forward end portion of the endoscope is inserted for the inspection thereof so that the hollow portion is inflated appropriately for the proper inspection and/or photographing of the hollow portion. The air supplying device comprises a foot switch, a timer and an air pump actuated by closing the foot switch through the timer for supplying air to the endoscope to which the air pump is connected. The timer is actuated each time the foot switch is closed for actuating the air pump so that the timer deenergizes the air pump after a predetermined time period set in the timer so that a predetermined quantity air is supplied to the endoscope each time the foot switch is closed while the air pump is stopped at any desired moment during the actuation of the timer by opening the foot switch so that excess quantity of air is prevented from being supplied to the endoscope.

3,730,646  
FLUID PROPELLING SYSTEM  
Ambrogio Affri, and Giovanni Affri, both of Via Campo dei Fiori 26, Induno, Italy  
Filed May 4, 1971, Ser. No. 140,188  
Int. Cl. F04b 23/04, 23/08; F16h 41/04  
U.S. Cl. 417—77

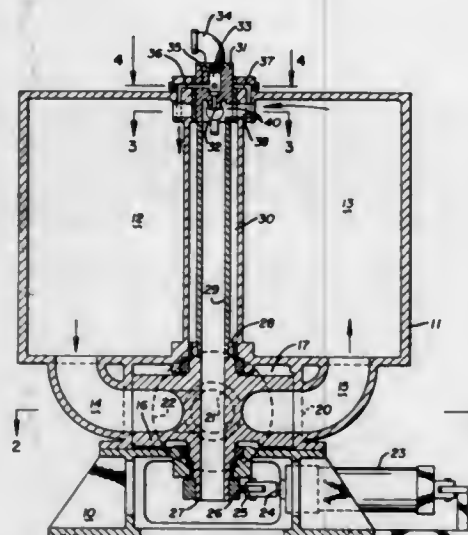
12 Claims



This invention relates to improvements in systems for propelling fluids i.e., gas and/or liquids. A system according to this invention comprises: a first reservoir filled with a liquid; a second reservoir preferably above said first reservoir, a duct connecting the bottom of said first reservoir to the top of said second reservoir; driving means, for feeding power into the system fluid, disposed in such duct; and an injector connecting the bottom of said second reservoir to the bottom of said first reservoir and extending for a short length into the inlet of said duct connecting the bottom of said first reservoir to the top of said second reservoir.

3,730,647  
AIR ACTUATED VACUUM PUMP  
Vincent P. Lonardo, 5890 Salt Springs Road, Girard, Ohio  
Filed Aug. 25, 1971, Ser. No. 174,855  
Int. Cl. F04f 1/02, 1/06, 5/48

4 Claims



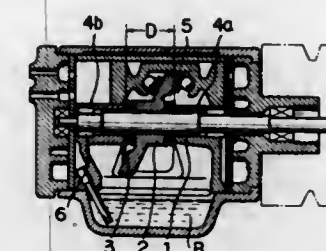
An air actuated vacuum pump has a pair of chambers positioned about a rotatable air passageway structure in which a partial vacuum is established by a Venturi jet with the air passageway structure arranged to communicate alternately with said chambers. A base including inlet and outlet passageways and a valve forming extensions of the air passageway structure supports the chambers and the valve establishes alternate communication between the chambers and said inlet and outlet passageways respectively. Means is provided for rotating said air passageway structure and openings in the upper portions of said chambers alternately communicate with said air passageway structure so that partial vacuums may be created therein so as to effect a pumping action.

3,730,648  
SWASH PLATE TYPE COMPRESSOR FOR AUTOMOBILE AIR-CONDITIONING  
Sampel Komlya, No. 1745-1 Ohaza Shimokoizumi Ohizumi-cho, Ohra-gun, Gunma, Japan  
Filed April 1, 1971, Ser. No. 130,216  
Claims priority, application Japan, April 13, 1970, 45/34730

Int. Cl. F04b 1/12, 27/08

U.S. Cl. 417—269

3 Claims



An improved swash plate type compressor for automobile air-conditioning, includes a swash plate chamber positioned centrally between axially spaced front and rear cylinder halves and having intermediate gas passageways forming a part of with the cylinder block gas passageways which inter-communicate between the suction chambers and the gas storage-discharging chambers of the cylinder halves. Further, the swash plate chamber forms an oil reservoir portion aligned and communicating with the oil reservoir portions of the cylinder halves and constituting a part of oil reservoir for the compressor.

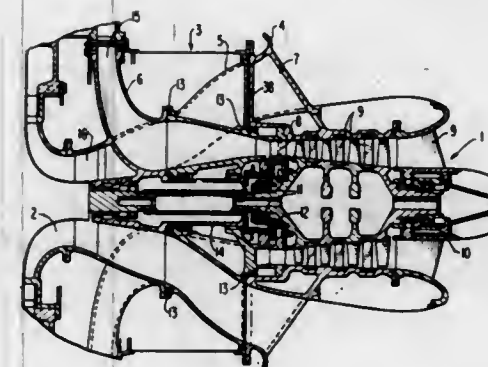
3,730,649  
SHIFT ELEMENT FOR GAS TURBINE FOR SHIFTING BETWEEN SERIES AND PARALLEL OPERATIONS  
Werner Bruder, Neckarrems, and Hubert Grieb, Stuttgart, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany  
Filed June 3, 1971, Ser. No. 149,699

Claims priority, application Germany, June 3, 1970, P 20 27 222.4

Int. Cl. F04b 17/00

U.S. Cl. 417—408

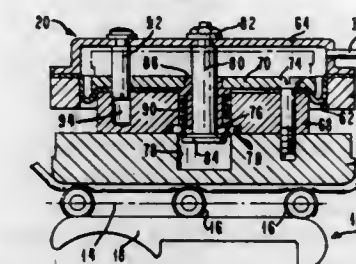
32 Claims



A shifting element for gas turbines for shifting between series and parallel operation which is arranged concentrically between two turbo-units and is subdivided into channel sectors for the connection of the flow paths of the turbo-units with each other or for the connection of the turbo-units with an inlet and a gas discharge; the shifting element consists of at least two mutually rotatable parts arranged one behind the other, of which the forward part is provided with a gas inlet and with a connection to the gas outlet of the upstream turbo-unit while the rear part is provided with a connection to the gas inlet of the downstream turbo-unit and with a gas outlet.

3,730,650  
PERISTALTIC PUMP AND SYSTEM THEREFOR  
Nelson G. Kling, deceased, late of Ocala, Fla. (by Alice Irene Kling, administratrix), assignor to Technicon Instruments Corporation, Tarrytown, N.Y.  
Filed Sept. 14, 1970, Ser. No. 71,773  
Int. Cl. F04b 43/08, 43/12, 45/06  
U.S. Cl. 417—475

7 Claims

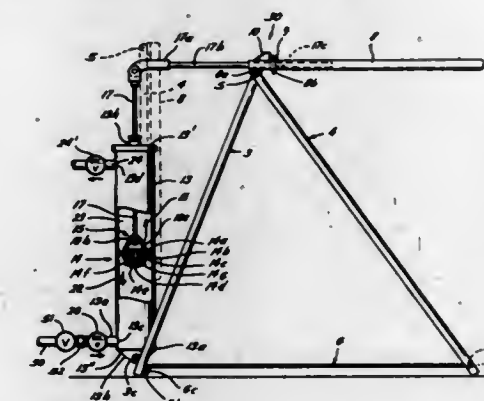


A peristaltic pump is provided, which may have auxiliary fluid introduction, for a plurality of resilient pump tubes progressively occluded concurrently along a portion of their lengths, recurringly, to advance fluids therethrough by a pressure roller assembly; and a control system for the pump to render the roller assembly inoperative to advance fluids. A platen is mounted for movement from an operative position, in which the pump tubes are engaged and sandwiched between the platen and the roller assembly, to an inoperative position in a direction away from the roller assembly. In the inoperative position of the platen, a tube or tubes of the auxiliary fluid introduction, which includes a pressure pin cooperating with a pad engageable with the tube or tubes therebetween, are released. The platen is power-operated to move to at least one of the two aforementioned positions thereof.

3,730,651  
PUMP AND FOLDING SUPPORT ARRANGEMENT THEREFOR

Lonnle T. Ellis, Route 2, Box 33-A, Orange, Tex.  
Filed Jan. 12, 1972, Ser. No. 173,105  
Int. Cl. F04b 21/04, 9/02

6 Claims



A pump and support arrangement therefor includes a first generally triangular frame means for pivotally supporting a hollow pump housing at its lower end. The converging sides of the first frame means are provided with a pivotal connection adjacent their upper ends and an additional frame means of a generally conforming triangular configuration and somewhat larger is also connected to the same pivot at its upper end. This enables the first frame means and the additional frame means to be pivoted toward and away from each other, so that when they are pivoted toward each other, the first frame means is nested within the additional frame means. Lock means are provided so that when the frame means are spread apart, they may be retained in such spread apart relationship for supporting the pump during operation.



The hollow housing of the pump includes a piston with an opening therein and valve means for accommodating flow through the piston in one direction, but preventing flow in another direction. A piston rod is connected to such valve means and extends out the upper end of the hollow housing and is provided with a support means pivotally connected thereto which is telescopically received within tubular means that are pivotally carried by the same pivotal support which pivotally supports the first and additional frame means.

The piston rod support means and the tubular housing telescopically receiving it are provided with securing means for securing the piston rod support means in an extended position relative to the tubular means and also in a collapsed position relative to the tubular means when the first frame means and additional frame means are in nested relation. When the piston rod support means and the tubular means are secured in extended relation, the tubular means functions as a handle to aid in moving the piston up and down within the housing so as to move fluid received from an inlet in the housing through the piston and thereabove, and thereafter on an upstroke of the piston, the valve means closes and moves the trapped fluid through an outlet in the housing.

3,730,652

## FLUID PRESSURE DEVICES

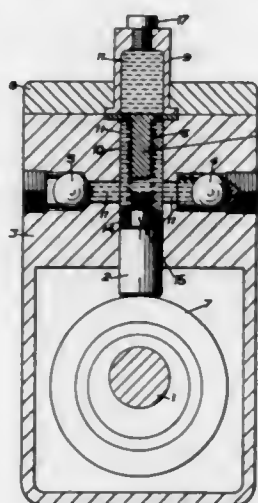
George Wavell Roberts, Crofton, near Wakefield, England, assignor to Gravaki Systems Limited, Hincley, Leicestershire, England

Continuation of Ser. No. 53,374, July 9, 1970. This application Sept. 21, 1972, Ser. No. 291,034

Int. Cl. F01b 31/14; F04b 21/02, 49/00

U.S. Cl. 417-568

10 Claims



In a fluid pressure device a compressible liquid is acted upon by a liquid displacement surface contained in a pressure chamber having a valve means for controlling the inlet of liquid thereto and the outlet of liquid therefrom. Said chamber includes portions defining respectively a volume swept by the liquid displacement surface and a volume unswept thereby; and during operation of the device with the valve means closed the liquid displacement surface is displaced to compress a volume of liquid equal to the swept volume into a volume of liquid equal to the unswept volume to produce a predetermined liquid pressure within the pressure chamber without any output of compressible liquid from the device.

3,730,653

## VARIABLE DELIVERY PUMP

Gilbert H. Druchas; Hubert M. Clark, both of Birmingham, and Harold A. Melendy, Troy, all of Mich., assignors to TRW Inc., Cleveland, Ohio

Filed Nov. 24, 1971, Ser. No. 201,876

Int. Cl. F01c 21/16; F04c 15/04, 29/10

U.S. Cl. 418-32

12 Claims

A pump utilizing basically the same pumping elements as currently in use in a slipper-type pump having a rotor rotatable

in a cam ring providing a double-lobed working chamber and wherein the rotor carries a plurality of slipper-type pumping elements which are free to move radially and to rock angularly in following the adjoining wall of the bore contour is modified by providing the cam ring and the adjoining pressure

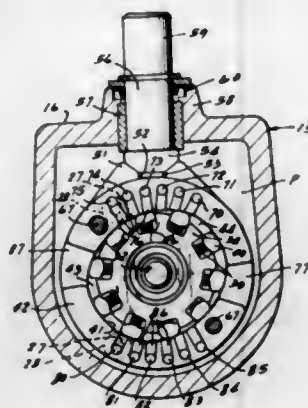


plate with two sets of multiple passages, for example, sets of six, and adding a freely rotatable actuator plate movable from a neutral position to either a forward position or a reverse position, thereby to preferentially bias the actuator plate in such a manner as to selectively exclude or include egress holes.

3,730,654

## GEAR ARRANGEMENT FOR PROVIDING AN OSCILLATING ROTATIONAL MOTION

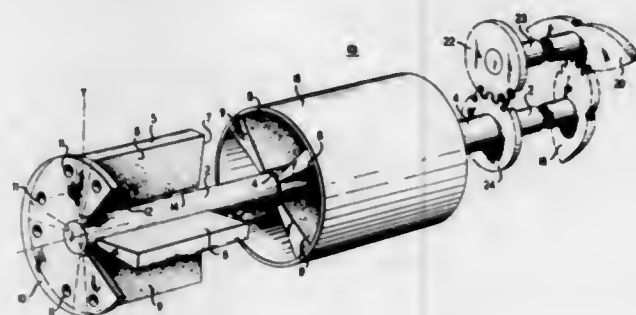
William McMahon, 20 Hillside Ave., Summit, N.J.

Filed Feb. 14, 1972, Ser. No. 226,127

Int. Cl. F01c 1/00; F16h 35/02; F04c 1/00

U.S. Cl. 418-34

16 Claims



A pair of meshed gears each of which comprises a plurality of sectors having the configuration of a logarithmic spiral provide an oscillating motion with respect to each other as they rotate. The gears can be coupled to the rotors of rotary piston machines and the like to provide the desired oscillating rotational motion thereto.

3,730,655

## SEALING BAR FOR A ROTARY PISTON INTERNAL COMBUSTION ENGINE

Heinz Lamm, Esslingen-St. Bernhard, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Nov. 12, 1971, Ser. No. 198,134

Claims priority, application Germany, Nov. 14, 1970, P 20 56 068.3

Int. Cl. F04c 27/00

U.S. Cl. 418-122

24 Claims

A sealing bar for a rotary piston internal combustion engine, especially of trochoidal construction, which is arranged radially movably in a piston groove provided with a spring and which sealingly slides with its head portion along a running

surface in the housing casing of the internal combustion engine whereby two slide members, preferably constructed

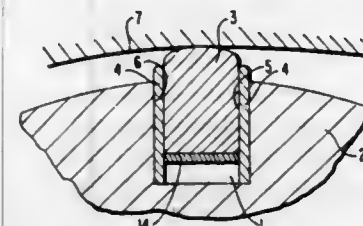


plate-shaped, are arranged along the longitudinal sides between the sealing bar and the piston groove.

3,730,656

## HYDRAULIC APPARATUS

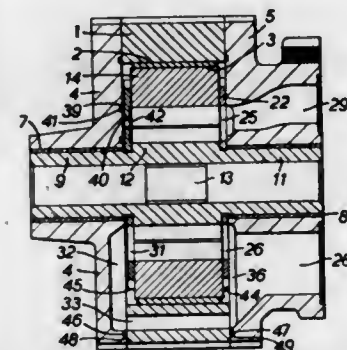
Dennis Ernest Lambeth, Benhall, Cheltenham, England, assignor to Dowty Technical Developments Limited, Cheltenham, England

Filed March 22, 1971, Ser. No. 126,553

Int. Cl. F01c 19/08; F03c 3/00; F01c 1/10

U.S. Cl. 418-131

2 Claims



A hydraulic displacement device such as an internal gear pump having an internally toothed gear in mesh with an externally toothed gear, a high pressure zone and a low pressure zone defined within the internally toothed gear and separated by the meshing position of the gears and an end bearing member loaded by liquid at the pressure of the high pressure zone to engage the end surfaces of the gears. In order to reduce excessive friction between the end bearing member and the gears the bearing member has an area of engagement with an end surface of the gears in the vicinity of the high pressure zone with part of its boundary at a position intermediate the tooth root radius and the periphery of the internally toothed gear.

3,730,657

## MOLD ASSEMBLY FOR PRESSING CONCRETE

Michael Anley Malet, and David Leslie Hills, both of St. Albans, England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 879,879, Nov. 25, 1969, Pat. No. 3,667,880. This application May 28, 1971, Ser. No. 148,099

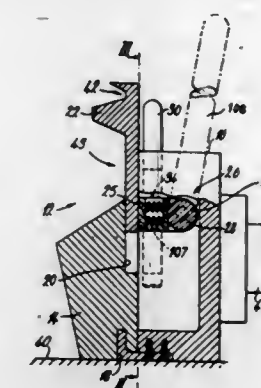
Int. Cl. B28b 3/04, 7/20

U.S. Cl. 425-3

13 Claims

A mould assembly for use in a concrete pressing process includes edge formers presenting mould surfaces to the concrete filling and slidable in the direction of pressing. Friction pads, permanent magnets or non-permanent magnets, are used firstly to hold the edge formers in place whilst the concrete is being introduced into the mould and secondly to control the downward movement of the edge formers when they are engaged by the moving platen of the press. During the latter part of the pressing process the friction pads or magnets are withdrawn or de-energised (as the case may be) so that the edge formers are free to move simultaneously with the adjacent edge surfaces of the concrete filling which expands

slightly after withdrawal of the press platen. The friction pads or magnets are brought into operation again for the withdrawal of wall members of which the edge formers form a



3,730,658

## SEGMENTED TIRE MOLD

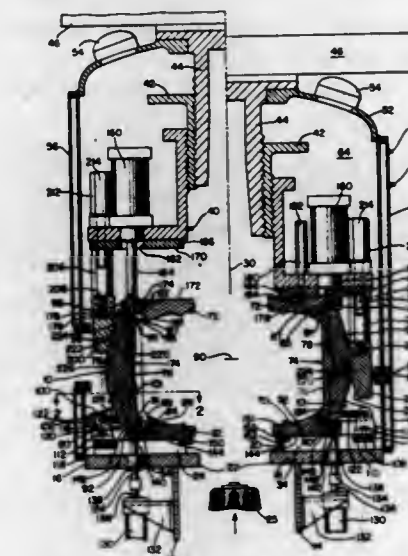
Theodore F. Marra, Barberton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 25, 1971, Ser. No. 156,632

Int. Cl. B29h 17/00, 5/08

U.S. Cl. 425-47

21 Claims



A tire curing mold for use in a press having a fixed platen and a movable platen, the mold including a first and a second sidewall molding member and a plurality of tread molding elements. A plurality of clevises are attached by T-bolts to a ring secured to one platen about the axis of the mold. An arm mounted on each of the tread molding elements is slotted to receive a pivot of the respective clevis so that each tread molding element is pivotable about the respective pivots. Hydraulic cylinders can lift the lower sidewall member to tilt the tread elements outwardly of and angularly with respect to the axis out of contact with a tire in the mold.

The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the full nature and extent of the technical disclosure of this application, reference must be made to the accompanying drawings and the following detailed description.



3,730,659

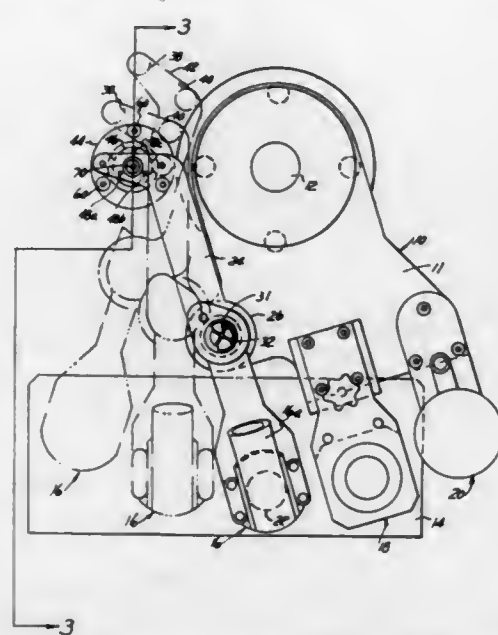
**POWDER DISPENSER FOR A POWDER COMPACTING PRESS**

Joseph E. Smith, Birmingham, and Georges D. DeTroyer, Grosse Ile, both of Mich., assignors to Wolverine-Pentronix, Inc., Lincoln Park, Mich.

Filed Oct. 4, 1971, Ser. No. 185,932  
Int. Cl. B29c 3/00

U.S. Cl. 425-78

15 Claims



A work station positioner for a powder compacting press operable to move through three separate operations, namely, fill, press and eject, in which there is provided an improved controllably vibratable powder dispenser mechanism actuable during the fill operation. The amplitude of vibration of the powder dispenser and the frequency with which it is vibrated are selectively adjustable for the particular type and particle size of powder material being used.

3,730,660

**APPARATUS FOR CONTINUOUSLY PRODUCING TUBULAR BODIES OF FOAMED MATERIAL**

Hermann-Josef Raffenberg, Ludinghausen, Germany, assignor to BASF Wyandotte Corporation, Wyandotte, Mich. Continuation-in-part of Ser. No. 760,280, Sept. 17, 1968, abandoned.

Filed Feb. 23, 1971, Ser. No. 118,127  
Int. Cl. B29c 27/16, 27/28

U.S. Cl. 425-122

8 Claims



An apparatus for continuously making a tubular polyurethane foam insulation adapted to be installed about a pipe or

the like combines a stationary mold and a mandrel disposed in the mold with means for convolutely winding a continuous web about the mandrel and out through a slot in the mold wall, means for convolutely winding a second web about the first web and out through the same slot, means for placing a foamable polyurethane mixture between the webs and means for pulling the exposed portions of the webs longitudinally and thereby moving the two radially spaced webs through the mold while the foamable reaction mixture forms a longitudinally split tubular foam body having the first web as a liner and the second as a cover. The product produced by the apparatus and a process for making the product are also provided.

3,730,661

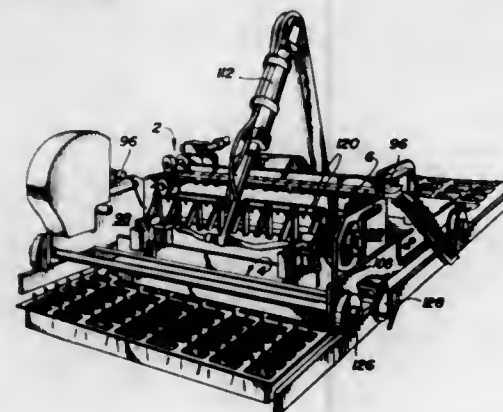
**STICK INSERTER**

Theodore Tremblay, Montreal, Quebec, Canada, assignor to John Lewis Inc., Montreal, Quebec, Canada

Filed Oct. 26, 1970, Ser. No. 84,099

Int. Cl. A23g 1/20, 1/22, 3/12, 3/16, 3/18, 5/02; B29c 27/14  
U.S. Cl. 425-126

13 Claims



A machine inserts sticks into rapidly freezing confections by presenting a tape which holds the sticks in a horizontal plane to a gripping mechanism. After this gripping mechanism has gripped certain sticks, it — the gripping mechanism — is moved away from the tape and turned; and it is then plunged downwardly towards the molds which are full of confection mixture, which is freezing rapidly, so that the sticks penetrate into and are held by the confection mixture. The sticks are released and the gripping mechanism is returned to the tape to begin the cycle again. Fresh sticks are presented to the gripping mechanism because movement of the tape took place while the gripping mechanism was inserting the sticks in the freezing mixture.

3,730,662

**SPINNERET ASSEMBLY**

Walter J. Nunning, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

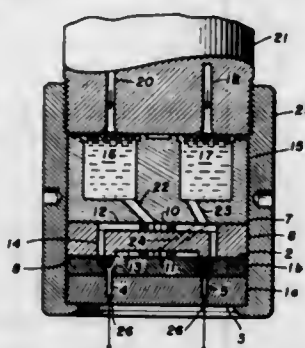
Continuation of Ser. No. 886,194, Dec. 18, 1969, abandoned.

This application Dec. 1, 1971, Ser. No. 203,895

Int. Cl. B29f 3/12

U.S. Cl. 425-131

3 Claims



A spinneret assembly for melt spinning bicomponent filaments is provided. A spinning block couples a spinneret plate,

3,730,665

**MOLDING APPARATUS**

Michael Joseph Fortin, Stouffville, Ontario; Joseph T. Latchford, Toronto, Ontario, and Marinus Theodorus Vandea Heuvel, King City, Ontario, all of Canada, assignors to Fortin-Latchford Limited, Scarborough, Ontario, Canada

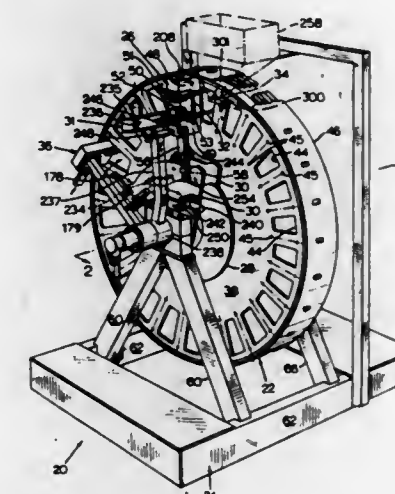
Division of Ser. No. 878,004, Nov. 19, 1969, Pat. No.

3,635,612. This application Sept. 3, 1971, Ser. No. 177,667

Int. Cl. B29b 5/04; B29c 7/00

U.S. Cl. 425-259

5 Claims



a distributor plate, and a dual reservoir plate in operative spinning relation. Grooves extend radially from a central cavity at the interface of spinneret plate and the distributor plate and at the interface of the distributor plate and dual reservoir.

3,730,663

**PELLETIZER**

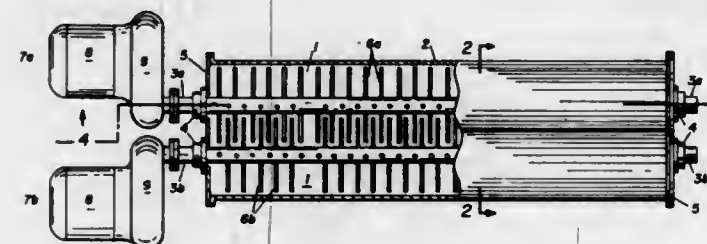
Paul N. Hare, Swartz, La., assignor to Cities Service Company, New York, N.Y.

Filed June 25, 1971, Ser. No. 156,722

Int. Cl. B29b 1/03

U.S. Cl. 425-222

10 Claims



A powder pelletizer having twin shafts which extend axially through an elongated conduit which bounds the pelletizing zone. Each of the shafts has a multiplicity of agitator members affixed thereto at spaced intervals along the length of the shaft and which extend radially outward therefrom. The agitator members of each shaft are arranged to move into and out interdigitating relationship with agitator members of the other shaft upon rotation of both shafts. The longitudinally extending peripheral wall of the conduit bounding the pelletizing zone is proximal to the tip-ends of the agitator members which are not interdigitating during rotation of the shafts.

3,730,664

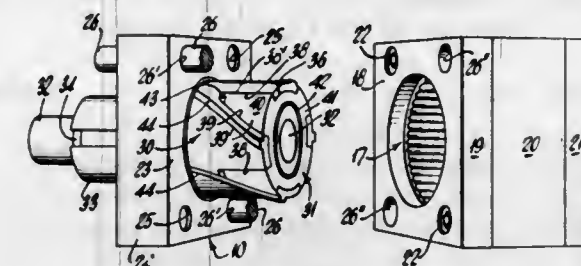
**MOLD APPARATUS FOR MAKING A CLOSURE CAP**  
Eric Alex Hultgren, Westport, Conn., assignor to Eyelet Specialty Company, Wallingford, Conn.

Filed Nov. 24, 1971, Ser. No. 201,780

Int. Cl. B29f 1/14

U.S. Cl. 425-338

4 Claims



The invention contemplates a three-part force-plug structure for determining the inner-wall configuration of a cap for removable closure of a bottle or other container, wherein one or more bayonet-type lugs on the cap are relied upon to establish a twist-lock engagement with the container. The three parts are coaxially related and are guided for longitudinal displacement with respect to each other, to determine (a) a first mutual relationship for the molding operation, (b) a second mutual relationship for clearing the molded lug or lugs from axial interference with the force-plug parts, and (c) a third mutual relationship for axially ejecting the molded part. A helically advancing spline formation on the outer cylindrical surface of one of the force-plug parts determines a corresponding spline groove in the molded piece, so that in the course of displacement from the first to the second mutual relationship, the molded piece is necessarily driven in partial rotation, to an extent adequate to clear the molded lug or lugs, for free piece ejection in the course of displacement from the second to the third mutual relationship.

3,730,666

**THREADED CLOSURE HIGH PRODUCTION ISOSTATIC MOLDING DEVICE**

Arnold Gordon Bowles, Warren, Pa., assignor to National Forge Company, Irvine, Pa.

Filed Jan. 10, 1972, Ser. No. 216,572

Int. Cl. B30b 5/02, 11/02; B28b 3/00

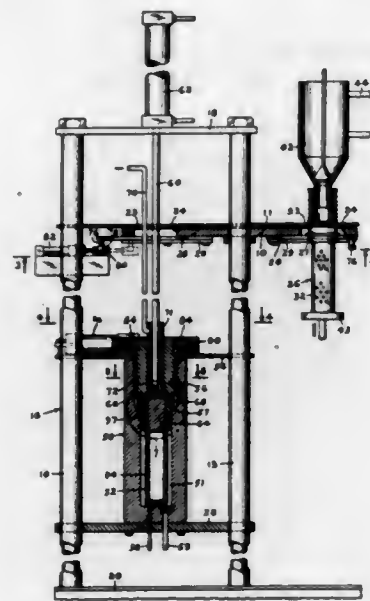
U.S. Cl. 425-405 H

8 Claims

A high production isostatic molding device comprising an upright isostatic press having an interrupted thread type closure and a turntable for rotating a plurality of elastomeric molds open at one end and hung beneath the table sequentially through various processing stages including filling, pressing and unloading. At one position a given mold is filled with compactible material from a hopper while being simultaneously vibrated. At another position the mold is positioned over the open end of a pressure vessel and lowered into the pressure vessel by a hydraulic ram which simultaneously seals the open end of the mold and lowers an interrupted thread closure plug into engagement with the correspondingly threaded open end of the vessel. An actuator rotates the closure to seal the vessel. An actuator rotates the closure to seal the vessel. After the mold is isostatically compacted by pres-



surized fluid within the sealed vessel the process is reversed to unseal the pressure vessel and to return the mold to the turna-



ble which thereafter rotates the compacted mold to a stripping position while simultaneously positioning a new filled mold over the open end of the vessel.

3,730,667

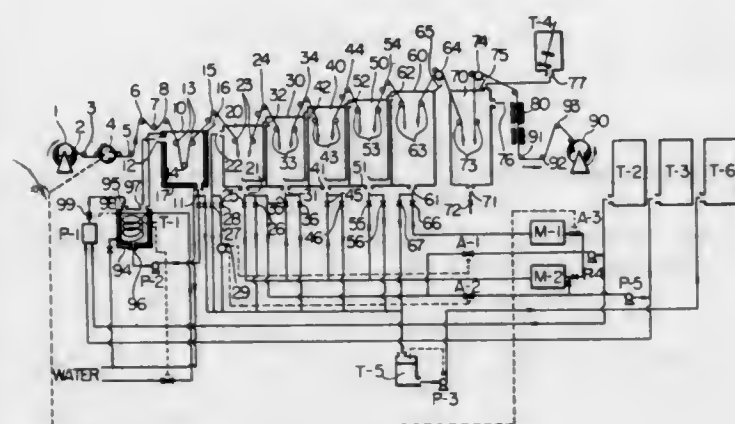
# APPARATUS FOR THE PRODUCTION OF A SYNTHETIC PAPER-LIKE PRODUCT FROM A POLYMER FILM

Kaneyasu Tani, and Shiro Kawazoe, both of Tokyo, Japan, assignors to Nippon Kakoh Seishi K. K., Tokyo, Japan

Filed June 1, 1970, Ser. No. 42,060

Int. Cl. B41m 5/14; D21h 5/00

U.S. Cl. 425-445



Apparatus for the continuous process for the preparation of synthetic paper by treatment of a polymer film to produce an opaque printable surface the process including treating the surface with a swelling agent followed by a coagulating agent with intermediate treatment in one or more baths containing adjustable quantities of swelling and coagulating agents, said baths being provided with overflow means leading to the preceding bath to provide adjustment for changes caused by carry-over from one bath to another by the advancing film.

## 3,730,668 COMBUSTION METHOD OF GAS BURNERS FOR SUPPRESSING THE FORMATION OF NITROGEN OXIDES AND BURNER APPARATUS FOR PRACTICING SAID METHOD

Hirofumi Iida, Chiba, and Kazufumi Watanabe, Yokohama, both of Japan, assignors to Tokyo Gas Company Limited, Tokyo, Japan

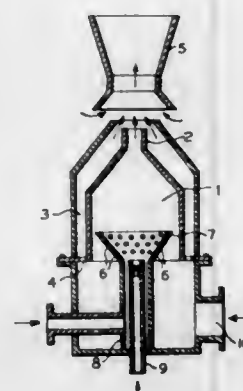
Filed May 21, 1971, Ser. No. 145,728

Claims priority, application Japan, March 3, 1971, 46/11207

Int. Cl. F23m 3/04

U.S. Cl. 431-10

5 Claims



The present invention relates to a novel method for suppressing the formation of nitrogen oxides formed in the combustion of gaseous fuels with air and a novel burner for practicing said method. Said burner comprises a combustion chamber having a converged nozzle portion formed at one end thereof and a draft tube having an upwardly expanding vertical cross-section and spaced ahead of said nozzle portion for guiding the combustion gases exhausted from said combustion chamber.

3,730,669

# PHOTOGRAPHIC FLASHLAMP UNIT HAVING CONTROL STRUCTURE ON BASE

John W. Shaffer, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Dec. 23, 1971, Ser. No. 211,553

Int. Cl. F21k 5/02

U.S. Cl. 431-93

10 Claims



A multilamp flash unit or flashcube having a base upon which is supported a plurality of percussively-ignitable flashlamps, each having a primer tube depending therefrom, and a plurality of preenergized striker springs individually releasable to fire a respective one of the flashlamps by impact against its primer tube. The base includes a plurality of bores, into which the primer tubes are inserted for supporting the flashlamps, and a plurality of apertures, each adjacent a respective striker spring. The unit is usable on a camera having a mechanical actuating member that sequentially is mov-

ble into the unit via the apertures, upon indexing of the unit, to release successive striker springs and thereby fire successive flashlamps in the unit. A control ramp is located between each aperture and bore in the flashcube base for guiding the travel of each striker subsequent to its release to assure reliable firing of the respective flashlamp.

3,730,670

# CURRENT-SAVING ELECTRICAL IGNITER FOR GAS LIGHTERS

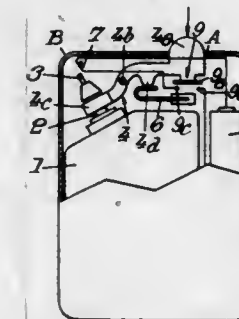
Jacques Lambert, Paris, France, assignor to Flaminalre Marcel Quercia, Paris, France

Filed Feb. 2, 1971, Ser. No. 111,983

Claims priority, application France, Feb. 17, 1970, 7005608

Int. Cl. F23q 2/16

U.S. Cl. 431-256



A gas lighter wherein a filament is heated to a temperature at which it ignites a stream of gaseous fuel in response to or at least substantially simultaneously with opening of a valve which permits pressurized gaseous fuel to escape from a tank. In order to save electrical energy, the circuit of the filament is opened automatically with a delay which invariably suffices to insure the ignition of the fuel stream. Delayed opening of the circuit can be effected by mechanical means, by an electronic circuit or by a confined body of a current-conducting liquid. The valve opening member of the lighter can be provided with, directly coupled to or made independent of that part or of those parts which complete the circuit simultaneously with the opening of the valve. The lighter furnishes a flame as long as the valve remains in open position but the circuit of the filament is opened with a fixed delay following completion of the circuit to thereby insure that the consumption of electrical energy takes place only during that interval which is needed to heat the filament to a temperature at which the fuel stream is ignited.

3,730,671

# CIGARETTE-LIGHTER FLINT WHEEL ACTION

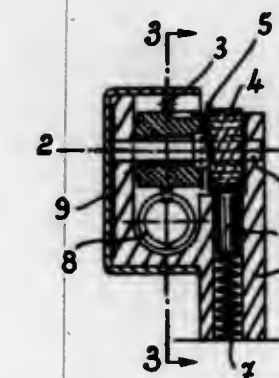
Pierre Chevallier, Sainte-Foy-les-Lyon, France, assignor to Etablissements Genoud & Cie, Venissieux, Rhone, France

Filed Dec. 29, 1971, Ser. No. 213,270

Int. Cl. F23q 1/02

U.S. Cl. 431-274

3 Claims



In this pyrophoric cigarette-lighter a casing is slidably mounted in the lighter body and has two end walls engaged in-

3,730,672

# MULTI-BURNER GAS STOVE WITH PIEZOELECTRIC IGNITION

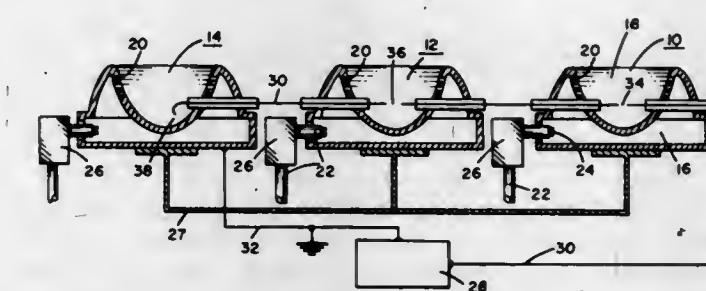
Don A. Berlincourt, Chagrin Falls, and Earl O. Schweitzer, Wickliffe, both of Ohio, assignors to Vernitron Corporation, Great Neck, N.Y.

Filed Jan. 4, 1971, Ser. No. 103,757

Int. Cl. F23q 3/00

2 Claims U.S. Cl. 431-264

7 Claims



A multi-burner gas stove utilizing a piezoelectric ignition system for igniting the gas which has a specific gravity greater than air. The system includes a circuit establishing a spark gap located below the outlet of the gas burner so that the combustible gas-air mixture before ignition will gravitate to and envelop the gap and after ignition the flame will be vertically spaced above the gap.

3,730,673

# VENT SEAL

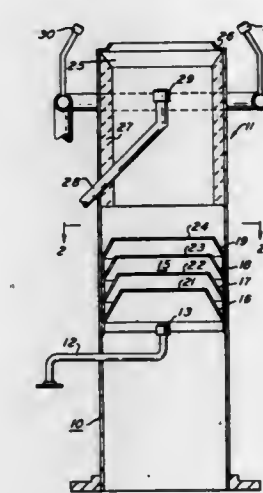
John F. Stratz, III, Cheltenham, Pa., assignor to Combustion Unlimited, Incorporated, Elkins Park, Pa.

Filed May 12, 1971, Ser. No. 142,700

Int. Cl. F23d 13/20

U.S. Cl. 431-278

3 Claims

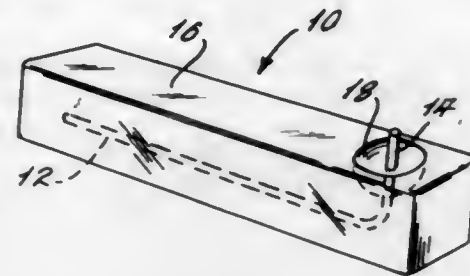


A vent seal is provided for use with vent stacks, blow down lines, flare systems and the like to prevent entrainment of air into the stack which comprises a diode interposed in the stack below the top, the diode comprising spaced frustoconical concentric baffles with aligned central openings providing an obstruction to down flow of air within the stack but not retarding upward delivery of hot gas.



3,730,674  
CANDLE

Bette L. Gross, 411 N. 7th St., Holly, Mich.  
Filed July 19, 1971, Ser. No. 163,841  
Int. Cl. F23d 13/16  
U.S. Cl. 431-288



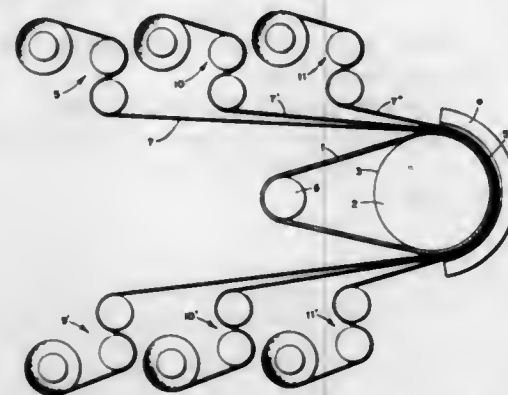
A candle having a wick embedded therein or attached thereto wherein the wick has a memory or self-movement characteristic during burning of the candle enabling disposition of the wick within the candle in many different arrangements.

3,730,675  
CURING APPARATUS FOR ELONGATE ELASTOMERIC ARTICLES

Augusto Prevati, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy  
Filed Aug. 3, 1971, Ser. No. 168,691  
Claims priority, application Italy, Aug. 7, 1970, 28402 A/70  
Int. Cl. F27b 9/28  
U.S. Cl. 432-60

18 Claims

10 Claims



The application relates to a curing apparatus for elastomeric articles of elongate shape, such as belts. The apparatus is such that a belt to be cured is passed over a heated rotating drum. This belt is pressed against the hot surface of the drum by other belt elements which are driven by a system of rollers which system includes the heated drum as a rotating element thereof.

## CHEMICAL

3,730,676

## DYE TRANSFERRING METHOD

Geoffrey Allan Smith, Melrose, England, and Alan James Laidlaw, Selkirk, Scotland, assignors of fractional part interest to Joseph Dawson (Holdings) Limited, Bradford, England

No Drawing. Filed May 10, 1971, Ser. No. 141,970  
Claims priority, application Great Britain, May 11, 1970, 70/22,689  
Int. Cl. D06p 3/16

U.S. Cl. 8-2.5

2 Claims

A method of transferring coloured dyes from a printed paper transfer onto a textile fabric or material particularly when it is comprised of animal fibres. The fabric is padded with a chemical mixture having an aqueous phase and a printing paste thickener. A press applies heat and pressure to the fabric which is in contact with the printed paper transfer, for a period not exceeding ten minutes. The printed fabric is then removed from the press, washed and dried.

3,730,677

## DYEING KERATINOUS FIBERS WITH A QUINONEIMINE AND A COUPLER

Gregoire Kalopissis, Paris, Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradler, Paris, France, assignors to L'Oreal, Paris, France

No Drawing. Filed July 6, 1970, Ser. No. 52,741  
Claims priority, application France, July 8, 1969, 59,063  
Int. Cl. A61k 9/12

U.S. Cl. 8-10.2

8 Claims

A composition for dyeing keratinous fibers comprises an aqueous solution of at least one quinoneimine and an aqueous solution of at least one coupler.

3,730,678

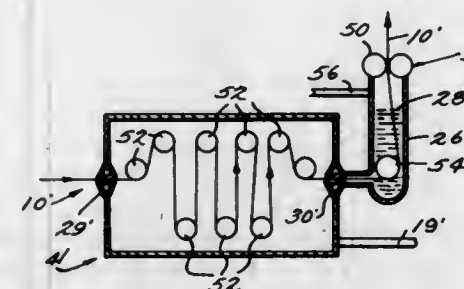
## PROCESS FOR TREATING TEXTILE MATERIALS

Frederick C. Wedler, and Kenneth Y. Wang, both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. Nos. 665,894, Sept. 6, 1967, abandoned, and Ser. No. 746,972, July 23, 1968, which is a continuation-in-part of Ser. No. 665,894, Sept. 6, 1967, abandoned. This application Oct. 28, 1970, Ser. No. 84,572  
Int. Cl. B05c 11/115

U.S. Cl. 8-149.1

4 Claims



A process and apparatus are described for impregnating a textile having relatively fine openings therein with a treating liquid whereby penetration and pick-up of the liquid are improved by relatively strong vacuum degassing the textile immediately before impregnation.

3,730,679

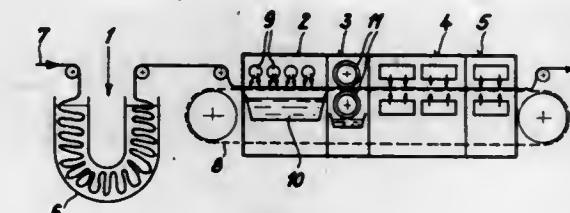
## PROCESS FOR WET TREATMENT AND SUBSEQUENT DRYING OF A TEXTILE WEB

Manfred Schulerer, Erbach/Odenwald, Germany, assignor to Bruckner-Apparatebau Michelstadt GmbH, Erbach/Odenwald, Germany

Filed March 17, 1971, Ser. No. 125,177  
Claims priority, application Germany, April 2, 1970, P 20 15 759.9; Feb. 25, 1971, G 71 07 117.5  
Int. Cl. D06c 1/08

U.S. Cl. 8-151

8 Claims



A process for wet treatment of fabric web including steps of washing, liquid removal, drying and airing, in which shrinking takes place in wet treatment zone before web is laid evenly on transport means for drying. Apparatus for carrying out the process provides essential treatment stations and mesh belt or suction drum transport means for conveying the web to be treated through each of the successive stages of treatment.

3,730,680

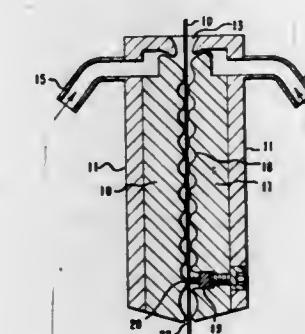
## PROCESS FOR EXTRACTING SOLVENT FROM POLYAMIDE FILAMENTS

Braxton C. Bowen and Jackie A. Weir, Richmond, Va., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 5, 1972, Ser. No. 215,603  
Int. Cl. D06c 1/06

U.S. Cl. 8-151.2

3 Claims



A process for extracting spin-mix solvent from a moving continuous bundle of dry-spun synthetic filaments and for detecting drips along the filament bundle. The process comprises sequentially (1) passing the bundle in a substantially straight path between a pair of rigid corrugated sheets positioned in parallel planes such that they cooperate to form an undulating channel between them; (2) forcing a liquid, which is a solvent for the spin-mix solvent but not for the polymer of which the synthetic filaments are composed, through the undulating channel at a velocity which causes it to pass along the channel back and forth through the bundle; and (3) passing the filaments past an appendage that is adjustable to allow



passage of a standard thickness continuously moving bundle but to prevent passage of a bundle of larger than standard thickness. The appendage contains passageways through it to permit carry-off of said liquid.

3,730,681

# BASIC DYED POLYESTER FIBER MODIFIED WITH A DIHYDROXYALKOXY-PROPYL OR BUTYL SULFONATE

Louis E. Trapasso, Westfield, and Robert W. Stackman, Morristown, N.J., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Application Sept. 26, 1966, Ser. No. 581,719, now abandoned, which is a continuation-in-part of application Ser. No. 502,520, Oct. 22, 1965. Divided and this application Feb. 2, 1971, Ser. No. 112,025

Int. Cl. D06p 5/04

U.S. Cl. 8—168

2 Claims

A polyethylene terephthalate fiber containing 1,2-dihydroxy-3-(3-sodium sulfopropoxy) propane and permeated uniformly throughout by a cationic dye, said dye being bound in the fiber by the available groups in the fiber.

3,730,682

# STERILIZATION SYSTEM FOR CLOTHES TREATING MACHINES AND METHOD OF USING

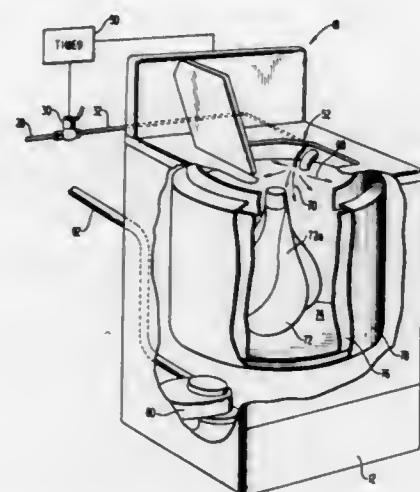
Robert D. Brubaker and Blanchard W. Brown, Albuquerque, N. Mex., assignors to Staphex Corporation

Filed Jan. 25, 1971, Ser. No. 109,258

Int. Cl. A61l 1/00; D06f 39/00

U.S. Cl. 21—58

35 Claims



A sterilization system for use with clothes treating machines which sterilizes the treating zones in the machines and the drain conduits connected thereto. An automatic sterilization cycle is initiated prior to each use of the machines whereby a sterilizing gas or aerosol or solution is distributed into the interior of the inner tub by a specially adapted nozzle. In combination with the spraying there may be used actuation of the agitator, inner tub, and drain pump of the machine to more thoroughly distribute the spray.

3,730,683

# METHOD OF PROSPECTING FOR MERCURY AND ASSOCIATED NOBLE AND BASE METALS

George H. Milly, Potomac, Md., assignor to Geomet Mining and Exploration Company, Rockville, Md.

Continuation-in-part of application Ser. No. 804,219, Mar. 4, 1969, now Patent No. 3,609,363, dated Sept. 28, 1971. This application Mar. 17, 1971, Ser. No. 125,084

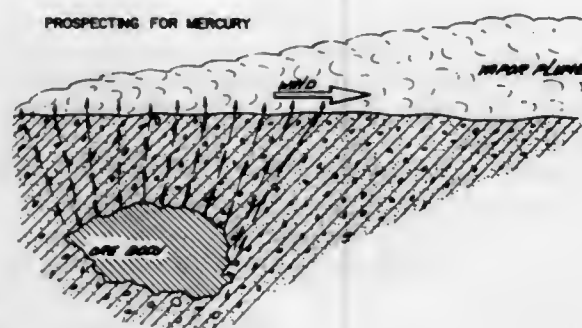
Int. Cl. G01n 33/24

U.S. Cl. 23—230 EP

5 Claims

Prospecting, particularly prospecting for mercury and noble and base metals such as gold, silver, copper, zinc,

and other metallic ores encountered in association with mercury, on the basis of the mobile gaseous phase of



mercury which diffuses through the earth's structure and becomes windborne.

3,730,684

# THYROXINE DETERMINATION METHOD EMPLOYING THE COMPETITIVE PROTEIN BINDING TECHNIQUE

James A. Demetriou, Sherman Oaks, Calif., assignor to Bio-Science Laboratories, Van Nuys, Calif.

Filed Nov. 1, 1971, Ser. No. 194,683

Int. Cl. G01n 33/16, 23/10

U.S. Cl. 23—230 B

5 Claims

A method for use in determination of thyroxine in biological fluids which comprises extracting thyroxine with tetrahydrofuran and separating thyroxine from the precipitated proteins and then from the tetrahydrofuran, and thereafter equilibrating with thyroxine binding globulin and radioactive labeled thyroxine, removing unbound thyroxine and determining the radioactive labeled thyroxine by counting techniques.

3,730,685

# COMPUTER CONTROLLED METHOD OF TITRATION

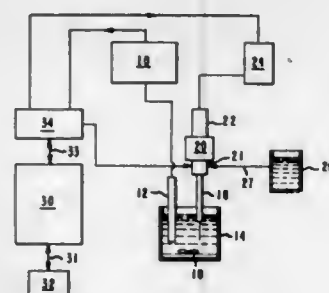
Charles Anton Prohaska, Seaford, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 24, 1971, Ser. No. 118,342

Int. Cl. B01k 3/00; G01n 27/10, 27/56

U.S. Cl. 23—230 R

5 Claims



A computer-controlled process of titration, wherein the computer adds titrant to a solution in amounts which decrease as the end point is approached. The solution is allowed to reach equilibrium between each stepwise addition of titrant. The computer calculates the titration end point by use of a curve fitting algorithm to fit data stored from a final preselected number of titration points to find the optimum constants for an appropriate mathematical equation, e.g., a cubic equation, relating solution pH as a function of titrant added and then computing the maximum slope of the equation.

3,730,686

# QUANTITATIVE MEASUREMENT OF SELECTED NITROGEN COMPOUNDS IN GASEOUS MIXTURES

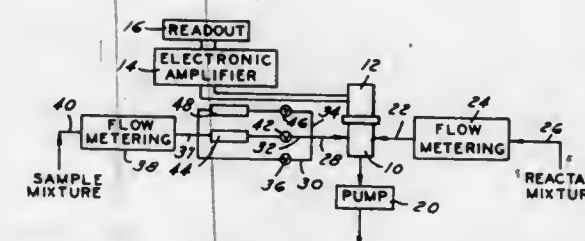
Lawrence P. Breitenbach, Royal Oak, and Mordecai Shelef, Southfield, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 29, 1971, Ser. No. 158,003

Int. Cl. C01b 21/00, 21/20; G01n 31/10

U.S. Cl. 23—232 R

20 Claims



Gaseous mixtures including nitrogen dioxide are passed through a converter containing molybdenum at a temperature of about 475° C. to convert the nitrogen dioxide to nitric oxide without converting significant amounts of any existing ammonia and without destroying any existing nitric oxide. The gaseous mixture leaving the converter is introduced into a reaction chamber where the chemiluminescence of the reaction of the nitric oxide and ozone is used to determine the amount of nitrogen dioxide in the original gaseous mixture. Subsequently, the gaseous mixture is passed through a second converter containing copper at a temperature of about 410° C. to convert any ammonia to nitric oxide and the increased chemiluminescence is used to determine the amount of ammonia in the original mixture.

3,730,687

# SPECTRAL SEPARATION AND ANALYSIS OF ISOMERIC AZOXYBENZENES

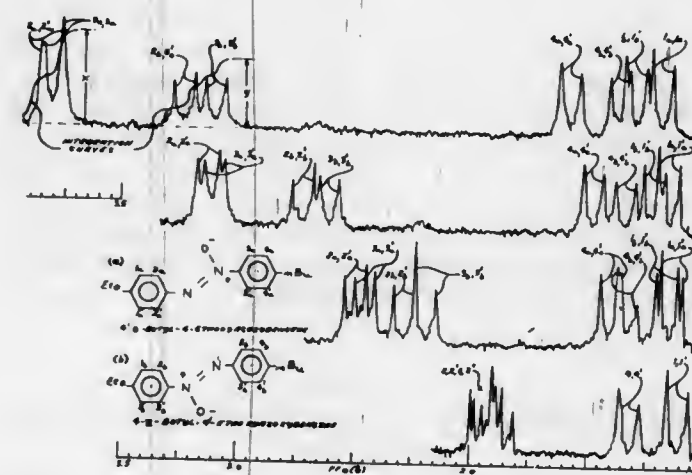
Roger E. Rondeau, Dayton, Ohio, assignor to the United States of America as represented by the Secretary of the Air Force

Filed Sept. 28, 1971, Ser. No. 184,386

Int. Cl. G01n 27/78

U.S. Cl. 23—230 R

10 Claims



A process is provided whereby tris (1,1,1,2,2,3,3-heptafluoro-7,7-dimethyl-4,6-octanedionate)europium(III) is added to a sample of a mixture of isomeric azoxybenzenes

3,730,688

# INDICATOR FOR THE DETECTION OF NICKEL IONS

Dieter Schmitt, Alfred Stein, and Wilhelm Baumer, Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Germany

No Drawing. Filed Mar. 9, 1971, Ser. No. 122,541

Claims priority, application Germany, Sept. 3, 1970,

P 20 43 600.4

Int. Cl. G01n 31/22

U.S. Cl. 23—253 TP

15 Claims

An indicator for the colorimetric detection of nickel ions is formed by impregnating an absorbent carrier with a composition comprising dimethylglyoxime, an alkali-metal or ammonium thiosulfate, alkali metal fluoride, a buffer and, optionally, hydroxylammonium chloride.

3,730,689

# APPARATUS FOR LEACHING CORE MATERIAL FROM SHEARED SEGMENTS OF CLAD NUCLEAR FUEL PINS

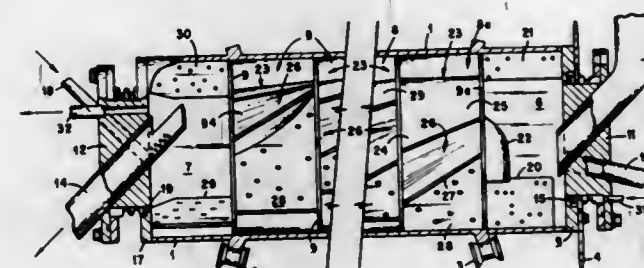
Clyde H. Odom, Knoxville and Maurice H. Kunselman, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Feb. 12, 1971, Ser. No. 114,769

Int. Cl. B01d 11/02

U.S. Cl. 23—269

8 Claims



Apparatus is described for selectively dissolving or leaching one or more solid components of a mixture such as clad nuclear fuel pin segments. The apparatus includes a rotatable, generally cylindrical drum designed to operate with its longitudinal axis disposed horizontally. A plurality of perforated, radially extending, circular partitions are spaced apart along the drum axis to form a series of feed, leaching, and discharge compartments. Axial movement of solids through the drum is restricted by the partitions while the dissolvent is permitted to flow through the perforations therein in a substantially unrestricted manner. Transfer chutes in the shape of slotted, skewed, conical frustums are provided within each leaching compartment for transferring solids between compartments only when the drum rotation is reversed one turn with respect to its normal direction of rotation during a leaching operation. Mixing or agitation of the solids to enhance dissolution is accomplished without solids transfer during rotation of the drum by perforated mixing baffles which extend axially and radially within the peripheral region of each leaching compartment. Feed and discharge compartments containing transfer baffles are provided at opposite ends of the drum for receiving unprocessed mixtures and for discharging undissolved solids.



Means for adding fresh dissolvent and for removing liquid containing dissolved solids are provided at the discharge and feed compartment ends of the drum, respectively.

3,730,690

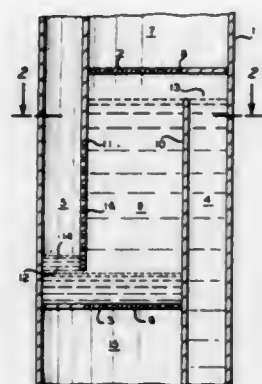
## LIQUID-LIQUID CONTACTING MEANS

William C. McCarthy and Merritt V. De Lano, Jr., Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of application Ser. No. 845,958, July 30, 1969. This application Oct. 18, 1971, Ser. No. 190,286 Int. Cl. B01d 11/04

U.S. Cl. 23—270.5

9 Claims



In a mass transfer device of the liquid-liquid extractor type using contacting trays, an improved upcomer conduit providing communication between tray zones is provided with a multiplicity of apertures at its lower extremity.

3,730,691

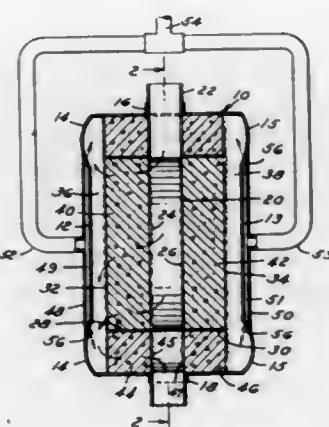
## MULTIPLE BED CATALYTIC CONVERTER

Charles R. Lang, Dearborn, and Donald N. Schock, Flat Rock, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 26, 1971, Ser. No. 137,350 Int. Cl. F01n 3/14; B01j 9/04

U.S. Cl. 23—288 F

14 Claims



Exhaust gases are supplied to the central portion of a cylindrical housing and pass axially through a first catalytic bed that reduces oxides of nitrogen. The gases then flow radially outward in spaces defined by the side walls of the cylindrical housing and finally pass axially inward through a second catalytic bed that oxidizes unburned hydrocarbons and carbon monoxide. Supplemental air is supplied in a manner that promotes good mixing and minimizes backflow.

3,730,692  
METHOD FOR REDUCING DUST DURING HANDLING OF REACTIVE FORM COKE BRIQUETTES

Michael O. Holowaty, Crown Point, and Jerome J. Knoerzer, Hammond, Ind., assignors to Inland Steel Company, Chicago, Ill.

No Drawing. Filed May 28, 1971, Ser. No. 148,214 Int. Cl. C10I 9/00, 10/00

U.S. Cl. 44—6

15 Claims

Briquettes of reactive form coke are treated by applying an aqueous agent containing a lignosulfonate while the briquettes are at an elevated temperature in the range 100–200° F. Aqueous agent may contain an alkaline oxide (CaO or MgO). Briquettes dry while cooling from elevated temperature to form an adherent film of lignosulfonate on briquettes. Alkaline oxide in film is reacted with CO<sub>2</sub> to form a carbonate in film. Film prevents dusting during handling.

3,730,693

## HYDROCARBONS AND NONPOLAR SOLVENTS GELLED WITH A LIPOPHILIC POLYMERIC CARBOHYDRATE DERIVATIVE

James Teng, St. Louis County, Mo., Chokun Rha, Southbridge, Mass., and Barry L. Scallet, Clayton, and Marcella C. Stubbs, St. Louis, Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

No Drawing. Continuation-in-part of applications Ser. No. 845,067, July 25, 1969; Ser. No. 44,640, June 8, 1970; and Ser. No. 106,882, Jan. 15, 1971. This application June 17, 1971, Ser. No. 154,219 Int. Cl. C10I 7/00

U.S. Cl. 44—7 B

12 Claims

A polymeric carbohydrate derivative such as cellulose laurate or starch laurate with a percentage of substitution between about 40% and about 100% is dispersed or dissolved in jet fuel or other hydrocarbon or nonpolar solvent at a concentration of at least about 0.5 gram solids/100 ml. fluid. The gelled jet fuel is helpful in avoiding fires in aircraft accidents.

3,730,694

## FUEL GAS UPGRADING

Donald K. Wunderlich, Richardson, Tex., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Aug. 11, 1971, Ser. No. 170,722 Int. Cl. C01b 2/14

U.S. Cl. 48—213

6 Claims



A method for upgrading a fuel gas feed by subjecting the feed gas to conditions which convert carbon monoxide to methane, saturate olefins, remove sulfur, and, if necessary, adding or retaining carbon dioxide to react with excess hydrogen present after conversion of the carbon monoxide and saturation of the olefins thereby providing a product gas which has an increased hydrocarbon content and heating value and a reduced sulfur and carbon monoxide content.

3,730,695

## LEVEL CONTROL MEANS FOR GLASS FIBER MAKING PROCESS

Eugene C. Varrasso, Heath, Ohio, assignor to Owens-Corning Fiberglass Corporation

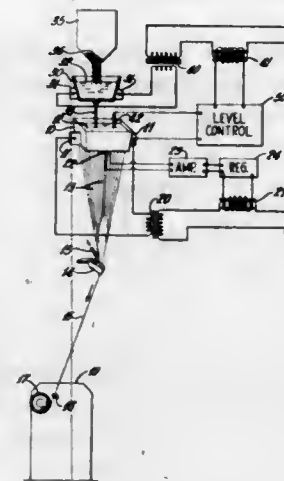
Filed March 23, 1971, Ser. No. 127,268 Int. Cl. C03b 37/02

U.S. Cl. 65—2

11 Claims

The invention is illustrated in a preferred embodiment for producing glass fibers in which the maintenance of a

preselected head of a molten body of glass is critical in the control of fiber diameter and fiber quality. The feeder contains a molten body of glass and has orifice means formed therein for issuing molten streams of glass. The molten streams of glass are attenuated into glass fibers. A glass melter replenishes the body of molten glass in the feeder as molten glass is withdrawn from the feeder and formed into glass fibers. A probe is disposed for contact with the molten body of glass in the feeder. A source of electrical energy is connected to the probe and the molten body of glass to establish a poten-



tial difference between the probe and the molten glass. Current flow in the probe is detected and a detection voltage is supplied proportional to the detected current flow. A bucking voltage is supplied which has a magnitude substantially equal to the magnitude of the detection voltage when the probe is initially touched by the body of molten glass in the feeder. The detection and bucking voltages are compared to provide a level signal which is a measure of the level of the molten body in the feeder. The rate of replenishment of the molten body from the glass melting unit is responsive to the magnitude of the level signal.

3,730,696

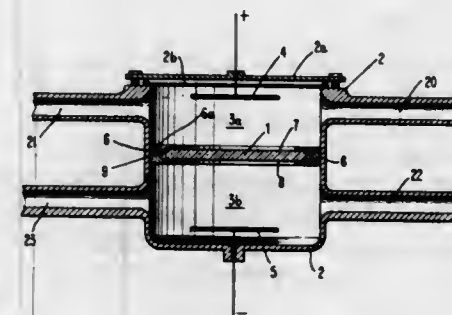
## METHOD AND APPARATUS FOR GAS PHASE ION INTERCHANGE IN SOLIDS

Pierre Pointu and Tran Thach Lan, Paris, France, assignors to Compagnie de Saint-Gobain, Neuilly-sur-Seine, France

Filed Dec. 5, 1968, Ser. No. 781,369

Claims priority, application France, Dec. 5, 1967, 130,982

Int. Cl. C23c 11/00; C03c 11/00, 21/00 U.S. Cl. 65—30 13 Claims



An electrical field is passed through a solid body carrying with it ions from a gas in contact with the body

which displace and replace ions in the body. The process is particularly useful in strengthening and coloring glass by displacing elements such as sodium and replacing them with elements such as potassium and copper.

3,730,697

## METHOD FOR SUPPORTING GLASS SHEETS WITH TONGS FOR HEAT TREATING

Samuel L. Seymour, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed March 15, 1971, Ser. No. 124,485

Int. Cl. C03b 27/00

U.S. Cl. 65—105

10 Claims

Marking glass sheets for tong processing.

3,730,698

## SEALING OF JOINTS IN REFRACTORY DEVICES WITH SILICATE COATING

Frederick Denys Richardson, Surrey, and Philip Sydney Rogers, Herts, England, assignors to Metallurgic Hoboken-Overpelt, Brussels, Belgium, RST International Metals Limited, London, and Frederick Denys Richardson, Epsom, Surrey, England

No Drawing. Filed Mar. 12, 1971, Ser. No. 123,900

Claims priority, application Luxembourg, Mar. 31, 1970, 60,630

Int. Cl. C03c 27/00, 29/00

U.S. Cl. 65—43

16 Claims

A method for sealing porous refractory joints which comprises applying a silicate glass to a refractory joint, and melting the silicate glass in order to fill the connecting channels between the pores and to block them with the silicate glass. The refractory joint may be obtained from alumina cement.

3,730,699

## MACHINE FOR WORKING ARTICLES OF THERMOPLASTIC MATERIALS

Jakob Dichter, Sachsendamm 93, Berlin, Germany

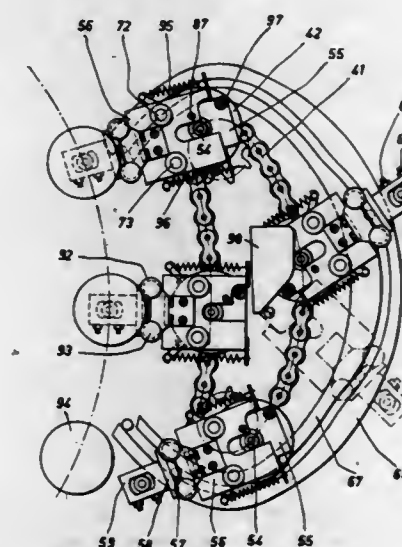
Continuation of application Ser. No. 686,181, Nov. 28, 1967. This application Oct. 27, 1970, Ser. No. 84,548

Claims priority, application Germany, Nov. 29, 1966, D 51,665

Int. Cl. C03b 9/00

U.S. Cl. 65—237

8 Claims



A machine for working thermoplastic articles having a carriage for carrying the articles to be worked and an



endless conveyor on which tools may be carried, each tool being arranged to work over a working path, for a respective article as it is conveyed on the carriage. The working path may be arranged to be longer than the spacing between the articles.

3,730,700

# PROCESS FOR THE PRODUCTION OF AMMONIUM PHOSPHATE FERTILIZERS

Pieter Groenveld, Rijswijk, Netherlands, assignor to Cominco Ltd., Trill, British Columbia, Canada

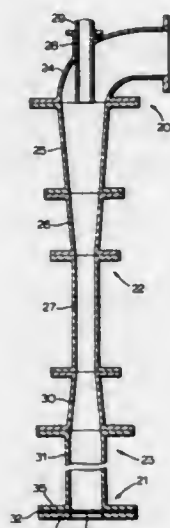
Filed July 6, 1970, Ser. No. 52,613

Claims priority, application Canada, July 7, 1969, 56,313

Int. Cl. C05b 7/00

U.S. Cl. 71—34

6 Claims



A process and apparatus for the production of ammonium phosphate fertilizer material in which gaseous anhydrous ammonia and phosphoric acid are reacted under pressure in a confined, elongated reaction zone under high velocity condition to prevent the deposition of solid reaction products within the reaction zone.

3,730,701

# METHOD FOR CONTROLLING THE GROWTH OF ALGAE IN AN AQUEOUS MEDIUM

Alan J. Isquith, Midland; Eugene A. Abbott, and Patrick A. Walters, both of Freeland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

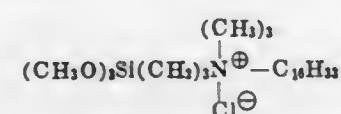
Filed May 14, 1971, Ser. No. 143,650

Int. Cl. A01n 9/00

U.S. Cl. 71—67

8 Claims

A method for controlling the growth of algae in an aqueous medium by adding to the medium an effective amount of certain silyl quaternary amines. For example, a silyl quaternary amine of the formula



is added to the liquid medium in an amount ranging from 1.0 to 10,000 micrograms per ml. of the aqueous medium and after a period of from 2.0 to 24 hours, the algae are flocculated without rendering the aqueous medium toxic to humans, animals and fish.

3,730,702

# BIOCIDAL UNSYMMETRICAL DI-HIGHER ALKYL DIMETHYL AMMONIUM COMPOUNDS

Edward G. Shay, Belle Mead, N.J., Reginald L. Wake-man, Philadelphia, Pa., and Alphonso N. Petrocci, Glen Rock, N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

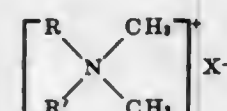
No Drawing. Continuation-in-part of abandoned application Ser. No. 782,439, Dec. 9, 1968. This application June 9, 1971, Ser. No. 151,583

Int. Cl. A01n 9/20

U.S. Cl. 71—67

1 Claim

A method of inhibiting microorganisms by applying thereto a water-soluble unsymmetrical di-higher alkyl dimethyl ammonium salt having the structure:



wherein R and R' are either straight chain or predominantly straight chain but dissimilar alkyls, one of said alkyls having from 9 to 10 carbon atoms and the other having from 11 to 12 carbon atoms, at least one of the alkyls having an odd number of carbons, and the total sum of both alkyls being between 20 and 21; and wherein X is a biocidally acceptable anion preferably derived from a halogen such as bromine or chlorine, or which may be methosulfate.

3,730,703

# HARVESTING

Raymond H. Daehnert, Tustin, Calif., assignor to Allied Chemical Corporation, New York, N.Y.

Filed June 16, 1966, Ser. No. 557,928

Int. Cl. A01n 11/00

U.S. Cl. 71—69

10 Claims

Chemical desiccation and defoliation of crop bearing plants, e.g., cotton, may be effected by treatment of the plant with an effective amount of ammonium thiosulfate.

3,730,704

# METHOD FOR THE PRODUCTION OF KILLED, UNALLOYED OR LOW-ALLOY, ALUMINUM CONTAINING STEEL WITH LOW CARBON CONTENT

Thorwald Fastner and Gerhard Papp, Linz, Austria, assignors to Vereinigte Österreichische Eisen- und Stahlwerke Aktiengesellschaft, Linz, Austria

No Drawing. Filed Jan. 26, 1970, Ser. No. 5,912

Claims priority, application Austria, Jan. 28, 1969, A 826/69

Int. Cl. C22c 39/02

U.S. Cl. 75—129

3 Claims

The invention relates to a method for the production of killed, unalloyed or low-alloy, aluminum containing steel having a low carbon content, according to the continuous casting method, wherein aluminum is added to the liquid metal in two portions, the first portion being added at a period before the liquid steel is cast into the tundish and being of a quantity sufficient to bind the major amount of oxygen present in the liquid steel, with the provision that the casting stream coming into contact with air contains only between 0.005 and 0.01% of metallic aluminum, and the second portion being added at a stage when the casting stream will no longer get into contact with the atmosphere and being of a quantity sufficient to obtain the desired analysis. According to the invention

a material is obtained whose surface is largely free from aluminum oxides and thus is suitable for deep-drawing purposes.

3,730,705

# METHOD OF MAKING LEADED-TIN BRONZE ALLOYS

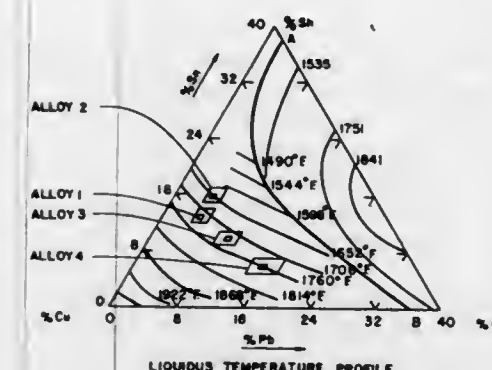
Charles H. Latrobe, Baltimore, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Mar. 1, 1971, Ser. No. 119,599

Int. Cl. C22c 9/02

U.S. Cl. 75—156

5 Claims



A method for making a leaded-tin bronze alloy of a predetermined composition comprises heating metal scrap to make a liquid alloy thereof, measuring and recording the temperature of a sample of the alloy while the sample cools to a solid, whereby the thermal liquidus and monotectic arrest temperatures of the alloy are determined, and adding sufficient quantities of copper, tin or lead to the molten alloy to obtain a desired thermal liquidus and monotectic arrest temperatures and accordingly the desired predetermined composition of the alloy.

This method is useful in controlling the composition of leaded-tin bronze alloys without using conventional analytical techniques.

3,730,706

# STRENGTHENED CATHODE MATERIAL AND METHOD OF MAKING

William E. Buescher and Donald R. Kerstetter, Emporium, Pa., assignors to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed June 29, 1970, Ser. No. 50,843

Int. Cl. B22f 1/00

U.S. Cl. 75—206

4 Claims

A cathode material containing discrete islands of thoria enriched nickel particles is disclosed, as well as a method for fabricating the same. Powder metal techniques are utilized and the material comprises a major amount of substantially pure nickel and a minor amount of a composite material. The composite material comprises composite particles of co-treated nickel and thoria. The thoria is homogeneously dispersed with respect to its co-treated nickel but non-homogeneously dispersed with respect to the remainder of the nickel.

3,730,707

**METHOD OF DEVELOPING LATENT IMAGES**  
Robert J. Hagenbach and Myron J. Lenhard, Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.  
No Drawing. Original application Apr. 17, 1967, Ser. No. 631,193, now Patent No. 3,595,794. Divided and this application Nov. 30, 1970, Ser. No. 93,904

Int. Cl. G03g 9/02, 13/08

U.S. Cl. 96—1 SD

3 Claims

A xerographic carrier bead material for use in developing electrostatic latent images comprising a glass composi-

tion of from about 5 to about 45 parts oxides of silicon and from about 20 parts to about 95 parts oxides of lead.

3,730,708

# ELECTROPHOTOGRAPHIC MULTI-COLOR PROCESS EMPLOYING LIQUID DEVELOPER

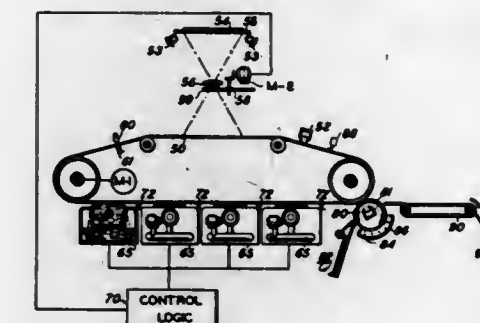
Don B. Jugle, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Original application Feb. 8, 1968, Ser. No. 703,985, now Patent No. 3,627,410. Divided and this application Mar. 15, 1971, Ser. No. 124,603

Int. Cl. G03g 13/22

U.S. Cl. 96—1.2

2 Claims



Apparatus for developing latent electrostatic images with a liquid developer by forming a wave to contact the image with sufficient turbulence, such that developer particles are suspended uniformly, but gentle enough so as not to destroy the electrical characteristics of the image thereby rendering a high quality print. The wave is formed by pumping liquid developer from a sump pit into a header pipe which is immersed below the surface of a development tray filled with liquid developer. Pressurized gas is introduced into the sump means to maintain uniform suspension of the particles in the developer liquid. In a preferred embodiment, an array of liquid development units of different colors are positioned at a development station to produce multi-color prints by selectively controlling the formation of different waves to contact latent images formed sequentially on a photoreceptor member advanced past the developing units. The liquid developed images are then transferred onto a support sheet in superposed relationship.

3,730,709

**METHOD FOR ELECTROPHOTOGRAPHY**  
Koichi Kinoshita, Narashino, and Masanori Watanabe, Tokyo, Japan, assignors to Katsuragawa Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1971, Ser. No. 108,733

Claims priority, application Japan, Jan. 24, 1970, 45/6,603

Int. Cl. G03g 13/22

U.S. Cl. 96—1.4

6 Claims

In a method of electrophotography comprising the steps of applying a first electric field across a photosensitive element including a photoconductive layer manifesting persisting internal polarization and a highly insulative layer integrally bonded to one side of the photoconductive layer for depositing a charge of one polarity on the surface of the highly insulative layer, and applying a second electric field across the photosensitive element for depositing a charge of the opposite polarity concurrently with projection of a light image upon the photoconductive layer whereby to form a latent image on the surface of the highly insulative layer corresponding to the light image, a third electric field is applied across the photosensitive element for depositing a charge of the same polarity as



the charge deposited by the second electric field for improving the contrast and then the latent image is developed to provide a visible image.

3,730,710

# ELECTROSTATIC IMAGING EMPLOYING A DOT ELECTRODE

Wasaburo Ohta, Yokohama, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

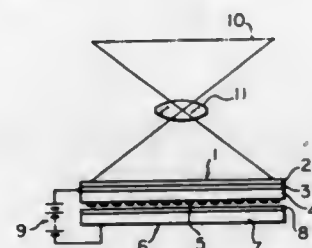
Filed July 13, 1970, Ser. No. 54,239

Claims priority, application Japan, July 11, 1969, 44/55,225

Int. Cl. G03g 13/22

U.S. Cl. 96—1 R

2 Claims



An electrostatic image recording method is provided. For preparing a photoreceptor, a transparent electrode is mounted on a transparent support, a photoconductor layer is laid on said electrode and a plurality of separate dot electrodes are further provided on said photoconductor layer. A recorder having an insulating layer on an electrode is positioned so that said dot electrodes of said photoreceptor and said insulating layer of said recorder may be faced with each other. A potential is applied to said transparent electrode of said photoreceptor and said electrode of said recorder, and under this potential applying condition, they are exposed to light, whereby a charged image is formed on said recorder.

3,730,711

# PHOTOCONDUCTIVE MATERIAL FOR ELECTROPHOTOGRAPHY

Hisatake Ono and Syu Watarai, Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed Aug. 13, 1970, Ser. No. 63,619

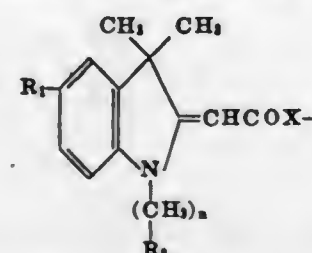
Claims priority, application Japan, Aug. 13, 1969, 44/64,037

Int. Cl. G03g 5/06

U.S. Cl. 96—1.5

8 Claims

A photoconductive material for electrophotography which consists essentially of an indoline derivative having a radical represented by the following Formula I:



wherein  $R_1$  represents a hydrogen, a halogen atom, a lower alkyl  $-\text{NO}_2$ ,  $-\text{OR}$  or  $-\text{COOR}$  group (R being a lower alkyl group);  $R_2$  represents H,  $-\text{OR}_3$ ,  $-\text{CN}$  or a phenyl group ( $R_3$  being H or a lower alkyl group);  $n$  is an integer having the value of 1-4; X represents either a single bond or  $-\text{NH}-$  group.

# PHOTOCONDUCTIVE MATERIAL FOR ELECTROGRAPHY

Kiyoshi Futaki, Kazuhiro Emoto, and Hirokazu Tsukahara, Kyoto, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

No Drawing. Filed Mar. 1, 1971, Ser. No. 119,886

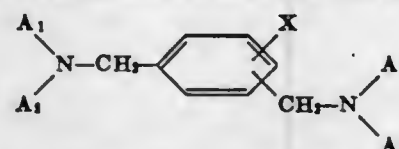
Claims priority, application Japan, Mar. 3, 1970, 45/17,645

Int. Cl. G03g 5/04, 5/06

U.S. Cl. 96—1.5

6 Claims

An excellent photosensitive material, which has a high sensitivity and has no strong absorption in the near ultraviolet region, may be obtained by use of a novel compound represented by the following general formula as the photoconductive substance for electrography:



wherein  $A_1$  is a phenyl group,  $A_2$  is a phenyl or naphthyl group, X is hydrogen, a halogen, or a methyl, methoxy, or nitro group, and said phenyl or naphthyl group represented by  $A_1$  and  $A_2$  may contain substituents. The compound is readily synthesized and also has a high solubility in solvents.

3,730,713

# DEVELOPER SCAVENGERS FOR IMAGE TRANSFER SYSTEMS

Thomas I. Abbott, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed May 26, 1971, Ser. No. 147,166

Int. Cl. G03c 5/54, 7/00

U.S. Cl. 96—3

18 Claims

A developer scavenger layer comprising a bis(vinylsulfonylethyl) derivative in a polymeric binder is useful for reducing background stain in a dye image-receiving element of a color diffusion transfer system utilizing immobile couplers which form diffusible dyes.

3,730,714

# PHOTORESPONSIVE ARTICLES COMPRISING MULTILAYER SPECTRAL SENSITIZATION SYSTEMS

George R. Bird, Princeton, N.J., and Alan E. Rosenoff, Carlisle, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of application Ser. No. 804,254, Mar. 14, 1969, which is a continuation-in-part of application Ser. No. 401,677, Oct. 5, 1964. This application Nov. 4, 1971, Ser. No. 195,779

Int. Cl. G03g 5/08; G03c 1/28

U.S. Cl. 96—1.7

15 Claims

Photoresponse of a given photosensitive medium is enhanced by utilizing a spectral sensitization system which comprises a layer of a cyanine spectral sensitizing dye adsorbed to said photosensitive medium and, superposed thereover, at least one layer of an energy absorbing and transmitting material which possesses a higher intrinsic energy absorption frequency than the energy absorption frequency of the immediately preceding layer, and an intrinsic energy transmitting frequency which overlaps the energy absorption frequency of the next preceding layer, thereby providing a radiationless circuit capable of transmitting photon-excitation-derived energy to said photosensitive medium.

3,730,715

# PROCESS FOR FORMING SILVERLESS CONTINUOUS TONE PHOTOGRAPHIC IMAGE WITH POLYTHIOL POLYMERS

Arthur Donald Ketley, Columbia, Clifton Leroy Kehr, Silver Spring, and Jennie Lee Touchette, Columbia, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Original application Oct. 11, 1968, Ser. No. 766,948. Divided and this application July 15, 1971, Ser. No. 163,078

Int. Cl. G03c 1/68, 5/00

U.S. Cl. 96—35.1

11 Claims

This invention is directed toward forming a silverless continuous tone photographic image having a scale index between 0.5 and 1.5 and a gamma of 0.5-1.5 (see "Kodak Notes on Practical Densitometry," Pamphlet No. E59, pages 1-17, Eastman Kodak Company, Rochester, N.Y., for definitions) from a supported pigment or dye filled liquid photosensitive composition by selectively insolubilizing portions of the composition on exposure to actinic radiation and removing the unexposed liquid portion of the composition from the support.

3,730,716

# SILVER IMAGE STABILIZATION WITH NOBLE METAL COMPOUNDS AND $\alpha,\beta$ -ENEDIOL DEVELOPER

Edwin H. Land, Cambridge, Stanley M. Bloom, Waban, and Leonard C. Farney, Melrose, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

No Drawing. Filed May 19, 1971, Ser. No. 145,044

The portion of the term of the patent subsequent to Nov. 28, 1989 has been disclaimed

Int. Cl. G03c 5/54

U.S. Cl. 96—29 R

17 Claims

The present invention relates to a novel photographic film unit adapted to provide silver images of enhanced image stability which comprises photosensitive silver halide, a noble metal compound containing a noble metal ion below silver in the Electromotive Force Series of Elements, and a silver halide developing agent whose oxidation product is substantially nonoxidative to the thus-formed silver image for a time sufficient to enable the noble metal ion to contact said silver image to provide sustained and long-lasting stabilization effects.

3,730,717

# PHOTOHARDENABLE ELEMENT WITH LIGHT-DEVELOPABLE DIRECT WRITING SILVER HALIDE OVERCOATING

Victor Fu Hna Chu, Wilmington, Del., and Abraham Bernard Cohen, Springfield, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Mar. 28, 1969, Ser. No. 811,608

Int. Cl. G03c 5/04, 1/68, 11/12

U.S. Cl. 96—27 R

10 Claims

An element comprising a light-hardenable layer upon which is coated a photodevelopable colloid silver halide emulsion. The photodevelopable silver halide emulsion is exposed, photodeveloped, and the image used as a negative to expose the underlying composition which is treated to remove the composition in unexposed, but not in exposed area. Printing reliefs suitable for letterpress and offset printing and printed circuits can be made from the elements of the invention, using wash-off procedures or thermal transfer means whereby unhardened image areas adhere to a previously or subsequently applied receptor sheet or plate.

3,730,718

# PHOTOGRAPHIC DYE DIFFUSION TRANSFER PROCESS

Justus Danhauser, Cologne, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Sept. 29, 1971, Ser. No. 184,936

Claims priority, application Germany, Oct. 9, 1970, P 20 49 688.2

Int. Cl. G03c 5/54, 7/00, 1/90

U.S. Cl. 96—29 D

6 Claims

For the production of a colored image by the dye diffusion transfer process a multilayer material is used which contains an image-receiving layer on a transparent support, and a light-sensitive, dye-giving combination, and between them a light-impermeable but diffusion-permeable layer and stripping material to enable stripping off the image-receiving layer. The light-sensitive element is exposed image-wise, then brought into contact with a processing composition that causes it to produce a dye image that diffuses into the image-receiving layer therein forming a transfer image visible through the transparent support. When it is observed that the transfer image is acceptable the image-receiving layer is stripped away from the light-sensitive combination.

3,730,719

# METHOD AND ARTICLE FOR COLOR KINESCOPE SCREEN AND MASK PRODUCTION

Harold Bell Law, Princeton, N.J., assignor to RCA Corporation

Continuation of abandoned application Ser. No. 834,759, June 19, 1969. This application June 15, 1971, Ser. No. 153,419

Int. Cl. G03c 5/00

U.S. Cl. 96—36.1

2 Claims

A method for producing a color kinescope having an image screen including a plurality of phosphor areas and a color selection barrier prepared from a preliminary mask used for screen printing. The preliminary mask is made by disposing an apertured layer of a second metal on one surface of a substrate of a first metal, disposing a perforated resist film on another such surface, etching portions of the substrate therebetween to provide apertures larger than those of the metal layer, and removing the resist film. The preliminary mask is used for printing the phosphor areas and the apertured metal layer removed to produce a color selection barrier. The preliminary mask may be used to provide a dark matrix to the image screen.

3,730,720

# FABRICATION OF INTEGRATED OPTICAL CIRCUITS

John David Cuthbert, Bethlehem, Pa., Donald Henry Hensler, Morris, N.J., and William Harold Orr, Carmel, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Aug. 5, 1970, Ser. No. 61,067

Int. Cl. G03c 5/00

U.S. Cl. 96—38.3

10 Claims

In this disclosure a process is described for the fabrication of optical integrated circuits. The process consists of forming a film of a metal or alloy on a substrate, removing part of the film by photolithographic techniques so as to form the desired pattern, and then oxidizing this film to the corresponding metal oxide. The metal oxide film on the substrate forms the optical integrated circuit. An advantage of this process is that photolithographic techniques can be used to produce quite complicated patterns of small dimensions.



3,730,721

**PHOTOGRAPHIC INTENSIFICATION PROCESS AND COMPOSITION**

John Williams and Paul Gilman, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 22, 1965, Ser. No. 502,389

Int. Cl. G03c 5/24, 5/26, 5/32

U.S. Cl. 96—48 PD

32 Claims

A physical developer for latent images in silver sensitized photographic materials comprises a cupric salt and a reducing agent such as ascorbic acid for this cupric salt. A silver salt solvent transfer developer also contains a silver halide solvent. Latent image nuclei are physically developed or intensified by the cupric salt physical developer.

3,730,722

**YELLOW COUPLER AND ITS USE**

Isaburo Inoue, Takaya Endo, Syunji Matsuo, Masahiko Taguchi, and Toshihiko Yamamoto, Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd.

Filed Nov. 20, 1970, Ser. No. 91,404

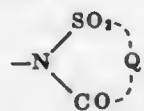
Claims priority, application Japan, Nov. 26, 1969, 44/94,274

Int. Cl. G03c 7/00

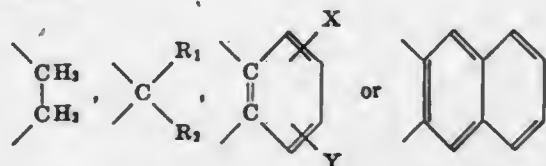
U.S. Cl. 96—56.3

1 Claim

A coupler capable of forming a yellow color image in color photography has an open chain active methylene group bonded to two adjacent carbonyl groups. One of the hydrogen atoms of the active methylene is substituted by a group of the formula



wherein Q is



R<sub>1</sub> and R<sub>2</sub> are lower alkyl, X is hydrogen, halogen or alkoxy, and Y is hydrogen, halogen, amino, acylamide, ureide, lower alkyl, alkoxy or hydroxy. A method is disclosed for forming a yellow color image on a light sensitive color photographic material using this coupler. The developed yellow color image exhibits excellent light and humidity fastness.

3,730,723

**DIRECT POSITIVE PROCESSES UTILIZING SILVER HALIDE SURFACE IMAGE EMULSIONS CONTAINING DESENSITIZERS**

Paul Brewster Gilman, Jr., Rochester, Ronald George Raleigh, Brockport, and Thaddeus Donald Koszelak, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed June 17, 1971, Ser. No. 154,224

Int. Cl. G03c 1/36, 15/24

U.S. Cl. 96—64

17 Claims

Improved processes are disclosed for obtaining positive images in an unfogged, silver halide emulsion wherein a photographic element comprising a support and said emulsion are imagewise-exposed and then either (1) developed in a silver halide developer in the presence of a silver halide fogging agent or (2) given a light flash during development in a silver halide developer. In one aspect,

the silver halide emulsions of this invention are surface-image emulsions comprising an electron acceptor and/or desensitizing concentrations of spectral-sensitizing dye and the grains of said emulsion have been chemically sensitized on the surface thereof to a level less than that which would provide a substantial density in Kodak Developer DK-50 after an imagewise exposure when said emulsions are coated at a coverage of between 300 to 400 mg. of silver per ft.<sup>2</sup>.

3,730,724

**SILVER HALIDE COLOR PHOTOGRAPHIC ELEMENT CONTAINING A MAGENTA COLOR COUPLER AND A CARBOXY SUBSTITUTED THIAZO LINE COMPOUND**

Thomas Irving Abbott, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 21,468, Mar. 20, 1970. This application June 3, 1971, Ser. No. 149,815

Int. Cl. G03c 1/28, 1/76, 1/34

U.S. Cl. 96—74

10 Claims

Light sensitive photographic elements comprising surface sensitized converted-halide silver halide grains are contained in emulsions which are particularly and effectively stabilized by addenda which resist pre-processing deterioration, post-processing dye stability and unwanted shifting in color balance. Preferred such addenda are carboxy substituted thiazolinethione and carboxy substituted thiazolidines.

3,730,725

**ADDITIVE COLOR SCREEN ELEMENTS CONTAINING AN AZO CHROME-COMPLEXED DYE**

Elbert M. Idelson, Newton Lower Falls, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

No Drawing. Continuation-in-part of abandoned application Ser. No. 873,131, Oct. 31, 1969. This application Sept. 30, 1971, Ser. No. 185,403

Int. Cl. G03f 5/00, 7/04

U.S. Cl. 96—81

12 Claims

Additive color screen elements are prepared using a mixed-azo chrome-complexed dye system to provide the red element, i.e., a combination of a phenylazo pyrazolone and a naphthylazo pyrazolone.

3,730,726

**COLOR PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENTS**

Nobuo Tsuji, Yoshiaki Ono, Fumihiko Nishio, and Hirozo Ueda, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Kanagawa, Japan

No Drawing. Continuation-in-part of abandoned application Ser. No. 717,420, Mar. 29, 1968. This application Sept. 14, 1970, Ser. No. 72,116

Claims priority, application Japan, Mar. 29, 1967, 42/19,696, 42/19,697, 42/19,698

Int. Cl. G03c 1/04

U.S. Cl. 96—84 R

11 Claims

By incorporating a copolymer of vinyl alcohol and vinyl pyrrolidone, a partially saponificated polyvinyl alcohol, or a copolymer of vinyl alcohol and cyanoethyl-vinyl ether or a copolymer of vinyl alcohol and alkyl-vinyl ether in a photographic layer of a color photographic light-sensitive element, in particular, a color photographic silver halide emulsion having incorporated therein an oil-soluble coupler and an oily solvent having a high boiling point, the silver removal or silver bleaching of developed silver in bleaching process after color de-

velopment is effectively improved whereby the color turbidity of colored images can be reduced.

3,730,727

**PHOTOGRAPHIC ELEMENT COMPRISING AN ALIPHATIC CARBOXYLIC ACID ARYL HYDRAZIDE AND ASCORBIC ACID**

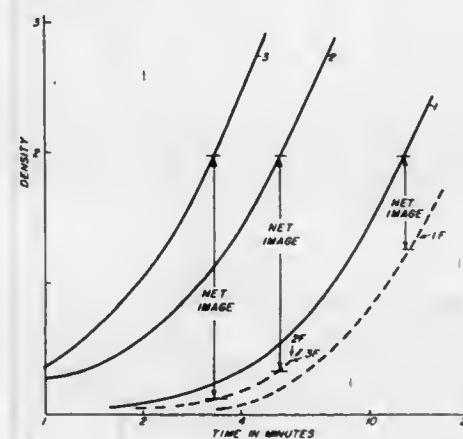
Ismael Adolfo Olivares, Frederic Roland Bean, and Grant Milford Halst, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 11, 1971, Ser. No. 123,317

Int. Cl. G03c 1/06, 1/76, 5/30

U.S. Cl. 96—95

6 Claims



Aryl, heterocyclic or aliphatic carboxylic acid aryl hydrazides are employed with ascorbic acid as a developing agent combination for exposed electromagnetic energy sensitive silver salts. The developing agent combination can be employed in developer solutions, in silver salt processing solutions, as an incorporated developing agent combination, as a developing agent combination in diffusion transfer processes and in dry processing techniques. The combination can be located in the same or different layers of a photographic element, or the hydrazide can be located in the photosensitive emulsion layer and the ascorbic acid located in an activator solution. The process of developing exposed photographic elements in the presence of the hydrazides and ascorbic acid is disclosed.

3,730,728

**ANIMAL FOOD FROM RAW WHOLE FISH**

Max Patashnik, Kirkland, and Mark C. Keyes, Kent, Wash., assignors to the United States of America as represented by the Secretary of the Interior

No Drawing. Filed Nov. 18, 1970, Ser. No. 90,805

Int. Cl. A22c 25/20; A23k 1/10

U.S. Cl. 99—3

1 Claim

Raw whole fish is coarsely ground to hamburger-like consistency while kelp and NaCl are added to the fish, the latter to salinize its aqueous content so as to solubilize myofibrillar protein in the fish. The "hamburger" is then passed through a colloid mill to form a paste-like emulsion containing dissolved protein, dispersed globules of fish fat, and dispersed particles of kelp. Dissolved protein is then coagulated to gel the emulsion into a product suitable as animal food or bait.

3,730,729

**CONTINUOUSLY PUFFING FINELY-DIVIDED PARTICULATE FOOD MATERIALS UTILIZING OPPOSING STEAM FORCES**

Palmer K. Strommer, Osseo, Minn., assignor to General Mills, Inc.

Filed July 27, 1970, Ser. No. 58,318

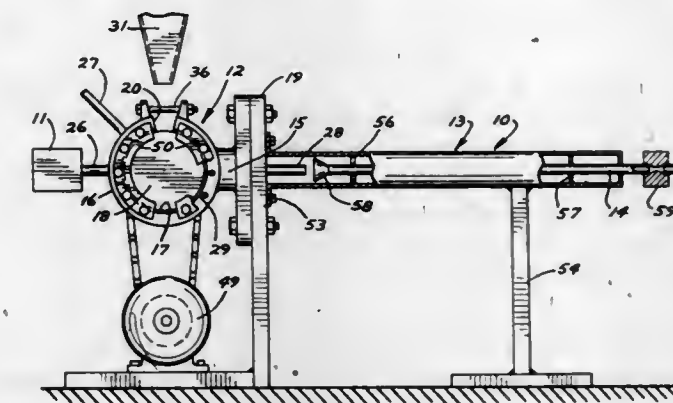
Int. Cl. A23g 1/04; A23i 1/10, 1/12

U.S. Cl. 99—26

22 Claims

Heat and pressure reactive particulate food materials such as cereal flour, cocoa powder, potato flour, or finely-divided protein containing materials are treated in an apparatus wherein the food material is propelled through

a treatment zone containing steam at a pressure of between about 15 p.s.i.g. and 110 p.s.i.g. by a steam flow which itself is at a pressure of at least 15 p.s.i.g. and a temperature of between 250° F. and 500° F. Once the food material passes through the treatment zone it is then



carried into a zone of lower pressure. The opposing forces on the food material from the flow of steam and the steam pressure in the treatment zone result in the material being either puffed, texturized, gelatinized, homogenized or agglomerated.

3,730,730

**STABLE AND EMULSIFIABLE HOP EXTRACT**

Francis Lloyd Rigby, Yakima, Wash., assignor to John I. Haas Inc., Washington, D.C.

No Drawing. Filed Nov. 23, 1970, Ser. No. 92,267

Int. Cl. C12c 9/02

U.S. Cl. 99—50.5

1 Claim

A hop extract composition comprises a resinous phase of the resinous constituents of hops, an aqueous phase of a syrup selected from the group consisting of (1) a syrup of hop water-solubles and (2) a sugar syrup, and a colloid stabilizing agent present in amounts sufficient to inhibit stratification of said phases during storage of said composition at a temperature up to 100° F.

3,730,731

**ROASTING METHOD FOR PARTICULATE SOLIDS**

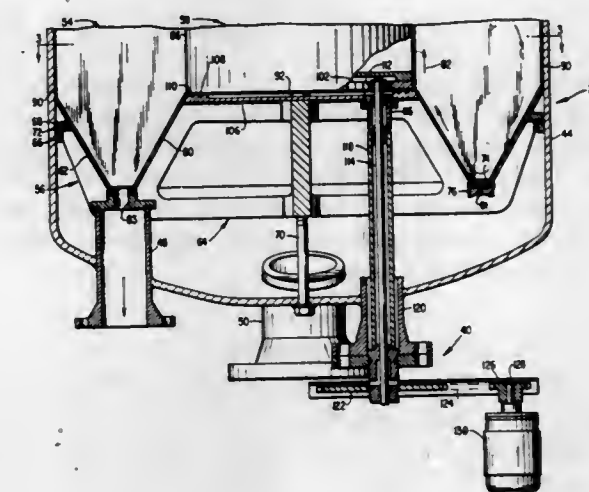
Horace L. Smith, Jr., Richmond, Va., assignor to Smitherm Industries, Inc., Richmond, Va.

Continuation-in-part of Ser. No. 44,464, June 8, 1970, Pat. No. 3,615,668. This application April 26, 1971, Ser. No. 137,247

Int. Cl. A23f 1/02

U.S. Cl. 99—68

7 Claims



A method for roasting particulate solids which includes a system for heating and circulating a fluid through a roasting vessel, and arrangements for supplying material to be processed to and discharging it from the reactor.



### 3,730,732 TORTILLA AND PROCESS USING WATER SOLUBLE ALKALINE SUBSTANCE

Manuel Jesus Rubio, Bridgeport, Conn., assignor to Roberto Gonzalez Barrera, Victor Hermosa, Monterrey, Mexico

No Drawing. Continuation-in-part of applications Ser. No. 58,141, July 24, 1970, and Ser. No. 58,655, July 27, 1970. This application May 2, 1972, Ser. No. 249,624 Int. Cl. A231 1/10

U.S. Cl. 99—80 R 5 Claims  
To increase the yield of dough and tortillas by incorporating water soluble alkaline substances.

Also to retard the microbiological spoilage of tortillas which are unleavened, unshortened food products made of nixtamalized corn or nixtamalized corn flour by adding water soluble alkaline substances.

### 3,730,733 ANTIDIABETIC COMPOSITION OF BEET ROOTS AND HORSE RADISH

Josef Vujcuf, 42 Schusselbergstrasse 8, Munich, Germany

No Drawing. Filed Jan. 12, 1971, Ser. No. 105,943  
Claims priority, application Germany, Dec. 24, 1970, P 20 63 845.3  
Int. Cl. A231 1/00

U.S. Cl. 99—100 5 Claims

An antidiabetic vegetable composition which is composed of red beet-roots and, per 100 parts by weight thereof, of 10 to 25 parts by weight, preferably 12 to 20 parts by weight of horse-radish, about 3 to about 15 parts by weight of a vegetable oil; preferably of high unsaturation, and from about 3 to about 16 parts by weight of vinegar, preferably apple or pear vinegar of about 5% concentration, and up to 5% by weight, based on the composition, of other taste modifying agents and/or food preservatives, preferably 2 to 6 parts by weight of wine per 100 parts by weight of beet-roots, said composition having surprisingly antidiabetic and some diuretic effects but convenient taste, especially if made up like a salad. The composition is stable more than a year if pasteurized at 75 to 90° C. and sealed air-tight without any preservatives added.

### 3,730,734 LIGHT-SENSITIVE PHOTOPOLYMERIZABLE MATERIAL CONTAINING PHOTOCHROMIC MATERIAL

Gerhard Albert Delzenne, 's-Gravenwezel, Belgium, assignor to Gevaert-Agfa N.V., Mortsels, Belgium

No Drawing. Filed Mar. 12, 1968, Ser. No. 712,362  
Claims priority, application Great Britain, Mar. 13, 1967, 11,703/67

U.S. Cl. 96—115 R 17 Claims

Light sensitive photographic materials are provided comprising a light sensitive layer comprising a photochromic material and a photo-hardening polymeric system. Normally, photochromic materials undergo reversible color change. In the disclosed materials, the color formed upon exposure to actinic light is preserved forming a non-fading image.

### 3,730,735 CONFECTION AND METHOD OF MANUFACTURE

Kenneth E. Rash, Jr., Pleasanton; John C. Colmey, and Charles E. Zanzig, both of Danville, all of Calif., assignors to Foremost-McKesson, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 807,280, March 14, 1969, abandoned. This application Feb. 23, 1971, Ser. No. 118,045 Int. Cl. A23g 3/00

U.S. Cl. 99—134 R 6 Claims

Confection or candy mixes and products having relatively high levels of solubilized protein obtained by using partially

delactosed and partially demineralized whey having an ash content of not more than about 6.5 percent in combination with a soluble caseinate.

### 3,730,736 LOW CALORIE SWEETENER

Alfred R. Globus, Bayside, N.Y., assignor to Farah Manufacturing Co., Inc., El Paso, Tex., and Guardian Chemical Corporation, Hauppauge, Long Island, N.Y.

No Drawing. Filed June 12, 1970, Ser. No. 45,925  
Int. Cl. A231 1/26

U.S. Cl. 99—141 A 7 Claims

Low calorie sweetener prepared by the steps of reacting a metal salt of saccharin with a non-toxic acid in the presence of an emulsifying agent comprising water, glycerin and glycerol monostearate, adding a non-toxic polyphosphate to the resultant emulsion of the reaction product formed in the reaction as a stabilizer therefor, and admixing the emulsion with a carrier such as an amino acid or glucono delta lactone. The resultant powder constitutes the low calorie sweetener.

### 3,730,737 COATED MOUTHPIECE CONSTRUCTION

Robert J. Harvey, Sudbury, and Gurbuz Ali Celebi, Marlboro, both of Mass., assignors to Meditron Inc., Wayland, Mass.

Filed April 1, 1971, Ser. No. 130,248  
Int. Cl. B65b 29/06

U.S. Cl. 99—171 B 28 Claims



A mouthpiece construction having a tip and a mouthpiece adapted to fit with a straw. The tip is coated with an effervescent taste-modifying composition comprising an effective amount of room temperature stable taste modifying principle known as miraculin obtained from the ripe fruit of *Synsepalum dulcificum* Daniell, and a non-toxic alkaline material capable of forming carbon dioxide when dissolved in an aqueous acidic solution. The coating is sealed from the atmosphere and the interior of the mouthpiece. The mouthpiece has a lengthwise passageway which fits with the interior of a straw and radial passageway which connects the lengthwise passageway and the peripheral surface of the mouthpiece. The radial passageways are positioned so that liquid passing out of them contacts the coating.

### 3,730,738 PACKAGE AND DISPLAY SYSTEM THEREFOR

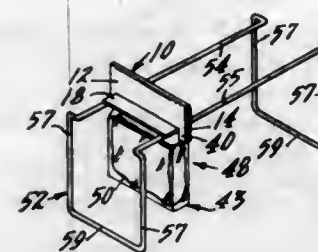
Russell John Cook, Appleton, Donald Roy Kuehl, Menasha, and David Charles Mueller, Neenah, Wis., assignors to American Can Company, Greenwich, Conn.

Filed Mar. 22, 1971, Ser. No. 126,640

U.S. Cl. 99—174 5 Claims

A header for a package adapted to hang suspended between a pair of spaced horizontal support members in a display case, the header having front and back panels connected at a fold line and folded for receiving an upper end portion of a transparent container to be supported thereby. The header has portions extending be-

yond the sides of the container and which have recesses a side wall of volumetric forming chamber along a horizontal plane and in the direction of the longitudinal axis for receiving the support members, and a hinged panel



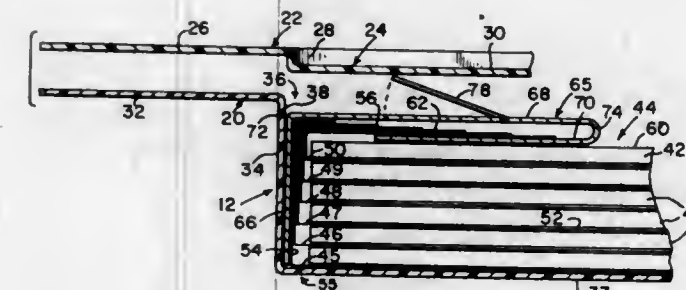
extension which is adapted to be engaged by the supporting members and moved into an awning-like position to shield the product in the transparent container from light.

### 3,730,739 PACKAGE FOR INTERLEAVED PRODUCTS

Oscar E. Seiferth and Glenn M. Austin, Madison, Wis., assignors to Oscar Mayer & Co., Inc., Madison, Wis.

Filed Sept. 29, 1971, Ser. No. 184,664

U.S. Cl. 99—174 4 Claims



A package for convenient separation and removal of any desirable number of stacked articles, such as slices of sausage or cheese, which are of such a nature that it is necessary or desirable to separate respective, stacked articles by interleaf sheets. Uniformly sized interleaf sheets extend from between respective adjacent articles from one edge of the stack, and are folded upward along the edge of the stack to provide shingled exposed margins of the individual sheets at the top of the package. The free ends of the interleaf sheets are folded down across the top surface of the top article in the stack and are separated from the top surface of the stack for easy separation from the top article.

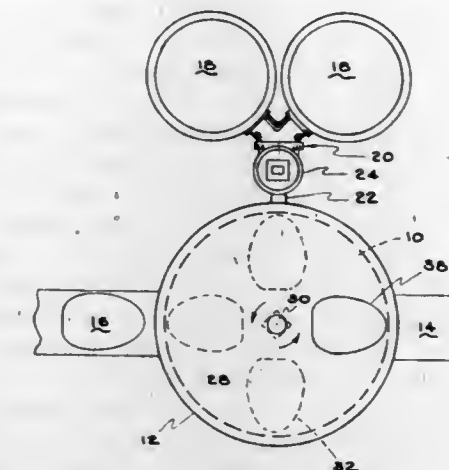
### 3,730,740 SHAPED AND FORMED MEAT PRODUCTS MANUFACTURE

Warren R. Schack, Western Springs, and Francis Glenn Connick, Downers Grove, Ill., assignors to Swift & Company, Chicago, Ill.

Filed May 10, 1971, Ser. No. 141,492

U.S. Cl. 99—187 5 Claims

Method and apparatus for rapid and accurate filling of meat containers with solid meat pieces having the muscle fibers thereof arranged in substantial parallel alignment with the longest dimension of the meat container to produce an improved appearance and melding of the meat surfaces into a superior unitary product. The solid meat pieces are passed under a constant shingled pressure through



thereof and thereafter the formed product is transferred intact to an identically shaped container.

### 3,730,741 METHOD FOR REMOVING EXCESS MOISTURE FROM WATER-BATH CHILLED POULTRY CARCASSES

Ralph S. Zebarth, Bldg. 1, Apt. 2, North Cliff Colony Apartments, Thompson Bridge Road, Gainesville, Ga. 30501

No Drawing. Continuation-in-part of application Ser. No. 2,352, Jan. 12, 1970. This application Nov. 8, 1971, Ser. No. 196,541

U.S. Cl. 99—194 12 Claims

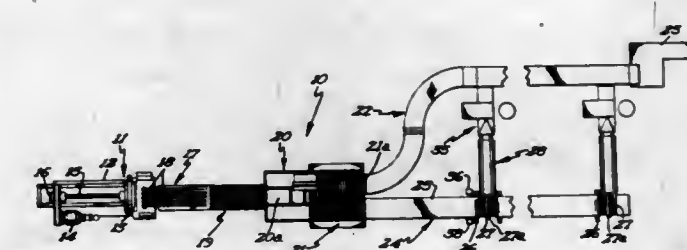
A method of removing excess moisture from cleaned water-bath chilled poultry carcasses, preparatory to cut-up, packaging or freezing thereof, consisting of positioning each carcass with the abdominal evisceration opening lowermost, subjecting the carcass to a quiet atmosphere of sub-freezing air till most of the excess moisture has been expelled from the sub-dermal fascia layers at the exterior surface of the carcass, then subjecting the carcass to a high velocity blast of sub-freezing air, until the total heat content of the carcass, will produce a uniform temperature above the freezing temperature of the flesh, but below the flowing temperature of the body fluids, and until any moisture frozen on the surface of the carcass is vaporized by sublimation and carried away.

### 3,730,742 PROCESS AND APPARATUS FOR SLICING AND WEIGHING BACON FOR PACKAGING

Jean A. Burton, T. Stanley White, and Harold M. Myrland, Austin, Minn., assignors to Geo. A. Hormel & Co., Austin, Minn.

Filed May 12, 1971, Ser. No. 142,557

U.S. Cl. 99—233.11 6 Claims



A process and apparatus for slicing and weighing bacon for packaging comprises slicing and placing bacon in



shingle fashion on a sheet of packaging material and conveying these sheets with the bacon slices thereon to a weighing station. Each sheet is weighed to determine if the weight of each sheet is below a predetermined weight, and those sheets that have a weight at least equal to the predetermined weight are directed by a conveyor to a packaging station where these sheets are packaged. Those sheets with bacon slices thereon that have a weight below said predetermined weight are mechanically moved to a reject conveyor which is comprised of a plurality of endless conveyors arranged in end-to-end relation. Transverse conveyors are interposed between the endless conveyor members of the reject conveyor and are normally disposed in a lower inoperative position but are vertically shiftable to an upper operative position to remove weight deficient sheets of bacon from the reject conveyor and direct the same to a weight adjusting station. At the weight adjusting station the weight of each weight deficient sheet is adjusted to equal the predetermined weight, and the sheets thereafter directed by a conveyor to the packaging station.

3,730,743

**ZINC DUST COATING COMPOSITION**  
Gordon Donald McLeod, Adrian, Mich., assignor to Stauffer Chemical Company

No Drawing. Continuation of application Ser. No. 768,208, Oct. 4, 1968, which is a continuation of application Ser. No. 484,768, Sept. 2, 1965. This application Aug. 24, 1970, Ser. No. 66,608  
Int. Cl. C09d 5/10

U.S. Cl. 106—1

5 Claims

A coating composition containing particulate zinc and a vehicle consisting of an alkyl polysilicate and an organic solvent.

3,730,744

**ALUMINUM PHOSPHATE BONDED REFRACTORY AND METHOD FOR MAKING THE SAME**

Paul J. Yavorsky, Wyckoff, N.J., assignor to Basic Ceramics Incorporated, Hawthorne, N.J.

No Drawing. Filed Aug. 31, 1970, Ser. No. 68,547  
Int. Cl. C04b 35/48

U.S. Cl. 106—57

10 Claims

A refractory ceramic composition suitable for use in casting refractory shapes and making a ceramic product. The composition comprises a ceramic aggregate which has a particle size distribution suitable for the production of a ceramic article. The aggregate particles are bonded together by an aluminum dihydrogen orthophosphate bonding solution which is cured with a curing agent capable of supplying alkalizing ions at a controllable rate to the solution to gel the same. The composition is capable of being cast in a mold, and hardens in situ. The cast article has high wet strength and can be stripped from the mold without removal of contained free water. Subsequent relatively intense heating produces the ceramic product.

3,730,745

**METHOD FOR CASTING OF PLASTER PRODUCTS**

Birger Rustan, Drammen, Norway, assignor to B. Rustan A/S, Drammen, Norway

No Drawing. Filed July 2, 1970, Ser. No. 52,085  
Claims priority, application Norway, July 7, 1969, 2,847/69

Int. Cl. C04b 11/00

U.S. Cl. 106—110

2 Claims

It is known to cast plaster products, and it is further known that moulds used for this casting have to be cleaned very frequently or provided with mould release agents to prevent the plaster from adhering to the mould walls. According to the invention this problem of adhesion to

the mould walls is solved by adding hydrogen peroxide to the aqueous plaster composition used for casting.

This invention relates to a method for casting of plaster products.

3,730,746

**SILICATE POLYMER VEHICLES FOR USE IN PROTECTIVE COATINGS AND PROCESS OF MAKING**

Donald P. Boaz, 3917 Harvest Hill Road, Dallas, Tex. 75234

No Drawing. Continuation-in-part of application Ser. No. 749,587, Aug. 2, 1968. This application Sept. 8, 1970, Ser. No. 70,215

Int. Cl. C09d 5/10; C07g 17/00

U.S. Cl. 106—287 SE

16 Claims

Silicate polymer vehicles are obtained by partially hydrolyzing ethyl silicate and reacting the resultant composition with a vinyl, such as vinyl butyraldehyde and one or more additives such as a borate, a silane or a Lewis acid and cellulose to produce a vehicle for use in protective coatings of various kinds and particularly coatings for use on metal.

3,730,747

**PIGMENT FORMULATIONS**

Horst Belde and Ewald Daubach, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Jan. 8, 1971, Ser. No. 105,094  
Claims priority, application Germany, Jan. 14, 1970, P 20 01 459.9

Int. Cl. C08h 17/04, 17/14

U.S. Cl. 106—288 B

6 Claims

Pigment formulations containing pigments, zinc chloride and water, which are eminently suitable for the mass-dyeing and spin-dyeing of polyacrylonitrile from aqueous concentrated salt solutions.

3,730,748

**PRODUCTION OF MIXED OXIDES CONTAINING ALUMINUM OXIDE**

Günter Lallach and Gottfried Gerlach, Krefeld, Gerhard Trenczek, Krefeld-Uerdingen, and Karl Brandle, Krefeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 17, 1971, Ser. No. 115,948  
Claims priority, application Germany, Mar. 5, 1970, P 20 10 357.5

Int. Cl. C08h 17/04

U.S. Cl. 106—288 B

10 Claims

This invention relates to a process for the production of mixed oxides by reacting the tetrachlorides of silicon, titanium, tin or zirconium, or mixtures thereof, and aluminum trichloride in the gas phase with an oxygen containing-gas at temperatures above 900° C., the metal tetrachloride/aluminum trichloride mixture required for the reaction being prepared in such a way that all the heat of reaction liberated during chlorination of the aluminum is utilized, and that, furthermore, any solid secondary products resulting from the chlorination of the aluminum do not need to be removed.

3,730,749

**PROCESS FOR PREPARING SILICA PIGMENT**

James E. Morgan, Barberton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Mar. 10, 1971, Ser. No. 123,073  
Int. Cl. C09c 1/28

U.S. Cl. 106—288 B

8 Claims

The substantial viscosity increase which occurs during the acidification or neutralization of aqueous alkali metal silicate is substantially minimized by adding a controlled amount of an alkali metal silicate.

3,730,750

**ISOLATION OF FINELY DIVIDED DYES FROM LIQUID DISPERSIONS**

Wolfgang Fabian, Heidelberg, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

No Drawing. Filed Mar. 15, 1971, Ser. No. 124,482  
Claims priority, application Germany, Mar. 23, 1970, P 20 13 818.5

Int. Cl. C08h 17/14

U.S. Cl. 106—309

10 Claims

Process for the isolation of finely divided dyes, particularly those having valuable tinctorial properties. According to the process a dispersion of a dye in a liquid mixture of organic water-immiscible solvent having a melting point between -20° and +120° C. and water (the mixture may not contain a greater weight of water than of dye) is solidified by crystallization, and the solvent is then removed by sublimation.

3,730,751

**METHOD FOR ERASURE DRAWING**

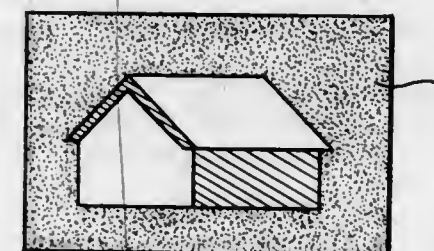
Judah Newberger, 149 S. Broadway, White Plains, N.Y. 10605

Filed June 4, 1971, Ser. No. 149,899

Int. Cl. B44c 1/22; B44d 1/54

U.S. Cl. 117—11

4 Claims



A method of drawing an original image by the selective erasing of an erasable coating, such as ink, from a multilayer sheet of drawing material. The coating has a starting shade which contrasts with the shade of the underlying layer, which may be the sheet itself, and is partially erasable to produce intermediate shades of the starting shade. More than one contrasting erasable coating layer may be provided in which instance selective erasing of one or more of the coating layers, either wholly or partially, is utilized to draw the original image.

3,730,752

**METHOD OF METAL COATING A FIBROUS SHEET**

Alejandro E. Guajardo Garza, Penoles 1515, and Gustavo Guajardo Garza, Colonia del Valle, both of Monterrey, Mexico

Filed July 26, 1971, Ser. No. 165,942

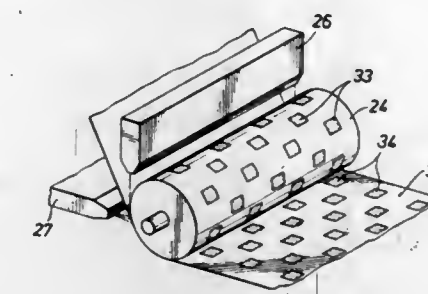
Claims priority, application Mexico, Sept. 29, 1970, 79,165

Int. Cl. C23c 13/02; D21h 1/18

U.S. Cl. 117—11

2 Claims

A rough or porous body, as uncoated paper, paper product, cloth, leather or the like is given an attractive metallized surface, figured or designed or of uniform appearance, by first being given a smooth surface by the application of a film of any of a number of plastic resinous priming materials, then, after solidification of the prime coat, by being given an extremely thin coating



of vaporized metal. A design may be inexpensively applied to such a sheet by forming the design in the surface of one or more of the press or thermal rollers used in

shaping and curing the plastic film coating, such design being reproduced in the plastic film during its manufacture and reflected in the finished, metallized surface.

3,730,753

**METHOD FOR TREATING A WEB**

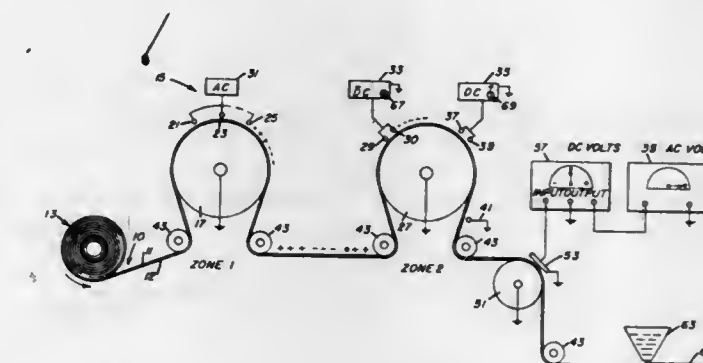
William C. Kerr, Middlesex, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 30, 1971, Ser. No. 167,758

Int. Cl. B44d 1/092

U.S. Cl. 117—34

19 Claims



An improved method for substantially eliminating charge from a surface of a corona-treated web, particularly for enhancing the surface's coatability. The improved method employs the technique of "flooding" the surface with charge of a first polarity so as to generally uniformly charge the surface and thereafter removing the charge imparted to the surface, so as to leave the surface generally free of charge. To ensure positive control between the amount of charge added to the surface and the amount removed, the invention provides the improvement of monitoring the surface of the web for charge variation and for net charge. The amount of charge added to and/or the amount of charge removed from the surface may be so controlled that the charge variation and the net charge on the surface is lowered to an acceptable level, preferably approximately zero.

3,730,754

**PRESSURE SENSITIVE RECORDING SHEET**

Sheldon Farber and Arthur John Wright, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

No Drawing. Original application Nov. 3, 1970, Ser. No. 86,644, now Patent No. 3,654,314. Divided and this application Oct. 1, 1971, Ser. No. 185,800

Int. Cl. B41m 5/16

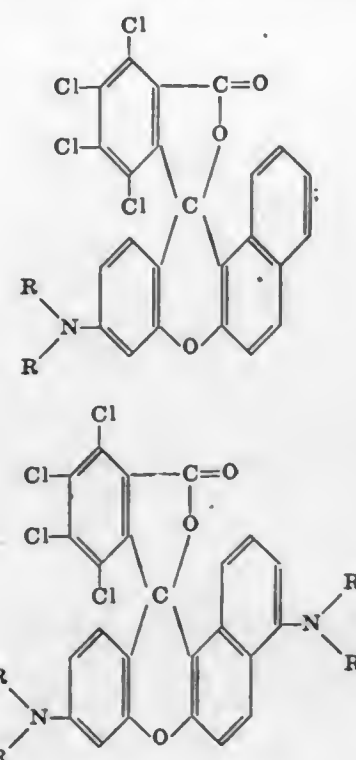
U.S. Cl. 117—36.2

13 Claims

A pressure-sensitive record unit and a mark-forming



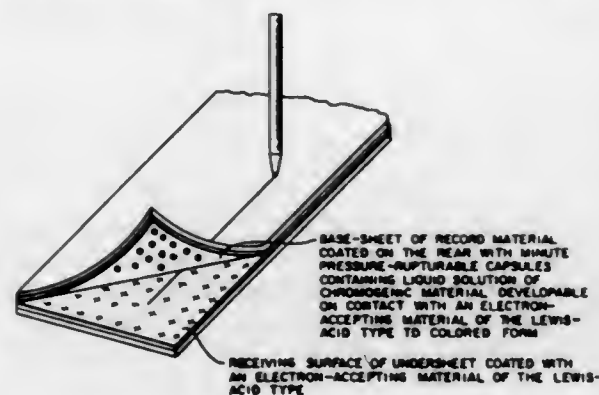
unit are disclosed which employ a chromogenic material of normally colorless form having a structural formula:



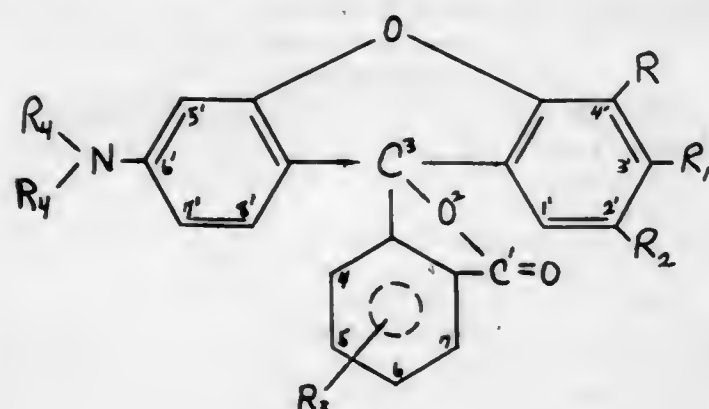
wherein each R is hydrogen or an alkyl radical having 1 to 4 carbon atoms.

3,730,755

**PRESSURE-SENSITIVE RECORD MATERIALS**  
Chao-Han Lin, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio  
Original application Jan. 21, 1969, Ser. No. 792,279, now Patent No. 3,624,107. Divided and this application Jan. 11, 1971, Ser. No. 105,687  
Int. Cl. B41m 5/16; C07d 5/00  
U.S. Cl. 117-36.2



A chromogenic material of normally colorless form is disclosed, having the structural formula:



wherein on of R, R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> represents a nitro- or amino-radical and the remaining other of R, R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> comprise hydrogen, halogen, phenyl and alkyl radicals and R<sub>4</sub> represents alkyl radicals having less than five carbons; said material assuming a colored form upon reactive contact with a Lewis acid molecule. Examples include 6'-diethylamino-2'-nitrofluoran; 6'-diethylamino-2'-methyl-4'-nitrofluoran; 2'-chloro-6'-diethylamino 3'-methyl-5-nitrofluoran; and 6-amino-2'-chloro-6'-diethylamino-3'-methylfluoran.

3,730,756

#### METHOD OF PRODUCING COBALT-COATED COMPOSITE POWDER

Wasyk Kunda and Donald Alan Randell, Fort Saskatchewan, Alberta, Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Ontario, Canada  
No Drawing. Filed Apr. 28, 1971, Ser. No. 138,313  
Int. Cl. C23c 3/04

**U.S. Cl. 117-47 R** 4 Claims  
Finely divided core particles are dispersed in a nickel-containing ammoniacal solution and the solution is subjected to gas reduction to deposit a thin layer of nickel on the particles. The nickel-coated particles are then separated from solution and contacted with a cobalt-containing ammoniacal solution. A layer of cobalt is deposited over the nickel coating by subjecting the solution to gas reduction.

3,730,757

#### PROCESS FOR ADHESIVE VARNISHING, PRINTING AND GLUING OF PLASTICS

Helmnt Knorre, Seligenstadt, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany  
Continuation-in-part of Ser. No. 762,635, Sept. 25, 1968, abandoned. This application May 25, 1971, Ser. No. 145,975  
Int. Cl. B44d 1/094, 5/12

**U.S. Cl. 117-47 A** 9 Claims  
The receptivity of thermoplastics, for example, polyethylene and polypropylene, to coatings is improved by incorporating into the thermoplastic a finely divided, particulate inorganic filler and an organic resin having a softening point lower than the thermoplastic, a softening range of about 30° to 100° C and capable of being degraded by conventional oxidizing pretreatment.

3,730,758

#### METHOD OF PROTECTING FERROUS STRIP IN HOT-DIP PROCESSES

John N. Laidman, Coopersburg, Pa., assignor to Bethlehem Steel Corporation  
Filed Oct. 29, 1970, Ser. No. 85,011  
Int. Cl. C23c 1/00

**U.S. Cl. 117-51** 5 Claims  
A method for coating batch annealed ferrous strip with molten metal by a hot-dip process in which fluxing is eliminated. The strip is initially coated with a very thin metallic layer by electroplating or vapor deposition and then, after suitable activation of the surface, passed through a molten metal coating bath.

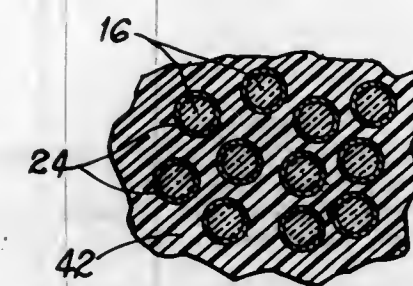
3,730,759

**GLASS FIBER REINFORCED ELASTOMERS**  
Alfred Marzocchi, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation  
Filed Dec. 16, 1970, Ser. No. 98,642  
Int. Cl. C03c 25/02

**U.S. Cl. 117-72** 26 Claims  
This invention is addressed to the improvement in the bonding relationship between glass fibers and elastomeric materials in the manufacture of glass-fiber-elastomeric products wherein individual glass fibers are coated with a composition containing an anchoring agent in the form

of a titanium orthoester or the reaction product of a titanium orthoester and an amine compound, or bundles of glass fibers are impregnated with a composition con-

molten state and moving an ultrasonically-excited probe over the surface, with the probe being in contact with the surface and with the molten metal.



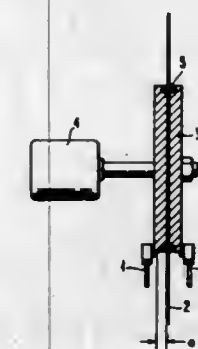
taining an elastomer compatible material and an anchoring agent in the form of the reaction product of a titanium orthoester and an amine compound.

3,730,760

#### VERTICAL CENTRIFUGAL SPIN COATING METHOD

Alfred A. Machmiller, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed Nov. 26, 1971, Ser. No. 202,417  
Int. Cl. B44d 1/08, 1/06

**U.S. Cl. 117-101** 14 Claims



A method of spin coating both sides of an object such as a disk substrate by mounting the object in a vertical position, exposing the both sides to be coated, vertically rotating the object about its own axis, and centrifugally coating both sides of the object during rotation of the object. Vertical coating eliminates skittering problems associated with horizontal spin coating and allows accurate thickness control.

3,730,761

#### COATING OF METALS

Frank Smith, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England  
No Drawing. Continuation-in-part of application Ser. No. 843,242, July 18, 1969. This application Jan. 7, 1971, Ser. No. 104,733

Claims priority, application Great Britain, Aug. 9, 1968, 38,107/68  
Int. Cl. C23c 1/00

**U.S. Cl. 117-131** 4 Claims  
A sheet of titanium, zirconium or tantalum is coated with tinning metal by heating the sheet while the surface to be coated is covered with the tinning metal in the

#### 3,730,762 PROCESS FOR IMPROVING THE SLIPPING RESISTANCE AND THE DELUSTERING OF TEXTILES

Hans Delner, Neusas, near Augsburg, and Heinrich Slinger, Horgau, near Augsburg, Germany, assignors to Chemische Fabrik Pforsee GmbH., Augsburg, Germany

No Drawing. Filed May 18, 1971, Ser. No. 144,624  
Claims priority, application Germany, June 30, 1970, P 20 32 387.9; July 7, 1970, P 20 33 523.3

Int. Cl. D06m 15/00  
**U.S. Cl. 117-139.5 CQ** 10 Claims

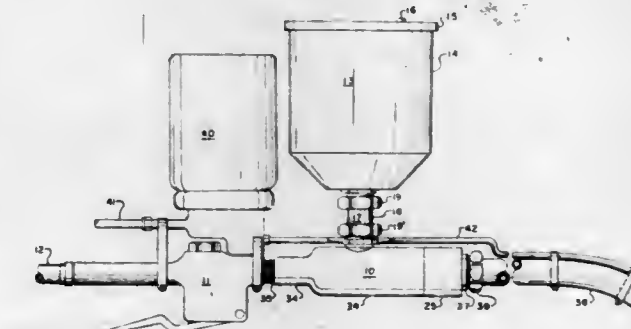
A process for improving the slipping resistance and the delustering of textiles comprises impregnating textiles with organic solutions containing reaction products of alcoholates of zirconium, titanium or aluminum with aliphatic, saturated 1- or 2-valent alcohols with 2 to 6 carbon atoms, or with monoalkyl ethers of these 2-valent alcohols, whereby these monoalkyl ethers have totally 4 to 8 carbon atoms, with paraformaldehyde in a mol ratio of 1:1 to 1:10 and possibly 0.06 to 1 mol metal salts derived from fatty acids with 6 to 18 carbon atoms with 2-valent metals per mol alcoholate as stabilizers. Then the superfluous solution is removed and the textiles are dried. The invention is particularly characterized in that the reaction products are derived from such alcoholates of zirconium, titanium or aluminum wherein 0.5 to 2.5 equivalents of alcohol residues are replaced by residues of low saturated and/or unsaturated carboxylic acids with 2 to 4 carbon atoms.

3,730,763

#### METHOD FOR DRY PACKING OF SURFACES

Roy Otto Schlottmann, 10810 Estate Drive, Boise, Idaho, and Paul Edward Yadon, P.O. Box 425, Parma, Idaho  
Continuation-in-part of Ser. No. 26,992, April 9, 1970, abandoned. This application Nov. 1, 1971, Ser. No. 194,221  
Int. Cl. B44d 11/08, 1/02

**U.S. Cl. 117-104 R** 3 Claims



This invention relates to the method for dry packing exposed surfaces, such as holes, cavities, cracks, planar surfaces, and the like, of buildings and structures, and includes the steps of mixing substantially dry granular and binder materials, such as calcined limestone or calcined gypsum material, and wetted sand together; wetting the surface to be finished with commonly known admixtures of adhesives; turbulating and suspending the mixture of materials in a chamber; and blasting the mixture into the wetted surface with sufficient impinging force to cause the mixed materials to pack in the surface. The



additional steps of applying finely atomized admixture of adhesive to the finished surface and repeating the steps above set out provides a method by which the thickness of the material to be packed may be varied.

3,730,764

# PROCESS FOR PRODUCING A PARALLEL OVERGROWTH FOR USE AS AN EPITAXIAL THIN FILM LASER

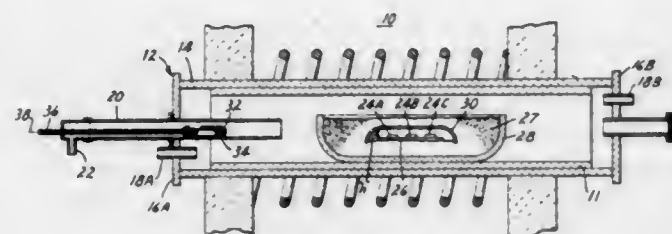
Gunther H. Dierssen, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 23, 1969, Ser. No. 887,650

Int. Cl. H011 7/32

U.S. Cl. 117—201

9 Claims



A static atmosphere process for production of laminar laser materials. An epitaxial film or parallel overgrowth of a source material is produced on a single-crystalline substrate. The source material and substrate are each a compound or solid solution of the elements cadmium, sulfur, zinc, selenium and tellurium. The substrate is selected to have an optical band edge at least equal to the source material optical band edge and to have an interatomic spacing within 12% of the interatomic spacing of a crystal of the source material. The substrate is provided with at least one growth surface which is substantially flat and has a crystallographic orientation corresponding to the crystallographic orientation of a naturally occurring major face of a crystal of the source material. The substrate growth surface is positioned proximate a bed of porous source material in a static atmosphere reaction chamber and the source material and substrate material are heated to a uniform predetermined temperature to promote sublimation of the source material to produce a parallel overgrowth of the source material on the substrate growth surface.

3,730,765

# METHOD OF PROVIDING POLYCRYSTALLINE SILICON REGIONS IN MONOLITHIC INTEGRATED CIRCUITS

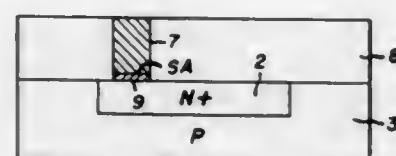
Leonard Stein, Dewitt, N.Y., assignor to General Electric Company

Filed Sept. 15, 1970, Ser. No. 72,402

Int. Cl. B44d 1/18; M011 7/16

U.S. Cl. 117—212

6 Claims



This invention relates to a method of providing selecting, within a body of monocrystalline silicon semi-

conductor material, polycrystalline regions at selected locations. Such regions may consist, for example, of columns or walls extending to the exterior surface from selected internal locations, and may be suitably doped to provide isolation or to provide paths of low resistivity forming low resistance connectors to selected locations within the monocrystalline body.

3,730,766

# SEMICONDUCTOR DEVICE AND A METHOD OF MAKING THE SAME

Shigeru Nishimatsu, Tokyo, and Takashi Tokuyama, Hoya-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

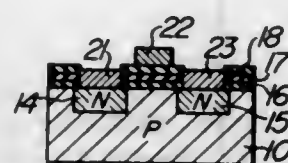
Filed Oct. 8, 1969, Ser. No. 864,638

Claims priority, application Japan, Oct. 9, 1968, 43/73,133

Int. Cl. B44d 1/18

U.S. Cl. 117—217

14 Claims



A method of stabilizing the surface characteristics of a silicon device wherein a first insulating layer of silicon dioxide is formed upon the silicon substrate, then a second insulating layer of alumina is deposited upon the first insulating layer and thereafter a third insulating layer of silicon dioxide is deposited upon the second insulating layer. The surface charge induced by coating said first and second insulating layers upon the surface of the substrate is controlled in accordance with the thickness of the third insulating layer.

3,730,767

# UNDERCOATING COMPOSITION FOR A MAGNETIC RECORDING MEDIUM

Goro Akashi, Masaaki Fujiyama, and Tokuaki Miyake, Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Continuation-in-part of application Ser. No. 739,172, June 24, 1968. This application Apr. 22, 1971, Ser. No. 136,585

Claims priority, application Japan, June 24, 1967, 42/40,398

Int. Cl. B32b 27/36; C08g 39/10; G11b 5/70

U.S. Cl. 117—239

8 Claims

An undercoating composition for bonding a magnetic recording layer, to a support composed of an amorphous polyester and a polycarbonate and a method for forming a magnetic recording device using said undercoating composition and a magnetic recording device resulting from said method are disclosed.

3,730,768

# CENTRIFUGE CONSTRUCTION

Kurt Pause, Grevenbroich, Germany, assignor to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft, Grevenbroich, Germany

Filed June 14, 1971, Ser. No. 152,778

Claims priority, application Germany, June 13, 1970, P 20 29 261.9

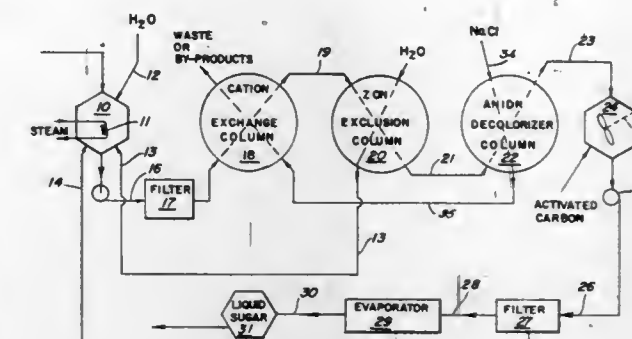
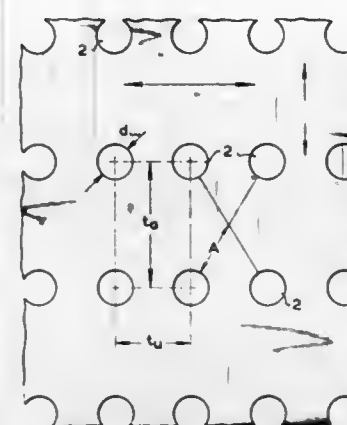
Int. Cl. C13f 1/10

U.S. Cl. 127—19

7 Claims

A centrifuge has a centrifuge drum provided with a circumferential wall which carries on its interior side a coarse-mesh support screen. A fine-mesh cover screen

overlies the support screen at the interior side thereof and comprises a plurality of apertures which are so distributed



that any four adjacent ones of them are located at the corners of a right-angular pattern.

the sugar solution prior to its deionization and ion exclusion treatment.

3,730,769

# METHOD AND APPARATUS FOR PROCESSING SOLUBLE CRYSTALS

Bernhard Fiedler, Grevenbroich, Germany, assignor to Maschinenfabrik Buckau R. Wolf AG., Munich, Germany

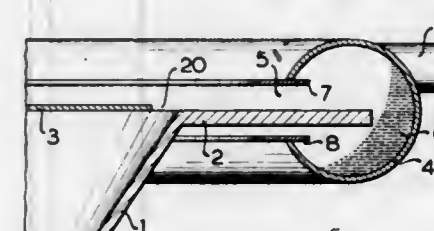
Filed May 26, 1971, Ser. No. 147,128

Claims priority, application Germany, May 27, 1970, P 20 25 828.0

Int. Cl. C13f 1/06

U.S. Cl. 127—19

16 Claims



Soluble crystals are treated in a centrifuge drum which rotates at a predetermined peripheral speed. The crystals are ejected through an outlet of the drum into a receiver of annular configuration and tubular cross-section, having a circumferential slot through which the crystals are ejected into it. A liquid in which the crystals are soluble is contained in the receiver and rotates at a second peripheral speed which is smaller than the peripheral speed of the centrifuge drum.

3,730,770

# SUGAR RECOVERY METHOD

James F. Zievers, La Grange, and Charles J. Novotny, Hickory Hills, Ill., assignors to Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Filed Apr. 7, 1971, Ser. No. 131,912

Int. Cl. C13d 3/12, 3/14

U.S. Cl. 127—46 B

9 Claims

A sugar recovery process and apparatus utilizes fresh activated carbon particles to treat a sugar solution after

3,730,771

# ELECTRIC ACCUMULATOR

Helmut Tannenberger, Geneva, and Jean-Claude Charbonnier, Chene-Bougeries, Switzerland, assignors to Battelle Memorial Institute, Carouge, Geneva, Switzerland

Filed Oct. 8, 1970, Ser. No. 79,204

Claims priority, application Switzerland, Oct. 9, 1969, 15,148/69

Int. Cl. H01m 35/00

U.S. Cl. 136—6

20 Claims

An electric accumulator comprises anodic and cathodic compartments which respectively contain an anode made of an alkali or alkaline-earth metal or lanthanum and a cathode made of a sintered solid body including an electronic conductor and an electron acceptor. The two compartments are separated by a fluidtight wall made of a solid substance in which the metal used for the anode can migrate relatively freely at ambient temperature in the form of positive ions. The cathodic compartment contains a solution of a salt of the anode metal in a polar organic solvent capable of dissolving a virtual reaction product formed during the discharge of the accumulator.

3,730,772

# SEPARATOR FOR ELECTROCHEMICAL CELLS AND PROCESS OF MAKING SAME

Robert E. Stark, Littleton, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Nov. 3, 1971, Ser. No. 195,385

Int. Cl. H01m 3/04

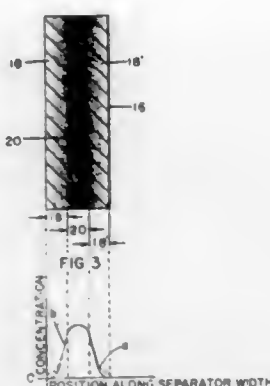
U.S. Cl. 136—30

12 Claims

A unitary separator for use in alkaline electrochemical cells is described and includes a bibulous layer impregnated with a gelling agent, the bibulous layer having along its thickness an inner zone containing a relatively high concentration of gelling agent flanked by two outer zones extending to the surface of the bibulous layer and containing a relatively low concentration of gelling agent. A method for producing such a separator is also disclosed and comprises impregnating the bibulous layer with the gelling agent and withdrawing at least a portion



of the gelling agent from the outer surfaces of the bibulous layer to form the desired separator. The separator offers



advantages in ease of handling and resistance to dendrite penetrations.

3,730,773

## FLOW VOLUME REGULATING VALVE

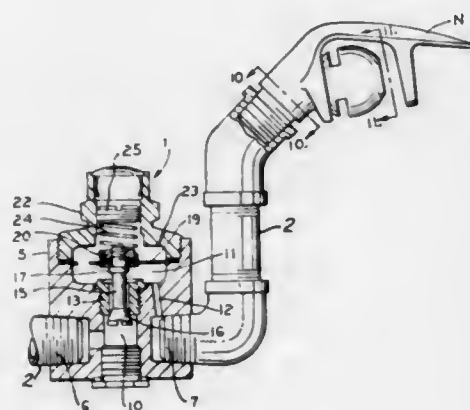
Carl W. Graber, Lyndhurst, Ohio, assignor to The Royal Brass Manufacturing Company, Cleveland, Ohio

Filed June 11, 1971, Ser. No. 152,228

Int. Cl. F16k 31/145

U.S. Cl. 138—46

9 Claims



The regulator has a valve body with a lineal passage extending therethrough and having an inlet at one end and an outlet at the other. A valve stem is slidable in the passage, fits therein with limited radial clearance, and has an inlet head and an outlet head seatable in the inlet and outlet, respectively. In cross section, the stem and heads are circular and the passage is polygonal, so that, with the radial clearance, a limited flow passage is provided between the wall of the lineal passage and the walls of the stem and seated one of the heads. The length of the stem between the heads is such that when either head is seated the other is unseated. Each head, when seated, restricts, but does not close, its associate end of the limited flow passage which always is open sufficiently to permit the limited flow. The stem is biased by a spring to hold the outlet head normally in its seated maximum restricting position. A housing having an inlet and outlet encloses the valve body. The housing has a cavity which is connected with the outlet of the lineal passage and is closed at one side by a diaphragm which, in response to a build up of pressure in the cavity, moves the stem in opposition to the spring so as to unseat the outlet head and seat the inlet head. The cavity has a continuously open discharge passage, the flow capacity of which is

equal to, or less than, that of the restricted flow passage when the heads are unseated, and is equal to, or greater than that of the restricted flow passage when the inlet head is seated.

3,730,774

## AMMONIA FUEL CELL WITH IRIIDIUM CATALYST AND METHOD OF USING THE CELL

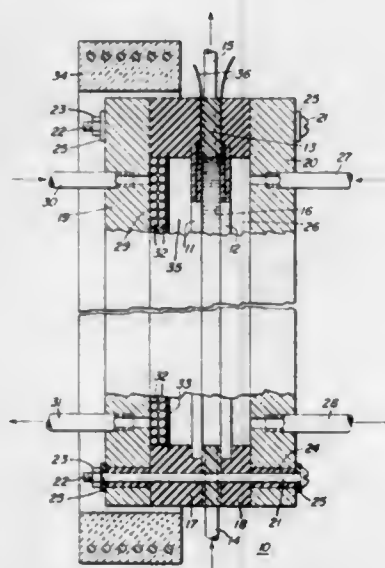
Douglas W. McKee, Burnt Hills, and Anthony J. Scarpellino, Jr., Glens Falls, N.Y., assignors to General Electric Company

Filed June 1, 1967, Ser. No. 642,947

Int. Cl. H01m 27/30

U.S. Cl. 136—86 R

3 Claims



A fuel cell has a catalyst material of iridium or an iridium alloy in the anode chamber and heating means associated with the chamber whereby ammonia vapor, which is fed to the chamber, is dissociated into its constituents, nitrogen and hydrogen. The dissociated gases are supplied to the anode as fuel. A hydrogen permeable membrane can also be employed between the catalyst material and the anode whereby hydrogen is supplied to the anode as fuel. A wide variety of electrodes and electrolyte are suitable in the fuel cell.

3,730,775

## TIN HALIDE CATHODE FOR SOLID ELECTROLYTE BATTERY SYSTEMS

Charles C. Liang, Andover, Mass., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Continuation-in-part of application Ser. No. 81,083, Oct. 15, 1970. This application July 9, 1971, Ser. No. 161,163

Int. Cl. H01m 11/00, 15/06

U.S. Cl. 136—83 R

4 Claims

A further improvement in the performance of a solid electrolyte cell containing lithium anode and lithium iodide-lithium hydroxide aluminum oxide electrolyte by the utilization of a cathode material containing a thin halide, such as  $\text{SnI}_2$ .

3,730,776

## ELECTRIC CURRENT GENERATOR AND METHOD USING CONSUMABLE ALKALI METAL ANODE

Wilson S. Geisler, Jr., Saratoga, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Feb. 4, 1970, Ser. No. 8,606

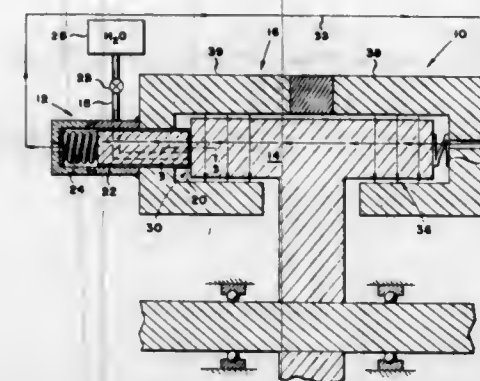
Int. Cl. H01m 17/02, 27/30

U.S. Cl. 136—100 R

12 Claims

The effective generation of high electrical currents is provided utilizing materials which are highly electrochemically reactive with one another, such as sodium

and water. The materials are continuously fed together into a very thin, low resistance electrochemical junction between conductive surfaces and moved relative to one another to continuously rapidly remove chemical re-



action products from the electrochemical junction. A mechanical energy output may be provided by an integral electrical generator-motor.

3,730,777

## SEPARATOR FOR GALVANIC DRY CELLS EMPLOYING AQUEOUS ELECTROLYTE

Winfried Krey, Neunheim, Germany, assignor to Varta Gesellschaft mit beschränkter Haftung, Ellwangen (Jagst), Germany

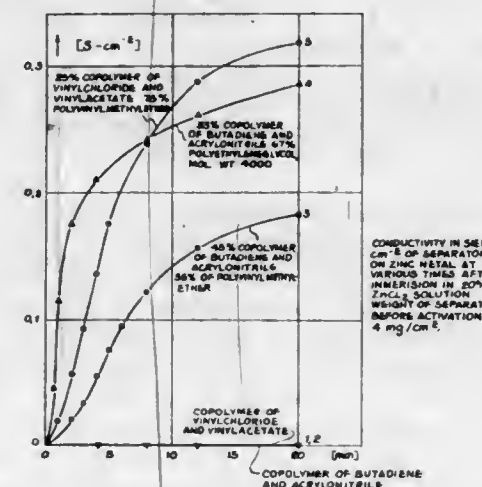
Continuation of abandoned application Ser. No. 806,800, Mar. 13, 1969. This application Apr. 27, 1971, Ser. No. 137,985

Claims priority, application Germany, Mar. 30, 1968, P 17 71 082.6; Mar. 4, 1969, P 19 10 924.1

Int. Cl. H01m 3/02

U.S. Cl. 136—131

8 Claims



Separators for galvanic dry cells which employ an aqueous electrolyte are prepared from mixtures of synthetic resins. At least one of these resins is soluble in water or in the aqueous electrolyte used in the dry cell and at least one resin is insoluble in the cell electrolyte. All the resins employed however must be soluble in the same single or multi-component organic solvent yielding a homogeneous solution. The separator is introduced into the cell by application of the homogeneous solution to one electrode. In contact with the aqueous dry cell electrolyte the separator is rendered permeable to water and dissolved ions. Additional substances such as fillers, swelling agents, ion exchangers, etc., may be incorporated in the separator to improve performance.

3,730,778

## METHODS OF MANUFACTURING A SEMICONDUCTOR DEVICE

John Martin Shannon, Reigate, and John Anthony Kerr, East Grinstead, England, assignors to U.S. Phillips Corporation

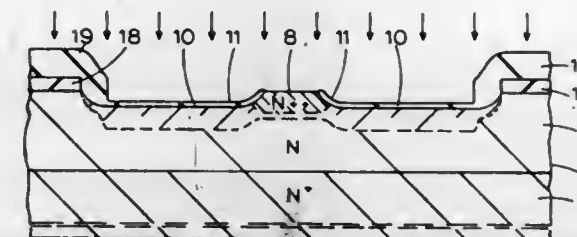
Filed Jan. 14, 1971, Ser. No. 106,489

Claims priority, application Great Britain, Jan. 15, 1970, 1,996/70

Int. Cl. H011 7/54

U.S. Cl. 148—1.5

7 Claims



A method of manufacturing a bipolar transistor in which impurities are introduced into a semiconductor body through a non-planar semiconductor body surface, the nature of the exposed surface being controlled so that the p-n junction formed has a desired contour. An emitter region of the transistor may be formed within a mesa of the semiconductor body surface and the collector junction formed by implantation of base impurity through both the mesa and the adjacent portions of the surface to give a mesa-shaped collector junction and a substantially plane emitter junction. The mesa may be defined by a silica pattern and formed by silicon nitride masking, etching and oxidation.

3,730,779

## OXIDATION RESISTANT IRON BASE ALLOY

Elmer J. Caule, 440 Yale Ave., New Haven, Conn. 06515; Philip R. Sperry, 60 Pool Road, North Haven, Conn. 06473; Michael J. Pryor, Maplevale Drive, Woodbridge, Conn. 06515; and James A. Ford, 51 Pool Road, North Haven, Conn. 06473

Original application Aug. 7, 1968, Ser. No. 750,991, now abandoned. Divided and this application Aug. 25, 1970, Ser. No. 66,866

Int. Cl. C23f 7/04

U.S. Cl. 148—6.35

2 Claims

Iron base alloys with alloying additions of Groups III and IV elements and/or beryllium are described which exhibit unique and unexpectedly low weight gains when exposed to oxidizing environments. One of the major advantages of the group of alloys described herein lies in their moderate cost, especially as compared to other oxidation resistant Fe-base alloys such as the various grades of stainless steel. The oxidation resistance is imparted to these alloys through the formation of a tenacious compact oxide film consisting essentially of one or both of the added alloying elements.

3,730,780

## METHOD OF TRANSPORTING AND POSITIONING CONTINUOUS CASTING BUTTS

Alfred Pfeuffer, Neu-Isenburg; Gustav Kalkhof, Langen/Hessen; Helmut Weber, Steinbach/Taunus, and Arnold Ludtke, Offenbach, all of Germany, assignors to Messer Griesheim GmbH, Frankfurt/Main, Germany

Filed Sept. 14, 1970, Ser. No. 71,825

Claims priority, application Germany, Sept. 18, 1969, P 19 47 287.8

Int. Cl. B23k 7/00

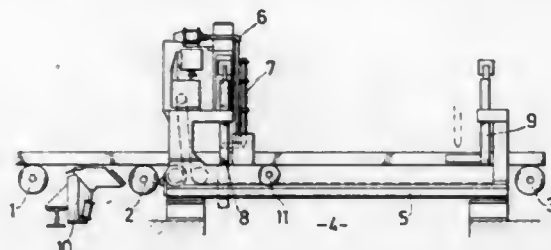
U.S. Cl. 148—9

3 Claims

A method of moving and positioning a casting butt produced in a continuous casting plant with the aid of holding



means and a cutting device used as the transport means. The device is secured to the butt, after which they are together moved in one direction into a position that corresponds to a



desired cut length, holding means clamp said butt, whereupon the cutting device is released and moved to a starting position operable to cut the held butt.

### 3,730,781 METHOD OF IMPROVING CREEP-RESISTANCE OF ALLOYS

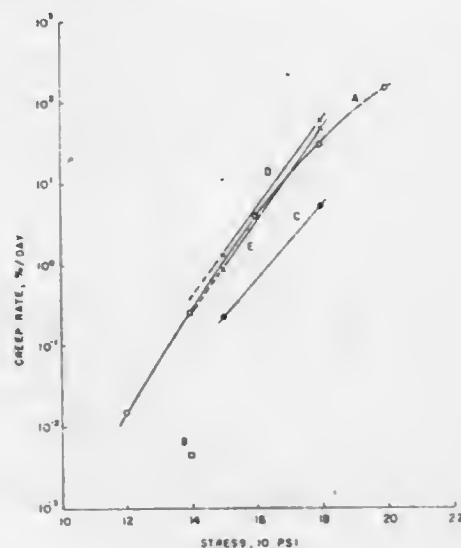
Leander A. Neumeier and John S. Risbeck, Rolla, Mo., assignors to the United States of America as represented by the Secretary of the Interior

Filed Dec. 8, 1971, Ser. No. 206,079

Int. Cl. C22f 1/16

U.S. Cl. 148—11.5 R

7 Claims



Zn-Cu-Ti alloys of improved creep-resistance and low creep anisotropy are prepared by cold-rolling to at least 67 percent total reduction, followed by annealing preferably at about 300 to 400° F. for a period of about 1/2 hr. to 8 hrs. Such alloys find utility in a variety of applications such as architectural structures, appliances, automobile parts, etc.

**3,730,782  
NON-ACTIVATED SOLDERING FLUX**  
Richard M. Pollak, Johnson City, and Leslie D. Rauch, Binghamton, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.  
No Drawing. Filed July 27, 1970, Ser. No. 58,644

Int. Cl. C23c 1/12

U.S. Cl. 148—23 27 Claims  
A non-activated soldering flux comprising from 20-65% rosin, 0.01-1% of a cationic fluorocarbon surfactant, balance organic solvents. The flux finds particular application in the field of microelectronics.

A process for using the above soldering flux comprises assembling two members to be joined, preferably metallic members, in contiguous relationship, applying the above flux thereto and then soldering the members together.

A process for forming a flux as described is also provided.

**3,730,783  
PROCESS FOR TREATING A COATING OF ALUMINIUM DEPOSITED ON A METAL SUPPORT, MORE PARTICULARLY, SHEET METAL**  
Dominique Thomas Francois Steel, Ougree, Belgium, assignor to Cockerill-Ougree-Providence et Esperance Longdoz en abregé "Cockerill," Seraing-lez-Liege, Belgium

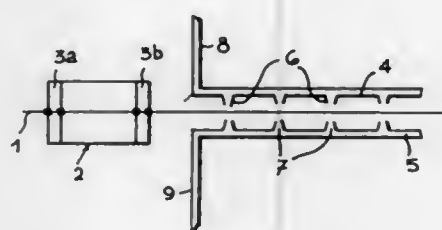
Filed June 17, 1971, Ser. No. 153,976

Claims priority, application Belgium, June 24, 1970, 752,488

Int. Cl. C23f 7/22

U.S. Cl. 148—6.3

4 Claims



A process for treating an aluminium coating deposited on sheet-metal such as a steel plate, sheet or strip, comprising applying the aluminium coating by evaporation under vacuum, with a thickness less than 20 microns, onto sheet-metal which advances continuously, subjecting systematically the aluminium coating to superficial hot oxidation by passing the coated sheet-metal directly to atmosphere while its temperature is still 100° C. so as to form a film of aluminium oxide, subjecting the thus formed film of aluminium oxide to the action of a hot fluid based on water while the sheet-metal is still advancing continuously in order to transform the aluminium oxide to hydrated aluminium oxide.

**3,730,784  
METHOD OF MAKING MANGANESE-ALUMINUM-CARBON TERNARY ALLOYS FOR PERMANENT MAGNETS**

Hiroshi Yamamoto, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan  
Continuation of application Ser. No. 429,260, Feb. 1, 1965. This application July 28, 1969, Ser. No. 850,307

Claims priority, application Japan, Feb. 1, 1964, 39/5,653; Mar. 3, 1964, 39/12,679

Int. Cl. H01f 1/04

U.S. Cl. 148—101

10 Claims

Ternary alloys consisting essentially of, by weight, (a) 67 to 69% Mn, 29 to 32.0% Al, and 0.3 to 3.0% C, and (b) 70.0 to 72.5% Mn, 26.5 to 29.0% Al and 0.5 to 2.5% C, are prepared by heating the selected alloy composition to a temperature of about 1380° C. to form a melt, casting the melt in a mold to form an ingot, quenching the ingot from a temperature of 880° to 1250° C. and then isothermally tempering the quenched ingot at a temperature of 380° to 700° C. The thus heat-treated alloys are suitable for use as permanent magnets with magnetic properties superior to those of binary alloys of similar manganese and aluminum contents.

**3,730,785  
DUAL STRENGTH BLADE OF 17-4PH STAINLESS STEEL**  
Joseph D. Conrad, Sr., Springfield, and Bruce W. Roberts, Lester, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 14, 1970, Ser. No. 97,555

Int. Cl. C21d 1/80; F01d 5/14

U.S. Cl. 148—142

7 Claims

A process is described for heat treating a precipitation hardening stainless steel containing, nominally, 17% chromium and 4% nickel for obtaining various mechanical properties. The steps include a solution heat treat-

ment, a conditioning treatment, a first stage aging treatment and a final aging treatment. Various mechanical properties are described including fatigue strength, and damping capacity. Utility is demonstrated in the turbine blade field.

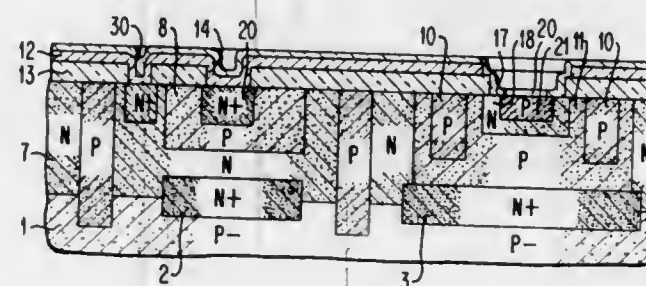
**3,730,786  
PERFORMANCE MATCHED COMPLEMENTARY PAIR TRANSISTORS**  
Hitendra N. Ghosh, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 3, 1970, Ser. No. 69,205

Int. Cl. H01l 7/36, 11/00, 19/00

U.S. Cl. 148—175

6 Claims



A method for fabricating a complementary pair of transistors having closely matched characteristics. A high performance npn transistor is matched to a pnp transistor whose performance is upgraded through the use of a doped oxide for simultaneously diffusing the base of the pnp transistor and the emitter of the npn transistor. After the base diffusion is completed, the doped oxide is etched away only from the base region of the pnp transistor and diffusion conditions are reestablished. The base doping of the pnp transistor then redistributes to produce a lower surface concentration and a sharper gradient at the collector base junction while the doped oxide remaining over the npn emitter acts as a continuing source of emitter impurity for enhanced emitter efficiency.

**3,730,787  
METHOD OF FABRICATING SEMICONDUCTOR INTEGRATED CIRCUITS USING DEPOSITED DOPED OXIDES AS A SOURCE OF DOPANT IMPURITIES**

Bernard Thomas Murphy and Peter Theodore Panousis, New Providence, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Aug. 26, 1970, Ser. No. 67,016

Int. Cl. H01l 7/44, 19/00; C23c 11/06

U.S. Cl. 148—175

7 Claims



A method for fabricating semiconductor integrated circuit structures of the type wherein surface zones of a first type semiconductivity extend through an otherwise relatively heavily doped surface layer of the other type semiconductivity. The method employs a doped-oxide mask to provide the layer-forming impurities and also as a mask for enabling selective introduction of zone-forming impurities. An important step in the method employs a silicon nitride cap over the doped oxide during layer-formation to prevent the layer-forming impurities from being introduced into undesired areas under the voids in the mask.

**3,730,788  
FLUORINE OXIDIZER GAS GENERATOR**  
Donald S. Jenkins, Tarzana, Calif., assignor to North American Rockwell Corporation  
Filed Dec. 4, 1967, Ser. No. 687,896

Int. Cl. C06b 15/00

U.S. Cl. 149—1

2 Claims

A gas generator pressurization device using a fluorine oxidizer, a fuel and a fuel-like modifier selected from the group consisting of hexachloroethane ( $C_2Cl_6$ ), hexabromoethane ( $C_2Br_6$ ), 1,2,3,4-tetrazole ( $CHN_4H$ ), 1,2,4,5-tetrazine ( $N_2CHN_2CH$ ), and cyanuric chloride ( $C_3Cl_3N_3$ )

The presently preferred fuel-like modifier is cyanuric chloride.

**3,730,789  
MONOPROPELLANT COMPOSITION INCLUDING HYDROXYLAMINE PERCHLORATE**  
Kurt F. Mueller and Manfred J. Czesla, Washington, D.C., assignors to the United States of America as represented by the Secretary of the Navy  
No Drawing. Filed July 8, 1969, Ser. No. 843,908

Int. Cl. C06d 5/06

U.S. Cl. 149—22

15 Claims

A gelled liquid monopropellant comprising an aqueous solution of a mixture of oxidants such as sodium perchlorate and hydroxylammonium perchlorate, a fuel such as boron, powder and a gelling agent such as silica gel.

**3,730,790  
EXPLOSIVE COMPOSITION CONTAINING A GLYCOL AND GUAR GUM ETHER**  
Errol Linton Falconer and Gerhard Franz Otto Karl Finch, Mont Saint-Hilaire, Quebec, Canada, assignors to Canadian Industrial Limited, Montreal, Quebec, Canada

No Drawing. Filed Feb. 29, 1972, Ser. No. 230,520

Int. Cl. C06b 1/04

U.S. Cl. 149—44

4 Claims

A gelatinized explosive composition comprising a high energy sensitizer and from about 3% to about 50% by weight of a non-explosive gel comprising at least one lower aliphatic glycol selected from the group consisting of ethylene glycol, diethylene glycol, propylene glycol and dipropylene glycol thickened with a material selected from the group consisting of hydroxyethyl and hydroxypropyl ethers of polysaccharides and mixtures thereof.

**3,730,791  
EXPLOSIVE COMPOSITION FOR BONDING CONTAINING AN ORGANO METALLIC POLYMER**  
Robert H. Velten, Boulder, Colo., assignor to E. F. Industries, Inc., Louisville, Colo.

Filed July 16, 1971, Ser. No. 163,156

Int. Cl. C06b 1/04

U.S. Cl. 149—46

5 Claims

A highly sensitive explosive having a low detonation velocity formed from a homogeneous mixture of a heavy metal oxide such as lead oxide ( $PbO$ ) and a polyhydroxy compound such as glycerol. The resulting novel explosive is of particular advantage when mixed with commercial explosives and utilized in the high energy bonding of two or more metallic members such as in the formation of honeycomb or other metallic structures.

**3,730,792  
CATALYSIS OF REACTIONS OF AZIRIDINES USED IN PREPARING HIGH ENERGY COMPOSITE PROPELLANTS**  
Charles B. Frost, Fair Oaks, and Philip S. Gisler, Folsom, Calif., assignors to Aerojet-General Corporation, Azusa, Calif.

No Drawing. Filed Feb. 18, 1964, Ser. No. 346,384

Int. Cl. C06d 5/06; C08c 1/12

U.S. Cl. 149—19

11 Claims

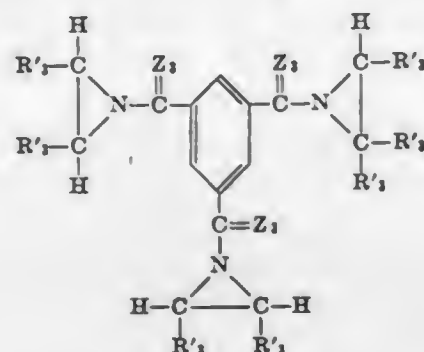
11. In the method of preparing a high energy propellant composition which comprises dispersing a solid ox-



dizer in a binder mixture comprising a terminally reactive polymer having the formula:



wherein  $\text{A}_2$  comprises a polymer of butadiene, said terminally reactive polymer having a molecular weight of about 6000; and an aziridine compound having the formula:



wherein  $\text{R}'_3$  is selected from the group consisting of hydrogen and lower alkyl, and  $\text{Z}_3$  is selected from the group consisting of oxygen and sulfur; the improvement which comprises employing zirconium acetylacetonate as the catalyst.

3,730,793

#### ETHYLDECABORANE OR $\text{B}_{10}\text{H}_{12}$ WITH MIXED $\text{ClF}_3$ OXIDIZER

Donald Pilipovich, Canoga Park, and John Q. Weber, Topanga, Calif., assignors to North American Aviation, Inc.

No Drawing. Filed Apr. 5, 1967, Ser. No. 629,865

Int. Cl. C06b 15/00

U.S. Cl. 149-22

4 Claims

Liquid rocket propellant systems comprising a fuel, either ethyldecaborane or pentaborane-9, and an oxidizer of  $\text{ClF}_3$  mixed with either an iodine oxyfluoride or an iodine fluoride-tetranitro methane mixture.

3,730,794

#### METHOD OF PRODUCING A NOVEL COMPRESSIBLE ROLL

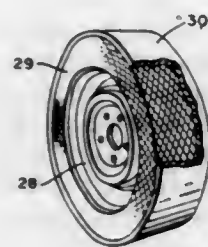
William Campbell Ross, Winchester, Mass., assignor to W. R. Grace & Co., Cambridge, Mass.

Continuation-in-part of application Ser. No. 725,577, Apr. 17, 1968, now Patent No. 3,568,286, which is a continuation-in-part of application Ser. No. 588,174, Oct. 20, 1966, now abandoned. This application Sept. 14, 1970, Ser. No. 71,801

Int. Cl. B29h 11/00

U.S. Cl. 156-112

19 Claims



A method of preparing novel products especially suitable as printing rolls is disclosed wherein elastomer-coated filaments (e.g. synthetic rubber coated glass filaments) are wound on a core at an angle to the core and apart from one another and are joined at the cross-over points by the elastomer. The filaments are wound in such a manner that void spaces are defined by the filaments resulting in a porous, compressible structure.

3,730,795

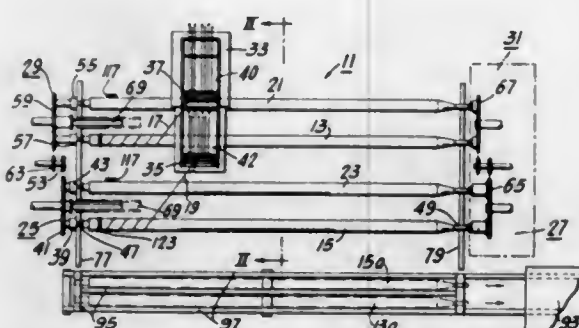
#### FILAMENT WINDING METHOD

Jonas Medney, Oceanside, and Donald J. Baumgarten, Smithtown, N.Y., assignors to Koppers Company, Inc. Original application Dec. 18, 1968, Ser. No. 784,812, now Patent No. 3,607,566, dated Sept. 21, 1971. Divided and this application Apr. 14, 1971, Ser. No. 134,087

Int. Cl. B65h 54/00

U.S. Cl. 156-169

4 Claims



Filament winding apparatus includes rotatable elements mounting supports between which mandrels, on which filament rovings are to be wound, are mounted. A winding head reciprocates along the length of the mandrel located at a winding station. When wound, the elements are rotated to place an unwound mandrel in the winding position. After the filament roving is severed, a wrap-cylinder helps to start to wrap or wind the filament roving on the unwound mandrel, while the wound mandrel is removed, moved into a curing oven, and replaced by an unwound mandrel.

A plurality of supports mounted adjacent a pair of winding heads operated simultaneously make it possible to wind two mandrels simultaneously.

3,730,796

#### BUILDING CONSTRUCTION AND METHOD OF MANUFACTURE

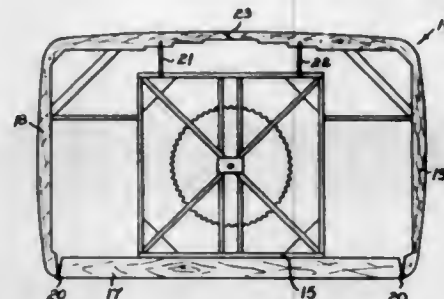
Reynald B. Richards, 27 Katoomba Road, 5066 Beaumont, South Australia, Australia, and William P. O'Brien, Kingston Park, and Peter Cannon, Glen Osmond, South Australia, Australia; said O'Brien and said Cannon assignors to said Richards

Filed June 4, 1970, Ser. No. 43,399

Int. Cl. B65h 81/08; E04b 1/32, 1/35

U.S. Cl. 156-173

2 Claims



A method of forming portable housing structures in which a substantial rectangular former is produced on a collapsible rotatable mould to provide a shell which forms the floor and roof and walls of the structure in the nature of a tube, the shell comprising inner and outer layers of rigid materials such as fiberglass with an infill material therebetween having thermal insulating properties, and at least partly closing in the ends of the building structure so formed.

3,730,797

#### METHOD FOR MANUFACTURING BUILDING BOARDS WITH CHEQUER-SQUARE PATTERN

Olav N. Jensen, Kotka, Finland, assignor to O. Y. Gutzeltin Laattikkotehdas-A.B. Gurzelts Ladfabrik, Kotka, Finland

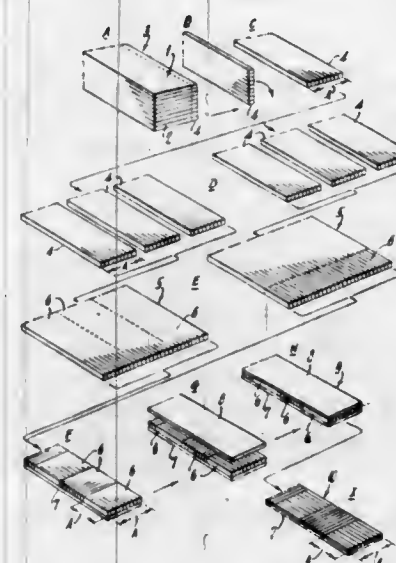
Filed Mar. 11, 1970, Ser. No. 18,626

The portion of the term of the patent subsequent to June 29, 1988, has been disclaimed

Int. Cl. B32b 31/00

U.S. Cl. 156-182

5 Claims



A method of manufacturing chequer-square parquet building boards of unrestricted length. The veneer strips constituting the exposed outer face of a finished parquet board all stand on their narrow faces. The narrow faces are secured to a flat base and the grain in every veneer strip runs parallel to the plane of the base to which the strips are secured. Starting with a stack of veneer sheets having identical grain direction and glue together to form a multilayered board, sticks are cut from the multilayered board and the strips are rotated to form a core board. The core board is cut up into core slabs. The core slabs are glued between flat base plates to form a sandwich and the sandwich is split by a cut through its core into two boards, each of which has a surface of veneer strips standing on their narrow faces.

3,730,798

#### METHOD OF FORMING AND ADHERING A WEB OF MATERIAL TO THE LOWER SURFACE OF A PAD OR THE LIKE

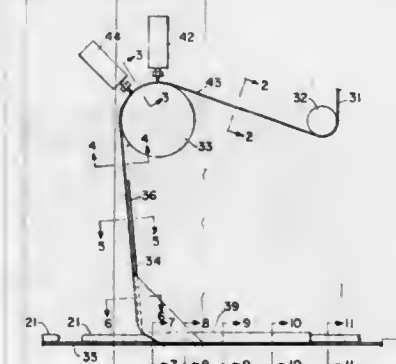
Norman J. Franz, Colerain Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 26, 1970, Ser. No. 66,932

Int. Cl. B32b 3/04, 7/14, 31/04

U.S. Cl. 156-201

8 Claims



A continuous web of material, e.g. polyethylene or the like, is moved in a substantially horizontal path for at least a portion of its total path of travel such that its

ultimate lower surface faces upwardly. In this portion of its travel path, one or more adhesive beads may be intermittently or continuously deposited at or near the web edges whereupon the web is passed over a suitably configured folding board. As the web passes over the folding board, its ultimate lower surface is folded down and around a pad or the like element, e.g. an absorbent diaper pad, such that the edge extremities of the web containing the adhesive beads are folded around and adhered to the lower surface of the pad. The method permits deposition of the adhesive bead on the ultimate lower surface of the web when it faces upwardly thus making the application of adhesive more positive and reducing substantially the possibility of adhesive fouling on the various elements used to carry out the method.

3,730,799

#### METHOD FOR METALLIC PATTERN DEFINITION

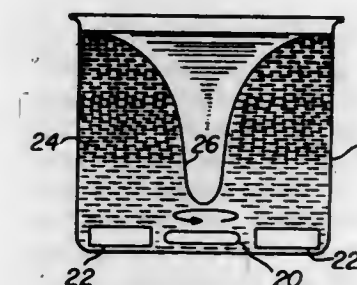
Jack W. Scannell, Richardson, Tex., assignor to Collins Radio Company, Dallas, Tex.

Filed July 7, 1971, Ser. No. 160,386

Int. Cl. C23f 1/02; H05k 3/06

U.S. Cl. 156-5

1 Claim



A metallic pattern definition system with improved tolerances wherein a plated substrate is immersed in an etchant solution and a vortex is established in said solution centered generally over said substrate. A rotatable substrate holder with magnetic induction means may be employed in establishing said vortex.

3,730,800

#### METHOD OF MAKING GERMANIUM SEMICONDUCTOR DEVICE

Shinichi Nakashima, Suita, and Morio Inoue and Hitoo Iwasa, Takatsuki, Japan, assignors to Matsushita Electronics Corporation, Kadoma, Osaka Prefecture, Japan

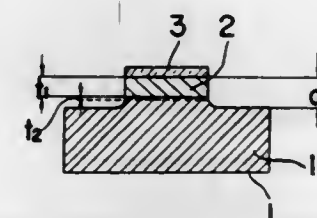
Filed Dec. 24, 1969, Ser. No. 887,935

Claims priority, application Japan, Dec. 27, 1968, 44/433; Dec. 30, 1968, 44/346

Int. Cl. H01l 7/50

U.S. Cl. 156-8

2 Claims



A method of making a germanium mesa-type semiconductor device by mesa-etching employing as an etching mask, a film of  $\text{SiO}_2$  applied onto the surface of a germanium substrate. The  $\text{SiO}_2$  film can be formed by thermal decomposition of organo-oxy-silane so as to have a thickness of about 1000 to about 7000 Å. The mesa-etching can be made either by electrolytic etching or by chemical etching.



3,730,801

## RETREATING OF TYRES

Aubrey Wilfred Martin, Heilbron, Orange Free State, Republic of South Africa, assignor to Republic Rubber Industries Limited, Heilbron, Orange Free State, Republic of South Africa

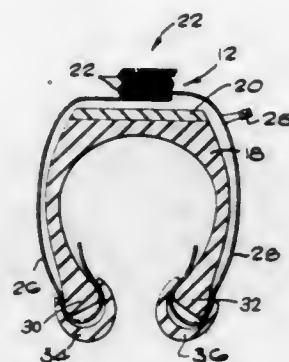
Filed Apr. 26, 1971, Ser. No. 137,195

Claims priority, application Republic of South Africa, Nov. 6, 1970, 70/7,541

Int. Cl. B29h 5/04, 17/36

U.S. Cl. 156—96

2 Claims



The invention provides for a method of and means for the retreading of tyres. In accordance with the invention, a tyre is retreaded by enclosing the tyre in a flexible envelope which is peripherally slit. The envelope is sealed by interfolding the overlapping regions of the envelope a plurality of times within one another. By then providing a higher fluid pressure outside the envelope than inside it, the envelope is forced against the new tread which is thereby forced against the tyre casing.

3,730,802

## METHOD OF FIXING PINS IN A MATRIX

David Bruce Stewart, Newtyle, Angus; John Main, Kettins, Angus, and Maurice Duncan, Carnoustie, all of Scotland, assignors to Wm. R. Stewart & Sons (Hacklemakers) Limited, Dundee, Scotland

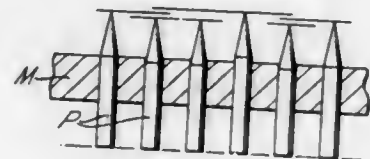
Filed March 10, 1970, Ser. No. 18,095

Claims priority, application Great Britain, March 10, 1969, 12,478/69

Int. Cl. B32b 35/00

U.S. Cl. 156—98

6 Claims



A carding or a drawing machine wherein the pins are a non-interference fit within the pin holes in the cylinder or other matrix and are secured in position by an adhesive which may or may not be a thermoplastic.

3,730,803

## METHOD OF REDUCING SOUND LEVEL OF SINGLE FACER MACHINE

Walter C. Morrison, Marlton, N.J., assignor to Harris-Intertype Corporation, Cleveland, Ohio

Original application Nov. 9, 1970, Ser. No. 88,043, now Patent No. 3,671,361. Divided and this application Dec. 1, 1971, Ser. No. 203,668

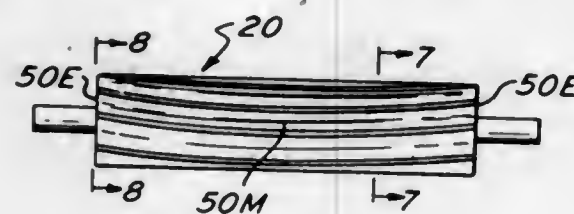
Int. Cl. B31f 1/22

U.S. Cl. 156—205

3 Claims

A single facer machine is disclosed having bowed flutes on the corrugating rollers. The curvature of the bow of

the flutes is chosen so that the middle portion of the flutes is disposed from a line interconnecting the ends of a flute by a distance corresponding to one pitch of the



flutes. This results in the crest of the flutes always being in engagement with a smooth pressure roll, thereby substantially decreasing the high sound level of such machines.

3,730,804

## METHOD OF HEAT SEALING A PAIR OF CLOSURES WITH A MAGNETIC SUSCEPTIBLE MATERIAL AND HIGH FREQUENCY ALTERNATING AND STEADY MAGNETIC FIELDS

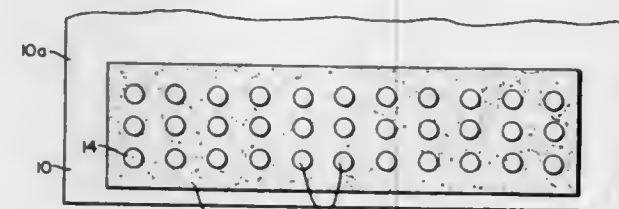
John W. Dickey, Standardsville, Va., assignor to The Fifth Third Bank, Cincinnati, Ohio

Continuation of abandoned application Ser. No. 754,029, Aug. 20, 1968. This application July 20, 1971, Ser. No. 164,496

Int. Cl. B29c 19/02; B65h 7/00

U.S. Cl. 156—272

5 Claims



A method of heat-sealing packages is provided wherein elements thereof to be sealed are heated and held by the combined heating and holding action of magnetic susceptible particles subjected to high frequency alternating and steady magnetic fields and to such a method wherein a heat softenable sealing material comprises a thermoplastic adhesive added to the elements of the package to be sealed, or the softenable material may comprise the packaging per se.

3,730,805

## METHOD OF JOINING BOOK LEAVES

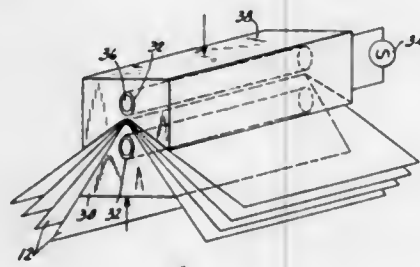
William C. Heller, Jr., Milwaukee, Wis., and Leonard Shatzkin, Croton-on-Hudson, N.Y.; said Shatzkin assignor to said Heller, Jr.

Filed Sept. 22, 1970, Ser. No. 74,270

Int. Cl. B29c 19/02; B42d 1/00

U.S. Cl. 156—272

26 Claims



An improved method of joining a plurality of leaves into a book section through the use of an adhesive thread. The thread is typically coated with an adhesive bonding

agent and is heatable by indirectly applied energy. The leaves are stitched together with the thread after which the thread is exposed to the indirectly applied energy to heat the thread and induce a period of adhesiveness in the bonding agent to fuse the strands of thread together and to the leaves. A book section having an improved sewn seam or joint is thus provided.

3,730,806

## BOOK BINDING PROCESS

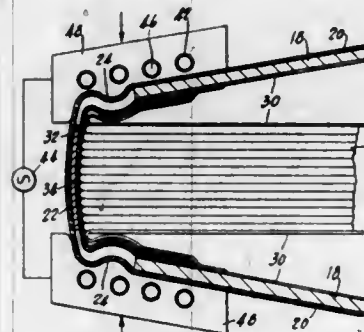
William C. Heller, Jr., Milwaukee, Wis., and Leonard Shatzkin, Croton-on-Hudson, N.Y.; said Shatzkin assignor to said Heller, Jr.

Filed Sept. 22, 1970, Ser. No. 74,271

Int. Cl. B29c 19/02; B42d 1/00

U.S. Cl. 156—272

24 Claims



An improved process of attaching a book body to a case at the hinge to form a hard bound book. A bonding agent having a short period of adhesiveness following exposure to indirectly applied energy is applied to the body of case adjacent the hinge area and the body is inserted into the case so that the portion to which the agent has been applied is located at the hinge of the completed book. The treated portion is then exposed to a selected form of indirectly applied energy to cement the body to the case at the hinge while pressure is applied to the hinge area. An improved hinge joint is thus formed.

3,730,807

AZIRIDINE- $\beta$ -PROPIOLACTONE ADHESIVES

Harry A. Smith, Midland, and Bobble E. Rooker, Hope, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Nov. 23, 1970, Ser. No. 92,181

Int. Cl. B32b 15/08; C08g 33/08

U.S. Cl. 156—331

9 Claims

The reaction products of (a)  $\beta$ -propiolactone and (b) N-substituted aziridines which bear one or more polar groups on the N-substituent are novel adhesives. E.g., the reaction product of (a)  $\beta$ -propiolactone and (b) N-(2-aminoethyl)aziridine is an excellent adhesive for bonding aluminum substrates. The adhesives are particularly effective in bonding metallic articles together.

3,730,808

## PRODUCTION OF COMPOSITE FIBER REINFORCED RESIN ARTICLES

Frank Fekete, Monroeville, and Leonard J. Pulman, Pittsburgh, Pa., assignors to Koppers Company, Inc.

Filed Sept. 24, 1970, Ser. No. 74,972

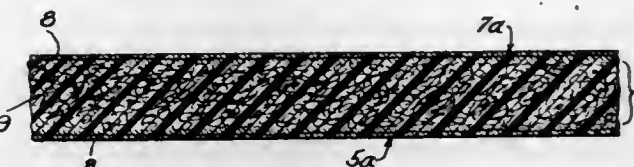
Int. Cl. C09j 5/02

U.S. Cl. 156—332

3 Claims

Composite fiber reinforced polyester resin articles comprising a multi-layered structure the interior of which is formed of polyester resin material having fiber reinforcement incorporating relatively coarse or heavy fibers in a relatively thick and/or dense fiber reinforcement mat, and a surface layer which is formed of polyester resin material which may also have a fiber reinforcement but

formed of relatively fine or light fibers in a relatively thin and/or sparse fiber reinforcement mat. The formation of the composite structure contemplates the use of prethickened uncured polyester resin material for both the interior portions or layers of the article and also for



the surface layer, and polyester resin formulations having different characteristics are contemplated for use in the interior and surface layers, respectively, the several layers being preassembled and then consolidated and cured under heat and pressure.

3,730,809

## RE-ETCH PROCESS FOR COLOR CATHODE-RAY TUBE

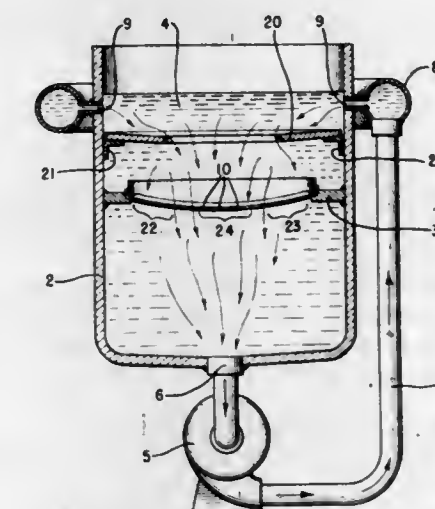
Leonard Dietch, Skokie, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed May 3, 1971, Ser. No. 139,482

Int. Cl. C03c 15/00

U.S. Cl. 156—345

1 Claim



An apparatus for re-etching the apertures of a color cathode-ray tube shadow mask to increase the diameter of each aperture by an amount dependent upon its spacing from the center of the mask. The apparatus comprises a tank adapted to contain a fluid etchant suitable for attaching the mask material, with circulating means to flow the fluid etchant through the mask apertures and baffling means to direct the fluid etchant through the apertures at velocities which differ from aperture to aperture as a function of the aperture spacing from the center of the mask.

3,730,810

## CORRUGATED PAPERBOARD CUTTING APPARATUS

Hugo Klein, Jesingen, Teck, Germany, assignor to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Germany

Filed June 15, 1971, Ser. No. 153,213

Int. Cl. B26d 5/20

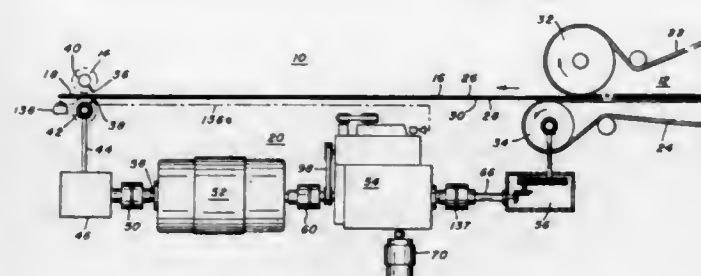
U.S. Cl. 156—353

11 Claims

After corrugated paperboard is completely prepared by pasting paper facing sheets to opposite sides of an intermediate corrugated sheet, the resulting elongated strip of



corrugated paperboard moves out of the pasting machine to cutters where the strip is cut into separate sheets of a length in accordance with the specification of a current production order before the sheets move along a conveyor line to a subsequent work station. Common drive means for the cutters and pasting machine include a planetary gear having a speed adjusting gear for reducing the speed of delivery of paperboard from the pasting machine when necessary such as when a subsequent production



order requires different length specifications. Moreover, additional gear means together with a photoelectric cell are provided for sensing suitable marks or optical indicia as printed on one side of the paperboard strip at regular intervals to cooperate with other sensor means such as another photoelectric cell associated with the cutters for sending separate electrical impulses to a servomotor in order to provide a series of sheets of equal length for a given production order.

3,730,811

# APPARATUS FOR SPLICING WEBS OF CIGARETTE PAPER

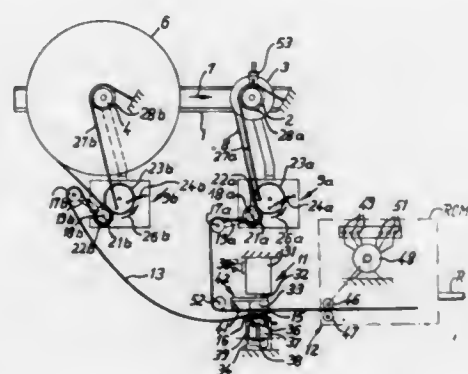
Gerd-Joachim Wendt, Hamburg-Bergedorf, Germany, assignor to Hauni-Werke Korber & Co. KG, Hamburg-Bergedorf, Germany

Original application Aug. 25, 1968, Ser. No. 755,255, now Patent No. 3,586,006, dated June 22, 1971. Divided and this application Jan. 28, 1971, Ser. No. 110,415 Claims priority, application Germany, Aug. 31, 1967, P 16 32 206.8

Int. Cl. B31f 5/06; B32b 31/18

U.S. Cl. 156—367

9 Claims



The leading end of a fresh web which is stored on a reel is automatically spliced to an expiring web when the machine which consumes the expiring web and draws such expiring web from a source of supply is arrested in response to a signal from a detector which scans the supply of expiring web and produces the signal when the supply of expiring web is depleted to a predetermined minimum value. The consuming machine is started with a predetermined delay following completion of the splicing operation and is accelerated to normal operating speed

in several stages at such a rate that the united webs which are accelerated in response to acceleration of the consuming machine are not subjected to excessive tensile stresses.

3,730,812

# HEAT SEALING DIE

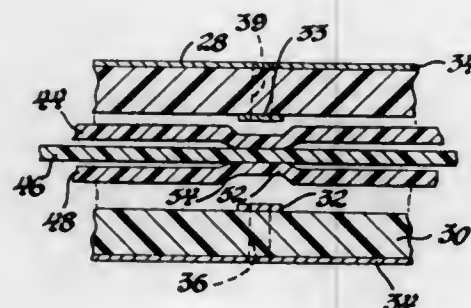
Bert C. Prisk, Grosse Pointe Woods; Raymond Kenneth Erickson, Warren, and Marlon E. Wheatley, Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 14, 1970, Ser. No. 97,522

Int. Cl. B30b 15/02, 15/34

U.S. Cl. 156—380

3 Claims



A dielectric die for use in heat sealing thermoplastic sheets comprising a laminate consisting of a rigid thermoset resin sheet having thin metal layers bonded to each side thereof with the metal layers being electrically connected through the thermoset resin layer at a plurality of locations. One of the copper layers has portions etched away to form an electrode of a desired configuration. The other metal layer is adapted for electrical connection to a source of electrostatic microwave energy. The invention includes a method for making the die which includes the steps of electrically connecting the metal sheets by drilling holes through the laminate and electroplating an electrical conducting metal in the holes, and etching away portions of one of the metal sheets to form an electrode of the desired configuration.

3,730,813

# APPARATUS FOR COMBINING TEXTILE STRANDS

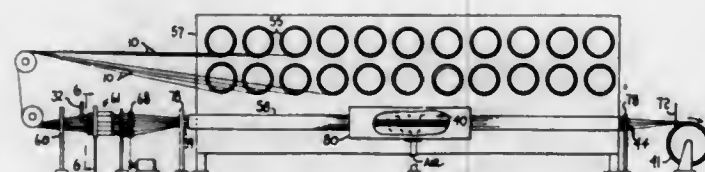
Warren W. Drummond, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Application Oct. 29, 1970, Ser. No. 85,253, now Patent No. 3,686,772, which is a division of application Ser. No. 829,521, June 2, 1969, now Patent No. 3,577,872. Divided and this application Mar. 31, 1972, Ser. No. 239,992

Int. Cl. D04h 3/12

U.S. Cl. 156—441

1 Claim



Means to coat individual strands. Oven means including a plurality of tubular driers, arranged in parallel and having drying gas flowing counter current to the direction of strand travel, receive each an individual coated strand. Means provide lateral motion to each strand while in the drier and means combine and collect the combined strand.

3,730,814

# DIE FOR MAKING BEADED ARTICLE

Minoru Kuroda, Amagasaki-shi, Hyogo, Japan, assignor to Nishizawa Shoji Co., Ltd., Osaka, Japan, and The Dimension Weld International Corporation, New York, N.Y., a fractional part interest to each

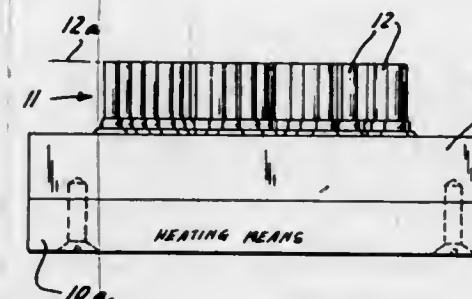
Application Mar. 18, 1969, Ser. No. 808,128, which is a continuation-in-part of application Ser. No. 662,962, Aug. 24, 1967, both abandoned. Divided and this application Oct. 13, 1970, Ser. No. 80,384

Claims priority, application Japan, Dec. 19, 1966, 41/115,532, 41/115,533, 41/115,535, 41/83,085

Int. Cl. B32b 31/00; B30b 15/34

U.S. Cl. 156—515

4 Claims



A die for making a beaded article having a support layer on which a bottom layer and a top layer of sheet material are superimposed. The top layer is heat bonded to the bottom layer and both are heat bonded to the support layer along a circumferentially complete narrow annular zone. In the area circumscribed by the annular zone the top layer is provided with a raised self-supporting bead-like prominence which contains ornamental particles visible to a viewer because the top layer is of transparent material. The die has a base portion from which extend projections whose free end faces are formed with recesses which are bounded by annular cutting edges located in the plane of the respective endface, and by a bevelled shoulder which is inwardly inclined away from the associated cutting edge.

3,730,815

# TAPE APPLICATOR

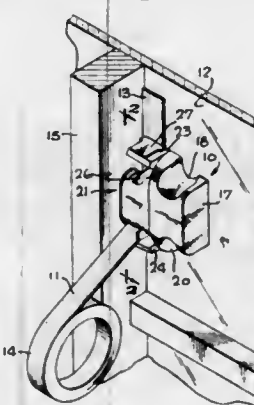
Leon Terzian, 8448 Samra Drive, Canoga Park, Calif. 91304

Filed Aug. 10, 1970, Ser. No. 62,303

Int. Cl. B32b 31/18; 31/20

U.S. Cl. 156—527

10 Claims



An applicator for installing a pressure sensitive tape onto a work surface is disclosed herein having a body which includes a finger holding portion and a tape tensioning and applying portion that is laterally carried on the finger holding portion. The applying portion includes an oval, in cross-section, member which is disposed in fixed spaced relationship between a pair of retainers laterally carried on the ends of the finger holding

portion so as to define a pair of side opening slots for conducting a portion of tape therethrough. Resiliently biased pressure means are carried by the retainer and serve to press against the tape as the applicator is moved along the work surface. Means are provided accommodating a variety of tape widths as well as for severing applied tape from its storage roll.

3,730,816

# APPARATUS FOR LAYING UP MULTIPLE-PLY CROSS-BONDED PLYWOOD PANELS

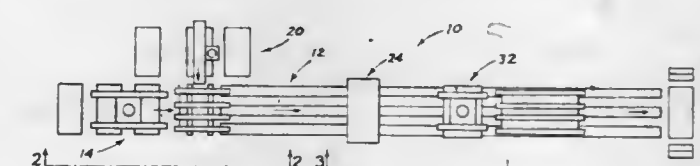
John H. Crawford, Corvallis, Oreg., assignor to Leading Plywood Corp., Corvallis, Oreg.

Filed Nov. 16, 1970, Ser. No. 89,746

Int. Cl. B32b 31/04

U.S. Cl. 156—559

11 Claims



Apparatus for laying up cross-bonded multiple-ply plywood panels comprising a main conveyor line for moving veneer sheets and core sheets, one after the other, through a glue applicator. The applicator applies a glue coating to the upper surfaces of the sheets. The sheets then move to a stacking region where the core and veneer sheets are stacked one on top of the other in the order in which they have been carried on the main conveyor line. Core sheet supply means positioned laterally of the main conveyor line delivers core sheets onto the main conveyor line. Veneer sheet supply means positioned in line with the main conveyor line delivers veneer sheets to the conveyor line. Face veneer sheet supply means superposed over the conveyor line, intermediate the glue applicator and stacking region, delivers uncoated face veneer sheets to be laid on top of a stack of core and veneer sheets in the stacking region.

3,730,817

# APPARATUS FOR THERMOFIXING OF SLIDE-FASTENER COUPLING CHAINS

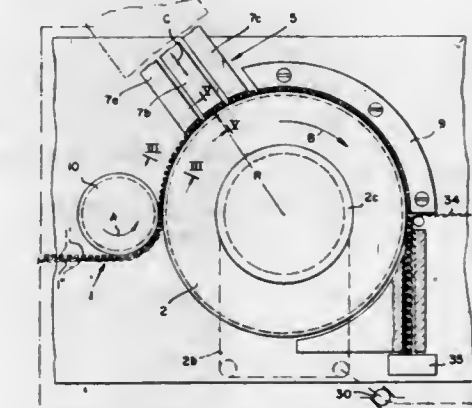
Alfons Frohlich, and Franz Hochlehnert, both of Essen, Germany, assignors to Opti-Holding AG., Glarus, Switzerland Division of Ser. No. 4,870, Jan. 22, 1970. This application March 24, 1971, Ser. No. 127,816

Claims priority, application Germany, Aug. 23, 1969, P 19 42 935.7; Oct. 9, 1969, P 19 50 810.2

Int. Cl. B32b 31/00; B23k 1/06

U.S. Cl. 156—580

10 Claims



A method of and an apparatus for the fixing or setting of continuous coupling elements of chains, preferably in the form of meandering or coiled monofilament, wherein the



coupling element is passed about a drum with predetermined coupling-head spacing through a station at which an ultrasonic transducer thermally sets the coupling element. Juxtaposed with the periphery of the transport wheel, which maintains the spacing of the turns or undulations of the coil or the meander, is a radially reciprocable member constituting the vibration source or the anvil against which the vibrator operates.

## ERRATUM

For Class 156—14 see:  
Patent No. 3,730,899

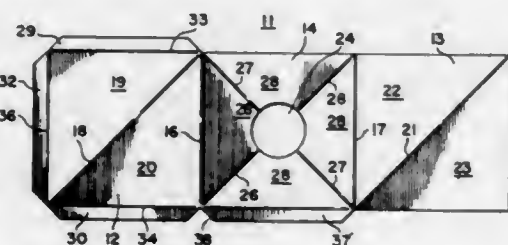
3,730,818

## EXPANDABLE NOVELTY DEVICE

Richard V. Salinari, Brooklyn, N.Y., assignor to  
Norcross, Inc., New York, N.Y.  
Filed Sept. 21, 1971, Ser. No. 182,483  
Int. Cl. G09f 14/00

U.S. Cl. 161—17

10 Claims



A pop-up device collapsible to a flat state and expandable to a pyramidal shape is formed of a unitary blank and includes three square panels, each of the first and second panels having a diagonal fold line extending from the device apex and the third panel having fold lines extending between opposite corners. The edges of the first and second panels extending from the apex are defined by fold lines and the other edges of the first and second panels are joined to respective edges of the third panel along corresponding edges to define fold lines. In the device collapsed condition, the third panel is folded flat along a diagonal and is sandwiched between the flattened superimposed first and second panels. By applying pressure to the opposite corners of the folded third panel, the device is expanded by unfolding the third panel to a base member and the first and second panels to pyramidal walls.

3,730,819

## TEMPERATURE CONTROL APPARATUS EMPLOYING HEATING AND COOLING CONTROL CIRCUITS ARRANGED IN A HEAD TO TOE CONFIGURATION

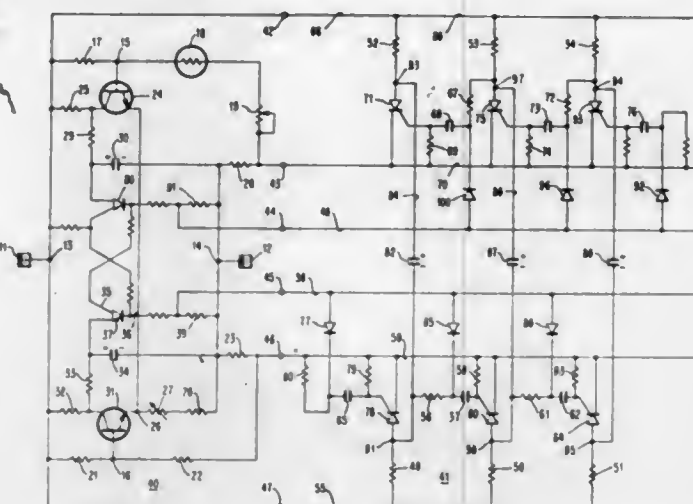
Egils Evalds, Ardmore, Pa., assignor to Athena Controls, Inc.,  
West Conshohocken, Pa.

Filed Oct. 18, 1971, Ser. No. 189,881  
Int. Cl. F25b 29/00

U.S. Cl. 165—26

8 Claims

The present system is a time proportional system for controlling both heat and cooling. The present system provides a plurality of stages of individual heating control circuits and a plurality of stages of individual cooling control circuits. The system in general follows a last on-first off procedure. The ascending stages of the heating series are respectively circuitry connected to the descending stages of the cooling series, i.e., the first stage of the heating series is connected to the last



stage of the cooling series and vice versa so that when a heating stage is turned on it will cause the cooling stage to which it is connected to be turned off and vice versa. Because of the

3,730,820

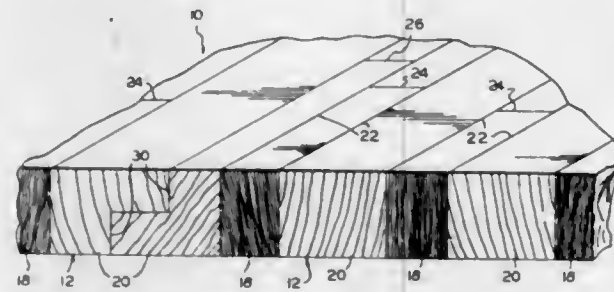
## SOFTWOOD-HARDWOOD LAMINATED PANEL

Walter M. Fields, 13975 SW. 20th, Beaverton, Oreg.  
90075; and Richard W. Mayer, 5660 SW. Willard,  
Portland, Oreg. 97219

Filed July 19, 1971, Ser. No. 163,962  
Int. Cl. B32b 3/10; E04c 2/00

U.S. Cl. 161—38

11 Claims



A high strength, lightweight, laminated panel includes boards composed of hardwood strips glued to softwood strips.

3,730,821

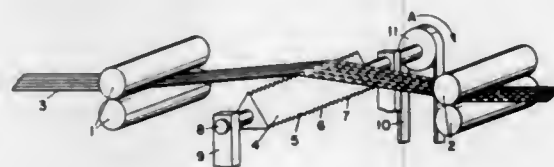
## INTERCONNECTED NETWORK STRUCTURE

David B. Jackson, Loveland, Ohio, assignor to  
Hercules Incorporated, Wilmington, Del.  
Filed Nov. 23, 1970, Ser. No. 92,099

Int. Cl. B32b 5/12

U.S. Cl. 161—57

3 Claims



A longitudinally striated film is contacted with a rotatable precision fibrillation apparatus controlled to con-

tact the film between about 0.5 to 2 impacts per linear inch between each pair of adjacent striations. The result is a plurality of continuous backbone filaments interconnected by substantial lengths of unsplit web sections. This interconnected web can be opened to form a unique network structure useful in a variety of laminar, non-woven fabric applications and as a reinforcing web in paper or plastic films.

3,730,822

## COMPOSITE OF FABRIC WITH FLEXIBLE BACKING

John A. Lovell, Monroe Falls, and Philip G. Harris, Akron,  
both of Ohio, assignors to The Goodyear Tire & Rubber  
Company, Akron, Ohio

Filed March 29, 1971, Ser. No. 129,187  
Int. Cl. D05c 15/04, 17/00

U.S. Cl. 161—66

8 Claims

A composite structure suitable for use as a carpet which comprises a yarn tufted through a primary backing to create yarn bundles on its underside, where the yarn bundles are adhered to the primary backing and substantially encapsulated by a backsize comprising an inorganic water-insoluble granular material of an average specific gravity greater than 1 and a flexible cured polyurethane binder therefor applied as a liquid polyurethane reaction mixture substantially free of volatile solvent. The invention has particular utility in creating carpet with a flexible backsize where the backsize is applied as a granular material with a liquid reaction mixture without striking through to the face of the carpet.

3,730,823

## EDGING MATERIAL FOR APPLICATION TO THE EDGES OF SUBSTRATES

Lee E. Veneziale, Jr., Tyrone, Pa., assignor to  
Westvaco Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No.  
113,455, Feb. 8, 1971. This application Aug. 30, 1971,  
Ser. No. 176,233

Int. Cl. C09j 7/04

U.S. Cl. 161—82

5 Claims

A decorative, functional edging material for application to the edges of panels or substrates. The edging material is a polyester resin impregnated paper sheet coated on the back side with a high viscosity thermosetting hot-melt glue. The base of the edging material is a single sheet of paper, preferably an alpha cellulose or kraft saturating paper having a basis weight of at least 65 pounds, impregnated with a polymerizable unsaturated polyester resin. The hot-melt glue is an ethylene-vinyl acetate copolymer, having certain definite characteristics which enable the edging to become permanently bonded to the edge panel surface under temperature and pressure. The sheet, impregnated with a polymerizable polyester resin, is suitably cured to give a non-cracking edging material, coated with the hot-melt glue, and cut into strips of suitable widths and wound into rolls.

3,730,824

## CONTINUOUS FILAMENT WEBS

George A. Watson, Davidson, N.C., assignor to  
Celanese Corporation, New York, N.Y.

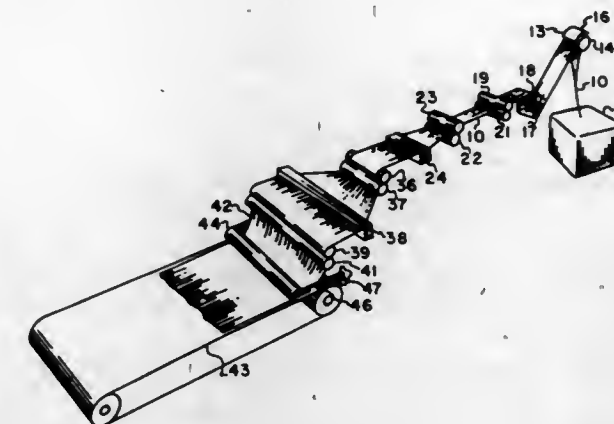
Continuation of abandoned application Ser. No. 871,366,  
Oct. 20, 1969, which is a division of application Ser.  
No. 650,796, July 3, 1967, now Patent No. 3,501,811,  
which in turn is a continuation-in-part of abandoned  
application Ser. No. 382,263, July 13, 1964. This ap-  
plication Oct. 18, 1971, Ser. No. 189,995

Int. Cl. B32b 5/02

U.S. Cl. 161—142

3 Claims

A method for producing a lightweight web of continuous filaments and the product produced thereby comprising deregistering a tow of continuous crimped fila-



ing a density of less than 1 ounce per square yard and preferably less than about 1/2 ounce per square yard.

3,730,825

## DECORATIVE SHEET MATERIAL HAVING PLURAL ADHESIVE LAYERS

Bubel Nakane, 1-92 Kitashirakawa Maruyama-cho,  
Sakyo-ku, Kyoto, Japan

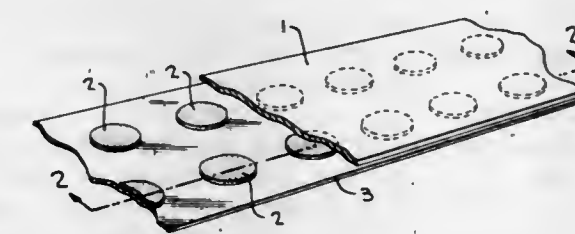
Continuation-in-part of abandoned application Ser. No.  
288,513, June 17, 1963. This application Apr. 7, 1970,  
Ser. No. 24,420

Claims priority, application Japan, June 21, 1962,  
37/26,021

Int. Cl. B32b 3/10

U.S. Cl. 161—148

4 Claims



A decorative material for adhesive attachment to a solid surface by wetting one surface of the decorative material consisting essentially of a decorative sheet material selected from paper and textile fabrics, a pressure- and thermosensitive adhesive agent coated on one surface of this decorative sheet in a series of spaced areas in a repeating pattern of a selected design and a self-supporting film of a water- and thermosensitive adhesive agent bonded to these spaced areas on the side opposite the decorative sheet, the areas being so spaced from each other that when the self-supporting film is in contact with water both adhesive agents come into contact to form a single adhesive layer.

3,730,826

## BORON CARBIDE BALLISTIC ARMOR MODIFIED WITH CALCIUM BORIDE, TITANIUM AND/OR MANGANESE

Ben Matchen and David Robertson, Niagara Falls, Ontario, Canada, assignors to Norton Research Corporation (Canada) Limited, Niagara Falls, Ontario, Canada  
No Drawing. Filed Nov. 22, 1971, Ser. No. 201,121

Int. Cl. B32b 1/12, 17/10; C04b 41/04

U.S. Cl. 161—193

9 Claims

Composite ceramic armor with improved ballistic properties. Basic boron carbide armor is improved by the



addition to the boron carbide of certain quantities of calcium boride, titanium and/or manganese, or a combination of one or more of these with chromium or boron. Improved ballistics also result from a multilayer ceramic face plate wherein one or more layers of the above modified boron carbide is combined with a layer of boron carbide to form an integral ceramic face plate.

3,730,827

# BORON CARBIDE BALLISTIC ARMOR MODIFIED WITH COPPER

Ben Matchen, David Robertson, and John J. Scott, Niagara Falls, Ontario, Canada, assignors to Norton Research Corporation (Canada) Limited, Niagara Falls, Ontario, Canada

No Drawing. Filed Nov. 22, 1971, Ser. No. 201,115

Int. Cl. B32b 1/12, 17/10; C04b 41/04

U.S. Cl. 161—193

7 Claims

Composite ceramic armor with improved ballistic properties. Basic boron carbide armor is improved by the addition to the boron carbide of certain quantities of copper or copper admixed with calcium boride, titanium, manganese, boron or chromium. Improved ballistics also result from a multilayer ceramic face plate wherein one or more layers of the above modified boron carbide is combined with a layer of boron carbide to form an integral ceramic face plate.

3,730,828

# POSTFORMABLE LAMINATE COMPRISING A BARRIER SHEET OF WOOD FIBER IMPREGNATED WITH FULLY CURED UNPLASTICIZED MELAMINE-FORMALDEHYDE RESIN

Kenneth D. Meiser, Dallas, Tex., assignor to Plastics Manufacturing Company, Dallas, Tex.

Continuation-in-part of Ser. Nos. 535,733, March 21, 1966, abandoned, and Ser. No. 9,456, Feb. 6, 1970, abandoned. This application March 23, 1971, Ser. No. 127,412

Int. Cl. B32b 27/10

U.S. Cl. 161—258

5 Claims

A laminate which is postformable to an arc of a circle having a radius at least as small as three-fourths inch without cracking or dulling of the surface is produced with a paper barrier sheet of wood fiber impregnated with a fully cured unplasticized melamine-formaldehyde resin by consolidating under heat and pressure a postformable substrate in direct contact with a paper barrier sheet consisting essentially of alpha cellulose impregnated with an unplasticized reaction product of formaldehyde and malamine in a mole ratio from 1:1 to 1.8:1. The reaction product has an acidity high enough to compensate for its low formaldehyde content, so as to cause it to become fully cured during the heat-and pressure-consolidation.

3,730,829

# STARCH XANTHATE DERIVATIVES USED IN PAPERMAKING

George G. Maher, Dunlap, Ill., assignor to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Oct. 18, 1971, Ser. No. 190,319

Int. Cl. D21h 3/28

U.S. Cl. 162—175

6 Claims

A method of preparing paper is disclosed which includes the step of adding to the paper pulp the products of the reaction of starch xanthate with either an alkyl diglycidal ether or an alkyl diepoxide to thus increase, burst, wet and dry strength and fold endurance of the paper. This reaction may take place ex or in situ.

3,730,830

# PROCESS FOR MAKING PAPER

William T. Driscoll, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Nov. 24, 1971, Ser. No. 202,013

Int. Cl. D21h 5/12

U.S. Cl. 162—146

12 Claims

Paper particularly useful as photographic paper base is made by preparing a slurry in water of a mixture of a synthetic polymer staple fiber, such as a linear polyester, carboxymethyl cellulose and an inorganic pigment such as titanium dioxide or clay or carbon, blending the slurry with cellulose fiber before or after refining the cellulose fiber and forming a sheet of paper from the blend. The inorganic pigment tends to prevent agglomeration of the polymer fibers and allows a polymer slurry of relatively high consistency to be prepared for blending with the cellulose fibers.

3,730,831

# ADJUSTABLE SLICE FOR CYLINDRICAL ROLL FORMER

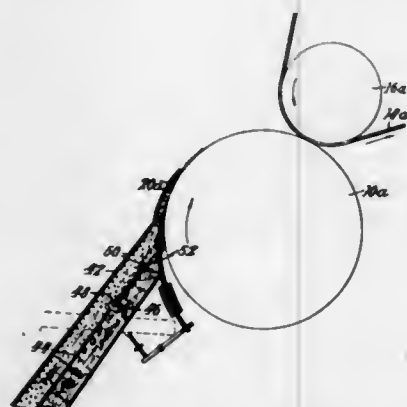
Samuel S. Stevens, P.O. Box 218, Erving, Mass. 01344

Filed Dec. 1, 1970, Ser. No. 94,043

Int. Cl. D21f 1/60

U.S. Cl. 162—321

5 Claims



In a cylindrical roll paper forming machine, a generally fixed upper apron former in gradually approaching association with respect to the surface of the roll, in combination with a lower slice lip member between the apron former and the roll, said slice lip member being longitudinally adjustable toward and from the apron former on an arc, selectively increasing or decreasing the size of the throat.

The same construction including a pair of separate stock feeding conduits for feeding stocks of different types to the roll, and a free moving, free-ended paddle-like member having its free end adjacent the adjustable slice member, and automatically conforming to the slice adjustment to provide for applying a uniform dual layer of different types of stock onto the roll regardless of the adjustment of the slice member.

3,730,832

# NUCLEAR REACTOR FUEL CHARGING AND DISCHARGING SYSTEM

William N. Jackonis, Fairborn, Ohio, assignor to the United States of America as represented by the Secretary of the Air Force

Filed June 23, 1971, Ser. No. 155,741

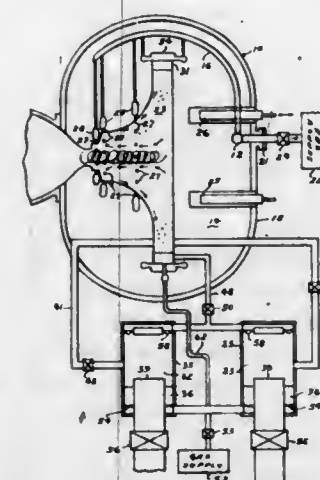
Int. Cl. G21 19/20

U.S. Cl. 176—30

3 Claims

A nuclear reactor fuel charging and discharging system for colloid core reactors having fuel stored in containers

in the shape of cyclone type separators. Valves positioned external to the reactor are opened to permit a gas flow through the containers to carry the nuclear fuel into the reactor cavity through a slot positioned near the periphery of the reactor cavity. A second set of valves



positioned external to the reactor are opened, and the first valves are closed to remove the nuclear fuel from the reactor cavity. The nuclear fuel is separated from the gas which carries the fuel to the storage containers in the cyclone type separators.

3,730,833

# SCAVENGERS FOR RADIOACTIVE IODINE

George E. Cremeans, Groveport, David A. Berry and Harvey S. Rosenberg, Columbus, Joseph M. Genco, Gahanna, and David L. Morrison, Columbus, Ohio, assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Continuation-in-part of application Ser. No. 803,465, Feb. 28, 1969. This application May 17, 1971, Ser. No. 144,298

Int. Cl. G21c 13/10

U.S. Cl. 176—37

3 Claims

A surface coating for absorbing radioactive vapor-phase iodine and radioactive vapor-phase methyl iodide to be applied to the inside of a containment vessel for a water-cooled power reactor. The active ingredients of the surface coating may be polyacrylamines and combinations of polyacrylamines and amine-terminated polyamides. The active polymer ingredients are cross-linked to provide the physical characteristics necessary to withstand the environmental conditions present in a containment vessel subsequent to a loss-of-coolant accident.

3,730,834

# GAS INJECTION SYSTEM FOR DUST CORE REACTOR

Bobby N. Turman, Fairborn, Ohio, assignor to the United States of America as represented by the Secretary of the Air Force

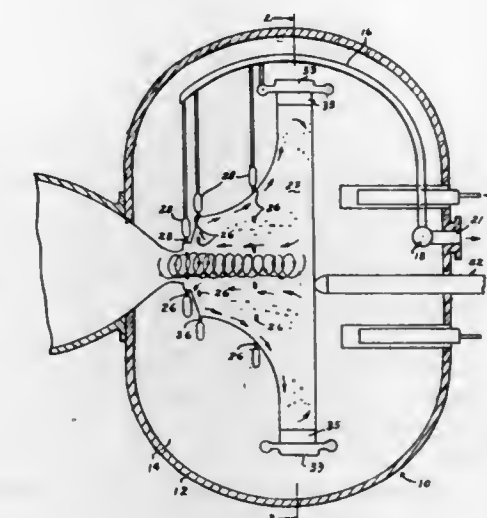
Filed May 4, 1971, Ser. No. 140,177

Int. Cl. G21c 19/28

U.S. Cl. 176—45

1 Claim

A hydrogen gas injection system for a dust core reactor having a plurality of closely spaced thin arcuate vane sections positioned around the reactor cavity, with the spac-



faces near the slots to enhance surface attachment of the gas jet.

3,730,835

# NOVEL DEVICE COATED WITH A PROSTAGLANDIN AND PREPARATION THEREOF

Harold M. Leeper, Palo Alto, and Peter W. Ramwell, Portola Valley, Calif., assignors to ALZA Corporation

Filed Apr. 15, 1971, Ser. No. 134,222

Int. Cl. A61f 1/24; A61m 5/14; A61n 5/18

U.S. Cl. 195—1.7

13 Claims

A device for adding a platelet anti-aggregation prostaglandin to a fluid containing platelets, or to platelets, the device comprising a substrate of increased surface area coated with a platelet anti-aggregation prostaglandin that releases the prostaglandin on contact by the fluid or platelet. The device is prepared by shaping and depositing a prostaglandin on the substrate by evaporation, solution deposition, coating in a fluidized bed and the like.

3,730,836

# PROCESS FOR PRODUCING ADENOSINE BY FERMENTATION

Kenichi Komatsu and Akira Saijo, Miyazaki, Katsuji Haneda, Saltama, and Ryoji Kodaira and Hiroshi Ohsawa, Miyazaki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed Nov. 20, 1970, Ser. No. 91,524

Claims priority, application Japan, Dec. 24, 1969, 44/103,388

Int. Cl. C12d 13/06

U.S. Cl. 195—28 N

5 Claims

A process for producing purine nucleoside, i.e. adenosine, which is a useful substance as precursors of nucleotides having flavoring properties or as precursors of energy supplying sources in living bodies, by fermentation. In the process new strain identified at ATCC No. 21616, which is derived from a parent strain named as Bacillus No. ASB-5741 (ATCC No. 21615) belonging to a new species of the genus Bacillus are cultivated in a culture medium under aerobic conditions to accumulate the purine nucleoside in the culture medium.



3,730,837

**PROCESS FOR PRODUCING YEAST WITH INCREASED METHIONINE CONTENT**

Takashi Iguchi, Shiro Hayakawa, and Hiroshi Ohosawa, Miyazaki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed Sept. 8, 1971, Ser. No. 178,812

Int. Cl. C12b 1/00

U.S. Cl. 195—28 R 7 Claims

A yeast containing a large amount of methionine is produced by aerobically culturing a hydrocarbon-assimilating yeast having resistance to ethionine and belonging to the genus *Candida* in a medium containing a hydrocarbon, a nitrogen source, inorganic salts and a growth-promoting compound, and then recovering the resulting yeast cell.

The hydrocarbon-assimilating yeast having resistance to ethionine includes *Candida petrophilum* NRRL Y-7338, *Candida tropicalis* NRRL Y-7339 and *Candida rugosa* NRRL Y-7340.

The thus obtained yeast contains a large amount of methionine and is preferable for use in feed and food-stuffs.

3,730,838

**ENZYMATIC PREPARATION OF L-CITRULLINE**

Ichiro Chibata, Suita-shi, Toshio Kakimoto, Sakai-shi, Takeji Shibata and Noriyuki Nishimura, Kobe-shi, Japan, assignors to Tanabe Selyaku Co., Ltd., Osaka, Japan

No Drawing. Filed Mar. 2, 1971, Ser. No. 120,368

Claims priority, application Japan, Mar. 14, 1970, 45/21,861

Int. Cl. C12d 13/06

U.S. Cl. 195—29 10 Claims

An L-arginine deiminase-producing microorganism selected from the group consisting of *Pseudomonas fluorescens*, *Pseudomonas ovalis*, *Pseudomonas pavonacea*, *Pseudomonas putida*, *Leuconostoc citrovorum*, *Leuconostoc mesenteroides*, *Sarcina lutea*, *Streptomyces griseus*, *Mycobacterium smegmatis* and *Mycobacterium avium* is cultivated in an aqueous nutrient medium and under aerobic conditions. The cultivation is preferably carried out at about 30–37° C. A fermentation broth is produced. The broth is incubated with L- or DL-arginine. Alternatively a refined aqueous preparation produced from the broth may be employed. The incubation is preferably carried out at 25–40° C. and at pH 4.5–7.0. L-citrulline is recovered from the resultant reaction mixture.

3,730,839

**PROCESS FOR PREPARING NOVENAMINE**

Oldrich K. Sebek, and Herman Hoeksema, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 829,757, June 2, 1969, Pat. No. 3,652,536. This application Dec. 13, 1971, Ser. No. 207,580

Int. Cl. C12d 13/02

U.S. Cl. 195—29 18 Claims

Novel process for enzymatic cleavage of 3-acylamino-4-hydroxy coumarins such as are found in some antibiotic substances. Process yields amine compounds having antibiotic properties per se and/or utility as intermediates to make antibiotically active substances. Examples of compounds which can be used as starting materials in the subject process and their amine cleavage products are as follows:

Novobiocin → novenamine  
Dihydroxynovobiocin → novenamine  
Isonovobiocin → isonovenamine  
Descarbamoyl novobiocin → descarbamoyl novenamine

Descarbamoyl dihydroxynovobiocin → descarbamoyl novenamine

3,730,840

**PROCESS FOR PREPARING LOW MOLECULAR WEIGHT AMYLOSES**

Kaname Sugimoto, Mamoru Hirao, and Mikihiko Yoshida, Okayama, Makoto Shiosaka, Fukuoka-shi, and Yasuyuki Yokobayashi, Sakai-shi, Osaka, Japan, assignors to Hayashibara Company, Okayama-shi, Okayama, Japan

Filed Mar. 25, 1969, Ser. No. 810,314

Claims priority, application Japan, Apr. 1, 1968, 43/21,365

Int. Cl. C131 1/00

U.S. Cl. 195—31 R 4 Claims

A process for the preparation of straight-chain amyloses having molecular chain lengths of 20 to 30 that have never been obtainable hitherto.

Straight-chain low molecular weight amyloses wherein the molecules have relatively uniform chain length are obtained by liquefying a starch slurry to a relatively low extent, rapidly cooling the liquefied slurry before there occurs a substantial retrogradation and selectively decomposing and cutting the  $\alpha$ -1,6-glucoside bonds of amylopectin contained in the starch.

3,730,841

**ENCAPSULATED CARRIER BOUND ENZYMES**

Peter Salvatore, Forgiione, Stamford, Conn.; Rocco Albert Polistina, Port Chester, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed March 24, 1971, Ser. No. 127,752

Int. Cl. C07g 7/02

U.S. Cl. 195—63 10 Claims

Enzymes bound to carriers can be maintained active and the channelling and compacting of the bound enzyme can be substantially reduced by encapsulating the bound enzyme in a coating through which the substrate and its conversion product are permeable.

3,730,842

**PROCESS FOR DETERMINING BACTERIAL DRUG SENSITIVITY**

Phillip J. Wyatt and Richard M. Berkman, Santa Barbara, and David T. Phillips, Goleta, Calif., assignors to Science Spectrum, Santa Barbara, Calif.

Filed May 4, 1970, Ser. No. 34,243

Int. Cl. C12k 1/04

U.S. Cl. 195—103.5 R 21 Claims

There is described a method of rapidly determining the sensitivity of bacteria to one or more antibiotic agents. The process involves subjecting the test bacteria to a highly directional narrow beam of light and measuring the intensity of the scattered light as a function of scattering angle and repeating the measurement at successive time intervals to determine the changes in the pattern of scattered light intensity. Sensitivity of the bacteria to the antibiotic agent results in a very noticeable change in the light scattering pattern produced by the bacteria.

3,730,843

**MASS SCREENING TEST FOR SERUM TRYPSIN INHIBITORS**

James E. McKie, Jr., Parsippany, N.J., assignor to Pfizer Inc., New York, N.Y.

Filed Dec. 14, 1970, Ser. No. 98,213

Int. Cl. C12k 1/04

U.S. Cl. 195—103.5 R 11 Claims

A diagnostic test package for use in an improved semi-quantitative method for estimating antitrypsin levels in human blood.

3,730,844

**POLYNUCLEOTIDE ANALYSIS**

Peter Thomas Gilham, and Herbert Lee Weith, both of West Lafayette, Ind., assignors to Purdue Research Foundation, Lafayette, Ind.

Filed Aug. 27, 1971, Ser. No. 175,756

Int. Cl. G01n 31/14

U.S. Cl. 195—103.5 R 4 Claims

Sequential analysis of a polynucleotide to determine the particular order of nucleoside units therein can be conveniently carried out by adsorbing a polynucleotide on a strongly basic anion-exchange material, oxidizing the terminal nucleoside of the polynucleotide with a periodate, removing any excess periodate by reaction with L-rhamnose, treating the adsorbed polynucleotide with an amine to remove the terminal nucleoside residue from the polynucleotide molecule and with a phosphatase to remove the resulting terminal phosphate group from the remaining polynucleotide molecule, separating the so-produced nucleoside residue from the adsorbed polynucleotide for subsequent identification and then repeating the above procedure for each remaining nucleoside unit of the polynucleotide.

3,730,845

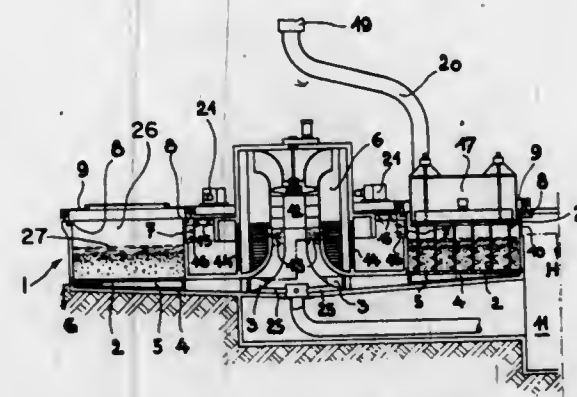
**INSTALLATION FOR PRODUCING MALT**  
Rolf Schultz, Duisburg, Germany, assignor to Rheinstahl Wanheim Gesellschaft mit beschränkter Haftung, Duisburg-Wanheim, Germany

Filed Apr. 15, 1969, Ser. No. 816,282

Claims priority, application Austria, Apr. 16, 1968, A 3,687/68

Int. Cl. A231 1/46; C12c 1/00

U.S. Cl. 195—129 8 Claims



An installation for producing green or cured malt having a closed annular chamber, an annular conduit below the floor of the chamber and sloping radially inwardly and downward to form an annular pipe which extends upward through the center of the annular chamber to an air conditioning unit which is connected back to the chamber above a predetermined level for the steeping water.

3,730,846

**APPARATUS FOR MALTING GRAIN**

Gerhart Neubert, Duisberg-Beeck, Germany, assignor to Rheinstahl Wanheim G.m.b.H., Duisburg-Wanheim, Germany

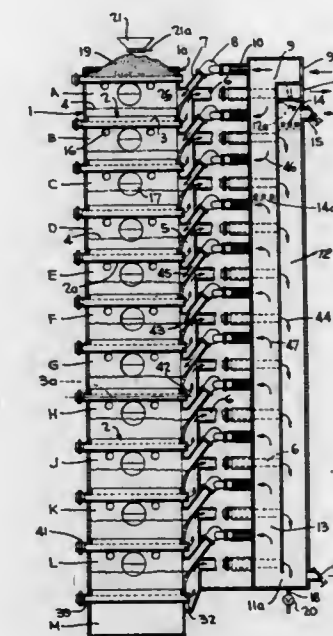
Application Sept. 30, 1969, Ser. No. 862,384, which is a continuation-in-part of application Ser. No. 595,527, Nov. 18, 1966, both abandoned. Divided and this application Aug. 21, 1970, Ser. No. 66,057

Int. Cl. A231 1/00; C12c 1/00

U.S. Cl. 195—129 5 Claims

Production of malt utilizing a vertical malting tower having a plurality of normally horizontal troughs with perforated strainers to support a quantity of grain, the troughs including imperforate bottoms and peripheral sealing means to define separate treatment spaces in vertical array, with means for individually tilting each trough

about a horizontal axis to drop the grain to successive treatment spaces. The preferred process comprises steeping the grain to about 38 percent water content, partially germinating the steeped grain, re-steeping the par-



tially germinated grain, aerating the grain, and repeating the re-steeping and aerating at least once to produce a steeped grain with a water content of at least about 48 percent, and allowing such grain to germinate further.

3,730,847

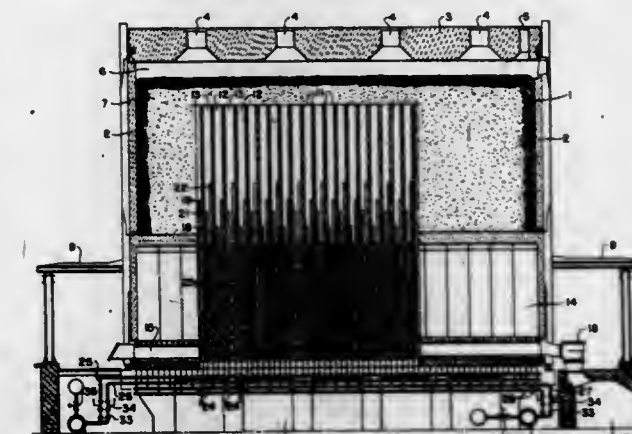
**PLURAL GAS MAINS FOR INDEPENDENTLY OPERATING LOW AND HIGH BURNERS IN ALTERNATIVE FLUE**

Erich E. Pries and Rolf Rossow, Bochum, Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Dec. 7, 1970, Ser. No. 95,613

Int. Cl. C10b 5/12

U.S. Cl. 202—139 1 Claim



A group of heating gas burners is disposed in the lower ends of the vertical heating flues between the oven chambers in a row of coke ovens. Another group of heating gas burners is disposed in the same flues at a higher level than the first group. Connected to each of the groups of burners is a heating gas distribution conduit with its own pressure control valve, so that the pressure of the gas supplied to one of the groups of burners can be regulated independently of the pressure of the gas supplied to the other group of burners.



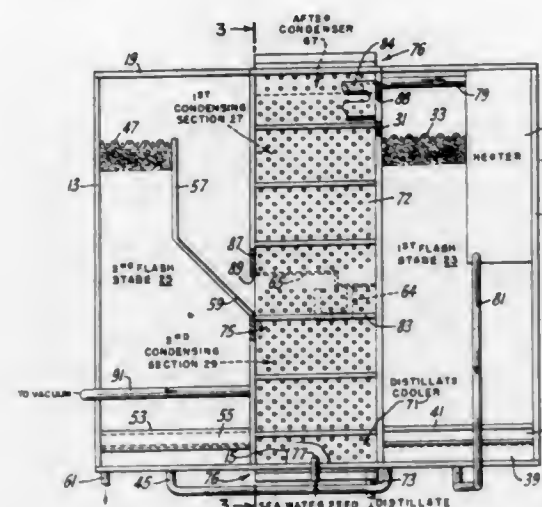
3,730,848

**MULTI-STAGE FLASH EVAPORATOR FOR DISTILLING BRINES**

Valentine Walter Kowalski, East Lyme, Conn., assignor to Riley-Beard, Inc., Chicago, Ill.  
Filed Aug. 21, 1970, Ser. No. 65,999  
Int. Cl. B01d 3/00, 3/10, 3/02

U.S. Cl. 202—73

11 Claims



This application covers a flash evaporator having two flash stages connected in series and condensing stages located between the flash stages, the condensing stages being stacked one on the other. The first condensing stage includes an after condenser and the second condensing stage an integral distillate cooler. In addition, a heater is integrally mounted in the upper portion of the first flash stage. An evaporator, in accordance with the invention, presents no hot walls for salt buildup. Vapor and distillate flow countercurrent to feed.

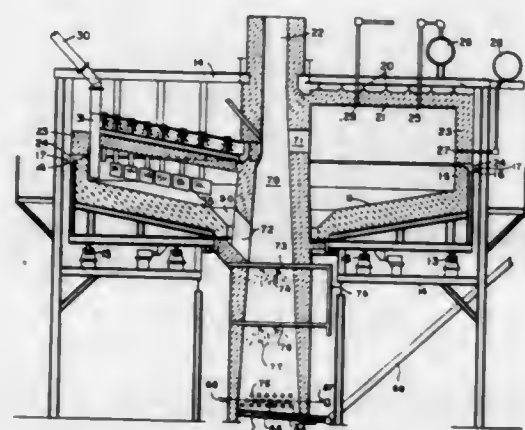
3,730,849

**INTEGRAL CALCINED COKE COOLER**

Victor D. Allred, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio  
Filed Nov. 13, 1970, Ser. No. 89,320  
Int. Cl. C10b 7/00, 49/06, 39/00

U.S. Cl. 202—103

5 Claims



A heat exchanger, e.g., a series of transverse heat-conductive conduits through which fluid circulates, or a conventional waste heat boiler, or a water spray can be incorporated into a soaking pit in a rotary hearth calcining furnace. The soaking pit can also be made integral with the flue.

3,730,850

**REMOVAL OF ODOR-CAUSING MATERIALS FROM SULPHUR-CONTAINING PLASTICIZERS BY DISTILLATION WITH A HYDRO-CARBON**

Rector P. Louthan, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Apr. 17, 1970, Ser. No. 29,634

Int. Cl. B01d 3/34; C07c 149/02

U.S. Cl. 203—52

10 Claims

Objectionable odor is substantially removed from plasticized sulfur-containing compositions by a process comprising admixing certain high-boiling inert solvents with partially-reacted plasticizer and stripping out the high boiling inert solvent under reduced pressure while completing the plasticizer preparation.

3,730,851

**METHOD FOR THE CONTINUOUS SEPARATION OF PLUTONIUM FROM URANIUM IN THE TWO-PHASE SYSTEM BY MEANS OF ELECTROLYTIC REDUCTION**

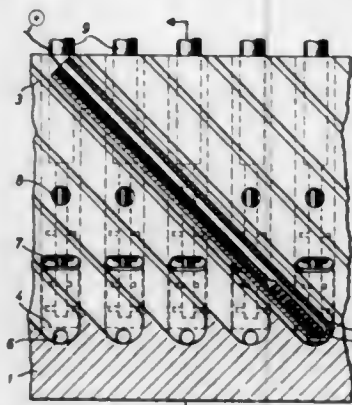
Eduard Schwind, Karlsruhe, and Peter Schlosser, Leopoldshafen, Germany, assignors to Gesellschaft für Kernforschung m.b.H., Karlsruhe, Germany  
Filed Feb. 5, 1970, Ser. No. 9,010

Claims priority, application Germany, Feb. 5, 1969, P 19 05 519.7

Int. Cl. B01k 3/00

U.S. Cl. 204—1.5

8 Claims



A method of separating uranium compounds and plutonium compounds by liquid-liquid extraction in which the plutonium is reduced to the trivalent stage by electrolytic reduction, with the plutonium being reduced during the extraction process in a region of thorough mixing of aqueous and organic phase and separated together with the aqueous phase.

3,730,852

**MANUFACTURE OF ABRASION-RESISTANT MAGNETIC RECORDING MEDIA**

Adolf Diebold, Ludwigshafen, Richard Sinn, Ziegelhausen, and Georg Schnell, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhein, Germany

No Drawing. Filed Nov. 9, 1971, Ser. No. 197,152

Int. Cl. C23f 17/00, 5/32, 5/26

U.S. Cl. 204—38 B

7 Claims

The invention relates to a process for the manufacture of magnetic recording media having thin metallic ferromagnetic coatings.

The magnetic recording media are manufactured by treating a substrate having a coating consisting of a dispersion of particulate iron or zinc in a binder such that electroless deposition of copper takes place by displacement of the iron or zinc, which copper coating may be

thickened by electrodepositing copper or silver thereon. A ferromagnetic coating consisting of cobalt and nickel and additionally phosphorus, copper or zinc and/or manganese and optionally iron is electrodeposited on the copper layer.

The process of the invention produces magnetic recording media with thin metallic coatings of high abrasion resistance which cause minimum head wear and have a high storage capacity.

3,730,853

**ELECTROPLATING BATH FOR DEPOSITING TIN-LEAD ALLOY PLATES**

Friedrich Sedlacek and Joachim Korplun, Geislingen, Steige, Germany, assignors to Dr.-Ing. Max Schloetter, Fabrik fuer Galvanotechnik, Geislingen, Steige, Germany

No Drawing. Filed June 18, 1971, Ser. No. 154,658

Int. Cl. G01n 5/38, 5/40

U.S. Cl. 204—43

18 Claims

Semibright to bright deposits of tin-lead alloys on articles are produced by electroplating the articles with an electroplating bath comprising a tin compound, a lead compound, preferably the fluoborates of stannous tin and plumbous lead, fluoboric acid, boric acid, a wetting agent, and, as brightening agent, a methylene aniline compound or a diamino diphenylmethane compound, preferably in combination with a brightener as conventionally used in electroplating tin baths.

3,730,854

**STABILIZED AQUEOUS SOLUTIONS OF UNSATURATED ALIPHATIC SULFONIC ACIDS OR SALTS THEREOF**

Walter Schenk, Bad Duerkheim, and Friedrich Hovemann, Hockenheim, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Filed Oct. 29, 1971, Ser. No. 193,996

Int. Cl. C23b 5/46; C07c 143/16

U.S. Cl. 204—49

6 Claims

Stabilized aqueous solutions of aliphatic unsaturated sulfonic acids which contain aliphatic chlorine compounds, and nickel-plating baths containing said stabilized aqueous solutions as brighteners.

3,730,855

**METHOD AND COMPOSITION FOR ELECTROPLATING ZINC**

John Gove Poor, Somers, and George Bernard Rynne, Rockville, Conn., assignors to Conversion Chemical Corporation, Rockville, Conn.

No Drawing. Continuation-in-part of abandoned application Ser. No. 711,504, Mar. 8, 1968, which is a continuation-in-part of abandoned application Ser. No. 626,951, Mar. 30, 1967. This application Dec. 18, 1968, Ser. No. 784,917

Int. Cl. C23b 5/10, 5/46

U.S. Cl. 204—55 R

33 Claims

An aqueous bath for producing ductile, adherent zinc electrodeposits upon metallic surfaces contains ammonium chloride, zinc chloride and a surface active component comprising a mixture of surface active agents including a primary surface-active agent selected from the group consisting of sulfated polyoxyalkyl carbinamines, condensate of alkyl phenols and an alkylene oxide, imidazoline derivatives, and mixtures thereof. In addition, a secondary surface-active agent is desirably included such as phosphoric acid esters of polyalkylene glycols and alkoxylated alkyl phenols and the alkali metal salts of such esters, polyoxyalkyl carbinamines, natural phosphatides and mixtures thereof. The bath has a pH of 3.0 to 10.0 and may additionally contain aldehyde brighteners, buffering and chelating agents, and secondary brighteners.

3,730,856

**ELECTROLYTIC PREPARATION OF VALVE GROUP METAL EQUIPMENT FOR USE IN CHEMICAL PLANTS**

John Grahame Hines, Runcorn, and Joseph Bernard Cotton, Sutton Coldfield, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Continuation-in-part of application Ser. No. 630,850, Apr. 14, 1967. This application Feb. 26, 1971, Ser. No. 119,415

Int. Cl. C23b 9/00, 3/00

U.S. Cl. 204—56 R

8 Claims

Equipment which is intended for use in chemical plant and which is made of titanium, zirconium, niobium, tantalum or any alloy of one or more of these metals, is exposed to an anodic treatment to remove heavy metals from the surfaces to be exposed to chemicals to thus protect the surfaces against embrittlement caused by hydrogen which is either present in the environment to which the equipment is exposed or is formed as a result of corrosive action at the surface of the metal.

3,730,857

**PRODUCTION OF ALKOXIDES**

Terence Gordon Tripp, Chester, England, assignor to Monsanto Chemicals Limited, London, England

Filed April 26, 1971, Ser. No. 137,613

Claims priority, application Great Britain, May 5, 1970, 21,644/70

Int. Cl. C07b 29/06; C07i 7/04, 7/100

U.S. Cl. 204—59 R

8 Claims

This invention relates to the production of alkoxides by passing an electric current through a liquid medium comprising a solution of a monohydric alcohol and as a supporting electrolyte an ammonium or quaternary ammonium salt using an anode and passing the electric current through the medium until the alkoxides are present in the liquid medium.

3,730,858

**POROUS ELECTRODE HAVING CAVITY WITH IMPERVIOUS DOME**

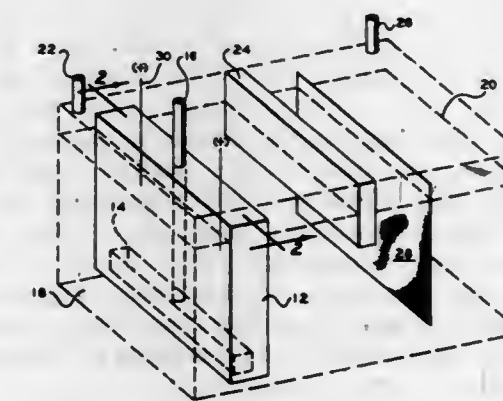
Keith A. Williams, Bartlesville, Okla., assignor to Phillips Petroleum Company

Continuation of application Ser. No. 74,133, Sept. 21, 1970, which is a continuation of abandoned application Ser. No. 739,506, June 24, 1968. This application Feb. 14, 1972, Ser. No. 226,040

Int. Cl. B01k 3/00; C07b 29/06

U.S. Cl. 204—59 R

14 Claims



In an electrochemical process, the reaction takes place within the confines of a porous electrode element. The bottom of this electrode element has a cavity open to the bulk of the electrolyte. Gaseous or vaporous feed materials are introduced into this cavity; a portion of the inner surfaces of the walls of this cavity are sufficiently impervious so as to cause a gas cap to form in the upper



portion of the cavity. This allows the feed materials to be distributed evenly throughout the entire horizontal span of the cavity. The feed materials then pass out of the impervious dome and into and upward through the porous reaction section of the electrode without contact with the bulk of the electrolyte and are converted to the desired products while within the confines of the electrode element.

3,730,859

# MULTICELL FURNACES FOR THE PRODUCTION OF ALUMINUM BY ELECTROLYSIS

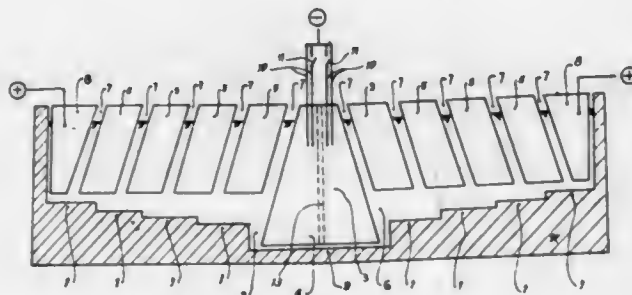
Giuseppe de Varda, Milan, Italy, assignor of a fractional part interest to Montecatini Edison S.p.A., Milan, Italy  
Filed June 26, 1970, Ser. No. 50,050

Claims priority, application Italy, June 30, 1969, 18,962/69

Int. Cl. C22d 3/12, 3/02

U.S. Cl. 204-67

9 Claims



A multicell furnace having inclined bi-polar electrodes for electrolytic production of aluminum. A terminal cathode is situated over a metal collection pit in the sloped vat bottom. The cathode extends into the collection pit whereby it contacts the molten metal.

3,730,860

# ELECTROLYTIC RECOVERY OF COPPER FROM OXIDIZABLE CUPRIFEROUS MATERIAL

Frank E. Horton, Sonora, Mexico, and Thomas M. Morris, Tucson, and Frank E. Christman, Inspiration, Ariz., assignors to Inspiration Consolidated Copper Company, New York, N.Y.

Filed Feb. 18, 1972, Ser. No. 227,592

Int. Cl. C22d 1/16, 15/08

U.S. Cl. 204-108

19 Claims

Oxidizable iron-bearing cupriferous material is leached with a sulfuric acid solution containing hexavalent chromium ions, e.g. chromic acid or a dichromate. The leach solution after separation from undissolved residue is hydrolyzed by heating under pressure at a temperature above 130° C. to precipitate iron as a basic sulfate salt. The iron precipitate is separated, and the residual solution is subjected to a first bifluid electrolysis to electrowin copper and to regenerate sulfuric acid and reoxidize trivalent chromium ions to hexavalent form. Anolyte discharged from the first electrolysis is subjected as anolyte in a second bifluid electrolysis to oxidize remaining trivalent chromium to hexavalent form, and thereafter the solution is recycled to the leaching operation.

3,730,861

# METHOD OF ELECTROCHEMICAL MACHINING

William Andrew Haggerty, Cincinnati, Ohio, assignor to The Cincinnati Milling Machine Co., Cincinnati, Ohio

Filed Apr. 8, 1968, Ser. No. 719,450

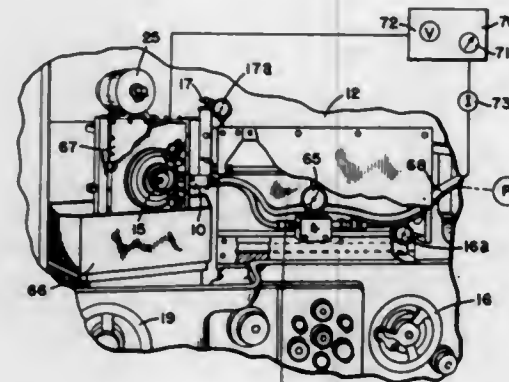
Int. Cl. C23b 3/02, 3/12; B23k 1/00

U.S. Cl. 204-129.75

9 Claims

A method of electrochemical machining workpieces to form surfaces of revolution having precise shapes

and dimensions includes the steps of rotating the workpiece and positioning an electrochemical machining tool adjacent the workpiece with the gap between the tool and the workpiece being adjusted initially to a first distance. A high velocity flow of electrolyte is forced under pressure into the gap between the tool and the workpiece to provide a path for the electrical current, to remove the heat generated during the machining operation, and to remove the reaction products of the machining operation. The current density between the workpiece and the tool is maintained at the highest possible level for substantially the entire machining operation, in the order of 6000 amperes per square inch, to obtain the highest quality surface finish and the best machining rates. After the workpiece has been machined to its finish dimension, the current may be reduced momentarily, for at least one revolution of the workpiece to a lower predetermined level, typically between 1500 and 3000 amperes per square inch, to produce a bright, pleasing appearance to be machined surface. The current is then terminated abruptly in order to maintain this bright surface appearance completely around the bearing surface.



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3,730,862

# PREPARATION OF LIQUID BROMINE-TERMINATED POLYMERS

Alan A. Csontos, Norton, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Filed June 21, 1971, Ser. No. 155,325

Int. Cl. B01j 1/10

U.S. Cl. 204-163 R

5 Claims

Liquid bromine-terminated polymers are directly prepared as by polymerizing one or more acrylates, acrylates in combination with isoprene, or butadiene with acrylonitrile using a combination of ultraviolet light and a dibromo-dichloro alkane containing at least two carbon atoms only as the polymerization initiator. These polymers are vulcanized with polyfunctional amines as curing agents to form solid elastomers, and are useful as base polymers for caulks, sealants, potting compounds, and like formulations.

3,730,863

# METHOD OF TREATING WORKPIECES IN A GLOW DISCHARGE

Klaus Keller, Paulstrasse 4, Cologne, Weiss, Germany  
Filed Feb. 10, 1971, Ser. No. 114,162

Claims priority, application Switzerland, Feb. 13, 1970, 2,093/70; Jan. 5, 1971 42/71

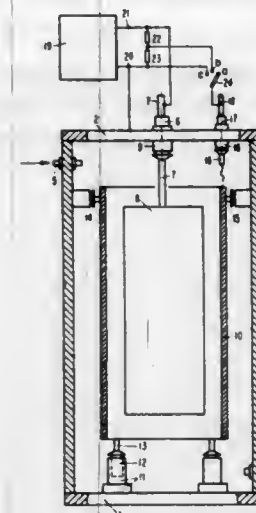
Int. Cl. C23c 11/16

U.S. Cl. 204-164

5 Claims

In nitriding ferrous workpieces in a glow discharge the workpiece and the container constitute the glow discharge electrodes during normal operation. A third electrode is

positioned between the workpiece and container and is provided with a heat reflecting surface facing the workpiece. During starting, the third electrode is held at a potential lower than that of the container to provide a low energy glow discharge to the workpiece and is later connected to the container to be at the same potential.



tential lower than that of the container to provide a low energy glow discharge to the workpiece and is later connected to the container to be at the same potential.

3,730,864

# DECREASING THE PHENOLIC CONTENT OF LIQUIDS BY AN ELECTROCHEMICAL TECHNIQUE

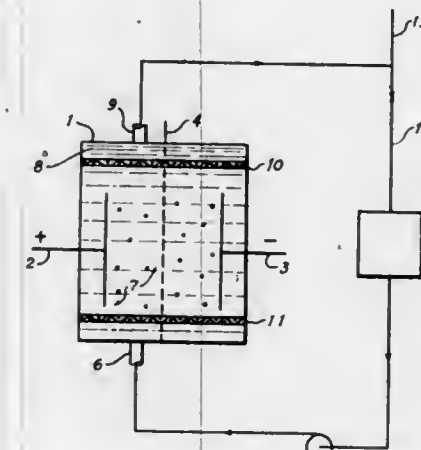
Michael Tarjanyi, North Tonawanda, and Murray P. Strier and Howard D. Siegeman, Amherst, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed Apr. 14, 1971, Ser. No. 133,918

Int. Cl. B01k 3/00; C02c 5/12

U.S. Cl. 204-149

15 Claims



A method for decreasing the phenolic content of a solution which comprises passing an electric current through a solution containing phenolic material, which solution is contained as the electrolyte in a cell, said cell having at least one positive and one negative electrode, between which the current is passed, and wherein the electrolyte also contains a bed of particles, distributed therein, such that the porosity of the bed is from about 40 to 80%, porosity being defined as

$$\left(1 - \frac{\text{Volume of particles}}{\text{Volume of cell wherein the particles are distributed}}\right) \times 100$$

The electrolysis of the electrolyte is continued until the desired reduction in the phenolic content thereof is obtained.

# ELECTRODEPOSITION OF A COMPOSITION CONTAINING AN ESTER RESIN AND A METHYLOL-PHENOL ETHER

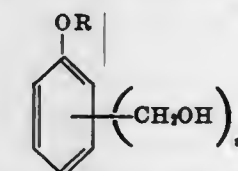
Erwin J. Kapalko and William H. English, Delaware, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.  
No Drawing. Continuation of abandoned application Ser. No. 748,953, July 31, 1968. This application Aug. 12, 1971, Ser. No. 171,380

Int. Cl. B01k 5/02; C23b 13/00

U.S. Cl. 204-181

7 Claims

Electrodepositable coating compositions having outstanding detergent resistance and other improved properties are provided by a combination of a vehicle resin which is a mixed partial ester of a resinous polyol containing free carboxyl groups, said polyol having a portion of its hydroxyl groups esterified with fatty acid and at least a portion of the remaining hydroxyl groups esterified with an unsaturated fatty acid alpha, beta-ethylenically unsaturated carboxylic acid anhydride adduct, said adduct forming the ester, then the anhydride ring of the adduct; and a methylolphenol ether composition of the formula:



where n is 1 to 3 and R is an unsaturated aliphatic group or a halogenated derivative of such a group. The properties of these coating compositions make them highly useful on appliances such as laundry equipment, particularly as primers.

3,730,866

# CATHOLYTE RINSE OF ELECTROCOAT

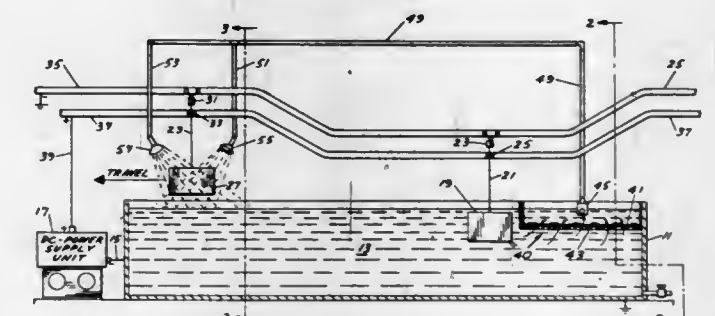
Leopold A. Madejczyk, Oak Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1969, Ser. No. 887,949

Int. Cl. B01d 13/02; B01k 5/02; C23b 13/00

U.S. Cl. 204-181

4 Claims



An improved method for electrodepositing paint upon an electrically conductive substrate from an aqueous dispersion of such paint is provided wherein catholyte liquid is separated from the coating bath and discharged upon an article which has been coated in and removed from such bath with such article positioned in a manner such that the liquid so discharged returns to the coating bath.

3,730,867

# RF SPUTTERING OF TETRAGONAL GERMANIUM DIOXIDE

Walter A. Albers, Jr., Northville, Carl E. Blell, Birmingham, and Don E. Swets, Sterling Heights, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 26, 1970, Ser. No. 83,779

Int. Cl. C23c 5/00

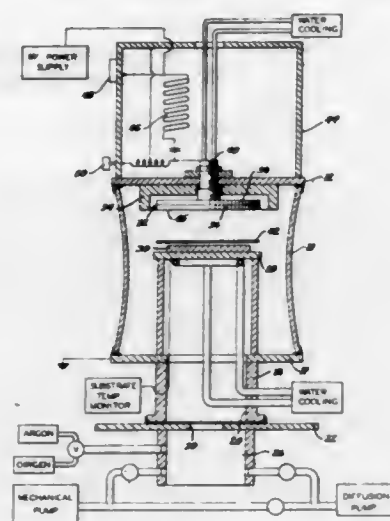
U.S. Cl. 204-192

4 Claims

Films of the non-naturally occurring, tetragonal, crystalline form of germanium dioxide are directly deposited



on any substrate in a controlled radio frequency sputtering process. The film is sputtered from a cooled tetragonal



germanium dioxide target onto a cooled substrate at a low rate in a non-reducing atmosphere.

3,730,868

## CARBON DIOXIDE SENSOR

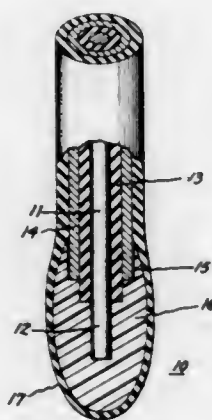
Leonard W. Niedrach, Schenectady, N.Y., assignor to General Electric Company

Filed Dec. 21, 1970, Ser. No. 100,126

Int. Cl. G01n 27/46

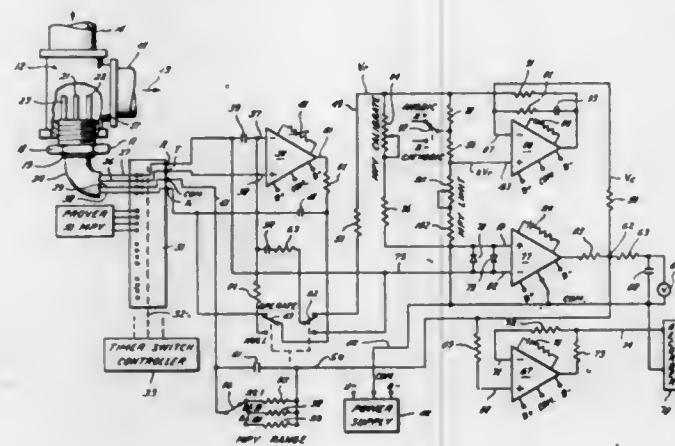
U.S. Cl. 204—195 P

3 Claims



A carbon dioxide sensor has an elongated flexible current collector with at least an exterior surface of gold or a noble metal on the current collector, an electrochemically active region of a quinone and a hydroquinone in electrical contact with a portion of the current collector, a second elongated flexible current collector surrounding at least partially the first current collector, a second electrochemically active region of silver and silver halide in electrical contact with the second current collector, a first layer of electrical insulation disposed between the first and second current collectors, a second layer of electrical insulation disposed over the second current collector, an anion exchange resin electrolyte contacting both electrochemically active regions, and an outer sheath of carbon dioxide permeable, ion-impermeable diffusion barrier material encapsulating at least the electrochemically active regions and the electrolyte.

3,730,869  
CORROSION RATEMETER  
Homer M. Wilson, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.  
Filed Feb. 16, 1971, Ser. No. 115,368  
The portion of the term of the patent subsequent to Oct. 26, 1988, has been disclaimed  
Int. Cl. G01n 27/46  
U.S. Cl. 204—195 C 14 Claims



A corrosion ratemeter with test (specimen), reference and third electrodes contactable by a corrodent. An input circuit connects the test and reference electrodes to an isolation amplifier. The amplifier provides in its output circuit an output current signal representative of the potential difference between the test and reference electrodes. A capacitance means in series with the input circuit is charged to the freely corroding potential representative of the potential difference between the test and reference electrodes during "null" operation. As a result, the input circuit applies a zero potential input signal to the isolation amplifier. A reference voltage signal is applied to the input circuit of the amplifier during "operate" conditions. The amplifier now provides, in its output circuit between the third and test electrodes, an output current signal of sufficient magnitude that the test electrode is polarized by a certain polarization potential (e.g., 10 millivolts). Readout means connected to the isolation amplifier measure the output current signal representative of this polarization potential, which output current signal is representative of the corrosion rate occurring at the test electrode. Voltage limiter means can provide the reference voltage signal to control the rate of change and magnitude of the output current signal.

3,730,870

## TOOL FOR ELECTROLYTICALLY HONING SPHERICAL SURFACES

Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

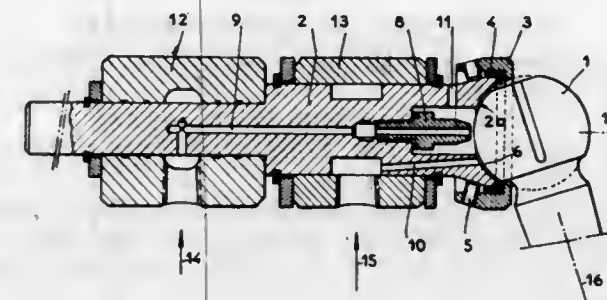
Filed June 29, 1971, Ser. No. 157,980

Claims priority, application France, July 3, 1970, 7024678

Int. Cl. B23p 1/10; C23b 5/72; B01k 3/00  
U.S. Cl. 204—224 3 Claims

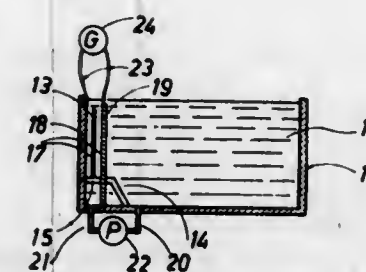
A tool for honing spherical surfaces by electrolytic action includes a concave spherical surface connected as one electrode whilst the spherical surface to be honed is connected as the other electrode. The spherical surface of the tool is encircled by a ring member faced with an

abrasive surface and the latter lies within the imaginary surface of the sphere. A sensing nozzle is disposed on the



common axis of the tool and spherical surface of the workpiece.

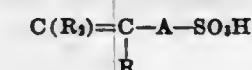
3,730,871  
APPARATUS FOR MODIFYING A PROPERTY OF AN ARTICLE BY DIFFUSION  
Maurice Boffe, Fleurus, Belgium, assignor to Glaverbel S.A., Watermael-Boitsfort, Belgium  
Continuation of abandoned application Ser. No. 722,379, Apr. 18, 1968. This application Apr. 8, 1971, Ser. No. 132,595  
Claims priority, application Luxembourg, Apr. 27, 1967, 53,530; Great Britain, Jan. 15, 1968, 2,167/68  
Int. Cl. C22d 3/02; C03c 15/00  
U.S. Cl. 204—245 10 Claims



In processes wherein at least one property of a glass, vitreous or stone material is improved by the diffusion of a substance into the material from a medium communicating with the material, a method and apparatus for substantially improving the diffusion process by preventing nonuniform changes in the liquid medium adjacent the surface being treated due to random currents in the rest of the medium.

3,730,872  
ELECTRIC CELLS  
Xavier Marze, Rhone, France, assignor to Rhone-Poulenc S.A., Paris, France  
No Drawing. Filed May 25, 1971, Ser. No. 146,827  
Claims priority, application France, May 27, 1970, 7019358  
Int. Cl. B01k 3/10 9 Claims

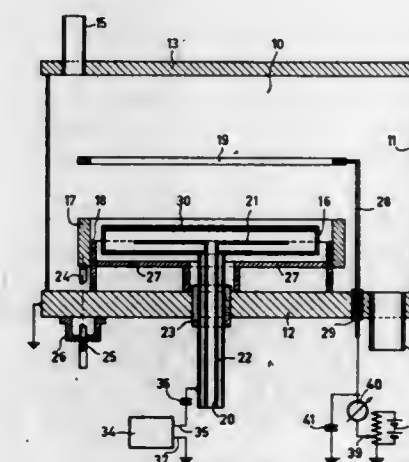
U.S. Cl. 204—252 9 Claims  
Electric cells are provided at least one partitioning membrane, at least one membrane consisting essentially of a copolymer derived from at least two, monomers, one of which is acrylonitrile and one of which is an olefinically unsaturated monomer containing a sulphonic acid group which may be salified, the latter monomer being present in an amount between about 0.4 and about 2 millimols per gram of copolymer and having the formula:



in which each R radical, which may be the same or different, represents hydrogen or an alkyl radical of up to 4 carbon atoms; and A represents:

- (i) a divalent wholly hydrocarbon group, the free valencies of which are carried by a wholly aliphatic, saturated or unsaturated, straight or branched chain radical or by an aromatic nucleus, or one of the free valencies of which is carried by an aliphatic carbon atom and the other free valency of which is carried by an aromatic carbon atom,
- or (ii) a  $-\text{O}-\text{A}'-$  or  $-\text{S}-\text{A}'-$  group, in which A' represents a group as defined under (i),
- or (iii) a divalent radical consisting of aliphatic and/or aromatic groups linked to one another by oxygen or sulphur atoms, the free valencies of which are carried by aliphatic and/or aromatic carbon atoms,
- or (iv) a group as defined under (i), (ii) or (iii) wherein one or more of the carbon atoms thereof is substituted.

3,730,873  
CATHODE SPUTTERING ETCHING DEVICE WITH MOVABLE GUARD RING  
Jean Pompei and Paul Gulochon, Evreux, France, assignors to U.S. Philips Corporation, New York, N.Y.  
Filed Mar. 18, 1971, Ser. No. 125,731  
Claims priority, application France, Mar. 18, 1970, 7009665  
Int. Cl. C23c 15/00  
U.S. Cl. 204—298 9 Claims

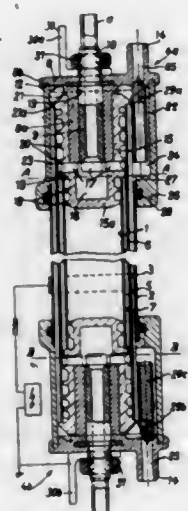


A device for engraving objects by cathodic sputtering including a cathode, which serves as the object holder, an anode, a vertically movable guard ring laterally surrounding the cathode, and an annular auxiliary electrode electrically insulated from the other electrodes and spaced from the cathode. A suitable potential is applied to the latter auxiliary electrode to correct ion trajectories and thereby improve engraving produced by ion bombardment of the object surface.

3,730,874  
TUBULAR-SHAPED OZONIZER POSSESSING COOLED INNER ELECTRODE  
Hannes Trüb, 95 Hoschgasse, 8008 Zurich, Switzerland  
Filed Nov. 22, 1971, Ser. No. 200,701  
Claims priority, application Switzerland, Dec. 1, 1970, 17,798/70  
Int. Cl. C01b 13/12 8 Claims  
U.S. Cl. 204—321 8 Claims  
A tubular-shaped ozonizer of the type equipped with a cooled inner electrode and a dielectric tube concentric



cally arranged between the inner electrode and an outer electrode. The tubular-shaped inner and outer electrodes and the dielectric electrode are held and maintained in spaced relationship from one another by electrically insulating closure cap members mounted at their ends. According to the invention, the space between the inner electrode and the outer electrode which is of substantially circular-shaped cross-sectional configuration is subdivided by the dielectric tube into an outer discharge



compartment and an inner cooling compartment. The discharge compartment and cooling compartment communicate by means of spaced hollow compartments of the closure caps with conduit connections provided at such closure caps for supplying the discharge compartment with air and the cooling compartment with a cooling fluid medium.

### 3,730,875 COMBINATION PROCESS FOR BLACK OIL CONVERSION

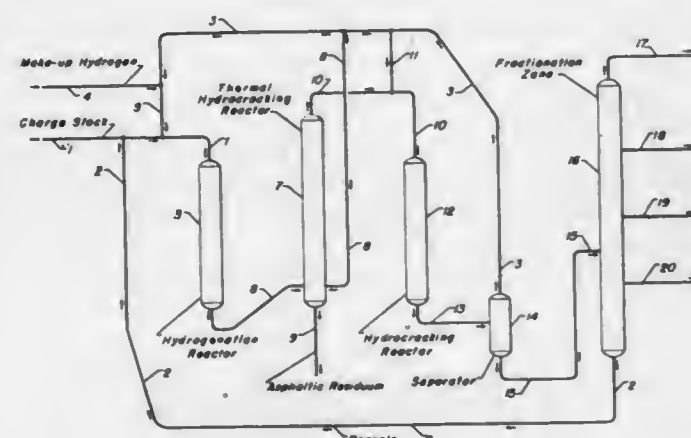
William K. T. Gleim, Island Lake, John G. Gatsis, Des Plaines, and Mark J. O'Hara, Prospect Heights, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 16, 1971, Ser. No. 115,352

Int. Cl. C10g 13/06, 23/02, 37/00

U.S. Cl. 208—57

7 Claims



A hydrocarbonaceous black oil is converted into lower-boiling hydrocarbon products in a combination process

involving catalytic hydrogenation, non-catalytic hydrogenative thermal cracking and catalytic hydrocracking.

### 3,730,876 PRODUCTION OF NAPHTHENIC OILS

Avilino Sequiera, Jr., Nederland, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 18, 1970, Ser. No. 99,644

Int. Cl. C10g 13/02, 37/04, 37/10; C01b 33/28

U.S. Cl. 208—59

12 Claims

Naphthenic oils are prepared by hydrocracking a petroleum residuum and catalytically dewaxing the lubricating oil so produced. The dewaxed oil is then subjected to solvent extraction or mild hydrogenation.

### 3,730,877 PROCESS FOR THE PREPARATION OF BASE OILS FOR THE PRODUCTION OF LUBRICATING OIL

Willem C. J. Quik and Pieter A. van Weeren, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Dec. 5, 1968, Ser. No. 781,628

Int. Cl. C10g 23/04

U.S. Cl. 208—143

4 Claims

High viscosity index lubricating base oils are prepared by treating paraffinic-naphthenic oils having a low aromatic content and a high content of naphthenes with condensed rings with hydrogen in the presence of platinum on alumina catalyst containing not more than 4% wt. of an alkali or alkaline earth metal at a hydrogen partial pressure above 10 kg./cm.<sup>2</sup> and a temperature of at least 345° C.

### 3,730,878 HYDROCARBON CONVERSION CATALYST

Ernest L. Pollitzer, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Mar. 4, 1971, Ser. No. 121,127

Int. Cl. C10g 23/02, 13/02

U.S. Cl. 208—143

9 Claims

A hydrocarbon conversion catalyst of discrete particles of (1) a porous, amorphous carrier material containing a Group VI-B metal component and (2) a porous, zeolitic carrier material containing a Group VIII metal component. Suitable for utilization in a multitude of hydroprocesses, wherein there is effected the chemical consumption of hydrogen, the principal advantage of the catalyst resides in its use for hydrotreating hydrocarbonaceous charge stocks.

### 3,730,879 TWO-BED CATALYST ARRANGEMENT FOR HYDRODESULFURIZATION OF CRUDE OIL

Robert D. Christman, Pittsburgh, George E. Elliott, Oakmont, and Guglielmo Guelfi, Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Nov. 19, 1970, Ser. No. 90,964

Int. Cl. C10g 23/02

U.S. Cl. 208—210

7 Claims

A two-bed hydrodesulfurization of crude oil or reduced crude oil containing the asphaltene fraction of the crude is carried out with catalytic particles of a Group VI and Group VIII metal supported on a non-cracking alumina. In the first bed at least 50% of the total pore volume of said catalyst has pores with radii in the 50–100 angstrom range; in the second bed less than 45% of the total pore volume of said catalyst has pores with radii in the 50–100 angstrom range. The higher percentage of pores in the first bed provides increased sulfur selectivity while the lesser percentage of pores in the second bed provides enhanced aging characteristic for the combined catalyst beds.

### 3,730,880 RESIDUAL OIL HYDRODESULFURIZATION PROCESS

Lambertus J. Van der Toorn, and Heinz Voetter, both of Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed Dec. 10, 1970, Ser. No. 96,920

Claims priority, application Great Britain, Dec. 12, 1969, 60,647/69

Int. Cl. C10g 23/02, 23/06

U.S. Cl. 208—213

10 Claims

Residual oils are desulfurized in a liquid phase over a fixed-bed hydrodesulfurization catalyst. The hydrogen required for the desulfurization is substantially completely dissolved in the oils under the prevailing reaction conditions and a large external product recycle (10:1 on fresh feed) is applied. Fresh catalyst is periodically introduced at the top of the reactor and spent catalyst is withdrawn at the bottom thereof. An apparatus for carrying out the process is also described.

### 3,730,881 WASTE WATER TREATMENT SYSTEM

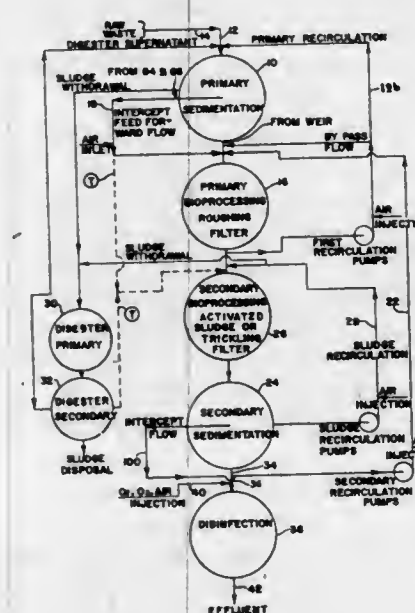
Edward T. Armstrong, 490 Pepperidge Tree Terrace, Butler, N.J. 07405

Continuation-in-part of application Ser. No. 813,382, Feb. 28, 1969, now Patent No. 3,549,528, dated Dec. 22, 1970, which is a continuation-in-part of abandoned application Ser. No. 362,118, Apr. 23, 1964. This application Dec. 21, 1970, Ser. No. 100,333

Int. Cl. C02c 1/08

U.S. Cl. 210—6

24 Claims



The invention represents a new concept in liquid processing particularly in sewage treatment utilizing air, oxygen or a carrier gas with ozone as an attenuator of anaerobic biota, for generalized disinfection, for aeration, or for oxygenation. Essentially, unique designs and/or processes are incorporated into the conventional settling tanks associated with sewage treatment, as well as in the bioprocesses, activated sludge or trickling filter operations. The structural improvements in settling reduce velocity, inhibit boundary layer separation and act to suppress mixing of the sewage to greatly enhance solid and fluid separation, while in the bioprocessing operations, the key is to improve efficiency of the liquid-gas exchange whereby much better oxygen contact is achieved. The liquid-gas exchange feature utilizes a high momentum exchange under turbulent flow conditions in a hydraulic pressure gradient to achieve intimate mixing of the desired gas in the fluid so as to achieve the desired very reliable and efficient liquid-gas exchange.

### 3,730,882 INTERNAL PRECIPITATION OF PHOSPHATE IN SETTLING ZONE

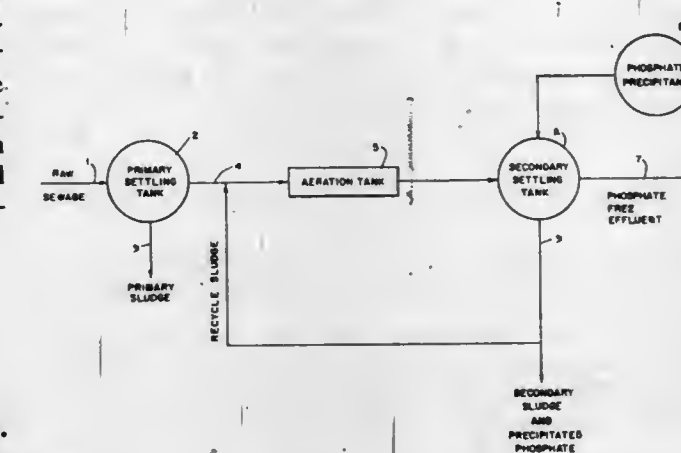
Gilbert V. Levin, Chevy Chase, and George J. Topol, Silver Spring, Md., assignors to Biospherics Incorporated, Rockville, Md.

Filed June 13, 1972, Ser. No. 262,190

Int. Cl. C02c 1/06

U.S. Cl. 210—6

6 Claims



There is disclosed an activated sludge sewage treatment process which comprises mixing influent sewage material with activated sludge to provide a mixed liquor. The mixed liquor is passed to an aeration zone wherein it is aerated to reduce the BOD content thereof and to cause the microorganisms present to take up phosphate. The mixed liquor is then passed to a settling zone containing an anaerobic layer of sludge. In the settling zone, phosphate-enriched sludge, in which the phosphate is present in the cells of the organisms, settles into the anaerobic layer of sludge and a substantially phosphate-free effluent is removed from above the layer of sludge. The sludge is maintained under anaerobic conditions in the sludge layer of the settling zone for a time sufficient to cause the organisms in the sludge to release phosphate to the liquid phase of the sludge. A phosphate precipitant is added to the sludge to precipitate the soluble phosphate in the phase thereof, resulting in a mixture of phosphate-depleted sludge and precipitated phosphate particles. This mixture is recycled for mixing with influent sewage material in the activated sludge sewage treatment process.

### 3,730,883 SEWAGE DISPOSAL METHOD

Louis Alfred Auguste Lefrancois, 24 Rue Barbet de Jouy, Paris, France

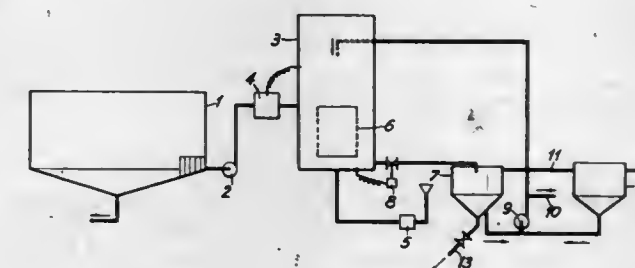
Filed Feb. 5, 1971, Ser. No. 112,901

Claims priority, application France, Feb. 13, 1970, 7005278; Jan. 15, 1971, 7101317

Int. Cl. C02c 1/06

U.S. Cl. 210—7

17 Claims



In the treatment of waste waters, or sewage disposal process, according to the activated sludge and aerobic fermentation treatment method, the water to be cleaned is introduced continuously into a fermentation apparatus



with a constant output while blowing air continuously into this apparatus in order to keep throughout the liquid mass a substantial homogeneity of the liquid, solid and gaseous phases and ensure a maximum dispersion of the microorganisms, under constant medium conditions, air being blown into the apparatus for transforming the liquid mass into a constant volume of expanded liquid, notwithstanding variations in the liquid composition, the content of living microorganisms in the mass being increased by the addition of similar organic substances up to a predetermined rate kept to a constant value, the liquid more or less loaded with organic substances such as activated sludge being removed from the apparatus in order to keep therein a constant mass of treated liquid.

3,730,884

# METHOD AND APPARATUS FOR CONVEYING SEWAGE

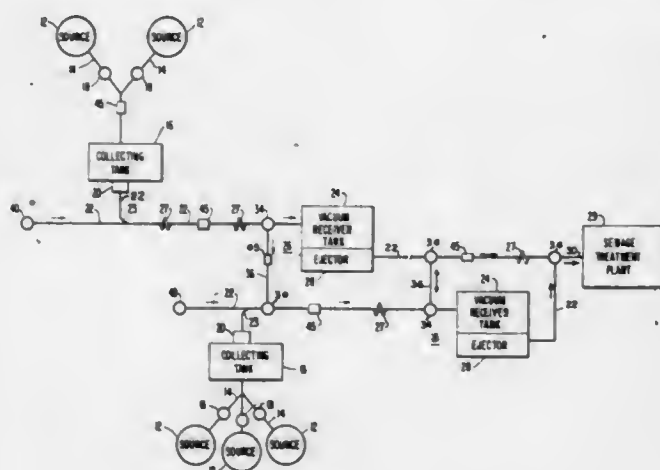
Bland Calvin Burns, P.O. Box 254, Woodbridge, Va. 22191, and Hans C. Albertsen, 105 Spring Valley Drive, Annapolis, Md. 21403

Continuation of application Ser. No. 16,734, Mar. 5, 1970, which is a continuation-in-part of application Ser. No. 767,626, Oct. 15, 1968, both now abandoned. This application Apr. 2, 1971, Ser. No. 130,791

Int. Cl. C02c 1/00

U.S. Cl. 210—15

48 Claims



A method and apparatus for conveying sewage from sewage sources such as residences to a remote location, the sewage initially being conveyed by gravity flow from the source into a collecting tank and thereafter by vacuum induced plug flow to a vacuum receiver tank at the remote location. The sewage may thereafter be discharged from the remote location, preferably under positive pressure, into another line such as a vacuum line for further vacuum induced plug flow or a gravity flow conduit. The final location to which the sewage is conveyed may be the sewage treatment facility. Substances for treating the sewage may be advantageously introduced into the system and mixed with the sewage during conveyance. Self-scouring tanks, rotation imparting plug reformers, and several alternative ways of introducing controlled amounts of air at or above atmospheric pressure into the vacuum portion of the system are provided.

3,730,885

# ELECTROCHEMICAL CONTROL OF ADSORPTION AND DESORPTION WITH ACTIVATED CARBON

Alkis C. Makrides, Newton, and Samuel B. Brummer, Wayland, Mass., assignors to Tyco Laboratories, Inc., Waltham, Mass.

Filed Jan. 21, 1971, Ser. No. 108,267

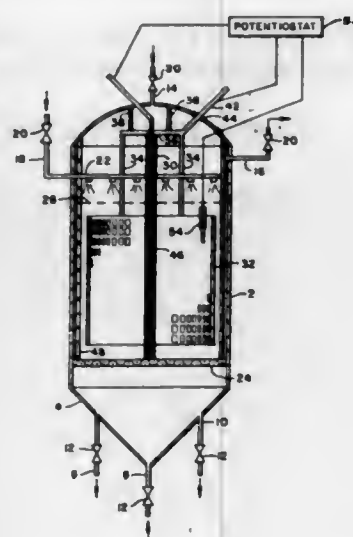
Int. Cl. B01d 15/06; C02b 1/14

U.S. Cl. 210—30

4 Claims

Method and apparatus for controlling the adsorption-desorption behavior of activated carbon. Adsorption and

desorption are controlled by controlling the potential at the interface between the carbon and the solution con-



3,730,886

# METHOD OF PURIFYING WATER

Sten Harald Ahrlund, Lund, Bengt Göran Fredrik Carlsson, Nyköping, and Jarl Sören Lindhe, Tystberga, Sweden, assignors to Aktiebolaget Atomenergi, Stockholm, Sweden

No Drawing. Filed Apr. 26, 1971, Ser. No. 137,690

Int. Cl. B01d 15/04

U.S. Cl. 210—37

2 Claims

Feed water for a boiler, and coolant water for a nuclear reactor, must be of a very high purity. Such a pure water can be produced by treating the feed water with zirconium phosphate and zirconium hydroxide. The zirconium phosphate should be in the form of crystals, the majority of which have a size of from 100 x 200 to 1000 x 2000 angstrom units. The zirconium hydroxide shall be neutral, i.e. release neither acid nor alkaline compounds. This can be achieved by precipitating the hydroxide with ammonia, and treating the precipitated hydroxide with ammonia.

3,730,887

# GRANULATING METHOD AND APPARATUS

Hidetomo Suzuki, Hidenobu Arimitsu, and Shigemasa Tanaka, Tokyo, Japan, assignors to Ebara Inflico, Kabushiki Kaisha, Tokyo-to, Japan

Continuation of abandoned application Ser. No. 843,436, July 22, 1969. This application July 14, 1971, Ser. No. 162,700

Claims priority, application Japan, Aug. 26, 1968, 43/73,461

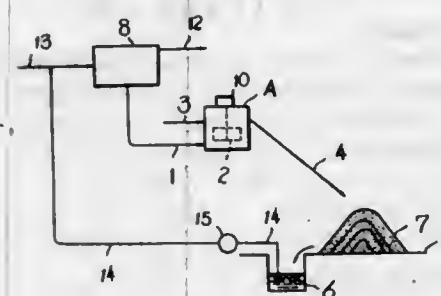
Int. Cl. B01d 21/10; C02b 1/20

U.S. Cl. 210—45

7 Claims

The present invention proposes a granulating method and apparatus for shaping suspended solids in solution into granular solids. There is provided a solid-liquid separating tank into which a suspension containing suspensoid materials is introduced and separated into solid and liquid. Said tank is arranged such as not to form any obstacle in its interior and comprises inlet ports provided at a lower part of the tank for introducing, respectively, a suspension liquid and a high molecular compound into the tank, an outlet port provided at an upper part of the tank for discharging the liquid in the tank, and a swirling flow generating means adapted to produce a swirling flow in the liquid in said tank. It is essentially required to produce a swirling flow without forming a turbulent flow

in the liquid within the tank. This swirling flow is of different nature from a so-called agitation mixture flow. The tank is free of any obstacle which may disturb the swirling flow and has a configuration best suited for forming



such swirling flow. Arrangement is also made such that the suspension flows swirlingly with the high molecular compound material and is flown out in the form of slurry from the outlet provided at an upper part of the tank.

3,730,888

# METHOD OF FLOCCULATING WITH TERTIARY AMINOHYDROXYALKYL ESTERS OF CARBOXYLIC ACID POLYMERS

John D. Buckman, Fred W. Rath, Pamela P. Boggs, and Robert L. Donerson, Memphis, Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

No Drawing. Filed Apr. 19, 1971, Ser. No. 135,459

Int. Cl. C02b 1/20

U.S. Cl. 210—52

16 Claims

High molecular weight, water-soluble tertiary amino-hydroxyalkyl esters of carboxylic acid polymers prepared by reacting a glycidyl tertiary amine with a carboxylic acid polymer are useful flocculants.

3,730,889

# FIRE-RESISTANT FUNCTIONAL FLUID COMPOSITIONS

Robert S. McCord, Pacific Palisades, Donald H. Nail, Los Angeles, and Martin B. Sheratte, Reseda, Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

No Drawing. Filed May 3, 1971, Ser. No. 139,869

Int. Cl. C09k 3/00

U.S. Cl. 252—78

26 Claims

Production of functional fluids, particularly aircraft hydraulic fluids, of improved fire resistance, comprising a functional fluid base stock, such as a phosphate ester, e.g., tri-n-butyl phosphate, or mixtures of such base stocks, and a small amount of a diseleno alkane compound, e.g., 3,8-diseleno-n-decane.

3,730,890

# FIRE RETARDANT COMPOSITION AND METHOD OF PRODUCTION

Kenneth E. Nelson, Phoenix, Ariz., assignor to Early California Industries Inc.

Continuation of abandoned application Ser. No. 36,064, May 11, 1970. This application Dec. 3, 1971, Ser. No. 204,724

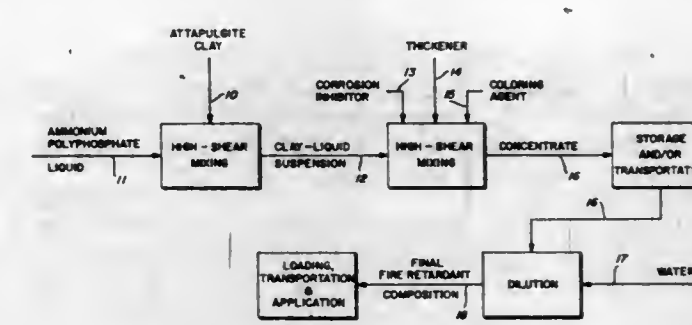
Int. Cl. A62c 3/02; A62d 1/00

U.S. Cl. 252—7

1 Claim

Attapulgite clay is suspended in liquid ammonium polyphosphate to form a concentrate. Various components such as corrosion inhibitors, gum thickeners and coloring agents which are insoluble in the polyphosphate liquid are carried and maintained in suspension by the attapulgite clay. Upon dilution of the concentrate with water as required to produce a retardant composition with

the desired viscosity, the components are uniformly dispersed and/or dissolved in the final fire-retardant com-



position. The composition is adapted for both aerial and ground application.

3,730,891

# INTUMESCENT COMPOSITION, FOAMED PRODUCT PREPARED THEREWITH, AND PROCESS FOR MAKING SAME

Salvatore R. Riccitiello, 1950 Montemar Way, San Jose, Calif. 95125, and John A. Parker, 22938 McClure Lane, Los Altos, Calif. 94022

No Drawing. Filed May 6, 1971, Ser. No. 140,946

Int. Cl. C09k 3/28

U.S. Cl. 252—8.1

8 Claims

An intumescent composition and the foamed product prepared by heating the composition are provided wherein the composition comprises the reaction product of para-benzoquinone dioxime and a concentrated mineral acid such as sulfuric acid, phosphoric acid, and polyphosphoric acid. The composition is useful as an intumescent agent either by itself or when combined with other materials. A fire-resistant and heat-insulating composition is provided by heating the intumescent composition above its intumescent temperature.

3,730,892

# PRODUCTION OF POLYESTERS

Robert Moore Marshall, Chester, and Kimon Constantine Dardoufas, Richmond, Va., assignors to Allied Chemical Corporation, New York, N.Y.

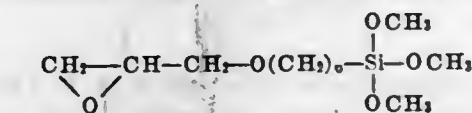
No Drawing. Filed Mar. 22, 1971, Ser. No. 126,963

Int. Cl. D06m 13/38

U.S. Cl. 252—8.75

9 Claims

An improved multifilament polyethylene terephthalate yarn and process for producing said yarn, said yarn being combined with a compatible fiber finish composition of hexadecyl (isocetyl) stearate, coconut oil or mineral oil; glycerol monooleate; decaglycerol tetraoleate; polyoxyethylene tall oil fatty acid; sulfonated glycerol trioleate; polyoxyethylene tallow amine; 4,4'-thiobis (6-tert-butyl-m-cresol); and a silane having the structural formula



wherein  $n=2$  to 5.

3,730,893

# SOLID LUBRICANTS AND METHOD

Norman Bilow, Los Angeles, and John R. Jones, Pacific Palisades, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 3, 1968, Ser. No. 756,799

The portion of the term of the patent subsequent to Feb. 1, 1989, has been disclaimed

Int. Cl. C10m 7/28, 7/04

U.S. Cl. 252—12.4

12 Claims

Improved thermosetting bonded solid lubricants comprising essentially a polymer resin of over 90% carbon



and preferably polyphenylene polymers of at least about 94% carbon bonding of solid lubricant particulates, compositions therefor and method.

3,730,894

## PROCESS FOR INHIBITING FOAMING

Israel J. Heilwell, Princeton, and Richard I. Leavitt, Pennington, N.J., assignors to Mobil Oil Corporation  
No Drawing. Filed Sept. 8, 1969, Ser. No. 856,198  
Int. Cl. C10m 1/50, 1/28, 1/06

U.S. Cl. 252—16 10 Claims  
This specification discloses inhibition of foaming in a liquid system containing water and a hydrocarbon. Inhibition is effected by the presence in the system of particles of a solid, insoluble material. These particles have a surface area of less than 50 square meters per gram and a portion of their surfaces is occupied by polar sites. Representative solid materials are poly-2,8-dimethyl-1,4-phenylene oxide, a copolymer of 2,6-dimethyl phenol and 2-methyl-1,6-tetradecyl phenol wherein the proportion of the latter compound does not exceed about 20 percent by weight of the copolymer, a copolymer of vinyl stearate and maleic anhydride, sublimed sulfur, silicon carbide, and polytetrafluoroethylene comminuted under cryogenic conditions.

3,730,895

## CORROSION INHIBITING COMPOSITIONS

Manley Kjonas, Hammond, Ind., assignor to Atlantic Richfield Company, New York, N.Y.  
No Drawing. Filed Oct. 21, 1970, Ser. No. 82,800  
Int. Cl. C10m 5/22, 5/14

U.S. Cl. 252—18 32 Claims  
Greases thickened with conventional grease thickeners and containing a cloudy-type overbased alkali metal or alkaline earth metal sulfonate or carboxylate dispersant and a water-soluble corrosion inhibiting salt.  
Corrosion inhibiting concentrates are also set forth which comprise lubricating oil, cloudy-type over-based dispersants, and water-soluble corrosion inhibiting salts.

3,730,896

## LOW TEMPERATURE GREASES

William P. Scott and Warren W. Woods, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.  
No Drawing. Continuation-in-part of application Ser. No. 860,091, Sept. 22, 1969. This application Sept. 10, 1971, Ser. No. 179,562  
Int. Cl. C10m 7/30, 7/20

U.S. Cl. 252—28 10 Claims  
Di-n-alkylbenzene oils thickened with clays or metal soaps. The greases may also contain the rust-inhibiting combination of lead naphthenate, didodecyl dimethyl quaternary ammonium nitrite, or nitrate, and a fatty imidazoline alkyl diamine dicaprylate.

3,730,897

## FIRE-RESISTANT FUNCTIONAL FLUIDS

Robert S. McCord, Pacific Palisades, Donald H. Nail, Los Angeles, and Martin B. Sheratte, Reseda, Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.  
No Drawing. Filed Mar. 29, 1971, Ser. No. 129,268  
Int. Cl. C09k 3/00

U.S. Cl. 252—78 25 Claims  
Production of functional fluids, particularly aircraft hydraulic fluids, of improved fire resistance, comprising a functional fluid base stock, such as a phosphate ester, e.g., di-n-butyl phenyl phosphate, or mixtures of such base stocks, and a small amount of an aryl selenide compound, preferably a chlorinated aryl selenide, e.g., ethyl p-chloro phenyl selenide.

3,730,898  
FUNCTIONAL FLUID COMPOSITIONS OF INCREASED FIRE RESISTANCE

Robert S. McCord, Pacific Palisades, Donald H. Nail, Los Angeles, and Martin B. Sheratte, Reseda, Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.  
No Drawing. Filed June 21, 1971, Ser. No. 155,267  
Int. Cl. C09k 3/00

U.S. Cl. 252—78 35 Claims  
Production of functional fluids, particularly aircraft hydraulic fluids, of improved fire resistance, comprising a functional fluid base stock, such as a phosphate ester, e.g., tri-n-butyl phosphate, or mixtures of such base stocks, and a small amount of a selenophene or tellurophene compound, preferably a chlorinated selenophene or a chlorinated tellurophene, e.g., tetrachloroselenophene or tetrachlorotellurophene.

3,730,899

## POWDERLESS ETCHING BATH ADDITIVE

Harold J. Messerschmidt, Jr., Box 8M, R.D. 1, Stockholm, N.J.; Karl Heyman, 10 Crestmont Road, Montclair, N.J.; and Bernadou W. Johnsen II, 110 E. 23rd St., Apt. 3, Paterson, N.J.  
No Drawing. Filed Sept. 24, 1971, Ser. No. 183,660  
Int. Cl. B44n 3/02; C23g 1/26

U.S. Cl. 156—14 12 Claims  
Etching bath for zinc and magnesium and alloys based thereon comprising an aqueous solution containing an etching amount of nitric acid, and a water-soluble or dispersible, anionic, aliphatic carboxylic acid containing at least one hydrophobic hydrocarbon group with about 8 to 24 carbon atoms and having a sulfonate group depending from a carbon atom in said hydrocarbon group.

3,730,900

## COMPOSITION AND PROCESS FOR DRILLING SUBTERRANEAN WELLS

Alphonse C. Perricone and Homer F. Young, Houston, Tex., assignors to Milchem Incorporated, Houston, Tex.  
No Drawing. Continuation-in-part of application Ser. No. 126,907, Mar. 22, 1971. This application Sept. 25, 1972, Ser. No. 291,778  
Int. Cl. C10m 3/34

U.S. Cl. 252—8.5 C 4 Claims  
A composition, additive, and process for the drilling of subterranean wells utilizing a low molecular weight styrene sulfonic acid-maleic anhydride copolymer as a colloidal stabilizer for aqueous drilling fluids. The composition, additive, and process are particularly effective when drilling under extremely high temperature and pressure environments.

3,730,901

## COMPOSITION AND METHOD FOR REMOVING COPPER CONTAINING IRON OXIDE SCALES FROM FERROUS METALS

John A. Knox, John A. Smith, and Roy F. Stout, deceased, by Richard E. Dixon, executor, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.  
No Drawing. Continuation-in-part of applications Ser. No. 56,987, July 6, 1970, and Ser. No. 138,410, Apr. 29, 1971, both now abandoned, and a division of application Ser. No. 248,136, Apr. 27, 1972. This application Apr. 27, 1972, Ser. No. 248,227  
Int. Cl. C23g 1/04, 1/08

U.S. Cl. 252—87 8 Claims  
A method of and composition for removing copper and iron oxide containing incrustations from a ferrous metal surface so as to prevent or at least impede the formation of a curdy adhesive precipitate and utilize low ratios of copper complexor-to-copper.

A surface sought to be cleaned is contacted with an aqueous acid solution comprising a composite copper

complexor composed of (i) hexahydropyrimidine-2-thione present as a first copper complexor in a concentration of from about 80% to about 20% by weight of the mixed complexor, and (ii) thiourea present as a second copper complexor in a concentration of from about 20% to about 80% by weight of the composite complexor. The composite copper complexor is present in solution in a weight ratio of at least about 4:1 relative to the copper sought to be removed. The solution also includes an acid, selected from the group consisting of hydrochloric, sulfuric, sulfamic and phosphoric acids, and present in a concentration of from about 3% to about 30% by weight.

3,730,902

## SCOURING AGENTS WITH A BLEACHING AND DISINFECTING ACTION

Karlheinz Disch, Hilden, Peter Krings, Krefeld, Dieter Kühlung, Monheim, Horst Bellinger, Düsseldorf, and Johannes Jürgen Perner, Neustadt, Germany, assignors to Henkel & Cie GmbH, Düsseldorf, Germany  
No Drawing. Filed Sept. 29, 1970, Ser. No. 76,612  
Claims priority, application Germany, Oct. 1, 1969, P 19 49 561.5

The portion of the term of the patent subsequent to Dec. 28, 1988, has been disclaimed  
Int. Cl. C11d 7/54

U.S. Cl. 252—99 9 Claims  
Scouring agents having a bleaching and disinfecting action comprising a major amount of water-insoluble scouring components and a minor amount of essentially water-soluble components including a solid water-soluble per-compound and an effective amount of acylated activator compounds wherein the acyl is selected from the group consisting of alkanoyl having 2 to 4 carbon atoms, benzoyl and substituted benzoyl, said acylated compounds are selected from the group consisting of N-acyl compounds, O-acyl compounds, carbonic acid esters and pyrocarbonic acid esters.

3,730,903

## WETTING AGENTS FOR ALKALINE BATHS

Franz Landauer, Frankfurt am Main, Claus Beermann, Neu-Isenburg, Martin Reuter, Kroneberg, Taunus, Karl Heinz Lebkücher, Hofheim, Taunus, and Hubert Kiesel, Schwalbach, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany  
No Drawing. Continuation-in-part of application Ser. No. 701,119, Jan. 29, 1968. This application Dec. 17, 1970, Ser. No. 99,264  
Claims priority, application Germany, Feb. 2, 1967, F 51,418  
Int. Cl. C11d 7/12

U.S. Cl. 252—156 2 Claims  
Detergent mixtures consisting of: (a) an alkylsulfonic acid containing a sulfonic acid group per 7 carbon atoms at most, (b) a low-molecular oxalkylation product of a lower alkyl amine, and (c) a phosphate of alkanols of 4 to 8 carbon atoms are useful as surface active agents for alkaline baths.

3,730,904

## HALOGENATED HYDROCARBON COMPOSITIONS AND USES THEREOF

John Joseph Clementson and Peter Graham Johnson, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England  
No Drawing. Filed Apr. 17, 1970, Ser. No. 29,697  
Claims priority, application Great Britain, Apr. 29, 1969, 21,814/69  
Int. Cl. C09d 9/04; C11d 7/52; C23g 5/02

U.S. Cl. 252—171 13 Claims  
A composition comprising a chlorohydrocarbon or bromohydrocarbon solvent and a sodium, ammonium or

amine salt of the monosulphonic acid derivative of a diester of a succinic acid in an amount of at least 0.5% by weight of the composition.

3,730,905

## METHOD OF ENVELOPING THE PARTICLES OF A DISPERSED PHASE

Gotz Koerner, Essen, and Gerd Rossmay, Essen-Werden, Germany, assignors to Th. Goldschmidt AG, Essen, Germany

No Drawing. Continuation of abandoned application Ser. No. 796,932, Feb. 5, 1969. This application June 4, 1971, Ser. No. 150,227  
Int. Cl. B01j 13/02; B44d 1/02

U.S. Cl. 252—316 10 Claims

Process of enveloping the particles of a phase dispersed in water by forming a boundary layer—capable of stabilization—around the particles. During or after the preparation of the dispersion, emulsifiers containing at least one hydrophilizing group and at least one silyl group having at least one hydrolyzable group attached to the silicon atom of the silyl group, are added, whereupon the hydrolyzable groups are hydrolyzed and the silanols thus formed are condensed. If only a single hydrolyzable group is present, the dispersion is enriched by a silane containing hydrolyzable groups. The hydrophilizing group is selected from the group consisting of polyethylene oxide units, quaternary ammonium salt groups and amino salt groups of sulfuric acid esters in which the sulfuric acid ester group is linked to a silicon atom of the siloxane structure through carbon. The hydrolyzable groups are halogen, acyloxy, alkoxy,  $\equiv\text{Si}-\text{N}=\text{}$ ,  
 $\equiv\text{Si}-\text{O}-\text{N}=\text{}$   
or  
 $\equiv\text{Si}-\text{O}-\text{C}(=\text{O})-\text{O}-$

or

wherein the free valences at N and O are satisfied by hydrocarbon.

3,730,906

## CRUDE OIL DEMULSIFIERS

Knut Oppenlaender, Ludwigshafen, Gert Liebold, Mannheim, and Egon Buettner, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany  
No Drawing. Filed Mar. 15, 1971, Ser. No. 124,574  
Claims priority, application Germany, Mar. 23, 1970, P 20 13 823.2  
Int. Cl. B01d 17/04

U.S. Cl. 252—342 7 Claims  
Crude oil demulsifiers based on esterification products of rosin with oxyalkylated alkylphenol/formaldehyde resins and their use for breaking crude oil emulsions at ambient temperatures.

3,730,907

## PROCESS OF PRODUCTION OF DEFOAMER COMPOSITIONS

Hugh J. S. Shane, John E. Schill, and John W. Lilley, Guelph, Ontario, Canada, assignors to Hart Chemical Limited, Guelph, Ontario, Canada  
No Drawing. Filed Dec. 21, 1971, Ser. No. 210,547  
Int. Cl. B01d 17/00

U.S. Cl. 252—358 17 Claims  
A defoamer composition is prepared by a series of steps including forming a mixture of an aliphatic diamide and a low viscosity mineral oil in which the aliphatic diamide



has a particular size of from 4 to 7 on the Hegman scale, and ageing the mixture at an elevated temperature and over an extended period of time while agitating the mixture.

3,730,908

# AMINE CURING AGENTS FOR POLYEPOXIDE COMPOSITIONS

James R. Harvey, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Original application June 22, 1970, Ser. No. 48,471. Divided and this application Aug. 9, 1971, Ser. No. 170,303

Int. Cl. C08g 30/14

U.S. Cl. 252—426

17 Claims

This invention relates to mixtures of a polyglycol polyamine and an alkylene polyamine, which when added to polyepoxides provide compositions which are useful in coating, casting or filament winding applications to form articles of desired shape, which when cured to infusible products, are characterized by excellent flexibility and toughness and by excellent surface characteristics.

3,730,909

# HYDRAZINE DECOMPOSITION CATALYST

Warren E. Armstrong, Lafayette, and Hervey H. Voge, Berkeley, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Apr. 5, 1966, Ser. No. 540,413

Int. Cl. B01j 11/82

U.S. Cl. 252—434

5 Claims

Improved catalysts for the decomposition of hydrazine and lower alkyl-substituted hydrazines comprise a platinum group metal catalyst in combination with a solid oxidizer hypergolic on a porous, inorganic solid support.

3,730,910

# NOVEL ZEOLITE SURFACES

Edwin W. Albers, Annapolis, and Grant C. Edwards, Silver Spring, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed Feb. 11, 1971, Ser. No. 114,737

Int. Cl. B01j 11/40

U.S. Cl. 252—455 Z

27 Claims

Aluminosilicates, and particularly those of the zeolite class, are formed on substrate surfaces. These substrate surfaces include those of fibers, pills, extrusions, pellets or those on bulk structures such as laminates, composites, rods, bricks, tubes, tiles, blocks, honeycomb structures, monoliths and so on. The shape and structure can be of essentially any variation. Suitable substrate surfaces are those of inorganic oxides which include glasses, silicas, aluminas, aluminosilicates, germanias, zirconias, magnesia, titanias, and mixtures and combinations of these materials. The process of forming aluminosilicates on these surfaces comprises either (i), contacting the substrate surface with an aluminosilicate, (ii), contacting the substrate surface with an alkaline sodium silicate-sodium aluminate aluminosilicate or zeolite yielding mixture, or (iii), contacting the substrate surface with a silicate or aluminate solution of a composition sufficient to produce a particular aluminosilicate with components on the surface of the substrate. This surface aluminosilicate or zeolite produced can then be ion exchanged or impregnated with any desired elements or chemicals for catalytic or ad-

sorption uses, or otherwise utilized for its novel surface features in composites or other structures.

3,730,911

# HEATING ELEMENT COMPRISING LANTHANUM CHROMITE AND OXIDATION-RESISTANT SILICON COMPOUND

Gérard Aubin, Evreux, and David Yerouchalmi, Le Mesnil Saint-Denis, France, assignors to Commissariat à l'Energie Atomique, Paris, France

No Drawing. Filed Oct. 4, 1971, Ser. No. 186,425

Claims priority, application France, Oct. 5, 1970, 7035867

Int. Cl. H01b 1/06

U.S. Cl. 252—516

1 Claim

A heating element which is electrically conductive from room temperature to at least 2000° C. in an oxidizing atmosphere and over a long period of time, the element being formed from a lanthanide chromite which is combined with a variable proportion of an oxidation-resistant silicon compound.

3,730,912

# TERNARY FOAM CONTROL SYSTEMS AND DETERGENT COMPOSITIONS CONTAINING SAME

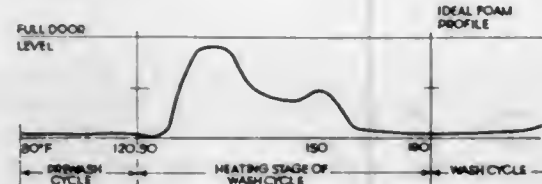
Jack Thomas Inamorato, Westfield, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of application Ser. No. 41,359, May 28, 1970. This application May 28, 1970, Ser. No. 41,358

Int. Cl. B01d 19/04; C11d 1/52, 1/62

U.S. Cl. 252—528

35 Claims



A detergent composition having an inverse foam to temperature relationship is disclosed, as well as a ternary composition for accomplishing this relationship when added to a detergent system. The inverse foam to temperature relationship is provided by a synergistic mixture of a fatty acid, a polyethoxylated quaternary ammonium salt, and a high molecular weight amide or a primary, secondary or tertiary amine.

3,730,913

# SYNTHETIC DETERGENT COMPOSITIONS

Yoichi Oba, Hachioji, Chiharu Kato, Tokorozawa, Teruo Tsunoda, Tokyo, and Shun Fujiki and Hajime Tsukuni, Hitachi, Japan, assignors to Hitachi, Ltd., and Hitachi Chemical Company, Ltd., both of Tokyo, Japan

No Drawing. Filed Feb. 2, 1971, Ser. No. 112,060

Claims priority, application Japan, Feb. 2, 1970, 45/8,460

Int. Cl. C11d 1/12, 3/26, 7/32

U.S. Cl. 252—541

9 Claims

Detergent compositions comprising an anionic or non-ionic surface active agent and a water-soluble salt of a copolymer of 3a,4,5,6,7,7a-hexahydro-4,7-methanoindene and maleic anhydride as a builder.

3,730,914

# MIXED ALUMINUM SILICON COATINGS COMPOSITIONS

James Patrick Dowd, % Napco Corporation, 5300 Sunrise St., Houston, Tex. 77021

No Drawing. Continuation-in-part of abandoned application Ser. No. 13,859, Feb. 24, 1970. This application Sept. 17, 1971, Ser. No. 181,578

Int. Cl. C08g 31/04

U.S. Cl. 260—2 S

3 Claims

Stable polymers are formed when alkoxy aluminum chelates are heated with alkyl alkoxy silicon derivatives. The hard resinous materials thus produced are soluble in a wide variety of organic solvents.

These polymers are particularly useful as binders for metallic pigmented coatings.

3,730,915

# BI-2-OXAZOLINE AND OXAZINE COMPOUNDS DERIVED FROM CYANOETHYLATED POLY(ETHYLENE AND PROPYLENE) GLYCOLS

Donald A. Tomalia and David P. Sheetz, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

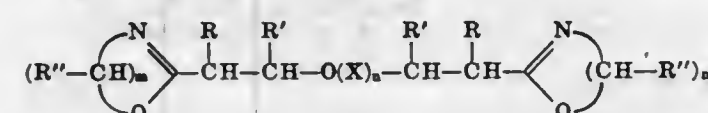
No Drawing. Application Mar. 29, 1971, Ser. No. 129,262, which is a continuation-in-part of abandoned application Ser. No. 835,910, June 19, 1969. Divided and this application Feb. 8, 1972, Ser. No. 224,587

Int. Cl. C08g 30/14

U.S. Cl. 260—2 N

1 Claim

Bi-2-oxazoline and oxazine compositions derived from cyanoethylated poly(ethylene and propylene) glycols and having the formula:



where R, R', and R'' can be H or alkyl containing from 1 to 4 carbon atoms, where X is (C<sub>2</sub>H<sub>4</sub>O) or (C<sub>3</sub>H<sub>6</sub>O), where n is a value from 1 to 50 inclusive and where m is 2 or 3.

3,730,916

# PROCESS OF TREATING MICROCELLULAR POLYMERIC STAPLE FIBERS TO RENDER THEM POSTINFILATABLE

Arthur William Etchells III, Philadelphia, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed July 13, 1971, Ser. No. 162,281

Int. Cl. C08j 1/26

U.S. Cl. 260—2.5 N

6 Claims

An improved process is provided for introducing impermeant inflant into the cells of a closed-cell polymeric foamed structure. Prior-art processes include treatment of the structure with (1) "plasticizing" liquid, which plasticizes the cell walls to permit fluids to diffuse into the cells, (2) "boosting" liquid containing impermeant inflant, which diffuses into the cells while the walls are plasticized, but normally does not permeate the cells when the walls are not plasticized, and (3) "stripping" liquid, which removes the plasticizing liquid, deplasticizes the cell walls and traps impermeant inflant within the cells. Fibers so treated become fully inflated when exposed to air. The improvement in this process comprises treating the foamed structure with plasticizing and boosting liquids that are dispersed and/or dissolved in water at concentrations below 10%, and preferably below about 3%.

3,730,917

# SELF-EXTINGUISHING POLYURETHANE FOAM COMPOSITE AND BINDER COMPOSITION THEREFOR

Robert G. Hesskamp, St. Louis, Mo., assignor to M R Plastics and Coatings, Inc., Maryland Heights, Mo.

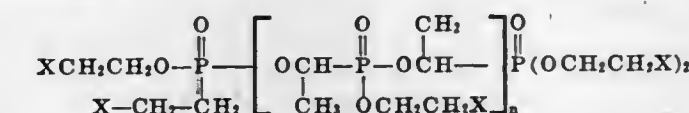
No Drawing. Filed July 31, 1970, Ser. No. 60,098

Int. Cl. C08g 22/44, 51/30, 51/58

U.S. Cl. 260—2.5 AK

7 Claims

A self-extinguishing flexible composite material useful as carpet padding, for example, is prepared by binding together particulate polyurethane foam material using a fire retardant binder composition comprising an isocyanate compound, a urethane prepolymer consisting of the reaction product of an isocyanate compound with a polyether polyol, and a fire retardant represented by the formula:



where X is chlorine or bromine and n is an integer between 0 and 6, inclusive. Methods of preparing the self-extinguishing composite are described. By use of optimum amounts of the fire retardant, increased tensile strength is also imparted to the composite.

3,730,918

# MICROPOROUS PARTICULATE THERMOPLASTIC POLYMER COMPOSITION

John Teti, Wilmington, Del., and Jerome Carlton Violette, Freehold, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 10, 1971, Ser. No. 151,648

Int. Cl. C08j 1/26

U.S. Cl. 260—2.5 M

14 Claims

A microporous particulate thermoplastic polymer composition is prepared by mixing a thermoplastic polymer composition with hexafluoroisopropanol, contacting the mixture in a stream with a stream of steam whereby hexafluoroisopropanol is substantially instantly evaporated and the polymer composition is obtained as microporous particulate polymer composition. The polymer composition may be a thermoplastic polymer, a mixture of thermoplastic polymers, or thermoplastic polymer containing additives such as colorant composition, lubricants, plasticizers, stabilizers, etc. The microporous particulate polymer compositions are useful in compounding with additional polymer and in forming shaped polymer articles.

3,730,919

# PROCESS FOR PRODUCTION OF RIGID SELF-SKINNING POLYURETHANE FOAM

James M. McGinn, Naugatuck, Conn., assignor to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed Mar. 9, 1970, Ser. No. 17,921

Int. Cl. C08g 22/44, 22/34

U.S. Cl. 260—2.5 AZ

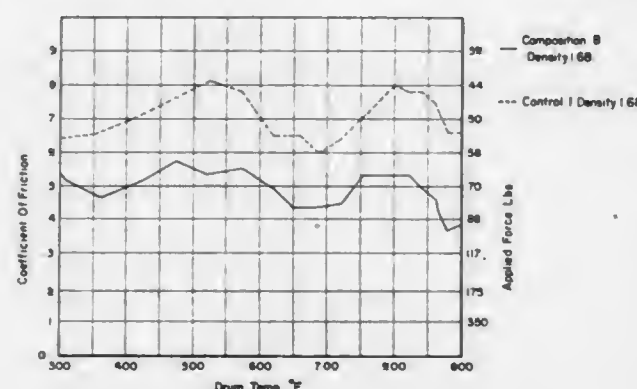
4 Claims

Rigid polyurethane foam with an integral solid skin is molded by a one-shot method using a formulation based on a diisocyanate [e.g., polymeric methylene bis-(phenyl-4-isocyanate)] and two polyols, one of which (e.g., propylene oxide adduct of N-aminoethyl piperazine) will react vigorously with the isocyanate, and the other of which (e.g., polypropylene oxide adduct of glycerine)



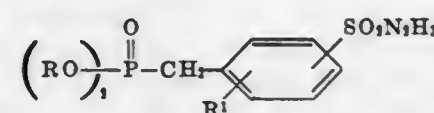
will react sluggishly with the isocyanate. A chelating agent (e.g., acetyl acetone) prevents metal ion contaminants from bringing about undesired side reactions. Blowing agent is included, as may be surfactant and catalyst. Control over the thickness of the solid skin may be exercised by varying the catalyst concentration and/or the ratio of the polyols.

**3,730,920**  
**COMPOSITIONS CONTAINING MICROSPHERES AND FRICTION ELEMENTS PRODUCED THEREFROM**  
William J. D'Alessandro, East Brunswick, N.J., assignor to Union Carbide Corporation, New York, N.Y.  
Filed Jan. 6, 1972, Ser. No. 215,764  
Int. Cl. C08j 1/14; B01j 13/02  
U.S. Cl. 260—2.5 B 13 Claims



The disclosure of this application is directed to compositions, containing microspheres, which are especially useful in the production of friction elements, such as automotive brake linings, characterized by excellent service life and which provide excellent brake action. The friction elements of this invention are capable of withstanding severe service conditions as are frequently encountered in the braking of high speed vehicles.

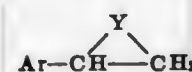
**3,730,921**  
**PHOSPHORUS-CONTAINING SULFONYLHYDRAZIDES AS BLOWING AGENTS FOR RESINS**  
John E. Herweh, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.  
No Drawing. Original application Aug. 5, 1969, Ser. No. 847,715, now Patent No. 3,658,951. Divided and this application June 14, 1971, Ser. No. 153,040  
Int. Cl. C08f 47/10, 29/18  
U.S. Cl. 260—2.5 P 1 Claim  
A new class of phosphorus-containing sulfonylhydrazides of the formula:



In addition a new class of chlorosulfonated phosphorus-containing compounds useful as organic intermediates in the preparation of the hydrazides is described. The phosphorus-containing sulfonylhydrazides are useful as blowing agents for resinous blends.

**3,730,922**  
**CYCLIC ETHER POLYMERIZATION PROCESS**  
John Boor, Jr., El Cerrito, Calif., assignor to Shell Oil Company, New York, N.Y.  
No Drawing. Filed Aug. 9, 1971, Ser. No. 170,392  
Int. Cl. C08g 23/14 8 Claims  
Cyclic ethers are polymerized in the presence of a catalyst formed by reacting (a) at least one dialkyl com-

pound of zinc, (b) a primary or secondary amine, (c) water and (d) at least one compound of the formula



wherein Ar is an aryl radical and Y is oxygen or sulfur. The high molecular weight products are useful, particularly in molding, coating, fiber and film fields of application.

**3,730,923**  
**POLYURETHANE FOAMS DERIVED FROM TRIS(β-HYDROXYALKYL) ISOCYANURATE-ALKYLENE OXIDE ADDUCTS**  
Robert L. Formaini, Millington, and Edwin D. Little, Convent Station, N.J., assignors to Allied Chemical Corporation, New York, N.Y.  
No Drawing. Continuation-in-part of application Ser. No. 738,851, June 21, 1968. This application Sept. 15, 1970, Ser. No. 72,509  
Int. Cl. C08g 22/14, 22/44  
U.S. Cl. 260—2.5 AQ 8 Claims

Polyether polyols, derived from tris(β-hydroxyalkyl)-isocyanurates and alkylene oxides are reacted with organic polyisocyanates in the presence of a blowing agent and catalyst to produce urethane foams of improved properties.

**3,730,924**  
**DYE COMPOSITIONS COMPRISING A FLUORO-CARBON, PIGMENT, BONDING AGENT AND DISPERSANT**  
Melville W. Uffner, Media, Pa., assignor to Air Products and Chemicals, Inc., Philadelphia, Pa.  
No Drawing. Filed Aug. 19, 1970, Ser. No. 65,313  
Int. Cl. C08f 45/66 13 Claims

A fluorine containing polymer of the monomer R<sub>1</sub>P, where P is —OCCF<sub>2</sub>—CH<sub>2</sub> and R<sub>1</sub> is H or CH<sub>3</sub>, and where R<sub>1</sub> is:

R<sub>2</sub>(CF<sub>2</sub>)<sub>a</sub>(CH<sub>2</sub>)<sub>x</sub>, where R<sub>2</sub> is F or H, a is an integer between 1 and 20 and x is either 1 or 2;  
(CF<sub>3</sub>)<sub>2</sub>CR<sub>3</sub>(CF<sub>2</sub>)<sub>b</sub>(CH<sub>2</sub>)<sub>x</sub>, where R<sub>3</sub> is F or H when b is 0, R<sub>3</sub> is F when b is an integer between 1 and 18 and x is either 1 or 2; or  
R<sub>4</sub>(C—C<sub>6</sub>F<sub>10</sub>)CH<sub>2</sub>, where R<sub>4</sub> is F or C<sub>n</sub>F<sub>2n+1</sub> and n is an integer between 1 and 4 and where C— designates an alicyclic structure,

is added to a dispersion containing a pigment, a bonding agent and a dispersing agent to obtain improved dye compositions.

**3,730,925**  
**PROCESS OF PRODUCING DEXTRIN ESTERS OF MALEIC ACID COPOLYMERS**  
Leslie P. Kovats, Granite City, Ill., assignor to Anheuser-Busch, Incorporated, St. Louis, Mo.  
No Drawing. Filed Feb. 8, 1971, Ser. No. 113,666  
Int. Cl. C08f 27/00, 27/12 5 Claims

A process is disclosed for dry reacting a starch dextrin with a maleic acid copolymer under controlled conditions to produce a dextrin ester of low degree of substitution in unswollen granule form. Specific copolymers suitable for use in this invention are a copolymer of methyl vinyl ether and maleic anhydride and a copolymer of ethylene and maleic anhydride. The dextrin has 0.5–5% moisture and the reaction is at a temperature of 100–135° C. for ½–3 hours. The amount of copolymer is 0.3–15%.

**3,730,926**  
**EPOXY RESIN ESTER BASED WATER-SOLUBLE OR WATER-DILUTABLE COATING COMPOSITIONS**

Rolf Gildenpennig, Bammental, Germany, assignor to Reichhold-Albert-Chemie Aktiengesellschaft, Hamburg, Germany

No Drawing. Continuation-in-part of application Ser. No. 861,229, Sept. 23, 1969, which is a continuation of application Ser. No. 617,813, Feb. 23, 1967, both now abandoned. This application May 17, 1971, Ser. No. 144,414

The portion of the term of the patent subsequent to Mar. 21, 1989, has been disclaimed

Int. Cl. C08g 45/00 8 Claims  
U.S. Cl. 260—18 EP

A method of preparing a water-soluble or water-dilutable synthetic resinous coating composition from compounds containing epoxide groups and/or hydroxyl groups either in the form of polyhydroxy compounds or as hydrolytic cleavage products of the epoxy compounds. The epoxy and/or hydroxy compounds are partially esterified by heating them with polycarboxylic acids produced by reacting unsaturated fatty acids with α,β-dicarboxylic acid anhydrides and subsequent hydrolysis, and the partial esters with their remaining free carboxyl groups are then neutralized by adding aqueous ammonia until the pH is between 7.8 and 9.0 and the viscosity of the obtained resin amounts to 30 to 120 sec. (German Industrial Standard 53,211).

**3,730,927**  
**POLYURETHANE ADHESIVES AND COATING COMPOSITIONS**

Hans R. Schloss, Wallington, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 29,306, Apr. 16, 1970, now Patent No. 3,666,835, dated May 30, 1972. This application Mar. 7, 1972, Ser. No. 232,611

The portion of the term of the patent subsequent to May 30, 1989, has been disclaimed

Int. Cl. C08g 51/22, 41/04 10 Claims  
U.S. Cl. 260—29.2 TN

Adhesives and coating compositions comprise a solution of a hydroxyl-terminated urethane prepolymer and an isocyanate-terminated urethane prepolymer in water.

**3,730,928**  
**METHOD AND APPARATUS FOR CONTROLLING REACTION RATE**

John M. Stone, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Corporation, Baton Rouge, La.

Continuation-in-part of application Ser. No. 820,868, May 1, 1969. This application Feb. 9, 1971, Ser. No. 113,856

The portion of the term of the patent subsequent to Aug. 17, 1988, has been disclaimed

Int. Cl. C08d 1/09, 3/04, 3/06 7 Claims  
U.S. Cl. 260—29.7 R

This invention is addressed to a new and improved method and apparatus for control of reaction rate in the aqueous emulsion polymerization of monomeric material to form elastomeric polymers wherein the monomeric material is passed into an elongate passage in a spiral path in combination with a small fraction of the catalyst to effect conversion of monomeric material to form polymer particles during flow through the passage, and the temperature rise in the monomeric material is measured

during flow through the passage for determination of reaction rate to thereby enable the rate of catalyst added to be controlled to provide a uniform reaction rate.

**3,730,929**  
**BLOOM INHIBITED FLAME RETARDANT COMPOSITIONS**

Michael Joseph Breza, Trenton, N.J., assignor to Cities Service Company, New York, N.Y.

No Drawing. Filed Apr. 30, 1971, Ser. No. 139,256

Int. Cl. C08f 45/58 10 Claims  
U.S. Cl. 260—23 H

Compositions are disclosed which comprise a thermoplastic polyolefin polymer, an organohalide fire retarding agent, and a saturated fatty acid or metal salt of a saturated fatty acid as a bloom inhibitor. Such compositions also preferably include a metal compound synergist such as antimony oxide.

**3,730,930**  
**COMPOSITIONS FOR POWDER COATINGS CONTAINING ACRYLATE POLYMERS OR ESTERS OF FLUORINATED FATTY ACIDS AS FLOW CONTROL AGENTS**

Santokh S. Labana, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

No Drawing. Filed Aug. 16, 1971, Ser. No. 172,310

Int. Cl. C08g 30/12 28 Claims  
U.S. Cl. 260—23 EP

Powder coating compositions are disclosed. In general, individual powder coating compositions are a mixture of the following materials. A copolymer of glycidyl methacrylate and an ethylenically unsaturated compound is formed in such proportions as to obtain a copolymer with a glass transition temperature in the range of 40° C. to 90° C. and a molecular weight ( $\bar{M}_n$ ) in the range of 2500 to 8500. The glycidyl methacrylate is present in the copolymer from at least about 8% by weight to no more than about 30% by weight. Another material of the coating composition is a cross linking agent containing 90 to 98% by equivalent weight of a saturated, straight chain, aliphatic, dicarboxylic acid containing 4 to 20 carbon atoms per molecule and 10 to 2% by equivalent weight of a saturated, straight chain, aliphatic, monocarboxylic acid containing 10–22 carbon atoms per molecule, the cross linking agent being present in the amount of 0.8 to 1.1 carboxylic groups for each epoxy group in the copolymer. A third material utilized in forming the powder coating mixture is a flow control agent which forms at least 0.05% by weight of the mixture. The flow control agent is a polymer having a molecular weight ( $\bar{M}_n$ ) of at least 1000. The flow control agent also has, at the baking temperature of the powder coating composition, a lower surface tension than the surface tension of the copolymer.

**3,730,931**  
**SILICONE RESINS USED AS SURFACTANTS IN VINYL CHLORIDE FOAM**

Edward T. Simoneau, Burnt Hills, Richard E. Moeller, Troy, and Norman G. Holdstock, Scotia, N.Y., assignors to General Electric Company

No Drawing. Continuation-in-part of application Ser. No. 53,973, July 10, 1970. This application Nov. 10, 1970, Ser. No. 88,472

Int. Cl. C08f 47/08, 29/24 17 Claims  
U.S. Cl. 260—2.5 P

A composition comprising a vinyl chloride polymer, a plasticizer and a silicone resin selected from a silicone



resin having  $R_3SiO_{1/2}$  monofunctional units and  $SiO_2$  tetrafunctional units with the ratio of the monofunctional units to the tetrafunctional units being from 0.25 to 0.75 with 3.0 to 5.0% by weight of hydroxyl groups and a silicone resin having  $R'_3SiO_{1/2}$  monofunctional units and  $SiO_2$  tetrafunctional units and  $R'_2SiO$  difunctional units with the ratio of monofunctional units to tetrafunctional units to difunctional units being from 0.25-0.75 to 1 to 0.05-0.1 with 3.0 to 5.0% by weight of hydroxyl groups and wherein  $R$ ,  $R'$ ,  $R^2$  are monofunctional hydrocarbon radicals. The composition is mechanically frothed with air to produce a foam which is then heated to gel and fuse the foam. There is preferably used in the above composition one of the above silicone resins which has been further treated so that it has less than about 0.5% by weight of hydroxyl groups. In addition, there is provided a very efficient foaming agent which is produced by adding one of the above silicone resins with a select class of plasticizers, such as dioctyl phthalate.

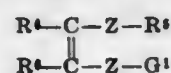
3,730,932

# SELF-BONDING, HEAT-CURABLE SILICONE RUBBER

George P. De Zuba, Waterford, and Abe Berger and Terry G. Selin, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Filed May 17, 1971, Ser. No. 144,249  
Int. Cl. C08g 51/04, 51/50

U.S. Cl. 260—29.1 SB 16 Claims  
Self-bonding, heat-curable silicon rubber composition comprising (a) a diorganopolysiloxane polymer (b) a curing catalyst and (c) a compound of the formula,



where  $R_1$  is selected from alkyl radicals and hydrogen,  $Z$  is selected from  $COO$ , phenylene,  $CO$ ,  $CONH$  and  $CON-R^2$ ,  $R^2$  is selected from monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals,  $R^3$  is selected from unsaturated monovalent hydrocarbon radicals and unsaturated halogenated monovalent hydrocarbon radicals,  $G^1$  is selected from hydrogen,  $R^2$  radicals and  $R^3$  radicals. There may also be used in the above composition a process aid, a filler and other ingredients commonly used in heat-curable silicone rubber compositions. In place of the maleate set forth above, and/or in addition to the maleate set forth above, there may be used a silylmalate.

3,730,933

# STABLE VINYL ACETATE N-METHYLOLACRYLAMIDE LATEX WITH FULLY-HYDROLYZED POLYVINYL ALCOHOL

Peter Fallon Stehle, Media, and Jack Dickstein, Huntingdon Valley, Pa., and Samuel Loshaek, Stamford, Conn., assignors to Borden, Inc., New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 881,580, Dec. 2, 1969. This application June 18, 1971, Ser. No. 154,642

Int. Cl. B32b 21/18; C08f 37/18

U.S. Cl. 260—29.6 WB 13 Claims  
Novel stable vinyl acetate/N-methylolacrylamide copolymer latexes containing fully-hydrolyzed polyvinyl alcohol, specially suitable in water-resistant adhesives, are prepared by a method which comprises dispersing the polyvinyl alcohol in water substantially in absence of the monomeric reactants and effecting copolymerization while adding both monomers gradually and simultaneously to the polyvinyl alcohol dispersion, the vinyl acetate and the N-methylolacrylamide being added in substantially constant ratio and at a rate substantially not exceeding the rate of their copolymerization.

3,730,934

# PLASTICIZED LACTONE POLYMER COMPOSITION

Roy F. Wright, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Aug. 27, 1971, Ser. No. 175,707  
Int. Cl. C08f 45/36

U.S. Cl. 260—31.6 10 Claims  
A plasticized lactone polymer composition comprising a polyester having a molecular weight in the range of about 1,000 to about 10,000 and a polymer of a lactone and a conjugated diene.

3,730,935

# PROCESS FOR THE PRODUCTION OF BONDED PARTICLES AS A MATERIAL OF CONSTRUCTION

Clifford V. Wittenwyler, Cherry Hill, N.J., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed June 9, 1971, Ser. No. 151,531  
Int. Cl. C08g 51/34

U.S. Cl. 260—33.4 EP 14 Claims  
Foundry cores having increased pot life are prepared by (1) mixing from about 90 to 99 parts by weight of foundry sand with from 1 to 10 parts by weight of a polyepoxide binder, (2) mixing said blend with (a) a curing amount of a boron trihalide complex, especially boron trifluoride dihydrate, in an oxygenated hydrocarbon and (b) a monofunctional aromatic tertiary amine, (3) packing the blend into suitable forms and (4) allowing the polyepoxide to cure with or without heating.

3,730,936

# GLASS-FIBER REINFORCED POLYURETHANE ELASTOMERS

Ernst Bugmann, Zurich, Switzerland, assignor to Unilan A.G., Chur, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 719,249, Apr. 5, 1968. This application Jan. 15, 1971, Ser. No. 106,927

Int. Cl. C08g 51/10

U.S. Cl. 260—37 N 2 Claims  
A substantially non-porous polyurethane adapted to be injection molded, extruded or similarly thermoplastically processed containing glass fibers is substantially transparent and has improved physical properties when the polyurethane is prepared by reacting an organic diisocyanate with a hydroxyl terminated polycaprolactone and a glycol, preferably, hydroquinone glycol ether.

3,730,937

# ELASTOMERIC CORROSION-INHIBITING COATING AND SEALING MATERIAL

Wilburn A. Boggs, Smyrna, and Robert N. Miller, Atlanta, Ga., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

No Drawing. Continuation-in-part of application Ser. No. 615,311, Feb. 13, 1967. This application Mar. 15, 1971, Ser. No. 124,461

Int. Cl. C08g 51/02; C09d 5/08

U.S. Cl. 260—37 R 6 Claims  
A protective coating and sealing material particularly adapted for fasteners, rivets and other metallic structural parts which are in intimate contact is composed of a resilient polymer containing dispersed particles of water-soluble inhibitor. The polymer when cured forms a resilient seal which prevents corrosion fluids, notably water, from entering the space between the adjacent parts, be it a fastener and adjacent hole surfaces or overlapping sheet surface. If moisture does diffuse through the polymer, some of the inhibitor is dissolved and converts the moisture to a corrosion-preventive solution. This material may also be used as a discreet layer in a coating system on a metal surface with or without a top coat, which top coat prevents excessive diffusion of moisture into the inhibited material.

3,730,938

# MOISTURE-THICKENED SILICONE COMPOUNDS

Alfred H. Smith, Jr., Jonesville, and Robert A. Murphy, Burnt Hills, N.Y., assignors to General Electric Company

No Drawing. Continuation-in-part of abandoned application Ser. No. 868,887, Oct. 23, 1969. This application May 17, 1971, Ser. No. 144,222

Int. Cl. C08g 51/04

U.S. Cl. 260—37 SB 8 Claims  
Organopolysiloxane compositions containing calcium carbonate in amounts of from 5 to 200 parts for each 100 parts of the organopolysiloxane are rendered thixotropic through the addition of water and/or a humectant. Removal of this water and/or humectant will return the composition to its lower viscosity state. The thixotropic organopolysiloxane composition is useful in room temperature vulcanizing compositions, in paint formulations and in grease compositions.

3,730,939

# FLAME RETARDANT POLYAMIDE COMPOSITIONS CONTAINING CERTAIN SULFANILAMIDES

Paul Joseph Koch, Mount Freedom, and Julie Ann Lapham, Denville, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Feb. 1, 1972, Ser. No. 222,694  
Int. Cl. C08g 51/60

U.S. Cl. 260—37 N 10 Claims  
Certain aromatic sulfonamide compounds impart flame retardance when blended with polyamides.

3,730,940

# FLAME RETARDANT COMPOSITION

John Versnel, Plainsboro, and Joseph Green, East Brunswick, N.J., assignors to Cities Service Company, New York, N.Y.

No Drawing. Filed Oct. 1, 1971, Ser. No. 185,831  
Int. Cl. C08f 45/04

U.S. Cl. 260—41 A 9 Claims  
A non-drip, self-extinguishing composition comprises polypropylene, a halogenated organic flame retardant, ammonium fluoborate or ammonium sulfate, a metal compound synergist such as antimony trioxide, and silica. The flame retardant is ordinarily a halogenated aliphatic compound, i.e., a compound having halo substituents on aliphatic or cycloaliphatic carbon atoms.

3,730,941

# POLYIMIDES FROM TETRAHYDROFURAN-2,3:4,5-TETRA-CARBOXYLIC ACID DIANHYDRIDES

William M. Alvino, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

No Drawing. Filed Aug. 9, 1971, Ser. No. 170,274  
Int. Cl. C08g 20/32

U.S. Cl. 260—47 CP 10 Claims  
Imide polymers prepared from tetrahydrofuran-2,3:4,5-tetracarboxylic dianhydride and diamine, preferably aromatic diamine and most desirably 4,4'-diaminodiphenyl ether.

3,730,942

# SELF-EXTINGUISHING COMPOSITION

Joseph Green, East Brunswick, and John Versnel, Plainsboro, N.J., assignors to Cities Service Company, New York, N.Y.

No Drawing. Filed Oct. 8, 1971, Ser. No. 187,896  
Int. Cl. C08f 45/04

U.S. Cl. 260—41 A 9 Claims  
A non-drip, self-extinguishing composition comprises polyethylene, a halogenated organic flame retardant, am-

monium fluoborate or ammonium sulfate, a metal compound synergist such as antimony trioxide, and silica.

3,730,943

# STABILIZED VINYL CHLORIDE POLYMERS

Lewis B. Weisfeld, Highland Park, and Carl W. Pause, Spotswood, N.J., assignors to Cincinnati Millacron Chemicals, Inc., Reading, Ohio

No Drawing. Continuation-in-part of application Ser. No. 485,094, Sept. 3, 1965, now Patent No. 3,567,681, dated Mar. 2, 1971. This application Dec. 16, 1970, Ser. No. 98,847

Int. Cl. C08f 45/62

U.S. Cl. 260—45.75 R 9 Claims  
Halogen containing resin food packaging materials are effectively stabilized with mixtures of calcium neodecanoate and zinc neodecanoate.

3,730,944

# PROCESS FOR THE PREPARATION OF POLYPHENYLENE ETHERS WITH PROMOTED COPPER-AMINE CATALYSTS

James G. Bennett, Menands, and Arthur Katchman, Delmar, N.Y., assignors to General Electric Company

No Drawing. Filed Apr. 30, 1971, Ser. No. 139,216  
Int. Cl. C08g 23/18

U.S. Cl. 260—47 ET 16 Claims  
There is disclosed an improved process for the preparation of high molecular weight polyphenylene ethers by oxidatively coupling a di-ortho-substituted phenolic precursor in a reaction system containing oxygen and a complex catalyst formed from a copper salt and either a primary, secondary or tertiary amine and an alkylene carbonate or a dialkyl sulfoxide promoter or a primary or tertiary amine and a dialkyl formamide promoter. Use of the promoters results in the formation of higher molecular weight polymer in a given reaction time or polymer of comparable molecular weight in substantially decreased reaction time.

3,730,945

# COMPOSITIONS OF EPOXY RESINS AND THE REACTION PRODUCTS OF MULTIAZIRIDINO COMPOUNDS AND HYDROGEN SULFIDE

Heinz Uelzmann, Cuyahoga Falls, and David C. Hidingier, Jr., Akron, Ohio, assignors to The General Tire & Rubber Company

No Drawing. Application Nov. 3, 1969, Ser. No. 873,683, which is a division of application Ser. No. 637,352, May 10, 1967, now Patent No. 3,514,369. Divided and this application Jan. 14, 1972, Ser. No. 217,970

Int. Cl. C08f 30/14

U.S. Cl. 260—47 EN 10 Claims  
Novel adducts of multiaziridino compounds are prepared by reacting  $H_2S$  with multiaziridino compounds. The reaction products, which contain secondary amino and thio groups, may be used to form adhesives, particularly with epoxy compounds, and metal-to-metal laminates.

3,730,946

# PROCESS FOR MAKING CYANOARYLOXY POLYMERS AND PRODUCTS DERIVED THEREFROM

Darrell R. Heath and Joseph G. Wirth, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Filed Jan. 20, 1971, Ser. No. 108,152  
Int. Cl. C08g 25/00

U.S. Cl. 260—47 R 19 Claims  
Cyanoaryloxy polymers are prepared from the reaction of a dinitrobenzene containing a cyano group directly attached to the benzene nucleus with an alkali-metal salt of a divalent carbocyclic aromatic radical in the presence of a dipolar aprotic solvent.



3,730,947

**CERTAIN LOW VISCOSITY THERMOSETTING ACRYLIC RESINS AND THEIR USE AS BINDERS IN DENTAL FILLING COMPOSITIONS**

Donald G. Stoffey, Hacienda Heights, and Henry L. Lee, Jr., San Marino, Calif., assignors to Lee Pharmaceuticals, South El Monte, Calif.

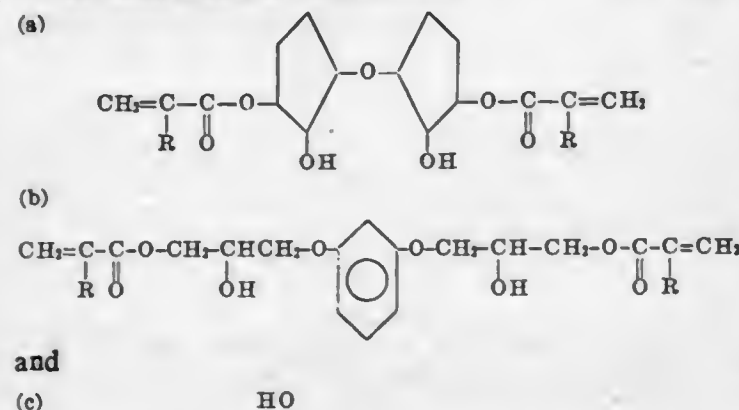
No Drawing. Filed Dec. 28, 1970, Ser. No. 102,043

Int. Cl. C07c 69/54; C08f 33/00

U.S. Cl. 260—47 UA

6 Claims

The compounds of the formulae:



wherein R is hydrogen, lower alkyl, or halogen, are utilized as thermosetting binders for dental restorative compositions. The compounds are prepared by the reaction of the appropriate diepoxide with acrylic acid and derivatives thereof.

3,730,948

**HEAT RESISTIVE RESIN COMPOSITIONS COMPRISING AN EPOXY, ORGANIC ACID ANHYDRIDE, AND MALEIMIDE**

Keliiti Akiyama and Kiyoji Makino, Yokosuka, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

No Drawing. Filed Mar. 22, 1971, Ser. No. 127,004

Claims priority, application Japan, May 13, 1970, 45/40,128

Int. Cl. C08g 30/14

U.S. Cl. 260—47 EC

4 Claims

Solventless composition used for heat resistive resin which is prepared by dissolving mutually a specific maleimide compound, a specific epoxy compound and a specific organic acid anhydride.

The mixing weight ratio of said maleimide compound, epoxy compound, and acid anhydride is respectively from 30 to 80%, from 10 to 35%, and from 10 to 35% on the basis of total mixture.

Heat resistive resin can be obtained by curing said composition at a temperature of from 100 to 200° C. for about from 10 to 100 minutes.

3,730,949

**THERMOSTABLE AND THERMOPLASTIC LINEAR POLYTHIOETHERS**

Camille Jungblut, 1 Tour Aquitaine, 92 Courbevoie, France

No Drawing. Continuation-in-part of application Ser. No. 22,048, Mar. 23, 1970. This application Oct. 1, 1971, Ser. No. 185,825

Int. Cl. C08g 33/10

U.S. Cl. 260—47 R

6 Claims

Linear thermoplastics, having exceptional thermal stability and weather resistance, of the general formula



in which R is a bifunctional aromatic radical and R' is an aromatic-like 6-membered ring compound containing 2 nitrogen heteroatoms and 3 conjugated double bonds in the ring, selected from the group consisting of pyridazine, phthalazine, pyrazine, and pyrimidine, and the

process for producing these polymers by the polycondensation of a salt of an aromatic dithiol with the dihalogenated derivative of pyridazine, phthalazine, pyrazine or pyrimidine under specified conditions are disclosed.

3,730,950

**POLYURETHANE COPOLYMERS DERIVED FROM THE CARBORANE-SILICON PHTHALOCYANINE MONOMER**

Robert L. Barnes, Clifton, N.J., William M. Block, Staten Island, N.Y., and Daniel Grafstein, Morristown, N.J., assignors to The Singer Company, New York, N.Y. No Drawing. Application Dec. 15, 1969, Ser. No. 885,335, which is a continuation-in-part of abandoned application Ser. No. 619,199, Feb. 28, 1967. Divided and this application Feb. 1, 1972, Ser. No. 222,706

Int. Cl. C08g 22/00, 22/08

U.S. Cl. 260—77.5 AQ

1 Claim

Polyurethane copolymers derived from the carborane-silicon phthalocyanine monomer which are useful as high temperature stable coating, adhesives, molding compounds for electronic components and laminating resins are described.

3,730,951

**POLYENES MODIFIED WITH POLYFUNCTIONAL N-HALO AMINES**

George L. Braude, Ellicott City, Md., assignor to W. R. Grace &amp; Co., New York, N.Y.

No Drawing. Filed Dec. 22, 1971, Ser. No. 211,094

Int. Cl. C08g 22/04

U.S. Cl. 260—77.5 B

26 Claims

Modified polymers are prepared by reacting liquid or solid polyenes containing at least two reactive carbon to carbon unsaturated groups per molecule with polyfunctional N-halo amines, particularly N-halo polycarbamates under ambient conditions in the presence of free radical generators such as UV irradiation. The resulting modified polymers range from solvent soluble chain extended polymers to solid cured, i.e. cross-linked stable and solvent resistant polymeric materials. The modified polymers may be used as coatings, films, sealants, molded products, wet strength resins, textile treating agents, bleaching agents, flame retardants and the like.

3,730,952

**AMIDE OXADIAZOLE POLYMERS AND POLYMER PRECURSORS**

Billy M. Culbertson, Burnsville, Minn., assignor to Ashland Oil, Inc., Ashland, Ky.

No Drawing. Application Sept. 20, 1968, Ser. No. 761,306, which is a continuation-in-part of application Ser. No. 502,322, Oct. 22, 1965. Divided and this application July 23, 1970, Ser. No. 63,988

Int. Cl. C08g 20/04

U.S. Cl. 260—78 A

5 Claims

Thermally stable fibers and films have been prepared by reaction of equimolar quantities of an amino aroyl hydrazide and an acid dichloride. The polymers can be converted to the corresponding amide-oxadiazole polymers by dehydration.

3,730,953

**PROCESS FOR PRODUCING HIGH MOLECULAR POLYURETHANES BY REACTING OXADIAZINONES WITH POLYOLS IN THE PRESENCE OF AN ORGANOTIN CATALYST**

Kenji Naito, and Kiyoshi Yasuda, both of Osaka, Japan, assignors to Takeda Chemical Industries Ltd., Osaka, Japan

Filed Dec. 7, 1971, Ser. No. 205,714

Claims priority, application Japan, Dec. 28, 1970, 45/124073

Int. Cl. C08g 22/42

U.S. Cl. 280—77.5 AM

21 Claims

A process for producing high molecular polyurethane compounds having wide uses as coating materials, resins and

foams. The high molecular compounds are produced by reacting an oxadiazinone compound, which has been obtained by the reaction of an organic isocyanate compound with carbon dioxide, with a polyol compound in the presence of a catalyst of such a specific organotin compound as tetrabutyl-1,3-diacetoxydistannoxane.

3,730,954

**N-(SUBSTITUTED INDAZOLYL-N'-METHYL)HEXAMETHYLENETETRAAMMONIUM HALIDES**

Pasquale Paul Miniari, Woodside, N.Y., assignor to Tenneco Chemicals, Inc.

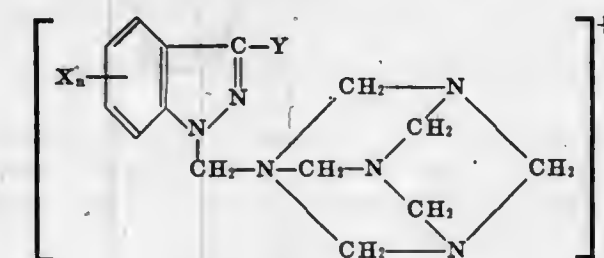
Filed Nov. 22, 1971, Ser. No. 201,178

Int. Cl. C07d 55/52

U.S. Cl. 260—248.5

10 Claims

Compounds that have the structural formula



wherein X represents halogen, nitro, amino, acetamino, or (halobenzylidene)amino; Y represents hydrogen or halogen; Z represents halogen; and n represents an integer in the range of zero to 2 are used to control the growth of bacteria, fungi, and other microorganisms. Illustrative of these compounds is N-(6-nitroindazolyl-N'-methyl)hexamethylenetetraammonium chloride.

3,730,955

**DIANTHRAPYRIMIDINE YELLOW**

Edward E. Jaffe, Union, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 10, 1971, Ser. No. 179,591

Int. Cl. C07d 51/48

U.S. Cl. 260—256.4 Q

1 Claim

Dianthrapyrimidine, a yellow pigment suitable for use in finishes, especially automotive finishes.

3,730,956

**4 ADAMANTYLAMINO QUINOLINES**

Koert Gerzon, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 26, 1971, Ser. No. 202,571

Int. Cl. C07d 33/52

U.S. Cl. 260—286 R

9 Claims

A group of novel 4-(adamantylamino)quinoline compounds which are useful as algacides and protozoacides. Some are useful as anti malarials.

3,730,957

**PROCESS FOR COUPLING LOWER OLEFINS**

John E. Bozik, Plum Borough, Pa.; John A. Ondrey, Tyler, Tex., and Harold E. Swift, Gibsonia, Pa., assignors to Gulf Research &amp; Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 660,901, Aug. 16, 1967, abandoned, which is a continuation-in-part of Ser. No. 588,311, Oct. 21, 1966, abandoned. This application Dec. 14, 1970, Ser. No. 98,018

Int. Cl. C07c 3/20, 11/12

U.S. Cl. 260—673

15 Claims

Propylene, isobutylene and related olefins are coupled at elevated temperatures in the presence of oxygen and a catalyst

comprising bismuth together with another metal in a binary metal oxide compound to produce higher molecular weight olefinic and aromatic compounds.

3,730,958

**SKELETAL ISOMERIZATION OF OLEFINS OVER HALOGEN-CONTAINING ZIRCONIA CATALYST**

John W. Myers, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 30,278, April 20, 1970, Pat. No.

3,663,453. This application Feb. 22, 1972, Ser. No. 228,321

Int. Cl. C07c 5/22, 5/24

U.S. Cl. 260—683.2

8 Claims

Olefins undergo skeletal isomerization by contact with a catalyst containing a zirconium compound and a halogen.

3,730,959

**FABRICATION OF HIGH PRESSURE SEALS FOR WATER EQUILIBRATED FIBER BUNDLES**

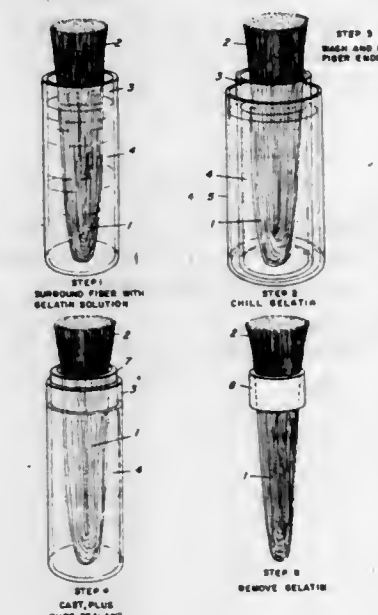
Charles Russell Horres, Jr., Chapel Hill, and Richard L. Leonard, Raleigh, both of N.C., assignors to The United States of America as represented by the Secretary of the Interior

Filed July 8, 1971, Ser. No. 160,668

Int. Cl. B29d 3/02, 27/00

U.S. Cl. 264—263

12 Claims



The formation of high pressure seals for water equilibrated, hollow fiber membranes is effected by injecting a solution of gelatin around the active membrane area, chilling the solution to solidify the gelatin and immobilize the water, washing the ends or inactive area of the membrane with warm water, drying the ends, and casting a seal on the solidified gelatin surface. The gelatin is removed by heating and washing the fibers.

3,730,960

**NOVEL FIRST AID PRODUCTS**

Ling Wei, Watchung, and Robert Marchisotto, East Brunswick, both of N.J., assignors to Plough Inc., Memphis, Tenn.

Division of Ser. No. 887,355, Dec. 22, 1969, Pat. No.

3,624,224. This application June 25, 1971, Ser. No. 165,857

Int. Cl. A61k 15/00

U.S. Cl. 424—78

6 Claims

Disclosed herein are novel antiseptic compositions comprising an aqueous solution of a quaternary ammonium compound, a local anesthetic and a polyoxyethylene-polyoxypropylene block polymer. They are most advantageously supplied as impregnants of a hermetically sealed pad.



## ELECTRICAL

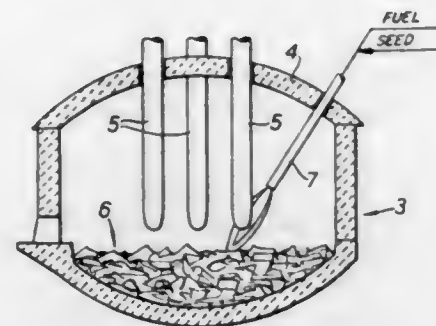
3,730,961

**ARC IGNITION BY SEEDED GAS**  
Laurence Miller Bryce, Fife, Scotland, assignor to British Steel Corporation, London, England

Filed Jan. 4, 1972, Ser. No. 215,310  
Claims priority, application Great Britain, Jan. 22, 1971, 2,970/71

Int. Cl. H05b 7/00

U.S. Cl. 13-9



A method of igniting an arc furnace in which a hot fluid is introduced into the space between an electrode and the charge, the fluid being seeded with a compound which is ionized at the subsisting temperature whereby to promote breakdown of, and initiate an arc across, the said space. The fluid may be fuel oil or a gas and is preferably aflame; it may be applied from an independent torch or it may issue from the electrode itself. The seed may be a salt of potassium or caesium.

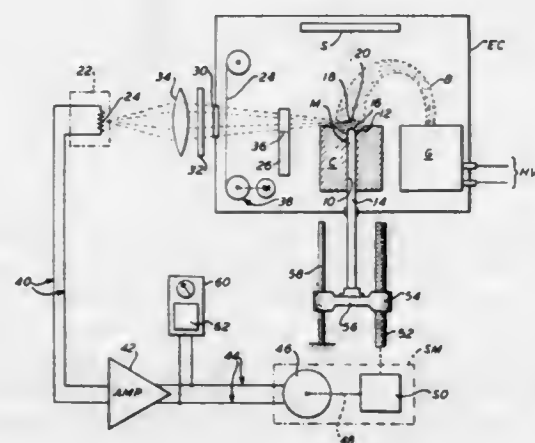
3,730,962

**ELECTRON BEAM FURNACE WITH MATERIAL-EVAPORANT EQUILIBRIUM CONTROL**  
Marshall H. Norwalk, Williamsville, N.Y., assignor to Airco, Inc., New York, N.Y.

Filed Aug. 24, 1971, Ser. No. 174,385

Int. Cl. H05b 7/00

U.S. Cl. 13-31



A vacuum coating device having an evaporation chamber and a rod fed electron beam gun, wherein the end (target) of a consumable rod is melted and vaporized by the electron beam; the meniscus of the melt being kept by automatic control at a constant height and in equilibrium with the evaporation rate of the rod material; the control comprising an electric servo motor for advancing the rod at a controlled rate into the evaporation chamber, a photocell subject to radiation from the rod melt, a fixed mask with a graduated aperture for varying the sensed radiation according to varying height of the meniscus, and a control amplifier responsive to the photocell for supplying a rate control voltage to the servo motor.

3,730,963  
**CONSTRUCTION FOR SUPPORTING THE ROTATABLE MEMBERS OF A PIANO ACTION MECHANISM EMPLOYING CARBON FIBER MIXED BUSHING CLOTH**  
Katsuhiko Imagawa, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamatsushi, Shizuoka-ken, Japan

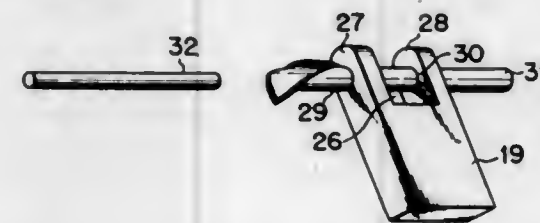
Filed Dec. 27, 1971, Ser. No. 212,017

Claims priority, application Japan, Dec. 30, 1970, 45/133764

Int. Cl. G10c 3/18

U.S. Cl. 84-251

3 Claims



A piano action mechanism wherein a shaft pin for rotatably supporting the rotatable members on a flange is wound with bushing cloth containing carbon fibers having high lubricity and increased durability.

3,730,964

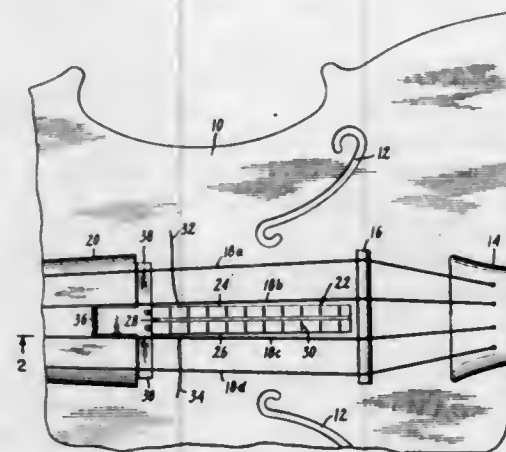
**METHOD AND APPARATUS FOR INSTRUCTION OF STRINGED INSTRUMENT BOW POSITIONING**  
Burton Kaplan, 817 West End Ave., New York, N.Y.

Filed Nov. 24, 1971, Ser. No. 201,844

Int. Cl. G09b 15/06

U.S. Cl. 84-470

9 Claims



A bow position sensor is secured to a stringed instrument and an indicator responsive to the sensor provides indication to the student of each departure of the bow from desired positioning during play.

3,730,965

**EXPANSION JOINT FOR GAS-INSULATED TRANSMISSION LINE**  
James Christofferson, West Newbury, Mass., assignor to High Voltage Power Corporation, Westboro, Mass.

Filed July 14, 1972, Ser. No. 272,083

Int. Cl. H02g 15/24

U.S. Cl. 174-13

4 Claims

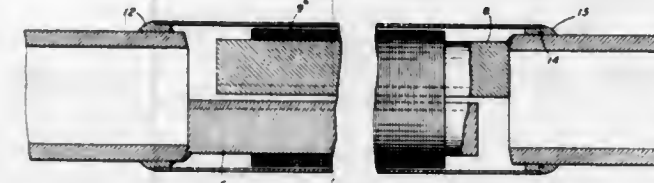
An expansion joint for the central conductor of a compressed-gas-insulated transmission line permits the desired mutual longitudinal movement of adjacent central conductors by means of flexible connectors so arranged as to provide a negligible increase of diameter of the central conductive path

MAY 1, 1973

ELECTRICAL

303

while having sufficient length and flexing properties such that fatigue is reduced. The flexible connectors are a multiplicity



of thin strips disposed in a circular path within a thin surface transverse to the axis of the transmission line.

3,730,966

**CRYOGENIC CABLE**  
Marcel Aupoix, Paris, and Francois Moisson-Franckhauser, Bretigny-sur-Orge, both of France, assignors to Compagnie Generale D'Electricite, Paris, France

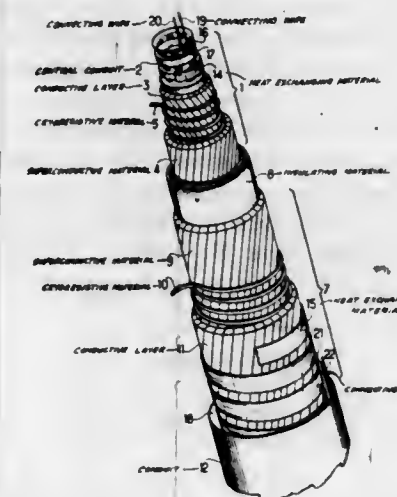
Filed Jan. 20, 1972, Ser. No. 219,398

Claims priority, application France, Jan. 21, 1971, 7102012

Int. Cl. H01v 11/00

U.S. Cl. 174-15 C

6 Claims



Cryogenic cable of great length consisting of two co-axial structures, each comprising, a cryogenic fluid transport tubing, a first layer of conductive material surrounding the tubing, a second layer of superconductive material surrounding the first layer and separated from it by a ring having high resistivity, this ring enabling the flow of the cryogenic liquid between the layers and preventing any thermal disturbances by magnetic interaction between layers. The layers of conductors or superconductors and the ring are wound helically.

3,730,967

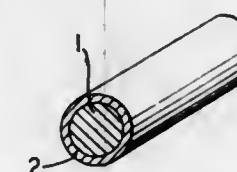
**CRYOGENIC SYSTEM INCLUDING HYBRID SUPERCONDUCTORS**  
James Nicol, Dover, Mass., assignor to Air Reduction Company, Incorporated, New York, N.Y.

Filed May 13, 1970, Ser. No. 36,739

Int. Cl. H01b 7/34, 5/10

U.S. Cl. 174-15 C

23 Claims



One or more superconducting strands are separated from a matrix of normally conducting material by a high resistance

barrier layer of german silver. This may take the form of a cylindrical shell of german silver, either partly or completely enclosing a core comprising one or more strands of superconducting material, or a composite of superconducting and normally conducting strands. The barrier may comprise a german silver layer sandwiched between a pair of layers of normally conducting material, such as copper. An alternative embodiment comprises a matrix of copper or other low resistance metal in which are embedded superconducting strands in a substantially parallel array separated by laminae of german silver. After corrodution, and twisting, superconductor wires, or composites, formed to include german silver barrier layers, may be used as superconducting coils in cryogenic systems.

3,730,968

**TUBULAR ENCLOSED 3-PHASE HIGH VOLTAGE LINE**  
Hermann Paul Szent-Varga, Nussbaumen, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

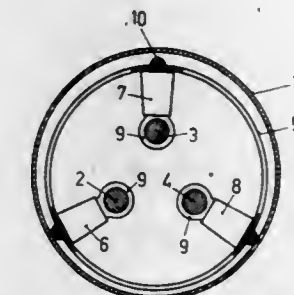
Filed Nov. 2, 1971, Ser. No. 194,839

Claims priority, application Switzerland, Dec. 3, 1970, 17930/70

Int. Cl. H01b 9/06

U.S. Cl. 174-27

3 Claims



A three-phase high voltage line in which the phase conductors are located within a grounded tubular, gas-pressurized casing. To facilitate assembly of the conductors within the casing, supporting rings are spaced along and surround the conductors, and the latter are secured within and connected to the ring by means of insulators. Projections which provide either a sliding or rolling contact are located on the outer surface of the rings and these engage the inner surface of the casing and serve as guides for introducing the conductor and ring assemblies into the casing.

3,730,969

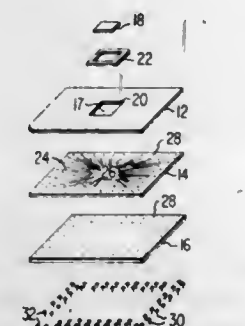
**ELECTRONIC DEVICE PACKAGE**  
Robert Leroy Buttle, Summit, and William Douglas Bailey, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed March 6, 1972, Ser. No. 232,038

Int. Cl. H01l 5/00

U.S. Cl. 174-52 S

10 Claims



An electronic device package comprises a ceramic top card having an opening therethrough and at least one other card including a ceramic pattern card on which an electronic device is mountable having a film pattern of electrical leads on an



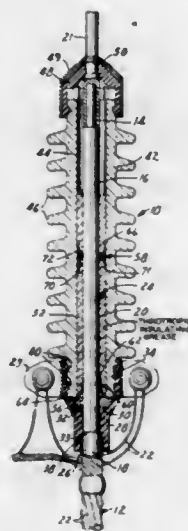
upper surface thereof. The pattern card is laminated to the top card and has a plurality of holes therethrough. Each hole communicates with an electrical lead and is interiorly plated with an electrically conductive film. A pin is brazed to the conductive film in each hole and to a corresponding electrical lead.

3,730,970

**TERMINAL WITH GREASE RETAINING MEMBERS**  
Leonard A. Johnson, Woodbury, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.  
Filed Oct. 4, 1971, Ser. No. 185,990  
Int. Cl. H02g 15/02

U.S. Cl. 174—73 R

8 Claims



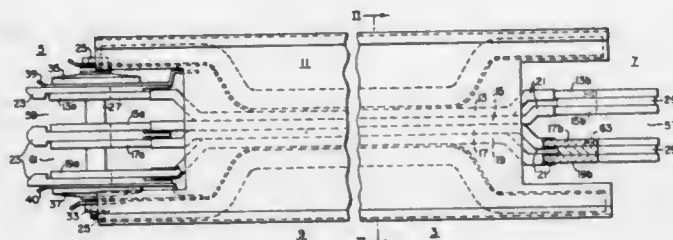
A terminal for high voltage electrical cable formed with a chamber extending through the terminal from an inlet end for engagement over the cable to an outlet end, and having a viscous insulating grease filling a portion of the chamber from the inlet end. The terminal includes means operable upon insertion of the cable into the inlet end of the chamber for retaining the grease in the chamber about the cable for a predetermined distance from the inlet end.

3,730,971

**BUS DUCT CONVERTIBLE FROM A.C. USE TO D.C. USE**  
Daniel R. Durham, Beaver Falls, and William W. Hamilton, Beaver, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.  
Filed April 28, 1971, Ser. No. 248,475  
Int. Cl. H02g 5/06; H01r 29/00

U.S. Cl. 174—68 B  
Int. Cl. H02g 5/06; H01r 29/00

9 Claims



A bus duct section characterized by four bus bars insulated from each other and within a housing the end portions of which are uninsulated and adapted for overlapping connection with corresponding bus bars of other similar sections, each outer pair of bus bars having conducting spacers between the end portions thereof, whereby the bus duct may be converted from a three-phase four wire alternating-current unit to a two pole direct current bus duct.

3,730,972  
**WIRE-WRAP TERMINAL AND A METHOD OF MAKING A WIRE-WRAP CONNECTION**  
William M. Hennessey, Somerville, N.J., assignor to Burroughs Corporation, Detroit, Mich.  
Filed March 20, 1972, Ser. No. 236,306  
Int. Cl. H02g 15/08

U.S. Cl. 174—94 R

10 Claims



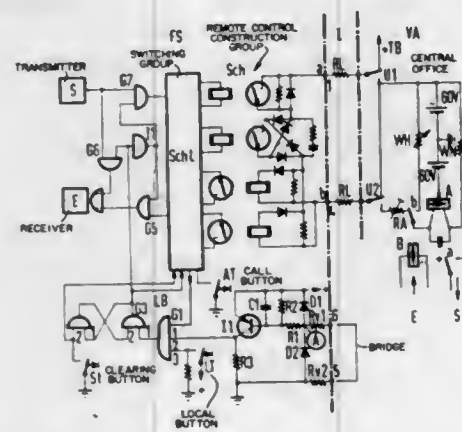
A wire-wrap terminal for a terminal pin for use with fine wire, in computer circuitry for example, is provided utilizing a pair of flat, juxtaposed, conductive extensions on one end of the pin to form a clamping interface. The extensions may be fabricated of the same electrically conductive metal sheet as the terminal pin with one of the extensions having portions cut away to form resilient prongs interfaced against a datum plate, being the other extension. The outer end of one of the extensions, such as the resilient prongs, is slightly bent outwardly for ease of insertion of the fine wire and at least one shoulder limits the depth of insertion. In making the wire-wrap, the wire is inserted between the interfacing extensions against the shoulder limit, wrapped around both extensions a plurality of times, preferably in a single layer, outwardly from the limit, thus constraining the extensions with the inserted portion therebetween, and again inserted into the clamping interface. The end of the wire may then be clipped or broken off against the edge of the datum plate. No strain or crimp is placed on the wire and no tools are required in making the wire-wrap.

## ERRATUM

For Class 178—6.8 see:  
Patent No. 3,730,277

3,730,973  
**TELEPRINTER SUBSCRIBER SET HAVING A REMOTE SWITCHING GROUP FOR GALVANIC DECOUPLING FROM THE CONNECTING LINE AND A CIRCUIT ARRANGEMENT FOR ENABLING LOCAL OPERATION**  
Roman Lutz, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany  
Filed June 11, 1971, Ser. No. 152,053  
Claims priority, application Germany, Aug. 12, 1970, P 20 40 161.0

U.S. Cl. 178—2 R  
Int. Cl. H04l 13/00  
3 Claims



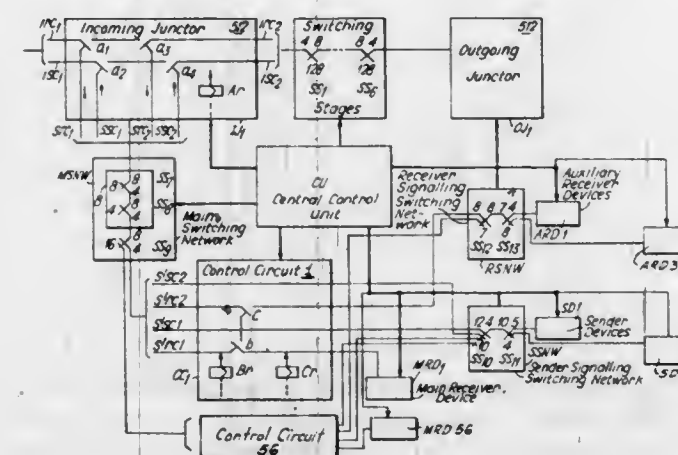
A Telex subscriber set includes a plug control circuit for preventing destruction of the electronic input relays of a

remote control switching group due to inadvertent short circuits arising in manipulation of the connecting plug.

3,730,974

**SIGNALING NETWORK FOR AUTOMATIC TELECOMMUNICATION SWITCHING SYSTEM**  
Guy A. J. M. G. H. Verschueren, Aartselaar, Belgium, assignor to International Standard Electric Corporation, New York, N.Y.  
Filed March 5, 1971, Ser. No. 121,260  
Claims priority, application Belgium, March 20, 1970, 7003952  
Int. Cl. H04l 11/00

U.S. Cl. 178—3  
6 Claims



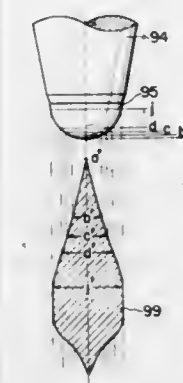
Disclosed is an automatic toll telegraph switching system in which an exchange includes a central control unit to control the establishment of a connection through the system. In the forwarding of a connection to a remote exchange, sender devices and auxiliary receiver devices in the exchange are used only during the establishment of a connection to a remote exchange and for sufficient duration to enable the remote exchange to receive and approve a class of traffic signal from the calling line and verification signals. The sender and auxiliary receiver devices are then released. This way the number of such devices which must be provided is significantly reduced.

3,730,975

**PICTURE AND WRITING RECORDER USING BALL-PEN SYSTEM**

Yoshinori Kono; Norio Iwasaki; Toshio Sato; Masaya Mizuno, and Jikko Takeuchi, all of Tokyo, Japan, assignors to Fuji Telecasting Company Ltd., Tokyo, Japan  
Filed March 10, 1971, Ser. No. 122,659  
Claims priority, application Japan, April 4, 1970, 45/28273  
Int. Cl. H04n 1/24, 1/46

U.S. Cl. 178—5.2 R  
5 Claims

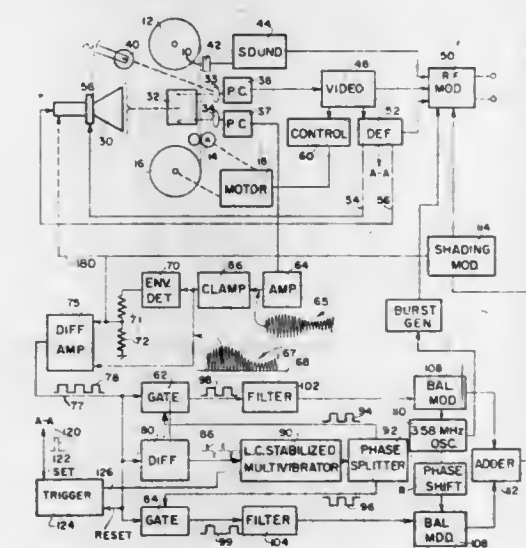


The present invention is used to make an excellent recording of color pictures and writings by a simple unit and easy

operation wherein each set of ball-pen system recording part is provided for each restored primary color signal at receiving part for a color recording apparatus which is composed of transmitting and receiving parts, and a ball-pen is held pressed on a recording paper with some pressure corresponding to the strength of said primary color signal related. The present invention is able to apply to a facsimile.

3,730,976

**COLOR SIGNAL RECORDING AND DECODING**  
Norman W. Parker, Wheaton, Ill., assignor to Motorola, Inc., Franklin Park, Ill.  
Continuation of Ser. No. 8,947, Feb. 5, 1970, abandoned. This application Dec. 20, 1971, Ser. No. 210,094  
Int. Cl. H04n 5/86, 9/02  
U.S. Cl. 178—5.4 CD  
16 Claims



Color signal recording in which recorded pulses have widths and positions to represent color saturation and hue. For example, pulses of variable width are recorded, with alternate pulses representing one hue while interspersed pulses represent another hue. The system may use a flying spot scanner operating on a brightness image representation and on the color signal information to generate complete image representative signals. Circuitry is disclosed for minimizing error in deriving signals from the recording, which may be in the form of photographic film, for example, and also reducing error in the synchronization of the scanning operation. Display of the image representative signals may be through known television techniques.

3,730,977

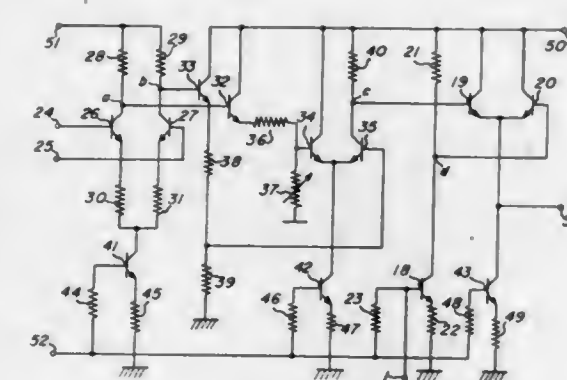
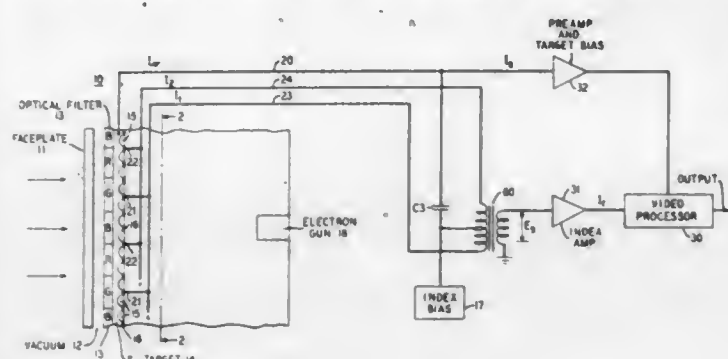
**COLOR CAMERA HAVING CAPACITANCE COMPENSATED INDEX STRIPS**

Arthur Bertel Larsen, Colts Neck, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.  
Filed Feb. 29, 1972, Ser. No. 230,344  
Int. Cl. H04n 9/06

U.S. Cl. 178—5.4 ST  
12 Claims  
Two sets of interdigitated conductive indexing strips are placed on the cathode side of a camera tube target onto which the scene is focused in color stripe sets. The conducting strips are dc biased to intercept part of the scanning electron beam and thereby provide an output current which serves to reference the beam position. The video target lead and one lead from each of the interdigitated indexing strip sets are connected respectively to the center tap and ends of a transformer primary. This interconnection acts to neutralize the capacitive



coupling between the conductive strips and the target, which may be a high conductivity silicon target, thereby preventing



coupling of the common frequency index and chrominance signals.

3,730,978

## COLOR KILLER CIRCUIT

Shuzo Wakai, Kyoto, and Hitoshi Sugano, Takatsuki, both of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

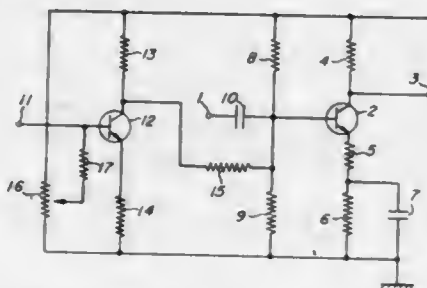
Filed March 22, 1972, Ser. No. 236,917

Claims priority, application Japan, March 30, 1971, 46/19359

Int. Cl. H04n 9/48

U.S. Cl. 178—5.4 CK

1 Claim



A color killer circuit in which means are provided so as to carry out a stable color killing operation free from fluctuations in power supply voltage so that the color killing operation may not be directly affected by the absolute value of the color killer control voltage.

3,730,979

## METHOD AND MEANS FOR PARTICLE AND LIGHT WAVE INTERACTION

Helmut J. Schwarz, 49 Carver Circle, Simsbury, Conn., and Heinrich W. Hora, Rottdornweg 4, 8012 Ottobrunn Bie Munich, Germany

Filed Dec. 7, 1970, Ser. No. 95,777

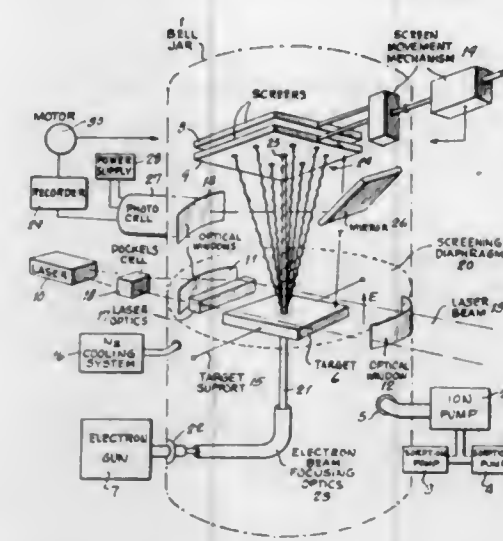
Int. Cl. H04n 9/22

U.S. Cl. 178—5.4 R

25 Claims

Method and means for creating an interaction between a beam of particles and electromagnetic waves, particularly at

optical frequencies, wherein a high velocity beam of particles, such as electrons, is passed through a suitable interaction zone, for example, in the form of an optically transparent dielectric target, such as a thin crystalline film, while the target is irradiated with laser light polarized generally in the direction of travel of the particles, whereby the particles upon



striking a suitable medium, such as a non-luminescent screen, give off light of the same color as the laser, which becomes visible on the screen. The interaction thus derived can be used in many particular applications such as, for example, in a color television tube and other electronic display or information storage devices.

3,730,980

## ELECTRONIC COMMUNICATION APPARATUS FOR SELECTIVELY DISTRIBUTING SUPPLEMENTARY PRIVATE PROGRAMMING

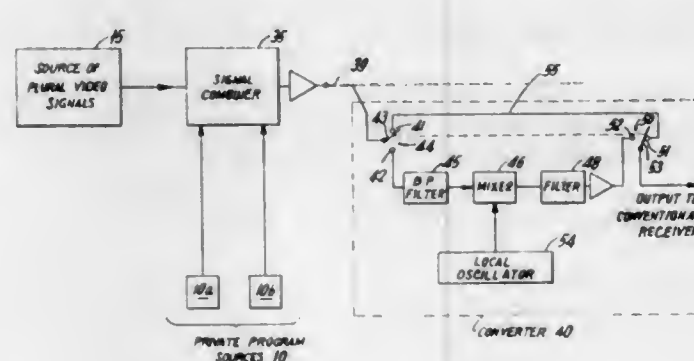
Donald Kirk, Jr., St. Petersburg, Fla., assignor to Television Communications Corporation, New York, N.Y.

Filed May 24, 1971, Ser. No. 146,086

Int. Cl. H04n 1/44

U.S. Cl. 178—5.1

4 Claims



Private programming information, e.g., television programs provided for a community antenna television signal distribution system (CATV) to supplement those programs received from local commercial television stations, are propagated over a common cable medium, and are selectively recoverable only by participating subscribers.

Two private programs are formed with inverted modulation spectra in the mid-band channel frequency spacing. One or both programs are recovered at participating subscriber stations by heterodyne converters which re-invert the encrypted signals, shifting one or both signal spectra to otherwise unoccupied commercial channels for recovery by a conventional television receiver.

3,730,981

## COLOR TELEVISION RECEIVER

Yasumasa Sagihara, and Akira Horaguchi, both of c/o The General Corporation, 1116 Suenaga, Kawasaki-shi, Kanagawa-ken, Japan

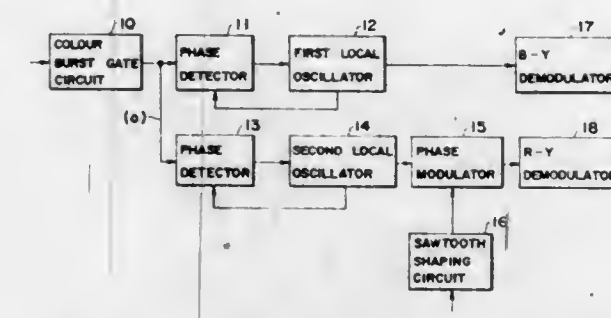
Filed June 1, 1971, Ser. No. 148,724

Claims priority, application Japan, Jan. 29, 1971, 46/3387; March 2, 1971, 46/11178

Int. Cl. H04n 9/44

U.S. Cl. 178—5.4 P

7 Claims



A color television receiver for use in a transmission system such as PAL system in which a pair of color signals provides quadrature balanced modulation of a color subcarrier simultaneously with respect to mutually orthogonal modulation axes with one of the axes being reversed by 180° for alternate horizontal scanning lines and in which the resulting color television signal contains a color burst signal capable of providing distinction of the polarity of the color subcarrier that is phase alternating, the receiver using two reference subcarriers indicating the demodulation axes during demodulation of the chrominance signal, one of said reference subcarriers reverting its phase in consecutive horizontal scanning lines by 180° in correspondence to the respective modulation axis, characterized in that for generating the reference subcarrier having an alternating phase a subcarrier of a frequency of  $f_{sc} \pm (2n-1)/2$  fH is generated, where  $f_{sc}$  denotes the color subcarrier frequency, fH the horizontal scanning frequency and  $n$  a positive integer, and this subcarrier is so modulated in a phase modulating means with a sawtooth wave of horizontal scanning frequency that its phase during each line keeps constant relative to the other reference subcarrier.

3,730,982

## BURST LEVEL DETECTORS AND PHASE DETECTORS UTILIZING THE SAME

Masayasu Niimi, Kodaira-shi, Tokyo, and Katsuo Mouri, Tot-suka-ku, Yokohama-shi, Kanagawa-ken, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

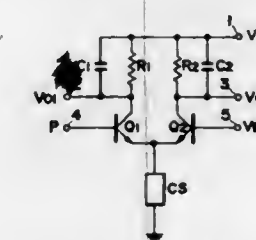
Filed Dec. 27, 1971, Ser. No. 212,183

Claims priority, application Japan, Dec. 28, 1970, 45/120454; April 16, 1971, 46/23865

Int. Cl. H04n 9/48

U.S. Cl. 178—5.4 CK

18 Claims



A burst level detector for use in a color television receiver comprises a balanced type differential amplifier stage including a pair of transistors, a pair of load resistors respectively connected to the transistors, means to impress a burst signal voltage upon the input terminal of the differential amplifier stage and means to derive an output signal from the differential amplifier, characterized in that the load resistors

have different resistance values to establish a point at which the polarity of the differential output from the differential amplifier stage reverses. The burst level detector can be converted into a phase detector by connecting a series circuit including a resistor and a capacitor across the load resistors.

3,730,983

## RECORDING AND REPRODUCING SYSTEM FOR COLOR VIDEO SIGNAL

Toshihiko Numakura, Tokyo, and Morio Yoshimatsu, Kanagawa-ken, both of Japan, assignors to Sony Corporation, Tokyo, Japan

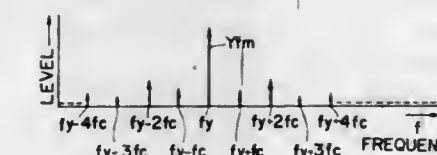
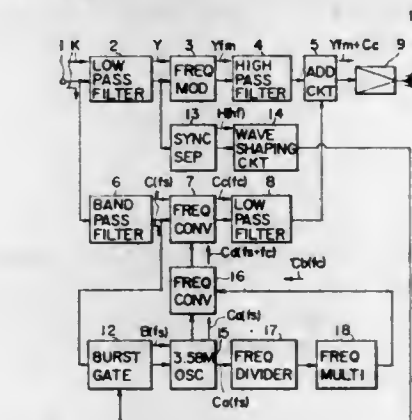
Filed May 15, 1970, Ser. No. 37,696

Claims priority, application Japan, Jan. 26, 1970, 45/6856

Int. Cl. H04n 9/38, 5/78

U.S. Cl. 178—5.4 CD

4 Claims



A composite color video signal may be magnetically recorded by separating the luminance and chrominance signals, and frequency modulating the former on a carrier, and frequency shifting the latter such that the bands of the frequency-modulated luminance signal and the frequency-converted chrominance signal are substantially not overlapping. The two signals are then combined and magnetically recorded with the frequency-converted chrominance signal added to the frequency-modulated luminance signal. To avoid a beat interference between the second harmonic of the carrier of the frequency-converted chrominance signal and the luminance signal, the system is designed to interleave the second harmonic of the carrier with the luminance signal. By avoiding the beat interference the amplitude of the frequency-converted chrominance signal relative to the amplitude of the frequency-modulated luminance signal can be made large with resulting good signal-to-noise ratio of the chrominance signal.

3,730,984

## METHOD AND APPARATUS FOR AUTOMATIC VIDEO DISTORTION CORRECTION

Clyde Smith, North Salem, N.Y., assignor to Columbia Broadcasting System, Inc., New York, N.Y.

Filed March 31, 1972, Ser. No. 240,195

Int. Cl. H04n 5/20, 7/10, 9/02

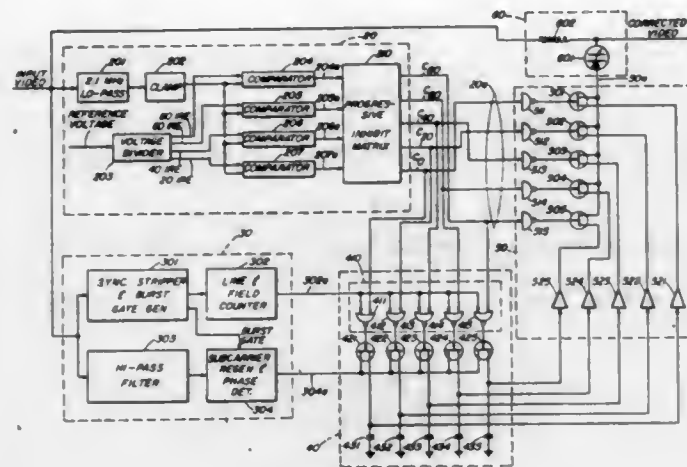
U.S. Cl. 178—6

21 Claims

An apparatus that receives input video which includes picture video and test signals that occur periodically between segments of picture video. The test signals contain video distortion errors dependent on at least one varying property of input



video. The system automatically generates corrected picture video, the degree of correction depending on errors extracted from the test signals. In a preferred embodiment of the invention, separate storage units are provided to store error signals



associated with differential gain and differential phase. Stored error signals, which are updated every video frame, are selectively used in corrective fashion, the instantaneous correction amount depending on the instantaneous luminance level of video picture information.

3,730,985

#### VIEWING AND MEASURING SYSTEM FOR REMOTE THERMAL ENERGY SOURCES

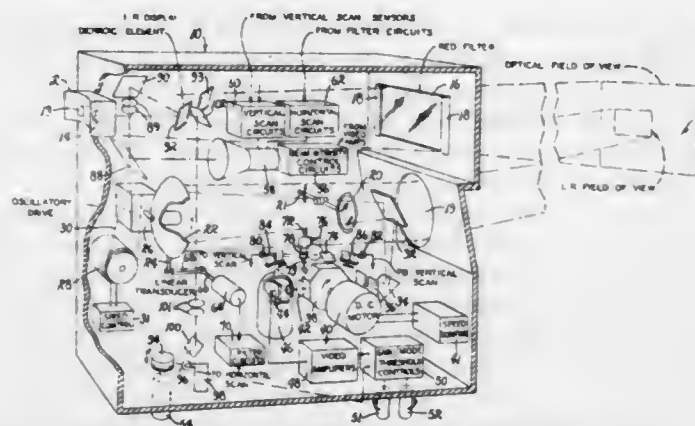
Theodore R. Whitney, Woodland Hills, Calif., assignor to Frank D. Orloff, Oildale; Everett C. Murray, Bakersfield and Miles I. Rider, Delano, Calif.

Filed Sept. 18, 1970, Ser. No. 73,488

Int. Cl. G01j 5/02; G01t 1/16; H04n 7/18

U.S. Cl. 178-6.8

42 Claims



A system for analyzing the temperature and other radiant energy characteristics of remotely located radiant energy sources which is provided with both an optical viewing system having a selected field of view, and a scanning and electronic display system viewing at least a portion of the selected field of view. The optical system provides a relatively wide information bandwidth display presenting an optical image having high detail but relatively low contrast, while the scanning and display system provides a relatively narrow information bandwidth display presenting a generated image with an extremely high level of contrast, typically of infrared sources having predetermined energy levels. The generated image preferably is in a distinct color from the optical image, and the images are superimposed for viewing by an operator in a manner such as to be distinctly displayed and spatially related.

#### 3,730,986 TELEVISION TRANSMISSION SYSTEM FOR TWO CLASSES OF INFORMATION

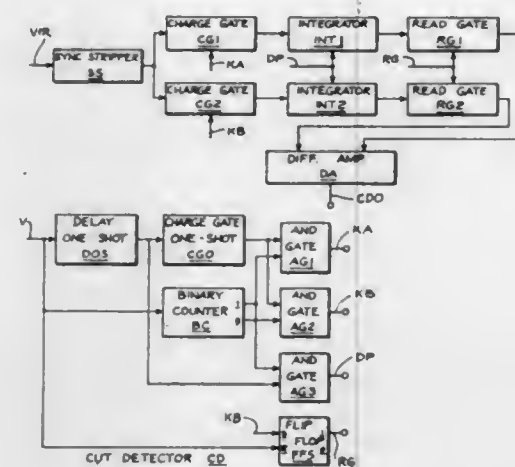
Charles A. Morchand, New York, N.Y., assignor to Data-Plex Systems, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 862,593, Aug. 26, 1969. This application April 5, 1971, Ser. No. 131,231

Int. Cl. H04n 7/08

U.S. Cl. 178-5.6

9 Claims



A television transmission system normally transmits fields of general viewer information which is interspersed with cuts. After at least some of the cuts a field of special viewer information is transmitted instead of the field of general viewer information. Associated with the field of special viewer information is a characteristic signal to identify the field so that a special television receiver, upon sensing the signal, can extract the field of special viewer information for display.

3,730,987

#### HORIZONTAL APERTURE CORRECTION WITH VARIABLE CHARACTERISTIC

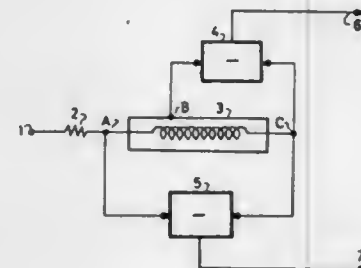
Helmut Radecke, Darmstadt Am Alten, Germany, assignor to Robert Bosch Fernsehgerate GmbH, Darmstadt, Filed May 12, 1971, Ser. No. 142,728

Claims priority, application Germany, May 12, 1970, P 20 22 971.4

Int. Cl. H04n 5/14

U.S. Cl. 178-7.1

9 Claims



A correction signal with a variable frequency characteristic especially for aperture correction of television signals in which a broad-band signal is fed into a delay device which is connected to difference amplifiers with opposite input polarity to separate and filter two signals and to cause portions of the signals to coincide. The resultant signals are mixed and may be attenuated for producing the correction signal of variable characteristic.

#### 3,730,988 ELECTRONIC TRANSMISSION SYSTEM OF STATIC PICTURE WRITINGS

Takehiro Shimizu, Setagayaku, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

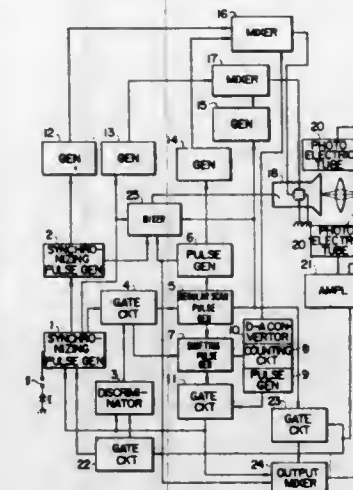
Filed July 29, 1970, Ser. No. 167,423

Claims priority, application Japan, July 29, 1970, 45/66378

Int. Cl. H04n 7/12

U.S. Cl. 178-6.8

3 Claims



The time required to electronically transmit the contents of a document, such as a picture or a printed paper, is markedly reduced. The document is divided into minute squares and each square is scanned by a preliminary scan for detecting the presence or absence of useful information. The preliminary scan is much more rapid than the regular scan used for forming a transmittable document image. Only those squares having useful information are scanned by the regular scan to form images which are transmitted. Sync pulses and shift pulses are transmitted along with the image signals to allow the receiver to properly position the image signals in generating a reproduction of the document.

3,730,989

#### TELEVISION HORIZONTAL TRANSISTOR OSCILLATOR AND AFC NETWORK

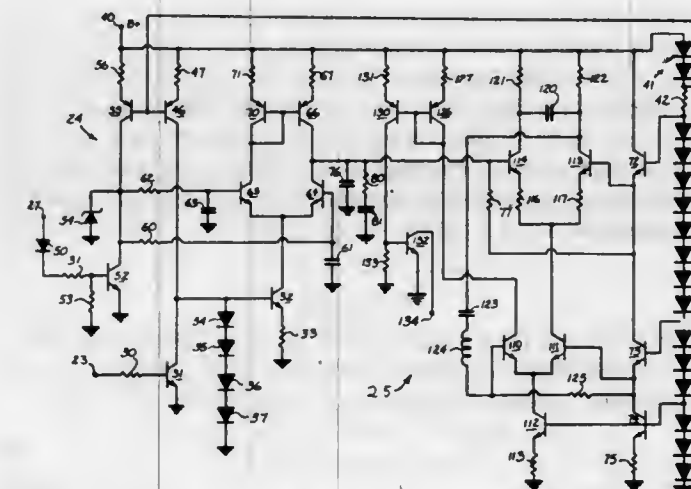
Dong Woo Rhee, Williamsville, N.Y., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Dec. 13, 1971, Ser. No. 207,216

Int. Cl. H04n 5/04; H03b 3/04, 5/12

U.S. Cl. 178-7.5 R

10 Claims



The oscillator includes first and second transistors and first and second resistors serially connected between the emitters of the first and second transistors, the base of the first transistor is connected to receive a control voltage and the base of the second transistor is biased at a reference voltage, a third transistor is connected to the common junction of the

first and second resistors, a positive feedback circuit is connected from the collector of one of the first and second transistors to the third transistor, and a capacitor is connected between the collectors of the first and second transistors. The AFC network receives an output derived from the oscillator output and with two integrators of different time constants generates two signals which are fed to a switching phase comparator together with a reference synchronizing signal to generate the oscillator control signal.

3,730,990

#### IMPLOSION-PROOF CATHODE-RAY TUBE

Yoshihiko Miyata, Mobara, and Noritada Katoh, Kitatama-gun, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

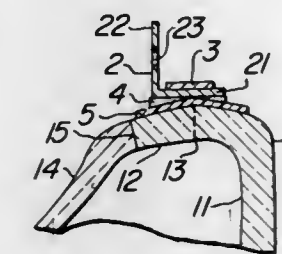
Filed July 28, 1970, Ser. No. 58,866

Claims priority, application Japan, Aug. 1, 1969, 44/72609

Int. Cl. H01j 61/50; H01k 1/28

U.S. Cl. 178-7.8

5 Claims



An implosion-proof cathode-ray tube which is provided with a reinforcing band for tightening the side walls of a joined portion what is called a mold-match portion, between a face portion and a skirt portion of a panel portion of a glass-made envelope through the so-called pad assemblies disposed on the four corners of the joined portion and each comprising a metallic fixture for a cabinet and a pad connected with the fixture, and in which a hardenable bulking agent is filled into gaps between the side walls of the joined portion or a single-side adhesive tape surrounding said side walls of the joined portion and the pads, thereby increasing the implosion-proof force and facilitating the location of the fixtures.

3,730,991

#### GROUNDING FACEPLATE KINESCOPE SYSTEM

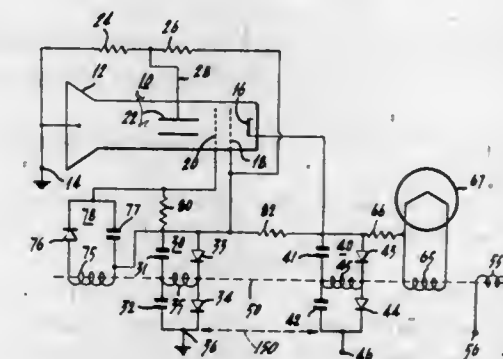
Robert Fincher Sanford, Princeton Junction, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 22, 1971, Ser. No. 108,921

Int. Cl. G01d 15/14; H04n 1/22; H01j 29/52

U.S. Cl. 178-7.5 R

6 Claims



The electron gun of a kinescope is operated at a negative high voltage so as to permit its thin faceplate to be grounded to reduce the possibility of "punch-through" while still maintaining reasonable spot size. Signals to be displayed are direct current coupled to the cathode of the electron gun through a first power supply of substantially the same magnitude as a second power supply providing the high voltage potential to the control grid. The use of a thin faceplate kinescope enables increases in light efficiency for recording on electrophoto-



graphic paper while the use of the direct current coupling provides an average brightness level which is substantially independent of the instantaneous value of applied signal amplitude.

3,730,992

# **LIGHT VALVE PROJECTOR WITH IMPROVED IMAGE DETAIL AND BRIGHTNESS**

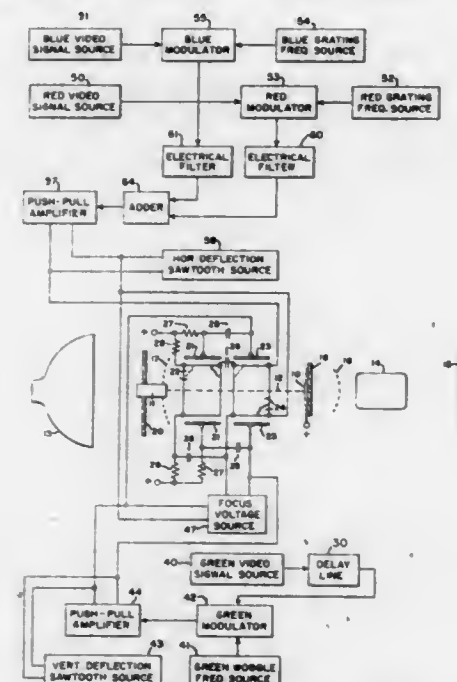
Thomas T. True, Camillus, N.Y., assignor to General Electric Corporation, Syracuse, N.Y.

Filed Dec. 17, 1970, Ser. No. 99,058

Int. Cl. G021 1/34; H04n 9/12

U.S. Cl. 178—5.4 BD

17 Claims



Vestigial filtering of each of the modulated red and blue electrical carriers in a light valve projector reduces light energy of the particular wavelength diffracted by optical diffraction gratings resulting from one electrical sideband and blocked by Schlieren optics output bars, and increases light energy of the same wavelength diffracted by optical diffraction gratings resulting from the other electrical sideband and passed through the Schlieren optics output slots. The red signal filter attenuates lower sideband energy and transmits upper sideband energy, and the blue signal filter attenuates a portion of upper sideband energy and transmits lower sideband energy. A delay line in the green video circuitry equalizes time delay introduced by the filters.

3,730,993

# **TRANSMISSION LINE CIRCUIT HAVING COMMON DELAY LINE FOR TWO SIGNAL PATHS OF OPPOSITE DIRECTION**

Hiro Moriyasu, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 15,567, March 2, 1970, abandoned.

This application Jan. 13, 1972, Ser. No. 217,647

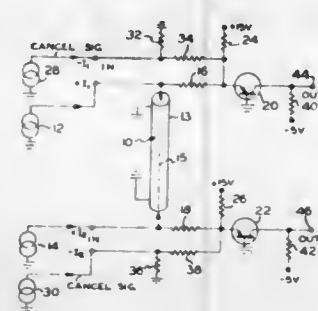
Int. Cl. H041 5/14

U.S. Cl. 178—59

14 Claims

A transmission line circuit is described in which a single delay line is employed for transmitting two different signals in opposite direction therethrough to provide the same time delay in both signals with no distortion. The transmission line is terminated at both ends in its characteristic impedance by a termination resistor approximately equal to such characteristic impedance connected in series with the emitter to base junction resistance of a termination transistor connected as a common base amplifier. A signal cancellation means is connected to the emitter of each transistor to cancel the undelayed portion of the input signal transmitted through the termination resistor while enabling the delayed portion of

such input signal to be transmitted through the delay line to the output at the collector of the other termination transistor



and thereby preventing crosstalk between the two signals. The transmission line circuit is employed as a delay line in the vertical deflection system of a cathode ray oscilloscope.

3,730,994

# **SYNCHRONIZING ARRANGEMENTS**

John Brian Terry, Great Totham, Maldon, Essex, and David Fleming Corlett, Chelmsford, both of England, assignors to The Marconi Company Limited, London, England

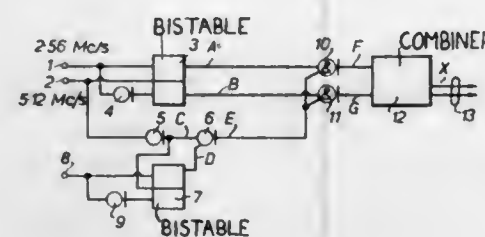
Filed Aug. 31, 1970, Ser. No. 68,210

Claims priority, application Great Britain, Aug. 30, 1969, 43,277/69

Int. Cl. H03k 5/13; H041 7/08

U.S. Cl. 178—69.5 TV

7 Claims



A synchronizing arrangement includes a source of a bi-polar signal at a fundamental synchronizing frequency in every  $n^{\text{th}}$  cycle of which the portion of time in the half cycle occupied by a signal excursion of one sense is varied with respect to the portion of time occupied by signal excursions of said one sense in other half cycles. The signal excursion variations are detected so as to provide a synchronizing signal at  $1/n$  of the fundamental frequency.

3,730,995

# **VOICE SWITCHED MICROPHONE CONTROL SYSTEM**

Max Vernon Mathews, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 16, 1971, Ser. No. 199,228

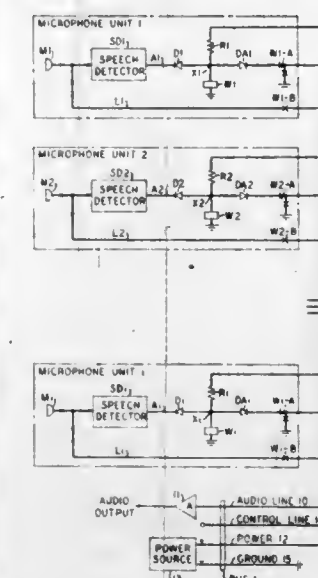
Int. Cl. G101 1/04

U.S. Cl. 179—1 VC

1 Claim

Voice activated control apparatus selectively connects one of a plurality of microphones to an audio line and inhibits all other microphones from capturing the line while the initial connection is maintained. Each microphone is connected to an associated speech detector and relay. In response to voice signals from a microphone, the associated speech detector activates a relay which connects the microphone to the line and

generates a signal which inhibits the other relays. Other users cannot interrupt the present speaker because their relays



remain inhibited as long as the speaker continues. The same circuitry can accommodate any number of microphones.

3,730,996

# **TELEPHONE AUXILIARY DEVICE**

Tadahisa Iwasaki, Sumida-ku, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

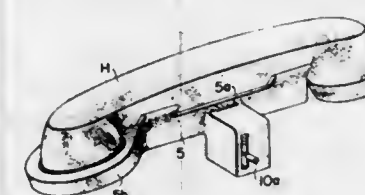
Filed July 28, 1971, Ser. No. 166,847

Claims priority, application Japan, July 29, 1970, 45/75553

Int. Cl. H04m 11/00

U.S. Cl. 179—1 HS

4 Claims



A telephone auxiliary device has a housing adapted to be seated on a telephone body with a handset removed, the handset being placed on the housing. Within the housing there are disposed a movable plate pivoted at one end to the housing and provided at the other end with an adapter button for detecting a handset; a hook button actuating plate pivoted at its intermediate portion to approximately the center portion of the movable plate, with one end coupled to a plunger responsive to an incoming bell signal and with the other end extending over the hook buttons of the telephone; and a spring to bias the movable plate and the hook button actuating plate into closely adjacent positions. In operation, the hook buttons of the telephone are allowed to move upward, but the handset placed on the telephone auxiliary device is held in a fixed position.

3,730,997

# **METHOD AND APPARATUS FOR REMOTELY MANIPULATING AN AUTOMATIC TELEPHONE ANSWERING DEVICE**

Akira Konno, Tokyo, Japan, assignor to Pioneer Electronic Corporation

Filed May 19, 1970, Ser. No. 38,854

Claims priority, application Japan, May 19, 1969, 44/38088

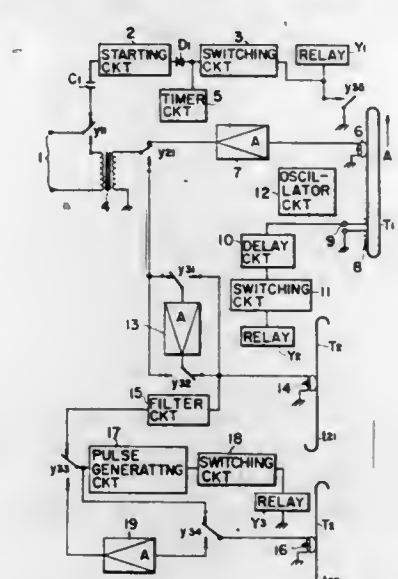
Int. Cl. H04m 1/64

U.S. Cl. 179—6

4 Claims

This is a device for remotely listening to a message of a calling party previously recorded in a telephone answering device in the owner's absence. This is accomplished by provid-

ing a first and second track in one message recording tape, for recording the message signal from a calling party. The recorded message signal from the calling party and a remote manipulating signal sent by a remote manipulating person are on the first track, and only the remote manipulating signal



recorded through a filter circuit is on the second track. When the message signal from the calling party recorded on the first track is remotely listened to all functions of the device are returned to the stand-by state by the use of the remote manipulating signal which is read out from the second track after all of the message signals have been read out.

3,730,998

# **TDMA SATELLITE COMMUNICATIONS SYSTEM WITH AN APERTURE WINDOW FOR ACQUISITION**

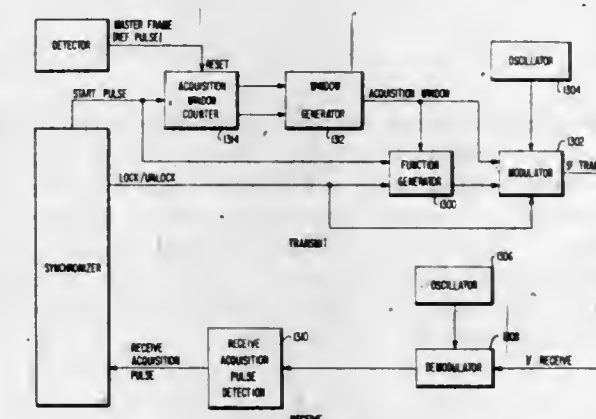
William G. Schmidt, Rockville; Ora G. Gabbard, Germantown, both of Md.; John M. Husted, Vienna, Va.; Wilfrid G. Maillet, Oxon Hill, and Marlinus A. Bos, Rockville, both of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Aug. 11, 1971, Ser. No. 170,932

Int. Cl. H04j 3/06

U.S. Cl. 179—15 BS

4 Claims



In a satellite transponder communication system operating in a time division multiple access mode, each earth station transmits data in a burst format. All bursts within a single transponder frame are synchronized to a special reference burst which contains no data communications. A single earth station sends out the reference burst as well as its normal burst, and in the case of multi transponders and multi transponder frames, the single reference station sends out all of the reference bursts for the various transponder frames. Data to be transmitted may be received in many different forms and included within the same burst because of the modular arrangement of the earth stations. Individual terrestrial interface modules receive data in various forms, convert the data into



bit form which is compatible with the TDMA system, store the converted bit stream and hold the block of data until a multiplexer requests the block of data for inclusion into the earth station's transmitted burst. The arrangement of blocks of data within a burst and the timing and duration of a burst is controlled by digital words stored in a memory. Complete reordering of burst times and the arrangement of blocks of data within a burst is accomplished by changing the words stored in the memory. A system on the receive side of the earth station extracts blocks of data in selected bursts for conveyance to selected terrestrial interface modules. Acquisition of the proper burst time within each frame is accomplished by sending out a low power signal and monitoring its phase relative to the received frame reference. Apertures are provided to insure that no two earth stations are simultaneously in the acquisition mode.

3,730,999

## TELEPHONE RING-TRIP CIRCUIT

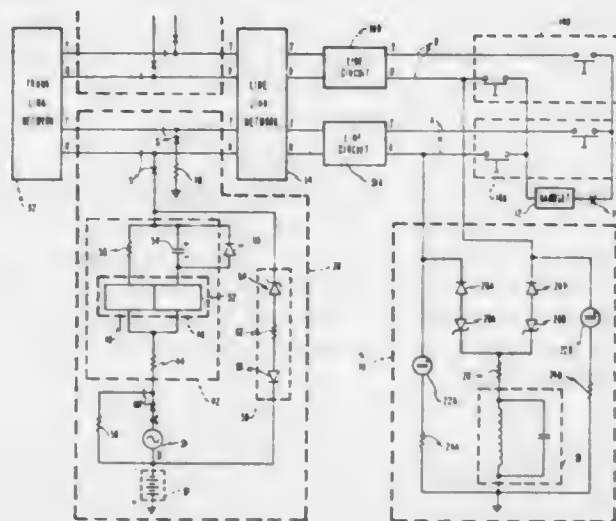
William E. Shaffer, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Oct. 26, 1971, Ser. No. 192,020

Int. Cl. H04m 3/02

U.S. Cl. 179-84 R

11 Claims



A discharge circuit prevents charge buildup on the plates of a capacitor in a telephone ring-trip circuit over each A.C. cycle of ringing current until a telephone call is answered, thereby avoiding premature ring-trip operation. During the application of a ringing signal through the ring-trip circuit, the capacitor charges up during a first half of each A.C. cycle and discharges through the discharge circuit during a portion of the second half of each A.C. cycle.

3,731,000

## EQUIPMENT FOR SWITCHING CALLS FROM REMOTE TRUNK GROUPS TO DISTANT CENTRALIZED OPERATOR SERVICE CENTER

Amos Edward Joel, Jr., South Orange, N.J., assignor to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Dec. 16, 1970, Ser. No. 98,801

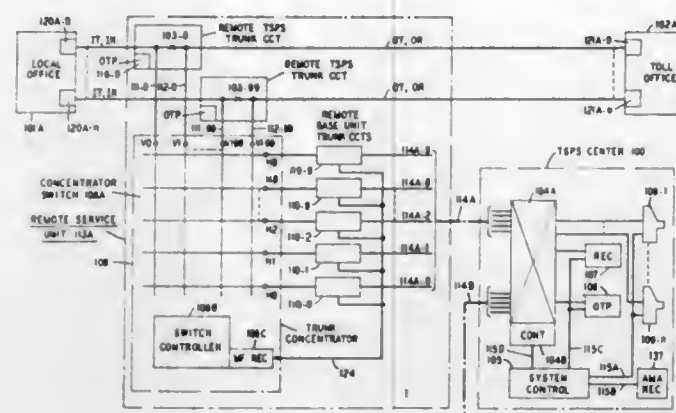
Int. Cl. H04m 15/26, 3/00

U.S. Cl. 179-8 R

20 Claims

A telephone system is disclosed in which centrally located traffic service position system (TSPS) equipment cooperates with groups of remotely situated trunks to provide the operator service required on the person-to-person type calls served by the trunks. A crossbar type switch operating as a concentrator at each remote location temporarily interconnects

calling ones of the remote trunks with digit receivers, outputters, and operator positions at the TSPS center. The TSPS



equipment also provides supervision and charge data recording via a data link for all calls served by the trunks.

3,731,001

## MULTIPLE LINE SCANNING SWITCHING SYSTEM

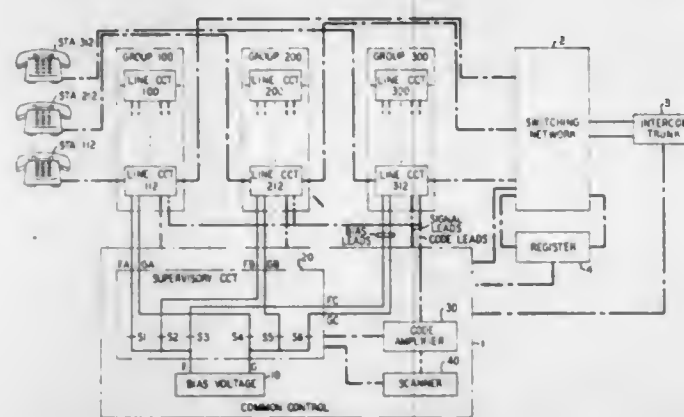
David Lee Fairchild, Broomfield, and Michael Stephen Lane, Boulder, both of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 30, 1971, Ser. No. 213,907

Int. Cl. H04q 3/72, 3/24

U.S. Cl. 179-18 FH

13 Claims



A switching system arrangement for simultaneously scanning multiple groups of line circuits to locate calling and called stations connected to concurrently scanned ones of the line circuits. A supervisory circuit selectively removes bias voltage from one lead of pairs of bias leads extending to idle and busy ones of the line circuits assigned to the concurrently scanned line circuits to facilitate the identity of a line circuit connected to a calling station. Subsequently, the supervisory circuit removes bias voltage from the pair of bias leads extending to the group of line circuits wherein the line circuit connected to the called station is located. Finally, the switching system interconnects the calling station and the called station through the line circuits identified from the ones of the concurrently scanned line circuits.

3,731,002

## INTERCONNECTED LOOP DATA BLOCK TRANSMISSION SYSTEM

John Robinson Pierce, Warren Township, Somerset County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 8, 1970, Ser. No. 79,185

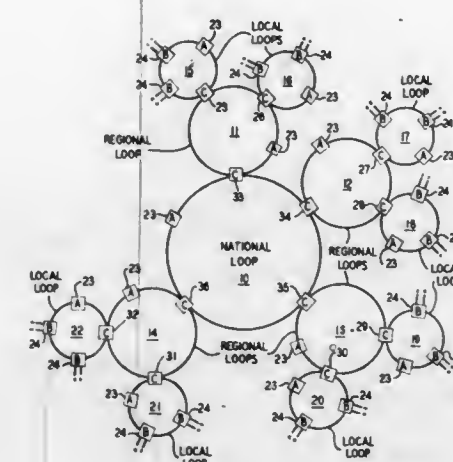
Int. Cl. H04j 3/08

U.S. Cl. 179-15 AL

11 Claims

A closed loop transmission system is described in which a plurality of stations have access to each loop to write messages

into and read messages from standard-sized message blocks transmitted around the loop. One station in each loop provides regeneration of all message blocks. The various loops are interconnected by switching stations which respond to ad-



dress information at the head of each message block to selectively switch the block to the interconnected loop. The next required address is always substituted for the current address to simplify address recognition. Alternate and redundant routing are also provided for.

3,731,003

## NON-DIAL STATION SERVICE FOR PABX TELEPHONE SYSTEM

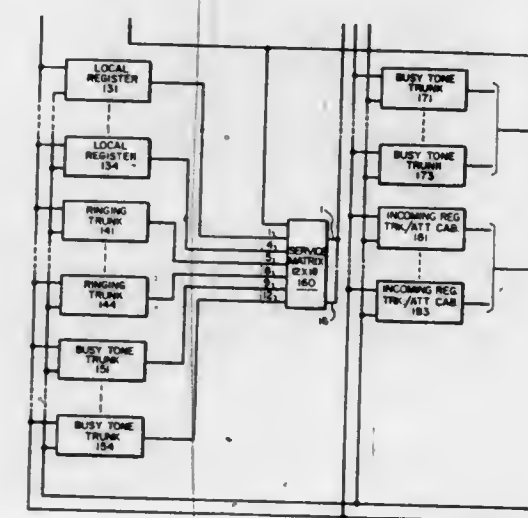
Elmer W. Krock, Chicago, and Charles J. Simon, Hinsdale, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed July 22, 1971, Ser. No. 165,252

Int. Cl. H04m 3/42

U.S. Cl. 179-27 FF

3 Claims



A private automatic branch telephone system controlled by a central processor to interconnect stations. Included are an attendant cabinet, central office trunks, a paging circuit and attendant's link circuits that are initially operable to connect a central office trunk to an associated attendant cabinet and further operated to access the paging circuit.

3,731,004

## IMPEDANCE MATCHING CIRCUIT FOR TONE RINGING

Michael C. J. Cowpland, and Donald A. Draper, both of Ottawa, Ontario, Canada, assignors to Microsystems International Limited, Montreal, Quebec, Canada

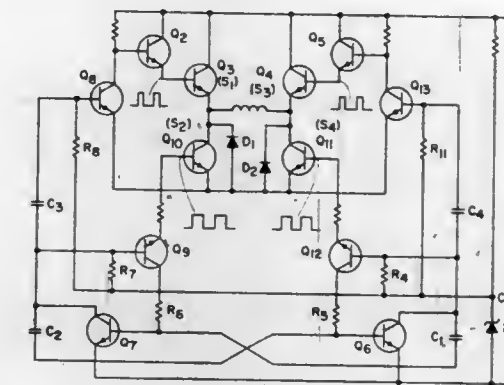
Filed June 1, 1971, Ser. No. 148,530

Claims priority, application Canada, May 28, 1971, 114,223

Int. Cl. H04m 1/76

U.S. Cl. 179-84 T

3 Claims



The invention relates to an impedance matching circuit designed to minimize current drain on the supply thereto while maintaining maximum current driving efficiency through a load and particularly adapted to drive an inductive load. The invention has particular applicability to the field of telephony, in that the circuit may be used to drive a tone ringer for a telephone set.

3,731,005

## LAMINATED COIL

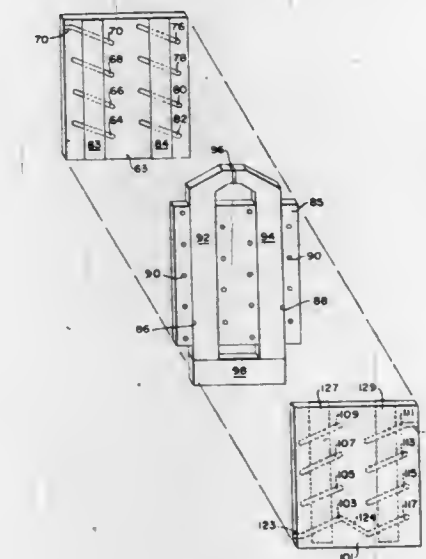
Paul M. Shearman, Plainville, Mass., assignor to Metalized Ceramics Corporation, Providence, R.I.

Filed May 18, 1971, Ser. No. 144,609

Int. Cl. G11b 5/20; H01f 5/00

U.S. Cl. 179-100.2 C

15 Claims



A coil having a core and method of fabricating that coil by forming layers of green ceramic, forming openings and depositing metal in predetermined patterns in and through the layers, assembling the layers with the metalized patterns so arranged as to form three-dimensional conductive paths, and firing the green ceramic layers simultaneously to bond the metal to the ceramic and to vitrify the ceramic. The openings may be formed by mechanical means or the layers may be discontinuous and staggered relative to each other to form the openings for the insertion of the core or cores about which the three-dimensional paths form coils.



# 3,731,006 DEVICE FOR SELECTIVELY REPRODUCING SOUND ON ONE OF A PLURALITY OF TRACKS

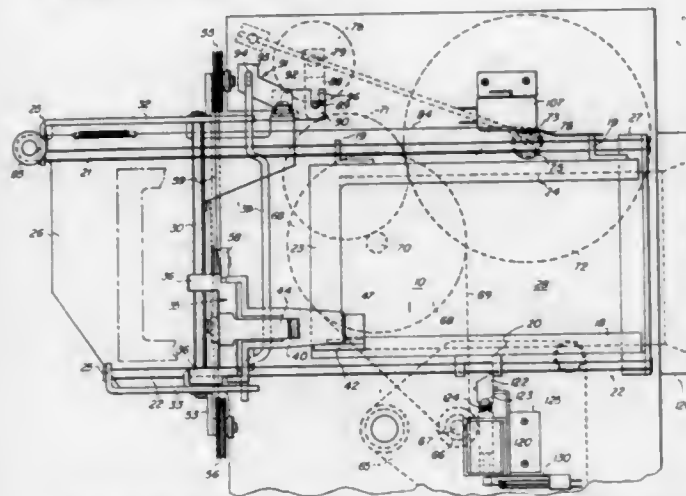
John G. Streiffert, and Edward Muka, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 7, 1971, Ser. No. 150,698

Int. Cl. G11b 21/12, 21/04

U.S. Cl. 179—100.2 MD

17 Claims



Reproducing apparatus comprises a device for selectively positioning a transducer head with respect to a selected one of a plurality of tracks on either of two opposed planar surfaces of a record medium and for rendering operative the transducer head associated with the selected track for reproducing information thereon.

# 3,731,007 MAGNETIC HEAD HAVING A MAGNETO-RESISTIVE BRIDGE CIRCUIT

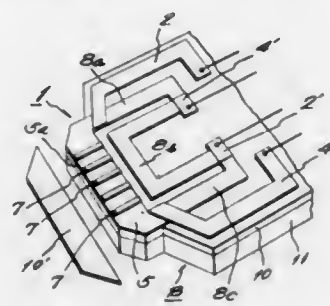
Noboru Masuda, Kawaguchi City, Saitama Prefecture; Masahi Kuroyanagi, Kohtoku, Tokyo, and Hiroaki Kase, Shinagawaku, Tokyo, all of Japan, assignors to Denki Onkyo Co., Ltd., Tokyo, Japan

Filed April 19, 1971, Ser. No. 135,238

Int. Cl. G11b 5/30; H01c 7/16

U.S. Cl. 179—100.2 CH

27 Claims



A magnetic head is provided having at least one loop-shaped magneto-resistance effect device to which two input terminals and two output terminals are alternately connected, four resistor portions being respectively formed between these four terminals. One of these resistor portions is selected as a detector portion and has an external surface arranged to contact a magnetic flux applying means, such as a magnetic tape.

# 3,731,008 CIRCUIT FOR ENERGIZING AND DE-ENERGIZING A RELAY TO CONTROL THE OPERATION OF A TAPE RECORDER

Kalju Meri, Maspeth, N.Y., assignor to ElectroSpace Corporation, Bronx, N.Y.

Filed April 9, 1971, Ser. No. 132,782

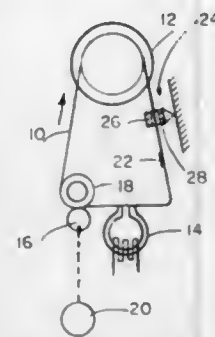
Int. Cl. G11b 15/06, 27/24

U.S. Cl. 179—100.2 S

11 Claims

A circuit for energizing and de-energizing a relay to start and stop a tape recorder receiving an endless tape loop pro-

vided with an electrically conductive foil disposed on a portion thereof. The circuit includes a capacitor in series with the relay so that when an energizing member is activated, the capacitor which is initially charged is then discharged across the relay to start the tape recorder and thereby cause movement of the endless tape loop. When foil sensing contact members, associated with the capacitor, are engaged by the moving



conductive foil of the endless tape loop, the capacitor which is recharged during operation of the tape recorder is again discharged to open the relay and thereby stop the tape recorder. The capacitor is disposed in the circuit to provide for the tape recorder starting in both conditions where the foil sensing contact members are engaged and are out of engagement with the conductive foil.

# 3,731,009 PHONOGRAPH PICKUP HAVING CAPACITIVE TRANSDUCER DIRECTLY COUPLED TO CANTILEVER STYLUS ARM

Shoji Watanabe, Shibuya-ku, Tokyo, and Nobuo Yakushiji, Totsuka-ku, Yokohama-shi, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

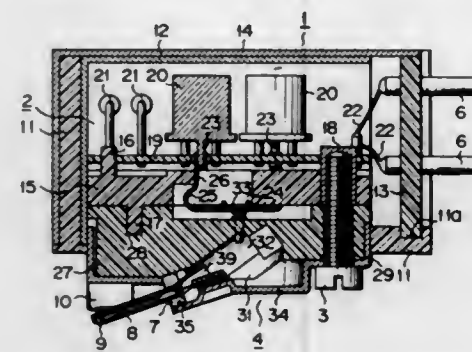
Filed Aug. 17, 1971, Ser. No. 172,591

Claims priority, application Japan, Nov. 4, 1970, 45/96422; Aug. 17, 1970, 45/81430

Int. Cl. H04r 19/10; G11b 3/00

U.S. Cl. 179—100.41 K

4 Claims



A pickup device comprises a base in which an active circuit is assembled, and a transducer detachably mounted on the base and having a cantilever stylus arm extending therefrom. The transducer has a sealed portion, and a variable capacitor portion disposed within the sealed portion. The variable capacitor is comprised of a stationary electrode having an electret plate, and a movable electrode integrally provided at the rear end of the cantilever stylus arm in a manner to face to the stationary electrode.

# 3,731,010 LATCHING TELEPHONE CUT-OFF SWITCH

Robert S. Goodrich, 27901 S. Golden Meadow Drive, Palos Verdes Peninsula, Calif.

Filed March 15, 1972, Ser. No. 234,946

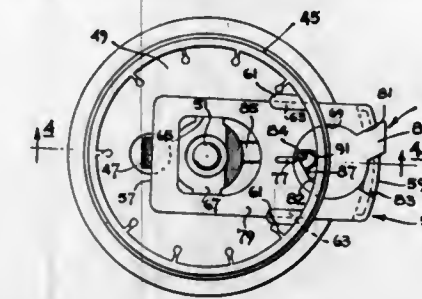
Int. Cl. H04m 1/19

U.S. Cl. 179—167

7 Claims

In a telephone cut-off device for a telephone transmitter, which comprises an insert housing disposed between the

mouthpiece of the transmitter and the main transmitter housing, having a spring switch means therein and a slidable switch actuator extending outwardly from the device, the improve-



ment which comprises means for locking the actuator in a depressed position relative to the cut-off device causing a displacement of the spring switch while the actuator is so locked.

# 3,731,011 SYSTEM FOR MEASURING THE REGENERATION THRESHOLD OF REPEATERS FOR MULTIPLEX PULSE CODE MODULATION AND DATA TRANSMISSION SYSTEMS

Jean M. Lachaise, 28 rue des Freres Lumiere, Fresnes, France

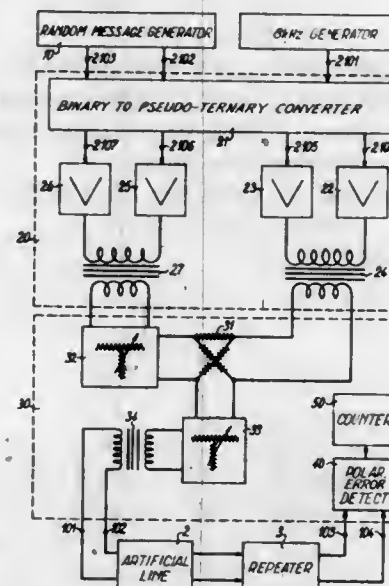
Filed Nov. 22, 1971, Ser. No. 200,805

Claims priority, application France, Dec. 3, 1970, 7043522

Int. Cl. H04b 3/46

U.S. Cl. 179—175.31 R

5 Claims



A system for supervising the operation of a repeater for pseudo-ternary coded signals, comprising means for applying a random sequence of message signals transmitted in pseudo-ternary code to the repeater input via an artificial line whose characteristics simulate the characteristics of a real line; means for periodically injecting into such sequence measuring signals having at least one of a number of predetermined compositions; means for adjusting the amplitude relationship of a single pulse chosen in each of the measuring signals to the peak amplitude of all the transmitted signals; and counting means for measuring at the repeater output the number of polarity errors occurring in a predetermined period of time.

# 3,731,012 CURRENT LIMITING AND RESISTANCE MONITORING CIRCUIT

William E. Shaffer, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Sept. 30, 1971, Ser. No. 185,180

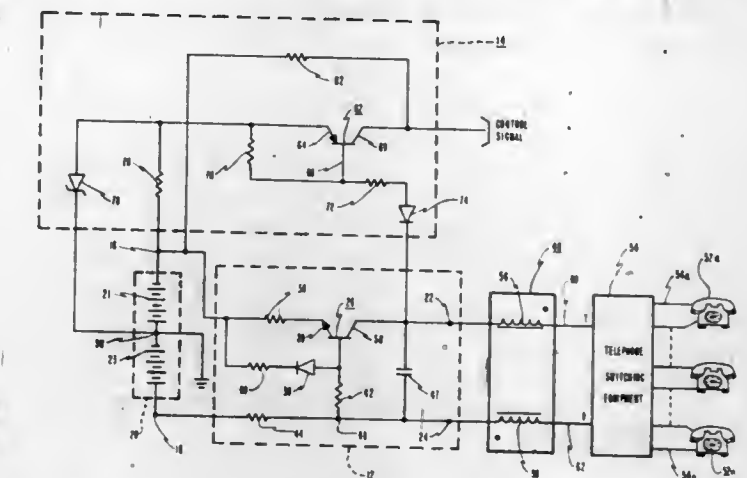
Int. Cl. H04b 3/46

U.S. Cl. 179—175.3

5 Claims

A current limiting and resistance monitoring circuit provides a means for limiting the amount of current flow to a

telephone connection connected thereto and for generating a



control signal having a level that is a function of the resistance of the telephone connection.

# 3,731,013 SWITCH CONTROL MEANS

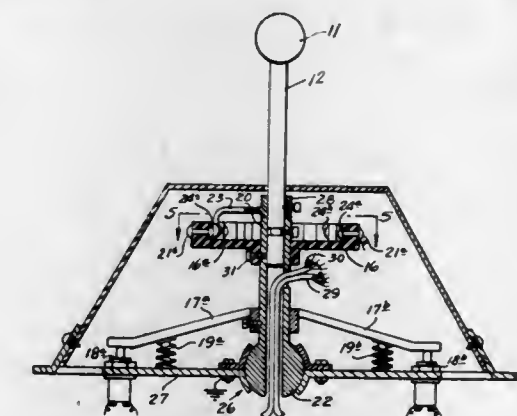
Charles D. Nightengale, Rural Route 3, Box 70, Scott City, Kans.

Filed Jan. 7, 1972, Ser. No. 216,134

Int. Cl. H01h 3/02

U.S. Cl. 200—4

11 Claims



A new and improved switch controller is described which permits any one of a predetermined number of switch controlled devices to be actuated in any one of a predetermined number of states. In the embodiment described, a rotary switch having a predetermined number of positions is interconnected with a plurality of push-button switches, so that for any position of the rotary switch one of four push-button switches may be selectively actuated. Each push-button switch can actuate the winding of a relay which in turn closes its associated contacts to provide current to the solenoid of a solenoid activated device. Thus, the rotary switch selects the apparatus to be actuated, while the selected push-button switch determines which solenoid winding associated with the selected apparatus will be energized with current. Described in conjunction with the aforesaid switch control device is a particular solenoid actuated device, comprising a unit for operating hydraulic valve box plungers.

# 3,731,014 KEYBOARD SWITCH AND UNITIZED MULTIPLE SWITCH CONFIGURATION

John F. Brady, Clifton, N.J., assignor to Universal Technology, Inc., Verona, N.J.

Filed Aug. 2, 1971, Ser. No. 168,053

Int. Cl. H01h 13/52

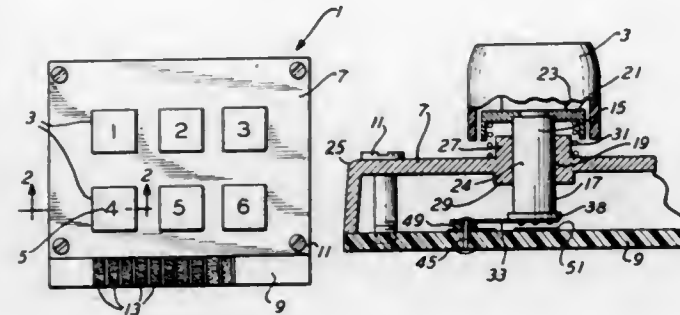
U.S. Cl. 200—5 A

21 Claims

A unitized configuration including plurality of key top switches. A single unit shell overlies and is secured to a circuit



board upon which the contact leafs for the various switches are so mounted as to be cantilevered over their respective printed contacts. The plungers associated with the several key tops pass through openings in the shell and are biased out of



contact with the underlying cantilevered leafs by spring means. Depressing of the key tops drives the plungers downward to deflect the respective contact leafs and close the associated circuits.

3,731,015

# CONTROL KEYBOARD SWITCH WITH CANTILEVERED CONTACT AND DIODE MATRIX ARRAY

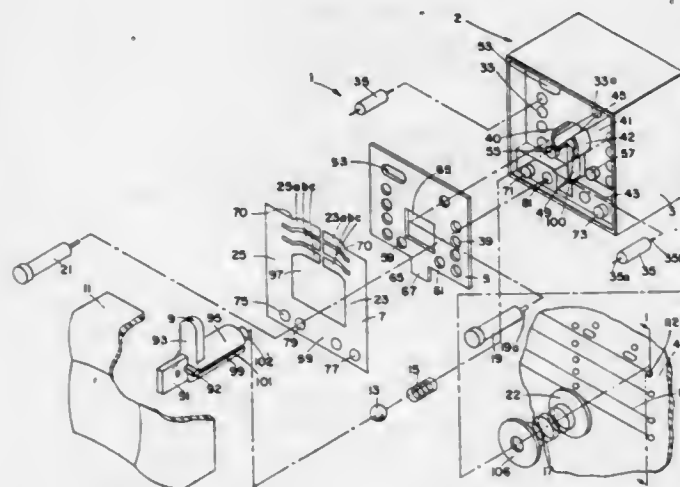
John F. Brady, Clifton, N.J., assignor to Universal Technology Inc., Verona, N.J.

Filed May 18, 1971, Ser. No. 144,606

Int. Cl. H01h 13/52

U.S. Cl. 200-5 A

18 Claims



A low profile keyboard unit including an etched circuit board and a plurality of keyboard switches mounted on one surface thereof. Individual switches include housings configured to carry in self-contained fashion up to ten diodes plus a resistor, the leads from these elements being passed through holes in the board and flow soldered at the back side of the board.

3,731,016

# SWITCH WITH ARC-PREVENTION GROOVES BETWEEN PLATE SUPPORTED CONTACTS

Takeshi Nadaguchi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed June 14, 1971, Ser. No. 152,677

Claims priority, application Japan, June 6, 1970, 45/64011

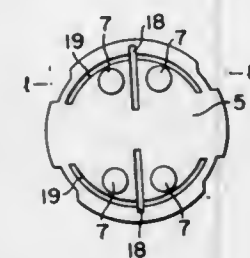
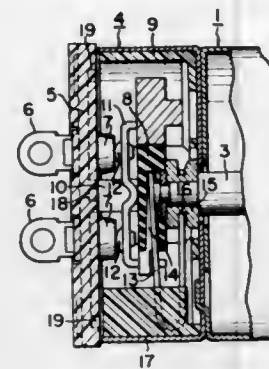
Int. Cl. H01h 9/30, 19/58

U.S. Cl. 200-11 R

4 Claims

A variable resistor-switch having a plurality of con-

tacts wherein a plurality of grooves are formed in order to in-



crease the surface insulation length, thereby improving the insulating effect to higher rated voltages.

3,731,017

# MULTI-POSITION SWITCH WITH IMPROVED WAFER SWITCH CONTACT ARRANGEMENT

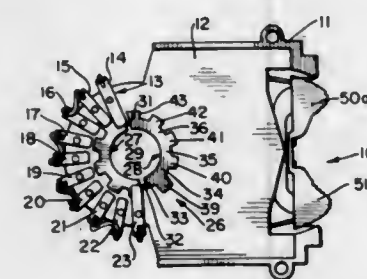
Jean W. Runtz, Morton Grove, Ill., assignor to North American Philips Corporation, New York, N.Y.

Filed Aug. 10, 1971, Ser. No. 170,521

Int. Cl. H01h 19/58

U.S. Cl. 200-11 D

11 Claims



A multi-position switch for a decade resistor capable of changing the resistance between a pair of terminals monotonically from 0 to 9 units in ten equal steps in one direction and back to 0 in the eleventh step in the same direction. One resistor of unit resistance value is connected in series with four resistors of 2-unit resistance value between the terminals, and the switch contacts are arranged so that the terminals are shorted together in a first position and in each successive position the unit value resistance is alternately included in series between the terminals or short-circuited and replaced by an additional 2-unit resistor.

3,731,018

# DISCONNECTING SWITCH OPERATING LINKAGE

Raymond J. Spisak, East Pittsburgh; Robert N. Becker, Irwin, and Wesley L. McKeithan, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 12, 1972, Ser. No. 261,894

Int. Cl. H01h 31/00

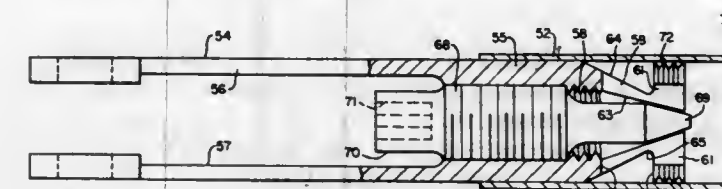
U.S. Cl. 200-48 R

8 Claims

A switch structure characterized by a plurality of spaced switch units and interconnected by movable tie rods including

adjustable connecting means between each unit and a corresponding tie rod which connecting means includes a clevis and a clamping portion comprising a plurality of spaced slots

wave in the structure. Provisions are included for adjusting the switch sensitivity by adjusting the spring preload on the spheres.



3,731,021

# TIME DELAY SWITCH WITH IMPROVED DASHPOT MEANS

Dominic Paul Edmund Barnard, Witney, England, assignor to Smiths Industries Limited, London, England

Filed Aug. 31, 1971, Ser. No. 176,568

Claims priority, application Great Britain, Sept. 11, 1970, 43,478/70

Int. Cl. H01h 7/03

U.S. Cl. 200-34

13 Claims

forming slotted sections movable between contracted and expanded positions, which sections include a serrated peripheral surface adapted for seizing the inner surface of the tie rods.

3,731,019

# OMNI-DIRECTIONAL FORCE SENSOR

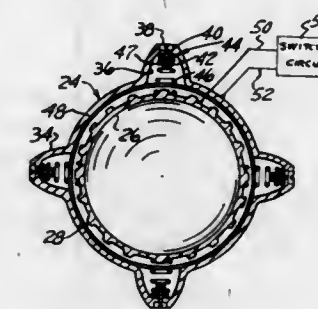
Byron T. Heurtebise, 2942 Lone Tree Road, Millford, Mich.

Filed July 23, 1971, Ser. No. 172,338

Int. Cl. H01h 35/14

U.S. Cl. 200-61.45 R

3 Claims



This application relates to a sensor. It is responsive to impact of predetermined magnitude from any direction. It can be mounted in a car for actuation responsive to impact of safety apparatus within an automobile.

3,731,020

# INERTIA SWITCH WITH MANUALLY ADJUSTABLE CONDUCTIVE SPRING ARM ASSEMBLY

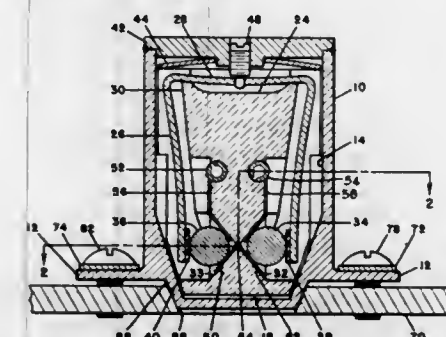
Kenneth C. York, Pomona, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Jan. 17, 1972, Ser. No. 218,329

Int. Cl. H01h 35/02

U.S. Cl. 200-61.45 R

15 Claims



An inertia switch capable of detecting the arrival of stress waves from any direction in the plane of the mounting surface is disclosed. In a preferred embodiment, a plurality of conductive spheres are held in a plurality of corresponding recesses by spring arms. A pair of interconnected conductors on each recess surface form, with the conductive spheres, an electrical circuit which is broken if any of the spheres is moved outwardly of its recess against the spring by any impact or stress

3,731,022

# INERTIA TYPE SWITCH WITH COAXIAL CONDUCTIVE SPRINGS

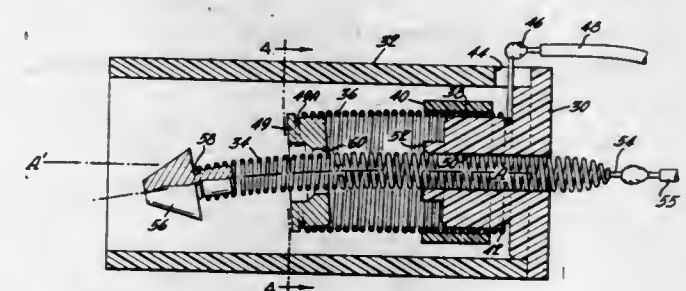
Peter J. Loftus, Middletown, Pa., assignor to Alcotronics Corporation, Mt. Laurel Township, N.J.

Filed Nov. 12, 1971, Ser. No. 198,219

Int. Cl. H01h 35/14

U.S. Cl. 200-61.49

5 Claims



A motion sensor for sensing shocks, vibrations or the like utilizing a pair of contacts mounted on vibratory supports so that when the supports vibrate the contacts close, completing an electrical circuit. The vibratory supports and the contacts are such that the quiescent deflections of the two supports in response to constant forces move the two contacts by the same amount to maintain a constant quiescent spacing



between the contacts and hence a constant sensitivity of the device to shocks, vibrations or other irregular motions. The sensitivity is therefore constant for a wide range of different quiescent orientations of the device.

3,731,023

## SAFETY REVERSING SWITCH

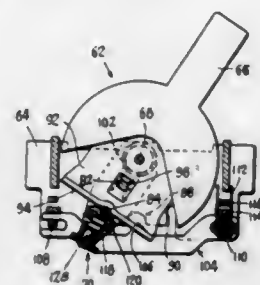
Robert E. Sheahan, Woodbridge, and Frank J. Plumb, Prospect, both of Conn., assignors to JBT Instruments, Inc., New Haven, Conn.

Filed July 28, 1972, Ser. No. 276,248

Int. Cl. H01h 15/18

U.S. Cl. 200—78

5 Claims



A lever-type operating mechanism for a safety reversing switch, comprising a manually operable lever having pivot means enabling it to undergo swinging movement, a U-shaped operating member disposed adjacent and actuated by the lever and having a pair of arms with elongate slots. A control means, which includes a cross pin extending through the slots, effects a snap movement of the operating member and pin when the lever is actuated. The mechanism includes an insulating slide plate which carries a switch contact and which has a slot through which the cross pin extends. The slide plate is characterized by a pair of hardened steel wear shoes, having flanges which extend into the slot of the plate to sustain impact forces from the pin during the snap movements of the latter, taken over a long period of time. The wear shoes are disposed on opposite sides respectively of the slide plate and have two sets of aligned apertures by which they are rigidly fastened thereto by means of rivets. The control means further comprises a compression spring carried by the operating member and a cup also carried thereby and having an indented bottom which engages the cross pin. One end of the spring is received in the cup, such that the spring is securely positioned or oriented as it biases the cross pin toward one set of corresponding ends of the elongate slots in the arms of the operating member.

3,731,024

## CENTRIFUGAL GOVERNOR

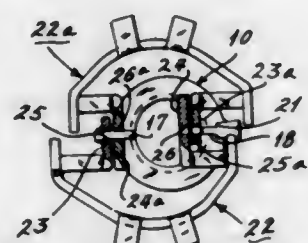
Earl A. Moody, St. Peters, Mo., assignor to Wagner Electric Corporation, Chicago, Ill.

Filed June 9, 1972, Ser. No. 261,274

Int. Cl. H01h 35/10; H02k 15/00

U.S. Cl. 200—80 R

20 Claims



A governor device for an electric motor having a rotatable shaft is provided with a retainer plate adapted to be connected for concerted rotation with the shaft, and opposed pivot pins are integrally provided on said retainer plate respectively hav-

ing free ends juxtaposed with the periphery of said shaft to retain a pair of governor weight members against displacement from pivotal engagement with said pivot pins when said shaft is connected with said retainer plate.

3,731,025

## BREATH OPERATED FLUSHING ARRANGEMENTS

Jacques J. Fillung, Chicago, Ill., assignor to Sloan Valve Company, Chicago, Ill.

Filed July 14, 1971, Ser. No. 162,412

Int. Cl. H01h 35/40

U.S. Cl. 200—81.9 R

2 Claims



A flushing arrangement for urinals in which the flush valve is operated without physical contact by the user of the urinal. An electric switch has a thin disc attached to the switch arm, which disc is activated by the breath of the user being blown against it. The switch closure effects the operation of the urinal flush valve through a solenoid operated by the switch.

3,731,026

## VACUUM SWITCHING SYSTEM

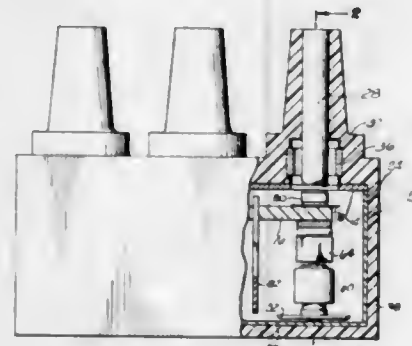
Floyd D. Miles, Saratoga, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 3, 1972, Ser. No. 215,059

Int. Cl. H01h 33/66

U.S. Cl. 200—144 B

4 Claims



A vacuum switching system having an evacuated housing and a plurality of electrical contacts therein. A buss is provided for internal connection to one of said contacts of said plurality of pairs. Another of said contacts may be connected to an external circuit. The other contacts of said pair are electrically connected to a shorting member and means are provided for electrically connecting and separating the pair of electrical contacts. Further, the system may comprise a plurality of sets of pairs of contacts with shielding means between adjacent sets. In addition, shielding means may be provided in the system wherever needed, in order to prevent splattering of parts of the system.

3,731,027

## ELECTRICAL PRESS KEY DEVICE WITH THERMIC EXCESS CURRENT RELEASE

Hans Arnhold, Kalberau, Germany, assignor to Heinrich Kopp, Kahl, Main, Germany

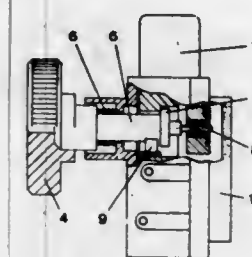
Filed Jan. 12, 1971, Ser. No. 105,895

Claims priority, application Germany, March 18, 1970, P 20 12 748.4

Int. Cl. H01h 21/10

U.S. Cl. 200—157

4 Claims



An electrical press key with a locking device and thermic excess current release wherein the actuating member of the locking device for the switch slide constitutes at the same time the rotary axle of a potentiometer of an electronic switching device for power regulation.

3,731,028

## RELEASEABLE LOCKING MECHANISM FOR PUSHBUTTON SWITCH WITH PILOT-LAMP ASSEMBLY

Sadao Ando, Fujisawa-shi, Kanagawa-ken, Japan, assignor to Yamatake Honeywell Co., Ltd., Tokyo, Japan

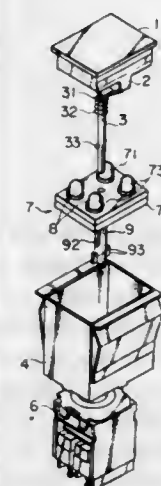
Filed Sept. 26, 1971, Ser. No. 175,102

Claims priority, application Japan, March 31, 1971, 46/23077

Int. Cl. H01h 9/02

U.S. Cl. 200—167 A

8 Claims



A four-sided pushbutton 1 projecting from the top of a housing 4 is secured to a switch-actuating rod 3 traversing a lamp holder 7 which supports the sockets of four pilot lamps 8, this holder consisting of two superposed and fixedly interconnected plates 71, 72 rotatably bracketing a flange 91 of a guide sleeve 9 for the rod in axially fixed position with reference to the holder. Upon depression of the pushbutton, the lower end of the rod operates a switch structure b; a cross-pin 33 on the rod normally engages in a pair of diametrically opposite longitudinal slots 92 of the sleeve to entrain the latter rotatorily for detaching a pair of lugs 93 at the foot of the sleeve from respective shoulders 52 in a depending neck 5 of the housing whereby, upon sufficient withdrawal of the pushbutton from the housing to enable its rotation, the lamp holder, the sleeve and the pushbutton with its rod can be bodily extracted from the housing as the cross-pin rises to the top of the slots at the level of the flange 91 to bear from below upon the upper holder plate 71. Such rotation is prevented in

a lower position of the pin 33 by a projection 72d depending from the lower holder plate 72; another projection 43, rising from the housing bottom, coacts with the depending projection 72d to insure correct reinsertion of the extracted unit into the housing. Proper relative orientation of the pushbutton and the pilot lamps is insured by an indexing spring 74 which normally fits into an elongate notch 31 on one side of the rod 3 to allow depression of the pushbutton 1 but which falls into another, lower notch 34 on the opposite side of the rod, blocking a descent thereof, if the pushbutton is rotated in the wrong sense to re-engage the lugs 93 of the sleeve with the shoulders 52.

3,731,029

## SYSTEM FOR PREVENTING CONTAMINANT DISPERSAL IN INSULATING FLUID OF ELECTRICAL APPARATUS

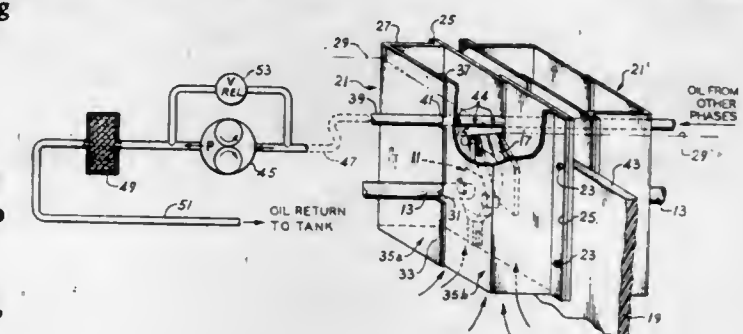
Arthur A. Hucker, Normandy, and David F. Winter, Kirkwood, both of Mo., assignors to Central Transformer, Inc., Pine Bluff, Ark.

Filed Jan. 20, 1971, Ser. No. 108,095

Int. Cl. H01h 33/68

U.S. Cl. 200—150 R

14 Claims



A system for use in electrical apparatus having contacts immersed in a body of insulating fluid and adapted to open and close causing arcing therebetween which produces contaminants in the fluid. The system includes a compartment for relatively closely confining said contacts, a fluid inlet in said compartment, a filter, and means, including a pump, for withdrawing fluid from the compartment through the inlet, pumping the withdrawn fluid through the filter, and returning the filtered fluid to said body of fluid. Contaminants produced in the fluid in the compartment by arcing of the contacts are thus filtered without being permitted to disperse throughout the body of fluid. As a method of preventing contaminant dispersal, the disclosure teaches withdrawing fluid of the body from a location closely adjacent the contacts, filtering the withdrawn fluid to remove the contaminants and subsequently returning the filtered fluid to the body of fluid.

3,731,030

## PUSHBUTTON SWITCH ASSEMBLY WITH PIVOTABLE CONDUCTIVE BRIDGING MEMBER AND MULTIPLE CONDUCTIVE PATH PRINTED CIRCUIT BOARD

Walter K. Holzer, Meersburg, Germany, assignor to Holzer Patent AG, Zug, Switzerland

Filed June 11, 1971, Ser. No. 152,163

Claims priority, application Switzerland, June 17, 1970, 9168/70

Int. Cl. H01h 13/14

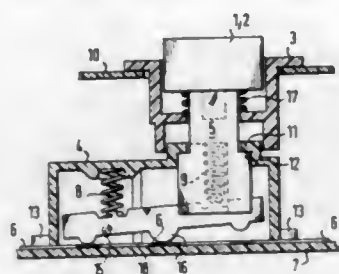
U.S. Cl. 200—159 R

5 Claims

A plurality of push-button switches mounted in a housing having a printed circuit board with conductive paths thereon as a base. Each push-button switch is mounted within the housing by a spring which biases the switch in an upward direction and includes a spring engaging a contact piece so that depression of the push-button switch causes the contact piece to rock on a bearing element in contact with a conductive path of the printed circuit board. A spring mounted between the housing and a portion of the contact bridge biases



the contact bridge in a first position where a conductive path is formed by the contact bridge between the conductive bearing element and one contact on the bridge and movement of



the contact bridge by depression of the push-button switch causes a new conductive path to be formed between another portion of the contact bridge, the conductive bearing element and another contact on the contact bridge.

3,731,031

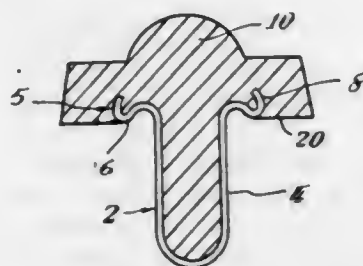
**OPERATING MEMBERS FOR SNAP-ACTION SWITCHES**  
Ernest McAlpine, Bill Quay, Gateshead, England, assignor to Burgess Micro Switch Company Limited, Durham, England  
Filed March 1, 1972, Ser. No. 230,591

Claims priority, application Great Britain, March 3, 1971, 5,884/71

Int. Cl. H01h 3/02

U.S. Cl. 200-172 R

4 Claims



An operating member, and method of producing same, for reciprocation within a close-fitting bore of a snap-action switch, the member including a guide pin having a hollow, deep-drawn shank portion with a consequential high-quality external finish thereto, an end portion of the guide pin comprising an increased-diameter shoulder forming the boundary of an insulating button moulded thereto and preventing deposition of the insulating material on the shank portion during the moulding process.

3,731,032

**ELECTRICAL SWITCH WITH CONTACT WIPING**  
Spencer C. Schantz, Oconomowoc, Wis., assignor to U.S. Controls Corp., New Berlin, Wis.  
Filed Oct. 28, 1971, Ser. No. 193,294

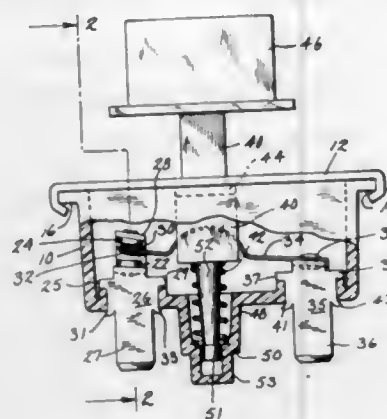
Int. Cl. H01h 1/36, 13/52

U.S. Cl. 200-164 R

6 Claims

An electrical switch having two fixed electrical contacts which are mounted within a housing in spaced-apart, face-to-face relationship. Two movable electrical contacts are mounted in back-to-back relationship on the end of a resilient arm between the two fixed contacts. The resilient arm is engaged in its central portion by an actuating plunger which is spring-loaded to hold one pair of contacts in a normally closed position and the other pair of contacts in a normally open position. Manual movement of the plunger closes the normally open contacts and opens the normally closed contacts. Release of the plunger reverses the action. The resilient arm is bowed in its central portion where it engages the actuating plunger to produce a transverse contact wiping movement of the movable contacts whenever the contacts are opened or closed to automatically clean the contacts every time the

switch is used. The fixed contacts are canted to increase contact pressure and to lengthen the contact wiping movement.



The housing contains a projecting socket to provide a guide of increased bearing length for the plunger and its spring.

3,731,033

**TWISTING MACHINE**

Gaston C. Ory, 7, rue des Jardies, Meudon, Hauts-de-Seine, France

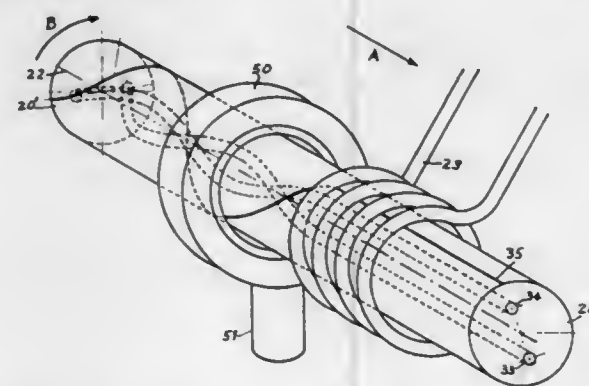
Filed July 23, 1971, Ser. No. 165,046

Claims priority, application France, Aug. 5, 1970, 7028860

Int. Cl. H05b 5/02

U.S. Cl. 219-7.5

2 Claims



Machine for twisting a bar between two puppets, said machine having a two-track bed, a carriage which moves along one of the tracks, the other track being provided at one extremity with a fixed puppet and with a sliding puppet at the other extremity, a high-frequency heat generator the housing of which is mounted on said carriage, a computing unit which furnishes the control signals for the heating characteristics of an inductor, the linear speed for the displacement of said carriage along its track and the angular rotational speed of the puppet spindles.

3,731,034

**HEATING ROLLERS WITH AXIAL MAGNETIC FORCE REDUCTION MEANS**

Koshei Arita, 10,23 2-chome, Minamimagone, Ohota-ku, Tokyo, Japan

Filed March 23, 1972, Ser. No. 237,249

Int. Cl. H05b 5/08

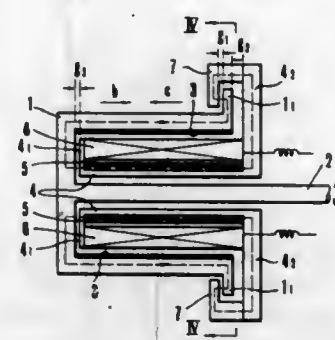
U.S. Cl. 219-10.49

7 Claims

In a heating roller of the class comprising a cup-shaped cylindrical roller having a closed bottom, a driving shaft for rotating the roller connected to the center of the bottom and extending coaxially through the cylindrical roller, a stationary bobbin supported within the cylindrical roller coaxially with the driving shaft, the bobbin having an inner flange facing to the bottom and an outer flange close to the open end of the cup-shaped cylindrical roller, and an induction coil wound about the bobbin for inductively heating the cylindrical roller,

there are provided a radially extending flange at the open end of the cup-shaped cylindrical roller and a surrounding annular

the piece rapidly to drive out the water initially to saturate the chamber and maintains the heat to condense water vapor on



ring connected to the periphery of the outer flange to surround the radially extending flange.

3,731,035

**MICROWAVE OVEN DOOR**

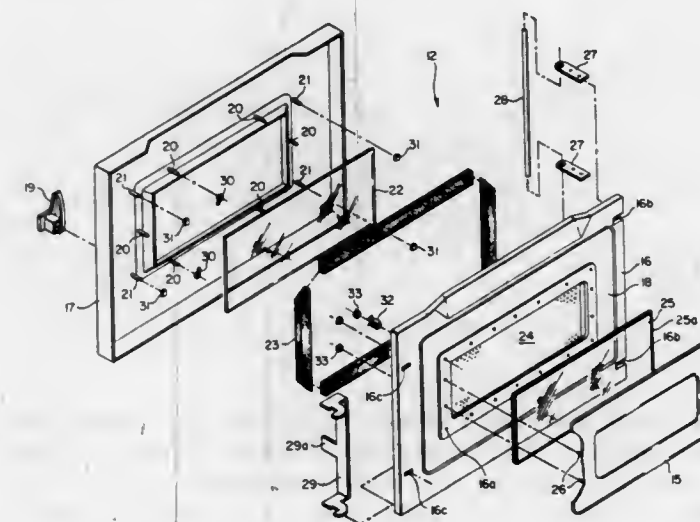
George A. Jarvis, and Allen M. Danley, both of Minneapolis, Minn., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Nov. 15, 1971, Ser. No. 198,750

Int. Cl. H05b 9/06

U.S. Cl. 219-10.55

5 Claims



An improved door for microwave ovens having no exposed nut and bolt type means to retain the various components of such door together. The door is so constructed that the method for taking the door apart is not readily apparent to the average microwave oven user. Various components are mounted on the interior housing panel and various other components are mounted on the exterior housing panel. Then the interior housing panel and the exterior housing panel and their associated respective components are mounted together by concealed retaining means.

3,731,036

**MICROWAVE DRYER EQUIPMENT**

Bernard Lucien D. Hallier, Saint-Maur, La Varenne, and Jean Louis Coquet, 87 Saint-Leonard de Noblat, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

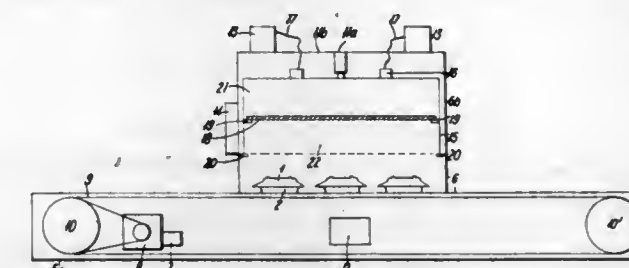
Filed Oct. 18, 1971, Ser. No. 189,866

Int. Cl. H05b 9/06

U.S. Cl. 219-10.55

3 Claims

Water is removed from ceramic pieces in a pre-drying stage of a microwave drying process in which microwave energy is absorbed more in thicker dielectric sections than in thinner sections. A thin dielectric partition provides a second lower cavity in a main microwave chamber. Microwave energy heats



cooler surfaces. A homogeneous humidity distribution is achieved which provides fast and uniform drying.

3,731,037

**MICROWAVE KILN TO COOK FOOD**

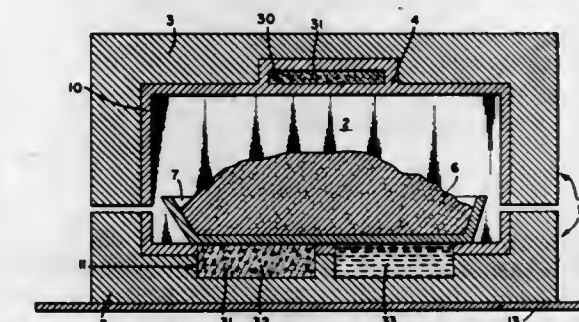
Melvin L. Levinson, 1 Meiner Street, Avenel, N.J.

Continuation-in-part of Ser. No. 704,389, Feb. 9, 1968. This application Oct. 29, 1971, Ser. No. 193,940

Int. Cl. H05b 9/06

U.S. Cl. 219-10.55

7 Claims



A microwave oven is provided with a heat insulating structure containing a work chamber lined with a microwave lossy material where said lining: 1) can be porous to water, 2) can represent an acceptable load to said microwave oven, 3) can define a closed cavity, 4) can be a mixture of a lossy electrical material and a lossy magnetic material, and 5) can be used in conjunction with a non-magnetic-metal, heat-conducting workload container.

3,731,038

**ZERO-MODE MICROWAVE APPLICATOR**

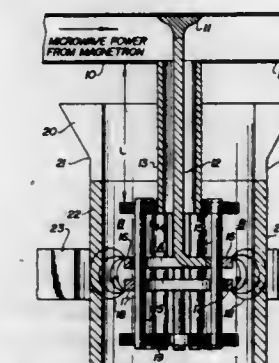
Renato G. Bosisio, Longueuil, Quebec, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Feb. 22, 1971, Ser. No. 117,538

Int. Cl. H05b 9/06

U.S. Cl. 219-10.55

1 Claim



A fast-mode particularly a zero-mode microwave application for the heating, drying, curing or other treatment by microwave energy of workpieces containing lossy dielectric



material having a fast wave microwave structure and microwave energization means connected to the structure to energize it such that a region adjacent said structure will contain a predominance of zero-mode or near zero-mode electric field energy.

3,731,039

## ELECTRIC COOKING OVENS

Sydney George Beech, Sevenoaks, England, assignor to Mansfield Heat Limited, London, England

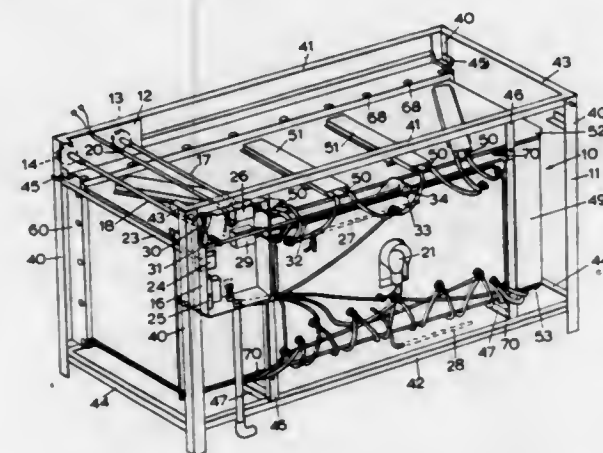
Filed April 20, 1971, Ser. No. 135,577

Claims priority, application Great Britain, Nov. 27, 1970, 56,445/70

Int. Cl. F27d 11/02

U.S. Cl. 219-407

7 Claims



An electrically-heated heat-storage oven in which an oven liner of open-fronted box form is fitted externally with upper and lower sole plates which carry electrical heating elements and are backed by layers of refractory material. The refractory layers are built up from cast pieces of refractory material contained within sheet metal trays, the whole assembly being held together by upper and lower horizontal clamping beams connected to one another at their ends by spring-loaded vertical tie rods.

3,731,040

## BILLET HEATING COIL

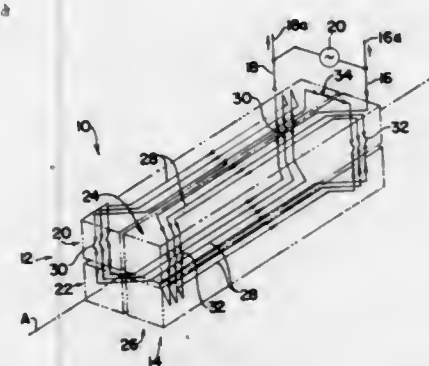
Robert Jerry Kasper, Seven Hills, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Sept. 24, 1971, Ser. No. 183,467

Int. Cl. H05b 5/00

U.S. Cl. 219-10.79

18 Claims



An induction heating coil arrangement is disclosed which includes coil means having a longitudinal axis and defined by a pair of coil portions which are supported in suspension by means providing for pivotal movement of the portions toward and away from one another in a direction lateral to the axis of the coil means. Lateral separation of the coil portions facilitates the longitudinal introduction therebetween of a metal workpiece to be heated. Support means is provided for a

workpiece to be heated, and when the coil sections are laterally closed relative to one another they are disposed in inductive heating relationship with respect to a workpiece on the support means. Means are provided to vertically displace a section of each coil portion relative to the remainder thereof both to facilitate movement of the coil portions into inductive heating relationship with a workpiece and to provide for the coil means to be adjustable to receive workpieces of various thicknesses.

3,731,041

## METHOD AND APPARATUS FOR MAKING A TUBE FROM A METAL STRIP

Hans Gebauer, 469 Herne, Germany, assignor to Hoesch Maschinenfabrik Deutschland Aktiengesellschaft, Dortmund, Germany

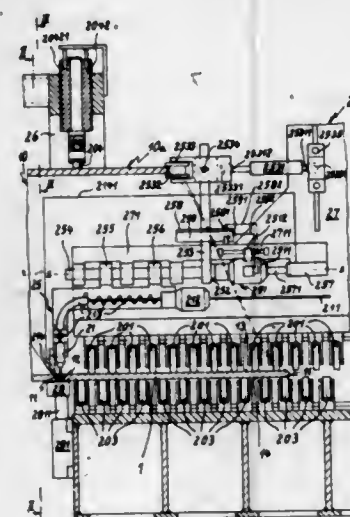
Filed June 9, 1971, Ser. No. 151,287

Claims priority, application Germany, June 10, 1970, P 20 28 560.3

Int. Cl. B23k 11/16

U.S. Cl. 219-62

36 Claims



A device is provided for continuously forming a metal strip to consecutive helical convolutions which together constitute a tube. The abutting edges of the successive convolutions, which edges advance in a helical path at a higher first speed, are intermittently tack-welded by an arc-welding unit. Downstream of this unit is located another arc-welding unit which receives the thus partially welded tube and continuously welds the abutting edges, but at a lower speed.

3,731,042

## WELDING MACHINE FOR MANUFACTURE OF WIRE MESH

Klaus Ritter; Hans Gott; Gerhard Ritter, and Josef Ritter, all of Graz, Austria, assignors to EVG Entwicklungs- und Verwertungsgesellschaft m.b.H., Graz, Austria

Filed Jan. 24, 1972, Ser. No. 220,306

Claims priority, application Austria, Jan. 28, 1971, A 723/71

Int. Cl. B23k 11/00

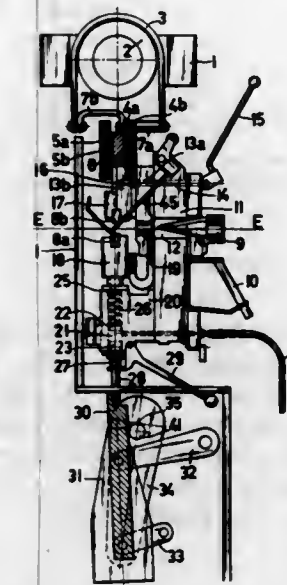
U.S. Cl. 219-56

13 Claims

A welding machine is disclosed of the type in which an array of longitudinal wires occupying a product plane of the machine is advanced past a transverse row of welding heads which weld transverse wires to the longitudinal wires by electric resistance welding. Each welding head comprises an electrode above the product plane and an electrode below the product plane, these being interconnected by a connecting piece which is rigid with the upper electrode and to which the lower electrode is movably mounted. A thrust beam is vertically reciprocated below the lower electrodes so that each longitudinal wire is thrust upwards against the traverse wire dur-

ing welding. Transformers for supplying the welding current and busbars for conducting the current to the welding heads

wire electrode and/or for a workpiece in a workpiece contour predetermined by data stored in an information carrier, the said data being converted, in consideration of the diameter of the wire electrode and the width of the operating gap, into the path curve of the axis of the wire electrode in consideration of the erosive condition in the operating gap. The information



are situated above the product plane and the welding heads are suspended from the busbars.

3,731,043

## DIGITAL CIRCUIT FOR AN ERODING MACHINE

Werner Ullmann, Locarno-Muralto, Switzerland; Rudolf Panschow, Hannover, Germany; Volker Suhr, Neustadt a./Ruebenberge, Germany; Wolfgang Meyer, Hannover, Germany; Arno Sieg, Locarno, and László Rabian, Locarno-Monti, both of Switzerland, assignors to Agie, A.G. für industrielle Elektronik, Locarno-Locarno, Switzerland

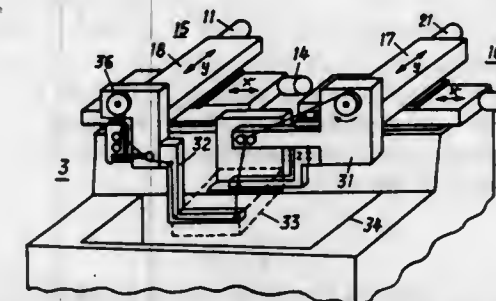
Filed June 7, 1971, Ser. No. 150,511

Int. Cl. B23p 11/12

Claims priority, application Switzerland, June 24, 1970, 9594

U.S. Cl. 219-69 V

10 Claims



This invention relates to a digital circuit for an eroding machine designed to control a relative movement between a workpiece and a wire electrode by the input of data stored in an information carrier, the said data being translated in a circuit into the curve defined by the axis of the wire electrode in consideration of the diameter of the wire electrode and the width of the operation gap.

3,731,044

## ELECTRO-ERODING MACHINE WITH A CIRCUIT FOR THE CONTROL OF AT LEAST ONE ADVANCING DEVICE FOR A WIRE ELECTRODE AND/OR FOR A WORKPIECE

Werner Ullmann, Locarno-Muralto; László Rabian, Locarno-Monti; Silvano Mattel, Locarno-Solduno; Arno Sieg, Locarno; Peter Suter, Locarno; Costantino Tadini, Locarno, all of Switzerland; Rudolf Panschow, Hannover, Germany; Volker Suhr, Neustadt a./Ruebenberge, Germany, and Wolfgang Meyer, Hannover, Germany, assignors to Agie, A.G. für industrielle Elektronik, Locarno-Locarno, Switzerland

Filed June 23, 1971, Ser. No. 156,007

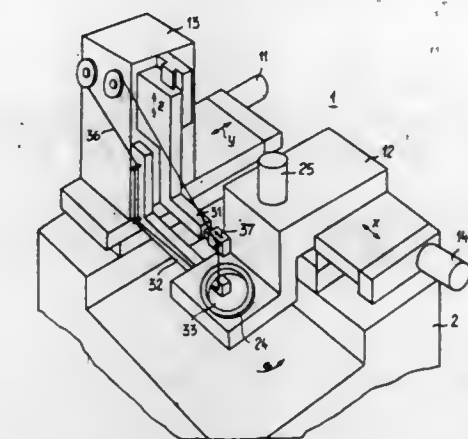
Int. Cl. B23p 11/04, 11/12, 11/14

Claims priority, application Switzerland, July 3, 1970, 10/23

U.S. Cl. 219-69 V

14 Claims

This invention relates to an electro-eroding machine with a circuit for the control of at least one advancing device for a



carrier comprises two computing units, one supplying control signals to driving means for advancing the wire electrode for a straight movement while the other supplies control signals to driving means for producing rotary movement. Each computing unit includes return memories which return the wire electrode by a certain length of the path curve in the event of trouble in the operating gap.

3,731,045

## CIRCUIT FOR AN ELECTRO-ERODING MACHINE FOR THE CONTROL OF THE RELATIVE MOVEMENT BETWEEN AT LEAST ONE ELECTRODE AND AT LEAST ONE WORKPIECE

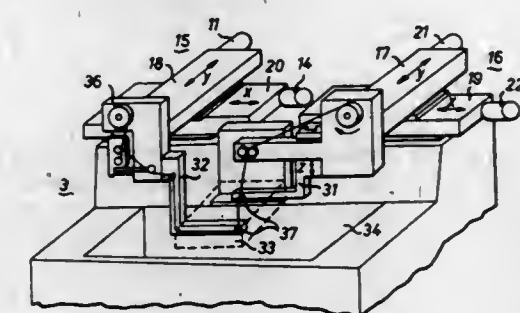
Werner Ullmann, Locarno-Muralto; László Rabian, Locarno-Monti; Silvano Mattel, Locarno-Solduno; Arno Sieg, Locarno; Peter Suter, Locarno; Costantino Tadini, Locarno, all of Switzerland; Rudolf Panschow, Hannover, Germany; Volker Suhr, Neustadt a./Ruebenberge, Germany, and Wolfgang Meyer, Hannover, Germany, assignors to Agie, A.G. für industrielle Elektronik, Locarno-Locarno, Switzerland

Filed July 1, 1971, Ser. No. 158,721

Int. Cl. B23p 11/12

U.S. Cl. 219-69 V

13 Claims



This invention relates to a circuit for an electro-eroding machine for the control of the relative movement between at least one electrode and at least one workpiece by virtue of data stored on an information carrier which relative movement contains at least one length of curve defined by the data and which data are corrected in consideration of the thickness of the electrode, the width of the operating gap, the erosive condition in the operating gap and which are supplied to at least one advancing device for the electrode and/or the workpiece as control signals generated in a computing unit by means of an interpolation process.



3,731,046

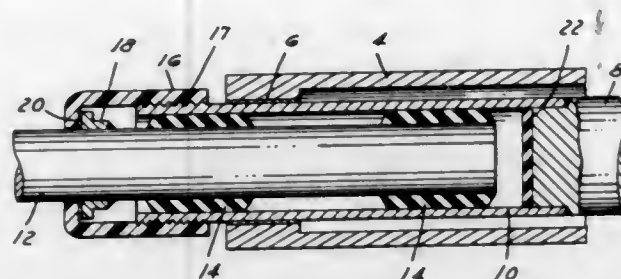
**ELECTRODE ROD HOLDER FOR RESISTANCE WELDING ACTUATORS**

John Henry Brems, 32867 White Oaks Trail, Birmingham, Mich.

Filed Oct. 26, 1971, Ser. No. 192,544  
Int. Cl. B23k 11/10

U.S. Cl. 219-78

4 Claims



An electrode rod holder for resistance welding to serve as an insulator for the welding current and also to produce a follow-up motion to maintain necessary pressure on the parts throughout the entire weld period which includes a holding member and resilient mounts which insulate and also preload the rod holder in an axial bias to produce follow-up pressure and motion.

3,731,047

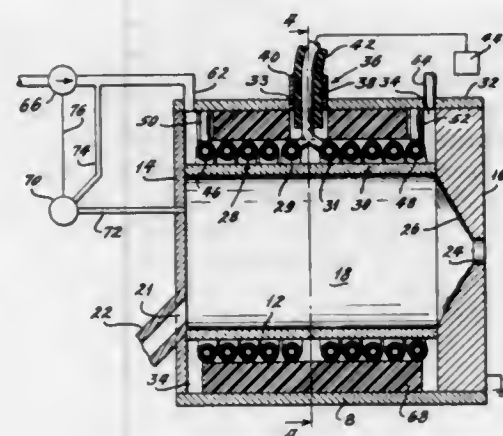
**PLASMA HEATING TORCH**

John H. Mullen, Saint Louis, and Edward A. Theby, Saint Ann, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Dec. 6, 1971, Ser. No. 204,854  
Int. Cl. B23k 9/04

U.S. Cl. 219-121 P

22 Claims



A high pressure plasma heating torch comprising a hollow dielectric cylinder and a pair of electrically conductive end plates which form a plasma chamber in the cylinder and where the end plates are respectively provided with gas inlet and discharge ports. A pair of aligned, electrically conductive heating coils are concentrically disposed about the cylinder and in this arrangement extend along the cylinder for substantially the entire length thereof. The coils are connected together at a central location and are fed energy from a relatively high voltage, high frequency electrical source and the outer or opposite ends of the coils are grounded or connected to a low potential location through the end plates so that a plasma introduced into the chamber is subjected to a relatively high energy field which extends between the two end plates, but which is developed by a source which has its highest potential near the center of the device thereby reducing the potential required and the possibility of high frequency sputtering and arcing. A cooling jacket surrounds the dielectric cylinder and forms a cooling chamber with the other parts in-

cluding the parts that house the heating coils, and this cooling chamber receives a suitable coolant which is used to remove excess heat generated during operation of the device. Provision can also be made to make the coils of tubular material and to pass coolant through the coils, if desired. In a preferred embodiment of the invention, means are also provided for sensing pressure changes in the plasma chamber and in the coolant chamber to control the introducing of coolant under pressure into the cooling chamber and to thereby also maintain substantially uniform and/or equal pressure conditions in both chambers.

3,731,048

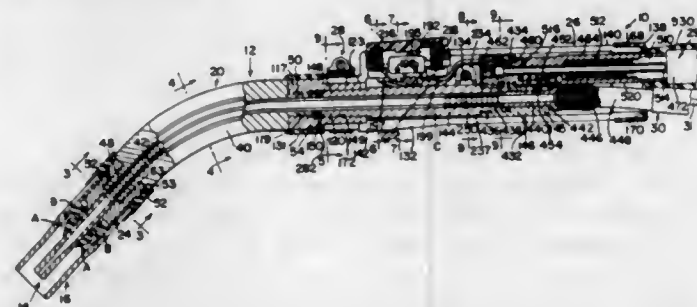
**AIR COOLED WELDING GUN**

Ralph Ogden, Sr., Munster; John G. Colley, Eminence, both of Mo.; Edward Neidhart, Chicago, Ill., and Carl J. Johnson, Highland, Ind., assignors to Ogden Engineering Corporation, by said Colley, Neidhart and Johnson

Filed March 3, 1972, Ser. No. 231,670  
Int. Cl. B23k 9/00

U.S. Cl. 219-130

15 Claims



The disclosure is directed to a welding gun for MIG welding in which the gas cup and contact tip of the nozzle are secured in place by a single clamp type device that permits ready replacement of both. The nozzle in turn is connected to the gun handle by a single clamp device that permits ready replacement of the nozzle as a unit or ready change of positioning of same relative to the handle. The contact tip carries a spatter deflector defining a tapered spatter deflecting surface which shields the gas passages defined by the gun gas diffuser. Shielding gas and welding current are supplied to the gun through a power cable and associated end connectors especially arranged for this purpose.

3,731,049

**CONTROL APPARATUS FOR SHORT-CIRCUIT ARC WELDING**

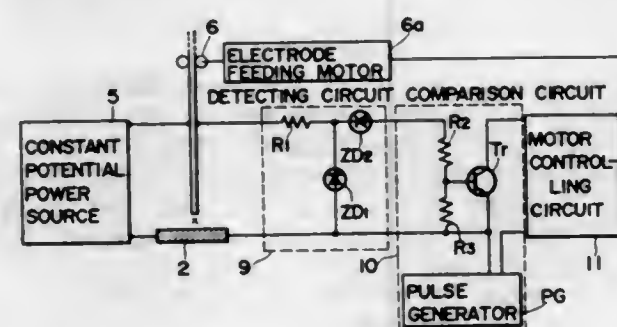
Michiya Kiyohara, and Hisao Goto, Higashiyodogawa-ku, Osaka, Japan, assignors to Osaka Transformer Co., Ltd., Osaka-shi, Osaka-fu, Japan

Continuation-in-part of Ser. No. 856,697, Sept. 10, 1969, abandoned. This application Sept. 27, 1971, Ser. No. 183,797  
Claims priority, application Japan, Sept. 16, 1968, 43/66123

Int. Cl. B23k 9/10

U.S. Cl. 219-131 F

2 Claims



An apparatus for controlling the feeding of the welding electrode in short circuit metal transfer arc welding which em-

plays a feeding speed detecting circuit. The feeding speed varies according to variations in the period of shortcircuiting between the electrode and the workpiece and the time during which a welding arc is generated.

3,731,050

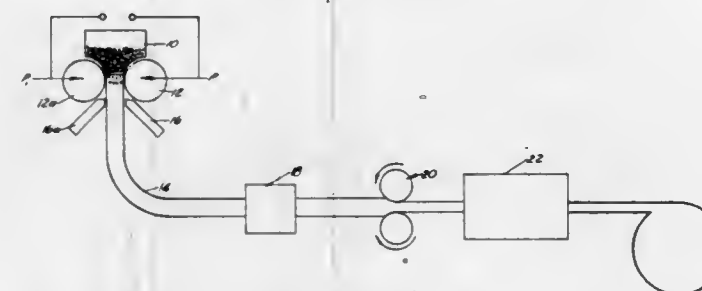
**METHOD OF MAKING ARTICLE FROM METALLIC POWDERS**

Harry LaTour, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed June 25, 1971, Ser. No. 156,651  
Int. Cl. B21j 1/06

U.S. Cl. 219-149

19 Claims



A method of making a continuous strip at rapid rates from metallic powders, which powders are devoid of non-metallic binders. This is accomplished by the simultaneous compacting and resistance-heating welding of the powders being fed between electrically energized rolls. The roll load coupled with a low voltage - high amperage current therebetween assures a highly dense metallic strip suitable for further metallurgical processing. Means are also provided to assure a full width of uniformly dense metallic strip substantially equal to the width of the fed metallic powders.

3,731,051

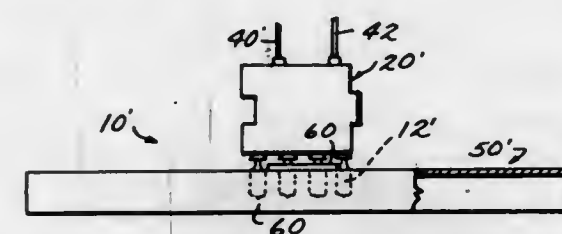
**ARTICULATED RADIANT HEATING MODULES**

Russell R. Eilersick, 7925 Twin Oak Avenue, Citrus Heights, Calif.

Filed March 26, 1971, Ser. No. 128,459  
Int. Cl. C21d 1/40

U.S. Cl. 219-162

1 Claim



Apparatus for stress relieving a welded joint between two large diameter pipes comprises a plurality of electric heater modules hinged end-to-end so as to fit chain-like around the circumference of the pipe. Each heater module comprises several quartz bulbs projecting from an air-cooled housing in which the bases of the bulbs are supported, and a reflector to direct heat from the bulbs toward the pipe.

3,731,052

**ELECTRON BEAM WELDING APPARATUS**

Yasuhide Ogawa; Yutaka Kawase; Makoto Takada; Akira Fujioka, and Hideki Kobayashi, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

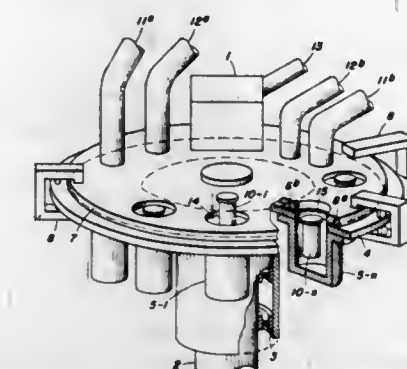
Filed June 2, 1971, Ser. No. 149,219  
Claims priority, application Japan, June 6, 1970, 45/49332  
Int. Cl. B23k 15/00

U.S. Cl. 219-121 EB

2 Claims

Electron beam welding apparatus is disclosed in accordance with the teachings of the present invention wherein a plurality

of welding chambers adapted to receive work pieces to be welded is supported in a radially outward direction by a table. A cover, concentric with the table, overlies said table and includes an electron beam source and evacuating means mounted thereon. Sealing members are interposed between the table and the cover to define an annular space therebetween, which space is maintained in a radially sealed



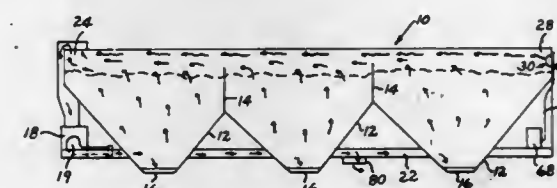
relationship. The table is rotated relative to the cover such that the welding chambers rotate within the annular space. A low pressure condition is produced in each welding chamber when the welding chamber is rotated into registration with the evacuating means; and the work piece contained in the low pressure environment of said welding chamber is subject to a beam of electrons when said welding chamber is rotated into registration with the electron beam source.

3,731,053

RAILWAY CAR HAVING A HEATED FRESH AIR INTAKE  
Edward L. Coyle, and Dennis J. Schipper, both of Saint Charles, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.Filed Dec. 27, 1971, Ser. No. 212,415  
Int. Cl. H05b 1/00

U.S. Cl. 219-202

7 Claims



In a railway car, such as a closed hopper car, conditioned by circulated air, condensation may occur near the roof, which is difficult to insulate effectively. The conditioning air, which may be heated air, is fed into the bottom of the hoppers and exhausted at one end of the car. A shielding stream of electrically heated air admitted at the other end of the car near the roof flows along the roof and prevents moisture laden circulated air from striking the cold roof directly, and thus prevents condensation. A portion of the circulated air is exhausted to atmosphere to facilitate the inflow of fresh air, and thus increase the oxygen content and reduce the humidity when the car contains oxygen consuming, moisture emitting lading.

3,731,054

**HEAT SEALER**

Lester E. Bair, Brownsville, Tex., assignor to Fairshare Marketing &amp; Manufacturing Co., Inc., Brownsville, Tex.

Filed May 19, 1972, Ser. No. 255,192  
Int. Cl. H05b 1/00

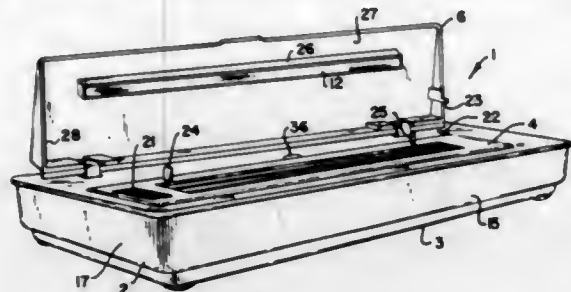
U.S. Cl. 219-243

11 Claims

A packaging device for closing containers formed of heat sealable flexible plastic is mounted in a housing having a base portion with a compartment therein which is closed by a cover



member having an elongated opening therein and a lid is hingedly mounted on the housing and movable between a position overlying the cover member and a position spaced from the cover member. A material engaging member is positioned within the compartment and is selectively movable between a position having an edge of a first portion aligned with the opening in the cover member and a position having a surface



of a second portion aligned with the opening in the cover member and a press member mounted on the lid and movable to a position in overlying relation with the material engaging member to effect engagement of material to be heat sealed with the material engaging member which is heated to a selected temperature. The edge of the first portion of the material engaging member is effective to heat seal the container and cut the plastic adjacent the heat sealed portion.

3,731,055

## RADIANT HEATING APPARATUS

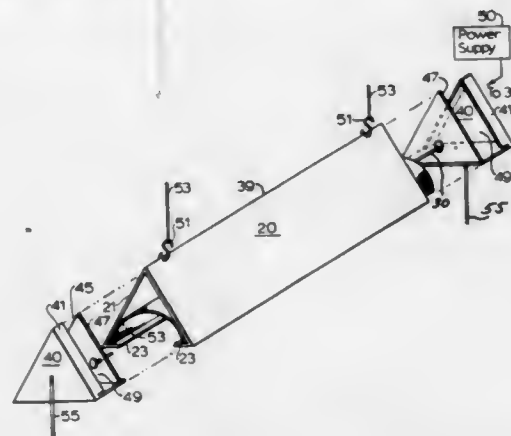
Charles F. Kerchner, Jr., Bath, and David A. Ball, Orefield, both of Pa., assignors to Kalglo Electronics Co., Inc., Allentown, Pa.

Filed Dec. 15, 1971, Ser. No. 208,159

Int. Cl. F24h 9/02; H05b 3/40

U.S. Cl. 219—349

6 Claims



The heating apparatus includes an elongated hood which carries an elongated heating element and an adjustable sensing element adapted to be positioned adjacent to the area or to the animals to be kept warm. The sensing element is electrically connected to a control circuit for controlling the heating current to the heating element.

3,731,056

## SUPPLEMENTAL HEATER UNIT FOR AIR CONDITIONER OF THE DUAL BLOWER TYPE

Edward A. Becker, Ferguson, Mo., assignor to Intertherm, Inc., St. Louis, Mo.

Filed Dec. 6, 1971, Ser. No. 204,998

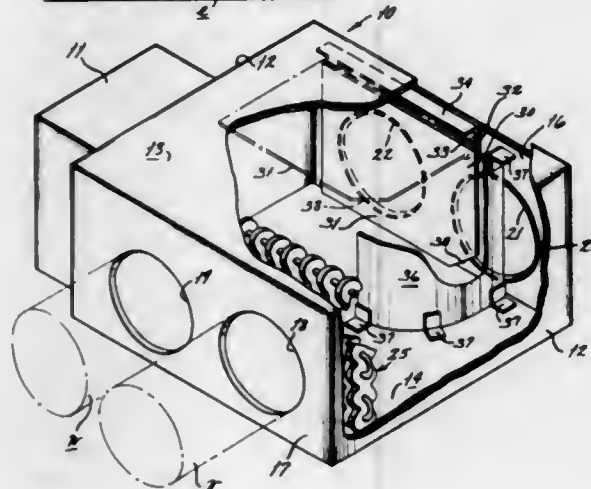
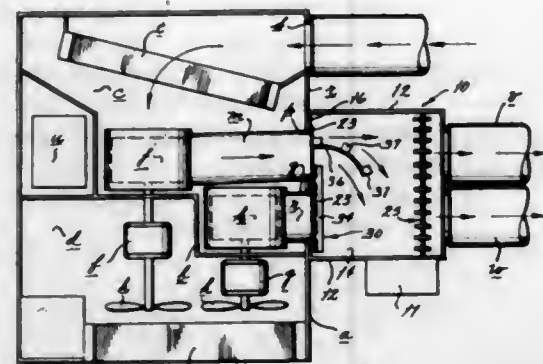
Int. Cl. H05b 1/00; F24h 3/04; F25b 29/00

U.S. Cl. 219—361

5 Claims

A supplemental heater unit for an air conditioner of the dual blower type, provides reduced air delivery while the heater is energized. The heater unit has an air casing with separate inlets from the two blowers. When only one blower of the air conditioner is powered, an atmospheric damper closes

automatically across the inlet from the unpowered blower, preventing re-circulation back to the air conditioner cabinet



3,731,057

## SENSING MEANS FOR ELECTRIC FAN HEATER

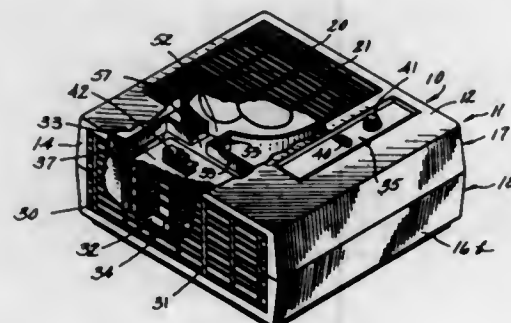
Raymond W. Kunz, Monroe, and Albert E. Schulz, Fairfield, both of Conn., assignors to General Electric Company, Bridgeport, Conn.

Filed June 21, 1971, Ser. No. 154,778

Int. Cl. H05b 1/02; F24h 3/04

U.S. Cl. 219—363

5 Claims



An electric fan heater of the space heating type includes a housing having an air inlet opening in the top wall and an air outlet opening in the front wall with an electric heating element in close proximity thereto. A motor driven axial flow fan having a vertical axis of rotation is utilized to provide an air flow through said housing between said inlet and outlet openings. A temperature responsive safety switch is located above the heating element and is positioned in an air flow passage having one end in air flow communication with the air outlet and its other end in air flow communication with the inlet side of the fan whereby heated air is allowed to flow back to the fan over the safety switch in the event of an obstruction

at the outlet opening. In one embodiment a shielding member is provided between the air inlet opening and the fan to partially block the inlet opening. The shielding member is positioned above the fan adjacent the centrifugal air stream path toward the front wall and overlies the air passage.

3,731,058

## AQUARIUM HEATER

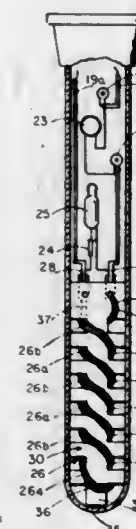
Eugene Bleiweiss, Maywood, N.J., assignor to Metaframe Corporation, Maywood, N.J.

Filed Jan. 20, 1971, Ser. No. 108,030

Int. Cl. H05b 3/80; H01c 1/02

U.S. Cl. 219—523

5 Claims



A heating coil in an aquarium heater housing which comprises an electrically insulative support member, being helically wrapped the support member helically with an electric heating element, the helically wrapped support member being disposed in an aquarium heater housing, and the entire helically arranged heating element being maintained in spaced relation with the interior of the aquarium heater housing. The support member is provided with a plurality of longitudinally spaced transverse limbs which act to define a plurality of longitudinally spaced slots. The heating element is helically seated entirely within the slots so that it and the heater housing are maintained in spaced relation by the transverse limbs contacting the interior of the housing. The support member is also provided with a longitudinally extending limb engaging a closed end of the housing for maintaining the heating element and the housing in longitudinally spaced relation.

3,731,059

## COOKING COMPUTER

James R. Willson, Garden Grove, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation-in-part of Ser. No. 47,345, June 18, 1970,

abandoned. This application Feb. 1, 1971, Ser. No. 111,727

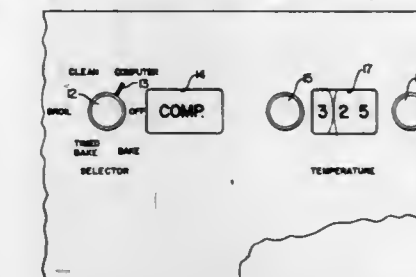
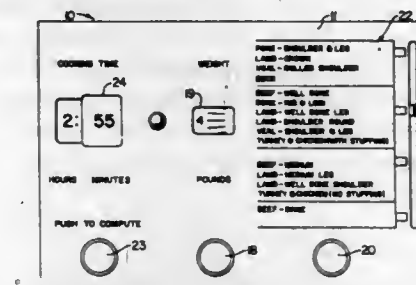
Int. Cl. G06c 29/00

U.S. Cl. 235—61 A

14 Claims

A computer-controller device for controlling the cooking operation of a cooking apparatus, the device having a weight input means for setting the device at a weight setting corresponding to the weight of a meat item to be cooked by the apparatus. The device has a meat doneness input means for setting the device at a doneness setting for a particular meat item. The device has means operatively associated with the input means to cause the cooking apparatus to cook the meat item at a predetermined and substantially constant cooking temperature for a period of time computed in accordance with a cooking time formula based on at least the weight setting of the device and for causing a subsequent reduction in the cooking temperature at a particular point in the time period as

computed in accordance with the doneness setting of the device whereby the meat item will be substantially at the



doneness of the doneness setting at the termination of the computed cooking time period.

3,731,060

## DOCUMENT STORAGE AND RETRIEVAL SYSTEM

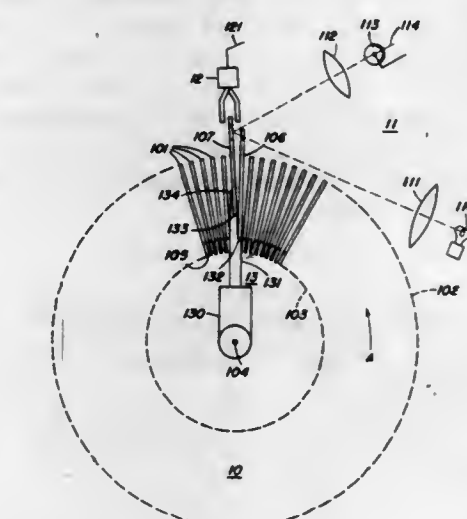
Hillel Weinstein, Haifa, Israel, assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 17, 1971, Ser. No. 172,496

Int. Cl. G06k 7/10; G11b 25/04; B01d 23/24

U.S. Cl. 235—61.7 R

18 Claims



A document storage and retrieval system is disclosed in accordance with the teachings of the present invention wherein a plurality of documents are arranged in rotating drum configuration such that each said document rotates through an optical scanning station. The optical scanning station includes optical scanning means for scanning an identifying optical code pattern recorded on a document when said document rotates into a predetermined position. An electrical representation of the scanned optical code pattern is compared with a predetermined electrical signal representative of a selected one of said document or group of said documents, and if said electrical representation corresponds to said predetermined electrical signal the scanned document is removed from said drum configuration. The document storage and retrieval system has the capability of retrieving a single stored document or a group of stored documents. In one embodiment of the present invention, the scanning station operates in a cooperating manner with reciprocating support means adapted to be interposed in the rotational path of the documents whereby a document that is rotated into said predeter-



mined position is displaced from the drum configuration and supported by said reciprocating support means such that the optical code pattern on said document is optimally positioned at said scanning station. In another embodiment of the present invention the scanning station includes deflecting means fixedly disposed in said rotational path and adapted for slidable contact with said documents whereby the document that is rotated into said predetermined position is deformed to enable the successive scanning of the optical code patterns on each document.

3,731,061

## TWO-WAY DRIVE MECHANISM

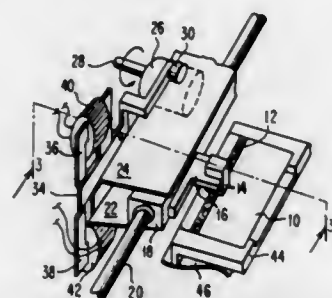
Robert J. Laybourn, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,682

Int. Cl. G11b 5/52; G06r 7/08

U.S. Cl. 235-61.11 D

1 Claim



A drive mechanism for causing, for example, a magnetic read head to scan a magnetic track on an identification card. The head is mounted to a carriage which is driven in a forward or reverse direction along a guide rod by bringing one of two feeler gauge drive ribbons fixedly attached to said carriage into engagement with a constantly rotating drive wheel. The head may be mounted to a rigid head mount and rotated out of contact with the card on the return stroke, with the card spring-biased against the head on the forward stroke. Alternatively, the head may be spring-loaded to the carriage with flexible feeler gauge drive ribbons alternatively brought into contact with the drive roller.

3,731,062

## OPTICAL CARD READER DRIVE

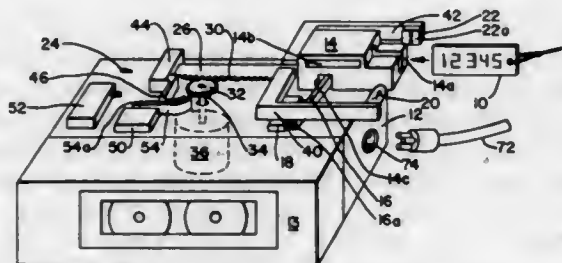
John J. Reilly, Jr., Orinda, Calif., assignor to Binary Systems, Inc., Orinda, Calif.

Filed May 21, 1971, Ser. No. 145,983

Int. Cl. G06k 7/14, 9/13; G11b 5/00

U.S. Cl. 235-61.11 E

1 Claim



A card reader for optically scanning a field of machine-sensible numeric information imprinted on an identifying tag or card attached to an article of merchandise and generating therefrom electronic signals representative of the information. The card is translucent and the imprinting material is opaque with respect to illumination directed against the surface of the card from a light source on one side thereof. Photodetecting means are positioned in light receiving alignment with the light source on the opposite side of the card to record the presence of light passing through the blank areas of the card and the absence of light blocked by the imprinted areas. The

photodetector output is connected to a suitable electronic signal generating circuit. Means are provided to move the aligned light source and photodetector unit along the card to scan across the machine readable data field and to return them to their initial position with respect to the card after the scan is completed.

3,731,063

## METHOD AND ARRANGEMENT FOR POSITIONING OF A SELECTED IMAGE IN A SEQUENCE OF IMAGES AT A PREDETERMINED LOCATION

Horst Bickl, Pullach, and Josef Pfeiffer, Unterhaching, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

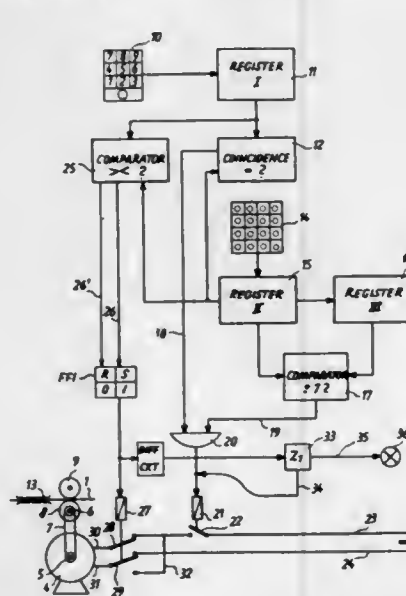
Filed Aug. 4, 1971, Ser. No. 168,836

Claims priority, application Germany, Aug. 6, 1970, P 20 39 208.9

Int. Cl. G06k 13/20

U.S. Cl. 235-61.11 E

18 Claims



Microfilm is transported past a read-out station. Each of the frame of the microfilm has a code markings in a cyclic progressive code. An optical read head furnishes code marking signals corresponding to the code marking of the frame at the microfilm read-out station. A keyboard furnishes an input signal signifying a selected frame. A first comparator compares the input signal to the code marking signal and furnishes a first coincidence signal when the two are equal. The first comparator further furnishes a comparator signal determining the direction of transport of the film in dependence on the sign of the difference between the code marking signal and the input signal. A second comparator compares each code marking signal with the last previously read code marking signal and furnishes a second coincidence signal when a unit step is indicated by said comparison. The film transport is stopped upon simultaneous presence of the first and second coincidence signals.

3,731,064

## DATA PROCESSING SYSTEM AND READER THEREFOR

Robert M. Berler, Westport, Conn.; Norman Alpert, Scarsdale, N.Y., and Nanjundiah N. Murthy, West Redding, Conn., assignors to Pitney Bowes-Alpex, Inc.

Filed July 28, 1970, Ser. No. 58,762

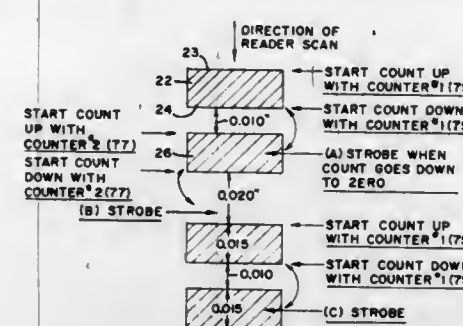
Int. Cl. G06k 7/10

U.S. Cl. 235-61.11 E

19 Claims

A novel data processing means is provided comprising a technique for scanning a coded document in which the code appears as a row of printed lines of substantially equal length. The spaces between the individual lines in the row are of predetermined widths. These lines, in combination with the associated spaces of different widths constitute, for example, a binary code that is registered through a photosensitive system,

i.e. a handheld reader which is drawn along the length of the document. The reader is characterized by its simplicity and absence of any moving parts; it has an extremely broad tolerance and produces a valid readout so long as it scans, i.e. crosses, any part of the line. Orientation of the reader during its scan stroke is immaterial; it may be held on any side. The reader has an area spot resolution which is no greater than the width of the thinnest space in the code grouping. Command signals, and logic circuits determine the character of the encoded digit under observation through the reader which has a



self-contained source of illumination for the lines and spaces on the document. In response to line activation, the logic system displays a degree of self-learning that enables it to adjust to varying scan speeds and nevertheless decode the array with great accuracy.

3,731,065

## CODED DOCUMENT

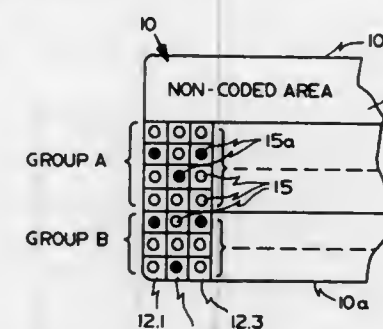
Fredric E. Zucker, Stamford, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Oct. 8, 1970, Ser. No. 79,193

Int. Cl. G06k 7/12, 19/06; H04q 9/14; H04m 17/02

U.S. Cl. 235-61.12 N

1 Claim



A Touch-tone coded credit card employing first and second code groups, the first group having four bit positions and the second group three bit positions, one of which is utilized in each group to identify a decimal digit. The card is provided with a non-coded area (used for a magnetic or signature stripe) which is positioned opposite the first code group, and is at least as wide. If the card is reversed side-to-side when positioned in a code reader, no output is derived from the first code group because the reader scans the non-coded area. This fact can be employed to prevent faulty operation of the card reading system.

3,731,066

## FORWARD AND BACKWARD ROLLER COUNTER ESPECIALLY WITH PRESELECTOR MEANS

Wilhelm Menke, 6530 Bingen, Germany, assignor to NSM Apparatebau GmbH, Bingen/Rhein, Germany

Filed Aug. 26, 1971, Ser. No. 175,104

Claims priority, application Germany, Sept. 2, 1970, P 20 43 501.2

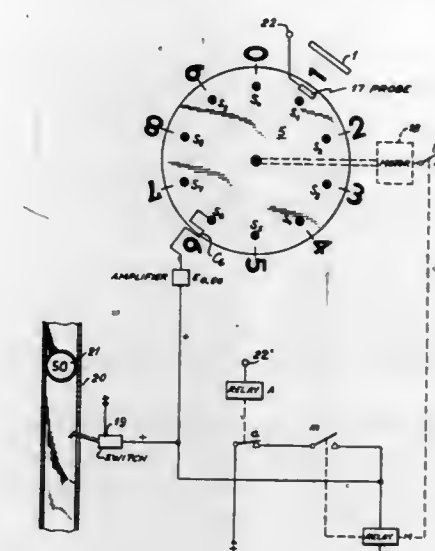
Int. Cl. G06m 3/08

U.S. Cl. 235-92 CN

10 Claims

The present roller or register counter has a read-out window and is useful in coin operated devices such as slot machines,

vending machines, and especially in automatic gaming devices for adding and subtracting amounts by means of forwardly and reversely rotating rollers or registers driven through the register for indicating the lowest credit. A memory member is provided for each position of the lowest credit register. A pick-up device is located at said read-out window. Storing sta-



tions are arranged at predetermined steps remote from said window for inserting values in the respective memory member in response to coins inserted into the apparatus.

3,731,067

## MONITORING APPARATUS FOR DETECTING THE PASSAGE OF OBJECTS PAST A POINT

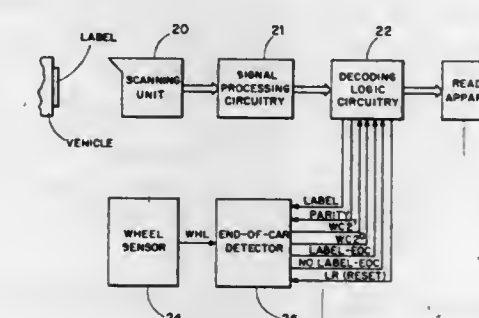
Garo Arevian, Whitman; Wilson P. Boothroyd, Carlisle, and Elton E. Dunbar, Waltham, all of Mass., assignors to GTE Information Systems, Incorporated

Filed Aug. 6, 1971, Ser. No. 169,762

Int. Cl. B61 1/16

U.S. Cl. 235-92 FQ

15 Claims



Apparatus for use with coded-vehicle identification systems for detecting the passage of the ends of railroad cars past a detection point. The apparatus determines the time interval between passage of adjacent wheels of each truck of a car past the detection point, and indicates that a truck has completely passed the detection point when a period of time equal to 1.6 times the time interval between passage of the last two wheels has elapsed without detection of another wheel. An end-of-car signal is produced at a time after the last wheel of the second truck has passed the detection point equal to 1.6 times the timer interval between passage of the last two wheels of the second truck. For the majority of railroad cars of the flat car type used in "piggyback" operations this end-of-car signal occurs as the region of the coupler passes the detection point. The apparatus also provides appropriate end-of-car signals for certain less common car configurations, and also includes arrangements for maintaining the apparatus in synchronism with the cars of a train by checking the occurrence of the coded labels on the cars.



3,731,068

## VALUE DISPENSING MECHANISMS

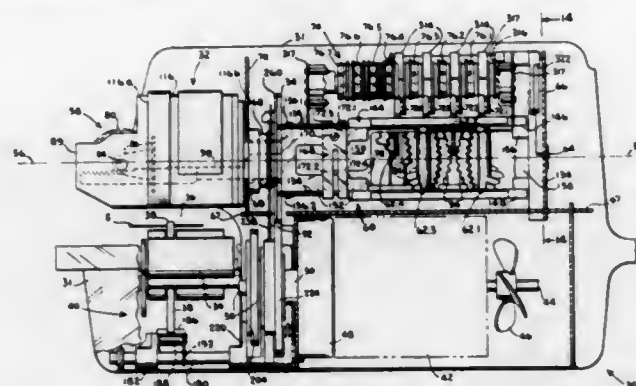
Walter J. Hanson, Old Greenwich, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Nov. 23, 1970, Ser. No. 91,800

Int. Cl. G07g 1/00; G06f 15/18

U.S. Cl. 235-101

30 Claims



A postage meter having a mechanism which is rotatable to print a postage impression of a selected value. A mechanism for setting the postage value is provided, and is assembled with the printing mechanism for rotation therewith. This setting mechanism includes selector wheels which are coaxially rotatable, and setting bars which are longitudinally translatable in response to rotation of the selector wheels. Economic accountability is assured by postage registers having four drivable decimal orders, and input pinions for each such order. The setting mechanism has four adjustable register-driving gear clusters which are normally disengaged from the register pinions, but engage them during printing. Mechanisms are provided for choking the register, and for clamping the choke devices to provide positive register locking when the driving gear clusters are disengaged from the pinions. The setting bars comprise an assembly of individual bar members, pairs of which are connected together for joint translation. The bars are nested in a unique way, and are formed with respective gear tooth racks which adjust the register-driving gear clusters and set the numerical value of the postage printing wheels. Rectification is accomplished by pawls which engage the setting bar racks, and have a mutually interlocking relationship with a shutter disk. This interlock operates either to disable the meter trip mechanism, and thus prevent postage printing operation, when the setting bars are not in rectified position; or to lock the setting bars during a postage printing cycle. A deadlock latch, which acts as an intermediate link between the shutter disk and trip mechanism, also blocks the trip mechanism when the descending postage balance is low, or the register compartment access door is open.

3,731,069

## APPARATUS FOR DETECTING YARN QUALITY INFORMATION

Tsugio Goto, and Tsutomu Tamura, both of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 27, 1971, Ser. No. 175,485

Claims priority, application Japan, Aug. 29, 1970, 45/75757; Nov. 4, 1970, 45/97368; Nov. 4, 1970, 45/97369; Feb. 3, 1971, 46/3908; Feb. 1, 1971, 46/3909

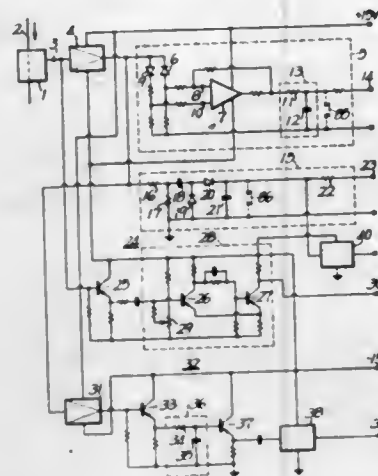
Int. Cl. G06g 7/66

U.S. Cl. 235-151.3

18 Claims

Yarn evenness or nonuniformity in thickness or mass of filamentary or film-shaped yarns formed of synthetic polymers, natural or regenerated celluloses or the like is detected in the form of electrical deviation signals, which are applied first to an areal average detector circuit to provide an areal average, lengthwise of the yarn, of irregularities, secondly to a peak value detector circuit to provide an average of crest values lengthwise of the yarn of the irregularities, and thirdly to an abnormality detector circuit to detect abnormally thick yarn portions such as fluff or slub which occur isolatedly or to detect filament abnormalities in a multi-filament yarn which also

occur isolatedly. These detected outputs are derived from a running yarn or yarns travelling through a yarn production,



finishing or false twist process and are adapted to be utilized in an electronic computer for overall evaluation to determine the yarn quality.

3,731,070

## GAS TURBINE ENGINE ANALYZER

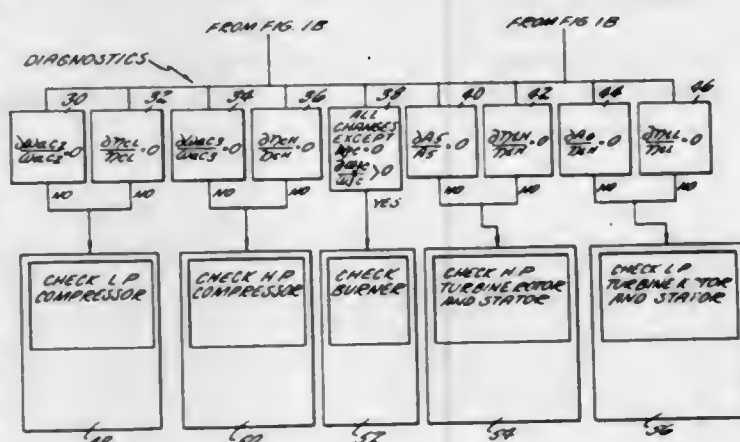
Louis A. Urban, Granby, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed April 27, 1971, Ser. No. 137,924

Int. Cl. G06f 15/20, 15/32

U.S. Cl. 235-151.3

11 Claims



The relative health of a gas turbine engine is analyzed and the particular faults are automatically determined by sensing monitored parameters of the gas path of gas turbine engine and electronically computing them into thermodynamically independent variables and comparing the rate of change of this value with a base line value used as a reference datum. A special purpose computer is programmed to include a general influence coefficient matrix containing the independent variables selected to determine the specific fault and serves to thermodynamically simulate the engine's operations.

3,731,071

## MINIMUM OPERATING PRESSURE CONTROL SYSTEM AND METHOD FOR CONTROLLING A PRODUCT SEPARATOR IN A CATALYTIC REFORMING UNIT

William D. White, Nederland, and Walker L. Hopkins, Groves, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed June 3, 1971, Ser. No. 149,596

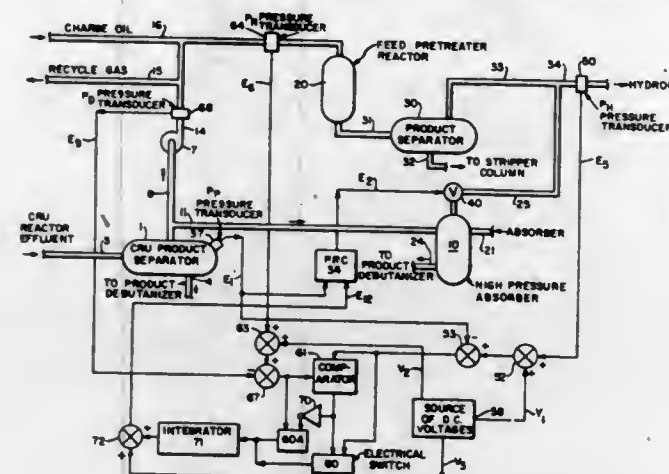
Int. Cl. G06g 7/58; C10g 35/04

U.S. Cl. 235-151.12

10 Claims

A control system for maintaining the operating pressure of a product separator in a catalytic reforming unit at a minimum value so as to provide economical operation. The gas output from the product separator follows two distinct paths: one

path includes a charge oil pretreating unit which provides hydrogen from the gas, the other path includes a high pressure absorber which also provides hydrogen from the gas. The pressure necessary at the product separator to provide steady flow in a path is determined for each each path in accordance



with equations hereinafter described in detail. The pressures in the paths are sensed and corresponding signals provided. A network determines constraint pressures for the product separator and selects the greater constraint pressure. The control system maintains the product separator at that pressure.

3,731,072

## SIGNAL PROCESSING CIRCUITS

James Stewart Johnston, Sussex, England, assignor to Rosemount Engineering Company, Limited, Bagnor Regis, Sussex, England

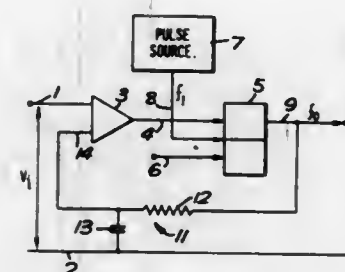
Filed July 22, 1971, Ser. No. 165,198

Claims priority, application Great Britain, Sept. 22, 1970, 45,143/70

Int. Cl. H03k 13/02

U.S. Cl. 235-151.3

16 Claims



A signal processing circuit comprises a difference amplifier receiving an input signal and a feedback signal. A bistable circuit switches repeatedly between states only when the difference amplifier's output is non-zero and positive. The feedback signal is developed by a switch that is closed to apply to an integrator a reference signal in response to pulses from the output of the bistable circuit. A source providing a pulse train clocks the bistable circuit. A heat meter in which the input signal comes from a temperature sensitive bridge and the pulse train comes from a flow meter is described.

3,731,073

## PROGRAMMABLE SWITCHING ARRAY

Philip John Moylan, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed April 5, 1972, Ser. No. 241,267

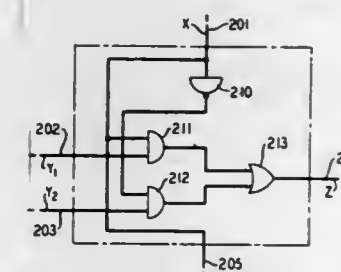
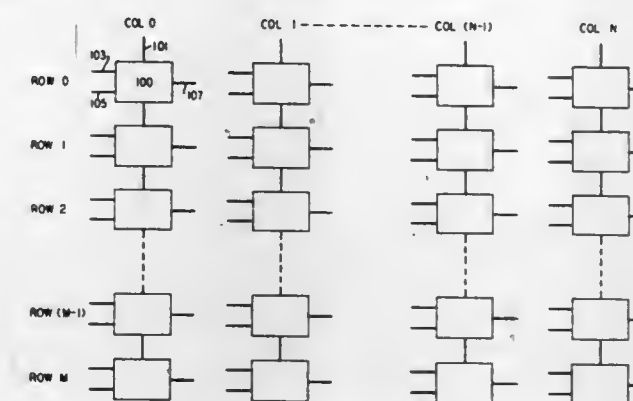
Int. Cl. H03k 19/20

U.S. Cl. 235-152

10 Claims

A method and apparatus are disclosed for programming a fixed array of identical logic modules to generate an arbitrary

combinational switching function. In particular, an array is provided which includes an ordered arrangement of columns of modules, each module having a plurality of input leads and at least one output lead. By completing electrical paths between the output leads of selected ones of the modules in a



3,731,074

## DECIMAL-BINARY CODE CONVERSION SYSTEM

Noboru Masuda, Kawaguchi, Japan, assignor to Denki Onkyo Co., Ltd., Tokyo, Japan

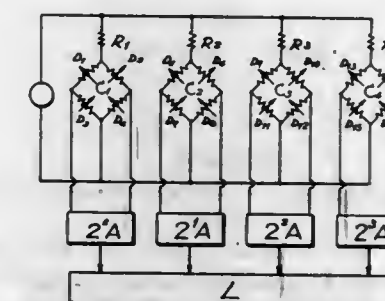
Filed March 12, 1971, Ser. No. 123,748

Claims priority, application Japan, March 12, 1970, 45/21013

Int. Cl. G06f 5/02; H03k 13/24, 13/247

U.S. Cl. 235-155

6 Claims



A decimal-binary code conversion system wherein four amplifying circuits are formed by respectively connecting four magneto-resistance effect devices formed as a bridge circuit to each of four amplifiers which produce different output signals, four different numerical values being binary-coded with independent operation of four amplifying circuits, and six numerical values being binary-coded with composite operations of the two of four amplifying circuits.



3,731,075

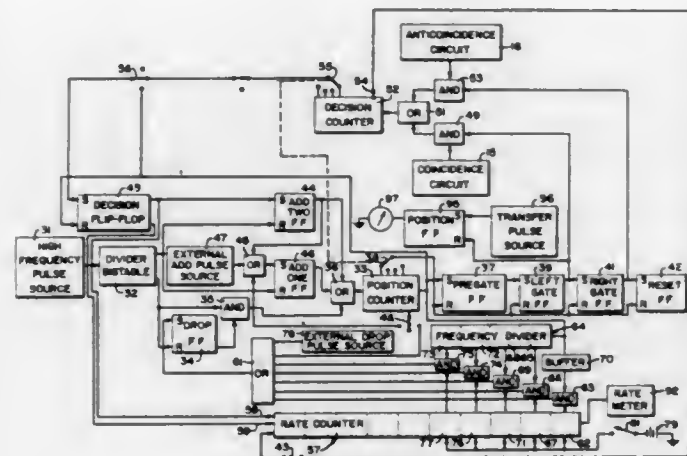
**AUTOMATIC RATE TRACKER**

John C. Munson, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 29, 1962, Ser. No. 206,526  
Int. Cl. G06f 15/34

U.S. Cl. 235-181

8 Claims



7. In a signal position determining means for determining the exact position of the maximum correlation in a correlation function signal obtained from a correlation circuit for comparing equally spaced pulses indicative of polarity samples of two different input waveforms, said correlation circuit producing a coincidence or a non-coincidence pulse for each comparison, decision circuit comprising gate timing means for generating a pair of gate intervals of equal time duration on either side of the approximate position of maximum correlation, coincidence gate means connected to said timing means for passing a coincidence pulse therethrough for each polarity coincidence occurring during one of said gate intervals, anti-coincidence gate means connected to said timing means for passing a non-coincidence pulse therethrough for each polarity non-coincidence occurring during the other of said gate intervals, decision counter means being connected to said first and second gate means to count the pulses passed through both said gates, whereby the number of pulses counted by said counter means during said first and second gate intervals is indicative of the position of said gate intervals with relation to said maximum correlation position.

3,731,076

**SYSTEM FOR PREVENTING IMPROPER USE OF CREDIT CARDS**

Masanori Nagata, and Katsuke Osaki, both of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan  
Filed Feb. 25, 1971, Ser. No. 118,600

Claims priority, application Japan, March 3, 1970, 45/18496

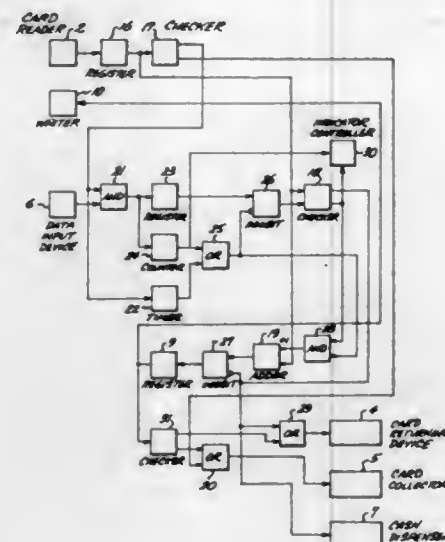
Int. Cl. G06f 7/04; H04q 3/02

U.S. Cl. 235-61.7 B

14 Claims

A system for preventing improper use of credit cards having necessary data recorded thereon in card-actuated machines, wherein the system checks for a predetermined correspondence between the data read from a card inserted into the machine, and the data manually entered by the user of the

card. If a correspondence does not exist, the stored number of times of absence of said correspondence with respect to the



individual card is increased. When the stored number reaches a predetermined number, the card is invalidated.

**ERRATUM**

For Class 235-61.11 D see:  
Patent No. 3,731,085

3,731,077

**ILLUMINATED INDICATOR FOR HIGH AND LOW AMBIENT LIGHT ENVIRONMENTS**

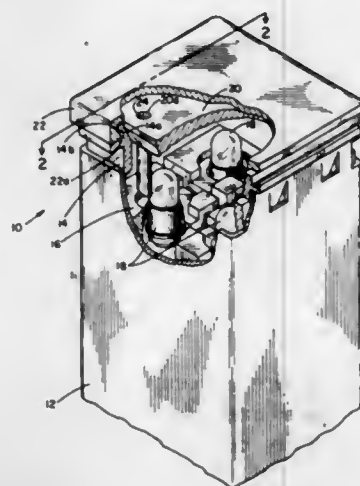
Franz S. Reisch, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed March 31, 1971, Ser. No. 129,867

Int. Cl. F21

U.S. Cl. 240-1 EL

4 Claims



An illuminated indicator having two concurrently illuminable portions, one of which provides a diffused signal clearly visible only under low ambient light conditions and the other of which provides a bright concentrated signal clearly visible under high ambient light conditions.

3,731,078

**LANTERN**

Willard F. Vanderbeek, Sycamore, Ill., assignor to Olin Corporation, New Haven, Conn.

Filed April 30, 1971, Ser. No. 138,961

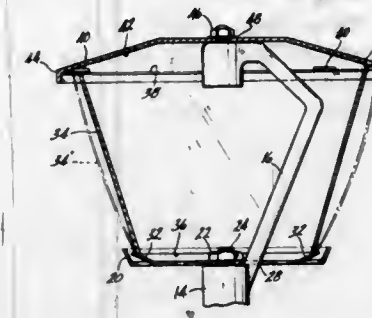
Int. Cl. F21I 7/00

U.S. Cl. 240-11

4 Claims

A lantern structure having a transparent or translucent globe member which protects a lantern mantle or flame. Top

and bottom support members are disposed above and below the globe, and spring means are mounted on at least one of the top and bottom support members in engagement with the



globe to bias the globe into snug engagement with the other of the top and bottom support members, thereby eliminating or sharply reducing globe rattle.

3,731,079

**SWINGABLE HEADLIGHT FOR VEHICLES**

Ferdinand Anton Ernst Porsche, Feuerbacher Weg 48, 7 Stuttgart-Nord, Germany, assignor to Firma Dr.-Ing. H. C. F. Porsche K. G., Zuffenhausen, Germany

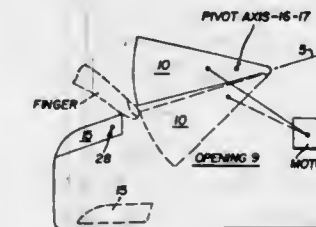
Filed Oct. 27, 1970, Ser. No. 84,418

Claims priority, application Germany, Nov. 8, 1969, P 19 56 346.3

Int. Cl. B60k 27/08; B60q 1/04

U.S. Cl. 240-7.1 H

28 Claims



A headlight mounting arrangement for vehicles utilizing headlights of the type that are pivoted from an in-use position above the surrounding surfaces of the vehicle body to a stored or rest position in an opening in the vehicle body. The structural element forming the forward outwardly facing edge of the opening within which the headlight is to be pivoted into is constructed so as to be movable in response to a force thereon such that the limb of a person that may be inadvertently positioned adjacent the front of the headlight when the headlight is being pivoted into the opening is protected from being squeezed between the headlight and the structural element. The structural element is mounted at the adjoining fixed vehicle body structure by way of yieldable elements in the form of pins. One embodiment of the invention utilizes pins with a constricted portion acting as shear pins, while another embodiment utilizes a two part disengagable pin structure. The structural element is contoured to smoothly blend with the surrounding body structure under normal use.

3,731,080

**HEADLAMP POLARIZING ATTACHMENT**

Vaio K. Eloranta, Needham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

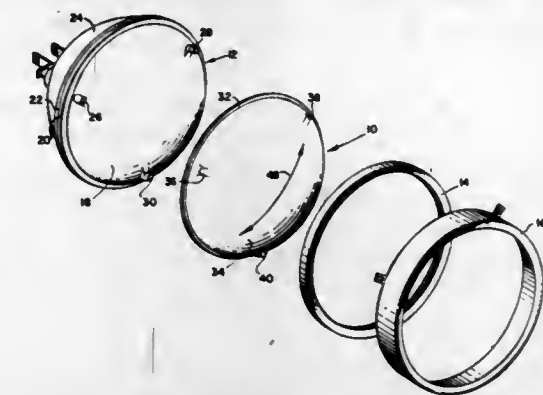
Filed June 28, 1971, Ser. No. 157,145

Int. Cl. F21v 9/14; G02b 5/30, 27/28

U.S. Cl. 240-9.5

21 Claims

This concept is directed to a headlamp polarizing attachment using a linear polarizer having a spherical shape with asymmetric receptacles formed in it. The attachment fits on a standard automobile headlamp when it is positioned so the



it is at 45° to the horizontal when the headlamp is mounted on an automobile. This application is further directed to a special gasket for sealing the headlamp polarizing attachment to the headlamp.

3,731,081

**ELECTRICALLY ILLUMINATED ORNAMENTAL DISPLAY**

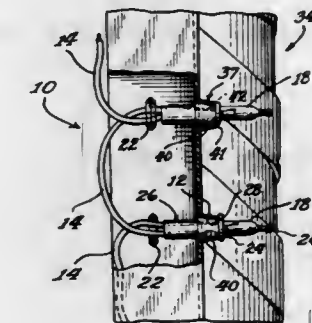
Bernard Yellin, 5252 South Kolmar Ave., Wilmette, Ill.

Filed Feb. 4, 1972, Ser. No. 223,481

Int. Cl. A47g 33/00

U.S. Cl. 240-10 R

5 Claims



3,731,082

**EMERGENCY WARNING LIGHT APPARATUS**

Arnold O. Blaylock, Fort Worth, Tex., assignor to Lectric Lites Company, Fort Worth, Tex.

Filed Sept. 30, 1970, Ser. No. 76,662

Int. Cl. B64f 1/20; F21v 21/00

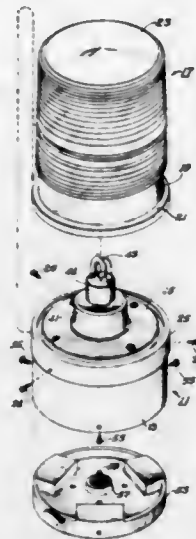
U.S. Cl. 240-10.5

6 Claims

An emergency warning light apparatus having a high-intensity bulb carried on a base and covered by a translucent, substantially cylindrical dome, one portion of which has the form of a Fresnel, ribbed pattern on a cylindrical wall surface and a conical deflector in its upper portion, with its apex disposed from the base of the cone toward the bulb. The base includes a lower plate adapted for essentially universal mounting, includ-



ing a central aperture that is threaded to receive a support bar, a plurality of smaller apertures clustered around the central aperture, and a plurality of sockets on a lower surface to receive permanent magnets. The high-intensity bulb carried by the base inside the dome is intermittently actuated, being a



strobe light connected with a power transistor of a circuit means, the heat generated by the transistor being conducted to the base by a heat conductive fastener which with the base defines a heat sink to dissipate the heat generated by the power transistor.

3,731,083

Patent Not Issued For This Number

3,731,084

## PORTABLE FLASHLIGHT

Blanche P. Trevorrow, 1090 Baxter, Waukesha, Wis.  
Filed March 20, 1972, Ser. No. 236,066  
Int. Cl. F21v 33/00, 21/00  
U.S. Cl. 240-6.4 W

1 Claim



A flashlight integral with a harness so it can be supported from the shoulders of a person and child so that their hands are free for other tasks. The device consists of a flashlight unit equipped with an electric lamp and dry cell battery which is attached to a pair of flexible hollow stems each of which is secured to an adjustable shoulderband and a mercury actuated switch pivotally attached to one of the shoulder bands.

3,731,085

## CREDIT CARD OR THE LIKE

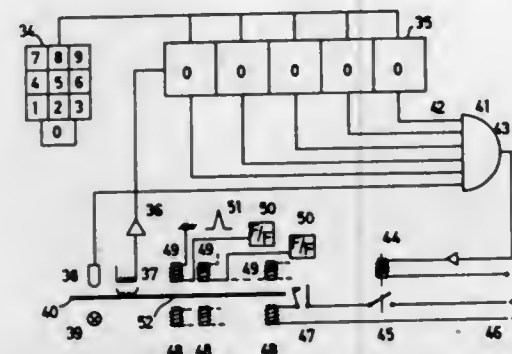
Sten-Lennart Bostrom, Hagersten, Sweden, assignor to Dasy Inter S.A., Geneva, Switzerland  
Filed Nov. 5, 1970, Ser. No. 87,254  
Claims priority, application Switzerland, Nov. 6, 1969, 15203; Jan. 19, 1970, 577  
Int. Cl. G06k 7/08, 19/08

U.S. Cl. 235-61.11 D

23 Claims

A system for checking cards serving as identification document and as proof of authorization, said system comprising: a

card serving as identification document and as proof of authorization, comprising visual identification information carrying elements, and at least one recording medium carrying invisible information and comprising a thin sheet of non-magnetizable metal, being a magnetically shielding high-permeable alloy, containing as major components, iron and nickel in which sheet a number of areas having other magnetic properties than the remainder of the sheet are located to provide at least one unamendable authorization code pattern, and means for reading information contained in said cards, and means for



checking the information read, and wherein said reading means comprises a slot for inserting said cards, at least one magnetic means located on one side of the inserted card, and magnetically operable means located on the opposite side of said card, the arrangement of at least said magnetically operable means corresponding to all possible code patterns on said sheet, and wherein a number of said magnetically operable means, upon the correct insertion of a card in said slot, are adapted to be magnetically influenced by said magnetic means, in correspondence to the code pattern of said inserted card, and to thereby control said checking means.

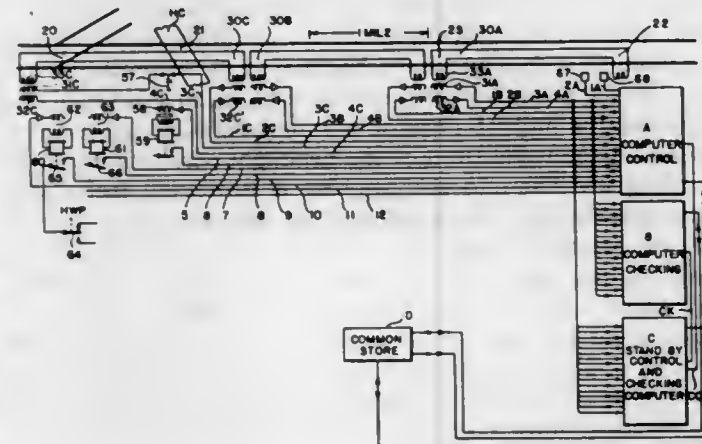
3,731,086

## RAILROAD VEHICLE CONTROL SYSTEM

Willis R. Smith, Rochester, N.Y., assignor to General Signal Corporation, Rochester, N.Y.  
Continuation of Ser. No. 14,909, Feb. 27, 1970. This application Oct. 15, 1971, Ser. No. 189,731  
Int. Cl. B6113/18

U.S. Cl. 246-63 C

7 Claims



A railroad vehicle control system governed by a wayside computer has a communications channel for each track section in the territory for periodically exchanging information between said computer and said railroad vehicle wherein the improvement comprises a tachometer means governed by the rate of rotation of the wheels of said vehicle for producing pulses indicative of the actual speed in accordance with said rate of rotation. The computer includes a control stage for calculating speed, and generating desired speed control signal pulses for transmission to the vehicle and a checking stage

responsive to said control stage for validating the desired speed signal. A standby stage responsive to the control and checking stages assumes control and checking functions upon failure of either of said stages. A comparator responsive to the control and actual speed pulses increases and decreases the speed of the vehicle until the frequency of the actual speed pulses equals the frequency of desired speed pulses.

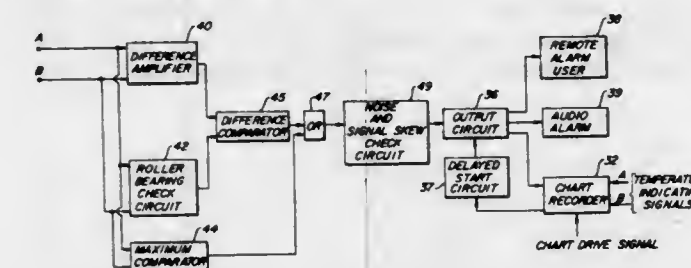
3,731,087

## HOT BOX ALARM SYSTEM

Joseph W. King, Lakewood, Ohio, assignor to Cleveland Technical Center, Inc., Cleveland, Ohio  
Filed Nov. 16, 1970, Ser. No. 89,910  
Int. Cl. B6113/10

U.S. Cl. 246-169D

22 Claims



Method and apparatus for evaluating temperature indicating signals from a railway hot box detector and producing an alarm signal therefrom. The signals are differentially evaluated and are compared to appropriate reference signals to detect overheated solid or roller bearings. False alarm signals produced from the differential evaluation because of the difficulty in distinguishing the temperatures of normally operating roller bearings from those of overheated solid bearings are detected and cancelled. False alarm signals caused by noise and by time displacement between temperature indicating signals are cancelled by checking the duration of all alarm signals and passing only those that have long enough durations not to have been produced by noise or by differential evaluation of time displaced temperature indicating signals. The alarm system is advantageously connected in circuit with a chart recorder to produce a permanent record of hot boxes.

3,731,088

## STATION STOP CONTROL ARRANGEMENT FOR SELF-PROPELLED VEHICLES

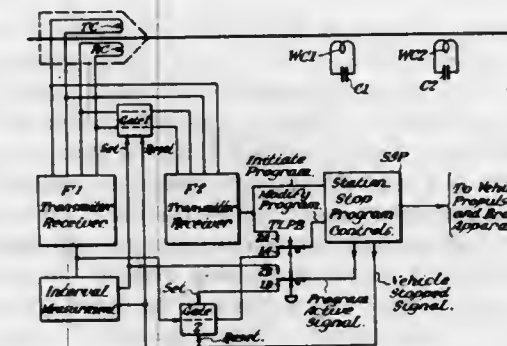
Reed H. Grundy, Murrysville, and Donald R. Little, Greensburg, both of Pa., assignors to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Feb. 17, 1971, Ser. No. 116,033

Int. Cl. B6113/06

U.S. Cl. 246-182 B

9 Claims



Coils tuned to a first and a second frequency are positioned in pairs along the track in approach to the station at which trains are to stop automatically, two pairs being shown. Other first pair are spaced a distance which establishes a selected passage time in accordance with average train speeds while the second pair are separated a distance proportional to

predetermined differences in train lengths. On the train two transmitter and/or receivers are coupled by a common pair of coils to inductively respond to the corresponding frequency wayside coil. Response to the initial first frequency coil opens a gate which enables the other transmitter-receiver for a predetermined time or distance interval to respond to the second frequency wayside coil of the initial pair. Only if the train coils pass this second frequency coil during this gating interval is the station stop program initiated by the response of the second transmitter-receiver. While passing the second set of wayside coils, the response of the first or second transmitter-receiver is selectively used, in accordance with a preset train length condition, to modify the station stop program to improve the accuracy of the station stop position.

3,731,089

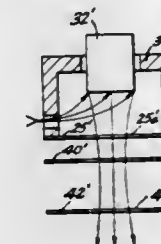
## MASS SPECTROMETER ION SOURCE HAVING MEANS FOR RAPIDLY EXPELLING IONS FROM THE SOURCE AND METHOD OF OPERATION

Richard M. Elliott, Sale, England, assignor to Associated Electrical Industries Limited, London, England  
Filed April 27, 1970, Ser. No. 32,324  
Claims priority, application Great Britain, April 28, 1969, 21,462/69

Int. Cl. H01j 37/08

U.S. Cl. 250-41.9 SB

4 Claims



An ion source for mass spectrometers including an ionization chamber having an aperture for the passage of ions and an electrode disposed therein, electron generating means for directing a beam of electrons toward the electrode, means for introducing a sample into the chamber, and source means for developing an electrical signal having a value greater than the value of a signal applied to an electron source and less than the value of a signal necessary to cause substantial field ionization. Also included are circuit means for connecting the source means to the electrode to generate an electrical field about the electrode to rapidly expel ions, developed upon bombardment of the sample by the electrons, through the aperture.

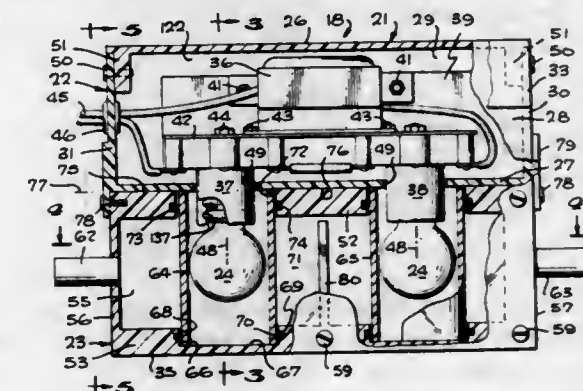
3,731,090

## FLUID STERILIZATION

Louis P. Veloz, 500 South Madison Avenue, Pasadena, Calif.  
Filed Oct. 30, 1970, Ser. No. 85,648  
Int. Cl. H01j 37/00

U.S. Cl. 250-43

18 Claims



A fluid sterilizer for an aquarium or the like, including an upper body section adapted to be suspended on an upper edge



of the aquarium and carrying downwardly projecting ultraviolet lamps, and a lower body section detachably connectible to the upper section and through which water to be sterilized flows, with tubes of ultraviolet passing material being mounted in the lower section to define upwardly opening spaces into which the lamps project when the body structure is assembled.

3,731,091

# METHOD AND MEANS FOR MONITORING THE QUANTITY OF DISPERSED OIL IN WATER WITH MEANS FOR WIPING THE SAMPLE CELL

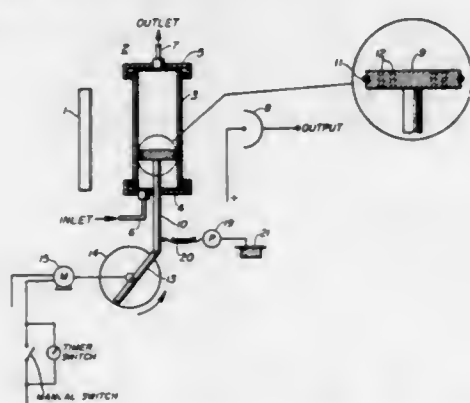
John B. Rosso, and Robert H. Ross, Tulsa, Okla., assignors to Combustion Engineering, Inc., Stamford, Conn.

Filed June 30, 1971, Ser. No. 158,436

Int. Cl. G01n 21/26

U.S. Cl. 250—43.5 R

2 Claims



A system is disclosed to monitor and quantify small amounts of oil dispersed in water which includes a source of ultraviolet light for transmission of light through a sample of the dispersion, a chamber for containing the sample of liquid being analyzed, a photocell for translating ultraviolet light transmitted through the sample into an electrical signal, circuit and registration means for compensating and utilizing the signal, and a reciprocating wiper for maintaining the interior walls of the sample chamber in a clean, and therefore in a suitably ultraviolet-transparent, condition.

3,731,092

# NON-DISPERSE INFRARED GAS ANALYZER HAVING SAMPLE AND REFERENCE BEAMS USING FLOW SENSITIVE DETECTOR AND WITH UNBALANCED OPERATION

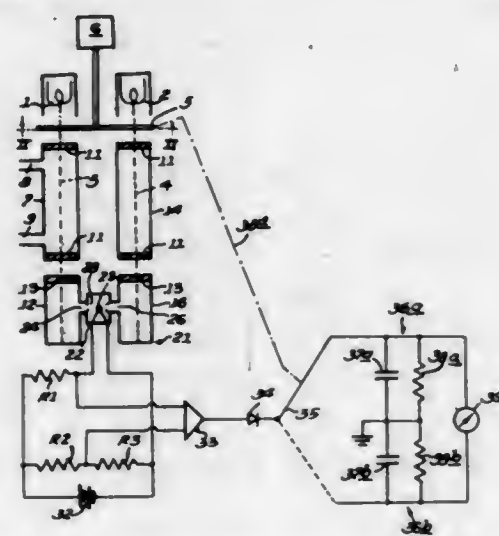
Ray S. Freilino, Pittsburgh, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Nov. 11, 1971, Ser. No. 197,899

Int. Cl. G01n 21/34

U.S. Cl. 250—43.5 R

10 Claims



Separate pulsed sample and reference beams of infrared energy are passed, respectively, through sample and reference

gases to separate chambers in a detector unit for measuring the absorption of the sample beam by a component of interest in the sample gas. The detector unit includes a flow responsive sensor having a rate of change of resistance that varies inversely with temperature. By cyclically modulating the two beams, as, for example, by a shutter device that in one portion of a cycle cuts off the sample beam but not the reference beam and in another non-consecutive portion of the cycle cuts off the reference beam but not the sample beam and that separates such modulated portions by a cyclical portion in which the infrared energy in both beam paths is substantially equally modulated (including the conditions in which both beams are fully cut off or not cut off at all), one obtains the advantages of unbalanced operation inherent in a single beam instrument (i.e., increased sensitivity due to the non-linear response of the sensor), as well as the advantages of a double beam instrument (i.e., for example, compensation for changes in ambient conditions because of the use of a reference gas). This invention is an improvement of that disclosed in U.S. Pat. No. 3,560,736, issued to the assignee of the present application.

3,731,093

# IONIZATION FIRE ALARM WITH WIND SCREEN

Andreas Scheldweller, Stafa, and Peter R. Muller, Sec, both of Switzerland, assignors to Cerberus AG, Mannedorf, Switzerland

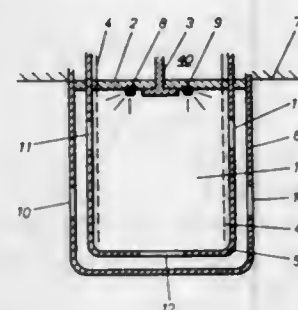
Continuation-in-part of Ser. No. 834,008, June 17, 1969, abandoned. This application April 5, 1971, Ser. No. 131,106

Claims priority, application Switzerland, June 18, 1968, 9035/68

Int. Cl. G01n 23/12

U.S. Cl. 250—44

10 Claims



A low-voltage ionization fire alarm comprising at least one ionization chamber connected in series with a resistance element, preferably defining a reference chamber means, across a pair of conductors supplied by a direct-current voltage of less than 60 volts. The ionization chamber has a sheathing means serving as a wind screen for reducing the velocity of air flow within the chamber such that circulation of air within the chamber has substantially no effect upon the ionization current. The sheathing means preferably includes an outer and inner portion, with the inner surface of the outer portion having a geometric shape similar to that of the outer surface of the inner portion, the two surfaces being disposed substantially parallel to one another. At least one aperture is provided through the inner and the outer sheathing portions, respectively, the respective apertures being displaced such that the lateral separation between the margins of the aperture in the outer sheathing portion and the aperture in the inner sheathing portion is greater than the separation between the two sheathing portions themselves.

3,731,094

# ELECTRON BEAM APPARATUS WITH MEANS FOR GENERATING A ROTATION-SYMMETRICAL MAGNETIC FIELD

Jan Bart Le Poole, Delft, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.

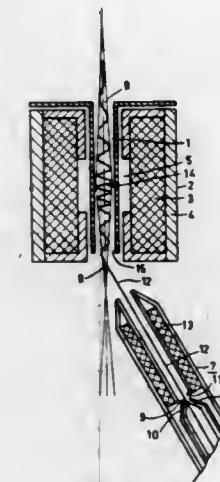
Filed Aug. 19, 1971, Ser. No. 173,045

Claims priority, application Netherlands, Aug. 21, 1970, 7012387

Int. Cl. H01j 37/26

U.S. Cl. 250—49.5 D

14 Claims



An apparatus for generating an electrostatic space charge in a rotation-symmetrical magnetic field, in which an electron beam from an electron gun which is arranged laterally on the field space generates the space charge in the field space. The electron beam may be adjusted by mechanical adjustment of the gun and also by means of the potential of a conducting sleeve in the magnetic field. By means of this potential, it is also possible to adjust the ratio between the contributions to the space charge which are due to primary electrons and to secondary electrons produced by the primary electrons in a residual gas in the field space.

3,731,095

# ELECTRON GUN DEVICE OF FIELD EMISSION TYPE

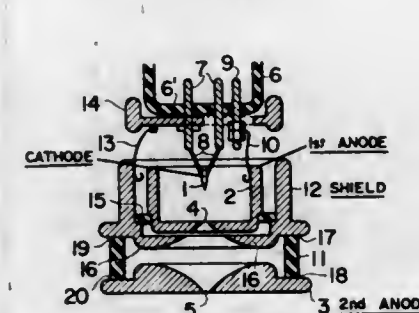
Tsutomu Komoda, Kodaira-shi, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed April 1, 1971, Ser. No. 130,283

Int. Cl. H01j 37/26

U.S. Cl. 250—49.5 A

10 Claims



In an electron gun device of the field emission type, a shield electrode whose potential is the same as that of a cathode-tip of needle shape is disposed in surrounding relationship to a first anode so as to shield said first anode from ground potential portions of the device, such as the envelope, so that discharge between the anode and the ground potential portions is prevented, whereby the needle tip of the cathode is protected from destruction due to said discharge.

3,731,096

# HIGH RESOLUTION, HIGH ETENDUE, RETARDING-POTENTIAL ELECTRON CONCENTRATOR

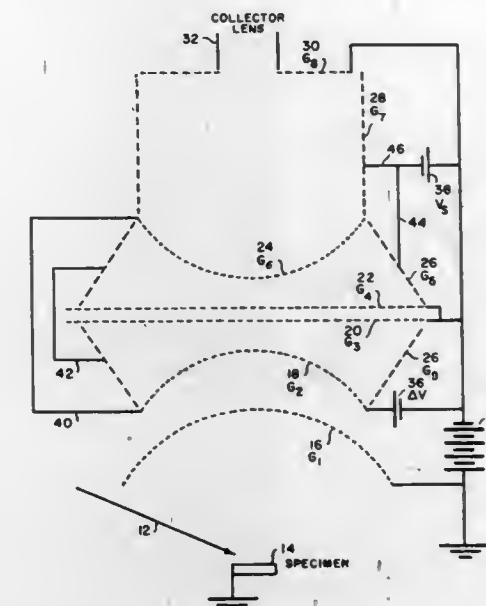
Forrest L. Carter, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Nov. 24, 1971, Ser. No. 201,699

Int. Cl. G01t 1/36

U.S. Cl. 250—49.5 AE

7 Claims



The invention comprises improvements in an electron-concentrator device of the spherical-grid, retarding-potential, post-monochromator spectrometer type. A pair of fine-mesh, high-transparency, spaced, planar grids is added after the first curved coarse focusing grid thereby determining the lower-energy limit of the electron passband. A second oppositely curved coarse focusing grid is added after the planar grids to provide assistance in focusing the passband electrons on the collector lens.

3,731,097

# METHOD AND APPARATUS FOR ELIMINATING SPOT DOUBLING IN PRECESSION X-RAY CRYSTALLOGRAPHY

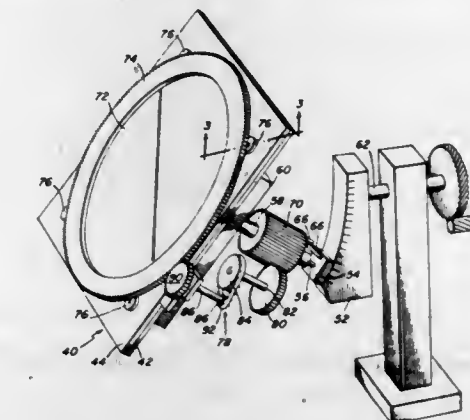
Roy Leander Thomas, Jr., Medway, Mass., assignor to Charles Supper Company, Natick, Mass.

Filed Oct. 7, 1971, Ser. No. 187,353

Int. Cl. G01n 23/20

U.S. Cl. 250—51.5

5 Claims



A film cassette for a precession-type crystallographic camera includes a mask adjacent the film plane of the camera which is rotated in synchronism with the camera's precession motion to block a selected one of the two X-ray beam reflections produced for each reciprocal lattice point during a precessing cycle of the camera. A novel method of precession photography is disclosed.



3,731,098

## IMAGE SCANNER DRIVE SYSTEM

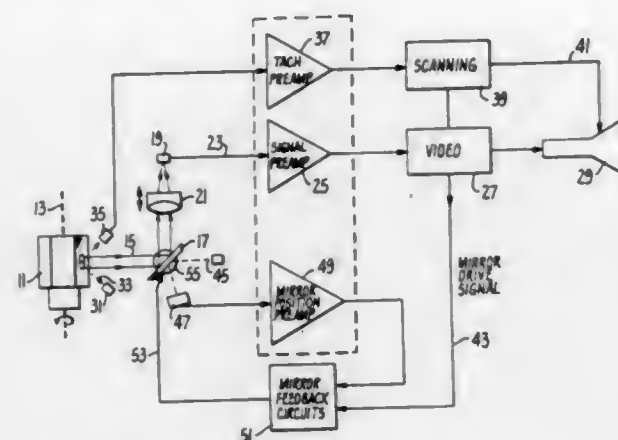
Robert P. Hunt, Menlo Park, Calif., assignor to Spectrotherm Corp., Mountain View, Calif.

Filed March 6, 1972, Ser. No. 232,036

Int. Cl. H04n 3/16

U.S. Cl. 250-83.3 H

17 Claims



A position detection technique for use in motion control feedback systems. The position of an object is determined by optically modulating a light beam an amount proportional to the position of the object. The degree of optical modulation is then detected by a detector not mechanically connected with the object. A position signal developed by the detector is used in an electronic feedback circuit to accurately control the position of the object. An improved operational amplifier circuit for supplying an object driving motor is disclosed along with an improved delay circuit for controlling object motion.

3,731,099

## BLACK BODY THERMOELECTRIC RADIOMETER

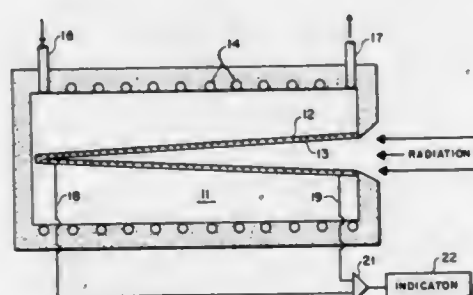
Norman D. Greene, Route 1, Box 148, Del Mar, Calif.

Filed Sept. 30, 1970, Ser. No. 76,756

Int. Cl. G01t 1/16

U.S. Cl. 250-83.3 H

1 Claim



A black body thermoelectric radiometer in which a heat sink is provided with a conical cavity therein; the cavity walls being lined with a uniform distribution of thin thermoelectric heat flux sensors which directly transduce radiation intensity impinging thereon to an electrical voltage having an amplitude proportional to radiation intensity; the radiation being transferred to heat energy and passing through the thermoelectric heat flux sensors into the surrounding heat sink and an insulative layer surrounding the heat sink; the insulative layer carrying cooling coils therein in heat exchange relationship with the heat sink.

3,731,100

## MONITOR OF THE CONCENTRATION OF RADIOACTIVE IODINE IN A STREAM OF GAS

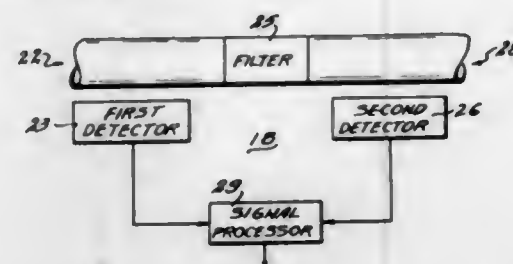
Kenneth R. Lattin, Richland, Wash., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed April 7, 1971, Ser. No. 131,970

Int. Cl. G01t 7/04

U.S. Cl. 250-83.6 FT

4 Claims



The concentration of a radioactive substance in the effluent from a nuclear reactor is measured by counting total radiation in the effluent, filtering out the particular radioactive substance, counting total radiation in the filtered effluent, and combining the results. This method is particularly sensitive to rapid changes in the concentration, and is especially adapted to the monitoring of amounts of radioactive iodine.

3,731,101

## SHIPPING CONTAINER FOR RADIOACTIVE MATERIAL

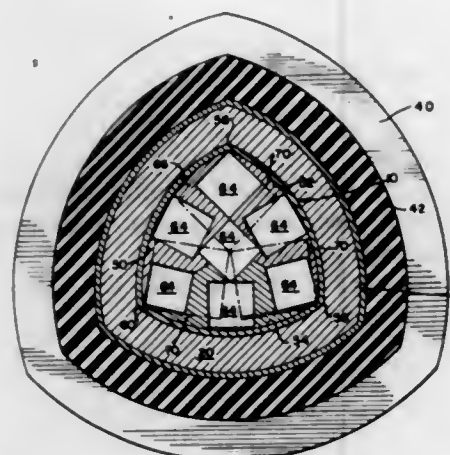
Reuben W. Peterson, Wilmington, Del.; Harold A. Backus, Wynwood, Pa., and Clifford J. Anderson, Buckeystown, Md., assignors to N L Industries, Inc., New York, N.Y.

Filed April 14, 1971, Ser. No. 133,966

Int. Cl. G21f 5/00

U.S. Cl. 250-108 R

18 Claims



The body means of the shipping container includes an inner shell means and an outer shell means spaced outwardly of the inner shell means, radiation shielding material being disposed within the space between the inner and outer shell means. The inner shell means defines a radioactive material receiving cavity therewithin having a cross-sectional configuration defining three sides, adjacent ones of the sides joining one another to define three apexes to thereby provide maximum capacity with a minimum size and weight container.

3,731,102

## SHIPPING CONTAINER FOR RADIOACTIVE MATERIAL

Reuben W. Peterson, Wilmington, Del., assignor to NL Industries, Inc., New York, N.Y.

Filed May 24, 1971, Ser. No. 146,355

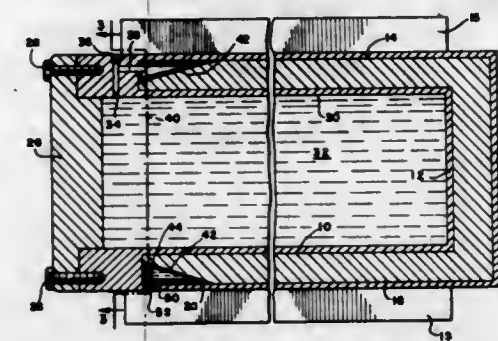
Int. Cl. G21f 5/00

U.S. Cl. 250-108 R

5 Claims

A body means includes inner and outer shell means having radiation shielding means therebetween and including a

radioactive material receiving central cavity which is filled with liquid coolant during shipment. Expansion means in the form of an annular tank is disposed in a void defined between the shielding means and the outer shell means, this tank



receiving liquid coolant from the cavity when the coolant expands upon an increase in temperature thereof and returning coolant to the central cavity when the coolant contracts upon a decrease in temperature.

3,731,103

## ADAPTIVE ARRAYS

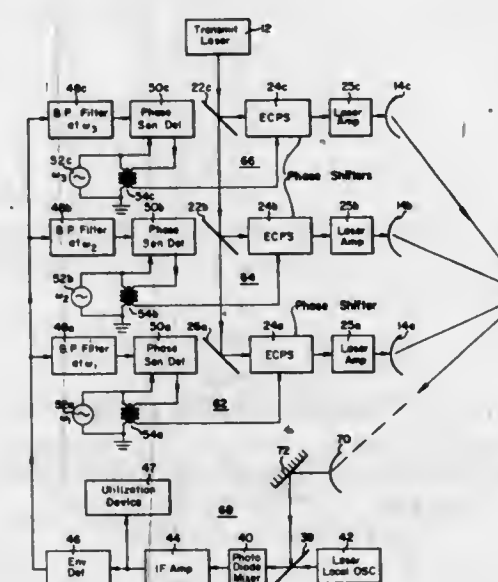
Thomas R. O'Meara, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 24, 1971, Ser. No. 128,628

Int. Cl. H04b 9/00

U.S. Cl. 250-199

7 Claims



Herein are disclosed multiple beam laser systems with adaptive phase control for establishing, at a target, an in-phase condition between the corresponding electromagnetic fields of all the beams. Phase modulation at different frequencies or differing waveforms is applied in the transmission paths of selected radiating elements of the array; and modulation components in the received energy are utilized to control phase shifters in the transmission paths so as to maintain the cophase condition at the target.

3,731,104

## BI-ADAPTIVE SCAN DIGITAL UNIVERSAL SENSOR TARGET TRACKER

Barry S. Todd, Norco, and Werner G. Hueber, China Lake, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Jan. 4, 1971, Ser. No. 103,904

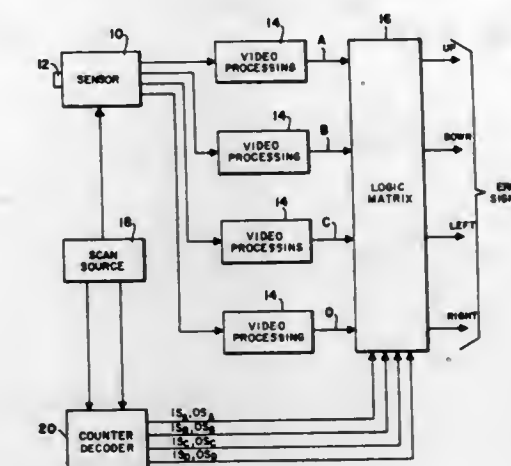
Int. Cl. G01s 9/64

U.S. Cl. 250-203

1 Claim

Two or more concentric scan boundaries are used to track small or large objects. A sensor which has multiple detectors,

or a detector with multiple readout signals displaced spatially so as to cover the area of concern with overlapping scans is used for scanning. The central area bounded by the scans is used to sense minor variations in relative object movement. The outer bounded area is used to sense large variations which



escape the central area, to sense an object which is initially larger than the central area, and to sense an object which has become larger due to range closure. A digital logic circuit is coupled to the sensor output and generates error signals based on the occurrence of object video signals coincident with scan derived timing signals.

3,731,105

## ARC SUPPRESSOR FOR DIELECTRIC APPARATUS

Mark Preston New Ipswich, N.H., assignor to Litton Business Systems, Inc., New York, N.Y.

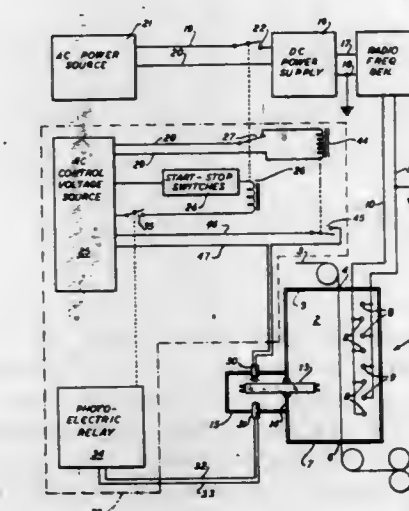
Continuation of Ser. No. 29,959, April 20, 1970, abandoned.

This application May 19, 1972, Ser. No. 255,297

Int. Cl. H05b 9/06

U.S. Cl. 250-217 R

3 Claims



Dielectric heating apparatus including spaced electrodes, power means for generating a high frequency electromagnetic field of predetermined magnitude between said electrodes, a fluorescent lamp which is energized in response to said electromagnetic field when at said predetermined magnitude, means responsive to de-energization of said fluorescent lamp for inhibiting operation of power means whereby, upon an arc being instituted between said electrodes, said electromagnetic field is reduced in magnitude, said fluorescent lamp is de-energized, said power means is interrupted and the arc is suppressed thereby avoiding the danger of fire and thereby preventing damage to both the electrodes and material being heated.



3,731,106

## BEAM SCANNER FOR HIGH POWER LASER

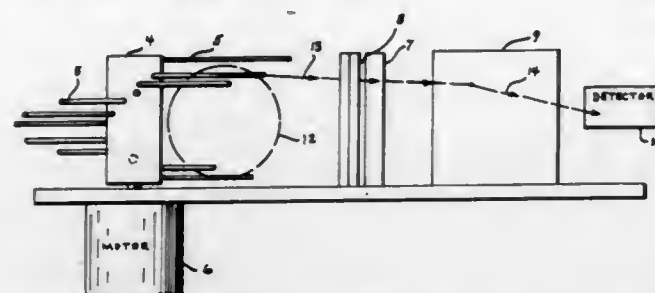
Dennis N. Mansell, Palos Verdes Peninsula, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Nov. 16, 1971, Ser. No. 199,185

Int. Cl. H01j 5/16

U.S. Cl. 250-236 R

2 Claims



Beam scanning of high power laser beam is accomplished by sequentially deflecting successive thin layers of the beam in such a way that each thin strip of deflected laser light passes across a narrow aperture mask. The laser light passing through the aperture is effectively a scan of that layer of the laser beam. It is subsequently focused onto an appropriate laser beam detector. A spiral arrangement of radial reflector rods mounted on a rotatable drum support structure is used to achieve sequential deflection of successive layers of the laser beam.

3,731,107

## OPTICAL SHAFT ENCODER

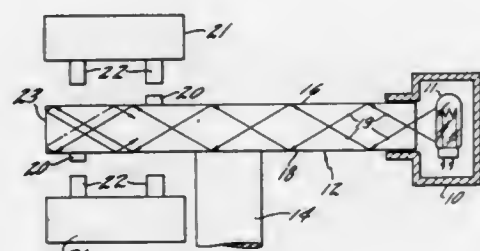
Raymond W. Goodwin, Westport, and James J. Alimena, Fairfield, both of, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 15, 1971, Ser. No. 208,348

Int. Cl. G01d 5/34

U.S. Cl. 250-231 SE

3 Claims



Light is transmitted through the edge of a transparent cylinder, a portion of the light inside the cylinder being incident to at least one face thereof at greater than the critical angle between the cylinder and air. Light escapes from the faces at a plurality of selected locations thereon in a plurality of unique output patterns, associated with angular positions of the cylinder. Stationary optical detectors, opposite the faces, detect the escaping light when the cylinder is rotated to a position that places a selected location opposite an optical detector. The optical detectors provide signals representative of a unique pattern and hence the angular position of the cylinder.

In one embodiment a material having an index of refraction intermediate to that of the cylinder and air is disposed at the selected locations, providing a critical angle greater than the critical angle between the cylinder and the environment, thereby causing light to escape through the faces only at the selected locations.

In another embodiment, notches in the faces of the cylinder are disposed at the selected locations, the notches being at an angle so that light is incident thereto at an angle less than the critical angle, thereby causing light to escape through the faces only at the selected locations.

3,731,108  
ENGINE AUTOMATIC CONTROL SYSTEM AND METHOD FOR VEHICLES

Kiyoshi Kobara, Tsutomu Fukuzawa, and Yuzuru Ujihara, all of Tokyo, Japan, assignors to Toyoto Jidosha Hanbai Kabushiki Kaisha, Nagoya, Japan

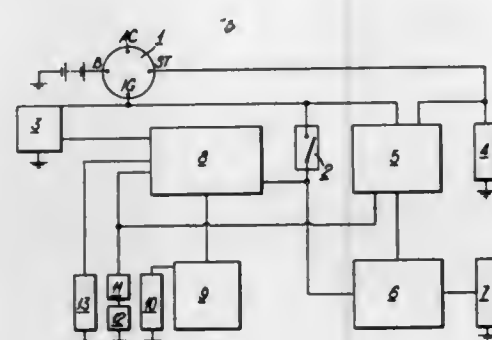
Filed Aug. 30, 1971, Ser. No. 175,843

Claims priority, application Japan, Dec. 25, 1970, 45/126927

U.S. Cl. 290-38

Int. Cl. H02p 9/04

10 Claims



An engine automatic control system for a vehicle having an ignition switch for selectively connecting an electric source with an engine starter and an ignition circuit is provided which comprises an accelerator switch conducted in response to the operation of the accelerator pedal of the vehicle, a clutch switch conducted in response to the operation of clutch means of the vehicle, a starter conducting circuit for automatically operating the starter in response to the conduction of the mentioned two switches, a starter cutting-off circuit to stop the operation of the starter upon starting of engine rotation, a speed detecting circuit to detect the running speed of the vehicle and an engine holding/arresting circuit controlled by the speed detecting circuit to regulate in turn the operation of the engine of the vehicle.

3,731,109

## MAGNETIC DOMAIN LOGIC APPARATUS

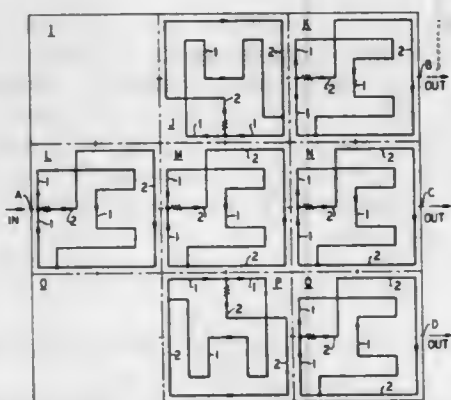
Michael Randolph Garey, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 17, 1971, Ser. No. 154,144

Int. Cl. G11c 11/14, 19/00

U.S. Cl. 307-88 LC

28 Claims



Magnetic domain logic cells for performing a wide variety of elementary logic operations are described. The cells are arranged so that any number can be compatibly interconnected to perform any logical functions realizable with conventional logic circuit devices.

3,731,110

## LASER SYSTEM FOR PRODUCING WAVELENGTH-TUNABLE OPTICAL RADIATION

Clarence Forbes Dewey, Jr., Belmont, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

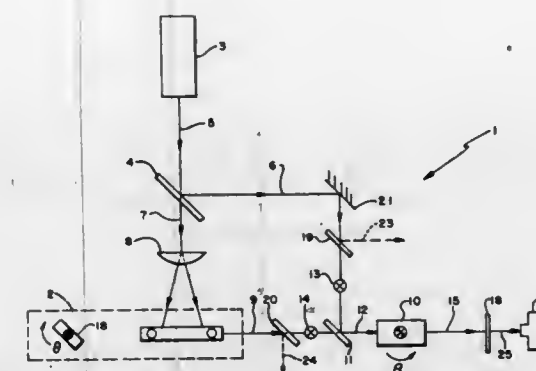
Filed July 12, 1971, Ser. No. 161,906

Int. Cl. H01s 3/10

U.S. Cl. 307-88.3

29 Claims

U.S. Cl. 307-109



A laser system for providing monochromatic optical radiation, the wavelength of which is tunable. The system employs two lasers, at least one of which is tunable, and one of which is a source of pumping energy for the other. The output of the pump laser is divided; one of the output beams is directed upon the laser medium of the second laser to serve as an optical pumping means therefor, and the other part is mixed in a nonlinear optical means with the output laser radiation from the second laser to produce wavelength-tunable radiation. In a preferred system, a Q-switched ruby laser is employed to pump a wavelength-tunable dye laser and an output from each is mixed in a phase-matched  $\text{LiNbO}_3$  crystal to provide monochromatic wavelength-tunable radiation in the infrared region of the spectrum.

3,731,111

## PULSE GENERATOR

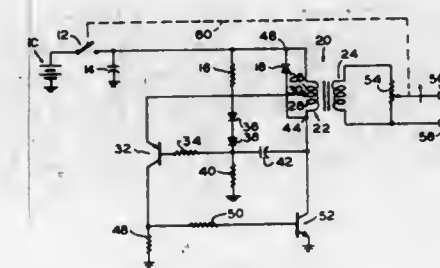
Thomas H. Charters, 6855 S.W. Raleighwood Way, Portland, Oreg.

Filed May 15, 1972, Ser. No. 253,462

Int. Cl. H03k 3/00

U.S. Cl. 307-106

14 Claims



A pulse generator for providing electrical impulses used for relieving muscle spasm comprises a low impedance source including a capacitor in parallel with a battery connected to one terminal of a step-up transformer's primary winding and a multivibrator switching circuit connected to the remaining terminals of the transformer's primary winding. The multivibrator is adapted for periodically completing the primary circuit and includes R-C time constant means causing the pulse generator to supply an output of definite pulse width and pulse period.

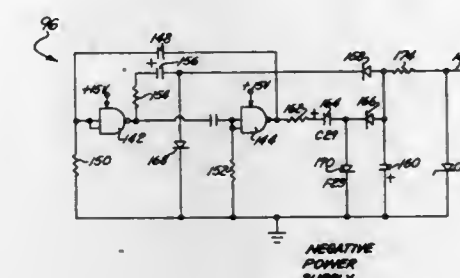
3,731,112

## REGULATED POWER SUPPLY WITH DIODE CAPACITOR MATRIX

Aubrey H. Smith, 6619 Pershing Boulevard, Kenosha, Wis. Division of Ser. No. 131,624, April 6, 1971. This application Dec. 15, 1971, Ser. No. 208,488

Int. Cl. H02m 3/06

6 Claims



A regulated power supply is provided capable of energizing various components of a control system. The regulated power supply includes a negative power supply which comprises an astable multivibrator and a diode-capacitor matrix for directly converting a positive voltage to a regulated negative voltage.

3,731,113

## BELT DAMAGE DETECTOR

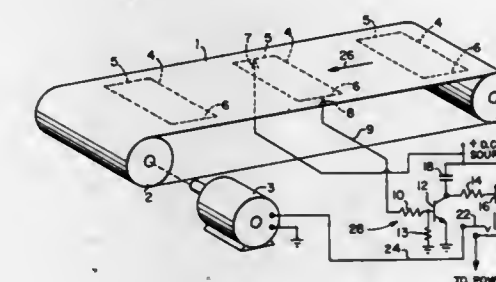
Richard B. Lowe, Glendale Heights, Ill., and Robert S. Enabnit, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 9, 1971, Ser. No. 178,977

Int. Cl. H01h 35/00

U.S. Cl. 307-119

5 Claims



A detector for indicating when a tear or other damage occurs in a conveyor belt and automatically turning off the belt drive motor before further damage can occur. The detector utilizes one or more electrical conductors such as wire loops extending transversely across the belt which are either embedded within the belt or positioned on one surface of the belt. A stationary electrical contact is positioned adjacent each edge of the belt to contact an exposed contact portion of the loop. The stationary contacts are connected to a circuit which controls the power to the belt drive motor and when the stationary contacts touch the contact portions of one of the conductor loops, current will flow through the loop and so long as the current flow is not stopped by a break in the conductor loop, the circuit will maintain a closed power line to the motor driving the belt. If a rip occurs in the belt, the conductor loop is broken at that point, thereby stopping the flow of current in the loop. When this occurs, the circuit shuts off the drive motor, thereby stopping the belt before further damage can occur.



3,731,114

## TWO PHASE LOGIC CIRCUIT

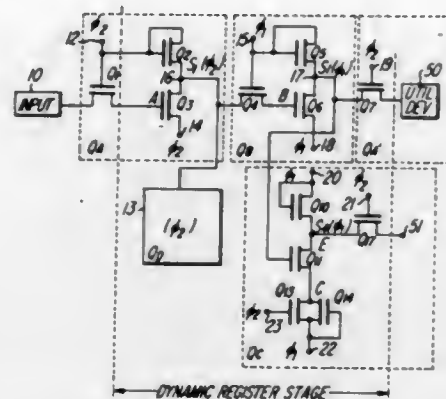
William Frederick Gehweiler, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 12, 1971, Ser. No. 161,479

Int. Cl. H03k 19/08; G11c 19/00

U.S. Cl. 307-205

5 Claims



A gate network which permits two levels of logic to be performed by interconnected gate networks which are controlled by the same phase.

3,731,115

## VOLTAGE MEMORY CIRCUIT

Saeki Yoshifumi, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Ohta-ku, Tokyo, Japan

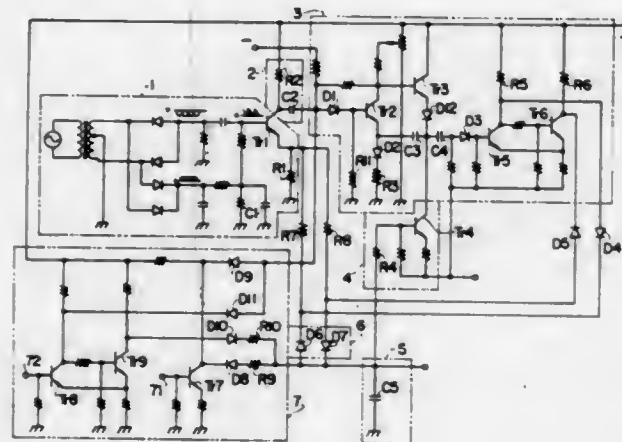
Filed March 10, 1971, Ser. No. 122,869

Claims priority, application Japan, March 10, 1970, 45/19684

Int. Cl. G11c 11/34; H03k 5/00

U.S. Cl. 307-238

3 Claims



A circuit having a condenser, the charging voltage for said condenser being selected by an instruction signal, and after being selected, the selected charging voltage is constantly checked and automatically held.

3,731,116

## HIGH FREQUENCY FIELD EFFECT TRANSISTOR SWITCH

Eugene R. Hill, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed March 2, 1972, Ser. No. 231,314

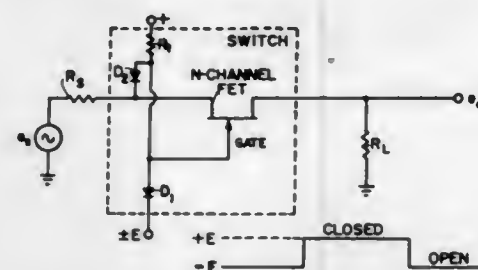
Int. Cl. H03k 17/00

U.S. Cl. 307-251

8 Claims

An improved field effect transistor (FET) switching circuit for sampling an analog input in response to a control pulse at

extremely fast turn-on and turn-off times. the FET operating potential is obtained from a constant voltage source rather than the control signal. A diode is provided between the FET



gate and the signal source and also a diode is provided between the FET gate and the control pulse source; the diodes retain sufficient stored charge to completely discharge the FET gate to channel capacitance during switching.

3,731,117

## ELECTRONIC GATING CIRCUITS

Frank G. Everest, Stevenage, and Thomas P. Veasey, Hitchin, both of England, assignors to British Aircraft Corporation Limited, London, England

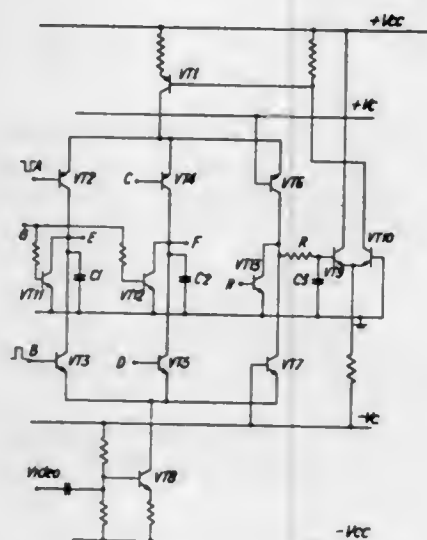
Filed Dec. 3, 1971, Ser. No. 204,458

Claims priority, application Great Britain, Dec. 4, 1970, 57,808/70

Int. Cl. H03k 17/60

U.S. Cl. 307-254

9 Claims



In an electronic circuit in which a gating circuit is connected between a transistor or other semiconductor element and an output terminal, the offset normally introduced by the transistor is cancelled by a compensating circuit responsive to variations in the D.C. level of the current passed by the transistor in the intervals between gating periods to derive a compensating signal which is operative during the gating periods to modify the output signal.

3,731,118

## VOLTAGE DETECTOR FOR SENSING AND DIGITALLY ENCODING STATES OF POTENTIAL

Wolf-Henning Harms, Berlin, Germany, assignor to Krone GmbH, Berlin-Zehlendorf, Germany

Filed May 12, 1971, Ser. No. 142,534

Claims priority, application Germany, May 12, 1970, P 20 23 164.5

Int. Cl. H03k 17/00

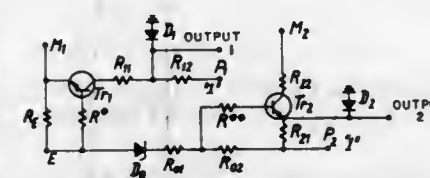
U.S. Cl. 307-255

7 Claims

In a detector for sensing four different states of potential applied to its input and for digitally encoding them at two detec-

tor outputs, there are provided two semiconductor components, each connected to the detector input and to one detector output; each semiconductor component is associated with a voltage divider, a reference source, a comparison

integrated current feeder circuit, consisting of a transistor-resistor combination which can be connected to the supply voltage source, and is coupled to all gates of each control module. In order to expand the permissible range of the operating and control voltages of the gate circuit elements, at least a portion



source and a digital source. On either detector output there may appear either a logic 1 or a logic 0, allowing four possible digital signal pair combinations at the detector output, whereby each digital signal pair characterizes one state of potential applied to the detector input.

3,731,119

## STATE RETENTION CIRCUIT FOR RADIATION HARDENED FLIP FLOP

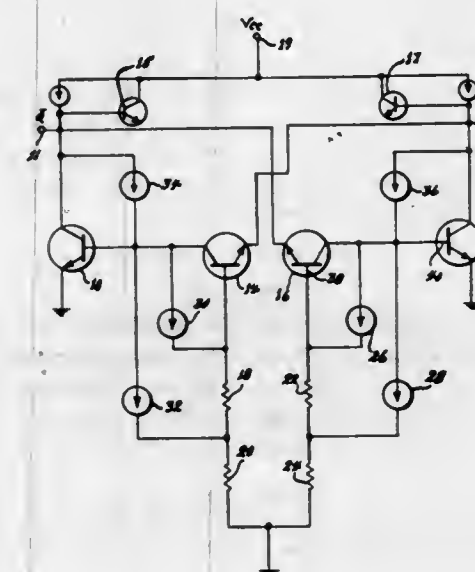
Walter T. Matzen, Richardson, Tex., assignor to The United States of America as represented by the Secretary of the Air Force

Continuation-in-part of Ser. No. 828,172, May 27, 1969, abandoned. This application Nov. 10, 1971, Ser. No. 197,385

Int. Cl. H03k 3/286

U.S. Cl. 307-291

3 Claims



A state retention apparatus for a radiation hardened flip flop for protecting the logic circuitry from radiation induced photocurrents. During periods of transient ionizing pulses of a predetermined magnitude, a switching function is performed to protect the logic state of the flip-flop and after the transients have decayed below a predetermined level, the flip-flop is returned to normal operation.

3,731,120

## DIGITAL COMPACT CONTROL MODULE

Dieter Eichmann, Erlangen; Gunter Heyer, Amberg; Ulrich Schaff, Erlangen, and Gunter Voigt, Karlsruhe, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin, Munich, Germany

Filed March 29, 1971, Ser. No. 128,688

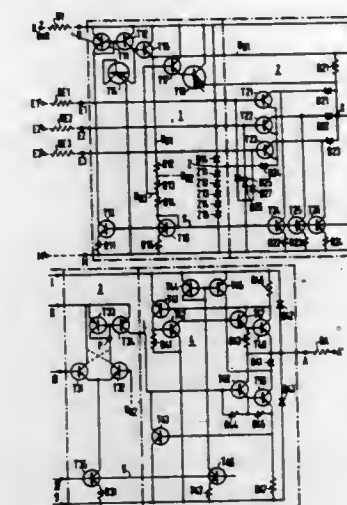
Claims priority, application Germany, April 2, 1970, P 20 15 639.2

Int. Cl. H03k 19/08

U.S. Cl. 307-213

14 Claims

A compact module with several AND or NAND stages, designed as a monolithic integrated circuit, comprises a fully



3,731,121

## COMMUTATOR AIR DEFLECTOR

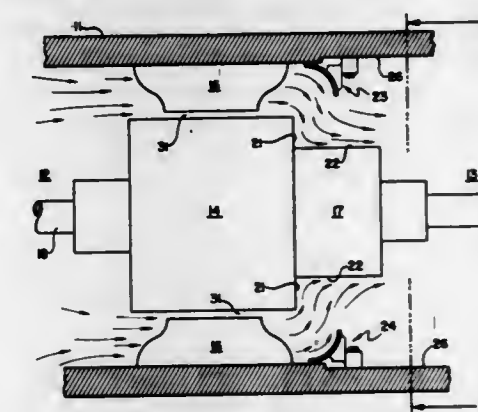
William K. Cook, North East, and Barry J. Turley, Wattsburg, both of Pa., assignors to General Electric Company, Erie, Pa.

Filed Dec. 22, 1971, Ser. No. 211,001

Int. Cl. H02k 9/28

U.S. Cl. 310-227

10 Claims



An air deflector for diverting the flow of forced air moving axially through a motor stator from the drive-end thereof, radially inwardly proximate the armature-commutator transition point, to cause increased air flow directly over the commutator surface and thereby increase the heat transfer therefrom. Annular sections having concave surfaces toward the commutator are rigidly secured on the stator inner wall to provide the baffle effect.

3,731,122

## ELECTRICALLY CONTROLLED RESISTIVE WEIGHTS

Erik Rosenbaum, Randallstown, and Edward George Klimchak, Owings Mills, both of Md., assignors to The Bendix Corporation, Southfield, Mich.

Filed March 31, 1971, Ser. No. 129,729

Int. Cl. H03k 1/14

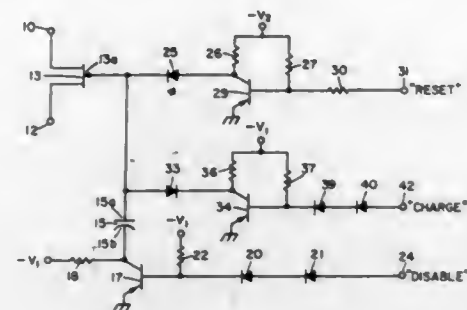
U.S. Cl. 307-264

7 Claims

A field effect transistor has a source-drain circuit which functions as a variable electrical resistance. A memory capaci-



tor has one end connected to the field effect transistor gate and the second end connectable through a switching transistor to ground. Charges are added or subtracted from the capacitor to vary the FET gate bias and thereby the FET drain-source resistance. The switching transistor is effective to either apply the capacitor voltage to the FET gate or al-



ternately to cause the capacitor to apply a pinch-off voltage to the FET gate by either grounding the capacitor's second end or applying pinch-off voltage to the capacitor's second end. In either event the charge across the capacitor is unaltered. The electrically controlled weight described is particularly adapted for use in a hyperplane signature recognizer.

3,731,123

**MAGNETIC FIELD DETECTING APPARATUS**

Takeshi Matsushita, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

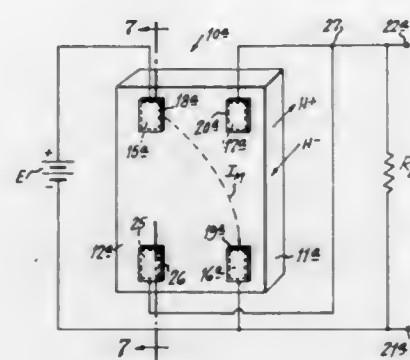
Continuation-in-part of Ser. No. 888,377, Dec. 29, 1969, abandoned, and a continuation-in-part of Ser. No. 873,399, Nov. 3, 1969, abandoned, and a continuation-in-part of Ser. No. 873,162, Nov. 3, 1969, abandoned. This application March 21, 1972, Ser. No. 236,776

Claims priority, application Japan, Nov. 5, 1968, 43/80836; Nov. 5, 1968, 43/80837; Dec. 28, 1968, 43/858

Int. Cl. H011 5/00, 9/10, 13/00

U.S. Cl. 307—309

7 Claims



A magnetic field detecting apparatus comprises a semiconductor substrate, preferably of a substantially intrinsic material, having at least first, second and third spaced apart regions of relatively high impurity concentration formed therein, with the first and second regions being of opposite conductivity types and forwardly biased by connection to a voltage source for injecting respective carriers, for example, holes and electrons, and for supplying a main current along a path between the first and second regions which are spaced from each other by a distance greater than the sum of the diffusion lengths of the carriers injected at the first and second regions, respectively. The third region is of the same conductivity type as the first region and reverse biased, preferably through the output region connected to the second and third regions, so as to be adapted for collecting the carriers injected by the first region, and the third region is closer to the first region than to the

second region and spaced from the path of the main current by a distance which, in the absence of any magnetic field, is greater than the diffusion length of the carriers injected at the first region so that the output circuit provides an output signal that sensitively corresponds to the strength and direction of any magnetic field to which the substrate is subjected.

3,731,124

**ELECTROACOUSTIC TRANSDUCER HAVING IMPROVED TRANSDUCING ELEMENT SUPPORTING MEANS**

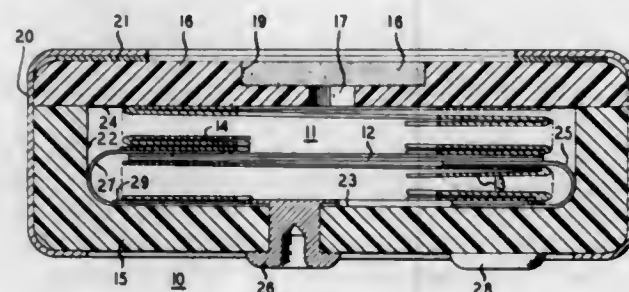
Herbert William Bryant, Middletown, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Oct. 18, 1971, Ser. No. 190,207

Int. Cl. H01v 7/00; H04r 17/00

U.S. Cl. 310—9.4

11 Claims



An electromechanical transducer element is supported within a transducer housing by at least one folded spring-like member having a plurality of generally annular "leaves" each having an annular width relatively large in comparison to its thickness. In operation, air resistance between the leaves or convolutions of the spring-like member serves to acoustically damp undesirable transducer resonances, thereby providing a transducer frequency response characteristic that is relatively uniform throughout the band of interest.

3,731,125

**PULSE MOTOR FOR TIME PIECE**

Akira Nikaido, Fuchu; Mitsuo Onda, Omiya; Fumio Nakajima, Terutaka Okano, both of Tokyo; Takayasu Machida, Iruma; Takashi Toida, and Yoshihiko Yanagawa, both of Tokyo, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

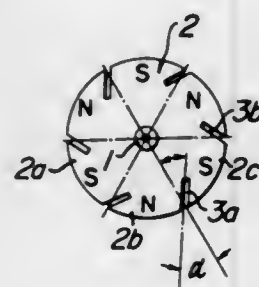
Filed June 10, 1971, Ser. No. 151,865

Claims priority, application Japan, June 13, 1970, 45/59037; Sept. 14, 1970, 45/91383

Int. Cl. H02k 37/00

U.S. Cl. 310—49

3 Claims



A pulse motor for use in time pieces comprises a stator which defines a circular space, and a circular rotor provided with a plurality of equally spaced slots extending inwardly from the periphery of the rotor at an angle to the radial direction. The rotor is concentrically disposed in said space so that a uniform annular interstice is formed between the stator and rotor. An index finger or pawl, provided for preventing backward motion of a ratchet wheel fixed to the shaft of the rotor, contacts only the tip portion of a tooth of the ratchet wheel.

3,731,126

**ELECTRICAL MACHINE WITH SHIELDED CIRCUIT PARTS**

Walter Hagenlocher, Leonberg, and Georg Binder, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

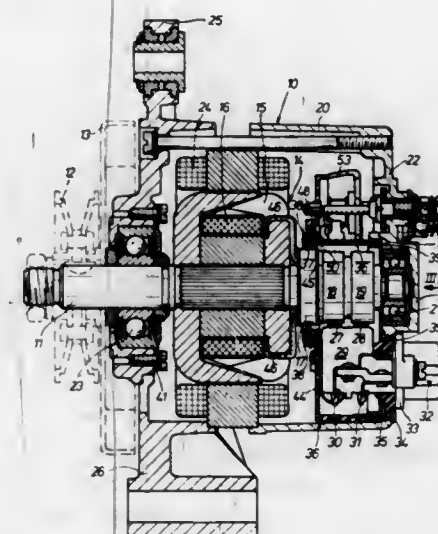
Filed Oct. 7, 1971, Ser. No. 187,432

Claims priority, application Germany, Oct. 12, 1970, P 20 49 962.1

Int. Cl. H02k 5/10

U.S. Cl. 310—68

27 Claims



An alternating current generator is provided with an insulating casing closed by an end cover of the housing and supporting circuit parts while enveloping slip rings and contact brushes so that the same are protected from dirt and splashed water.

3,731,127

**GENERATOR END TOOTH FLUX SHIELD**

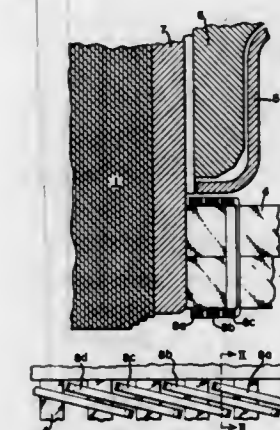
Dean B. Harrington, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 19, 1971, Ser. No. 190,537

Int. Cl. H02k 1/12

U.S. Cl. 310—254

3 Claims



A shield for the end of a laminated dynamoelectric machine stator core to reduce penetration of the stray end region flux into the tooth portion of the stator core. The shield comprises electrically conductive material encircling the stator armature bars as they emerge from the slots comprising individual overlapped coils, or alternatively, radially spaced rings with interconnecting radial conductors between bars.

3,731,128

**X-RAY TUBE WITH ROTARY ANODES**

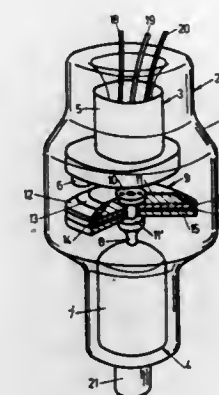
Klaus Haberrecker, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

Filed March 8, 1972, Ser. No. 232,853

Int. Cl. H01j 35/10

U.S. Cl. 313—60

8 Claims



An X-ray tube has a rotary anode which is a compound body of heavy metal and graphite parts, the focal spot path lying upon the heavy metal. The invention is particularly characterized by the provision of a layer of metal selected from the group consisting of tantalum and/or tungsten and located between the heavy metal part and the graphite part. The heavy metal part consists at least primarily of molybdenum, is shaped as a plate and is soldered to the graphite part outside of the focal spot path.

3,731,129

**RECTANGULAR COLOR TUBE WITH FUNNEL SECTION CHANGING FROM RECTANGULAR TO CIRCULAR**

Asahide Tsuneta, Kawasaki-shi; Yasuo Ohta, and Makoto Ikegaki, both of Fukaya-shi, Saitama-ken, all of Japan, assignors to Tokyo Shibaura Electric Co., Kawasaki-shi, Japan

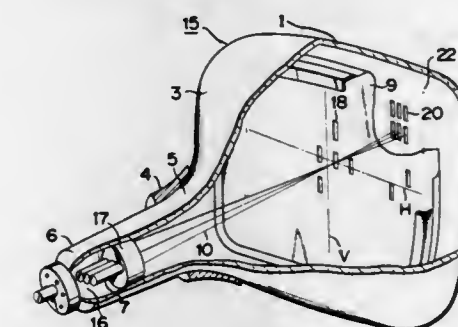
Filed Oct. 28, 1970, Ser. No. 84,809

Claims priority, application Japan, Nov. 4, 1969, 44/87632

Int. Cl. H01j 29/00, 29/06, 31/20

U.S. Cl. 313—64

1 Claim



A color receiving tube having a maximum deflection angle of greater than 90° disposed close to phosphorescent surface, the perforations of the mask being formed as slits arranged in vertical rows, and an electron gun assembly comprised by three unit electron guns disposed in-line on a common horizontal plane. The deflecting portion of the tube, around which is disposed a deflecting device, is formed as a funnel whose cross-sectional configuration gradually varies from that similar to the configuration of the reproduced image to circular.



3,731,130

## WOUND-FILM DRY CAPACITORS

Pulin Kumar Dutta, Poona, India, assignor to Plessey Handel Und Investments AG, Zug, Switzerland

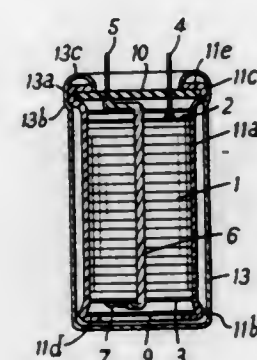
Filed Feb. 10, 1972, Ser. No. 225,225

Claims priority, application Great Britain, March 2, 1971, 5,759/71

Int. Cl. H01g 1/02

U.S. Cl. 317-258

10 Claims



A wound-film capacitor of metallized polypropylene film is mechanically strengthened, and made more fire-resistant, and the risk of oxidation of its metallized layer is reduced, by placing a sleeve of polyvinyl-chloride plastics round the wound coil and the adjacent decks and heat-shrinking it to form a sheath in tight, shape-hugging contact with the wound-film unit and the decks and a sealing disc of greater diameter before the thus completed unit is placed into a can, with the thus wrapped radially projecting part of the sealing disc resting against an internal shoulder of the can.

3,731,131

## GASEOUS DISCHARGE DISPLAY DEVICE WITH IMPROVED CATHODE ELECTRODES

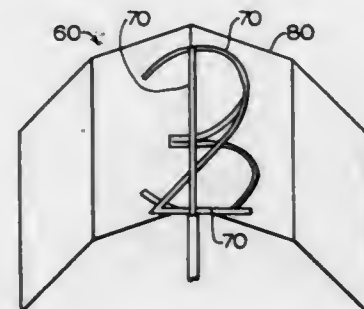
George A. Kupsky, Milford, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 13, 1971, Ser. No. 188,850

Int. Cl. H01j 61/08, 61/66

U.S. Cl. 313-109.5

12 Claims



A display device includes an envelope having a gas filling, at least one anode electrode, and at least one cathode electrode for operation therewith. The cathode electrode comprises a metal plate having a conductive coating comprising pure metal particles in a glass carrier matrix.

3,731,132

## GAS DISCHARGE TUBE HAVING A NUMBER OF JUXTAPOSED MATRIX GROUPS FOR DISPLAYING CHARACTERS

Adrianus Antonius Maria Hendrika, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

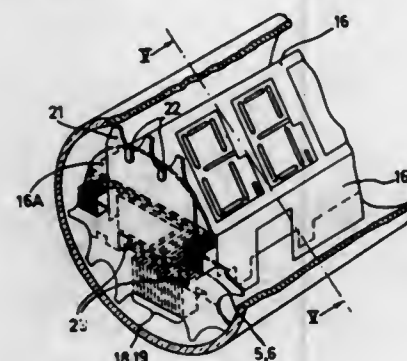
Filed Oct. 6, 1971, Ser. No. 186,913

Claims priority, application Netherlands, Oct. 17, 1970, 7015261

Int. Cl. H01j 61/66

U.S. Cl. 313-109.5

4 Claims



A multiple matrix tube in which the planes of cathodes and anodes extend at right angles to the wide surfaces of the connection strips connected to said electrodes, said strips being placed against each other with the interposition of insulating strips.

3,731,133

## HIGH-INTENSITY ARC LAMP

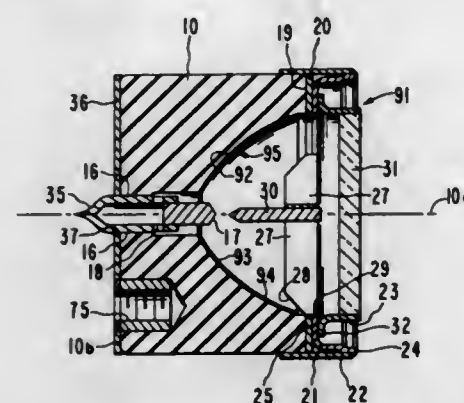
Russell C. McRae, Cupertino, and William R. Stuart, San Carlos, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Continuation-in-part of Ser. No. 109,527, Jan. 25, 1971, abandoned. This application Jan. 7, 1972, Ser. No. 216,025

Int. Cl. H01j 5/16; H01k 1/28

U.S. Cl. 313-113

13 Claims



A short arc gas discharge lamp includes a solid ceramic body provided with a reflector-shaped surface extending from one end face into the body. A thermally conductive tube inserted in an aperture extending through the other end face of the ceramic body supports an anode opposite to a cathode. The cathode is mounted adjacent to a window of the lamp and in predetermined relationship to the one end face of the body so that the point of highest intensity of a gas discharge within the lamp will be located at the focal point of the reflector surface. In one embodiment of the lamp, the reflector-shaped surface of the ceramic body is metallized to provide a reflective surface, whereas in a second embodiment the reflector-shaped surface is provided with a smooth glazed coating that is suitable for direct reception of a metallic reflective coating without the use of intermediate metallizing steps such as plating and polishing.

3,731,134

## COLOR PICTURE TUBE UTILIZING A SHADOW MASK WHICH SELECTS COLORS AND DETECTS THE DISPLACEMENT OF THE BEAM

Teiji Iida, Chiba-ken, Japan, assignor to Hitachi, Ltd., Tokyo and Teiji Iida, Chiba-ken, Japan

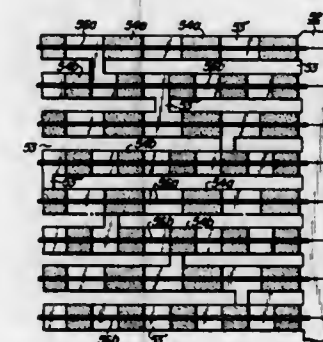
Filed June 25, 1969, Ser. No. 836,424

Claims priority, application Japan, June 28, 1968, 43/45337; Oct. 24, 1968, 43/92713 (utility model); Oct. 24, 1968, 43/92714 (utility model); Nov. 11, 1968, 43/81915; Jan. 20, 1969, 44/3935; Jan. 20, 1969, 44/3936; Feb. 8, 1969, 44/9440; March 14, 1969, 44/19369; March 14, 1969, 44/22806 (utility model); April 9, 1969, 44/27510; May 13, 1969, 44/36788; May 13, 1969, 44/36789

Int. Cl. H01j 29/70

U.S. Cl. 315-21 C

24 Claims



A color picture tube having a shadow mask which has, in addition to the function of selecting colors depending on the difference in incidence angles of a plurality of electron beams, a function of detecting the displacement of such electron beams. A signal thereby obtained is utilized so as to automatically correct vertical displacement and out-of-focussing of the electron beams thereby to increase the density of the electron beams impinging against the fluorescent screen and to improve the brightness and resolution of the picture obtained.

3,731,135

## GRADED FIELD CATHODE RAY TUBE

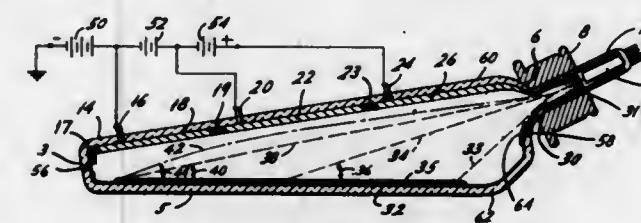
Robert A. Iadicco, Philadelphia, and Paul G. Wolfe, Oreland, both of Pa., assignors to Philco-Ford Corporation, Philadelphia, Pa.

Filed June 15, 1970, Ser. No. 46,020

Int. Cl. H01j 29/56

U.S. Cl. 315-31 R

8 Claims



A cathode ray tube having a screened flat faceplate and an electron gun oriented off-normal thereto, in which means are provided to produce in the vicinity of the screen an electrostatic field shaped so as to sharpen electron beam focus over the entire screen and reduce raster distortion thereover.

Discrete sections of the backplate portion of the tube are coated with conductive material. Operating potentials are supplied to each such conductive section and to the screen to create electrostatic fields in the regions between the screen and each conductive section. The shape of the conductive sections and the operating potentials are selected so that the forces exerted on the electron beam when deflected toward

the portion of the screen remote from the electron gun bend the beam toward the screen. This bending causes the beam to impinge on the screen along a path more nearly perpendicular to the screen at the point of impingement of the beam than the path which the beam would follow in the absence of such bending. As a result the area of the region of intersection of beam and screen is reduced, sharpening the focus. By additional appropriate shaping of the electrostatic fields, raster distortion also is reduced.

3,731,136

## CYLINDRICAL ELECTRODE SYSTEM FOR FOCUSING AND DEFLECTING AN ELECTRON BEAM

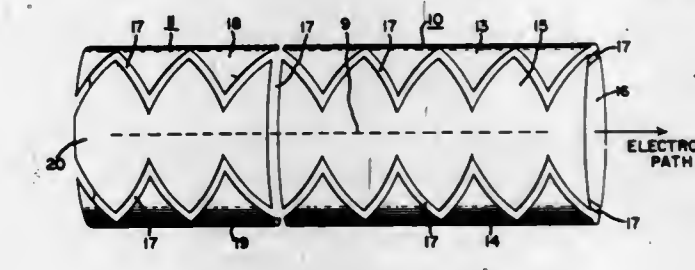
Alfred G. Roussin, Syracuse, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed April 19, 1971, Ser. No. 135,240

Int. Cl. H01j 29/56

U.S. Cl. 315-16

10 Claims



An electron optical system permitting both focusing and deflection of an electron beam utilizes a plurality of sets of electrodes, each set of electrodes comprising two pairs of conductive coatings distributed according to a predetermined pattern and formed coaxially with the path of the undeflected electron beam emerging from a cathode. The electrodes of each set are formed of substantially the same radius of curvature, and the sets are aligned, one ahead of the other, along the path of the undeflected electron beam.

3,731,137

## COAXIAL MAGNETRON

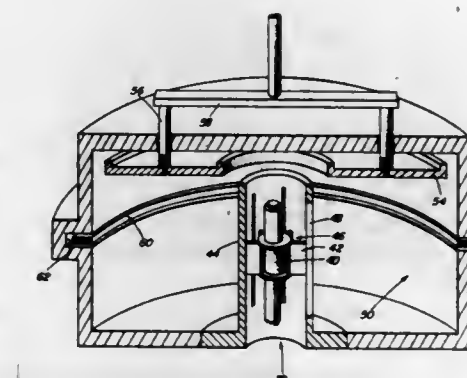
Robert J. Foreman, Southboro, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Feb. 3, 1972, Ser. No. 223,250

Int. Cl. H01j 25/50

U.S. Cl. 315-39.77

12 Claims



A coaxial magnetron having a cylindrical cavity operating in a circular mode is tuned by means circumferentially disposed in the region of maximum electric field intensity. In one embodiment a ring tuner is retained within an annular groove at the midpoint of the outer cavity wall and adapted to be reciprocated in introduce a dissymmetry in the cavity geometry along a path transverse to its axis. The paths of the electric field currents are altered by each excursion of the



tuner. Dither tuning of the disclosed structure provides a frequency agility in transmission systems over a portion of the frequency band. Another embodiment provides for the combination with a large plate-type tuner to add a fine tuning capability over a portion of a broad frequency band. Temperature compensation is also attainable by means of the ring tuner arrangement.

3,731,138

# SIGNAL GENERATING CIRCUIT FOR A DEFLECTION SYSTEM

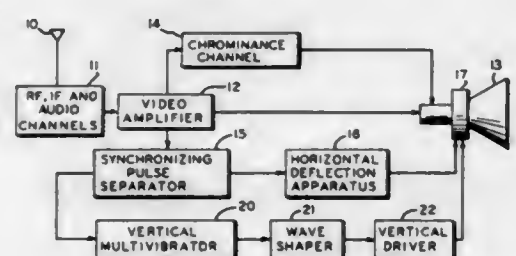
William Elias, Batavia; Valdes Silverio Antonio, Alexander, and George Cleveland Waybright, Oakfield, all of N.Y., assignors to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Aug. 26, 1971, Ser. No. 175,159

Int. Cl. H01j 29/70

U.S. Cl. 315—29

13 Claims



A signal generating circuit for generating a signal of a predetermined waveform for application to a deflection winding of a deflection yoke associated with a cathode-ray tube is disclosed. The signal generating circuit includes a linearity or branch circuit for varying the charging rate of a capacitor which wave shapes the voltage across the capacitor.

3,731,139

# INTERFACE AMPLIFIER

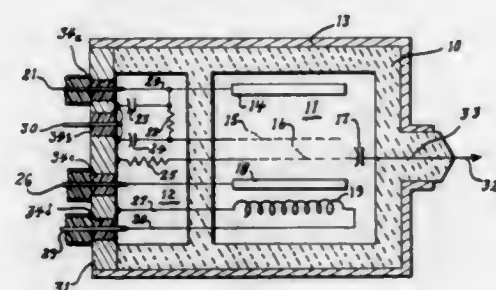
Robert J. Herickhoff, Mankato, and William D. Kimmel, Saint Paul, both of Minn., assignors to The United States of America as represented by the Secretary of the Air Force

Filed Nov. 16, 1970, Ser. No. 90,072

Int. Cl. H01j 7/44

U.S. Cl. 315—33

5 Claims



An electrical monitoring apparatus having a single ceramic envelope encased in a ground shield with two separated evacuated compartments, contained in one of the compartments are the active electrical components of a vacuum tube amplifier and in the other compartment are the associated passive electrical components that are used in conjunction with the operation of the vacuum tube amplifier. The input terminal to the amplifier is physically positioned at one end of the ceramic envelope, while the output and all other circuit connections are at the other end. Thus, the possibility of electrical interference due to radiation effects when the apparatus is used in a gamma environment are minimized.

3,731,140

# MAGNETRONS

Peter Frederick Lewis, Chelmsford, England, assignor to English Electric Valve Company Limited, London, England

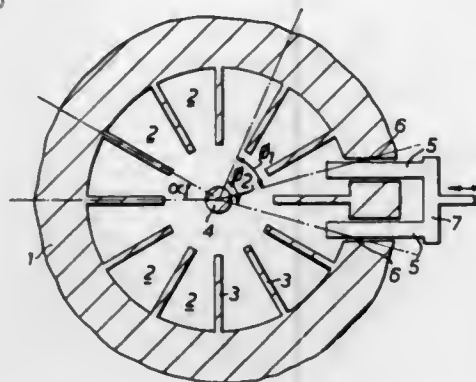
Filed July 14, 1971, Ser. No. 162,532

Claims priority, application Great Britain, Aug. 8, 1970, 38,342/70

Int. Cl. H01j 25/50

U.S. Cl. 315—39.61

6 Claims



The invention is concerned with tunable multi cavity magnetrons and provides a tuning arrangement having only two movable tuning elements. Each of the elements is associated with one of a pair of adjacent cavities. The two movable elements are moved together and are arranged such that for any position of the tuning elements the two adjacent cavities are tuned to identical frequencies.

3,731,141

# ROAD VEHICLE LIGHTING SYSTEMS

Harris Vernon Hicks, 61 Ferndale Road, Lichfield, England

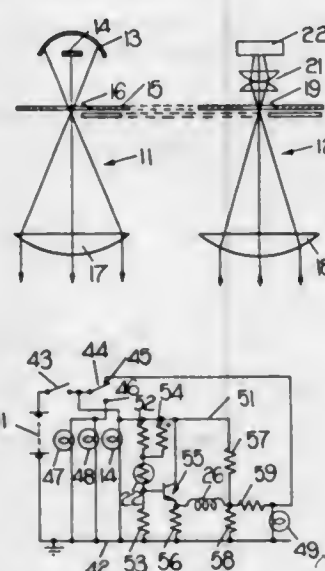
Filed Nov. 15, 1971, Ser. No. 198,534

Claims priority, application Great Britain, Nov. 20, 1970, 55,209/70

Int. Cl. B60q 1/14

U.S. Cl. 315—83

2 Claims



A road vehicle lighting system has first and second dipped beam headlamps, one main beam headlamp and a projector receiver unit which replaces the second main beam headlamp. The unit projects a divergent beam of light, and cuts off sufficient of that beam to prevent dazzling an oncoming driver. The normal dip switch is employed but is arranged to energize the projector receiver unit in both positions of the dip switch, and when the dip switch is in its second position the minimum strength of the signal required by the receiver to operate the projector receiver unit is increased.

3,731,142

# HIGH-FREQUENCY FLUORESCENT TUBE LIGHTING CIRCUIT WITH ISOLATING TRANSFORMER

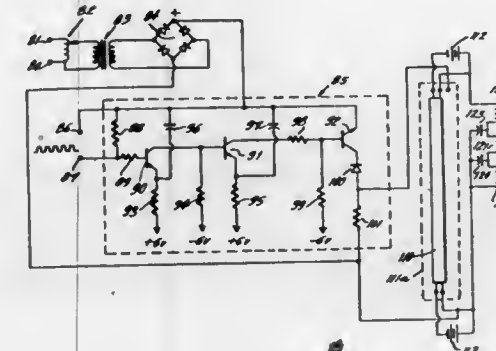
Joel S. Spira, Allentown, and Joseph Licata, Schnecksville, both of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Continuation-in-part of Ser. No. 843,927, July 23, 1969. This application Aug. 20, 1971, Ser. No. 173,530

Int. Cl. H05b 39/00

U.S. Cl. 315—94

11 Claims



A pulse forming network, energized through a semiconductor switching circuit, contains an inductance and capacitance which develop a high-frequency pulse output. The inductance of the pulse forming network serves as the primary winding of a step-up voltage transformer which has a secondary winding connected in series with a gas discharge device where the voltage across the gas discharge device is higher than the voltages seen by the semiconductor device.

3,731,143

# TRANSISTORIZED IGNITION SYSTEM FOR GAS TURBINE ENGINES

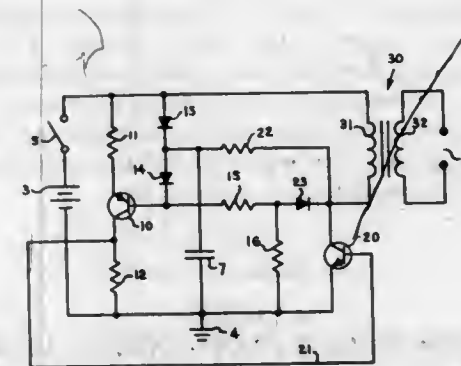
Kaushik H. Thakore, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 25, 1972, Ser. No. 229,333

Int. Cl. H03k 3/30

U.S. Cl. 315—209 T

4 Claims



An ignition system for a gas turbine engine that includes a 2-transistor oscillator which utilizes a transformer and requires only a spark plug in the secondary of the transformer to ignite fuel in the turbine.

3,731,144

# DIRECT CURRENT POWERED IGNITION SYSTEM WITH BLOCKING OSCILLATOR

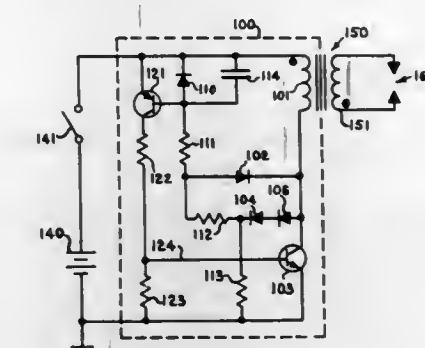
James E. McKeown, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 25, 1972, Ser. No. 229,332

Int. Cl. H05b 37/02

U.S. Cl. 315—209 T

4 Claims



An electrical system for igniting fuel in a turbine engine or the like which utilizes a battery-powered blocking oscillator and a transformer having its primary winding in the oscillator circuit and its secondary winding connected to a spark plug that ignites fuel in the engine.

3,731,145

# ELECTROSTATIC SPRAY GUN WITH SELF-CONTAINED MINIATURIZED POWER PACK INTEGRAL THEREWITH

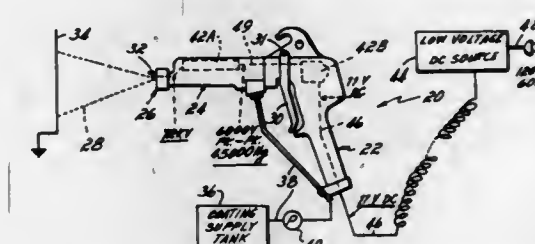
Robert S. Senay, Lake Carmel, N.Y., assignor to Nordson Corporation, Amherst, Ohio

Filed Nov. 23, 1970, Ser. No. 92,114

Int. Cl. B05b 5/02

U.S. Cl. 317—3

52 Claims



An electrostatic spray gun having physically integral therewith a power pack for transforming low voltage supplied to the gun to high voltage for application to the gun electrode. The power pack is contained completely within the gun, and includes a combined oscillator and transformer which converts low voltage d.c., e.g., 11 volts, supplied to the gun via a low voltage cable to an intermediate voltage at high frequency, e.g., 6,000 volts peak-to-peak at 45 KHz; and a voltage multiplier circuit which transforms the high frequency 6,000 volt peak-to-peak power to 72,000 volts d.c. for application to the gun electrode.

3,731,146

# TONER DISTRIBUTION PROCESS

Albert C. Bettiga, and Leo S. Chang, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1970, Ser. No. 100,971

Int. Cl. G03g 13/08

U.S. Cl. 317—3

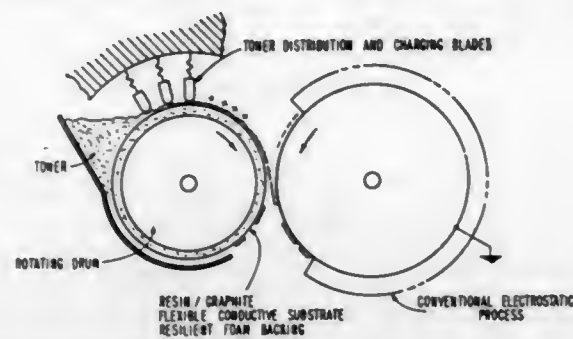
5 Claims

Toner is distributed and charged on an impression development surface by contact with at least one doctor blade electri-



cally insulated relative to other parts of the apparatus and made of material remote from the toner in the triboelectric se-

put of the homopolar transformer and the electromechanical relay and characterized in that the aforementioned amplifier



ries and close to the impression development surface material in the triboelectric series. The toner particles are charged because of contact with the doctor blade.

3,731,147

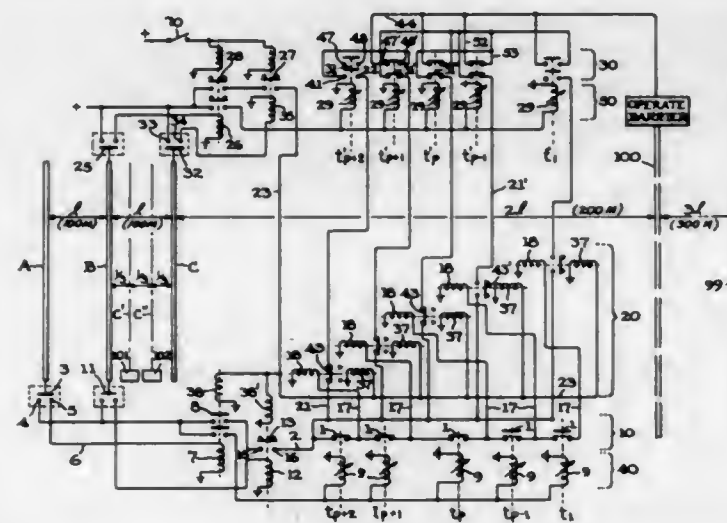
### DEVICE FOR MEASURING THE ACCELERATION OF A VEHICLE

Jean Lavarenne, Villecresnes, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France  
Filed May 21, 1971, Ser. No. 145,835

Claims priority, application France, May 27, 1970, 7019444  
Int. Cl. H02p

U.S. Cl. 317-5

5 Claims



A ground device for measuring the acceleration of a vehicle on a speed basis in which at least three primary switches operate by three sensors, time-delayed relays being adjusted to be effective in causing stepped triggering of a number of storage flip-flop contacts whereby to store a first classification of a first average speed and a second speed classification of a second average speed, a certain chosen difference between said second and first average speeds producing an output signal if its detection occurs before transiting of the vehicle beyond said speed basis resets the storage flip-flops in their neutral state.

3,731,148

### HIGH-SENSITIVITY DIFFERENTIAL RELAY PROTECTED AGAINST DISTURBANCES

Jean-Francois Fournis, Grenoble, France, assignor to Societe D'Appareillage Electrique Sapeval, Saint-Marcellin, France  
Filed March 15, 1971, Ser. No. 124,639

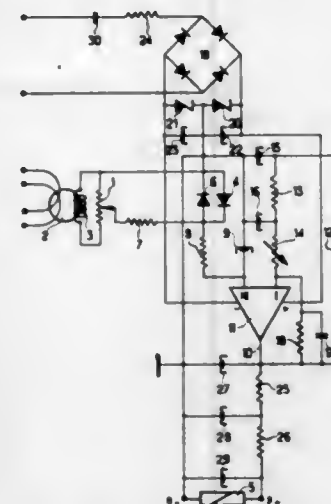
Claims priority, application France, March 13, 1970, 7009178

Int. Cl. H02h 1/02

U.S. Cl. 317-18 D

6 Claims

A differential relay comprising a homopolar transformer and a parallel electromechanical relay having low power consumption comprising an amplifier disposed between the out-



comprises essentially a differential amplifier, one of the inputs of which receives the output voltage of said transformer.

3,731,149

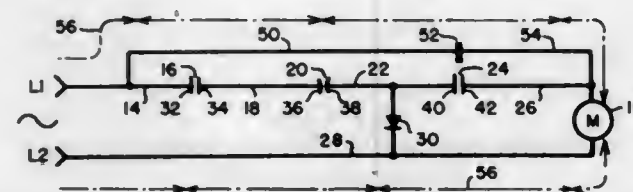
ARC SUPPRESSION, MOTOR PROTECTION AND DYNAMIC BRAKING NETWORK FOR A.C. MOTORS  
Lawrence V. Sherman, Kirkland; Richard A. Marson; Jack D. Keeler, both of Seattle, and Edmund I. Fagan, Bellevue, all of Wash., assignors to EMF Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 9,736, Feb. 9, 1970, which is a continuation-in-part of Ser. No. 815,811, April 14, 1969. This application Aug. 30, 1971, Ser. No. 176,099

Int. Cl. H02h 3/00

U.S. Cl. 317-11 A

4 Claims



Arc suppression, motor protection, and dynamic braking network for A.C. motors. Rectifying means are used to provide positive polarity half-cycle power or interrupted pulsating current to one side of an A.C. motor. The back EMF of the motor maintains the stationary magnetic field during the negative half cycle of power in the braking circuit. The electro-inertial characteristics of sudden braking and stopping action produce power surges in the motor circuits. The network reduces arcing and thermal loading when the braking circuit is opened at the moment the motor reaches a stopped condition. It is at the instant the motor stops that maximum current is passing through the stator windings and the need for arc suppression and motor protection is greatest.

3,731,150

### FILTER-TO-LINE TRANSIENT ISOLATOR

Earnest F. Weiser, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Jan. 5, 1972, Ser. No. 215,572

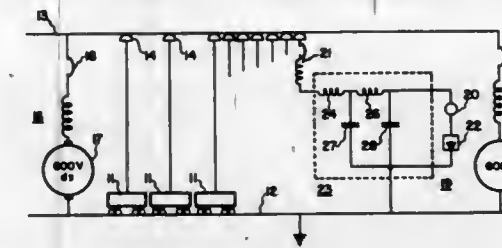
Int. Cl. H02h 7/10

U.S. Cl. 317-20

8 Claims

A device serially coupled between a wayside power source and the input filter of a chopper or inverter propulsion circuit, for attenuating the rate of charge and discharge of input filter capacitors to the wayside power source during the respective

application and interruption of power to the input circuit. A saturable reactor in parallel with a resistor effectively switches



the resistance into the circuit to impede current flow during periods of current in-rush or out-rush, and out of the circuit during periods of normal current flow.

3,731,151

### PROTECTIVE CIRCUIT

Akio Ozawa, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

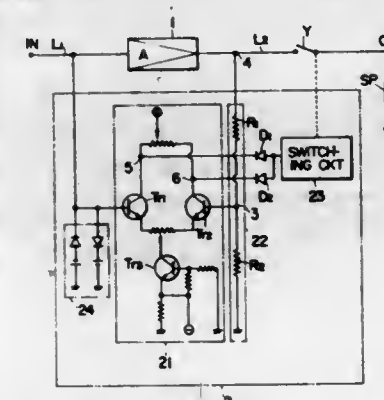
Filed Nov. 16, 1971, Ser. No. 199,208

Claims priority, application Japan, Nov. 16, 1970, 45/113493

Int. Cl. H02h 3/28

U.S. Cl. 317-27 R

3 Claims



A protective circuit for protecting an output circuit and a load circuit of a signal amplifier from abnormal conditions, and including a differential amplifier for detecting the abnormal conditions of and a clipping circuit clipping a signal applied to one of the input terminals of the differential amplifier higher than a predetermined voltage.

3,731,152

### IMPEDANCE DISTANCE RELAY

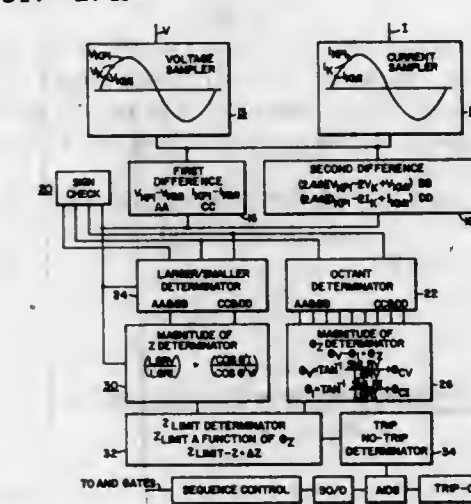
George D. Rockefeller, Jr., Morris Plains, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 25, 1972, Ser. No. 256,668

Int. Cl. H02h 3/40

U.S. Cl. 317-27 R

37 Claims



An apparatus for determining the peak value of the sinusoidal component of an electrical quantity which may in-

clude a non-sinusoidal component by means of comparing the first and second differential magnitudes of the electrical quantity at any time interval of the period of the sinusoidal component whereby the value of any low rate of change component is attenuated, as for example the D.C. offset which is normally present during fault conditions. The apparatus also includes means to determine the phase angles between two sinusoidal components and when such two sinusoidal components represent current and voltage to determine the magnitude of the impedance of the network energized by said sinusoidal quantities.

3,731,153

### PROTECTIVE DEVICE FOR LOUDSPEAKER

Akira Nishimoto, Tokyo, Japan, assignor to Sansul Electric Co., Ltd., Tokyo, Japan

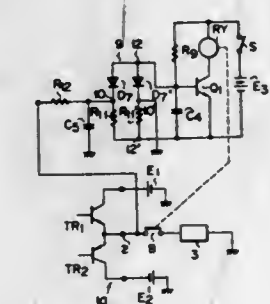
Filed Aug. 25, 1971, Ser. No. 174,875

Claims priority, application Japan, Aug. 27, 1970, 45/85091; Aug. 27, 1970, 45/85092; Aug. 27, 1970, 45/85093; June 9, 1971, 46/40184

Int. Cl. 317 36 TD; H02h 3/08, 7/00

U.S. Cl. 317-33 R

5 Claims



In an audio amplifier comprising first and second transistors with their emitter-collector circuits connected in series to provide an output terminal, first and second sources respectively connected in series with the first and second transistors and a loudspeaker connected directly to the output terminal, there is provided a protective device for the loudspeaker comprising a circuit interrupting element connected between the output terminal and the loudspeaker and a control circuit responsive to a DC voltage exceeding a predetermined level which appears at the output terminal for operating the circuit interrupting element.

3,731,154

### SURGE ARRESTER, PREDOMINANTLY FOR POWER TRANSMISSION LINES

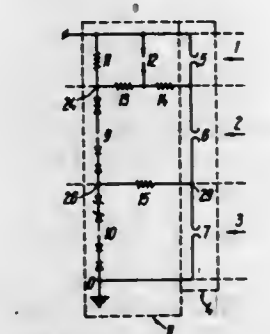
Argist Saakovich Torosian, Leningradskaya ulitsa, 8, kv. 10, Erevan, U.S.S.R.

Filed Nov. 12, 1971, Ser. No. 198,307

Int. Cl. H02h 9/06

U.S. Cl. 317-70

4 Claims



The present invention relates to surge arresters for power transmission lines, characterized in that their auxiliary circuits incorporate stabilizing means, such as Zener or avalanche diodes connected in series with firing means provided in the same circuit.



3,731,155

**ROM ROD STORAGE MATRIX WITH ELECTRICAL COMPONENTS IN ADJACENT ROD BLOCKS**

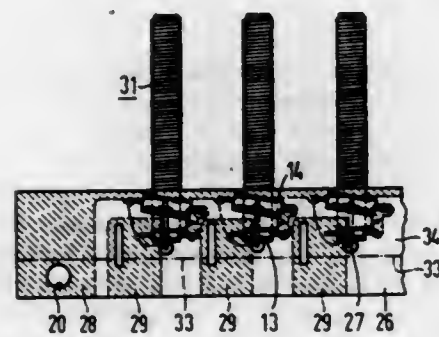
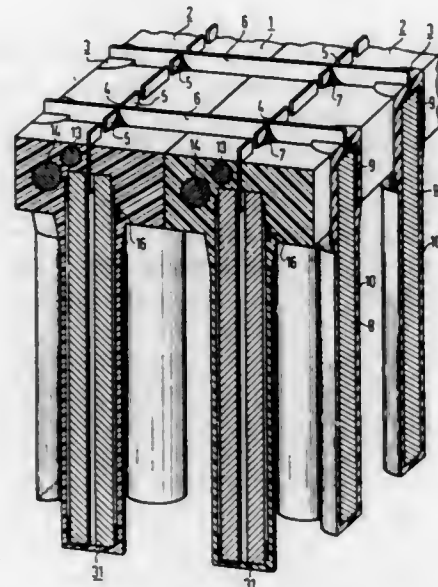
Ferdinand Utner, Regensburg, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany  
Filed March 30, 1972, Ser. No. 239,533

Claims priority, application Germany, April 7, 1971, P 21 17 063.8

Int. Cl. G11b 1/04, 5/00

U.S. Cl. 317—99

14 Claims



A ROM rod storage matrix comprises a plurality of similar side-by-side ROM rod blocks each containing several ROM rods and separately associated resistors and diodes, wherein a portion of the ROM rods are provided for the storage function while another portion of the ROM rods may be provided as respective magnetic flux return paths. Each of the ROM rods which participate in the storage function include a coil which is electrically connected to an electrical junction shared by the other ROM rods of a block, the connection being effected either directly or via one or more of the associated resistors and diodes. Another contact of each ROM coil is connected to another junction shared in common with a ROM coil from each of the side-by-side blocks, either directly or by way of one or more of the resistors and diodes, the common electrical connection being effected by means of an electrical conductor which is attached perpendicularly to the ROM rod blocks and extends transversely thereof.

3,731,156

**ELECTRICAL COMBINATION LOCK AND VEHICLE THEFT PREVENTION SYSTEM**

Donald G. Watson, 16 Stillmeadow Drive, Rochester, N.Y.  
Filed May 21, 1971, Ser. No. 145,744

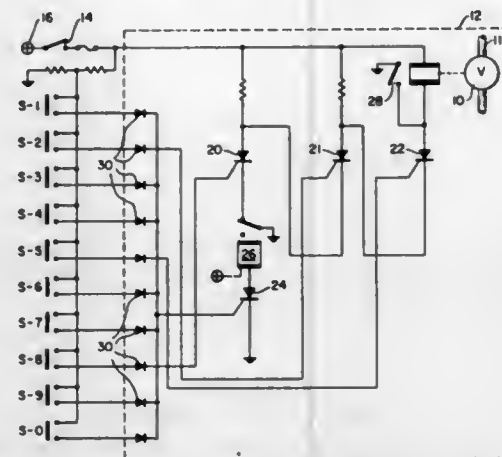
Int. Cl. H01b 47/00; F16k 35/08

U.S. Cl. 317—134

2 Claims

A combination lock controlled by an electronic circuit that responds to actuation of selected ones of a bank of switches in

predetermined order and is inhibited in response to actuation of any other one of the switches. The circuit includes an array of SCR's connected in series, each triggerable by actuation of a selected one of the switches. A solenoid is energized in



response to firing of the last SCR in the array to open the lock. When used in an automobile to deter theft, the solenoid is preferably connected to control a valve in the fuel line, and includes a self-holding contact so that, once energized it remains energized until the ignition switch is turned off.

3,731,157

**PRINTED WIRING CARD GUIDE SHELF AND A METHOD FOR MANUFACTURE THEREOF**

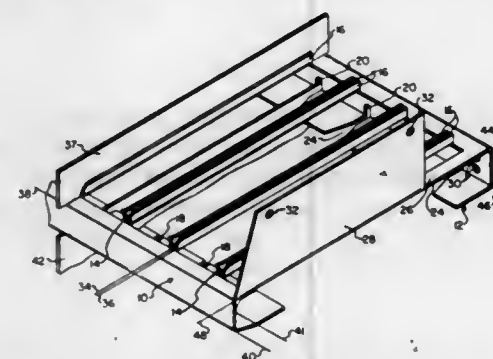
William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Sept. 1, 1971, Ser. No. 176,895

Int. Cl. H05k 7/18

U.S. Cl. 317—101 DH

7 Claims



A printed wiring card guide shelf is stamped as a unitary structure from a single sheet of stock material and formed to provide alignment and support for printed wiring cards.

3,731,158

**ELECTRODE-CARBON-ELECTRODE JUNCTIONS**

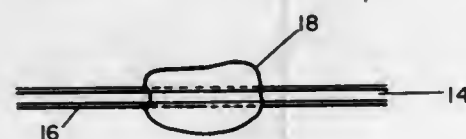
Margaret L. A. MacVicar, Fenton, Mich.; Stuart M. Freake, Berkeley, Calif., and Clement J. Adkins, Cambridge, England, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed July 20, 1970, Ser. No. 56,425

Int. Cl. H011 5/06

U.S. Cl. 317—234 R

10 Claims



Quantum mechanical tunneling barriers, and non-linear gates are comprised of disordered carbon and integrated as the middle layer in electrode-carbon-electrode junctions.

3,731,159

**MICROWAVE DIODE WITH LOW CAPACITANCE PACKAGE**

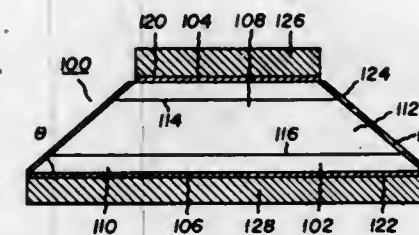
Joseph A. McCann, Auburn, N.Y., assignor to Anheuser-Busch, Incorporated, St. Louis, Mo.

Continuation-in-part of Ser. No. 886,662, Dec. 19, 1969, abandoned. This application May 19, 1971, Ser. No. 144,989

Int. Cl. H011 1/10, 5/00, 9/10

U.S. Cl. 317—234 R

9 Claims



A microwave diode is packaged solely by contacts and a glass passivant layer adhered to the entire exterior surface of the diode mediate the contacts. The glass layer is of substantially uniform thickness of no less than one mil, exhibits a thermal coefficient of expansion in the range of from  $2.6$  to  $4.8 \times 10^{-6}$  in/in/°C and a dielectric constant in the range of from 6 to 18. The glass is in non-wetting association with the contacts.

3,731,160

**MICROWAVE SEMICONDUCTOR DEVICE ASSEMBLY**

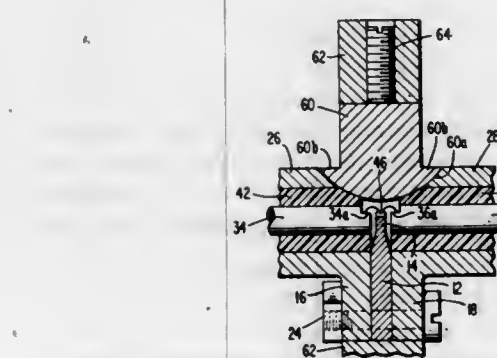
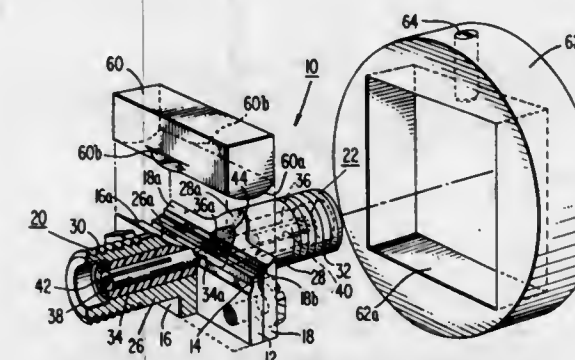
Norman Sam Klein, Freehold, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 8, 1972, Ser. No. 251,385

Int. Cl. H011 3/00, 5/00

U.S. Cl. 317—234 R

8 Claims



A semiconductor device assembly includes a semiconductor element mounted on a pedestal of a mounting plate. The mounting plate is secured between a pair of flanges, and co-axial terminals extend from the flanges. The co-axial terminals include outer ground plane walls and inner conductor

pins electrically insulated from the outer walls. The conductor pins extend to the semiconductor element. The contacts of the semiconductor element are electrically connected to the mounting plate and conductor pins by short wires. A cover block is mounted on the flanges and extends over the semiconductor element. A retainer ring fits around the cover block and the flanges and firmly secures the cover block to the flanges.

3,731,161

**SEMICONDUCTOR INTEGRATED CIRCUIT**

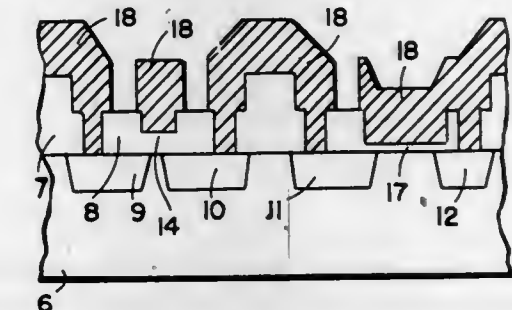
Hirohiko Yamamoto, Tokyo, Japan, assignor to Nippon Electric Company Limited, Tokyo, Japan

Filed Sept. 3, 1971, Ser. No. 177,631

Claims priority, application Japan, Sept. 5, 1970, 45/78080  
Int. Cl. H011 19/00, 11/14

U.S. Cl. 317—235 R

3 Claims



A semiconductor integrated circuit comprises a plurality of insulated gate type field effect transistors formed in a common semiconductor substrate. One of the transistors receives an input signal from an external circuit. The gate insulator film of the receiving transistor is thicker than the insulator film of the other insulated gate type field effect transistors formed on the common substrate.

3,731,162

**SEMICONDUCTOR SWITCHING DEVICE**

Masanobu Suenaga, Minami-ku, Yokohama; Tetsuo Machii, Meguro-ku, Tokyo, and Syuji Sugioaka, Yokohama, Tsurumi-ku, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

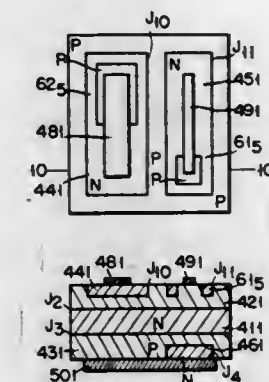
Filed Sept. 22, 1970, Ser. No. 74,504

Claims priority, application Japan, Sept. 25, 1969, 44/76101;  
Jan. 31, 1970, 45/8278

Int. Cl. H011 1/10

U.S. Cl. 317—235 R

2 Claims

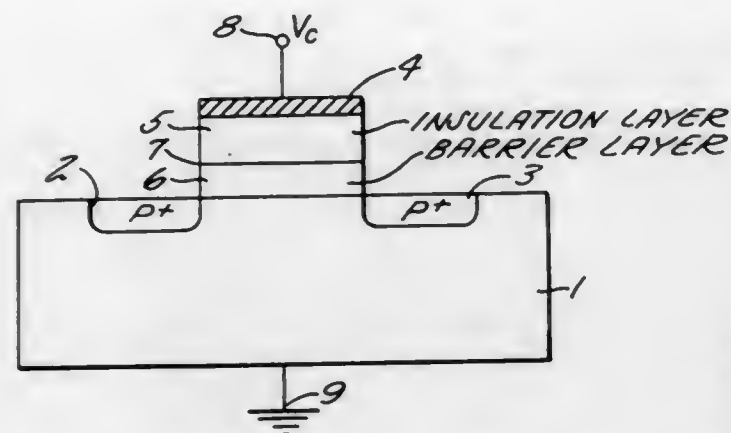


A semiconductor switching device comprising a semiconductor body having at least four regions arranged in succession, the adjacent ones thereof being of different conductivity types, a pair of main electrodes mounted on both sides of the semiconductor body and a gate electrode disposed on that side of the semiconductor body on which there is provided one of the main electrodes and spaced from said main electrode, wherein there are provided semiconductor shielding regions or discontinuous recesses for obstructing the flow of a gate current on at least part of the surface of the region between the gate electrode and said one main electrode.



### 3,731,163 LOW VOLTAGE CHARGE STORAGE MEMORY ELEMENT

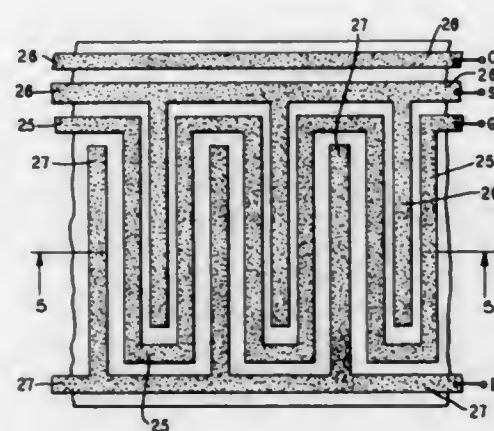
Alexander J. Shuskus, West Hartford, Conn., assignor to  
United Aircraft Corporation, East Hartford, Conn.  
Filed March 22, 1972, Ser. No. 237,042  
Int. Cl. H01l 1/14  
U.S. Cl. 317-235 R 2 Claims



A variable threshold, dual insulator, insulated gate field effect transistor charge storage memory element comprises a relatively thin barrier layer of silicon dioxide adjacent to the semiconductor surface which has disposed thereon, beneath the gate metalization, a somewhat thicker layer of an insulator having a dielectric constant over 18. Dielectric materials include: strontium titanate ( $\text{SrTiO}_3$ ), titanium dioxide ( $\text{TiO}_2$ ), lead zirconate ( $\text{PbZrO}_3$ ), refractory metal oxides, such as hafnium dioxide ( $\text{HfO}_2$ ), zirconium dioxide ( $\text{ZrO}_2$ ), tantalum oxide ( $\text{Ta}_2\text{O}_5$ ), and tungsten oxide ( $\text{WO}_3$ ); rare earth metal oxides; and ferroelectrics and antiferroelectrics.

### 3,731,164 COMBINED BIPOLAR AND FIELD EFFECT TRANSISTORS

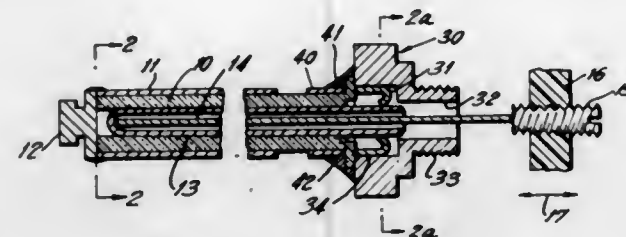
Glen Trenton Cheney, Allentown, Pa., assignor to Bell  
Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Sept. 17, 1971, Ser. No. 181,478  
Int. Cl. H01l 19/00  
U.S. Cl. 317-235 R 6 Claims



In an integrated circuit of the type in which the drain region of an insulated gate field effect transistor (IGFET) also constitutes a base region of a bipolar transistor, the IGFET has interdigitated source and drain regions separated by a serpentine channel region. An emitter stripe of the bipolar transistor is included in each drain region protrusion. This configuration increases the efficiency of modulation of the bipolar emitter currents by the IGFET channel currents.

### 3,731,165 TRIMMER CAPACITOR WITH SLOTTED PISTON

Benjamin Solow, North Hollywood, Calif., assignor to JFD  
Electronics Corp., Brooklyn, N.Y.  
Filed Oct. 4, 1971, Ser. No. 185,988  
Int. Cl. H01g 5/14  
U.S. Cl. 317-249 T 11 Claims



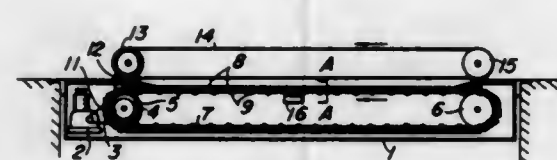
The movable piston of a piston trimmer capacitor has shallow narrow slots extending along its outer surface either longitudinally, or helically, to adjust the maximum capacitance of the unit while maintaining a close fit within a surrounding dielectric tube. Short slots are also placed at various longitudinal locations along the piston to adjust the functional relation between capacitance and piston position.

### ERRATUM

For Class 317-258 see:  
Patent No. 3,731,130

### 3,731,166 DUPLEX DRIVING SYSTEM FOR AN ELECTRICALLY OPERATED MOVING OBJECT WITH AN ENDLESS CHAIN

Isao Inuzuka, Akinori Watanabe, and Takeshi Oohira, all of  
Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed May 11, 1971, Ser. No. 142,235  
Int. Cl. H02k 33/00  
U.S. Cl. 318-35 1 Claim



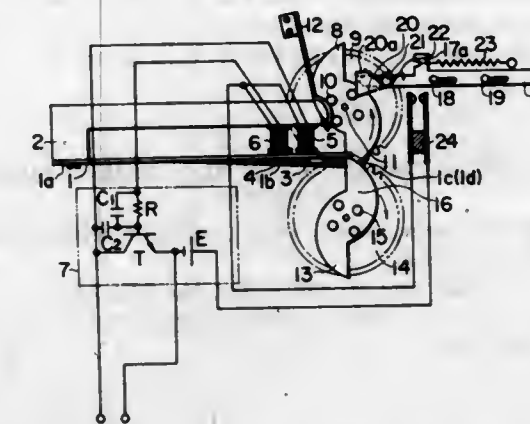
A duplex driving system comprising a driving means or linear motor for electromagnetically transmitting linear force interposed between a driving sprocket and an idle sprocket which is located at both sides of a frame, and on which an endless chain is wound.

### 3,731,167 STARTING DEVICE FOR A VIBRATING ELEMENT FOR TIME MEASURING MEANS

Nagao Mizutani, Hachioji, and Masamitsu Nojima, Tokyo,  
both of Japan, assignors to Citizen Watch Co. Ltd., Tokyo,  
Japan  
Filed Dec. 23, 1971, Ser. No. 211,440  
Int. Cl. H02k 33/10  
U.S. Cl. 318-114 3 Claims

A starting device for a vibrating element in which the vibrat-

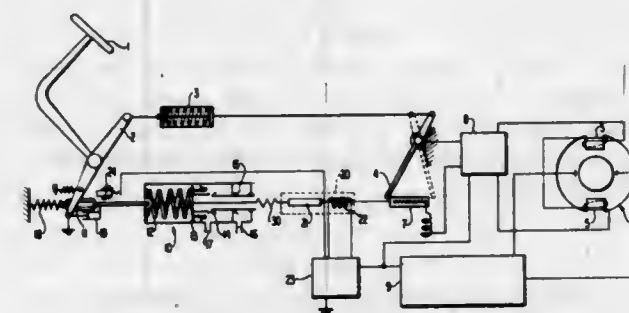
ing element is locked in a position of substantially the maximum amplitude prior to starting and instantaneously released



for free vibration at starting and, at the same time, a driving circuit for the element is energized.

### 3,731,168 BRAKE INSTALLATION FOR ELECTRICALLY DRIVEN VEHICLES

Paul E. Striffler, Dettingen, Teck, Germany, assignor to  
Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim,  
Germany  
Filed Feb. 5, 1970, Ser. No. 8,970  
Claims priority, application Germany, Feb. 5, 1969, P 19 05  
641.8  
U.S. Cl. 318-139 14 Claims



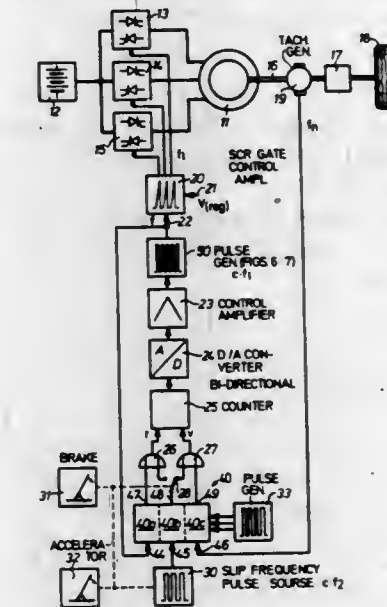
A brake installation for an electrically driven vehicle which includes mechanical brakes and utilizes the electric driving motor as electric brake by connecting it as generator, whereby the battery is recharged by this recovered energy; a control installation is provided which determines by way of a common brake lever, such as a brake pedal, the proportions in the overall brake deceleration shared by the mechanical brakes and the electric brake.

### 3,731,169 DIGITAL SLIP FREQUENCY CONTROL CIRCUIT FOR ASYNCHRONOUS DYNAMO ELECTRIC MACHINES

Alwin Burgholte, 208 Pinneberg; Rainer Wirtz, 7141 Unter-  
rexingen, and Helmut Domann, 725 Leonberg, all of Ger-  
many, assignors to Robert Bosch GmbH, Gerlingen-Schiller-  
höhe Robert-Bosch-Platz, Germany  
Filed March 24, 1972, Ser. No. 237,650  
Claims priority, application Germany, April 24, 1971, P 21  
20 193.4  
U.S. Cl. 318-227 14 Claims

A control pulse generator is connected to control the gates of thyristor-type inverter circuits supplying an asynchronous

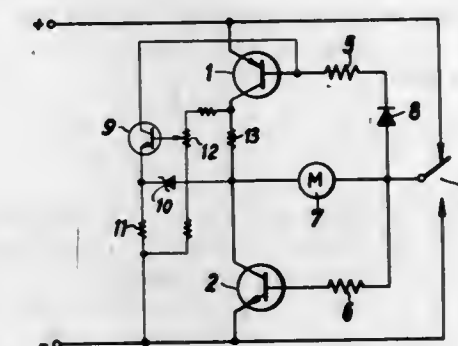
dynamo electric machine with a-c power from a d-c source. The slip frequency is determined by a slip frequency pulse generator supplying pulses at a pulse repetition frequency (PRF) representative of a command value, in a feedback circuit including a tachometer generator supplying pulses at a PRF representative of speed of the machine; pulses are applied to a bi-directional counter, the count in the counter controlling the control pulse generator. To prevent simultaneous input to the forward and reverse terminals of the bi-directional counter, a clock pulse source of predetermined frequency



which is higher than the highest PRF expected is connected to a time-scanning and division network interconnecting the outputs of the various pulse sources and the counter so that pulses will be applied to the counter only as controlled by the clock pulse source. To enable the control pulse generator to have a wide range, for example between 50 to 30,000 Hz with controlled on-off ratio, a chopper applies positive and negative pulses to an integrator which is connected to a threshold amplifier, providing an output each time the threshold from the integrator is exceeded in either direction, the output controlling the operating rate of the chopper.

### 3,731,170 CIRCUIT FOR CONTROLLING THE DIRECTION OF CURRENT FLOW IN A LOAD IMPEDANCE

Reinhold Emmert, D-8510 Fuerth, Germany, assignor to  
Grundig EMV, Furth Bay Kurgartenstrasse, Germany  
Filed June 19, 1972, Ser. No. 264,029  
Claims priority, application Germany, June 22, 1971, P 21  
30 847.4  
U.S. Cl. 318-257 5 Claims



One terminal of a load impedance is connected to the collectors of two transistors of opposite conductivity type. Their emitters are connected to positive and negative power supply



terminals to receive direct current, and the emitter-collector circuits of the two transistors are in current-carrying polarity with respect to the direct current terminals. The bases of the two transistors are connected to the arm of a single-pole-double-throw switch. The fixed contacts of the switch are connected to the positive and negative power supply terminals so that in one position the base of one transistor is biased to conductivity to allow current to flow in one direction through the load impedance and the conductive transistor. When the switch is in the opposite position the other transistor is conductive and current can flow in the opposite direction through the latter transistor and the load impedance.

3,731,171

## DIRECT CURRENT SERVO MECHANISM

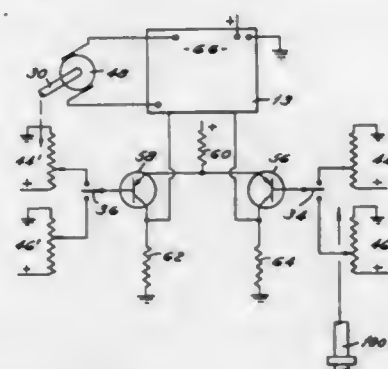
George M. Holley, Jr., 510 Sheldon Road, Grosse Pointe Shores, Mich.

Filed March 30, 1972, Ser. No. 239,453

Int. Cl. G05b 1/14

U.S. Cl. 318—396

12 Claims



The control characteristics of potentiometers driven by the input and output shafts are compared and imbalance therebetween utilized to drive the output shaft motor in a direction to restore the balance. To avoid ambiguity in operation the potentiometers have an effective control characteristic range extending beyond 360° of shaft rotation to provide an overlap between the beginning and end of their ranges, which overlap is at least as great as the operational angular lag between the shafts. Means are provided for switching both potentiometers simultaneously near the end of their ranges back to near the beginning of their ranges with such switchover occurring in the area of the overlap.

3,731,172

## BIPOLAR SERVO AMPLIFIER COMMUTATION CIRCUIT USING A SEPARATE SILICON CONTROLLED RECTIFIER AND ISOLATED POWER SUPPLY FOR CHARGING A COMMUTATION CAPACITOR

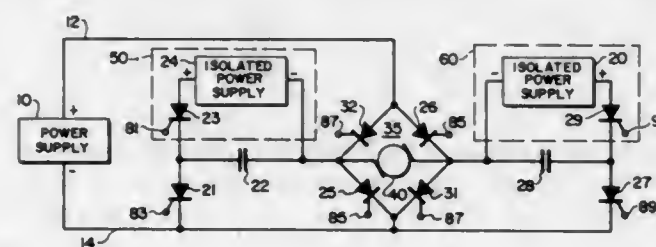
Raymond H. Kaufman, El Paso, Tex., assignor to The United States of America as represented by the Secretary of the Army

Filed March 24, 1972, Ser. No. 237,667

Int. Cl. H02k 29/00

U.S. Cl. 318—439

3 Claims



A direct current powered commutation and damping system for a servo motor having both forward and reverse

direction commutation circuits that use silicon controlled rectifiers for control. A logic circuit with a plurality of sequentially timed outputs is used for controlling the period of the duty and the damping cycles. The damping cycle is on for about 5 percent of the entire system repetition period, and is specifically on during the off period of the motor power pulse.

3,731,173

## CONDITION CONTROLLED REVERSIBLE MOTOR SYSTEM

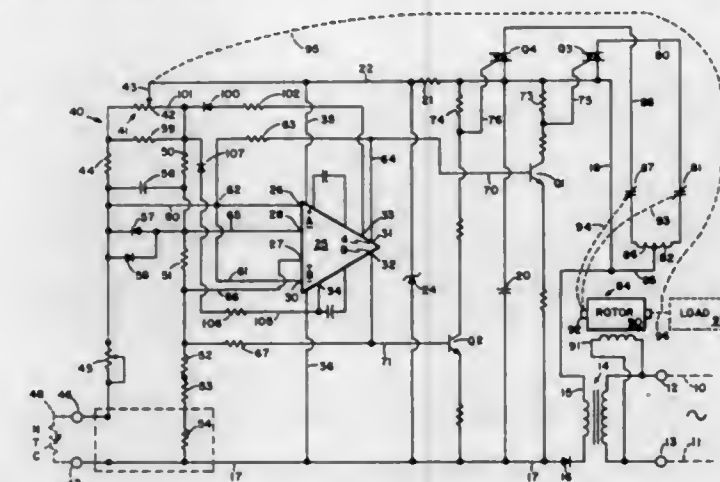
B. Hubert Pinckaers, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed July 19, 1972, Ser. No. 273,245

Int. Cl. G05b 1/06

U.S. Cl. 318—471

6 Claims



A condition controlled reversible motor system, disclosed as a temperature responsive system, operates to rebalance a bridge by means of a feedback potentiometer. The amplifier system connecting the bridge to the motor has a circuit means including a back biased diode that insures that the system always drives to a preferred or safe end in the event that the feedback potentiometer open-circuits or has a discontinuity between the wiper and the potentiometer resistor due to dirt or some other defect.

3,731,174

## CONDITION CONTROL DEVICE AND SYSTEM

John L. Harris, 470 Palm Island, N. E., Clearwater, Fla.

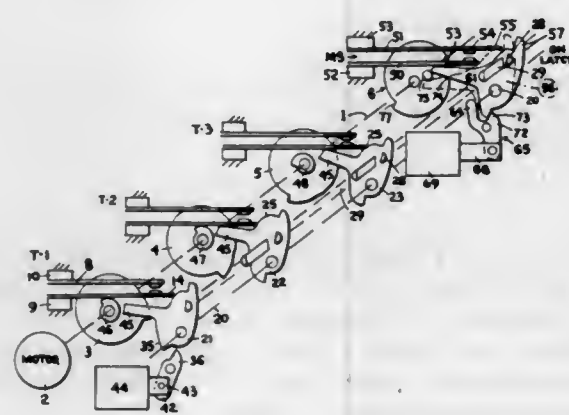
Division of Ser. No. 133,236, April 12, 1971. This application

Aug. 24, 1972, Ser. No. 283,273

Int. Cl. G05g 21/00

U.S. Cl. 318—485

4 Claims



A timing device controls a group of electric heaters, turning them on in sequence in response to call for heat by a thermostat and turning them off in sequence when the call for heat is satisfied. The timer has two stopping points, one with the heaters off and the other with the heaters on. A single switch

controls the timer motor and is opened by a timer cam at the off and on positions. The switch is held open at the off position by an off latch and at the on position by an on latch. These latches are released by a solenoid controlled by the room thermostat. The latches are also controlled by a timer cam, the off latch being held released when the timer is in the on position, and the on latch being held out at the off position. The load switches for the heaters are also opened instantly by a second solenoid responding to an unfavorable condition. This same action releases the on latch to cause the timer to return to the off position.

3,731,175

## SERVO SYSTEM FOR VELOCITY AND POSITION CONTROL

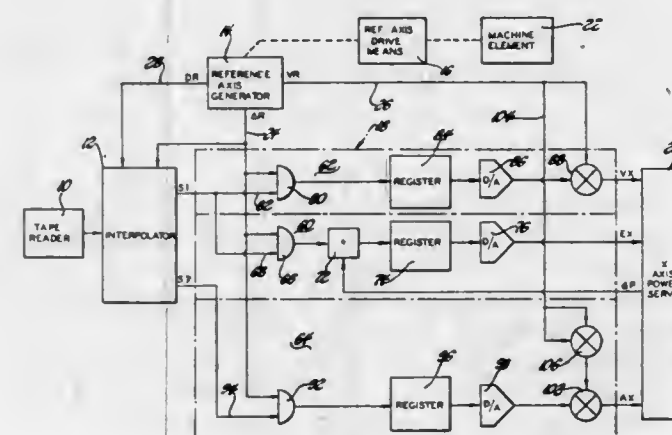
Dudley B. Hartung, Somerville, Mass., assignor to Xerox Corporation, Waltham, Mass.

Filed March 6, 1972, Ser. No. 232,078

Int. Cl. G05b 19/24

U.S. Cl. 318—570

20 Claims



An automatic control system in the form of a servomechanism is disclosed which is especially adapted for position and velocity control for machine tools. The invention provides increased accuracy and enables high speed operation by utilizing input command signals with the controlled axis variable expressed as a function of a reference axis variable. A signal processor operates on the command signal to produce control signals for the servo, such as position, velocity and acceleration signals. Preferably the command signals take the form of first and second difference signals and the necessary time base signal is supplied from a signal generator connected with the reference axis drive means so as to produce a velocity signal corresponding to motion with respect to the reference axis. The system is implemented in a manner to accept digital input signals from an interpolator or computer and to produce analog control signals for the servo.

3,731,176

## DECELERATION AND STOP-LOCK MOTOR CONTROL APPARATUS

John O. Mitchell, Longmont; Spencer D. Roberts, Broomfield, and Richard W. Van Pelt, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed April 21, 1972, Ser. No. 246,213

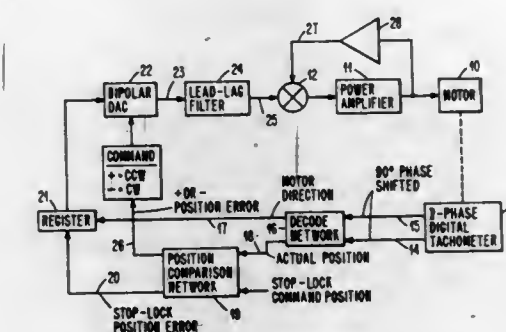
Int. Cl. G09b 1/06

U.S. Cl. 318—619

20 Claims

A motor, moving at a known speed, is stopped in a controlled manner by a speed control servomechanism which compares the actual speed-versus-distance deceleration profile to an optimum or desired speed-versus-distance deceleration profile, and variably controls the reverse ener-

gization, or plugging, of the motor in a manner devised to achieve the desired profile. When the speed servo has reduced motor speed to a low level, and preferably zero, a stop-lock control servomechanism is enabled to position and maintain the motor at a preselected stop-lock position. The stop-lock servo implements a motor-control algorithm which, for a



given position error, provides a higher magnitude motor energization when the motor is moving away from the stop-lock position than when the motor is moving back toward the stop-lock position. This control algorithm provides increased servo gain when the motor is moving away from the stop-lock position.

3,731,177

## DISC FILE HEAD MOVEMENT CONTROL SYSTEM

Robert D. Commander, Eastleigh, England, and Jerry D. Dixon, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

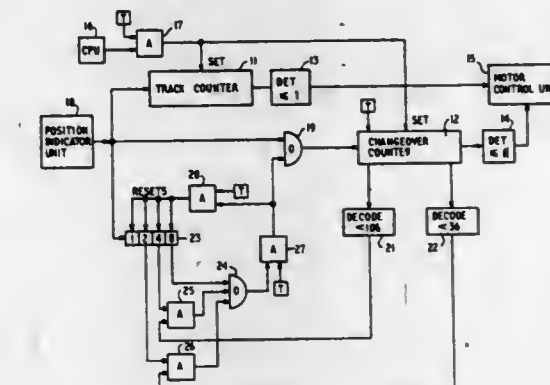
Filed Dec. 15, 1971, Ser. No. 208,150

Claims priority, application Great Britain, Feb. 15, 1971, 4,681/71

Int. Cl. G05b 19/28

U.S. Cl. 318—603

29 Claims



According to the present invention a movement control system comprises a motor for moving said body into a required position, a motor control unit for controlling the acceleration and deceleration of said motor, a position indicator unit producing positioning signals corresponding to movement of said body while accelerating toward said required position, and a calculating unit responsive to position data representing said required position and to said positioning signals to produce a control signal for said motor control unit to change from acceleration to deceleration in order to provide required speed/position characteristics for the movement of said body.



3,731,178

# PROCESS AND APPARATUS FOR EFFECTING CONTROL OVER CONTROL SYSTEMS FOR NON-LINEAR CONTROL PROCEDURES

Manfred Schwannemann, Dueseldorf, Germany, assignor to Zellweger Ltd., Uster, Switzerland

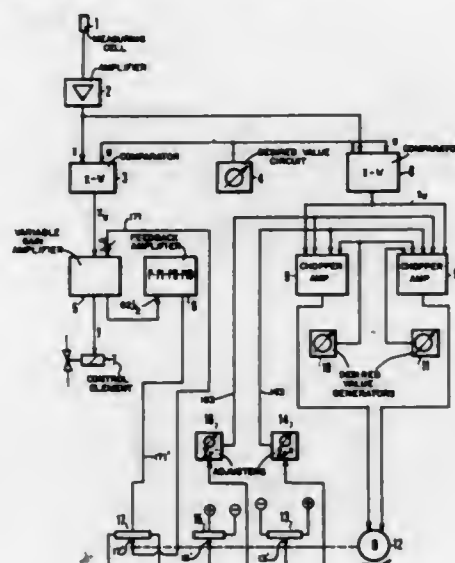
Filed Jan. 27, 1971, Ser. No. 110,034

Claims priority, application Switzerland, Feb. 10, 1970, 1873/70

Int. Cl. G05b 5/01

U.S. Cl. 318—620

7 Claims



Process and apparatus for effecting control over control systems for non-linear control procedures wherein the amplification of the servo control amplifier in the main control system is adjusted in accordance with the control deviation by a secondary control system including a pair of chopper amplifiers responsive to the same input as the main control system for controlling a servo motor which drives respective feedback potentiometers controlling desired value generators connected to the respective chopper amplifiers and a control potentiometer for controlling the amplification of the servo control amplifier in the main control system.

3,731,179

# ADJUSTABLE HIGH VOLTAGE POWER SUPPLY WITH OUTPUT POLARITY SWITCHING

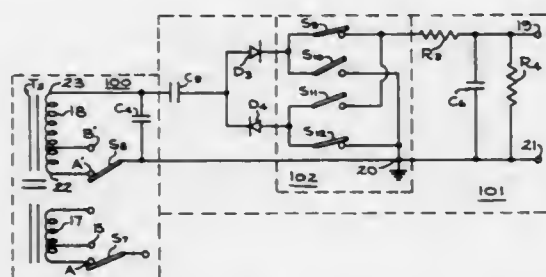
Leo C. Rademaker, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Sept. 22, 1972, Ser. No. 291,220

Int. Cl. H02m 7/00

U.S. Cl. 321—15

8 Claims



There is provided a high voltage power supply utilizing a high leakage reactance transformer connected to a voltage doubler which has a capability of reversing its output voltage. The power supply is of a type which may be used at several different input frequencies. There is provided an inexpensive low voltage switch connected to the secondary winding of the transformer and to ground. The low voltage switch is used to switch from one number of turns to another number of turns on the secondary winding depending on the frequency of the input signal.

3,731,180

# FREQUENCY TRANSLATOR CIRCUIT

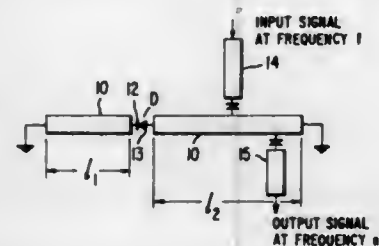
Louis Sebastian Napoli, Hamilton, and John Joseph Hughes, Spotswood, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed March 13, 1972, Ser. No. 234,179

Int. Cl. H02m 5/30; H01p 3/08

U.S. Cl. 321—69 NL

8 Claims



The reactance of an active element exhibiting a nonlinear current-voltage characteristic in response to an applied input signal and generating an output signal at a desired frequency is incorporated as part of a circuit resonant at both the frequency of the applied input signal and of the output signal.

3,731,181

# IMPROVED REFERENCE CURRENT SOURCE

James B. Cecil, Tempe, and William G. Howard, Jr., Mesa, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

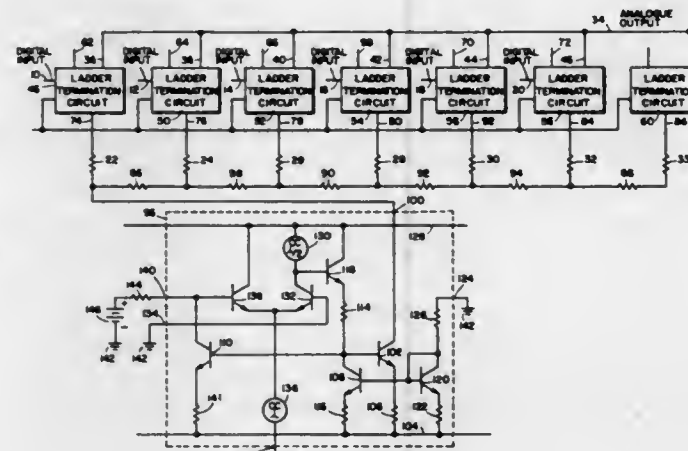
Continuation of Ser. No. 110,936, Jan. 29, 1971, abandoned.

This application April 12, 1972, Ser. No. 243,490

Int. Cl. G05f 1/56

U.S. Cl. 323—4

9 Claims



A digital to analog converter is supplied with operating current from a reference current source including an operational amplifier, across the input terminals of which are connected a reference voltage and a reference resistor in series. The output of the operational amplifier is fed back to the input by a reference transistor coupled between one of the input terminals and a source of potential. The current flowing through the reference transistor is established by the reference voltage and the reference resistor. The base of the reference transistor is coupled in common with the base of another transistor matched to it, so that the collector of such other transistor supplies the operating current to the digital to analog converter circuit.

3,731,182

# PHASE CONTROL TYPE DIMMING SYSTEM WITH MEANS TO COMPENSATE FOR THE HYSTERESIS EFFECT

Akira Hirano, and Masayoshi Miyajima, both of Kyoto, Japan, assignors to Blackwell Electronics Ind. Co., Ltd., Kyoto, Japan

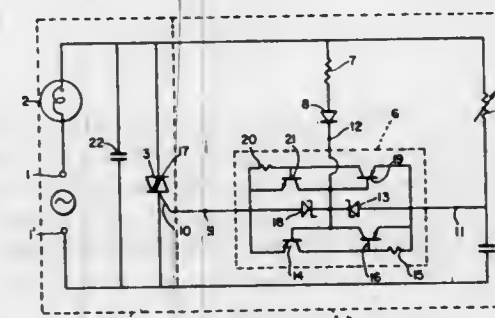
Filed Nov. 3, 1971, Ser. No. 195,408

Claims priority, application Japan, Sept. 6, 1971, 46/68759; Sept. 6, 1971, 46/68760; Sept. 6, 1971, 46/68761

Int. Cl. G05f 3/04

U.S. Cl. 323—19

4 Claims



A phase control type dimming circuit employs a TRIAC in series with a load and an A.C. power source and a trigger circuit including a variable resistor and condenser in series across the TRIAC with a SBS connecting the junction between the resistor and condenser and the gate electrode of the TRIAC. A compensation circuit, which is connected to the gate terminal of the SBS to eliminate the hysteresis effect and extend the control range, includes in one embodiment a resistor and diode in series, in a second embodiment a pair of resistors in series and a pair of diodes connecting the junction point between the resistors to the anodes of the SBS, and in a third embodiment a resistor and a first diode in series and a pair of additional diodes connecting the junction between the resistor and the first diode to the anodes of the SBS. The third embodiment may be provided as a monolithic integrated circuit including the three diodes incorporated within the SBS.

3,731,183

# POWER CONTROL AND PHASE ANGLE CORRECTING APPARATUS

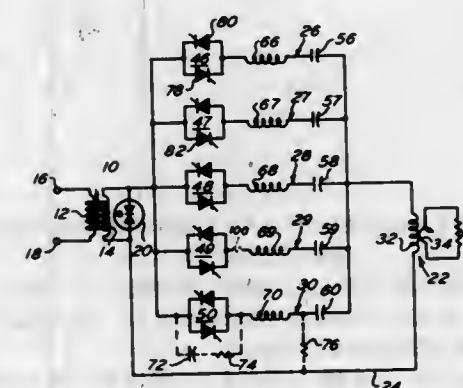
Arthur C. Johnson, and Robert F. Herrman, both of Rancocas, N.J., assignors to Inductotherm Corporation, Rancocas, N.J.

Filed Sept. 29, 1971, Ser. No. 184,851

Int. Cl. H02p 13/16; H02m 5/22

U.S. Cl. 323—24

7 Claims



Apparatus for controlling power and for compensating for a low power factor due to a relatively large varying inductive load. A number of branches having an inverse parallel connected pair of thyristors and a capacitor connected in series are connected in parallel. These parallel branches are con-

nected in series between an alternating current source and the load. At least one thyristor of one of the inverse parallel connected pairs of thyristors is gated on at some time during each half cycle of the alternating current supply voltage in order to control the power flow to the load. One thyristor of one or more of the inverse parallel pairs of thyristors is gated on at appropriate times during each half cycle in order to place one or more of the capacitors, which are in parallel with each other, in series between the source and the load.

3,731,184

# DEFORMABLE PICK UP COIL AND COOPERATING MAGNET FOR MEASURING PHYSICAL QUANTITIES, WITH MEANS FOR RENDERING COIL OUTPUT INDEPENDENT OF ORIENTATION

Harold D. Goldberg, King Street, Port Chester, N.Y., and Milton I. Goldberg, Barrett Rd., Katonah, N.Y.

Continuation-in-part of Ser. No. 456,885, May 3, 1965, Pat.

No. 3,560,845, which is a continuation-in-part of Ser. No.

4,766, Jan. 26, 1960, which is a continuation-in-part of Ser.

Nos. 374,782, Aug. 17, 1953, abandoned, and Ser. No.

374,868, Aug. 18, 1953, Pat. No. 3,142,796, each is a

continuation-in-part of Ser. No. 66,523, Dec. 21, 1948, Pat.

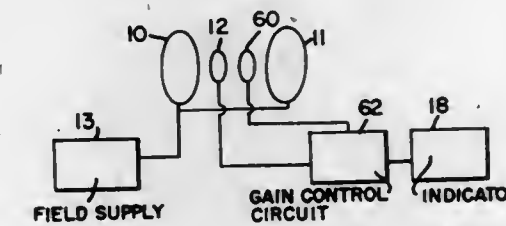
No. 2,649,573. This application Nov. 24, 1970, Ser. No.

92,449

Int. Cl. G01r 33/00

U.S. Cl. 324—34 R

19 Claims



A device is disclosed for the measurement of cross-sectional area, volume, and related quantities, as well as physical quantities which can be transformed into area, volume, and the like, and mathematical functions of such quantities. It comprises a deformable pick-up conductor disposed in a magnetic field, which field may be produced externally, or by passing current through the pick-up conductor itself. A voltage is induced in the pick-up which is a function of its configuration, and of changes in this. Means are disclosed for rendering the output of the device independent of the orientation of the pick-up, comprising variously the use of at least one auxiliary coil, linked to the pick-up, for producing a reference signal, the use of magnetic fields which are capable of change in orientation and may scan or track with the pick-up, and the use of a plurality of magnetic fields.

3,731,185

# INSULATION TEST APPARATUS FOR THE HIGH FREQUENCY VOLTAGE DISCHARGE TYPE WITH IMPROVED SWITCHING ARRANGEMENT TO INITIATE DISCHARGE

Paul F. Pittman, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 24, 1971, Ser. No. 146,234

Int. Cl. G01r 31/14

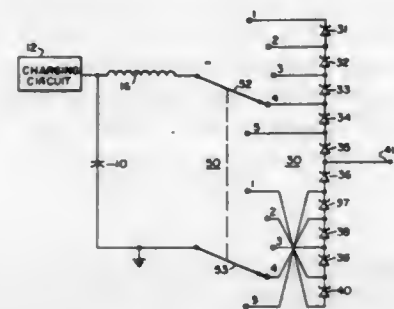
U.S. Cl. 324—54

4 Claims

An improved high frequency voltage test apparatus for insulated conductors is provided with a switching arrangement,



preferably utilizing solid state switching devices, particularly reverse switching rectifiers, with means to minimize the turn



on time of the switching devices and thus increase their life and reliability and also permit operation of the apparatus over a wide voltage range.

3,731,186

## RADIO FREQUENCY MEASUREMENTS

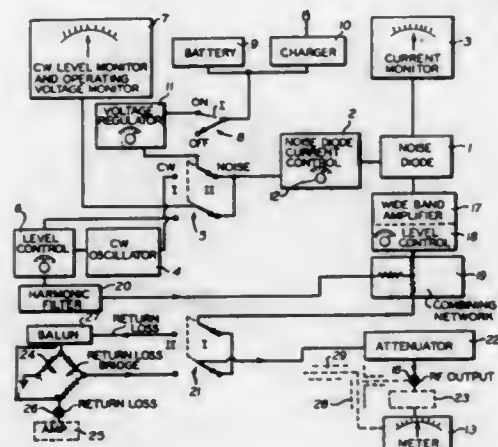
Hans Sadel, 299 Park Avenue, Weehawken, N.J.

Filed June 1, 1971, Ser. No. 148,599

Int. Cl. G01r 17/04

U.S. Cl. 324-57 N

4 Claims



There is disclosed a method for determining the absolute response of a signal strength meter, or the absolute response of a device under test with the use of a previously calibrated signal strength meter. In the former case, a continuous wave signal of predetermined amplitude and frequency is applied to the input of the meter while it is tuned to the frequency of the continuous wave signal. A white noise signal is then applied to the input of the meter while it is tuned to the same frequency, and the level of the white noise signal is adjusted so that the meter reading is the same as the reading taken for the continuous wave signal. Thereafter, as the signal strength meter is tuned throughout the frequency range of interest, the absolute response of the signal strength meter can be determined by observing the meter reading even though the bandwidth of the filter of the meter may not be known. In a similar manner, a previously calibrated meter can be used to measure the absolute response of a device under test to whose input there are applied the white noise and continuous wave signals, and whose output is connected to the meter.

3,731,187

## TEMPERATURE COMPENSATED FOULING MEASURING METHOD AND APPARATUS

Rudolf H. Hausler, Rolling Meadows, and Robert W. Sampson, Arlington, both of Ill., assignors to Universal Oil Company, Des Plaines, Ill.

Filed Oct. 6, 1971, Ser. No. 186,888

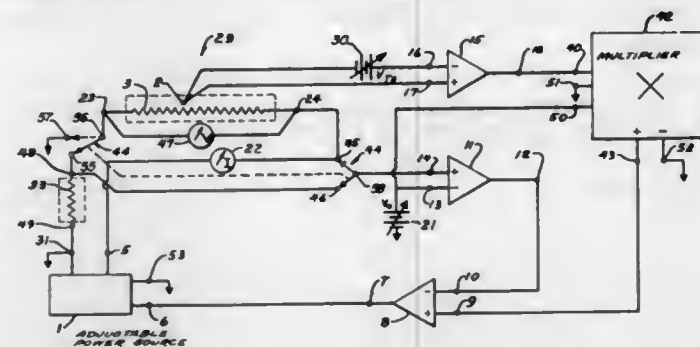
Int. Cl. G01r 27/02

U.S. Cl. 324-65 R

6 Claims

An apparatus and method for measuring material buildup or fouling on a test specimen in which at least a portion of a tem-

perature sensitive voltage output means is located proximate to a test specimen. The extent of fouling is determined by the change in current value or voltage value resulting from the change in the heat transfer coefficient of the test specimen.



The temperature sensitive voltage output means is at the same temperature as the temperature of the medium in which the test specimen resides and adjusts either the current value or voltage value to negate the effects of varying temperature of the medium on the other value across the test specimen.

3,731,188

## SIGNAL ANALYSIS OF MULTIPLICATIVELY RELATED FREQUENCY COMPONENTS IN A COMPLEX SIGNAL

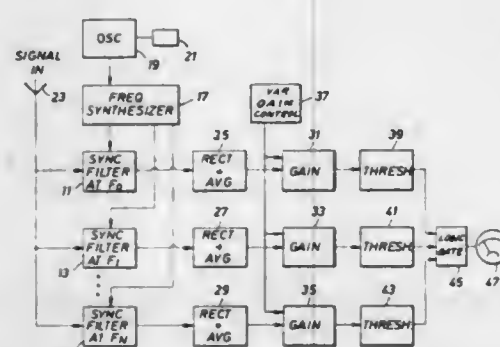
Spurgeon E. Smith, Austin, Tex., assignor to Tracor, Inc., Austin, Tex.

Filed April 19, 1971, Ser. No. 135,090

Int. Cl. G01r 23/16

U.S. Cl. 324-77 E

12 Claims



Apparatus including a plurality of frequency-tunable filters controlled by a frequency synthesizer in turn controlled by a variable oscillator for examining a complex signal at frequency "bins" which are multiplicatively related, the amplitudes of the signals in these bins yielding quality information about the complex signal when compared to predetermined amounts known to be indicative of quality.

3,731,189

## PULSE SAMPLING RESISTANCE METERING METHOD AND MEANS

Harold M. Sharaf, Milton, and Richard L. Eby, South Weymouth, both of Mass., assignors to Anderson Power Products, Inc., Brighton, Mass.

Division of Ser. No. 37,630, May 15, 1970, Pat. No. 3,676,770.

This application May 18, 1972, Ser. No. 254,497

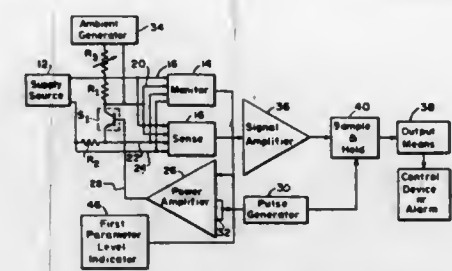
Int. Cl. G01r 27/02

U.S. Cl. 324-62 R

18 Claims

A continuously operating low dissipation system for sensing the electrical resistance of an element while the element carries a normal operating current. A pulse of electrical energy having a regulated first parameter is switched through the ele-

ment while a second parameter of the element's response to the energy pulse is simultaneously measured. These two known parameters provide the information necessary to determine the element's resistance using Ohm's law. The system is calibrated for the regulated level of the first parameter while the second parameter is amplified and stored in a sampling circuit for continuous display between pulses as an indication of



resistance. The pulse techniques of this disclosure allow continuous operation of the system without heating of the resistive element or excessive power use. The resistance indication is additionally useful for indicating the remaining charge in a battery where the indicated resistance is the battery's internal resistance. A distinct battery terminal voltage is also given.

3,731,190

## SWITCHING CIRCUIT FOR MEASURING THE ELECTRICAL POWER IN TWO ENERGY FLOW DIRECTIONS (DELIVERED AND RETURNED)

Manfred Schwendner, Schwarzenbruck, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

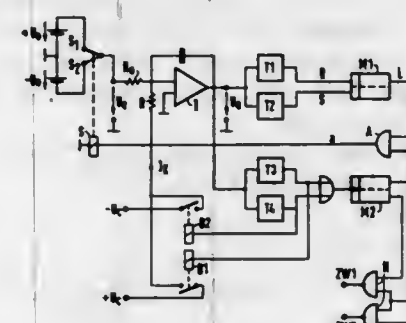
Filed June 12, 1972, Ser. No. 261,657

Claims priority, application Germany, June 11, 1971, P 21 28 883.5

Int. Cl. G01r 21/00

U.S. Cl. 324-142

3 Claims



An electronic counter for measuring the electrical power in two energy flow directions (delivered and returned) is disclosed. The circuit comprises an integrator for the product of current and voltage, and a first pair of threshold circuits having a predetermined positive voltage threshold circuit and a predetermined negative voltage threshold circuit connected at their outputs to a bistable flip flop circuit. A second pair of threshold circuits, whose two predetermined threshold levels are higher than the threshold levels of the first pair of threshold circuits, is connected in parallel with the first pair of threshold circuits. An additional flip flop circuit is connected after this second threshold circuit. The outputs of the two flip flop circuits are connected via an exclusive OR circuit to the input of the integrator to change the polarity of the input signal in response to changes in direction of the power flow. Two counters are connected through a gate circuit to the outputs of the flip flop circuits to count signals proportional to the power and to feed the signal to one counter for energy flow in one direction and to the second counter for energy flow in the opposite direction.

3,731,191

## MICRO-MINIATURE PROBE ASSEMBLY

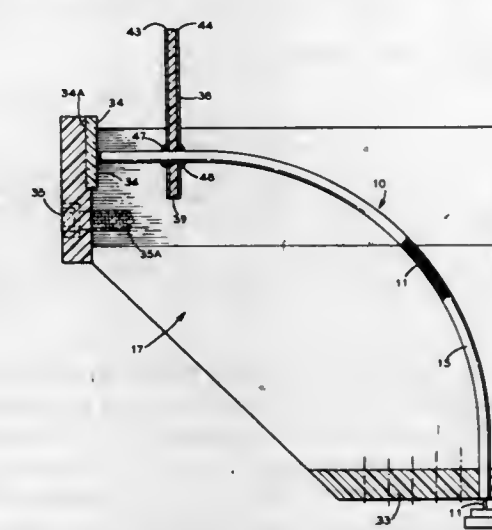
Robert L. Bullard, Poughkeepsie, and Donald C. Wheeler, LaGrangeville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1969, Ser. No. 887,229

Int. Cl. G01r 31/02

U.S. Cl. 324-158 F

1 Claim



This invention is directed to a multi-probe test circuit assembly particularly adapted for producing low resistance electrical connections to a semi-conductor component of which the electrical parameters are to be evaluated.

3,731,192

## METHOD AND APPARATUS FOR ANALYZING SEMICONDUCTORS

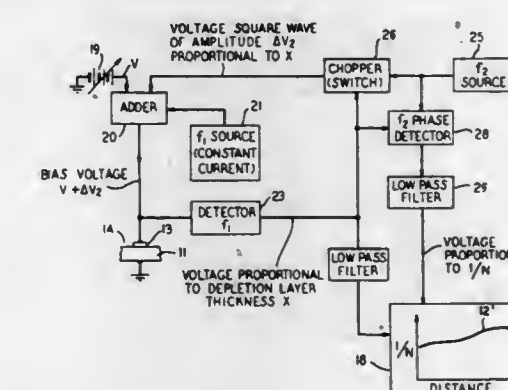
Gabriel Lorimer Miller, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 28, 1971, Ser. No. 147,846

Int. Cl. G01r 31/26

U.S. Cl. 324-158 D

14 Claims



A semiconductor wafer is analyzed by applying successive values of reverse-bias voltage  $V$  to a diode region to form successive depletion layers of different depth  $X$ . Current of frequency  $f_1$  is applied to the diode and detected to determine  $X$ . Voltage at frequency  $f_2$ , which is lower than  $f_1$ , is applied to the diode such as to produce a modulation  $\Delta E_2$  of the electric field in the depletion layer and a modulation  $\Delta X_2$  of the depletion layer depth. The voltage input at frequency  $f_2$  is controlled to maintain either  $\Delta E_2$  or  $\Delta X_2$  constant with changes of  $X$ , and the modulation of the  $f_1$  voltage at frequency  $f_2$  is measured to determine one of these semiconductor parameters at different values of  $X$ . In this manner, a profile of semiconductor carrier density  $N$ , or its reciprocal  $1/N$ , can be determined. An improved method of determining  $X$  is also disclosed.



3,731,193

VITAL VEHICLE BRAKE ASSURING CIRCUIT  
ARRANGEMENT

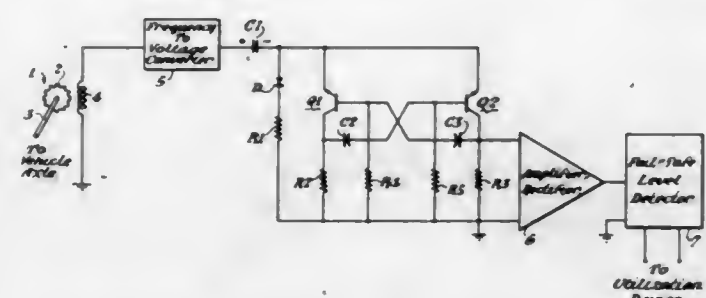
John O. G. Darrow, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Feb. 16, 1971, Ser. No. 115,247

Int. Cl. G01p 3/42

U.S. Cl. 324-162

9 Claims



A fail-safe deceleration measuring circuit which includes a signal generator for producing signals having a frequency proportional to the speed of a vehicle, a converter for converting the frequency of the signals to a proportional voltage signal, a differentiator for differentiating the voltage signal and for producing a rate of change signal, a multivibrator powered by the rate of change signal for producing output signals proportional thereto, an amplifier-rectifier for amplifying and rectifying the output signals, and a level detector for measuring the amplitude of the amplified-rectified signals and energizing a utilization device when and only when the amplitude of the signals exceeds a predetermined level thereby signifying that the vehicle is decelerating at a sufficient rate.

3,731,194

AUTOMATIC TIME INTERVAL RANGING CIRCUIT FOR  
DELAY INTERVAL MEASUREMENTS INCLUDING  
UNCERTAINTY ELIMINATION

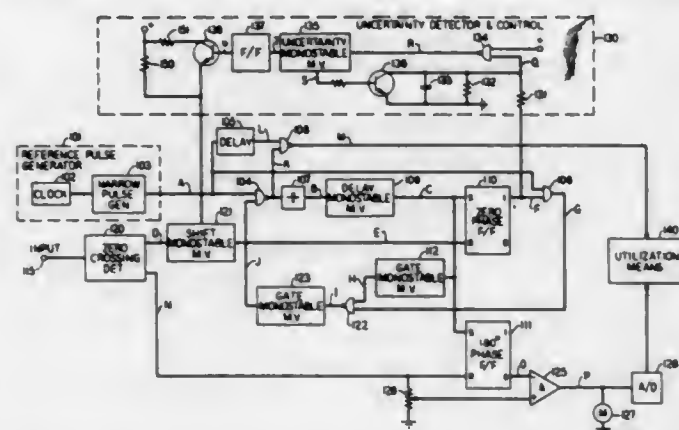
David Leonard Favin, Little Silver, and Paul Jerry Snyder, Linden, both of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 10, 1971, Ser. No. 197,410

Int. Cl. G04f 9/00

U.S. Cl. 324-186

12 Claims



Delay time intervals are measured by employing a flip-flop circuit which is SET by a reference pulsating signal and RESET by a test pulse signal. A desired measurement precision is obtained by causing the flip-flop to be SET and RESET within the interval between adjacent pulses developed by a reference clock. This is achieved automatically by selectively shifting the phase of the reference pulsating signal waveform to delay SETTING of the flip-flop. The incremental shift in the reference signal waveform is directly related to the number of reference pulses occurring during the initial interval in which the flip-flop is SET and RESET. Uncertainty in automatic ranging is eliminated by selectively altering the pulse width of the test signal to assure that the flip-flop circuit is SET and RESET in a prescribed sequence.

3,731,195

## PULSE DURATION MEASURING ARRANGEMENT

Wolf Wessel, Schwieberdingen, Germany, assignor to Robert Bosch GmbH, Gerlingen-Schillerhöhe, Germany

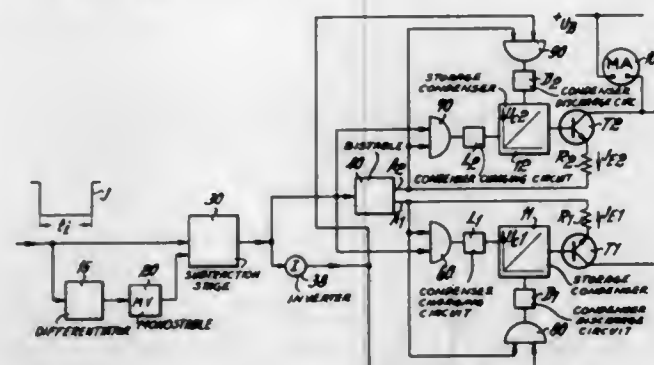
Filed Oct. 4, 1971, Ser. No. 186,030

Claims priority, application Germany, Oct. 7, 1970, P 20 49 133.2

U.S. Cl. 324-189

Int. Cl. G04f 9/00

15 Claims



To convert the duration of single sequentially occurring pulses to proportional continuous current characteristic, for example voltage or current, a capacitor is charged by a constant current during the duration of the pulse, and condenser charge measured; to permit use of components in the circuit at operating points of their operating characteristics which exhibit sharp bends, rather than gradual transition, the charging of the condenser is delayed by a predetermined time period with respect to the start of the pulse to be measured, and the capacitor is maintained at a predetermined initial charge corresponding to the charge which would otherwise accumulate during the delay period. Two capacitors, in two alternately activated channels are used to permit partial discharging, and recharging to a reciprocal level of one capacitor, while the other holds its previous charge for continuous indication of pulse length of the previous pulse.

3,731,196

METHOD AND APPARATUS FOR ELIMINATING COUNT  
SCATTER INTRODUCED BY PHASE-LOCKED LOOP  
FREQUENCY MULTIPLIERS

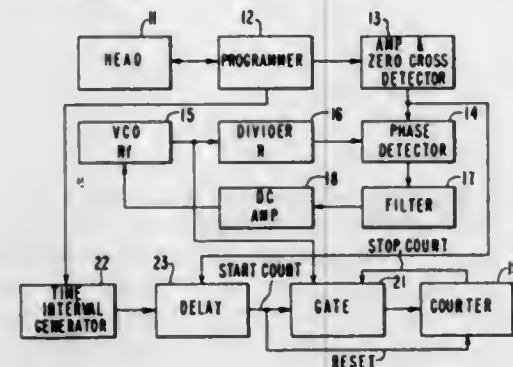
Byron A. Young, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Dec. 20, 1971, Ser. No. 209,912

Int. Cl. G01r 23/02, 33/08

U.S. Cl. 324-0.5 E

12 Claims



A frequency measuring system for use, for example, in an atomic resonance magnetometer device, comprising a phase-locked loop multiplier system to which the incoming AC signal is delivered including a voltage controlled oscillator having an operating frequency at a multiple of the frequency of the incoming signal, counter means being employed to count the cycles of the VCO signal output as a measure of the frequency of the incoming signal, the means for transmitting the VCO output signal to said counter means being synchronized with said incoming frequency signal to insure that the count is initiated at a predetermined point during the cycle of the incoming frequency signal.

3,731,197

## SECRECY COMMUNICATION SYSTEM

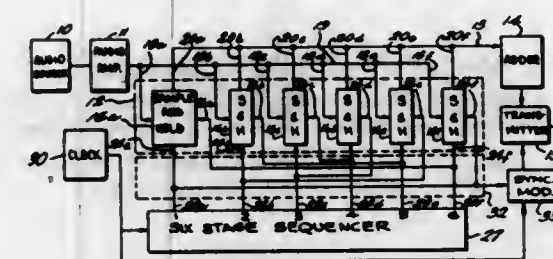
John E. Clark, Ann Arbor, Mich., assignor to Ritt Laboratories, Inc., Ann Arbor, Mich.

Filed Dec. 15, 1969, Ser. No. 885,250

Int. Cl. H04k 1/00

U.S. Cl. 325-32

29 Claims



A secrecy communication system wherein an input signal is sampled at the encoder by electronic sample-and-hold circuits, each of which includes a capacitor to temporarily hold a sample. The input signal is sampled at contiguous intervals and at a rate selected according to the sampling theorem of at least twice the highest frequency component in the input signal. The samples are read from the capacitors in a rearranged abnormal order to obtain unintelligible secured signals. The decoder at a receiver essentially operates in a reverse sequence from the encoder to reconstruct the original input signal. The sample-and-hold circuits are arranged in groups so that while information is read into one group of capacitors, samples are simultaneously read from capacitors in another group.

3,731,198

SYNCHRONIZATION DEVICE FOR ANTI-JAMMING  
COMMUNICATIONS SYSTEM

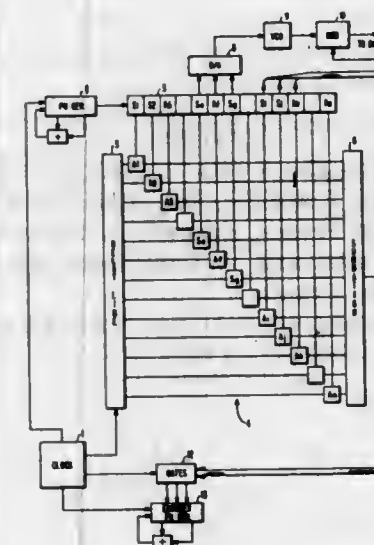
Herman L. Blasbalg, Baltimore, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 25, 1966, Ser. No. 575,501

Int. Cl. H04b 1/10; H04l 7/00

U.S. Cl. 325-42

7 Claims



The invention is a synchronizing device for an anti-jam communications system producing at the transmitting station a synchronizing pulse formed by introducing a clock pulse into a matched filter pulse shaping network controlled by a shift register pseudo-noise sequence generator. At the receiving station a mirror image of the matched filter pulse shaping network is provided to decode the synchronizing pulse and eventually synchronize the clock at the receiving station.

3,731,199

## MULTILEVEL SIGNAL TRANSMISSION SYSTEM

Kimio Tazaki; Hajime Yamamoto, both of Tokyo; Shigehiko Hinochita, Yokohama, and Shoji Hagiwara, Tokyo, all of Japan, assignors to Nippon Telegraph &amp; Telephone Public Corporation, Tokyo, Japan and Fujitsu Limited, Kawasaki, Japan

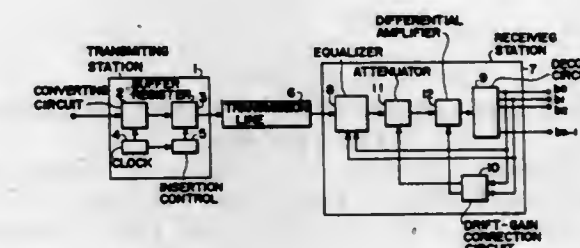
Filed April 18, 1972, Ser. No. 245,115

Claims priority, application Japan, April 30, 1971, 46/29081

U.S. Cl. 325-38 A

Int. Cl. H04b 1/00

11 Claims



Apparatus for transmitting a signal in the form of a multilevel signal over a transmission line is disclosed in which a reference level signal having fewer levels than the multilevel signal and predetermined level values are inserted in a multilevel signal train with a predetermined period. On the receiving side of the transmission line, an error of the reference level signal from the aforesaid predetermined levels is detected, and gain and DC level adjusting devices supplied with the received multilevel signal are controlled based upon the detected error for correcting variations in the DC level and/or the gain of the transmission line.

3,731,200

SUBAUDIBLE REMOTE CONTROL TONE ENCODING  
SYSTEM

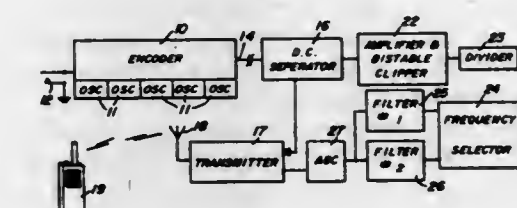
Robert J. Schwendeman, Pompano Beach; Thomas V. D'Amico, Fort Lauderdale, and Nicholas Petrakos, Plantation, all of Fla., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Feb. 22, 1972, Ser. No. 227,747

Int. Cl. H04b 1/00

U.S. Cl. 325-55

19 Claims

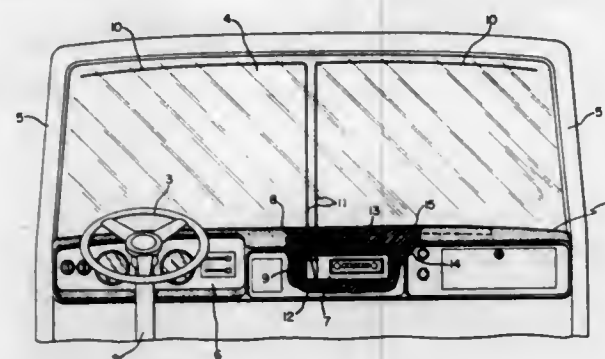


A paging system includes a transmitter for transmitting a carrier frequency signal modulated by subaudible tone signals in response to audible tone signals coupled to the transmitter from a remote point. An encoder at the remote point develops the audible tone signals which are coupled to the transmitter over standard telephone channels. At the transmitter, a circuit converts the audible tone signals to first square wave signals having the same frequency as the audible tone signals. A divider circuit divides the first square wave signals by a particular number to develop second square wave signals having the same frequency as the desired subaudible tone signals. The second square wave signals are coupled to a low pass filter which attenuates all frequencies above the subaudible tone signal frequencies and develops a sine wave having the desired subaudible tone frequency.



A frequency selector circuit may also be employed and is coupled to the divider circuit. The frequency selector circuit is operative to select the second square wave signals having a frequency above a predetermined frequency and couple them to a first filter; and is further operative to select the second square wave signals having a frequency below a predetermined frequency and couple them to a second filter. The first and second filters have low pass attenuation characteristics and are operative to filter the square wave signals coupled thereto and develop the particular subaudible tone signals therefrom for modulating the transmitter RF carrier.

foam member and a reinforcing member adapted to permit a radio to be installed in the dash of a vehicle and a flexible



3,731,201

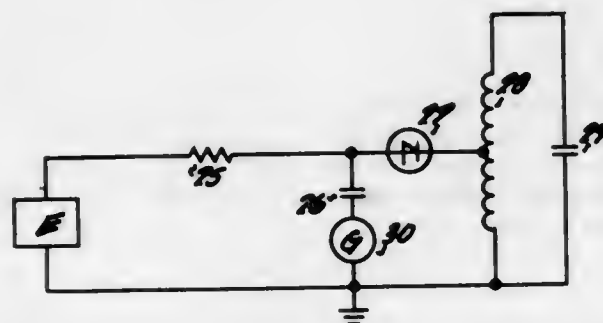
### CIRCUIT ARRANGEMENT FOR GENERATING RADIO FREQUENCIES

Jack G. Frisbie, McLean, Va., assignor to International Telephone and Telegraph Corporation, New York, N.Y.  
Continuation of Ser. No. 689,987, Dec. 12, 1967, abandoned.  
This application Nov. 12, 1970, Ser. No. 89,049

Int. Cl. H04b 1/04

U.S. Cl. 325-105

5 Claims



The invention provides a general purpose RF oscillator which may have any of many uses, depending upon bias and voltage levels which may be used. An LC circuit is repeatedly triggered into self-damped bursts of RF oscillations responsive to a relaxation oscillator which is recurrently triggered by a negative impedance device. The time at which the relaxation oscillator is triggered may be varied as a function of an analog signal to thereby produce a repetition rate modulation of the analog. Also, the negative impedance characteristic of the trigger device may be used to gain a tremendous amount of momentary amplification which provides an amount of power that is adequate to generate vast quantities of heat. Therefore, at the low voltage end of the scale, the RF generator may be used as a transmitter for walkie-talkies, and at the high voltage end of the scale the RF generator may be used as an oven. In between these two ends of the scale, the generator has many other uses.

3,731,202

### CRASH PAD CONTAINING A RADIO SHIELDING ELEMENT

Dale J. Meyers, Logan, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio  
Filed March 30, 1970, Ser. No. 23,672

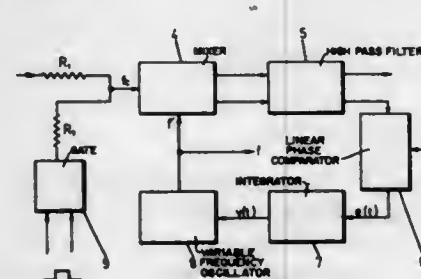
Int. Cl. H04b 1/18

U.S. Cl. 325-357

3 Claims

A crash pad which includes a decorative skin covering of a

Frequency tracking device for determining the frequency shift between the predominant frequency of an input signal



radio frequency shielding member having a ground connection.

3,731,203

### MONITORING CIRCUIT AND SYSTEM FOR DETECTING SIGNALS IN A SIGNAL TRANSMISSION SYSTEM

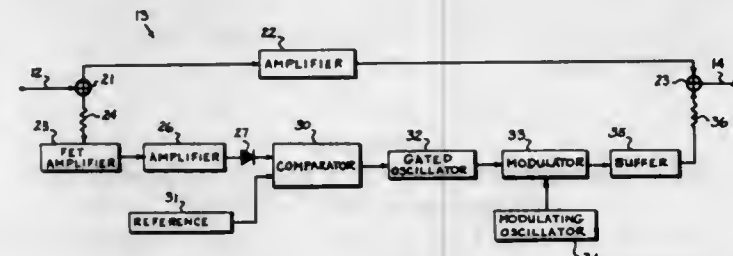
Daniel Lieberman, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Sept. 25, 1970, Ser. No. 75,429

Int. Cl. H04b 3/46, 1/60; H041 25/28

U.S. Cl. 325-363

11 Claims



A monitoring circuit which detects the presence or absence of signals on a signal transmission medium and generates a coded signal when the absence of signals is detected is shown. Also, a system utilizing a plurality of monitoring circuits is disclosed wherein each monitoring circuit generates a unique coded signal when the absence of signals on a cable is detected, and a receiving station determines which monitoring circuit generated the coded signal.

3,731,204

### FREQUENCY TRACKING DEVICE

Robert Deligniers, Colombes, and Alain Ausset, Rueil-Malmaison, both of France, assignors to Institut Francais du Pétrole des Carburants et Lubrifiants, Rueil-Malmaison (Hauts-de-Seine), France

Filed Sept. 20, 1971, Ser. No. 182,039

Claims priority, application France, Sept. 25, 1970, 7034947  
Int. Cl. H03b 3/04

U.S. Cl. 328-134

2 Claims

spectrum and a reference frequency, comprising means for generating a local signal of controlled frequency, means for producing a resultant signal at a frequency which is the sum of the respective frequencies of the input signal and the local signal and means for controlling the frequency of said local signal in response to the phase difference between the phase of said resultant signal and the phase of a signal at twice the reference frequency.

3,731,205

### SEQUENCE DETECTOR CIRCUIT

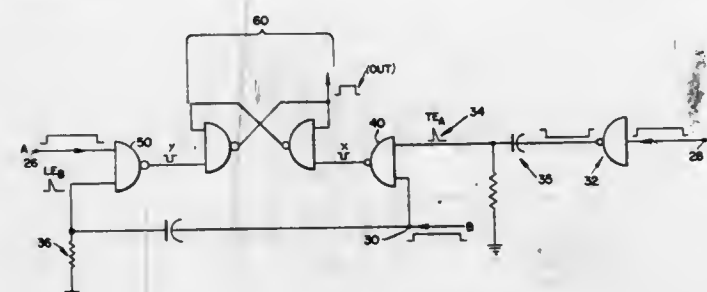
Edward Boyd Gardner, Bloomfield, Conn., assignor to Emhart Corporation, Bloomfield, Conn.

Filed March 23, 1972, Ser. No. 237,367

Int. Cl. G01n 27/00; G08b 13/16

U.S. Cl. 328-5

3 Claims



First and second longitudinally spaced photocell transducers are provided alongside a conveyor upon which articles are fed in sequence past these photocells, the spacing of the photocells being such that each is adapted to be located just inside the leading and trailing edges respectively of an article on the conveyor, each photocell is adapted to be activated in response to passage of the articles on the conveyor. Electric circuit means of the solid state type is adapted to accept sequential output signals from the photocells and to generate an output (OUT) pulse when the sequential photocell outputs bear a predetermined phase relationship to one another.

3,731,206

### MULTIPLYING CIRCUIT WITH PULSE DURATION CONTROL MEANS

John R. Veale, London, England, assignor to Xerox Corporation, Rochester, N.Y.

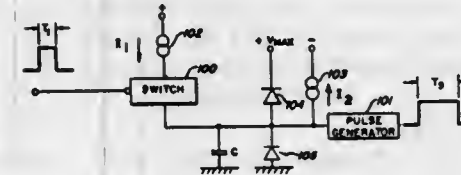
Division of Ser. No. 731,857, May 24, 1968. This application

Oct. 14, 1970, Ser. No. 80,707

Int. Cl. H03k 5/04

U.S. Cl. 328-58

2 Claims



A multiplying circuit wherein a capacitor is charged at a constant rate for the duration of an input pulse and then discharged at another constant rate. The total of the charge and discharge times is a predetermined multiple of the input pulse duration. A pulse generator supplies an output pulse having a duration equal to the sum of the capacitor charge and discharge times.

3,731,207

### SYSTEM FOR IDENTIFYING PHASE CODED GROUPS OF RADIO FREQUENCY SIGNALS

Brian Thomas Holyman, London, England, assignor to Decca Limited, London, England

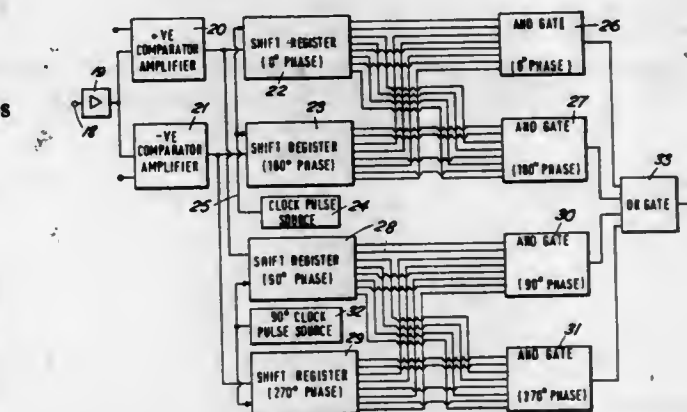
Filed Aug. 30, 1971, Ser. No. 176,065

Claims priority, application Great Britain, Sept. 28, 1970, 46,115/70

Int. Cl. H03k 5/20

U.S. Cl. 328-119

9 Claims



A system for identifying phase coded groups of radio frequency pulses. Two sampling means provide, at times corresponding to the interval between pulses, a single binary digital sample of the radio frequency signal and the complementary digit. Shift registers receive the sample and its complement respectively. AND circuits are coupled to mutually exclusive sets of stages of the shift register in order to detect the code characteristic of the desired group of pulses. The system is useful in Loran C receivers and otherwise.

3,731,208

### APPARATUS FOR AND METHOD OF INTEGRATION DETECTION

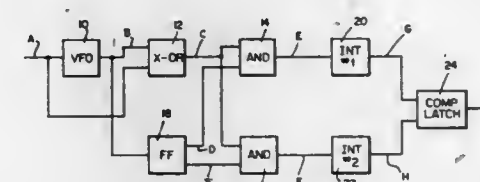
Richard G. Laatt, Longmont, and Juan A. Rodriguez, Boulder, both of Colo., assignors to Storage Technology Corporation, Boulder, Colo.

Filed May 17, 1971, Ser. No. 144,085

Int. Cl. H03k 3/00

U.S. Cl. 328-127

8 Claims



A variable frequency clock is slaved to phase encoded data arranged in sequential bit cells. The phase encoded data is then exclusively OR'ed with the output of the clock and applied to a pair of AND gates which are alternately enabled during successive bit cells. A pair of integrators operating in a differential mode and utilizing negative feedback are provided, one for the output of each AND gate, to alternately integrate successive bit cells. Since each integrator must only integrate over every other bit cell, ample squelch time is provided after each integration thereby assuring return to the squelch reference level.



3,731,209

## PEAK VOLTAGE DETECTOR CIRCUIT

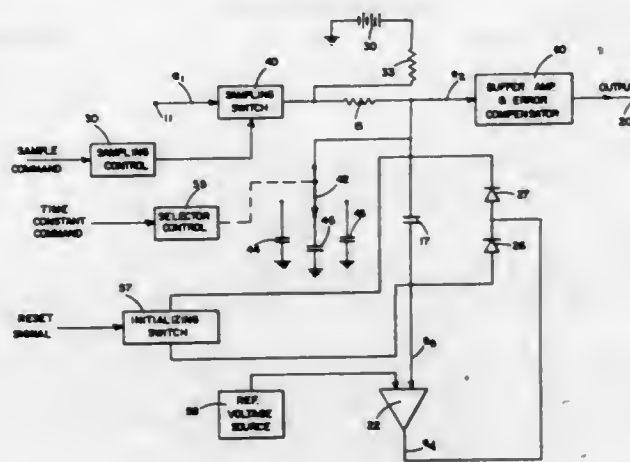
Richard Alan Satterfield, Huntington Beach, Calif., assignor to Northrop Corporation, Beverly Hills, Calif.

Filed May 15, 1972, Ser. No. 253,158

Int. Cl. H03r 5/00

U.S. Cl. 328-151

7 Claims



A peak voltage detector for detecting the peak of an input voltage and holding this peak value for a predetermined period of time includes a capacitive charging circuit for charging to the peak of the input voltage, a pair of series connected unidirectional electronic valve devices such as diodes connected across the capacitor, and an inverting amplifier, the input of which is connected to receive the voltage on one plate of the capacitor, the output of which is connected to the interconnection point between the electronic valve devices. The peak voltage is held on the capacitor by means of an amplifying feedback circuit provided by the inverting amplifier and the electronic valve devices.

3,731,210

## REDUCTION OF TIMING RESOLUTION IN DIGITAL PHASE LOCK LOOPS

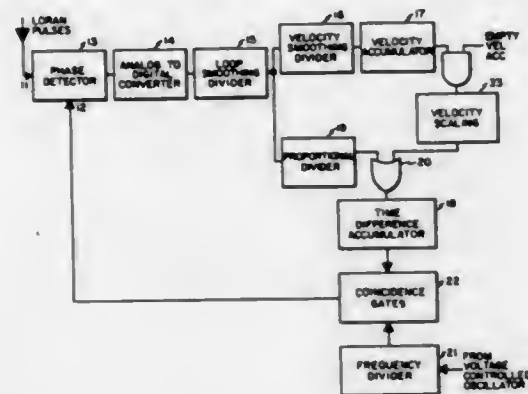
Leonard D. Mollod, New York, N.Y., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed May 4, 1972, Ser. No. 250,396

Int. Cl. H03b 3/00

U.S. Cl. 328-155

4 Claims



This invention relates to a method of reducing the timing resolution necessary to obtain a given level of phase measurement accuracy from a digital phase lock loop in a digital sample data system such as is used in radio navigation systems; i.e. Loran. The phase lock loop tracks and measures the phase of a preselected cycle of the Loran pulse by repetitively sampling the incoming RF and modifying the phase number used to generate a sampling strobe pulse. If and when the strobe pulse does not straddle the zero crossing, a persistent phase error is

detected, converted to digital form, smoothed to reduce noise, and then used to update all binary bits of a phase number integrator. The phase number integrator is used to measure the phase and control the strobe time event. The lower order bits of the phase number integrator, corresponding to the phase increments which are too fine to effect accurate control of the strobe timing, are converted to an equivalent phase error and fed back and subtracted from the output of said phase error detector to cancel any phase error arising from the insufficient timing resolution of the strobe pulse.

3,731,211

## PARTICLE ACCELERATION TUBE HAVING IMPROVED BEAM FOCUS CONTROL

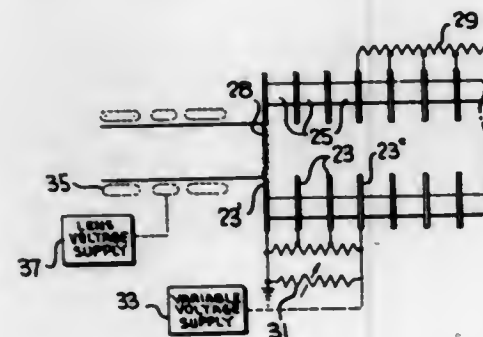
Kenneth H. Purser, Honeoye, N.Y., assignor to Radiation Dynamics, Inc., Westbury, N.Y.

Filed Sept. 29, 1969, Ser. No. 861,554

Int. Cl. H01j 23/00, 23/34; H05h 7/00

U.S. Cl. 328-233

10 Claims



Improved focusing of a beam of charged particles is achieved in an acceleration tube comprising alternate insulating rings and apertured electrodes to which progressively increasing electric potentials are applied to create an electric field for accelerating the charged particles along the length of the tube. In order to achieve precise beam focusing for different electric field strengths the aperture of the grounded electrode at the tube entrance is covered with a grid-like structure and a variable control voltage is applied to a downstream control electrode. For different field strengths the control voltage is adjusted to modify the field between the grounded and control electrodes to provide a variable lens effect. A preferred embodiment employs a variable resistor connected between the grounded and control electrodes to provide the variable control voltage.

3,731,212

## AUTOMATIC PHASE ADJUSTMENT SYSTEM FOR THE DEMODULATION OF SINGLE SIDEBAND TRANSMITTED CODED RHYTHMIC SIGNALS

Jacques B. Claisse, Paris; Moni S. Mitranl, La Varenne Saint-Maur, and Jean-Rene Berland, Paris, all of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed March 24, 1972, Ser. No. 237,793

Claims priority, application France, Jan. 14, 1972, 7201315

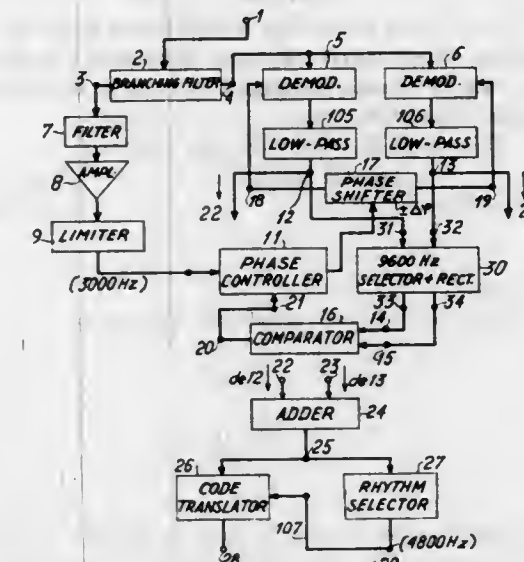
Int. Cl. H03d 1/24

U.S. Cl. 329-50

8 Claims

A system for demodulating coded bipolar rhythmic signals having a rhythm frequency  $f_r$  and which are frequency-transposed and single-sideband transmitted simultaneously with a carrier current of frequency  $f_c$ , said system comprising two balanced demodulators whose signal inputs receive said signals and whose control inputs are controlled by carrier currents having same said frequency  $f_c$  but which are out of phase with one another, said system comprising means for deriving from said transmitted carrier current a main carrier current of frequency  $f_c$  and means for additively combining the other signals delivered by said demodulators, said system being

characterized by means controlling the phase of said main carrier current, such means being controlled by a slowly varying control voltage obtained from the difference between the amplitude of two auxiliary signals having a frequency twice the rhythm frequency  $f_r$  and obtained from the respective outputs



of said demodulators; means for deriving from said phase-controlled main carrier current two further carrier currents which are out of phase with one another by a predetermined phase angle, and means for applying said out-of-phase carrier currents to the respective control inputs of said demodulators.

3,731,213

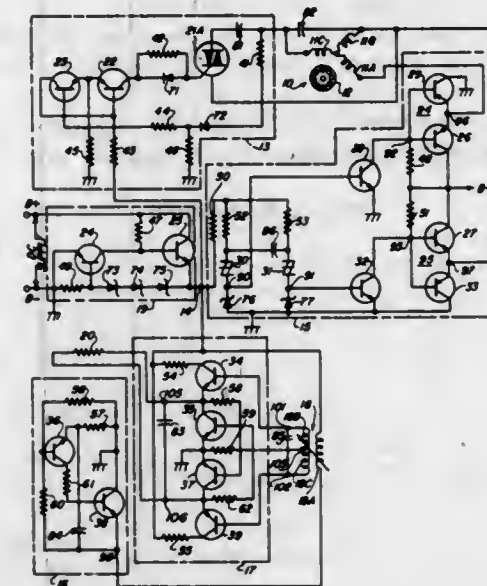
DIFFERENTIAL DEMODULATOR FOR RATE GYRO  
John Van Dyke, Byron Center, and Benard Lamfers, Jenison, both of Mich., assignors to R. C. Allen Inc., Grand Rapids, Mich.

Division of Ser. No. 794,018, Jan. 27, 1969, Pat. No. 3,617,842. This application June 18, 1970, Ser. No. 47,523

Int. Cl. H03d 1/18

U.S. Cl. 329-166

5 Claims



An electrical control and indicator system for a rate gyro of the kind comprising a synchronous A.C. spin motor and a pick-off device for developing two A.C. turn rate analog signals, comprising a motor start control circuit for switching a starting capacitor into and out of the motor circuit in response to changes in the stator voltages. The system further includes an inverter power supply with driver and switch circuits to

energize the motor from a D.C. source without appreciable loading of the inverter. The demodulator of the system, to which this application is directed, is a balanced differential rectifying amplifier comprising two cross-connected emitter follower stages each using a transistor as the load impedance for the emitter follower. The start control circuit, the inverter power supply, and the demodulator may all comprise a single non-inductive integrated silicon circuit.

3,731,214

## GENERATION OF WEAKLY DAMPED ELECTRON PLASMA SURFACE WAVES ON A SEMICONDUCTOR: AMPLIFICATION AND COUPLING OF ACOUSTIC WAVES ON AN ADJACENT PIEZOELECTRIC

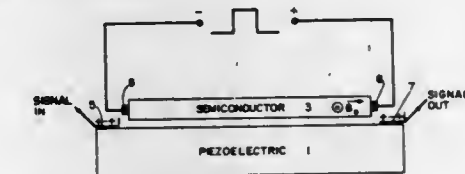
Abraham Bera, Arlington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed April 16, 1971, Ser. No. 134,854

Int. Cl. H03f 3/04

U.S. Cl. 330-5.5

7 Claims



Conduction electrons in a semiconductor which is subjected to an applied electric drift field and magnetic field are excited to give rise to a weakly damped electron plasma surface wave carrying negative or positive energy depending upon the direction of the applied magnetic field. Acoustic waves traveling along the surface of an adjacent piezoelectric are resonantly amplified and coupled to the electron surface waves.

3,731,215

## AMPLIFIER OF CONTROLLABLE GAIN

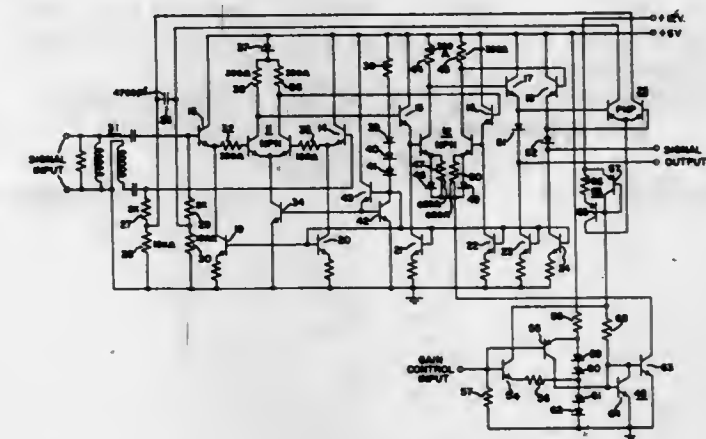
William Peil, North Syracuse, and Joseph P. Hesler, Liverpool, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Aug. 6, 1971, Ser. No. 169,642

Int. Cl. H03g 3/30

U.S. Cl. 330-29

12 Claims



An amplifier of controllable gain which is d.c. coupled throughout and capable of wide band operation is described. It employs a first and a second differential amplifier for producing the principal voltage gain of the amplifier. The differential amplifiers are interspersed with paired buffer amplifiers in emitter follower configuration, and a d.c. feedback path is provided to correct for any d.c. offset. Control of the gain of the first differential amplifier is implemented by an impedance connected in series with the base leads of the transistors and control of the collector emitter voltage to provide "forward" gain control operation. Control of the gain of



the second differential amplifier is implemented by control of the emitter currents and by insertion in the emitter leads of a nonlinear impedance comprising a diode and a shunt resistance. The amplifier is of high gain and wide bandwidth and is suitable for amplification at intermediate frequencies (44 megahertz) of a television signal. The gain control range equals the forward gain of the amplifier. The circuit is adapted for integrated circuit fabrication.

3,731,216

## AUTOMATIC GAIN CONTROL CIRCUIT

Hideo Nakamura, Chofu-shi, Kitatama-gun, Tokyo, and Kokichi Morii, Kita-ku, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 828,597, May 28, 1969, abandoned.

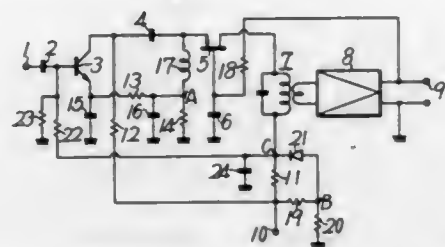
This application June 23, 1971, Ser. No. 156,015

Claims priority, application Japan, May 31, 1968, 43/37154

Int. Cl. H03g 3/30

U.S. Cl. 330-29

10 Claims



An automatic gain control amplifier has at least two amplifier stages forming a transmission line for an input signal with one of the stages constituted by a transistor and the other stage constituted by a field effect transistor. A reverse automatic gain control signal for the field effect transistor is derived from the output of the transmission line and a forward automatic gain control signal responsive to a current flowing through the field effect transistor is applied to the transistor, and improper bias of the transistor is suppressed so as to maintain the latter at its proper quiescent DC bias.

3,731,217

## QUASI-OPTICAL SIGNAL PROCESSING UTILIZING HYBRID MATRICES

Carl W. Gerst, Skaneateles; Hugh A. Hair, Liverpool; Robert G. Hiller, Tully; Charles G. Simpson, Liverpool, and Robert A. Worden, Cazenovia, all of N.Y., assignors to Research Corporation, New York, N.Y.

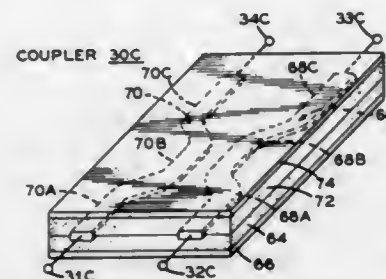
Continuation of Ser. No. 570,232, Aug. 4, 1966, abandoned.

This application April 3, 1970, Ser. No. 25,523

Int. Cl. H03f 3/60; H01p 5/12

U.S. Cl. 330-56

17 Claims



A microwave signal processing device comprises a first phase-transform matrix having a plurality of input ports and a plurality of output ports. Signals in a first domain applied to the input ports are power divided and phase coded upon transmission to the output ports. These signals at the output ports which have been transformed into a power distributed phase-coded domain are applied to the input ports of an operator matrix which changes the characteristics of the signals. The

signals at the output ports of the operator matrix are applied to the input ports of a second phase-transform matrix which retransforms the signals to the first domain and transmits the retransformed signals from its output ports.

3,731,218

## ACTIVE DOUBLE TUNED BAND PASS FILTER

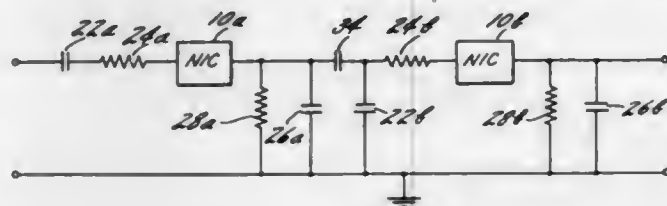
John Saunders, East Hartford, and Clarence Casper, Jr., Windsor, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 9, 1971, Ser. No. 178,960

Int. Cl. H03f 1/00

U.S. Cl. 330-178

5 Claims



A double tuned active band pass filter is formed by utilizing a pair of band pass filters including negative impedance converter (NIC) circuits coupled with a pi-type or T-type capacitive coupling network, the capacitances of which provide the output capacitance of the first stage in the input capacitance of the second stage and a coupling capacitor. The first stage and the coupling capacitor form essentially a current generator allowing current mode operation of the second stage. In one mode, the coupling capacitor is chosen to be roughly two orders of magnitude less than the capacitors in the leg of the pi, the capacitances of which are the natural capacitances of the individual filter stage. In another mode, the coupling capacitor is made to be somewhere on the order of magnitude of the capacitance of the original devices, and the legs of the pi are adjusted to be equal to the value of the coupling capacitor divided by one plus the decimal fraction that the coupling capacitance bears to the basic capacitance. In a T-type configuration, greater, rather than lesser capacitance is used.

3,731,219

## PHASE LOCKED LOOP

Heinz Bernhard Mader, ch 8570 Weinfelden, Switzerland, and Roger Maurice Hochreutner, Harlow, England, assignors to International Standard Electric Corporation, New York, N.Y.

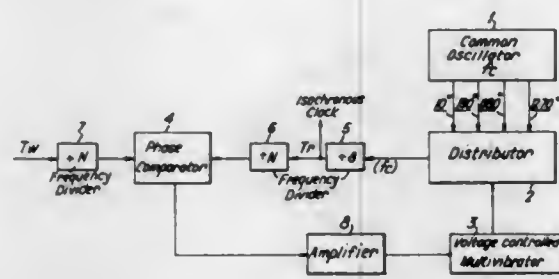
Filed June 13, 1972, Ser. No. 262,402

Claims priority, application Great Britain, July 29, 1971, 35647/71

Int. Cl. H03b 3/04

U.S. Cl. 331-14

9 Claims



A hybrid digital phase locked loop is disclosed to recover an isochronous clock from a "stuffed" multiplexed input signal as found in an asynchronous PCM demultiplexer. A low frequency voltage controlled multivibrator is controlled by the output of a phase comparator. The phase comparator is coupled to the input signal and the output signal of a distributor. The distributor is controlled by the multivibrator to sequentially switch a multiphase output signal of a crystal oscillator to pro-

vide the output signal of the distributor. This arrangement overcomes the requirement of a voltage controlled crystal oscillator per channel group in the demultiplexer.

3,731,220

## PHASE LOCKED OSCILLATOR FOR USE WITH VARIABLE SPEED DATA SOURCE

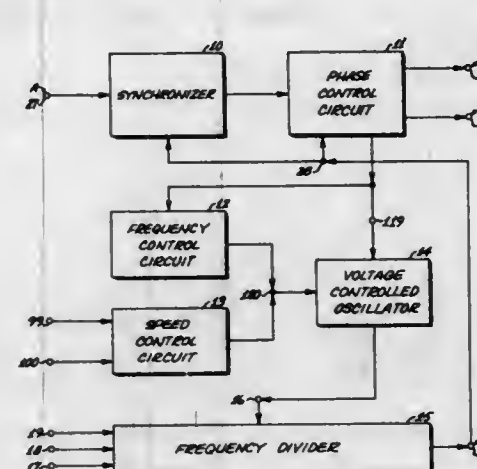
Edward R. Besenfelder, Oklahoma City, Okla., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed May 30, 1972, Ser. No. 260,335

Int. Cl. H03b 3/04

U.S. Cl. 331-1 A

12 Claims



Phase encoded data is retrieved from a magnetic tape or a magnetic disk and used to synchronize an oscillator with the data being read. The frequency of the oscillator can be synchronized over a wide range of frequencies. The basic frequency of the oscillator can be changed over a relatively wide range and the basic frequency can also be divided by 2, by 4 or by 8 so that a wide range of tape speeds may be used in a magnetic tape machine.

3,731,221

## TUNABLE OPTICAL CAVITY FOR CHEMICAL LASER

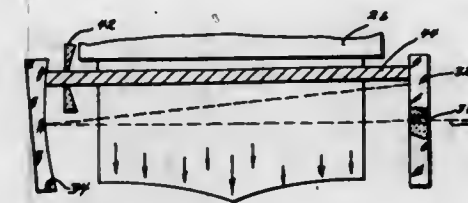
Donald J. Spencer, Torrance; Donald A. Durran, Manhattan Beach, and Henry A. Bixler, Hawthorne, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force

Filed Aug. 10, 1971, Ser. No. 170,505

Int. Cl. H01s 3/08

U.S. Cl. 331-94.5

2 Claims



A tunable optical cavity for use with a chemical laser of the type utilizing a supersonic jet flow of a vibrationally excited gas as a lasing medium and further characterized by having a variable optically active dimension running transverse to the longitudinal axis of its optically active region. The tunable optical cavity is defined by a first laser mirror fixedly positioned on one side of the gas flow and characterized by having an optically flat mirror surface oriented parallel to the direction of the gas flow and a second laser mirror rotatably positioned on the other side of the gas flow and characterized by having a spherical shaped mirror surface oppositely disposed from the flat mirror surface.

3,731,222

## PHENOXAZINE DYE LASERS

Karl H. Drexhage, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed March 30, 1972, Ser. No. 239,775

Int. Cl. H01s 3/20

U.S. Cl. 331-94.5

12 Claims

Phenoxazine dyes are useful as laser dyes. These dyes are used in solution with a non-interfering solvent to form lasing media useful in dye lasers. Such lasers generally include a reservoir for containing the laser dye solution and a pumping energy source operably associated therewith for producing stimulated emission of the laser dye solution.

3,731,223

## LASER APPARATUS FOR OPTICAL MODULATION TRANSFER

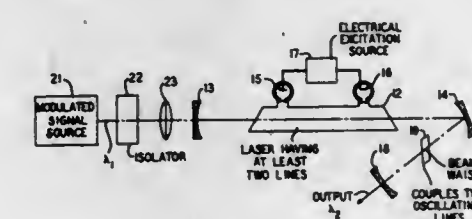
Wilbur Dexter Johnston, Jr., Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 23, 1971, Ser. No. 183,076

Int. Cl. H01s 3/20, 3/10, 3/09

U.S. Cl. 331-94.5

6 Claims



There are disclosed arrangements for transferring optical information from one optical beam of a first frequency to another optical beam of a second frequency within a laser apparatus, particularly for the cases in which the laser transitions corresponding to the two frequencies are independent or very strongly competitive. The arrangements are based upon the use of a broadband gain medium, such as a dye laser medium, to modify the intensity relationship between two or more independent transitions or two or more competing transitions of a single laser medium.

3,731,224

## COMPENSATED FOLDED RESONATOR

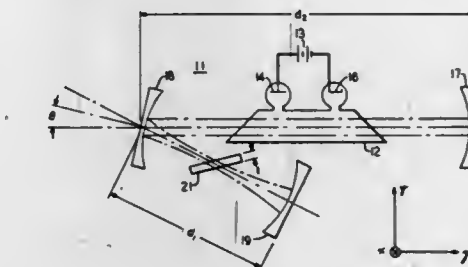
Andrew Dienes, Middletown; Erich Peter Ippen, Red Bank; Herwig Werner Kogelnik, Fair Haven, and Charles Vernon Shank, Laurence Harbor, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 17, 1971, Ser. No. 154,087

Int. Cl. H01s 3/08

U.S. Cl. 331-94.5

6 Claims



In a folded optical resonator, in one arm of which a Brewster element is located, the tilted reflector and the Brewster element both introduce astigmatism into the system, which gives rise to resonator instability. The astigmatic effects can be made to counteract each other to a large extent with resonator stability thereby assured if the several parameters of the system are properly related to each other according to an equation for stability.



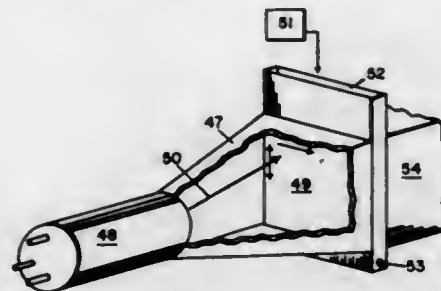
### 3,731,225 FIBER OPTIC LASER SYSTEM

Norman R. Wild, Nashua, N.H., and Paul M. Leavy, Jr., Lynnfield, Mass., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed April 2, 1962, Ser. No. 184,602  
Int. Cl. H01s 3/00, 3/04, 3/09

U.S. Cl. 331—94.5 P

14 Claims



1. A fiber optic lasing system comprising an active fiber optic element, said active fiber optic element having a core and a cladding around said core, said core having therein an active material which will produce stimulated emission when an excitation source pumps energy into said active material, an excitation source, said excitation source located at one end of said active fiber element to pump energy into said active fiber optic element to produce a stimulated emission of said active material, said excitation source being in physical contact with said end of said fiber optic element.

### 3,731,226

#### LASER USING PHOSPHATE BASE LASER GLASS

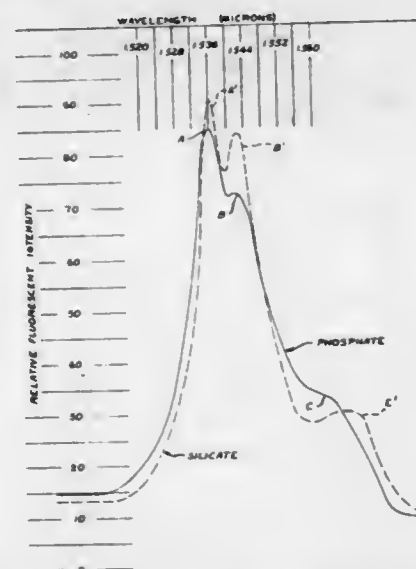
Elias Snitzer, Wellesley, and Robert E. Graf, Southbridge, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Continuation-in-part of Ser. No. 80,458, Oct. 13, 1970, abandoned, which is a continuation of Ser. No. 712,744, March 13, 1968, abandoned. This application Nov. 10, 1971, Ser. No. 197,394

Int. Cl. H01s 3/16

U.S. Cl. 331—94.5

5 Claims



A laser device uses a material for incorporating into a glass laser host consisting essentially of a phosphate glass composed principally of an erbium metaphosphate admixed with an yttrium metaphosphate. The properties of the glass may be varied by additional  $R(PO_3)_2$  and  $S(PO_3)_2$  contents wherein said R is a trivalent ion selected from the group consisting of

aluminum, lanthanum, gadolinium, gallium, scandium, yttrium, neodymium, cerium, europium, manganese, molybdenum and chromium, and said S is a divalent ion selected from the group consisting of zinc, magnesium, cadmium, calcium, strontium or barium. The resulting glass composition provides a material capable of producing laser emission from the erbium ion at a wavelength of 1.536 microns, when disposed in a resonant cavity having an output reflector whose reflectance is a maximum of 80 percent.

### 3,731,227 GAS LASER

Dieter Rosenberger, and Alfred Hermann, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

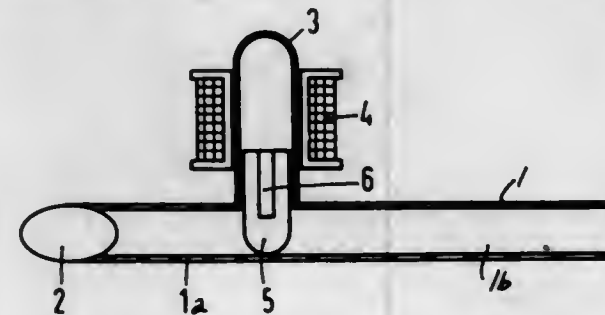
Filed March 30, 1972, Ser. No. 239,537

Claims priority, application Germany, April 23, 1971, P 21 19 948.4

Int. Cl. H01s 3/02

U.S. Cl. 331—94.5

9 Claims



Condensation of metallic vapors on the cooler Brewster window ends of a laser tube during warm up and cool down periods are prevented by positioning a blocking member adjacent each end of the laser tube. The blocking members move from an operative position blocking the end of the laser tube to a position out of the path of the laser. In one embodiment the laser tube includes a lateral projection which receives the blocking member in its inoperative position. In another embodiment the blocking member is a curved disk having an outer diameter conforming to the cross sectional configuration of the tube and a transverse cross section generally conforming to the inner diameter of the laser tube.

### 3,731,228

#### OSCILLATING CIRCUIT

Noriyoshi Kubo; Kazuhiro Nakamura; Yoshinori Endo, all of Yokohama; Takeshi Katano, and Eisuke Ichinobe, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

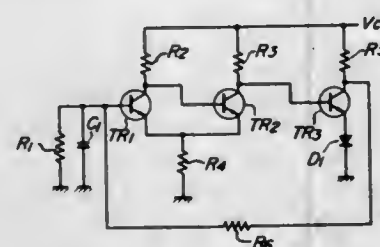
Filed Sept. 16, 1971, Ser. No. 181,034

Claims priority, application Japan, Sept. 18, 1970, 45/82356

Int. Cl. H03k 3/295

U.S. Cl. 331—111

1 Claim



An oscillating circuit comprising a Schmitt circuit, a grounded capacitor connected to the input side of the Schmitt circuit and a control circuit connected to the output side of the Schmitt circuit for controlling the charging and discharging of the capacitor.

### 3,731,229 CIRCUIT ARRANGEMENT FOR MAINTAINING THE OSCILLATIONS OF AN ELECTRO-MECHANICAL OSCILLATOR

Hans Keller, Freiburg, Germany, assignor to ITT Industries, Inc., New York, N.Y.

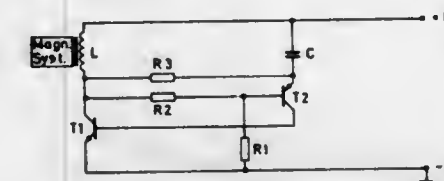
Filed Aug. 4, 1971, Ser. No. 169,015

Claims priority, application Germany, Aug. 22, 1970, P 20 41 827.3

Int. Cl. G04c 3/04; H03b 5/30

U.S. Cl. 331—116 M

1 Claim



This is a circuit for driving an electro-mechanical oscillator having one coil and two complementary transistors. The emitter resistor of the control transistor is connected to that end of the coil not facing the supply voltage. The emitter capacitor of the control transistor is connected to the supply voltage.

### 3,731,230

#### BROADBAND CIRCUIT FOR MINIMIZING THE EFFECTS OF CRYSTAL SHUNT CAPACITANCE

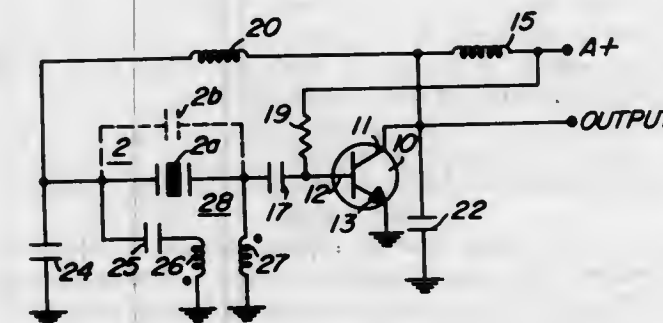
Frank J. Cerny, Jr., North Riverside, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 17, 1971, Ser. No. 209,230

Int. Cl. H03b 5/36

U.S. Cl. 331—116 R

2 Claims



A crystal controlled oscillator circuit having broadband circuitry for balancing out the effects of the static shunt capacitance of a crystal. A broadband phase inverting network is connected across the crystal to cancel the signal flowing through the crystal as a result of capacitive coupling between the plates. The phase inverting network may include a transformer, a center tapped inductor or a broadband inductance-capacitance network. A capacitor having a capacitance value related to the value of the static shunt capacitance is used in conjunction with the phase inverting network to determine the magnitude of the phase inverted cancellation signal.

### 3,731,231

#### ACOUSTO-OPTICAL MODULATOR SYSTEMS

Roger Torguet, Paris, France, assignor to Thomason-CSF, Paris, France

Filed April 20, 1971, Ser. No. 135,658

Claims priority, application France, April 24, 1970, 7015106

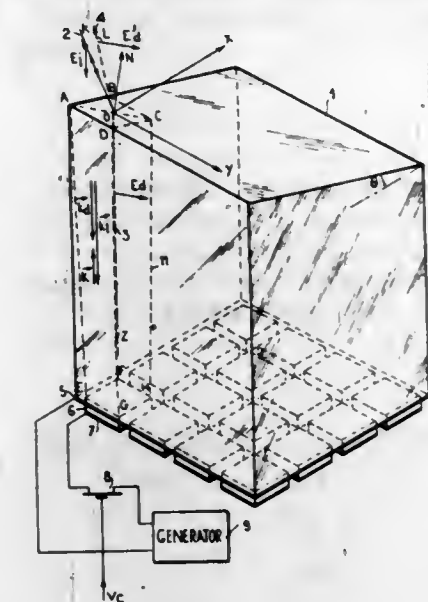
Int. Cl. H01s 3/10

U.S. Cl. 332—7.51

9 Claims

The present invention relates to acousto-optical modulator systems which enable the luminous intensity of a beam of parallel coherent monochromatic light to be spatially modulated.

The modulator comprises a block of birefringent material and means for exciting therein a plurality of ultrasonic parallel



pencils capable of selectively reflecting the refracted portion of an incident light beam.

### 3,731,232

#### PHANTASTRON CIRCUIT EMPLOYING OPERATIONAL AMPLIFIER

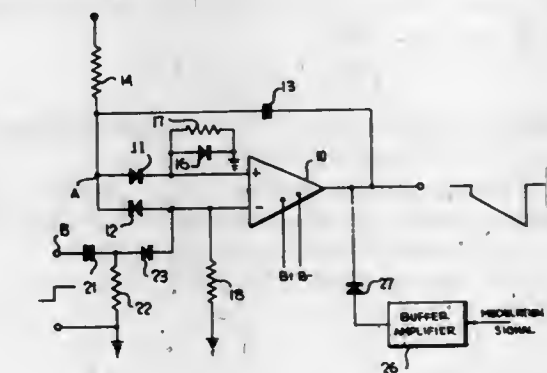
Norris C. Hekimian, Rockville, Md., assignor to Hekimian Laboratories, Inc., Rockville, Md.

Filed July 13, 1971, Ser. No. 162,088

Int. Cl. H03c 1/06

U.S. Cl. 332—31 R

9 Claims



A phantastron circuit includes an operational amplifier connected as an absolute value amplifier by connecting its inverting and non-inverting input terminals through respective oppositely poled diodes to a common input junction. The input junction is resistively coupled to a source of supply voltage and capacitively coupled to the output terminal of the operational amplifier. The capacitor thus provides positive feedback to the non-inverting input terminal when the amplifier output signal exhibits positive rate of change, and supplies negative feedback to the inverting input terminal when the output signal exhibits negative rate of change. In the quiescent state the diode at the inverting input terminal is back biased and the non-inverting input terminal is clamped slightly above ground to provide a high positive output signal from the amplifier. Application of a positive trigger to the inverting input terminal or a negative trigger to the non-inverting terminal produces a negative going step at the output terminal of the amplifier which, through the feedback capacitor, back biases the diode at the non-inverting terminal and forward biases the diode at the inverting input terminal to thereby create a negative feedback loop. The capacitor runs down linearly by means of a constant current delivered to the power supply resistively coupled to the common input junction. When the amplifier output



reaches a predetermined negative limit, the polarity of the rate of change reverts to positive, thereby reversing the bias on the input diodes and creating a positive feedback loop. Recovery time is substantially instantaneous by virtue of the feedback action and relatively low resistance in the charging circuit for the capacitor.

3,731,233

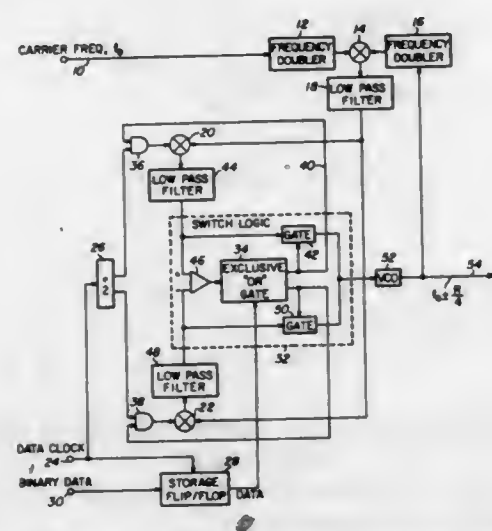
**MINIMUM SHIFT KEYING MODULATING APPARATUS**  
William M. Hutchinson, Corona Del Mar, Calif., assignor to Collins Radio Company, Dallas, Tex.

Filed Nov. 17, 1971, Ser. No. 199,706

Int. Cl. H04I 27/20

U.S. Cl. 332-9 R

8 Claims



A minimum shift keying transmitter utilizing a voltage controlled oscillator and logic circuitry for altering the frequency output of the oscillator in accordance with the logic level of the binary data to be supplied while preventing phase discontinuities in the output signal.

3,731,234

**COMBINED VOICE FREQUENCY TRANSMISSION AND DC SIGNALING CIRCUIT**

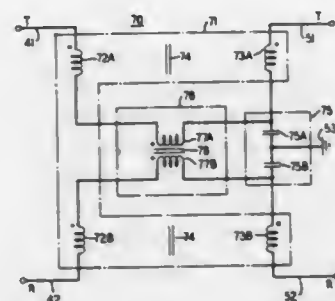
Russell William Collins, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 27, 1971, Ser. No. 212,364

Int. Cl. H04b 3/28; H03h 7/42

U.S. Cl. 333-1

7 Claims



A coupler exhibiting substantially improved insertion loss performance comprises a split winding transformer, an inductor network, and a capacitor network. The coupler longitudinally balances voiceband signals derived from a grounded source for transmission along a balanced cable pair and simultaneously provides metallic circuit continuity between the source and the cable pair for superimposed direct current (DC) and low frequency signaling. The transformer inductively transfers voiceband signals via its windings and, further, by having associated winding sections along the tip and ring connected series opposed, allows for the transfer of DC and low frequency signals without impairment of voiceband transmission. The inductor network provides metallic circuit continuity between the transformer windings to effect this transfer of

DC and low frequency signals and, in addition, suppresses the longitudinal voiceband signal components.

3,731,235

**DUAL POLARIZED DIPLEXER**

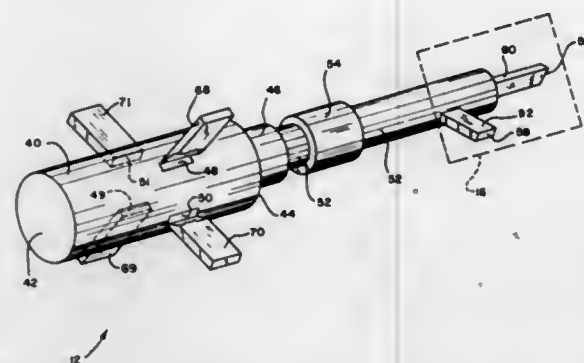
Joseph G. DiTullio, Woburn; Leonard I. Parad, Framingham, and Kenneth E. Story, North Reading, all of Mass., assignors to GTE Sylvania Incorporated, New York, N.Y.

Filed Nov. 3, 1971, Ser. No. 195,413

Int. Cl. H01p 5/12; H04I 5/06

U.S. Cl. 333-6

7 Claims



A microwave diplexer employs a section of circular waveguide having a transmit port coupled to two transmitters, an antenna port coupled to an antenna, and a receiver port including four openings symmetrically located around the periphery of the circular waveguide. Coupled to each receiver opening is a filter operative to improve the isolation between the receiver port and the transmit port for signals coming from the direction of the transmitter port. Two orthogonally related signals introduced at the transmit port are conducted along the circular waveguide to the antenna and are isolated from the receiver port by the impedance characteristics of the filters. Signals received via the antenna are isolated from the transmit port by a section of wave guide having a cutoff frequency above that of the received signal.

3,731,236

**INDEPENDENTLY ADJUSTABLE DUAL POLARIZED DIPLEXER**

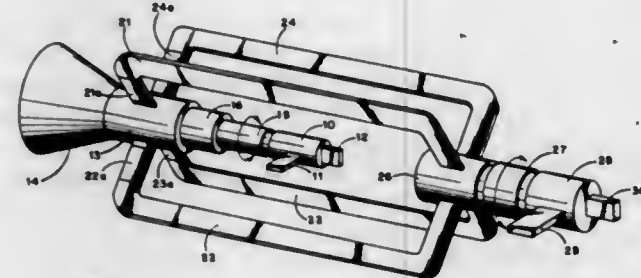
Joseph G. DiTullio, Woburn, Mass.; Donald J. Sommers, Brookline, N.H., and Windsor D. Wright, Cambridge, Mass., assignors to GTE Sylvania Incorporated, New York, N.Y.

Filed Aug. 17, 1972, Ser. No. 281,522

Int. Cl. H01p 5/12

U.S. Cl. 333-9

6 Claims



Microwave diplexer apparatus for handling two independent polarized transmitted signals at one frequency and two independent received signals at a lower frequency. The two transmitted signals are introduced separately into a first two-port orthomode transducer so as to be mutually orthogonal. From the orthomode transducer they pass through a polarization rotator, which can be rotated to adjust their angle of polarization, to a first four-port orthomode transducer. The transmitted signals pass through an antenna port of the four-port orthomode transducer to the antenna. Received orthogonally polarized signals from the antenna pass into the four-port orthomode transducer. They are blocked from entering the first two-port orthomode transducer since they are below the cutoff frequency of that transmission path. They pass through four ports which are positioned orthogonally in

the four-port orthomode transducer. Filters at these ports prevent the high frequency transmitted signal from passing through. The received signals are conducted by four sections of rectangular waveguide to a second four-port orthomode transducer. The orthogonally polarized received signals pass through a polarization rotator to a second two-port orthomode transducer. When the rotator is properly oriented, the two polarized received signals are separately and independently coupled to two ports of the two-port orthomode transducer which are mutually orthogonal. By separately adjusting the angles of polarization by means of the two polarization rotators, the polarizations of the transmitted and received signals can be changed independently of each other without changing the physical orientation of the apparatus.

3,731,237

**BROADBAND TRANSFORMERS**

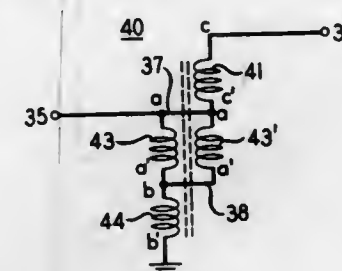
Henry Richard Beurrier, Chester Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 3, 1972, Ser. No. 223,117

Int. Cl. H03h 7/38, 13/00

U.S. Cl. 333-24 R

4 Claims



A high return loss is maintained over the passband of a broadband transformer by reducing parasitic interwinding capacitance. This is accomplished by locating the windings along physically separated regions of a common magnetic core. To compensate for any loss of magnetic coupling at the higher frequencies due to a decrease in core permeability, equal portions of the physically separated windings are connected in parallel.

3,731,238

**BALUN TRANSFORMER WITH A SINGLE MAGNETIC CORE AND IMPEDANCE TRANSFORMING MEANS**

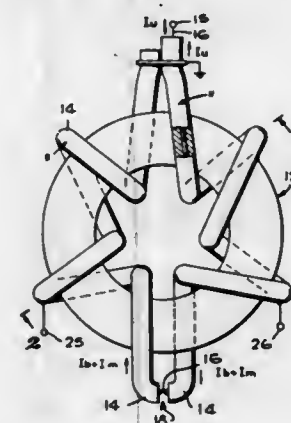
Edward M. T. Jones, Portola Valley, and Robert L. Tanner, Palo Alto, both of Calif., assignors to Technology for Communications International, Mountain View, Calif.

Filed Jan. 17, 1972, Ser. No. 218,139

Int. Cl. H03h 7/42, 7/38

U.S. Cl. 333-26

13 Claims



Several embodiments of a high power wideband balun transformer are disclosed. In each embodiment a single high permeability magnetic core is incorporated. It is wound with a balun winding which converts an unbalanced impedance  $Z_u$  at

unbalanced terminals to an equal balanced impedance across a gap region. Balanced terminals are connected to the gap region of the balun winding by impedance transforming means, so as to provide a balanced impedance  $Z_b$  which is not equal to the unbalanced impedance  $Z_u$ . When the impedance transforming means are the outer conductors of the balun winding a selected number of turns from the gap region,  $Z_b$  is less than  $Z_u$ . When the impedance transforming means are additional windings wound about the core  $Z_b$  is greater than  $Z_u$ , and the ratio  $Z_b/Z_u$  is a function of the number of turns  $N_b$  between the balanced terminals and the number of turns  $N_u$  of the balun winding. Apertures insulating boards are employed to control the spacings between the windings and the core, and the spacings between adjacent turns of the balun winding and the impedance transforming winding.

3,731,239

**EXCESS CURRENT SWITCH**

Jakob Ellenberger, Altdorf near Nuernberg, Germany, assignor to Ellenberger & Poensgen GmbH, Altdorf near Nuernberg, Germany

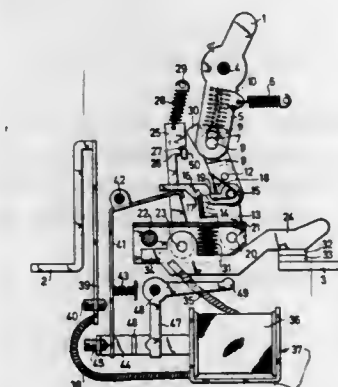
Filed June 23, 1972, Ser. No. 265,911

Claims priority, application Germany, July 1, 1971, P 02 13 273.8

Int. Cl. H01h 9/24

U.S. Cl. 335-167

7 Claims



An excess current switch has a thermal and/or electromagnetic trip, a pivoted actuating member, a bell crank lever connecting the actuating member with a movable contact carrier and a locking lever for locking the bell crank in an extended position to establish a switched on position of the switch. The switch is further provided with a spring biased latch having a retaining portion which during switch on engages a stop prior to the contact carrier reaching its switched on position. The latch is subsequently disengaged from the stop by an arm of the actuating member to allow the contact carrier to move to its switched on position. When a thermal and/or electromagnetic trip occurs a release lever actuates the locking lever to move it to a release position to thereby allow the bell crank to assume its switched off position and thus allow the switch to break. Such a switch provides for instantaneous switch on and off which results in a lengthening of the life of the contacts of the switch.

3,731,240

**SWITCHING RELAY WITH A MAKE-AND-BREAK CONTACT MEMBER**

Hans Peter Meyer, 8500 Nurnberg, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 23, 1971, Ser. No. 211,518

Int. Cl. H01h 1/18

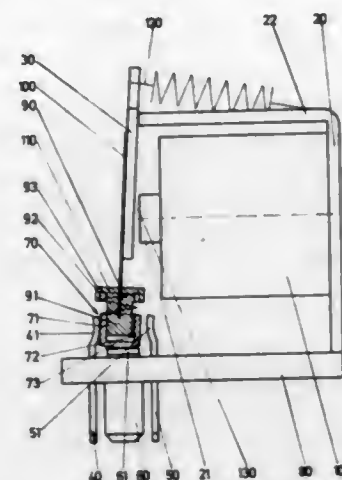
U.S. Cl. 335-196

13 Claims

Switching relay with an electromagnet actuating an armature which armature actuates a contact member acting as bridging contact which in two end positions electrically connects to one another the center one and one of the outer ones of three stationary contact members arranged next to each other, the contact member consisting of a cup of contact



material elastically connected with the said armature, the center one of the stationary contacts being arranged so that the bottom of the said cup is in slidable contact with the said stationary center contact, the two other stationary contacts



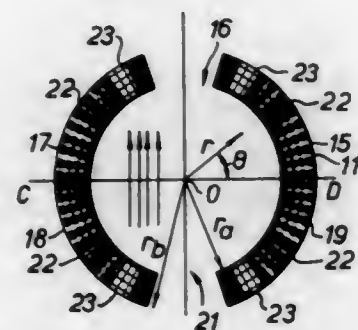
being arranged so that the side wall of the said cup is in contact with one of the said stationary contacts in the end positions of the said cup contacting at the same time the said stationary center contact.

### 3,731,241 ELECTRICAL COILS FOR GENERATING MAGNETIC FIELDS

John Herbert Coupland, High Holburn, Abingdon, England, assignor to Science Research Council, London, England  
Filed Sept. 11, 1970, Ser. No. 71,590  
Claims priority, application Great Britain, Sept. 18, 1969, 46,172/69

Int. Cl. H01f 5/00  
U.S. Cl. 335-213

10 Claims



A novel approach to the mathematical analysis of the magnetic field produced by the coil windings of accelerator beam bending/focussing magnets has led to the proposal for inserting accurately located and dimensioned azimuthal spaces in the windings. The spaces provide a simple means for improving the uniformity of the magnetic field. A mathematically specified pattern of end winding reduces their disturbing influence.

### 3,731,242 METHOD OF FORMING PLURAL STRIP-SHAPED MAGNETIC POLES

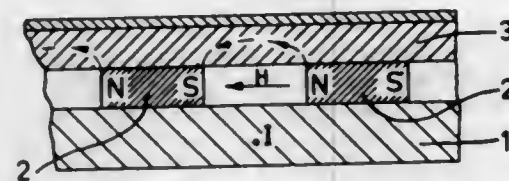
Wytze Hofman, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.  
Filed Aug. 23, 1971, Ser. No. 173,904  
Claims priority, application Netherlands, Aug. 31, 1970, 7012889

Int. Cl. H01f 13/00  
U.S. Cl. 335-284

8 Claims

To form strip-shaped poles in a preferably resilient magnet an electric conductor is provided in the direction of current flow with a plurality of parallel soft-iron strips on which the

object to be magnetized is placed. A current pulse is passed through the conductor; the resulting magnetic field is highly directed by the strips. The device by means of which this

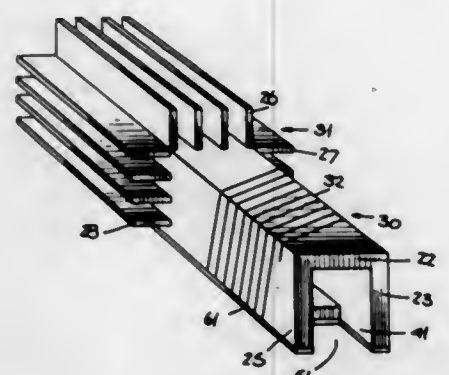


method may be carried out is very simple and may comprise a hollow conductor on the inner or outer surface of which the strips are arranged.

3,731,243  
INDUCTIVE WINDING  
Ariel R. Davis, 3476 Fleetwood Drive, Salt Lake City, Utah  
Continuation of Ser. No. 99,132, Dec. 11, 1970, abandoned.  
This application Dec. 8, 1971, Ser. No. 206,048  
Int. Cl. H01f 27/08, 27/28

U.S. Cl. 336-61

19 Claims



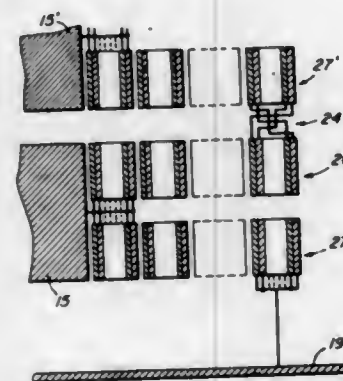
A tubular aluminum member is extruded in a rectangular shape and cut to a given length. The four walls of the tubular member are successively cut by a circular saw to form a portion of the tubular member into a generally spiral shape winding with terminal portions at each end. The member is treated to form an insulating layer on the surfaces of the member including the facing sides of the winding to form an inductive winding for passing current. The winding may be compressed and one set of edges treated for engagement by current taps to produce a variable voltage and current device.

3,731,244  
TRANSPPOSITION OF INSULATING CORE WINDINGS  
Byron L. Johnson, Westboro, Mass., assignor to High Voltage Power Corporation, Westboro, Mass.

Filed July 3, 1972, Ser. No. 268,761  
Int. Cl. H01f 27/28

U.S. Cl. 336-187

6 Claims



A device for reducing the incidence of circulating currents within the coil structure of multiple-conductor windings of

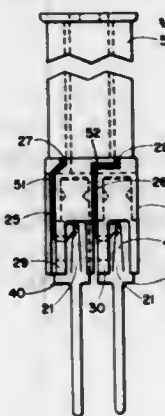
transformer/reactors of the insulating magnetic core type, by a transposition of the electrical connections between the several conductors of the multiple-conductor winding at the outer part of the winding after the core and coil assembly is completed. When effecting the necessary electrical connections between adjacent outer layers of winding, connections between analogous conductors of the multiple-conductor bundle are interchanged, the outermost conductor of one bundle being connected to the innermost conductor of the other bundle, second-outermost conductor of the one bundle being connected to the second-innermost conductor of the other bundle, and so forth.

3,731,245  
INDUCTOR BOBBIN WITH TERMINALS  
Victor Oscar Rodin, Islington, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Dec. 21, 1971, Ser. No. 210,441  
Int. Cl. H01f 15/10

U.S. Cl. 336-192

1 Claim



Coil winding form in which the flange at one end of the body portion has an extension. In the arrangement described the extension extends away from the body portion, but in line with it. Slots in the end of the extension remote from the body portion receive terminals which are pushed in and gripped by the slot sides. Grooves are formed up the flange face and along the surface of the extension, the ends of the grooves adjacent to the terminal slots connected to these slots by transverse passages. In position the tab of each terminal can extend upward from the slot, clear of the surface of the extension for soldering of the wire lead from the coil. On pushing the tap down the wire is not stretched as it passed along the grooves, through the transverse passages to the slots adjacent the position for attachment to the tab. No stresses are caused in the wire, nor is it pushed against the turns of wire in the coil.

3,731,246  
IGNITION COILS  
William Lawrence Fry, Woolahra, Haughton, Staffordshire, England

Filed Dec. 31, 1970, Ser. No. 103,126  
Claims priority, application Great Britain, Dec. 3, 1970, 52,124/70

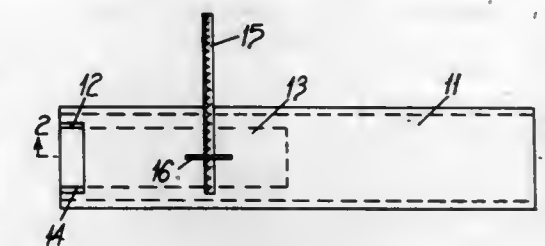
Int. Cl. H01f 15/10

U.S. Cl. 336-192

5 Claims

A method of manufacturing ignition coils, and a former assembly for use in such manufacture, the former assembly including a hollow insulating former having a first conductor positioned therein. One end of the first conductor projects at one end outwardly beyond the adjacent end surface of one end of the former, and a second electrical conductor is positioned on the outer surface of the former. The first and second conductors are electrically interconnected by means of a conductive fastening device which also secures the first and second conductors to the former. The method includes the step of manufacturing the assembly, and inserting a core into

the former from said one end of the former so that the core engages the first conductor. A wire is connected to the second conductor, so that the wire is connected to the core through



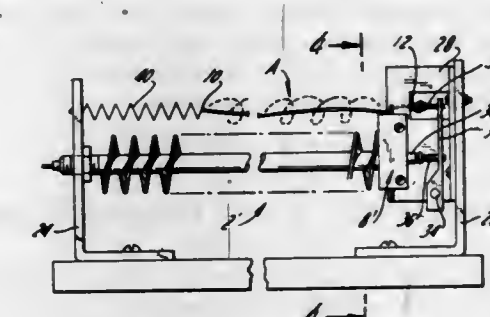
the first and second conductors and the fastening device. The wire is then wound on to the former to constitute a winding of the ignition coil.

3,731,247  
HIGH TEMPERATURE SENSING APPARATUS  
EFFECTIVE OVER EXTENSIVE LENGTHS  
Robert N. Levinn, Catskill, N.Y., assignor to American Thermostat Corporation, South Cairo, N.Y.

Filed Jan. 8, 1971, Ser. No. 104,989  
Int. Cl. H01h 61/06

U.S. Cl. 337-140

9 Claims



In order to sense the presence of excessively high temperatures at points along an extended length, an elongated element is extended along that length in heat-transfer relationship to the area where temperature is to be sensed, that element being formed of a material having a "memory" which is actuated when the material is subjected to the predetermined excessive temperature, that "memory" causing the material then to change its shape and therefore alter the effective length of the element. Work means is operatively connected to that element, the work means performing a function appropriate to the sensing of the excessive temperature. That function may, for example, be the opening of a circuit to a heater, the sounding of an alarm, or the actuation of fire extinguishing apparatus. Because of the characteristics of the material of which the elongated element is formed, it is essentially inactive over a range of temperatures below the predetermined excessive temperature, and becomes operatively active only when that predetermined excessive temperature is reached. The arrangement in question is particularly well adapted for use in conjunction with elongated baseboard heaters the heating action of which is normally controlled by a room thermostat located remotely from the heater. The apparatus of the present invention will determine whether sections of the heater become heated to excessive temperatures even though the room being heated may not be at an excessive temperature.



3,731,248

**THERMAL LIMITER CONSTRUCTIONS**

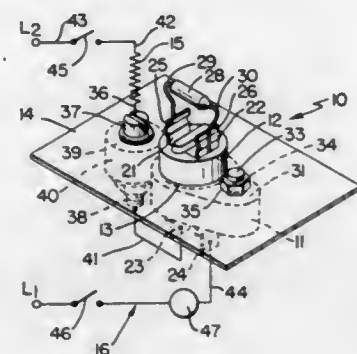
Emil Robert Plasko, Washington Township, Montgomery County; James Allen Kohl, Kettering, and Michael Raymond Hutchison, Wayne Township, Montgomery County, all of Ohio, assignors to Micro Devices Corp., Dayton, Ohio

Filed Sept. 13, 1971, Ser. No. 179,688

Int. Cl. H01h 85/48

U.S. Cl. 337—208

20 Claims



A thermal limiter construction for at least one electrical circuit comprising a body member of electrical insulating material having a reduced portion projecting therefrom and adapted for insertion in an opening of a frame while the body member is adapted to abut one side of the frame outboard of the opening. A pair of leads are carried by the body member and project from the body member remote from the projecting portion thereof for lead attachment thereto. A thermally responsive fuse is carried by the reduced projecting portion and is interconnected in series with the leads. Either the body member or one of the leads has a single fastening opening passing therethrough adapted to fasten the body member to the frame solely by a single fastening member passing through the fastening opening when the projecting portion of the body member is inserted in the frame opening.

3,731,249

**POLYCONDUCTING DEVICE AND APPLICATIONS THEREFOR**

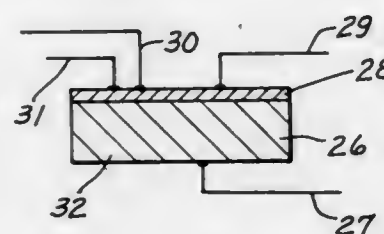
Max Lipsicas, Riverdale, and Daniel C. Mattis, Scarsdale, both of N.Y., assignors to Yeshiva University, New York, N.Y.

Filed Sept. 26, 1969, Ser. No. 861,380

Int. Cl. H01c 1/14

U.S. Cl. 338—325

2 Claims



A polyconducting device, both two terminal and three terminal, is shown which includes a metallic oxide or metallic salt and conducting members operatively connected thereto. Various applications of the device, including use as an oscillator, a gated oscillator and a modulation device are also shown.

3,731,250

**METHOD OF MAKING ELECTRICAL CONNECTORS AND CONNECTORS THEREFOR**

Philippe J. F. Bonnamy, 92 Boulogne, Billancourt, France, assignor to Compagnie Francaise Des Petroles, Paris, France

Filed Nov. 30, 1971, Ser. No. 203,173

Claims priority, application France, Nov. 30, 1970, 7042940

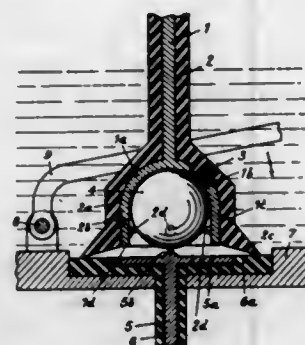
Int. Cl. H01r 1/30

U.S. Cl. 339—12 V

22 Claims

A method of obtaining an electrical connection underwater and connectors for carrying out the method, without requiring

precise alignment of the connectors by employing a breakable rigid container filled with gas at a reduced pressure within a sealable waterproof housing surrounding the metal contact of a movable connector. The contact of the movable connector is engaged with a metal contact of a stationary connector and



the breakable envelope is broken, causing a reduction in the pressure within the waterproof housing to remove any water from between the metal contacts and retain the metal contacts in contact with each other and seal them from the surrounding environment.

3,731,251

**MEANS FOR TERMINATING FLAT CABLE**

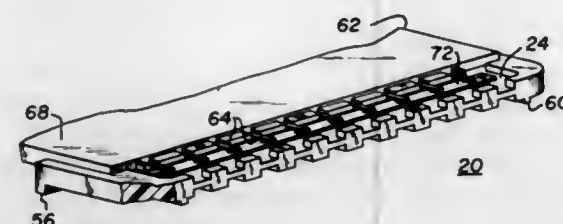
William Young Sinclair, Frenchtown, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed April 13, 1972, Ser. No. 243,635

Int. Cl. H05k 1/06; H01r 3/06, 3/108

U.S. Cl. 339—17 F

15 Claims



Novel means for terminating flat cable comprising a flat, elongate base member selectively apertured to provide an access way between a pair of conductor receiving portions disposed on opposing surfaces of the base member, wherein selective conductors of the flat cable may be disposed adjacent one or the other of said conductor receiving portions and connected to a selectively formed terminal positionable within an associated terminal receiving recess in said conductor receiving portions, affording additional separation between adjacent conductors. In a further embodiment coupling means are provided to permit the interconnection of a plurality of conductors to one or more metallic strips interposed within one of the conductor receiving portions to provide a common termination point therefore. A suitably formed enclosure which may be provided with spaced ribs for receiving a portion of the terminals affixed to the base member may be employed to provide an enclosed assembly. The base member further includes a cable receiving portion adapted to provide a support for a selective portion of the flat cable.

3,731,252

**PRINTED CIRCUIT BOARD CONNECTOR**

James E. McKeown, and Donald E. Michel, Sidney, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed March 22, 1971, Ser. No. 126,801

Int. Cl. H05k 1/04

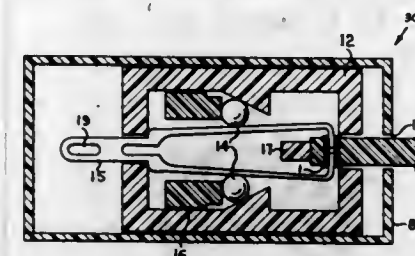
U.S. Cl. 339—17 L

8 Claims

A circuit board having metal eyelets in one end thereof that are the terminals of the electrical circuit on the board is mated with a connector that has a plurality of pairs of male members that are aligned with and pass into the eyelet holes in the cir-

cuit board. When the circuit board is inserted into the connector, the male members enter both sides of the holes in the circuit board and, by action of the planar surfaces of the end por-

ductor cable. The arrangement of the terminals in the housing enables the conductors of the flat multi-conductor cable to be



tions of opposing male members, the male members are forced into pressure contact with the inner wall of the holes thereby completing the electrical circuit between the connector and the circuit board.

3,731,253

**SNAP-ON TERMINAL ASSEMBLY FOR METER SOCKETS**

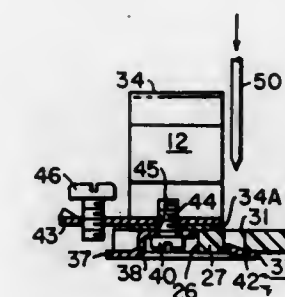
William F. Coffey, Stratford, Conn., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 3, 1972, Ser. No. 223,155

Int. Cl. H01r 9/08

U.S. Cl. 339—217 S

7 Claims



A snap-on terminal assembly for a meter socket includes a retaining clip fastened to the bottom of an auxiliary jaw terminal. The retaining clip includes a flat base with an offset cantilever projection for supporting the auxiliary jaw terminal above the base. An integral tab on the base projects toward the free end of the cantilever projection. The retaining clip holds the auxiliary jaw terminal in a clamped relationship on the face of the meter socket base when the retaining clip base is positioned on the back of the meter socket base and the tab is received by a meter socket hole.

3,731,254

**JUMPER FOR INTERCONNECTING DUAL-IN-LINE SOCKETS**

Edward H. Key, Doylestown, Pa., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

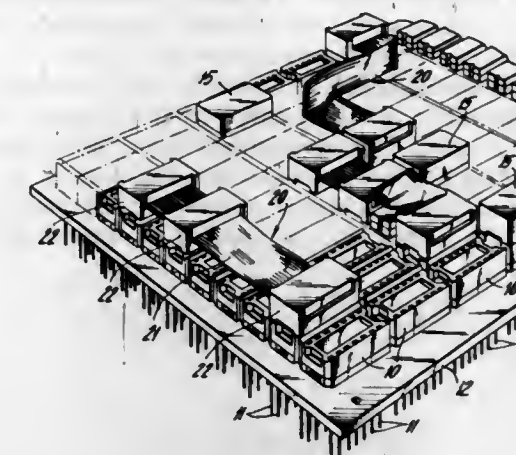
Filed Aug. 2, 1971, Ser. No. 168,257

Int. Cl. H01r 1/104; H05k 1/04

U.S. Cl. 339—17 CF

9 Claims

A jumper for interconnecting the leads of dual-in-line sockets mounted on a panel board comprises the combination of a flat multi-conductor cable terminated at its opposite ends with a connector, each connector including a housing having a plurality of terminals which extend from the lower portion of the base for connection to the dual-in-line socket, while the upper portion of the terminals are disposed in the housing and respectively connected to the conductors of the flat multi-con-



3,731,255

**AUTOMATICALLY OPERABLE END CONNECTOR FOR A POWER DISTRIBUTION SYSTEM**

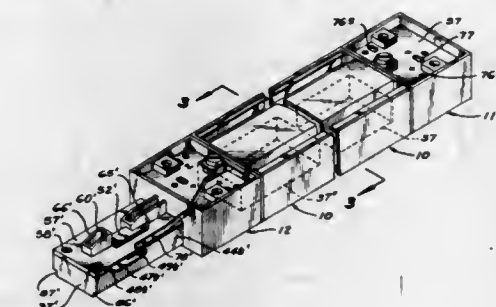
James Contratto, Livermore, Calif., assignor to U.S. Industries, Inc., New York, N.Y.

Filed June 21, 1971, Ser. No. 154,782

Int. Cl. H01r 9/00

U.S. Cl. 339—21 R

11 Claims



An end connector for a power distribution system of the type providing an essentially continuous convenience outlet enabling electric plugs to be connected thereto at substantially any selected location therealong. The system includes one or more elongated track components that provide such convenience outlet, and each such track component is equipped along its length with a conductor assembly comprising a plurality of spaced apart electric conductors insulated one from another. The end connector is connectable with such track component at an end thereof, and may take the form either of a splice box used to join successive track components or of an end closure used to attach an end block or junction box thereto and within which the conductors of the distribution system are connected with power supply lines. The end connector, for the purpose of establishing connection thereof with a track component, has a housing portion insertable into the end of a track component, and the connector is equipped with a plurality of contacts that automatically engage and establish an electric connection with the respective conductors of the track component upon insertion of the housing portion of the end connector thereinto.

3,731,256

**PLUG-IN BUS DUCT**

Paul M. Hafer, Florence, Ky., assignor to Arrow-Hart, Inc., Hartford, Conn.

Filed Aug. 30, 1971, Ser. No. 176,001

Int. Cl. H01r 13/60

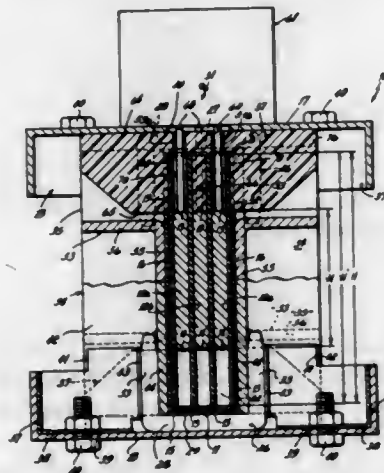
U.S. Cl. 339—22 B

15 Claims

A plug-in bus duct comprised of a group of elongated, flat busbars positioned in side-by-side relation within an elongated



housing, the housing having the side walls of a height substantially greater than the width of the busbars. Insulator sheets separate the busbars one from the other, and from the sides of the housing, to form a side wall-insulator sheet-busbar 'sandwich.' In preferred form, the busbars are all of the same cross-sectional configuration and dimensions, and each retains a planar configuration along its entire length from one end of the duct to the other. This construction leaves the top and bottom edges of the busbars exposed within the housing. An insulator template is installed in each of a plurality of openings cut in the top and bottom of the housing at spaced intervals.



therealong. Each template cooperates with the insulator sheets to define a series of stab chambers insulated one from the other, each stab chamber being partially defined by an exposed busbar edge; each chamber is adapted to receive one stab from a plug unit in a manner that permits the stab to make contact with the exposed edge of the busbar in that chamber, thereby allowing power to be taken off the bus duct through the plug unit and dispersed into power leads. A cover is provided for each of the housing's openings, the cover being pivotable between a position at which the stab chambers are opened to receive the plug unit's stabs and a position at which the stab chambers are closed.

3,731,257

## DIAGNOSTIC CONNECTOR

Roelef Johan Bakker, Langen, Hessen, Germany, assignor to AMP Incorporated, Harrisburg, Pa.

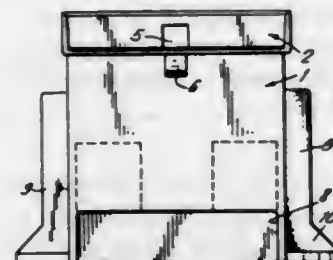
Filed Feb. 24, 1971, Ser. No. 118,267

Claims priority, application Germany, March 11, 1970, P 20 11 622.7

Int. Cl. H01r 9/08, 13/44, 13/54

U.S. Cl. 339-44 M

2 Claims



An electrical socket housing for a vehicle, comprising a one-piece body moulded of insulating material having contact receiving through-passageways. The socket body has a mounting means for mounting the housing on a panel support of a vehicle.

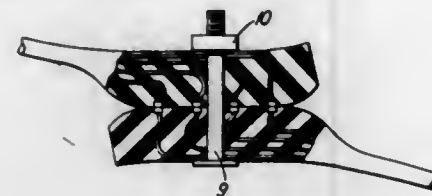
3,731,258  
UNDERWATER CONNECTION  
Lyndon Reginald Spicer, Cascades, Llandevand, Monmouthshire, Wales, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 22, 1971, Ser. No. 182,699

Int. Cl. H01r 31/00, 13/24

U.S. Cl. 339-48

1 Claim



An electrical connector for use underwater or the like including two convex rubber bodies having one or more contacts embedded therein flush with the convex surfaces thereof. A bolt projects through aligned holes in the bodies. When the bolt is tightened with the convex surfaces in contact with one another, fluid between the bodies is squeezed out and a fluid tight seal is provided around each pair of mutually engaging contacts.

3,731,259

## ELECTRICAL CONNECTOR

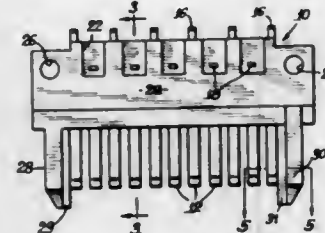
Carl Occhipinti, Melrose Park, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed July 2, 1971, Ser. No. 144,552

Int. Cl. H01r 13/62

U.S. Cl. 339-66 M

3 Claims



A multiple-contact electrical plug and mating receptacle having coating contacts and contact pins with mating polarizing guide posts and slide sockets to facilitate easy mating of the plug and receptacle, with minimum tendency toward canting or binding of the parts; the assembly being designed to facilitate manufacture by molding the individual contacts in place in the dielectric plug while the leading ends of such contacts are still jointed and then shearing the ends of the contact pins.

3,731,260

## SOCKET HOUSING

Prisco D. Nardone, Rochester; Ronald G. Hollett, Roseville, and James E. Warrick, Birmingham, all of Mich., assignors to Microdot Inc., Greenwich, Conn.

Filed May 6, 1971, Ser. No. 140,674

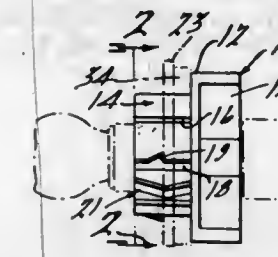
Int. Cl. H01r 13/60

U.S. Cl. 339-127 R

5 Claims

The invention relates to a novel configuration for the housing portion of a lamp socket which is insertable through a notched aperture in a panel or the like. The housing has at least one finger which flexes circumferentially thereof when passing through a notch in the wall of the panel aperture. A rigid detent is circumferentially spaced from the flexible finger. After the detent passes beyond the edge of the aperture it is advanced thereover by rotation of the housing in a locking direction produced by the bias of the flexible finger on an edge portion of the aperture to lock the housing within the aperture. Additional notches may be provided for other fingers.

and detents if a greater bias or locking overlap is necessary. To remove the housing from the panel the housing is rotated in reverse direction. The recording time of the tape at the remote point is determined by using the time the playback is started



the opposite direction to the locking direction to flex the finger until the detent clears the edge of the notch so that the housing can be pulled outwardly thereof.

3,731,261

## ELECTRICAL CONNECTOR WITH TWISTED POSTS

Frank G. Spadoni, Jr., Orange, Conn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

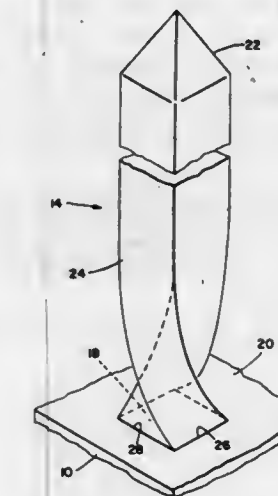
Continuation of Ser. No. 760,561, Sept. 18, 1968, abandoned.

This application March 24, 1972, Ser. No. 237,942

Int. Cl. H01r 9/16

U.S. Cl. 339-220 R

6 Claims



An improved electrical connector is disclosed which may be used to connect to a printed circuit board and is adaptable for use with automatic wire-wrapping machines. The terminal posts of the connector have a square cross section as do the holes in the base into which the posts are located. The posts are twisted about 90° to strengthen, straighten and insure a secure lock of the posts in the base.

3,731,262

## TIME MARK-NUMERAL GENERATOR SYSTEM

Roy B. Blake, Jr., Kernersville, N.C., assignor to The United States of America as represented by the Secretary of the Navy

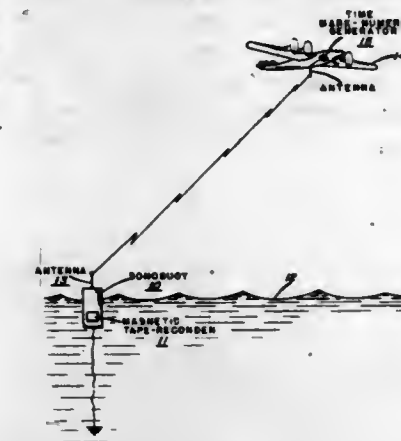
Filed Sept. 28, 1967, Ser. No. 672,679

Int. Cl. G01s 1/72

U.S. Cl. 340-2

6 Claims

A system for recording at some remote point data which has been previously recorded by equipment located in a sonobuoy. Upon receipt of an interrogation signal the sonobuoy stops recording and starts to play back in the



and by using a digital clock circuitry to duplicate in time the sequence and rate of operation of the tape in the sonobuoy.

3,731,263

## UNDERWATER GUIDANCE METHOD AND APPARATUS

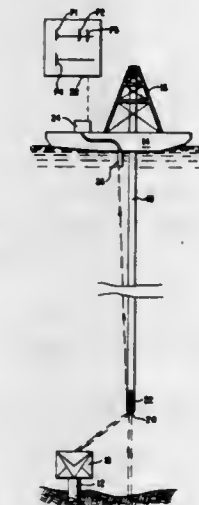
Charles K. Daniels, Weston, and John P. McCarthy, Cohasset, both of Mass., assignors to EG & G, Inc., Bedford, Mass.

Filed April 28, 1971, Ser. No. 138,037

Int. Cl. G01s 9/66

U.S. Cl. 340-3 R

15 Claims



Equipment, such as a drill string, is guided from an ocean platform to a submarine wellhead by an acoustical energy system including a corner reflector at the wellhead, a pulse transmitter and associated transponder near the lower end of the drill string, and a receiver at the platform. The transmitter, operating at a first frequency, transmits pulses to the reflector, which reflects the pulses to the transponder. Energy is sent by the transponder to the platform receiver at a second frequency. When the transmitter and the receiver are in line with the wellhead reflector, energy at the first frequency is reflected directly to the receiver to produce a "go" signal.

3,731,264

## APPARATUS FOR DETERMINING THE POSITION OF A SURFACE VESSEL WITH RESPECT TO A SIGNAL SOURCE

Leslie T. Campbell, Lakewood, and Joseph J. Vetter, Monrovia, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Jan. 24, 1972, Ser. No. 219,964

Int. Cl. G01s 3/80

U.S. Cl. 340-3 PS

7 Claims

Apparatus for determining the position in azimuth of a surface vessel, with respect to an underwater sonar signal source,



irrespective of the motion of the surface vessel, comprising a hydrophone, capable of determining the azimuth of an underwater sonar signal source with respect to the roll and pitch axes of the surface vessel, and a universal joint, connecting the hydrophone to the surface vessel, its two axes of rotation being parallel to the roll and pitch axes of the surface vessel, thereby effectively permitting the hydrophone to rotate about the roll and pitch axes of the surface vessel. A vertical

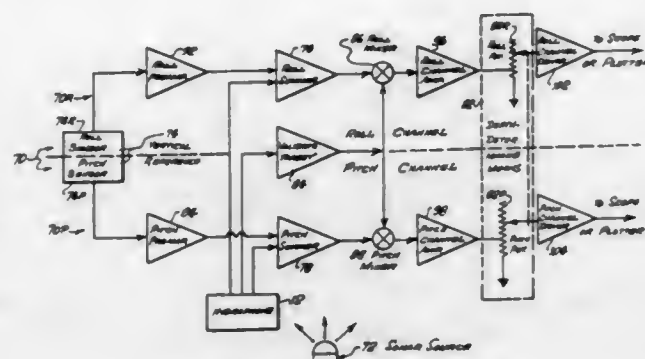


FIG. 1. Schematic diagram of roll and pitch determining system.

reference, attached to the hydrophone so as to pitch and roll with it, comprises a roll sensor and a pitch sensor for determining the roll and pitch, respectively, of the hydrophone. A roll summer and a pitch summer, whose two inputs are the outputs from the hydrophone and the roll sensor and pitch sensor, respectively, serve to determine the true azimuth of the sonar signal source, with respect to the roll and pitch axes of the surface ship, in spite of any roll or pitch of the hydrophone, or of the surface vessel.

3,731,265

**HOLOGRAPHIC IMAGING SYSTEM BY ULTRA-SOUND**  
Soji Sasaki, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

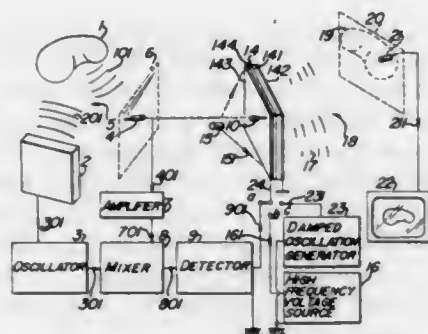
Filed Dec. 1, 1971, Ser. No. 203,725

Claims priority, application Japan, Dec. 16, 1970, 45/111797

Int. Cl. H04b 11/00

U.S. Cl. 340-5 H

9 Claims



In ultrasonic holography in which a hologram is obtained by a process including the steps of projecting an ultrasonic beam on to an object to be analyzed, mixing the beam transmitted through or reflected from the object with a reference ultrasonic wave to produce an interference pattern or a hologram on a plane, and recording the interference pattern by a photographic or other recording means; a system for reproducing a holographic image from the thus obtained hologram using an ultrasonic wave instead of a coherent light, use of the latter on a miniaturized hologram having been common in the conventional system; and modified systems of the same.

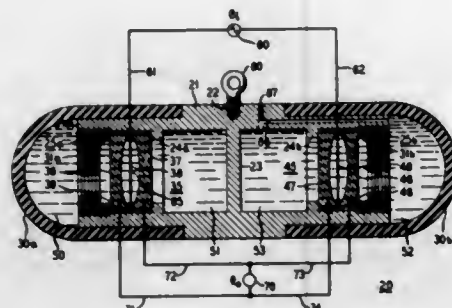
3,731,266  
**INERTIA-COMPENSATED A.C. BIASED HYDROPHONE INCORPORATING A POROUS CAPACITANCE TRANSDUCER**

Hans Hugo Ammann, Chester, N.J., assignor to Bell Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.  
Filed March 25, 1971, Ser. No. 128,011

Int. Cl. H04b 13/00

U.S. Cl. 340-8 LF

13 Claims



A porous capacitance transducer for producing electrical output signals in response to dynamic pressure fluctuations in a surrounding liquid medium substantially comprises an electrically conductive membrane in parallel spaced relation with a collimated hole structure (CHS) plate, which is a porous metal structure containing a controlled number and distribution of discrete parallel capillaries. An inertia and depth-compensated a.c. biased hydrophone incorporating the basic porous capacitance transducer substantially comprises first and second membranes respectively associated with first and second pairs of CHS plates and first and second pairs of oil-filled reservoirs. Such a hydrophone exhibits improved sensitivity, acoustic bandwidth response, dynamic pressure response, and noise immunity.

3,731,267

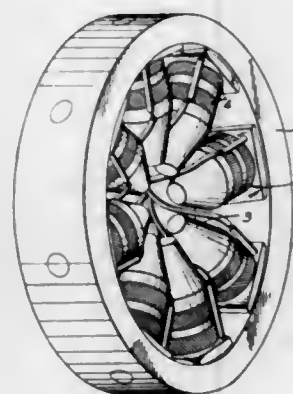
**ELECTRO-ACOUSTIC TRANSDUCER**  
Otto Brandt, Villa Aurora-Quartier les Faysses, 83 Le Brusc, and Bernard Tocquet, 2, Hameau la Poussaraque, 83 Sanary s/Mer, both of France

Filed Jan. 4, 1971, Ser. No. 103,666

Int. Cl. H04b 13/02

U.S. Cl. 340-9

3 Claims



An electro-acoustic transducer comprises an enclosure of closed form containing a plurality of piezo-electric motors, each connected to the enclosure to excite the same, the motors having no mechanical connection between one another capable of transmitting static or dynamic forces. The transducer has two acoustic frequency ranges which are independent of the value of the static pressure prevailing on the outside of the transducer, one frequency range being due to the resonance of the envelope, and the other to the resonance of the motors.

3,731,268  
**TIME-COMPRESSING MULTI-TRANSMISSION SIGNALS**  
Ralph A. Landrum, Jr., Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 796,348, Feb. 4, 1969, abandoned. This application Dec. 7, 1970, Ser. No. 95,964

Int. Cl. G01v 1/28

U.S. Cl. 340-15.5 TA

8 Claims

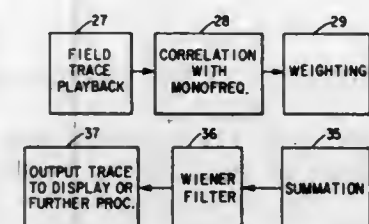
3,731,270  
**SEISMIC EXPLORATION USING THE COMMON REFLECTION POINT TECHNIQUE**  
John O. Penhollow, Houston, Tex., assignor to Esso Production Research Company

Filed April 21, 1971, Ser. No. 135,957

Int. Cl. G01v 1/28

U.S. Cl. 340-15.5 CP

6 Claims



For each seismic receiver location  $n$  multi-transmission signals, which are similar in form but differ in peak frequency within a frequency range of interest, are time-compressed by cross-correlating the received signals containing it with each transmitted signal alone, weighting the resulting  $n$  correlation functions to produce for each event arrival the simplest compressed central wavelet when said  $n$  correlation functions are added with zero-lag times in coincidence, summing the weighted correlogram traces, and Wiener filtering the summation trace to reduce its amplitudes substantially to zero outside of said central wavelets.

3,731,269

**STATIC CORRECTIONS FOR SEISMIC TRACES BY CROSS-CORRELATION METHOD**

Roger D. Judson, Houston, Tex., and John W. C. Sherwood, Whittier, Calif., assignors to Chevron Research Company, San Francisco, Calif.

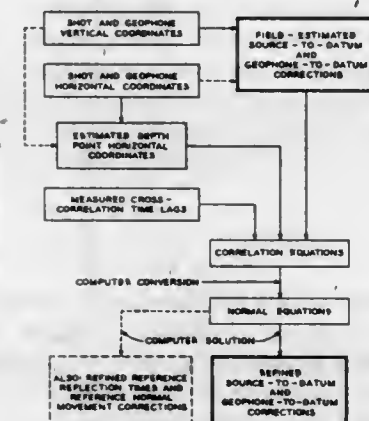
Continuation of Ser. No. 848,061, Aug. 6, 1969, abandoned.

This application April 5, 1971, Ser. No. 134,099

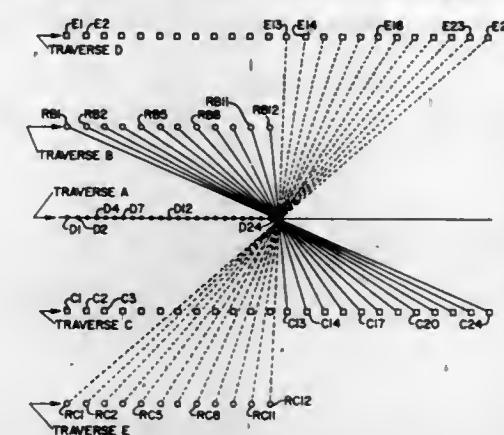
Int. Cl. G01v 1/36

U.S. Cl. 340-15.5 CC

7 Claims



A method is disclosed for determining source-to-datum corrections for a multitrace seismic cross-section. The method comprises the measurement of a multiplicity of cross-correlation functions between selected traces of the seismic section to establish a redundant set of simultaneous equations including the desired source-to-datum and geophone-to-datum quantities. The simultaneous equations are then solved for the desired corrections by the least squares error method. The method of the invention also provides for the determination of residual normal moveout corrections.



The common reflection point seismic technique wherein the locations of seismic disturbances and the locations of seismic wave detection stations are positioned on the same traverse, is utilized to produce a plurality of seismic records having events produced by reflections from common reflection points. A plurality of detection locations are located on one side of the first traverse and a plurality of transmitting locations are located on the other side of the traverse such that ray paths from a given disturbance location to a given detecting location will include a common reflection point. Seismic disturbances are initiated in sequence at the transmitting locations and detected at the detection locations. Seismic records thus produced are combined such that event records from common reflection points reinforce each other.

3,731,271

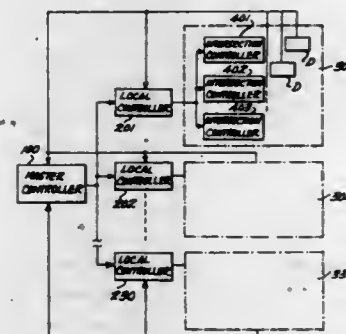
**TRAFFIC SIGNAL CONTROL SYSTEM**

Akira Muramatsu, Osaka, and Tadao Endo, Kyoto, both of Japan, assignors to Omron Tateisi, Kyoto, Japan  
Continuation-in-part of Ser. No. 828,645, May 28, 1969, abandoned. This application Nov. 26, 1971, Ser. No. 202,536

Int. Cl. G08g 1/07

U.S. Cl. 340-41

2 Claims



A relatively wide area, in which the traffic signals are to be controlled is divided into a plurality of local areas each having a local signal controller. There are provided a plurality of different cycle signals and a plurality of different synchronizing signals paired with the cycle signals. A master controller always watches the traffic condition in each of the local areas and causes each local controller to select that one of the pairs of cycle signals and synchronizing signals which is most suitable for control of the traffic signals in each local area under the present traffic conditions. In turn, each local controller uses the selected cycle and synchronizing signal to control a plurality of intersection controllers in the local area, each in-



tersection controller being associated with an intersection traffic signal.

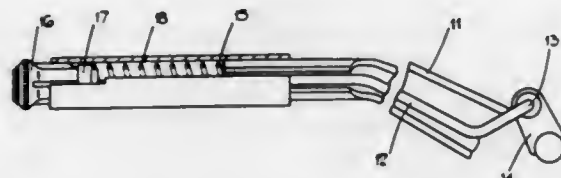
3,731,272

**HANDBRAKE CONTROLS FOR ROAD VEHICLES**  
Edward Cryer, Higham, near Burnley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England  
Filed March 29, 1971, Ser. No. 128,864  
Claims priority, application Great Britain, April 24, 1970, 19,699/70

Int. Cl. B60t 17/22

U.S. Cl. 340—69

4 Claims



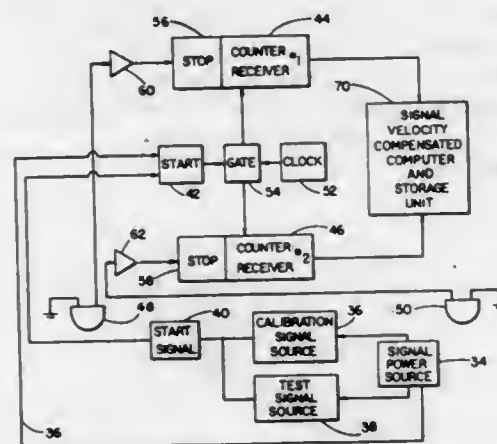
In a vehicle handbrake control, the operating button of the handbrake carries a bulb which is exposed through a lens positioned in the button. One electrical connection to the bulb is made by a conductive rod which is connected to the handbrake release mechanism and is movable by the button to operate the handbrake release mechanism. Another electrical connection to the bulb is made by way of a hollow conductive member within which the conductive rod is mounted so that an electrical circuit through the bulb can be made to energize the bulb. The circuit also includes a switch so that the circuit can only be completed when the handbrake is operative.

3,731,273

**POSITION LOCATING SYSTEMS**  
William E. Hunt, 2221 South Anchor, Anaheim, Calif.  
Filed Nov. 26, 1971, Ser. No. 202,361  
Int. Cl. G01s 3/80

U.S. Cl. 340—16

8 Claims



Position location and plotting is mechanized and accurately accomplished in a system employing a movable transmitter of acoustic signals and at least two acoustic receivers whose position is fixed. The system measures transit time from the transmitter to the receivers. It measures propagation velocity of the acoustic signal to determine distance from the transmitter to the two receivers and ultimately locates the transmitter's position relative to the two receivers. A signal of a kind that is more rapidly propagated than acoustic signals is generated simultaneously with initiation of the acoustic signal to form a start signal. Receipt of the acoustic signal at the receivers is made the occasion for generating a stop signal and the distance computation is made on the basis of the time interval elapsing between the start and stop signals. In the preferred embodiment the transmitter comprises a spark gap and the start signal is an electrical signal which is provided as an incident to current flow through the gap. A second spark gap,

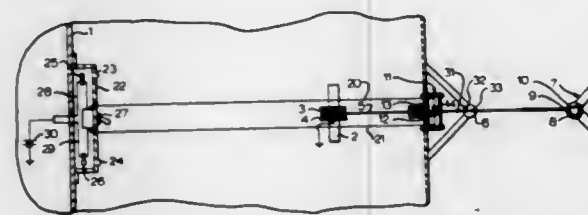
and means for developing a second start signal, has a fixed position relative to the two receivers. That arrangement is utilized to provide a high order of accuracy. To enhance accuracy even more, the two spark gaps are miniaturized and the structure for supplying energy currents to them and for developing start signals are made similar and the two systems are energized alternately from a common source. Special microphones receive acoustic signals at a known distance from a reference position whereby point-to-point distance and direction is accurately measured.

3,731,274

**GUIDING LIGHT SYSTEM FOR TRAILER TOW CAR HOOK-UP**  
Laurence Green, P.O. Box 1127, Twin Falls, Idaho  
Filed Sept. 20, 1971, Ser. No. 182,017  
Int. Cl. B60q 1/00

U.S. Cl. 340—52 R

4 Claims



This apparatus embodies equipment to produce in front of the driver of a tow car two signal devices in the form of lamps which show the driver of the car whether or not it is backing directly toward the hook-up position to attach a trailer coupling when it is close to this position and when it reaches hook-up position. The signal devices are right-hand and left-hand lamps, mounted on the dash or the instrument panel of the car. At the rear end of the car two spring contactors are mounted on the car side by side. A cable passes between the contactors and is wound on a spring take-up reel that is spaced in front of the spring contactors on the car. The cable is an electricity conductor and has means, insulated from the cable at its free end to attach it to the trailer coupling. The lamps each have one terminal connected to the ungrounded side of the car battery and the other terminal connected to one of the spring contactors so that so long as the cable engages both contactors there is a circuit completed from the battery through each lamp then through its conductor to the spring contactor, then through the cable to ground and the grounded side of the battery. If the cable pushes either contactor away from the other one then the lamp connected to the other one has its circuit broken, and shows dark to the driver. The cable has an insulation, covering it adjacent to its free end to darken both lamps when the car is in close proximity to hook-up position.

3,731,275

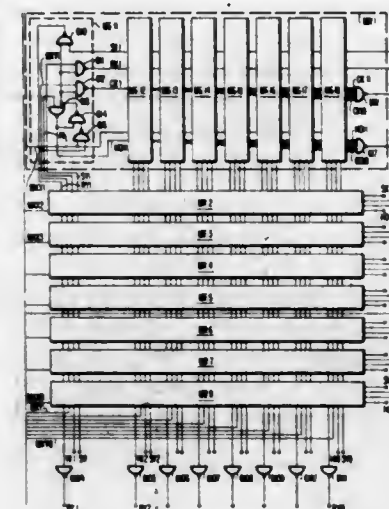
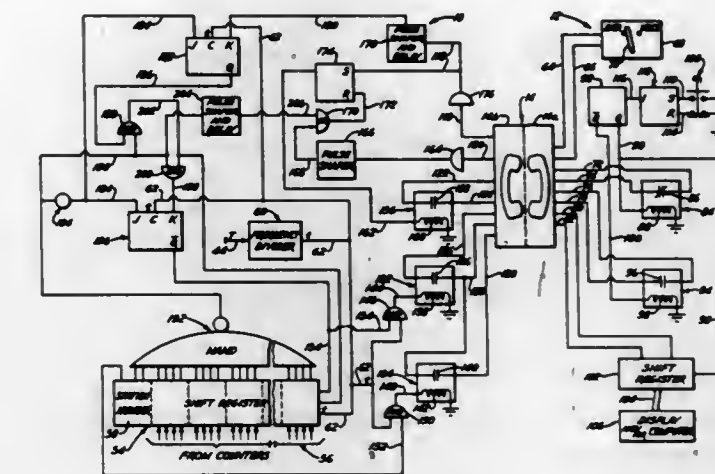
**DIGITAL SWITCHING NETWORK**  
Pedro A. Lenk, Rochester; William C. Dunn, Pittsford, and Ramses R. Mina, Rochester, all of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.  
Filed Sept. 3, 1971, Ser. No. 177,743  
Int. Cl. G11c 29/00

U.S. Cl. 340—146.1 AB

24 Claims

A solid state semiconductor matrix switch for transmitting digital data from a set of input-output leads to any one of a number of output-input leads includes circuitry for marking and selecting cross point circuits through the network of the switch. In addition, circuitry for holding selected crosspoints after mark signals have been removed is employed. Typically, the switch includes an 8 X 8 matrix array of cross point circuits which are capable of providing eight individual paths through the matrix, no two operated crosspoints being located in any vertical or horizontal matrix strip. In addition, a circuit for checking the vertical matrix strips to determine which of

the crosspoint circuits are completed is included. Also, an error checking system is employed to determine if more than a



single crosspoint circuit in any one of the vertical matrix strips is operates.

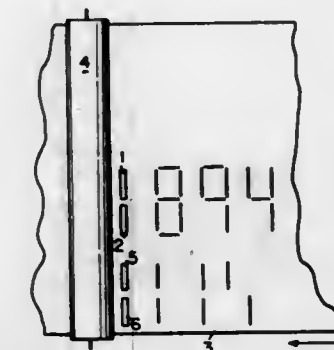
taneously gate-in the clock pulses with the data at the sending telephone.

3,731,276

**RETRIEVAL CODE**  
Harry F. Rayfield, Bradbury, Calif., assignor to Terminal Data Corporations, Van Nuys, Calif.  
Filed May 19, 1971, Ser. No. 144,960  
Int. Cl. G06k 9/18

U.S. Cl. 340—146.3 Z

2 Claims



A numeric code having human-readable and correlative mark elements. These are impressed upon a medium carrying information to be read by either human or machine inspection. Block numerals with two additional rows of marks are employed, one row being clock pulse marks.

3,731,277

**DATA ACCUMULATION AND TRANSMISSION SYSTEM FOR USE BETWEEN REMOTE LOCATIONS AND A CENTRAL LOCATION**  
Ronald L. Krutz, and Thomas J. Vilella, both of New Kensington, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.  
Filed June 24, 1970, Ser. No. 49,235  
Int. Cl. H04q 3/00

U.S. Cl. 340—163 R

41 Claims

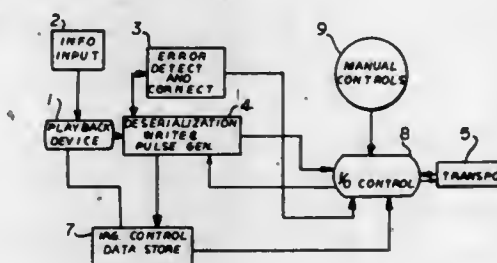
A data accumulation and transmission system wherein a plurality of independent data generators are sequentially triggered in such a manner that the rate of speed of the triggering pulse is much greater than the rate of speed of data production. Double counting is prevented by utilizing the trailing edge of each data pulse to reset the device which the triggering pulse sets. The data is communicated, for example, across

3,731,278

**FORMAT CONVERSION SYSTEM**  
Brice Eldridge, Ramsey, N.J.; Christopher G. Davy, Vienna, Va., and Richard A. Michals, Skokie, Ill., assignors to Stenographic Machines, Inc., Skokie, Ill.  
Filed Feb. 9, 1970, Ser. No. 9,516  
Int. Cl. G06f 3/02; B41j 3/26

U.S. Cl. 340—172.5

9 Claims



A computer interfacing device for converting serial input data representing phonetic constructions of words or word parts of the link produced by a shorthand machine into parallel output data is described. The device includes means for accumulating input data which arrives in serial bit by bit form and generating output data in a computer compatible format comprising successive bytes of parallel data bits. Means are included for detecting and correcting errors in the alignment of the output data as it is recorded on magnetic tape, for separating the output data into records and recording a prescribed inter-record gap between records, and for detecting the end of recorded input data and recording a prescribed file gap at the end of the last record.

3,731,279

**CONTROL SYSTEMS**  
James Richard Halsall, 17, Whitelights Road, Reading, and Alan Percy Cooper Murrell, Old River Cottage, Guildford, both of England  
Continuation-in-part of Ser. No. 787,737, Dec. 30, 1968, abandoned. This application July 29, 1971, Ser. No. 167,413  
Int. Cl. G06f 3/00

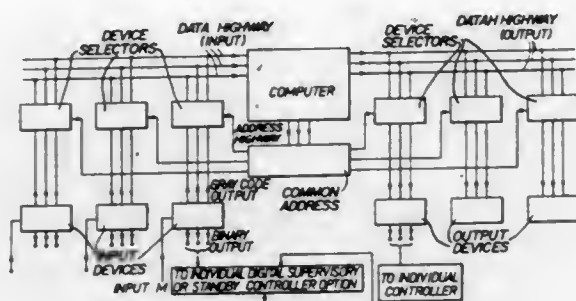
U.S. Cl. 340—172.5

9 Claims

A control system in accordance with this invention provides a Digital computer supervised electric control system for



monitoring and controlling a plurality of separate variables each variable having an associated and individual measuring channel, alternatively provides new address words and new status words to the store. If the processor does not provide a



device and each measuring device having an associated and individual encoder.

3,731,280

## PROGRAMMABLE CONTROLLER

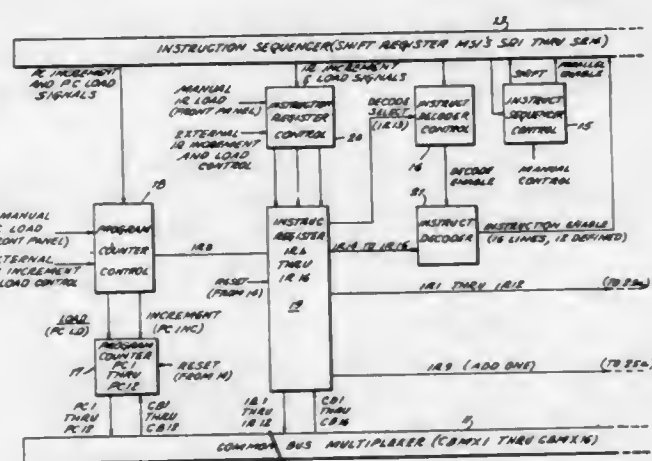
Robert Shevlin, Manhasset, N.Y., assignor to Varisystems Corporation, Plainview, N.Y.

Filed March 16, 1972, Ser. No. 235,202

Int. Cl. G06F 9/06

U.S. Cl. 340-172.5

7 Claims



A programmable controller for use in controlling a wide variety of external data and production devices and having an extremely flexible stored program capability enabling the device to function as a small-scale computer adapted for use as either a systems controller or as a "stand alone" mini-computer.

3,731,281

## RECIRCULATING STORE CIRCUIT FOR TIME-DIVISION SWITCH PROCESSOR

Travis Hill Gordon, Eatontown; Patrick John Marino, Middletown, and Randolph John Pile, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

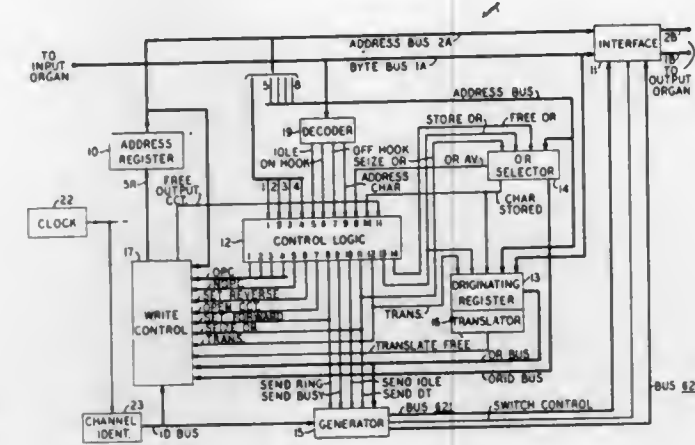
Filed June 28, 1971, Ser. No. 157,155

Int. Cl. H04J 3/00; G11c 21/00

U.S. Cl. 340-172.5

12 Claims

In a time-division switch, a recirculating store alternatively stores address words and channel status words. When two subscribers are interconnected, the store applies address words to an address bus to enable the switch to steer data from one subscriber to the other. When a channel is idle or a call is being set up, the store passes status words to a processor to define the state of the channel. The processor, in turn, and under control of the store output words together with data from the



new word to the store, the store output is recirculated back to the input.

3,731,282

## MULTIFUNCTION ROUTING NETWORK

Douglas E. Dancis, Putnam Valley; Gerald E. Dorfuss, White Plains, and Benjamin C. Zitron, New York, all of N.Y., assignors to Allied Management & Systems Corporation, New York, N.Y.

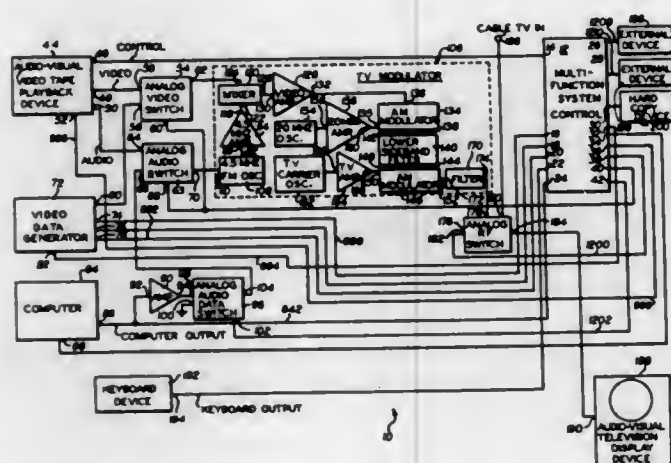
Continuation of Ser. No. 41,795, June 1, 1970. This

application Aug. 27, 1971, Ser. No. 175,557

Int. Cl. G06F 9/19, 3/00, 15/56

U.S. Cl. 340-172.5

19 Claims



A multifunction routing network. The routing network is provided with a function control means including a condition responsive logic network having an iterative multifunction control loop. Register and memory means are also provided in the routing network which are operatively associated with the control means for providing input conditions thereto and for receiving output conditions therefrom. The logic network is provided with a multistable means having a plurality of states and is responsive to the states thereof and the input conditions thereto to provide a plurality of control functions of both a data control and an execute non-data control nature for the routing network. A computer, an input keyboard, an audio-visual playback device, and a television are also provided which are operatively associated with the register and memory means for providing input conditions thereto and for responding to output conditions therefrom.

3,731,283

## DIGITAL COMPUTER INCORPORATING BASE RELATIVE ADDRESSING OF INSTRUCTIONS

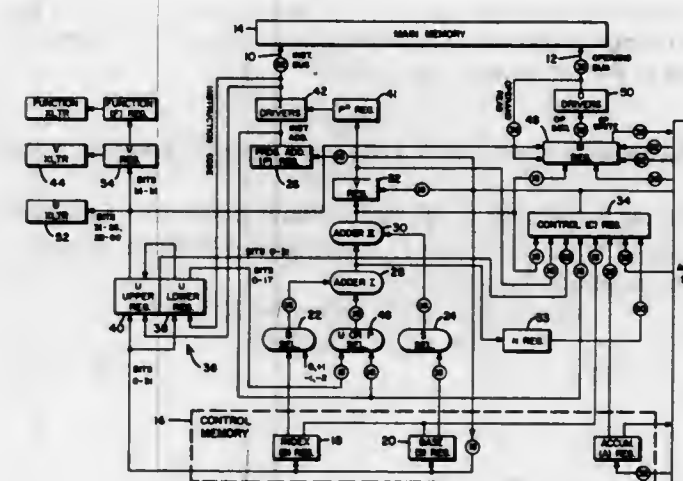
Lewis R. Carlson, 1055-24th Ave. S.E., Minneapolis, Minn.; Eugene E. Hervig, 7131 Clay Ct., South Saint Paul, Minn., and Kenneth J. Oehlers, 5950 Donna Ave., Tarzana, Calif.

Filed April 13, 1971, Ser. No. 133,654

Int. Cl. G06F 9/10

U.S. Cl. 340-172.5

4 Claims



A relative addressing scheme for a digital computer which allows programs of instructions to be stored in the computer memory at locations which may be addressed relative to predetermined base values rather than at absolute assigned addresses to facilitate program relocation within the memory. The program address register is divided into two segments, namely, a base register selection segment and a displacement segment. During instruction acquisition, the base register selection segment is decoded to read out the contents of a selected base register and these contents are added to the displacement segment of the program address register to define the address of the instruction to be acquired.

3,731,284

## METHOD AND APPARATUS FOR REORDERING DATA

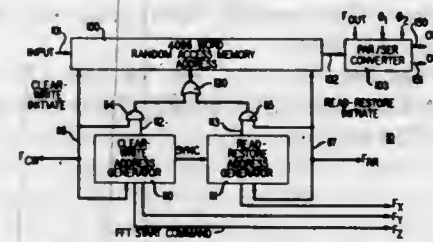
Fred Walter Thies, Greensboro, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 27, 1971, Ser. No. 211,882

Int. Cl. G06F 9/20, 7/00

U.S. Cl. 340-172.5

13 Claims



A reordering method and associated apparatus for storing and accessing samples of a physical process to facilitate the generation of Fourier series coefficients is disclosed. In particular, methods and apparatus for generating storage and retrieval patterns for a sequence of sampled data for facilitating the computation of fast Fourier transformation (FFT) of a plurality of overlapped records is disclosed.

910 O.G.—13

3,731,285

## HOMOGENEOUS MEMORY FOR DIGITAL COMPUTER SYSTEMS

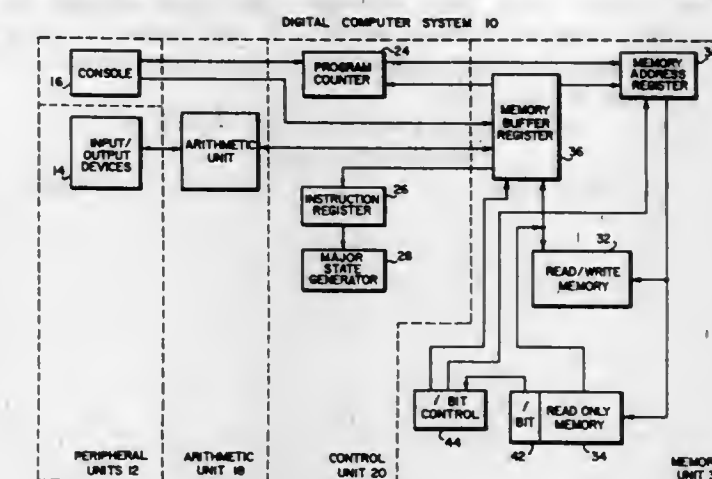
C. Gordon Bell, 553 Briarcliff, Pittsburgh, Pa.

Filed Oct. 12, 1971, Ser. No. 188,084

Int. Cl. G11c 7/00

U.S. Cl. 340-172.5

7 Claims



A digital computer system with a memory unit comprising both "read-only" locations from which information can only be read and "read-write" locations from which information can be read and into which information can be written. Both read-only and read-write memory locations store information in the same format, but each read-only location contains an extra bit position for a "state" bit. The digital computer system normally addresses the read-only locations in sequence. If a state bit in any read-only location is set, a control in the memory interprets the information in that location as an address, normally for a read-write memory location for storage or retrieval of information. When the state bit is not set, the read-only location contains information for direct use by the digital computer system.

3,731,286

## ANALOG SIGNAL DELAY ARRANGEMENT

Gerhard Grahlmann, Wohlfarth, and Dieter Wellach, Hamburg, both of Germany, assignors to Hauni-Werke Korber & Co. K.G., Hamburg, Germany

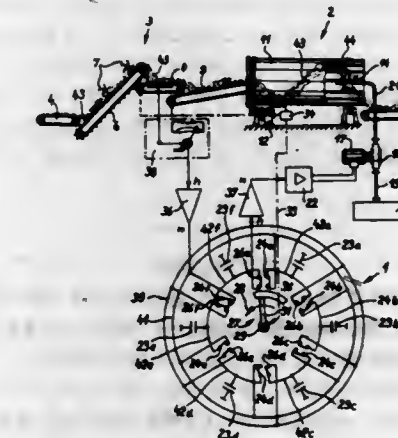
Filed June 25, 1970, Ser. No. 49,718

Claims priority, application Germany, June 28, 1969, P 19 32 906.7

Int. Cl. G11c 11/24, 27/00

U.S. Cl. 340-173 RC

10 Claims



An analog signal representing a continuously measured value is distributed to a plurality of capacitors, by a cyclic closing of a first set of contacts. The signal stored on the capacitors are read out by cyclic closing of another set of contacts which connect the capacitors to a receiver station. Each value of analog signal is delayed by the time interval between



the storing in the capacitor and the read out from the same capacitor which occurs during the same cycle.

3,731,287

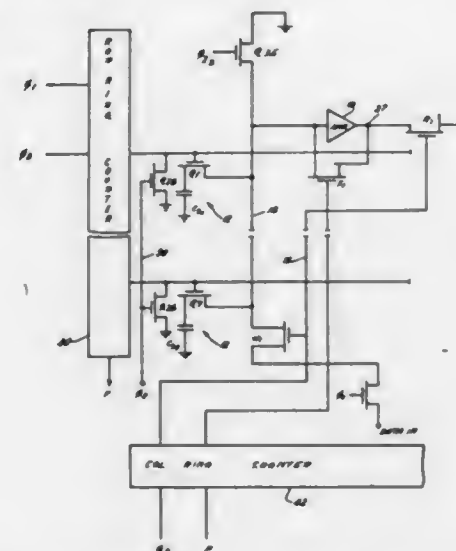
# SINGLE DEVICE MEMORY SYSTEM HAVING SHIFT REGISTER OUTPUT CHARACTERISTICS

John Leland Seely, Fort Salonga; Leo Cohen; Ronald P. Colino, both of Commack, all of N.Y., and Robert E. Pace, Glenrothes, Scotland, assignors to General Instrument Corporation, Newark, N.J.

Filed July 2, 1971, Ser. No. 159,365  
Int. Cl. G11c 11/40

U.S. Cl. 340—173 R

29 Claims



A memory or delay system having a fixed address layout provides an output of the shift register type with a significant decrease in the number of transistors per bit required resulting in a greatly increased storage capacity. A plurality of memory cells are arranged in a fixed address array and means are provided for addressing all memory cells in timed sequence. The addressing means comprises a row ring counter and a column ring counter responsive to the row ring counter and effective to sequentially address each column of memory cells after a complete row address cycle. A plurality of column conductors operatively connect the memory cells in each column to a common output circuit and are adapted to transfer the data signal stored in the selected address to said output circuit.

Means are provided to clear all column conductors to a given reference voltage prior to each addressing operation, all memory cells being isolated from their respective column conductors during this clearing operation.

A refresh amplifier is provided for each column conductor and is effective to develop an output signal corresponding to the data signal stored in the memory cell of the selected row, at an enhanced signal level, and to feed back that enhanced signal to the memory cells in the selected row. Means operatively connected to the column address means are provided to disable the feedback means of the amplifier in the selected row.

3,731,288

# CIRCULAR MAGNETIC DOMAIN DEVICES

Anthony Marsh, Blisworth, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed July 28, 1971, Ser. No. 166,751

Claims priority, application Great Britain, Aug. 19, 1970, 39,838/70

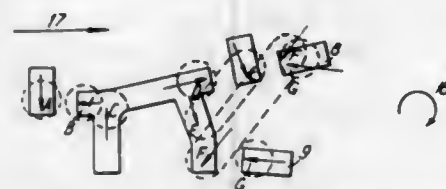
Int. Cl. G11c 11/14, 19/00

U.S. Cl. 340—174 TF

6 Claims

A circular magnetic domain device wherein binary information in the form of propagating circular magnetic domains is converted into information in the form of electrical impulses by causing each of the propagating magnetic domains to be expanded in a direction transverse to its direction of propaga-

tion in order to effect an abrupt division of the domain into at least two separate parts which collapse very rapidly after division into two circular magnetic domains. Means are provided



for detecting the division of each of the magnetic domains and generating an electrical impulse whose magnitude is proportional to the velocity of the division.

3,731,289

# CLEANING APPARATUS AND METHOD IN A MAGNETIC TAPE UNIT

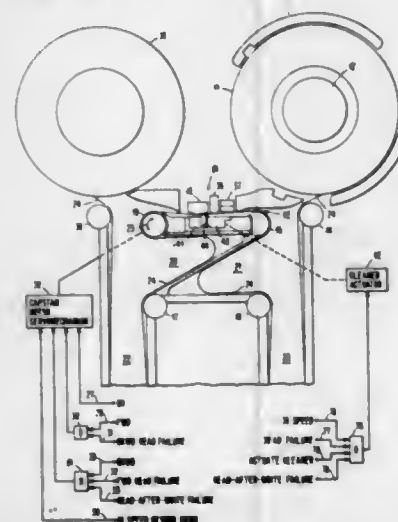
Teddy A. Bajgert, Boulder, and William J. Schaffer, Loveland, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 11, 1972, Ser. No. 225,441

Int. Cl. G11b 27/36

U.S. Cl. 340—174.1 R

29 Claims



Automatic head/tape cleaning apparatus wherein a cleaning member is selectively positioned in the head/tape transducing interface. The tape tension, normally effective to hold the tape to the head during read/write operation, is effective to hold the cleaning member against the head when it is in operative cleaning position. The movement of the cleaning member to its operative position at the transducing interface is automatically accomplished as part of read-after-write error detection, as part of read error detection, and as a result of high speed tape movement.

3,731,290

# OPTICAL MASS MEMORY

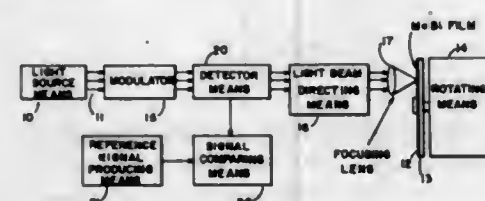
Roger L. Aagard, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed July 15, 1971, Ser. No. 162,919

Int. Cl. G11c 11/14, 11/42; G01d 15/12

U.S. Cl. 340—174 YC

6 Claims



An optical mass memory of the Curie point writing type includes a system for instantaneously checking written bits to

ensure that the magnetization direction of the bit was properly stored.

3,731,291

# INTEGRATED POSITIVE PRESSURE AND SELF-PURGE SYSTEM

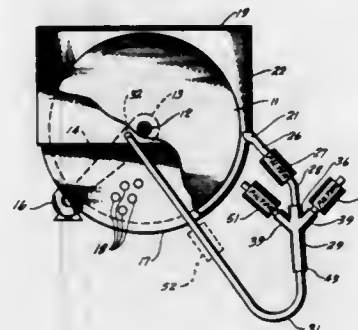
Robert J. Walsh, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed April 12, 1971, Ser. No. 133,213

Int. Cl. G11b 23/04

U.S. Cl. 340—174.1 E

22 Claims



A magnetic memory disk file system operates with a rotating memory disk within a closed housing. The air in the housing is preferably maintained at a slight positive pressure by addition of filtered air. Generation or release of particles within the housing during rotation of the disk may interfere with the magnetic memory system and are, therefore, removed by a self-purging loop taking air from the housing through a filter and returning it to the housing. The pressurization and self-purging systems are combined by way of an ejector pump for vectorially adding gas streams, thereby in one embodiment providing a positive pressure throughout the interior of the housing due solely to the "pumping" action of the rotating disk without a requirement for auxiliary pressurization. In another embodiment, a source of pressurizing gas induces self-purging within the housing whether or not the disk is rotating.

3,731,292

# FINGER BETWEEN FLEXIBLE DISC AND BACKING PLATE

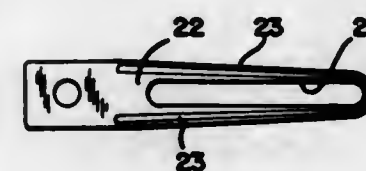
Jerry O. Kelley, Grass Valley, Calif., assignor to Arvin Industries, Inc., Columbus, Ind.

Filed Sept. 27, 1971, Ser. No. 183,856

Int. Cl. G11b 5/58

U.S. Cl. 340—174.1 E

11 Claims



A magnetic recording system includes a flexible record disc with a magnetizable surface, and a guide finger which engages the underside of the rotating disc and moves a portion of the disc flowing over the finger out of the plane of rotation of the disc. A transducer has its active face mounted close to a channel formed in the guide finger, such that a part of the deflected portion of the flexible disc is captured between the guide finger and the transducer. The flexible disc is supported either upon the perforated turntable, or as part of a sandwich construction including a flexible self-sustaining base attached at its center to the record disc, and a cover extending over the magnetizable surface of the record disc. A hub structure is secured to the record disc and the supporting disc, with the cover having a rotatable connection to the hub structure.

3,731,293

# AUTOMATIC PHASE SWITCHING OF PHASE-CODED RECORDINGS

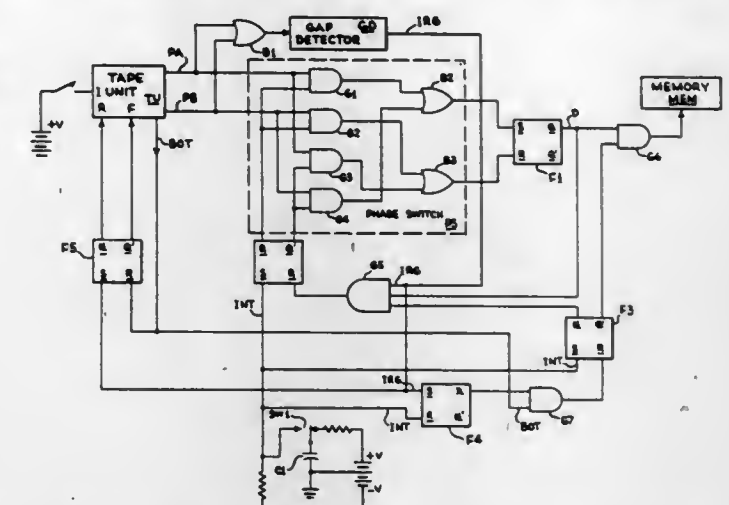
Robert B. McFiggans, Stamford, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed April 5, 1972, Ser. No. 241,266

Int. Cl. G11b 5/02, 5/44

U.S. Cl. 340—174.1 H

8 Claims



Apparatus reads phase-coded flux representing data from a magnetic tape and at the end of a block of data determines whether the representation of the magnetic flux transition at the end of the block is in a particular direction and if not the read out signals are inverted while the tape is reread.

3,731,294

# MONITORING SYSTEM

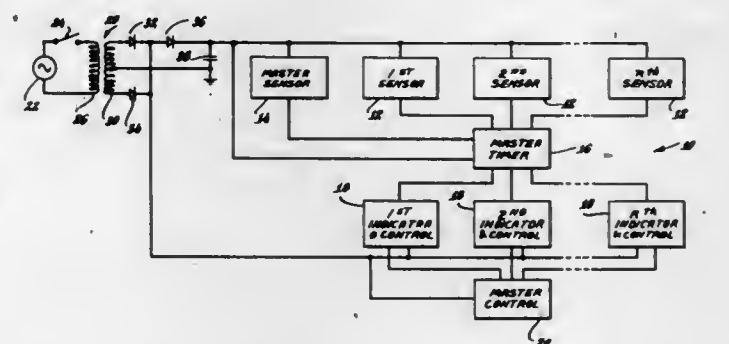
Leslie Vass, Bridgeport, Conn., assignor to Harvey Hubbell, Incorporated, Bridgeport, Conn.

Filed Aug. 24, 1971, Ser. No. 174,422

Int. Cl. G08b 19/00

U.S. Cl. 340—213 R

12 Claims



A monitoring system for manufacturing or processing operations which is highly flexible and adaptable to provide a number of diverse monitoring functions. The system includes a highly sensitive sensor having a pressure switch and a resistance probe which may be connected in a number of diverse ways to provide different combinations of sensing functions; a resistance bridge connected to the pressure switch and resistance probe which becomes unbalanced when the predetermined event is sensed; an amplifier for amplifying the unbalance of the bridge; and an electronic switch controlled by the resistance bridge to provide an output signal when the event is sensed. The output signal may be connected directly to an indicator and control section for indicating the sensed event or it may be coupled through a master timer under the control of a master sensor or clock. The indicator includes a latch and nonlatch mode and provides an output signal to a master control which, through appropriate contact logic, can initiate a variety of control functions as desired.



3,731,295

## LEAK DETECTOR FOR ENCLOSED ELECTRICAL APPARATUS

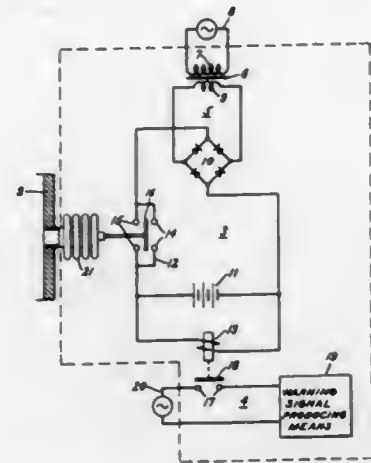
Robert Van Luyk, Rome, Ga., assignor to General Electric Company

Filed March 17, 1971, Ser. No. 125,121

Int. Cl. G08b 21/00

U.S. Cl. 340-242

5 Claims



A detector for sensing the presence of a leak in a sealed, fluid-filled enclosure for electrical apparatus. The detector includes means for determining when the pressure within the enclosure is substantially equal to the pressure without the enclosure. When such a condition has existed for a preselected time period a warning device is actuated to indicate the existence of a leak in the enclosure.

3,731,296

## TRANSFER CHECKING DEVICE FOR ANALOG DATA ACQUISITION SYSTEM

Nathan Spira, Clamart, France, assignor to Controle Bailey (Societe Anonyme), Clamart, France

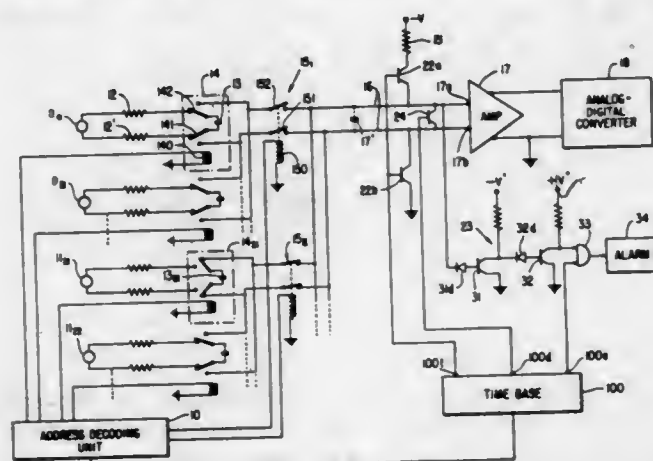
Filed Jan. 28, 1972, Ser. No. 221,698

Claims priority, application France, Feb. 5, 1971, 7103870

Int. Cl. G08b 21/00

U.S. Cl. 340-248 A

3 Claims



A data transfer checking device for an analog data acquisition system of the type in which each one of a plurality of data sources each delivering a data voltage are cyclically made to charge a capacitor, the charging voltage of which is subsequently transferred to the input terminals of an amplifier after the capacitor electrodes have been switched to said terminals. These terminals are respectively connected to the poles of a d.c. voltage source through the source-and-drain circuits of two field effect transistors, the gates of both of which receive test pulses from a time base. A difference voltage between the actual potential of one of said input terminals and a reference voltage is thus cyclically obtained, and this difference voltage is applied to one of the inputs of an AND gate, the other input of which cyclically receives sampling pul-

ses from said time base. When the capacitor voltage has not been properly transferred, the difference voltage takes such a value that a signal appears at the output of the AND gate and actuates an alarm circuit. A third field effect transistor connected across the amplifier input and the gate of which cyclically receives discharge pulses eliminates any residual voltage existing at said amplifier input.

3,731,297

## APPARATUS FOR DETECTING THE ACID FORMATION IN LIQUID SOLVENTS

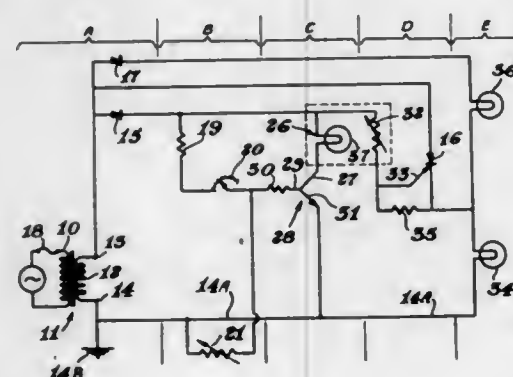
James L. Dunn, Jr.; James C. Renfro, and John V. Goode, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 25, 1968, Ser. No. 762,532

Int. Cl. G08b 21/00

U.S. Cl. 340-248

4 Claims



The present invention comprises a method and apparatus for detecting acid-formation in non-conductive liquids by monitoring the change in resistance brought about by the acid-corrosion of a metal immersed in said liquid.

3,731,298

## ATHLETIC FALSE STARTS DETECTOR

Michael Weidacher, Spichenstrasse 10, Munich, Germany

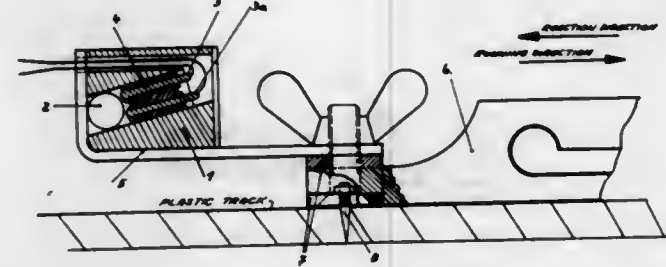
Filed April 8, 1971, Ser. No. 132,356

Claims priority, application Germany, April 10, 1970, P 20 17 288.7

Int. Cl. G08b 21/00

U.S. Cl. 340-262

11 Claims



The present device is constructed for detecting false starts in athletic events. For this purpose inertia switching means are rigidly but nevertheless removably attachable to the starting plate so that any athlete may use his own individual starting plate. The inertia switching means comprise an insulating block and a conducting inertia body movably supported in said insulating block which also has supported therein two contact wires with exposed ends to be directly connected to each other when the entire insulating block moves in a given direction in response to a start while the electrically conducting inertia body remains briefly in position due to its inertia. A slope in the insulating block assures that the inertia body goes back to its non-contacting position.

3,731,299

## GRAPHICAL KEYBOARD OPERATED DISPLAY DEVICE

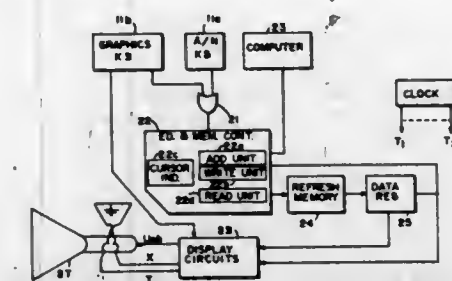
Richard J. Bouchard, Amherst, N.H., and William R. Sanders, Palo Alto, Calif., assignors to Sanders Associates, Inc., South Wausau, N.H.

Filed Oct. 2, 1970, Ser. No. 77,490

Int. Cl. G061 3/14

U.S. Cl. 340-324 A

11 Claims



Graphical display apparatus in which an operator can display on a cathode ray tube (CRT) screen in real time graphical images by operating a graphical keyboard. The graphical keyboard has keys which are designated by differently sloped ones of a group of incremental line segments. The graphical keyboard can be employed in a display system which also includes an alphanumeric keyboard.

3,731,300

## DIGITAL TO SIN/COS CONVERTER

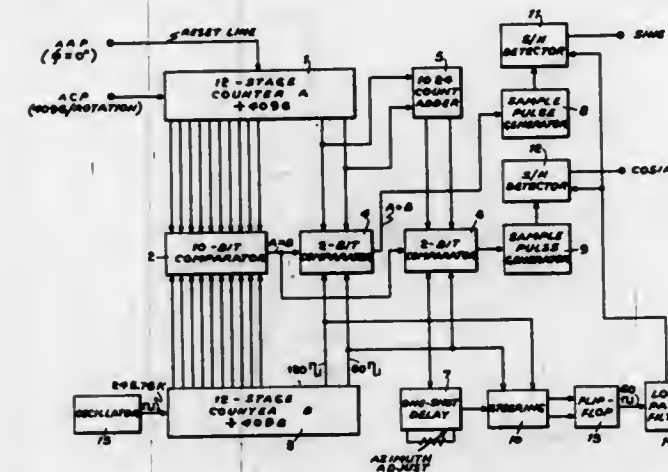
Weldon Wayne Grentman, Hicksville, Ohio, and Isaac Roger Studebaker, Fort Wayne, Ind., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 13, 1971, Ser. No. 171,577

Int. Cl. H03k 13/02

U.S. Cl. 340-347 DA

7 Claims



In a radar system, an arrangement for converting digital information representative of the rotational (azimuthal) position of the radar antenna to sine and cosine of azimuth waveforms for use in a display such as a plan position indicator. Azimuth change pulses indicative of the antenna's rotation and azimuth reference pulses indicating the 0° reference direction are applied to a first counter, the individual outputs of each stage of which are in turn coupled to a comparator arrangement. The state of the first counter is compared with that of a second counter which is fed by a pulse source standard. The output of the last stage of the second counter is treated and filtered to provide a pure sinusoidal reference waveform to be sampled in a sample/hold detector arrangement. From the comparator arrangement sampling pulses are derived in accordance with the rotational position of the antenna relative to the digital reference as represented by the count in the second counter, with these sampling pulses then being applied to the sample/hold detector in order to produce a sine of azimuth waveform. A cosine of azimuth waveform is also derived via an adder stage in conjunction with the comparator

3,731,301

## METHODS OF DETECTING ROTATION SPEED

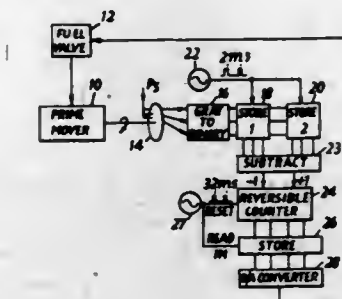
John Christopher Hammond Davis, Taplow, England, assignor to Plessey Handel Und Investments A.G., Zug, Switzerland

Filed July 6, 1971, Ser. No. 159,890

Int. Cl. G08c 9/06

U.S. Cl. 340-347 P

15 Claims



Apparatus, preferably fluidic, for providing a control signal indicative of any deviation of the speed of movement of a jet engine or other moving object from a desired speed, comprising a code disc rotated at a speed proportional to the speed of rotation of the jet engine, logic means which cyclically samples the tracks on the code disc at equal time intervals and produces an output signal if the difference between two successive samples is more than a predetermined amount, and integration means which receives and integrates said output signals to provide said control signal. The control signal may be applied to a valve controlling the supply of fuel to the engine so as to govern the engine speed.

3,731,302

## DIGITAL/ANALOG CONVERSION SYSTEM

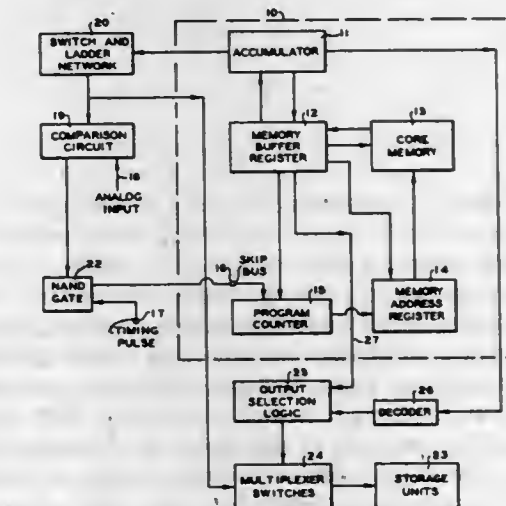
Harold M. Neer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 14, 1970, Ser. No. 71,903

Int. Cl. H03k 13/02

U.S. Cl. 340-347 AD

5 Claims



A general purpose computer is utilized for analog to digital conversion by utilizing a switch and ladder network which cooperates with a comparison circuit and a gate to perform a conversion subroutine in the computer. Several analog inputs can be successively converted to digital form and stored in core memory. These input values, or computed values, can further be transferred to analog storage units for recording, by utilization of multiplexer switches having their output selection logic controlled by the computer program.



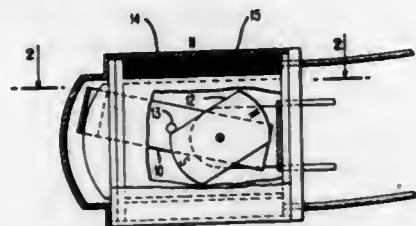
3,731,303

**MAGNETIC LATCHING INDICATOR**

Harry E. Wohlbach, Allentown, Pa., assignor to Electro Mechanical Instrument Company, Inc., Perkasie, Pa.  
Filed May 5, 1970, Ser. No. 34,720  
Int. Cl. G08b 5/22

U.S. Cl. 340—373 R

8 Claims



In an indicator having a moving permanent magnet mounted on an arbor, a pointer is mounted on the arbor for rotation independent of the rotation of the moving magnet. This moving permanent magnet engages a projection on the pointer during a portion of its rotation. A control permanent magnet is positioned with its poles lying in the plane of the first permanent magnet poles to latch the moving permanent magnet by repulsion upon rotation in one direction or the other.

3,731,304

**TRACK-BEFORE-DETECT SYSTEM**

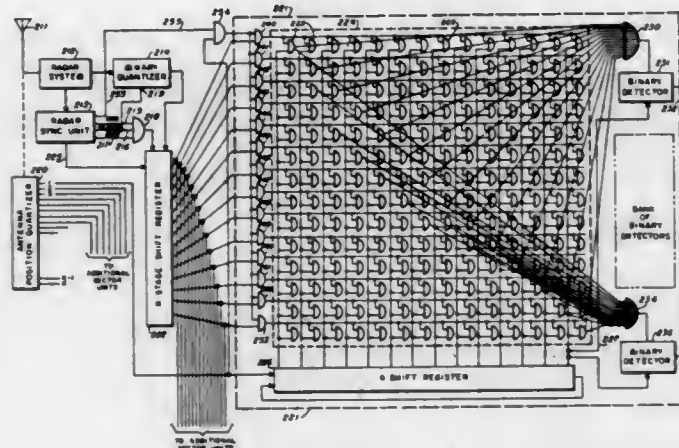
James W. Caspers, and Carlos Nuñez, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Sept. 8, 1961, Ser. No. 137,944

Int. Cl. G01s 9/14

U.S. Cl. 343—5 DP

13 Claims



1. A track detection system comprising; receiving means for receiving reflected radio frequency signals from an object in a given medium, range storage means operatively coupled to said receiving means for storing range, information therein between a minimum and maximum range, position indicating means operatively coupled to said receiving means for indicating the direction from which said radio frequency signals are received, position storage means comprising shift register means operatively coupled to said position indicating means for storing information therein corresponding to receiving means position and sequentially shifting said information through said register with respect to time, coinciding means operatively coupled to said range storage means and said position storage information and producing outputs therefrom when data corresponding to a particular range and a particular position of the receiving means are coincident therein, said coincidence means being operative to perform a cross-correlation with a class of possible tracks; counting means operatively coupled to said coinciding means for counting a number of outputs from said coinciding means and performing a decision as to the presence or absence of an object for each test track.

3,731,305

**OBJECT DETECTION SYSTEM USING ELECTRO MAGNETIC WAVES**

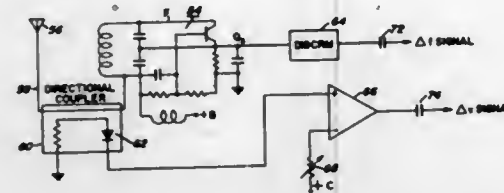
John B. Gehman, San Diego, Calif., assignor to General Dynamics Corporation, San Diego, Calif.

Filed Dec. 9, 1971, Ser. No. 210,264

Int. Cl. G01s 9/42

U.S. Cl. 343—5 PD

32 Claims



Objects such as personnel and vehicles are detected when they enter a sensing field produced by an antenna which is excited by oscillators operating in the VHF frequency band by producing cyclic variations in the frequency and in the amplitude of the oscillators exciting signal, which variations are in approximately quadrature phase relationship. The system responds to the correlation between the amplitude and the phase variation so as to produce an alarm indication of both the presence of an intruding object and its direction of movement, either toward or away from sensing the antenna.

3,731,306

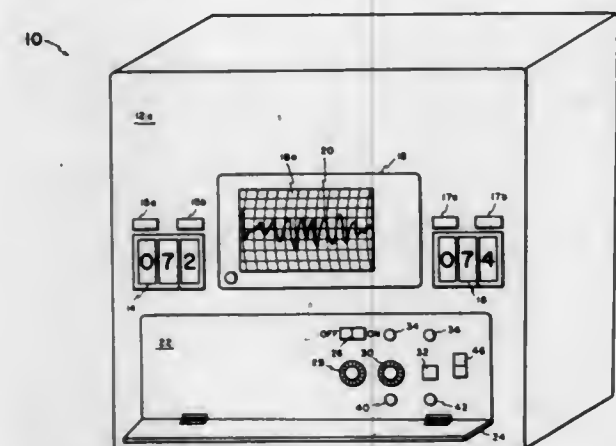
SEA STATE ANALYZER USING RADAR SEA RETURN  
George F. Andrews, Miami, Fla., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 24, 1972, Ser. No. 220,089

Int. Cl. G01s 7/04, 9/02

U.S. Cl. 343—5 R

8 Claims



A sea state analyzer samples sea clutter video from a selected range at the radar pulse repetition rate and passes the sample through an active filter to provide ocean wave analog voltage signals which are recorded. Circuitry is described which derives from the analog voltage signals and from clock signals, the average wave time period for waves of each group having a predetermined number of waves. One digital display shows the average for the last group computed while another shows the average being developed for a current group.

3,731,307

**ELECTRICAL DETECTING MEANS**

Lincoln H. Charlot, Jr., Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
Continuation of Ser. No. 817,081, April 21, 1969, abandoned.

This application July 9, 1971, Ser. No. 161,917

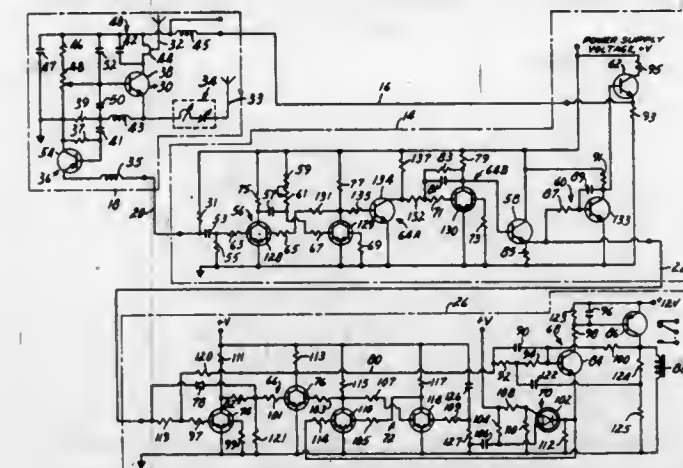
Int. Cl. G01s 9/42; G08b 13/22

U.S. Cl. 343—7.5

16 Claims

A pulsed mode radar detector the pulse repetition rate of which is a function of environment and moving object reflected signals which has a negative feedback voltage regula-

tor for maintaining the radar detector pulse rate constant from one environment to another. The detector pulse interval is essentially constant but the interpulse interval, for a given supply voltage, varies according to the reflected signal phase



and amplitude. The negative feedback voltage regulator compensates for a change in the environment reflected signal to provide a constant duration interpulse interval from one environment to another.

3,731,308

**SUBAUDIBLE FREQUENCY INDICATOR FOR DOPPLER RADAR**

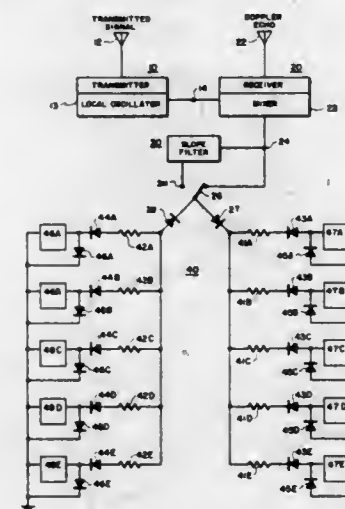
Richard S. Felner, Barnegat, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed June 10, 1971, Ser. No. 151,662

Int. Cl. G01s 9/42, 9/44

U.S. Cl. 343—7.7

7 Claims



This invention relates to doppler-radar indicating systems and particularly to a system for detecting and indicating doppler beat frequencies in the extremely low frequency range. In this system, a series of lights are actuated by relatively small changes in voltage to clearly indicate a very-slowly-changing alternating voltage.

3,731,309

**DOPPLER RADAR SIMULATOR**

Bennett A. Meyer, Port Chester; Thomas A. Burns, New York, and Peter Anelli, Ossining, all of N.Y., assignors to The Singer Company, Little Falls, N.J.

Filed Nov. 8, 1971, Ser. No. 196,326

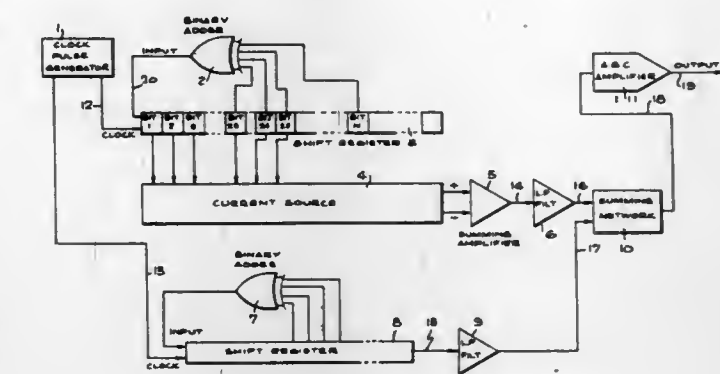
Int. Cl. G01s 7/40

U.S. Cl. 343—17.7

9 Claims

A Doppler radar simulator is provided for generating signals for testing Doppler radar navigational systems. The Doppler

simulator of the invention utilizes digital techniques in order to perform with the required high degree of accuracy and precision for the proper simulation of Doppler radar navigational system.



The simulator of the invention utilizes shift registers and other components to generate, on a digital basis, the required Doppler simulation signals and wide band background noise.

3,731,310

**OPERATING PROXIMATE RADARS WITH INTERLACED SPECTRAL LINES**

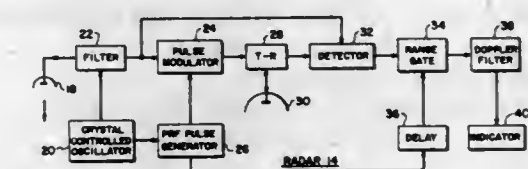
Otto E. Rittenbach, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed June 30, 1971, Ser. No. 158,358

Int. Cl. G01s 9/02

U.S. Cl. 343—17.1 R

9 Claims



A plurality of radars are operated in the same electronic spectrum segment and, though close enough to one another to intercept reflected or direct beam energy from one another, they do not interfere. All the radars are coherently pulsed at the same pulse repetition frequency. Their carrier frequencies differ by frequency steps that are equal to a fraction of the pulse repetition frequency so that the spectral lines of the respective radars interlace. All of the radars may utilize a common reference frequency source for their carrier frequencies.

3,731,311

POLYPHASE ENCODING-DECODING SYSTEM  
Frederick C. Williams, Topanga, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 18, 1970, Ser. No. 73,470

Int. Cl. G01s 17/32

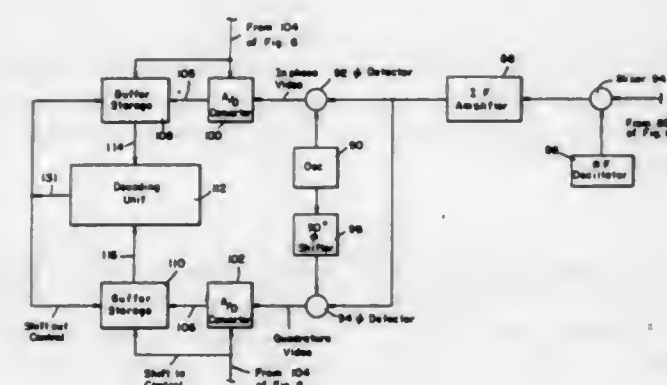
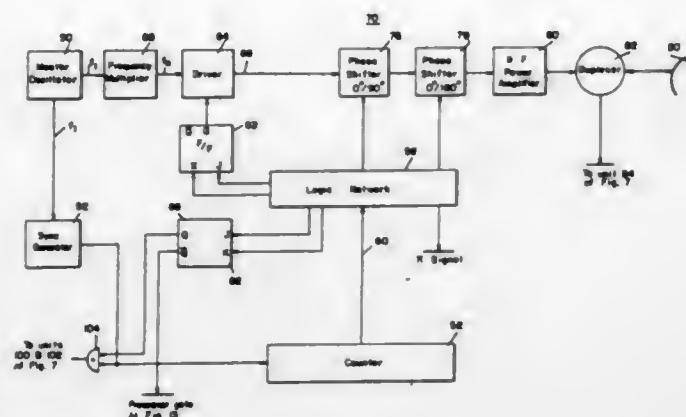
U.S. Cl. 343—17.2 PC

26 Claims

A polyphase pulse compression system for simultaneously decoding and amplitude weighting groups of sequentially applied phase encoded signals. For a phase encoded signal group of  $N^2$  signal elements the decoded amplitude weighted value of a particular signal group is formed by modifying only  $N$

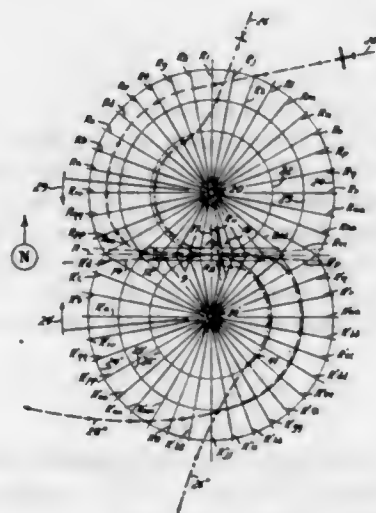


stored sub-accumulation signals from the preceding decoding cycle. Dual processing storage channels associated with each



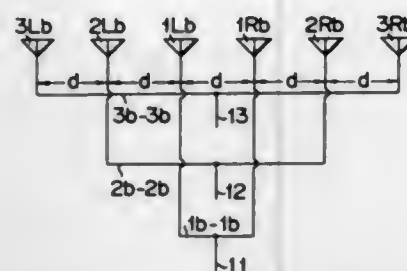
sub-accumulation signal are alternately cleared to reduce processor error "build-up."

**3,731,312**  
**AIR TRAFFIC CONTROL UTILIZING ROTATING RADIAL SIGNALS**  
Haig Kurkjian, R.D. 1, Malvern, Pa.  
Filed March 27, 1970, Ser. No. 23,344  
Int. Cl. G01S 3/02  
U.S. Cl. 343-112 TC 16 Claims



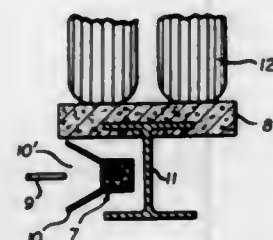
Air traffic is controlled to follow azimuthally rotating radial signals, from an off-airport terminal omnirange station, sweeping over an air-port in a direction and at a speed suitable for approach to landing. Dual omnirange stations flanking the air-port may be used similarly for control of traffic to respective dual runways or for control of departure after takeoff as well as approach to landing.

**3,731,313**  
**VAN-ATTA ARRAY ANTENNA DEVICE**  
Kiyoshi Nagai, Yokohama-shi, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan  
Continuation-in-part of Ser. No. 868,415, Oct. 22, 1969, abandoned. This application Sept. 9, 1971, Ser. No. 179,053  
Int. Cl. H01q 3/26  
U.S. Cl. 343-854 2 Claims



In a Van-Atta array antenna device of the type wherein a plurality of equally spaced antenna elements are disposed in parallel and respective pairs of antenna elements disposed symmetrically with respect to the center of the antenna array are interconnected by feeders of substantially the same length, impedance matching stubs having an adjustable length are connected to substantially the center of respective feeders in order to enable incoming electromagnetic waves to be reradiated either straight backward or in an opposite direction to that in which they are receiving, with respect to the antenna boresight, without changing the characteristic impedance of feeders.

**3,731,314**  
**VEHICULAR COMMUNICATIONS SYSTEMS**  
Theodore Hafner, 1501 Broadway, New York, N.Y.  
Filed March 24, 1971, Ser. No. 127,588  
Int. Cl. H01q 1/32  
U.S. Cl. 343-717 8 Claims

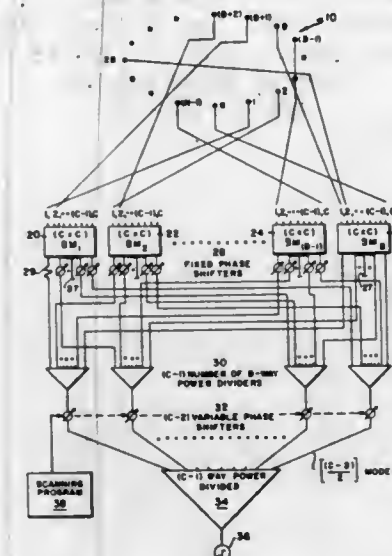


This invention consists of a waveguide of substantially trapezoidal cross section, having at its smaller end a closed base portion, surrounding a conductor spaced therefrom, and extending therefrom a gradually widening top portion open at its outer end to permit the wave propagated along the wave guide to emerge therefrom into a space adjoining said top portion.

**3,731,315**  
**CIRCULAR ARRAY WITH BUTLER SUBMATRICES**  
Boris Sheleg, Ft. Washington Estates, Md., assignor to The United States of America as represented by the Secretary of the Navy  
Filed April 24, 1972, Ser. No. 247,087  
Int. Cl. H01q 3/26  
U.S. Cl. 343-854 4 Claims

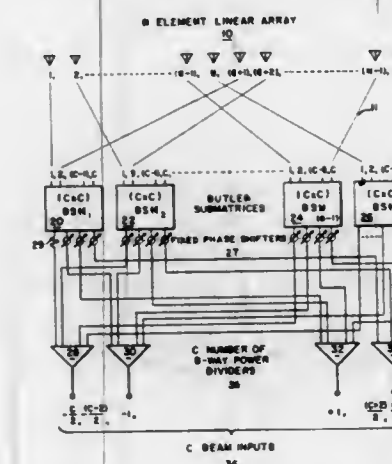
Several small Butler matrices are interconnected in a manner to replace a large Butler matrix employed in a beam forming and scanning network for a circular antenna array. This system of Butler submatrices (a set of low order Butler matrices simulating a single higher order Butler matrix) permits a reduction in the size of an existing feed system without any sacrifice in the 360° beam steering capability. Also this system produces only a minimal loss in beamwidth. A major

difference between this system and the systems of the prior art is the number of modes available. For this instant submatrix feed system, the number of available modes is at most, one-half of that in the well known single Butler matrix system. The additional modes in the single Butler matrix system of the prior art are "high order" modes and have generally produced



poor quality far field patterns. As a result only a small percentage of these modes could be used in practice. Hence for most applications, the two systems provide essentially the same performance with the submatrix feed system being more economical since it is simpler, requires less hardware, and is more efficient in that all but one of the available modes are high quality modes.

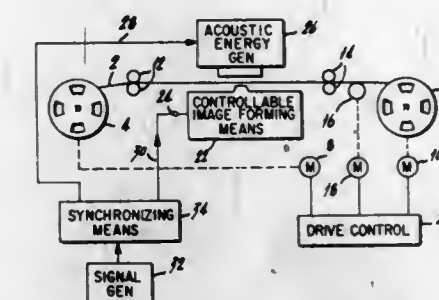
**3,731,316**  
**BUTLER SUBMATRIX FEED FOR A LINEAR ARRAY**  
Boris Sheleg, Fort Washington Estates, Md., assignor to The United States of America as represented by the Secretary of the Navy  
Filed April 25, 1972, Ser. No. 247,426  
Int. Cl. H01q 3/26  
U.S. Cl. 343-854 5 Claims



Several small Butler matrices are interconnected in a manner to replace a large single Butler matrix employed in a beam forming and scanning network for a linear array. This system of Butler submatrices (a set of low order Butler matrices simulating a single higher order Butler matrix) permits reduction in the size of existing feeding systems, which results in a substantial savings of system components and hardware. The function of this submatrix feed system is substantially identical to that of the single multibeam matrix network in most respects except for a fewer number of available beams. Also, this submatrix feed system is capable of exciting linear arrays which cannot presently be excited by a single Bu-

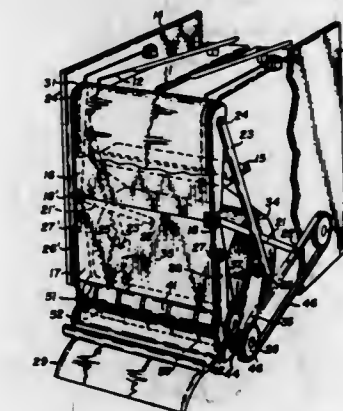
ter matrix. Also, the system has application in satellite communications and direction finding equipment.

**3,731,317**  
**VIBRATING WEB TRANSPORT APPARATUS**  
Pieter deBruyne, Burlington, Mass., assignor to RCA Corporation, New York, N.Y.  
Filed Dec. 21, 1970, Ser. No. 100,279  
Int. Cl. G01d 15/28; G03b 1/48  
U.S. Cl. 346-107 R 3 Claims



A technique for providing information transducing with a moving optical record medium so that a desired transducing resolution is achieved while preventing abrasion damage to the recording medium and build up of foreign substances in the information interface. This is accomplished by vibrating the medium into intermittent contact with an image forming means, which is enabled only during the contacting relation, to transduce information with the recording medium.

**3,731,318**  
**PAPER TRANSPORT STRUCTURE FOR RECORDER COMPRISING FOLDABLE FACE PLATE**  
K. Shirian Dickey, North Ogden, Utah, assignor to Hewlett-Packard Company, Palo Alto, Calif.  
Filed May 25, 1972, Ser. No. 256,859  
Int. Cl. G01d 15/24  
U.S. Cl. 346-145 18 Claims



A recorder utilizing a recording medium such as paper threaded over a front face plate where the recorded signals may be viewed, the front face plate being formed by two separate plate sections which may be folded at a central region to produce an opening in the front of the recorder for loading and unloading the paper supply roll. The mechanical linkage for moveably supporting the face plate sections on the recorder chassis also carries a moveable paper supply support structure, the support structure moving forwardly as the front plate is folded such that the access to the supply roll support is substantially enhanced. The threading path for the paper is extremely simple with the two face plate sections in the folded condition, the unfolding operation of the face plate sections serving to carry the paper into engagement with the paper drive mechanism. The paper drive mechanism remains in engagement with the main drive train during the paper loading operation.



# DESIGNS

MAY 1, 1973

226,791  
HAT

Eleanor R. Schaller, 364 W. Heather Court,  
Eau Claire, Wis. 54701  
Filed Nov. 15, 1971, Ser. No. 199,080  
Term of patent 14 years  
Int. Cl. D2-03

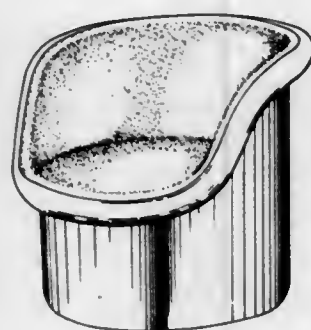
U.S. Cl. D2-251



226,793  
SEAT

Donald Watamura, West Hempstead, N.Y., assignor to  
Herman Miller, Inc., Zeeland, Mich.  
Filed Sept. 21, 1970, Ser. No. 25,123  
Term of patent 14 years  
Int. Cl. D6-02

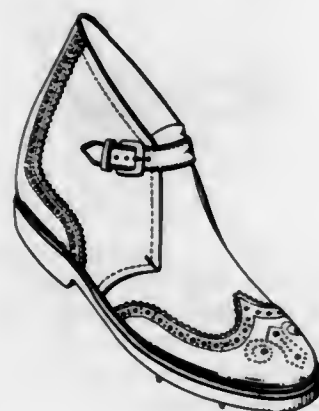
U.S. Cl. D6-20



226,792  
GOLF BOOT

Clara H. Gault, 1218-B Greenoaks Lane,  
Charlotte, N.C. 28201  
Filed Oct. 4, 1971, Ser. No. 186,591  
Term of patent 14 years  
Int. Cl. D2-04

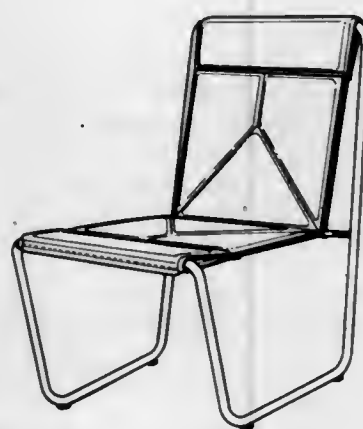
U.S. Cl. D2-311



226,794  
CHAIR

Gerry D. Welton, 910 E. Tripp, Peoria, Ill. 61603  
Filed July 14, 1971, Ser. No. 162,759  
Term of patent 14 years  
Int. Cl. D6-02

U.S. Cl. D6-66



MAY 1, 1973

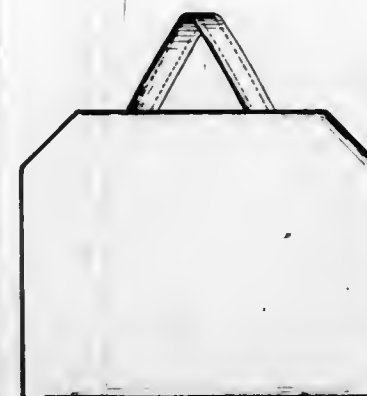
U. S. PATENT OFFICE

395

226,795  
PORTABLE CUSHION

Andrew Johnson, 3140 N. 12th St.,  
Philadelphia, Pa. 19133  
Filed Aug. 5, 1970, Ser. No. 24,310  
Term of patent 14 years  
Int. Cl. D6-09

U.S. Cl. D6-201



226,798  
CAN OPENER

Samuel J. Mann, Englewood, N.J., assignor to Westing-  
house Electric Corporation, Pittsburgh, Pa.  
Filed Oct. 14, 1971, Ser. No. 189,486  
Term of patent 14 years  
Int. Cl. D7-04

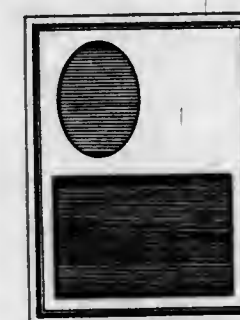
U.S. Cl. D8-36



226,796  
PICTURE FRAME

Richard L. Shinnick, 10659 Cranks Road,  
Culver City, Calif. 90230  
Filed Apr. 6, 1972, Ser. No. 241,879  
Term of patent 14 years  
Int. Cl. D6-07

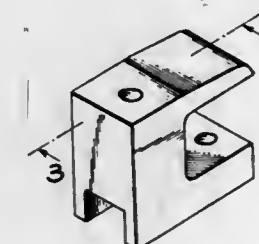
U.S. Cl. D6-234



226,799  
BEAM CLAMP BODY

Raymond M. Rumble, Girard, Ohio, assignor to Michigan  
Hanger Company, Inc., Hubbard, Ohio  
Filed May 10, 1972, Ser. No. 252,151  
Term of patent 14 years  
Int. Cl. D8-08

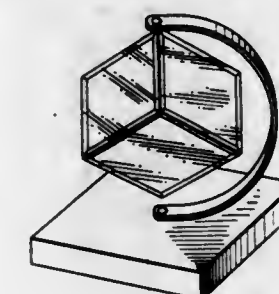
U.S. Cl. D8-235



226,797  
COMBINED DISPLAY CUBE AND  
STAND THEREFOR

Marshall C. Schneider, Newton Center, Mass., assignor to  
Charles D. Barnes Co.  
Filed May 26, 1971, Ser. No. 147,294  
Term of patent 14 years  
Int. Cl. D6-06

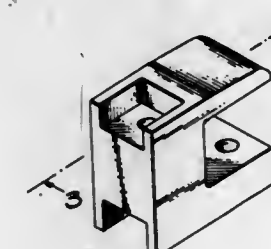
U.S. Cl. D6-235



226,800  
BEAM CLAMP BODY

Raymond M. Rumble, Girard, Ohio, assignor to Michigan  
Hanger Company, Inc., Hubbard, Ohio  
Filed May 10, 1972, Ser. No. 252,152  
Term of patent 14 years  
Int. Cl. D8-08

U.S. Cl. D8-235



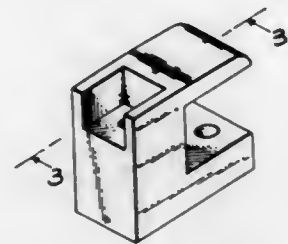


226,801

**BEAM CLAMP BODY**

Raymond M. Rumble, Girard, Ohio, assignor to Michigan Hanger Company, Hubbard, Ohio  
 Filed May 10, 1972, Ser. No. 252,154  
 Term of patent 14 years  
 Int. Cl. D8—08

U.S. Cl. D8—235

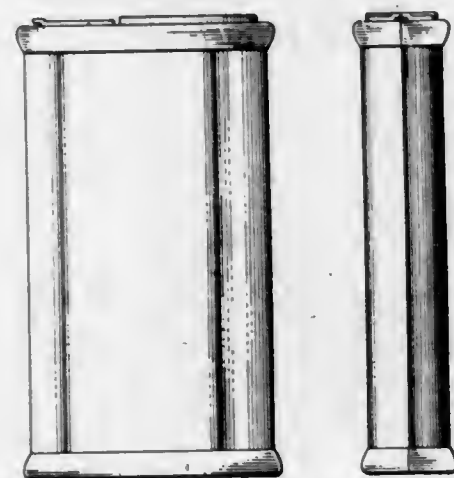


226,802

**DISPENSING CONTAINER**

John B. Ames, Box 670, Marion, Ala. 36256  
 Filed Sept. 15, 1971, Ser. No. 180,946  
 Term of patent 14 years  
 Int. Cl. D9—01

U.S. Cl. D9—71



226,803

**BOTTLE**

Frank E. Wood, 700 E. 1st St., Tulsa, Okla. 74120  
 Filed Oct. 20, 1971, Ser. No. 191,142  
 Term of patent 14 years  
 Int. Cl. D9—01

U.S. Cl. D9—139

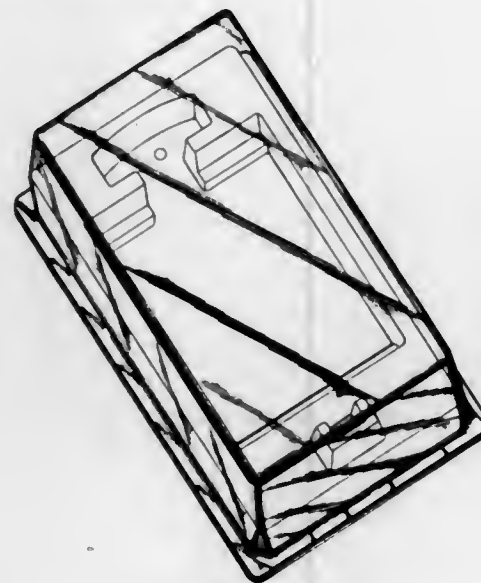


226,804

**RAZOR CASE**

Donald A. Leathers, South Easton, Mass., assignor to The Gillette Company, Boston, Mass.  
 Filed Apr. 24, 1972, Ser. No. 247,259  
 Term of patent 14 years  
 Int. Cl. D9—03

U.S. Cl. D9—186

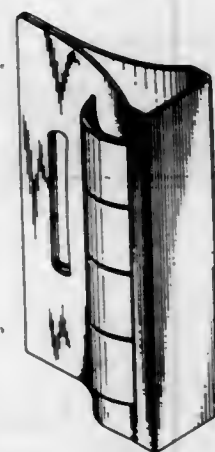


226,805

**PACKAGE OF MUGS**

Bela B. Neval, Dobbs Ferry, N.Y., assignor to Nevco Products Co., Inc.  
 Filed June 18, 1971, Ser. No. 154,710  
 Term of patent 14 years  
 Int. Cl. D9—03

U.S. Cl. D9—193



226,806

**DISPENSING CLOSURE**

Robert E. Hazard, North Kingstown, R.I., assignor to Polytop Corporation, Slatersville, R.I.  
 Filed Aug. 2, 1971, Ser. No. 168,533  
 Term of patent 14 years  
 Int. Cl. D9—07

U.S. Cl. D9—275

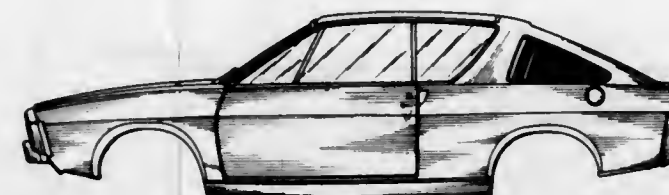


226,807

**VEHICLE BODY**

Michel Tixier, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt, France  
 Filed Nov. 15, 1971, Ser. No. 199,088  
 Term of patent 14 years  
 Int. Cl. D12—08

U.S. Cl. D14—3 G

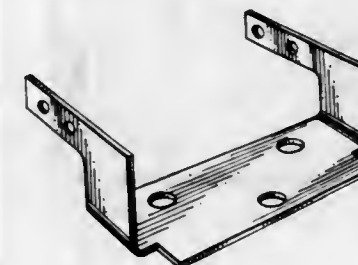


226,808

**TRAILER HITCH PLATE**

Richard W. Rollins, Joliet, Ill., assignor to Nash Bros. Co., Joliet, Ill.  
 Filed Mar. 4, 1971, Ser. No. 121,231  
 Term of patent 14 years  
 Int. Cl. D12—10, 16; D8—08

U.S. Cl. D14—6 C

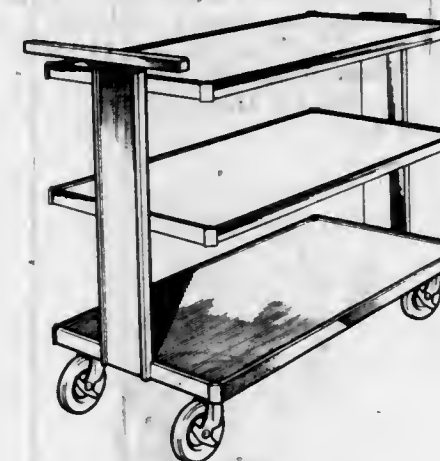


226,809

**CART**

Gilbert A. Cummings, Norwell, and William J. Hannon, Cohasset, Mass., assignors to Peters & Company, Inc., Boston, Mass.  
 Filed May 15, 1971, Ser. No. 124,643  
 Term of patent 14 years  
 Int. Cl. D12—14

U.S. Cl. D14—6 M



226,810

**GUN CARRIER**

Ralph Winfrey, 7012 Lexington Ave., St. Louis, Mo. 63121  
 Filed Apr. 28, 1972, Ser. No. 248,781  
 Term of patent 14 years  
 Int. Cl. D22—99

U.S. Cl. D22—13

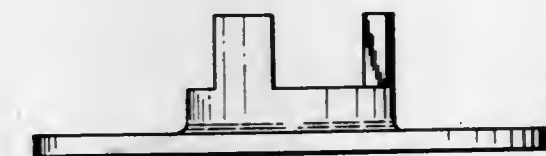


226,811

**CASSETTE REEL MOTION INDICATOR**

John M. Baker, San Clemente, Calif., assignor to Cassette Magnetics Corporation, doing business as American Cassette Corporation, Inglewood, Calif.  
 Filed Nov. 12, 1971, Ser. No. 198,491  
 Term of patent 14 years  
 Int. Cl. D14—01

U.S. Cl. D26—14 B

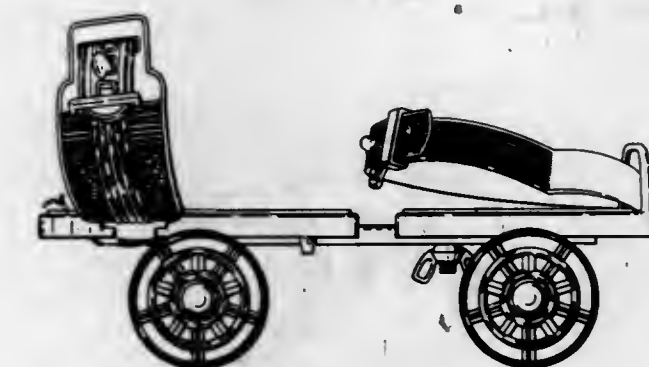


226,812

**ROLLER SKATE**

Choy Cheung Tat, Kowloon, Hong Kong, assignor to Grace Artificial Jewellery Manufacturing Co. Ltd., Kowloon, Hong Kong  
 Filed June 7, 1971, Ser. No. 150,884  
 Claims priority, application Great Britain Apr. 21, 1971  
 Term of patent 7 years  
 Int. Cl. D21—01

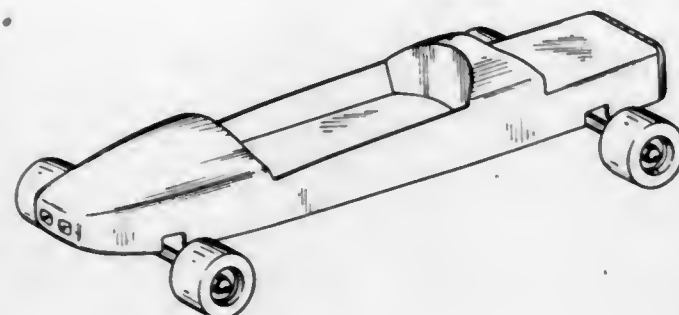
U.S. Cl. D34—14 C





**226,813**  
**ORNAMENTAL SKATEBOARD**  
 Lawrence C. French, 8267 Buffalo Ave.,  
 Norfolk, Va. 23518  
 Filed Dec. 6, 1971, Ser. No. 205,480  
 Term of patent 14 years  
 Int. Cl. D21-01

U.S. Cl. D34-15 AJ



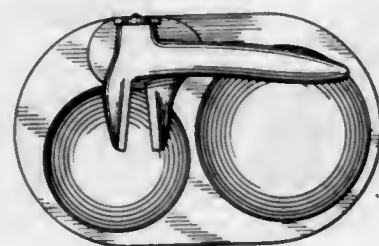
**226,814**  
**SLED**  
 Leonard R. Gaylord, Gates, N.Y., assignor to  
 International Valde Corp., Rochester, N.Y.  
 Filed Feb. 4, 1972, Ser. No. 223,811  
 Term of patent 14 years  
 Int. Cl. D21-02

U.S. Cl. D34-15 AK



**226,815**  
**COMBINED NUTCRACKER AND BOWL**  
 Joel T. Hartmeister, P.O. Box 268,  
 Aspen, Colo. 81611  
 Filed June 14, 1971, Ser. No. 153,162  
 Term of patent 14 years  
 Int. Cl. D7-04

U.S. Cl. D44-1 E



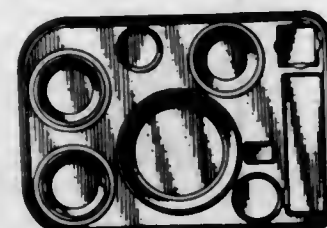
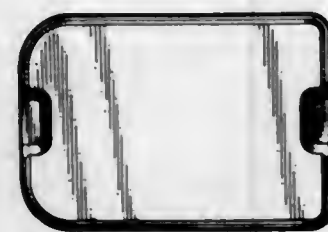
**226,816**  
**FRYING PAN**  
 Fred Press, White Plains, N.Y., assignor to House  
 Mates, Inc., Hartsdale, N.Y.  
 Filed June 23, 1971, Ser. No. 156,165  
 Term of patent 14 years  
 Int. Cl. D7-02

U.S. Cl. D44-1 J



**226,817**  
**COVERED SERVING TRAY**  
 William A. Madalin, Franklin, Mich., assignor to  
 American Supply Corporation, Evanston, Ill.  
 Filed Oct. 21, 1971, Ser. No. 191,567  
 Term of patent 14 years  
 Int. Cl. D7-01

U.S. Cl. D44-10 E



**226,818**  
**COMBINED FLASHLIGHT AND DETACHABLE  
 PUMPKIN MASK THEREFOR**  
 Perry Feuer, Roslyn, N.Y., assignor to Creative  
 Creations, Inc., New York, N.Y.  
 Filed Feb. 25, 1971, Ser. No. 119,075  
 Term of patent 14 years  
 Int. Cl. D26-02

U.S. Cl. D48-24 A



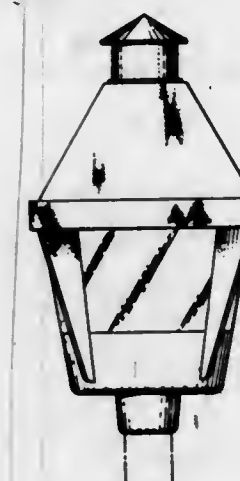
**226,819**  
**GAS LOG LIGHTER**  
 Carl A. Sundstrom, deceased, late of Torrance, Calif., by  
 Carl C. Sundstrom, administrator, 1700 Via Arriba,  
 Palos Verdes Estates, Calif. 90274  
 Filed July 15, 1971, Ser. No. 163,126  
 Term of patent 14 years  
 Int. Cl. D26-99

U.S. Cl. D48-27 C



**226,820**  
**POST TOP COLONIAL LUMINAIRE**  
 John B. Arens, Cleveland, Ohio, assignor to Westinghouse  
 Electric Corporation, Pittsburgh, Pa.  
 Filed Oct. 5, 1971, Ser. No. 186,595  
 Term of patent 14 years  
 Int. Cl. D26-03

U.S. Cl. D48-31



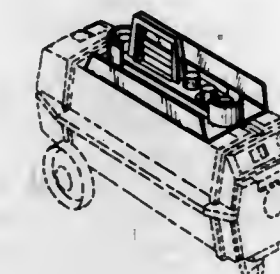
**226,821**  
**HEEL REST FOR ELECTRIC IRON**  
 Masatoshi Naito, Ikeda, and Yukio Hirano, Mino, Japan,  
 assignors to Matsushita Electric Industrial Co., Ltd.,  
 Osaka, Japan  
 Filed June 18, 1971, Ser. No. 154,704  
 Claims priority, application Japan Dec. 24, 1970  
 Term of patent 14 years  
 Int. Cl. D7-05

U.S. Cl. D49-6 A



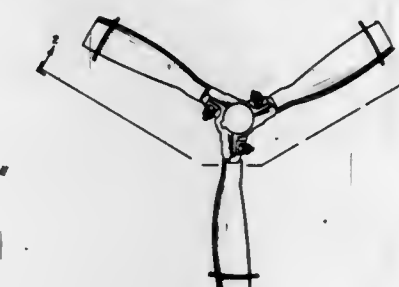
**226,822**  
**TOOL HOLDER FOR VACUUM CLEANER  
 OR THE LIKE**  
 Julian R. Haynes, Hinsdale, Ill., assignor to Sunbeam  
 Corporation, Chicago, Ill.  
 Filed July 12, 1971, Ser. No. 161,372  
 Term of patent 14 years  
 Int. Cl. D15-05

U.S. Cl. D49-17



**226,823**  
**IMPELLER FOR MIXING LIQUIDS OR THE LIKE**  
 George Gustaf Landberg, Rochester, N.Y., assignor to  
 Mixing Equipment Co., Inc., Rochester, N.Y.  
 Filed Oct. 5, 1970, Ser. No. 25,342  
 Term of patent 14 years  
 Int. Cl. D15-99

U.S. Cl. D55-1 D



**226,824**  
**OPHTHALMIC SLIT LAMP**  
 David E. Staub, Clearwater, Fla., assignor to  
 Concept, Inc., St. Petersburg, Fla.  
 Filed Mar. 31, 1971, Ser. No. 130,047  
 Term of patent 14 years  
 Int. Cl. D24-02

U.S. Cl. D57-1 E





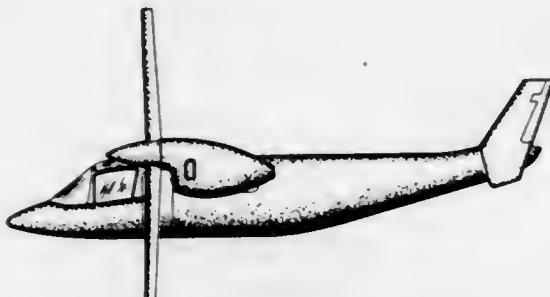
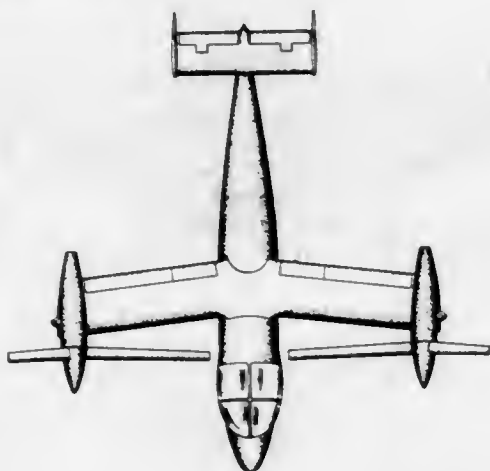
**226,825**  
**TANK CAR BODY**  
Jack Hickman, 5766 Fair Oaks Blvd.,  
Carmichael, Calif. 95608  
Filed Mar. 1, 1971, Ser. No. 119,996  
Term of patent 14 years  
Int. Cl. D12—03

U.S. Cl. D66—1



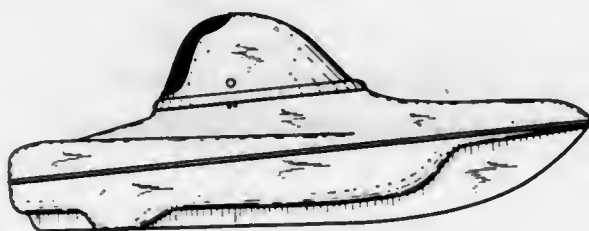
**226,826**  
**TILT ROTOR CONVERTIPLANE**  
Kenneth G. Wernicke, Hurst, Tex., assignor to  
Textron Inc.  
Filed May 17, 1971, Ser. No. 144,358  
Term of patent 14 years  
Int. Cl. D12—07

U.S. Cl. D71—1 N



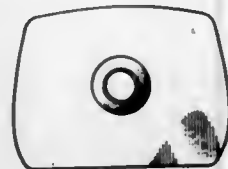
**226,827**  
**WATER CRAFT**  
Laurence L. Lampert, New York, N.Y., and Arthur B.  
Joyal, Bristol, R.I., assignors to MiniJet Sportcrafts  
Inc., New York, N.Y.  
Filed July 21, 1971, Ser. No. 164,971  
Term of patent 14 years  
Int. Cl. D12—14

U.S. Cl. D71—1 CC



**226,828**  
**RESUSCITATING DEVICE**  
Norman H. Stensager, 11032 Harrison Ave. S.,  
Minneapolis, Minn. 55431  
Filed Mar. 11, 1971, Ser. No. 123,497  
Term of patent 14 years  
Int. Cl. D24—02

U.S. Cl. D83—1 G



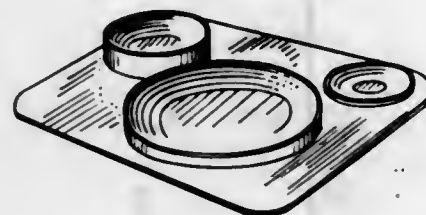
**226,829**  
**CORNEAL RUST RING REMOVER**  
David E. Staub, Clearwater, Fla., assignor to  
Concept, Inc., St. Petersburg, Fla.  
Filed Mar. 31, 1971, Ser. No. 130,048  
Term of patent 14 years  
Int. Cl. D24—02

U.S. Cl. D83—12



**226,830**  
**DISPOSABLE MEAL SERVING UNIT**  
John A. Bridges, Nashville, Tenn., assignor to Aladdin  
Industries, Incorporated, Chicago, Ill.  
Filed Mar. 9, 1971, Ser. No. 122,647  
Term of patent 14 years  
Int. Cl. D7—99

U.S. Cl. D44—10



## LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF MAY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A-T-O Inc.: See—  
Latina, Roland N., 3,729,745.  
Aagard, Roger L., to Honeywell Inc. Optical mass memory. 3,731,290, Cl. 340-174.0yc.  
AAI Corporation: See—  
Cricher, John L., 3,729,853.  
Abbott, Eugene A.: See—  
Isquith, Alan J.; Abbott, Eugene A.; and Walters, Patrick A., 3,730,701.  
Abbott, Thomas I., to Eastman Kodak Company. Developer scavengers for image transfer systems. 3,730,713, Cl. 96-3.000.  
Abbott, Thomas Irving, to Eastman Kodak Company. Silver halide color photographic element containing a magenta color coupler and a carboxy substituted thiazoline compound. 3,730,724, Cl. 96-74.000.  
Abildgaard Laboratories, Inc.: See—  
Abildgaard, William H.; and Grosz, Charles T., III, 3,730,560.  
Abildgaard, William H.; and Grosz, Charles T., III, to Abildgaard Laboratories, Inc. Method of forming and casing books and product thereof. 3,730,560, Cl. 281-21.000.  
Accumed, Inc., mesne: See—  
Buddecke, Charles L.; and LeValley, John, 3,730,172.  
ACF Industries, Incorporated: See—  
Coyle, Edward L.; and Schipper, Dennis J., 3,731,053.  
Ackermann, Ernst: See—  
Espeel, Frans Joris; and Ackermann, Ernst, 3,729,903.  
Acme-Cleveland Corporation: See—  
Taylor, Samuel K., 3,729,871.  
Acs, Steven: See—  
Sack, John J.; and Acs, Steven, 3,730,551.  
Adachi, Kiyoshi: See—  
Kosaka, Kenzo; Adachi, Kiyoshi; Kitagawa, Hiroshi; Nakamura, Toshihiko; and Kato, Osami, 3,729,831.  
Adams, George Edward: See—  
Beharrell, George David; and Adams, George Edward, 3,730,248.  
Adcock, Carolyn P.; and Stewart, Troy L. Educational and recreational device. 3,729,838, Cl. 35-9.00c.  
Adkins, Clement J.: See—  
MacVicar, Margaret L. A.; Freake, Stuart M.; and Adkins, Clement J., 3,731,158.  
Adrian, Claire M.: See—  
Adrian, Robert G.; and Adrian, Claire M., 3,730,390.  
Adrian, Robert G.; and Adrian, Claire M., to Tear Gas Products Corporation. Aerosol gun. 3,730,390, Cl. 222-79.000.  
Aerojet-General Corporation: See—  
Frost, Charles B.; and Gisler, Philip S., 3,730,792.  
Aerotherm Corporation: See—  
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Boschen, John A.; and Francis, Reid E., to Ford Motor Company. Vehicle window system. 3,729,867, Cl. 49-98.000.

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Bossens, Walter Howard; Rorer, David George; and Burcher, George Davey. Article presenting apparatus. 3,730,356, Cl. 214-1.00c.

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Bowles, Arnold Gordon, to National Forge Company. Threaded closure high production isostatic molding device. 3,730,666, Cl. 425-405.00h.

Bowser, John O.; and Moga, Nicholas I., to Aluminum Company of America. Slat floor assembly. 3,730,140, Cl. 119-28.000.

Boydell, Kenneth Raymond, to Dowty Technical Developments Limited. Selector valves. 3,730,220, Cl. 137-596.200.

Bozik, John E.; Ondrey, John A.; and Swift, Harold E., to Gulf Research & Development Company. Process for coupling lower olefins. 3,730,957, Cl. 260-673.000.

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Brady, John F., to Universal Technology, Inc. Keyboard switch and unitized multiple switch configuration. 3,731,014, Cl. 200-5.00a.

Brady, John F., to Universal Technology Inc. Control keyboard switch with cantilevered contact and diode matrix array. 3,731,015, Cl. 200-5.00a.

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Braun Aktiengesellschaft: See—  
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Braun, Francois Marie Joseph, to Societe anonyme belge d'Exploitation de la Navigation aerienne, (Sabena). Seat, couch or bed, provided with at least one vacuum cushion. 3,730,588, Cl. 297-284.000.

Braunberger, Benjamin A.: See—  
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Brayton, Donald B., to United States of America, Air Force. Laser velocimeter employing reference beam detection. 3,730,625, Cl. 356-28.000.

Breitenbach, Lawrence P.; and Shelef, Mordecai, to Ford Motor Company. Quantitative measurement of selected nitrogen compounds in gaseous mixtures. 3,730,686, Cl. 23-232.00r.

Brems, John Henry. Rotary indexing mechanism. 3,730,014, Cl. 74-394.000.

Brems, John Henry. Electrode rod holder for resistance welding actuators. 3,731,046, Cl. 219-78.000.

Brenner & Bender Inc.: See—  
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Bricker, Carl E.; and Hillegass, Kenneth P., to Goodyear Tire & Rubber Company, The. Parking brake, spring applied, hydraulic released. 3,730,303, Cl. 188-170.000.

Bridgestone Tire Company Limited: See—  
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Brigilano, Florent; Vogt, Ernest; and Marmoud, Edmond, to Fabrique de Boites de Montres F. Kuhn SA. Wrist watch with dial illumination. 3,729,923, Cl. 58-50.00r.

Brincks, Richard Joseph, to American Can Company. Pull tab end for can. 3,730,377, Cl. 220-27.000.

Brinkley, Max D.; and Kerr, Glenn D., to Goodyear Tire & Rubber Company, The. Locking device for the clamps of a tube splicer. 3,730,510, Cl. 269-25.000.

British Aircraft Corporation Limited: See—  
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Brockmuller, Friedrich Franz, to Windmoller & Holcher. Severing apparatus for severing lengths of tube from a continuously fed flattened tubular web. 3,730,411, Cl. 225-100.000.

Bronne, William B.; and Linthicum, Harley E., to Carrier Corporation. Method for tube removal. 3,729,806, Cl. 29-427.000.

Bronstein, Benjamin. Folding boot-drying rack. 3,730,354, Cl. 211-38.000.

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Brown, Carlton E.; and Armstrong, Raymond I., to Lear Siegler, Inc. Control and indicator mechanism. 3,730,132, Cl. 116-133.000.

Brown, Larry P., to Cities Service Oil Company. Method of offset explosive stimulation. 3,730,274, Cl. 166-299.000.

Brown, Morris E., to Eastman Kodak Company. Stripper mechanism. 3,730,454, Cl. 242-192.000.

Brown, Omar L., to Frazee, Ermal C. Easy opening can end with non-removable tab. 3,730,379, Cl. 220-48.000.

Brown, Peter W., to Outboard Marine Corporation. Drain return for engine. 3,730,149, Cl. 123-73.00r.

Brubaker, Robert D.; and Brown, Blanchard W., to Staphex Corporation. Sterilization system for clothes treating machines and method of using. 3,730,682, Cl. 21-58.000.

Bruckner-Apparatebau Michelstadt GmbH: See—  
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Bruder, Werner; and Grieb, Hubert, to Daimler-Benz Aktien-gesellschaft. Shift element for gas turbine for shifting between series and parallel operations. 3,730,649, Cl. 417-408.000.

Brugler, Joseph S., to United States of America, Navy. Target center television tracking system. 3,730,277, Cl. 178-6.800.



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Brunswick Corporation: See—  
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Bryce, Laurence Miller, to British Steel Corporation. Arc ignition by seeded gas. 3,730,961, Cl. 13-9.000.

Bryner, Renald F., Jr.: See—  
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BTM Corporation: See—  
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Buchwald, Robert M., to General Motors Corporation. Engine accessory arrangement. 3,730,147, Cl. 123-41.440.

Buckman, John D.; Raths, Fred W.; Boggs, Pamela P.; and Donerson, Robert L., to Buckman Laboratories, Inc. Method of flocculating with tertiary aminohydroxyalkyl esters of carboxylic acid polymers. 3,730,888, Cl. 210-52.000.

Buckman Laboratories, Inc.: See—  
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Budd Company, The: See—  
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Buddecke, Charles L., and LeValley, John, to Accumed, Inc., mesne. Sphygmomanometer. 3,730,172, Cl. 128-2.05m.

Budris, Allan R.; and Tokarczyk, Tadeusz A., to Worthington Corporation. Floating debris recovery basket. 3,730,119, Cl. 114-50r.

Buescher, William E.; and Kerstetter, Donald R., to GTE Sylvania Incorporated. Strengthened cathode material and method of making. 3,730,706, Cl. 75-206.000.

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Buhrer, Erwin; and Keller, Franz, said Keller assor. to said Buhrer, Erwin. Pattern device for foundry molds. 3,730,253, Cl. 164-241.000.

Bullard, Robert L.; and Wheeler, Donald C., to International Business Machines Corporation. Micro-miniature probe assembly. 3,731,191, Cl. 324-158.00f.

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Burke, Donald J.; and Cole, Judson C., to Continental Industries, Inc. Tool for squeezing off flexible pipe. 3,730,478, Cl. 251-8.000.

Burkett, Francis L., to Dow Chemical Company, The. Egg carton. 3,730,420, Cl. 229-44.00r.

Burkhardt, Gisbert, to Telefunken Patentverwertungsgesellschaft m.b.H. Apparatus for the separate discharge of flat items from a stack. 3,730,514, Cl. 271-11.000.

Burlington Industries, Inc.: See—  
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Burns, Bland Calvin; and Albertsen, Hans C. Method and apparatus for conveying sewage. 3,730,884, Cl. 210-15.000.

Burns, John Andrew, to Western Electric Company, Incorporated. Method of forming a circuit. 3,729,816, Cl. 29-593.000.

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Burrough, Donald E.; and Braunberger, Benjamin A., to Gehl Company. Mower conditioner. 3,729,907, Cl. 56-14.100.

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Burton, Jean A.; White, T. Stanley; and Myrland, Harold M., to Hormel, Geo. A., & Co. Process and apparatus for slicing and weighing bacon for packaging. 3,730,742, Cl. 99-233.110.

Burum, Harold J. Frame connecting piece. 3,729,868, Cl. 49-420.000.

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Bush, John W.; and Cunningham, Andrew E., to Borg-Warner Corporation. Fluid pressure brake system. 3,730,541, Cl. 303-21.00f.

Buske, Ervin. Claw hook for chains. 3,729,926, Cl. 59-93.000.

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Butler, Richard G. Friction type screwdriver. 3,730,238, Cl. 145-76.000.

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Cassel, Thomas R. Exhaust pipe with combined bendable partition. 3,730,293, Cl. 181-36.00b.

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Chikama, Toshio, to Kabushiki Kaisha Machida Seisakusho. Endoscope providing an image of an observed object and a scale by which the true size of the object can be determined from the image. 3,730,632, Cl. 356-156.000.

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Christensen, Thorkild, to Danfoos A/S. Valve arrangement for hydraulic steering system. 3,730,207, Cl. 137-106.000.

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Cook, Sidney D.; and Watkins, Louie W., Jr., to Data Packaging Corporation. Flotation assembly. 3,729,756, Cl. 9-8.00r.  
Cook, William A.; and Lerwick, Everett R., to Cook, Inc. Endarterectomy apparatus. 3,730,185, Cl. 128-303.000.  
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Cox, Rodney S. Universal joint trailer hitch with coupling pin socket aligning and bearing means. 3,730,557, Cl. 280-504.000.  
Coyle, Edward L.; and Schipper, Dennis J., to ACF Industries, Incorporated. Railway car having a heated fresh air intake. 3,731,053, Cl. 219-202.000.  
Crane, Burke J.; D'Hooge, Richard E.; and Roberts, Frank D., to Rixson-Firemark, Inc. Latching lever assembly for door holder-closer. 3,729,771, Cl. 16-48.500.  
Crawford, John H., to Leading Plywood Corporation. Apparatus for laying up multiple-ply cross-bonded plywood panels. 3,730,816, Cl. 156-559.000.  
Cremeans, George E.; Berry, David A.; Rosenberg, Harvey S.; Genco, Joseph M.; and Morrison, David L., to United States of America, Atomic Energy Commission. Scavengers for radioactive iodine. 3,730,833, Cl. 176-37.000.  
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Cruvellier, Paul E.; and Duban, Michel, to Centre National d'Etudes Spatiales. Monochromators with concave spherical gratings. 3,730,626, Cl. 356-101.000.  
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Csontos, Alan A., to Goodrich, B. F., Company, The. Preparation of liquid bromine-terminated polymers. 3,730,862, Cl. 204-163.00r.  
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Cuthbert, John David; Hensler, Donald Henry; and Orr, William Harold, to Bell Telephone Laboratories, Incorporated. Fabrication of integrated optical circuits. 3,730,720, Cl. 96-38.300.  
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Dahl, Einar S.; and Kidd, Earl H., to Outboard Marine Corporation. Rotary lawn mower with safety features. 3,729,911, Cl. 56-320.200.  
Dahlberg, John R.; Oravitz, James L., Jr.; and Michalik, Edmund R., to PPG Industries, Inc. Thermally directed glass cutting. 3,730,408, Cl. 225-2.000.  
Daiker, Artur Lvovich; Morozov, Alexandr Nikolaevich; Veis, Anatoly Ivanovich; Kushtuev, Boris Grigorievich; Novoselov, Nikolai Mikhailovich; Zhuravlev, Viktor Nikolaevich; Zinoviev, Alexei Fedorovich; Alfeev, Ivan Ivanovich; Nikitin, Viktor Ivanovich; Kocergin, Alexei Ilich; Matashkov, Vladimir Filippovich; Karelin,

Nikolai Ivanovich; Volchematiev, Jury Venediktovich; Zaluzhentsev, Veniamin Fedorovich; and Morozov, Gennady Yakovlevich. Workpiece scarfing device. 3,730,504, Cl. 266-23.00h.  
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- Dibrell, James W.; Pennington, James; and Schutz, Frank C., to Nospil Limited. Non-spill drinking cup top. 3,730,399, Cl. 222-482,000.
- Dicianni, Anthony M., to Laminar Flow, Inc. Filtering device. 3,729,905, Cl. 55-490,000.
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- Dickey, John W., to Fifth Third Bank, The, meane. Method of heat sealing a pair of closures with a magnetic susceptible material and high frequency alternating and steady magnetic fields. 3,730,804, Cl. 156-272,000.
- Dickey, K. Shirian, to Hewlett-Packard Company. Paper transport structure for recorder comprising foldable face plate. 3,731,318, Cl. 346-145,000.
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- Dierssen, Gunther H., to Minnesota Mining and Manufacturing Company. Process for producing a parallel overgrowth for use as an epitaxial thin film laser. 3,730,764, Cl. 117-201,000.
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- Eichmann, Dieter; Heyer, Gunter; Schaff, Ulrich; and Voigt, Gunter, to Siemens Aktiengesellschaft. Digital compact control module. 3,731,120, Cl. 307-213,000.
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- Ellersick, Russell R. Articulated radiant heating modules. 3,731,051, Cl. 219-162,000.
- Elliott, George E.: See—  
Christman, Robert D.; Elliott, George E.; and Guelfi, Guglielmo, 3,730,879.
- Elliott, Richard M., to Associated Electrical Industries Limited. Mass spectrometer ion source having means for rapidly expelling ions from the source and method of operation. 3,731,089, Cl. 250-41,90b.
- Ellis, Lonnie T. Pump and folding support arrangement therefor. 3,730,651, Cl. 417-554,000.
- Ellman, Irving A. Electrosurgical apparatus for dental use. 3,730,188, Cl. 128-303,140.
- Eloranta, Vaito K., to Polaroid Corporation. Headlamp polarizing attachment. 3,731,080, Cl. 240-9,500.
- Elsbett, Gunter; and Elsbett, Ludwig, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft Werk Nurnberg. Piston for injection type internal combustion engines. 3,730,163, Cl. 123-193,00p.
- Elsbett, Ludwig: See—  
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- Emerson Electric Co.: See—  
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- Kozbelt, Lloyd S., 3,730,373.
- Emerson, Frank W., to General Time Corporation. Drive arrangement for timekeeping system. 3,729,925, Cl. 58-23,00d.
- EMF Corporation: See—  
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- Emhart Corporation: See—  
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- Gerlach, John R., 3,730,578.
- EMI Limited: See—  
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- Emmert, Reinhold, to Grundig EMV. Circuit for controlling the direction of current flow in a load impedance. 3,731,170, Cl. 318-257,000.
- Emoto, Kazuhiro: See—  
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- Enabnit, Robert S.: See—  
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- Endo, Tadao: See—  
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- Endo, Takaya: See—  
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- Endo, Yoshinori: See—  
Kwbo, Noriyoshi; Nakamura, Kazuhiro; Endo, Yoshinori; Katano, Takeshi; and Ichinohe, Eisuke, 3,731,228.
- Energy Sciences Incorporated: See—  
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- Engel, Walter H. Space volatilizing device. 3,730,434, Cl. 239-47,000.
- English Electric Valve Company Limited: See—  
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- English, William H.: See—  
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- Enyeart, Raymond J.: See—  
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- Epoch Company, Ltd.: See—  
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- Erickson, Raymond Kenneth: See—  
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- Escoubas, Thomas A.: See—  
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- Espeel, Frans Joris; and Ackermann, Ernst. Pneumatic dust collection system. 3,729,903, Cl. 55-283,000.
- Esso Production Research Company: See—  
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- Weiner, Peter D., 3,730,286.
- Estradier, Françoise: See—  
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Françoise, 3,730,677.
- Etablissements Genoud & Cie: See—  
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- Etchells, Arthur William, III, to Du Pont de Nemours, E. I., and Company. Process of treating microcellular polymeric staple fibers to render them postinflatable. 3,730,916, Cl. 260-2,50n.
- Ethyl Corporation: See—  
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Ets J.J. Carnaud & Forges de Basse-Indre: See—  
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Etischer, Helmut; Ort, Wolfgang; Simon, Horst; and Steissinger, Kurt, to Eastman Kodak Company. Film movement prevention means. 3,730,066, Cl. 95-31.00r.  
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Evalds, Egils, to Athena Controls, Inc. Temperature control apparatus employing heating and cooling control circuits arranged in a head to toe configuration. 3,730,819, Cl. 161-26.000.  
Evequoz, Jean-Yves. Bobaki, 3,730,546, Cl. 280-16.000.  
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Fabian, Wolfgang, to Badische Anilin- & Soda-Fabrik Aktien-gesellschaft. Isolation of finely divided dyes from liquid dispersions. 3,730,750, Cl. 106-309.000.  
Fabriksaktieobagat Eka: See—  
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Fairchild, David Lee; and Lane, Michael Stephen, to Bell Telephone Laboratories, Incorporated. Multiple line scanning switching system. 3,731,001, Cl. 179-18.00d.  
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Falconer, Errol Linton; and Finch, Gerhard Franz Otto Karl, to Canadian Industries Limited. Explosive composition containing a glycol and guar gum ether. 3,730,790, Cl. 149-44.000.  
Faller, Edwin; and Faller, Hermann, to Gebr. Faller GmbH, Fabrik Feiner Modellspielwaren. Toy railroad vehicle and switching section. 3,729,866, Cl. 46-216.000.  
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Farber, Sheldon; and Wright, Arthur John, to National Cash Register Company. The Pressure sensitive recording sheet. 3,730,754, Cl. 117-36.200.  
Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: See—  
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Faris, Edwin E.: See—  
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Fastner, Thorwald; and Papp, Gerhard, to Vereinigte Österreichische Eisen- und Stahlwerke Aktiengesellschaft. Method for the production of killed, unalloyed or low-alloy, aluminum containing steel with low carbon content. 3,730,704, Cl. 75-129.000.  
Favin, David Leonard; and Snyder, Paul Jerry, to Bell Telephone Laboratories, Incorporated. Automatic time interval ranging circuit for delay interval measurements including uncertainty elimination. 3,731,194, Cl. 324-186.000.  
Fedrigo, Renzo, to Olivetti, Ing. C., & C., S.p.A. High velocity press. 3,730,039, Cl. 83-170.000.  
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Feinler, Raimund, to Maschinen-Konstruktions-Gesellschaft mit beschränkter Haftung, Firma. Adjustable mounting for shaft-supported elements. 3,730,569, Cl. 287-52.080.  
Fekete, Frank; and Pulman, Leonard J., to Koppers Company, Inc. Production of composite fiber reinforced resin articles. 3,730,808, Cl. 156-332.000.  
Feldman, Alter. Packaged liquid containers. 3,730,336, Cl. 206-47.00b.  
Feldman, Burton G. Unitary hanger for displaying articles. 3,730,355, Cl. 211-59.000.  
Felix, Gerardus L.; and Bennett, Frank C., to General Motors Corporation. Brake control system and vehicle having same. 3,730,596, Cl. 303-3.000.  
Fellows, Harrison E. Method of making a sand mold. 3,730,250, Cl. 164-22.000.  
Felner, Richard S., to United States of America, Army. Subaudible frequency indicator for doppler radar. 3,731,308, Cl. 343-7.700.  
Felson, Raymond. Prefabricated building. 3,729,875, Cl. 52-79.000.  
Fenco, Inc.: See—  
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Fernandez, Richard E.: See—  
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Ferry, Kirk: See—  
Blachut, Theodore J.; Paulun, Manfred; Ferry, Kirk; and Amaro, Angel Garcia, 3,729,830.  
Fiber, Theodore. Shoe inner sole and orthopedic support. 3,730,169, Cl. 128-2.00s.  
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Field, Milton M.: See—  
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Fields, Walter M.; and Mayer, Richard W. Softwood-hardwood laminated panel. 3,730,820, Cl. 161-38.000.  
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Flaminaire Marcel Quercia: See—  
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Fliesser, Engelbert, to Agfa-Gevaert Aktiengesellschaft. Cinematographic apparatus. 3,730,616, Cl. 352-166.000.  
Fling, John J., to Sigma Engineering Company. Diaphragm ear valve. 3,730,181, Cl. 128-152.000.  
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Ford Motor Company: See—  
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Bochen, John A.; and Francis, Reid E., 3,729,867.  
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Rash, Kenneth E., Jr.; Colmey, John C.; and Zanzig, Charles E., 3,730,735.  
Forgione, Peter Salvatore; and Polistina, Rocco Albert. Encapsulated carrier bound enzymes. 3,730,841, Cl. 195-63.000.  
Formaini, Robert L.; and Little, Edwin D., to Allied Chemical Corporation. Polyurethane foams derived from tris ( $\beta$ -hydroxyalkyl) isocyanurate-alkylene oxide. 3,730,923, Cl. 260-2.5aq.  
Fortin, Michael Joseph; Latchford, Joseph T.; and Vandenheuvel, Marinus Theodorus, to Fortin-Latchford Limited. Molding apparatus. 3,730,665, Cl. 425-259.000.  
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Fournis, Jean-Francois, to Societe d'Appareillage Electrique Saparel. High-sensitivity differential relay protected against disturbances. 3,731,148, Cl. 317-18.00d.  
Fouts, Norman G., to Ford Motor Company. Shock absorber piston. 3,730,305, Cl. 188-322.000.  
Fox, John J., to Westinghouse Electric Corporation. Laundry dryer with oblique tumbling vanes. 3,729,834, Cl. 34-139.000.  
Foy, Lawrence F. Safety enclosure for off-shore oil rigs. 3,730,278, Cl. 169-2.00r.  
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Franz, Norman J., to Procter & Gamble Company. The Method of forming and adhering a web of material to the lower surface of a pad or the like. 3,730,798, Cl. 156-201.000.  
Franzen, Gustav; Nimitz, Klaus; and Riefers, Horst, to Palitex Project-Company GmbH. Apparatus for use in connection with spooling and twisting machines for placing a thread reserve onto the winding bobbin. 3,730,447, Cl. 242-18.0pw.  
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Freder, Herman; and Wilt, Homer E., to Goodrich, B. F., Company. The High temperature brake disc. 3,730,320, Cl. 192-107.00m.  
Freeland, Stanley R., to Bell & Howell Company. Motor driven camera focusing mechanism. 3,730,068, Cl. 95-44.00r.  
Freeman, Lawrence M.; and Arnold, Francis T., to Micro Information Systems, Inc. Microfilm viewer-printer. 3,730,622, Cl. 355-14.000.  
Freilino, Ray S., to Mine Safety Appliances Company. Non-dispersive infrared gas analyzer having sample and reference beams using flow sensitive detector and with unbalanced operation. 3,731,092, Cl. 250-43.50r.  
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Frost, Charles B.; and Gialer, Philip S., to Aerojet-General Corporation. Catalysis of reactions of aziridines used in preparing high energy composite propellants. 3,730,792, Cl. 149-19.000.  
Fry, William Lawrence. Ignition coils. 3,731,246, Cl. 336-192.000.  
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Ono, Hinateke; and Watarai, Syu, 3,730,711.  
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Galle, Edward M., to Hughes Tool Company. Well bore acoustic apparatus. 3,730,269, Cl. 166-177.000.  
Gallogly, Donald R.; and Wheeler, William E. Seed and fertilizer spreader. 3,730,395, Cl. 222-145.000.  
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Gardner, Edward Boyd, to Emhart Corporation. Sequence detector circuit. 3,731,205, Cl. 328-5.000.  
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Garza, Alejandro E. Gaujardo; and Garza, Gustavo Guajardo. Method of metal coating a fibrous sheet. 3,730,752, Cl. 117-11.000.  
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Geisler, Wilson S., Jr., to Lockheed Aircraft Corporation. Electric cur-rent generator and method using consumable alkali metal anode. 3,730,776, Cl. 136-100.00r.  
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Gilham, (, Peter Thomas; and Weith, Herbert Lee, to Purdue Research Foundation. Polynucleotide analysis. 3,730,844, Cl. 195-103.50r.

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Globus, Alfred R., to Farah Manufacturing Co., Inc. and Guardian Chemical Corporation. Low calorie sweetener. 3,730,736, Cl. 99-141.00a.

Goda, George G. Liquid dispensing apparatus. 3,730,398, Cl. 222-309.000.

Goeckel, Helmut, to Neckermann Versand KGaA. Sound source cabinets. 3,730,291, Cl. 181-31.00b.

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Goodwin, Richard Rohland. Automatic working liquid sampler for providing liquid samples for spectrographic wear analysis. 3,730,001, Cl. 73-422.00r.

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Gran, Torleif. Apparatus for heating water by means of an oilburner. 3,730,166, Cl. 126-350.00r.

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Graves, James G. Two-cycle internal combustion engine. 3,729,927, Cl. 60-39.600.

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Gray, Kenneth W.: See—  
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Green, Joseph: See—  
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Green, Joseph; and Versnel, John, to Cities Service Company. Self-extinguishing composition. 3,730,942, Cl. 260-41.00a.

Green, Laurence. Guiding light system for trailer tow car hook-up. 3,731,274, Cl. 340-52.00r.

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Greenblatt, David; and Greenblatt, Allan. Soft-soled footwear. 3,729,843, Cl. 36-4.000.

Greene, Michael L.; and Waugh, Theodore R., to United States of America, Navy. Programmed cord cutter. 3,730,045, Cl. 83-580.000.

Greene, Norman D. Black body thermoelectric radiometer. 3,731,099, Cl. 250-83.30h.

Gregory, Gerrett W., to Rohr Industries, Inc. Nutplate riveting device and method. 3,729,801, Cl. 29-243.530.

Greutman, Weldon Wayne; and Studebaker, Isaac Roger, to International Telephone and Telegraph Corporation. Digital to sin/COS converter. 3,731,300, Cl. 340-347.00a.

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Griffis, Juniper, 49% to Lyst, Harold E. Truck or trailer with laterally tiltable dump body with hinged side panels hydraulically operated from closed to open position. 3,730,591, Cl. 298-17.600.

Groenvelde, Pieter, to Cominco Ltd. Process for the production of ammonium phosphate fertilizers. 3,730,700, Cl. 71-34.000.

Gross, Bette L. Candle. 3,730,674, Cl. 431-288.000.

Grosseau, Albert, to Societe Anonyme Automobiles. Tool for electrolytically honing spherical surfaces. 3,730,870, Cl. 204-224.000.

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Gueussier, Andre; Tricot, Roland; and Lacoude, Michel, to Ugine Aciars. Apparatus for treatment of metal products. 3,730,501, Cl. 266-4.00a.

Guimbellot, Bobby E. Fusible safety device. 3,730,205, Cl. 137-73.000.

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Gurkin, David E. Burnishing device for rotary television set tuners' contacts. 3,729,768, Cl. 15-256.510.

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Haberrecker, Klaus, to Siemens Aktiengesellschaft. X-ray tube with rotary anodes. 3,731,128, Cl. 313-60.000.

Haddad, Mitchell J., to General Motors Corporation. Engine exhaust reactor and method of making. 3,729,937, Cl. 60-298.000.

Hadfield, Harry J., to United States of America, Army. Mechanical anti-disturbance device. 3,730,100, Cl. 102-70.00s.



Hafer, Paul M., to Arrow-Hart, Inc. Plug-in bus duct. 3,731,256, Cl. 339-22.00b.

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Hagenbach, Robert J.; and Lenhard, Myron J., to Xerox Corporation. Method of developing latent images. 3,730,707, Cl. 96-1.05d.

Hagenlocher, Walter; and Binder, Georg, to Bosch, Robert, G.m.b.H. Electrical machine with shielded circuit parts. 3,731,126, Cl. 310-68.000.

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Hanzlik, William M. Screw-supporting attachment for the shank of a screw driver tool. 3,730,237, Cl. 145-52.000.

Hardee, Eldred V. Hydraulically operated offset cutter. 3,729,910, Cl. 56-11.900.

Hardin, George T., to Robertshaw Controls Company. Time schedule controller and parts and system therefor. 3,730,427, Cl. 236-46.000.

Hardway, Edward V., Jr., to Spearhead, Inc. Capacitive displacement transducer. 3,729,991, Cl. 73-136.00a.

Hare, Lloyd E., to Litton Business Systems, Inc. Changeable type heads and changeable key caps. 3,730,322, Cl. 197-36.000.

Hare, Paul N., to Cities Service Company. Pelletizer. 3,730,663, Cl. 425-222.000.

Harlin, Paul L. Cam generating device. 3,730,052, Cl. 90-20.000.

Harman, John W. Front fork assembly for two wheel vehicles. 3,730,553, Cl. 280-277.000.

Harms, Wolf-Henning, to Krone GmbH. Voltage detector for sensing and digitally encoding states of potential. 3,731,118, Cl. 307-255.000.

Harper, William H.; Peace, Charles R.; and Keller, Jake B., to A.M.H. Equipment, Inc. Mobile particulate material carrier and dispenser. 3,730,396, Cl. 222-166.000.

Harrington, Dean B., to General Electric Company. Generator end tooth flux shield. 3,731,127, Cl. 310-254.000.

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Harris, Clarence P. Grinding apparatus. 3,730,442, Cl. 241-60.000.

Harris, Darel E. Shower chair. 3,730,590, Cl. 297-445.000.

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Hart Chemical Limited: See—

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Hartung, Dudley B., to Xerox Corporation. Servo system for velocity and position control. 3,731,175, Cl. 318-570.000.

Harvey, James R., to Union Carbide Corporation. Amine curing agents for polyepoxide composition. 3,730,908, Cl. 252-426.000.

Harvey, Robert J.; and Celebi, Gurbuz Ali, to Meditron Inc. Coated mouthpiece construction. 3,730,737, Cl. 99-171.00b.

Hastings, James T.; and Boulaine, Paul, to Canam Manufacturing & Packaging Limited. Inflatable air cushion article. 3,729,754, Cl. 51-348.000.

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 Inuzuka, Isao; Watanabe, Kikuo; Yuminaka, Takeo; Iwasaka, Tatsuo; and Ochi, Toshio, to Hitachi, Ltd. Elevator control system. 3,730,299, Cl. 187-29.00r.  
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 Sloane, Ivan Henry; Mailhot, Armand Ludovic; Beliveau, Roger Louis; and Sawhney, Harbans Lal, 3,729,917.  
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 Jonakin, James, to Combustion Engineering, Inc. Damper-rod scrubber. 3,730,499, Cl. 261-109.000.  
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 Kaessen, Donald A.: See—Conery, William J.; and Kaessen, Donald A., 3,730,215.  
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 Kapalko, Erwin J.; and English, William H., to PPG Industries, Inc. Electrodeposition of a composition containing an ester resin and a methylophenol ether. 3,730,865, Cl. 204-181,000.  
 Kaplan, Burton. Method and apparatus for instruction of stringed instrument bow positioning. 3,730,964, Cl. 84-470,000.  
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 Karpf, Josef, to Steffens, G. W. Cutting head for comminuting machines. 3,730,363, Cl. 241-282,100.  
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 Kaufman, Raymond H., to United States of America, Army. Bipolar servo amplifier commutation circuit using a separate silicon controlled rectifier and isolated power supply for charging a commutation capacitor. 3,731,172, Cl. 318-439,000.  
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 Kawase, Yutaka: See—Ogawa, Yasuhide; Kawase, Yutaka; Takada, Makoto; and Fujioka, Hideki, 3,731,052.  
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 Kay, Robert De Witt. Apparatus for cleaning paint roller covers. 3,730,195, Cl. 134-138,000.

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 Keene, Derek K.; and Miller, Edward W., to Eaton Corporation. Thrust imparting joint connection. 3,730,369, Cl. 214-674,000.  
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 Keller, Anthony T. Pivot limiting assembly. 3,730,555, Cl. 280-432,000.  
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 Keller, Hans, to ITT Industries, Inc. Circuit arrangement for maintaining the oscillations of an electro-mechanical oscillator. 3,731,229, Cl. 331-116,00m.  
 Keller, Jake B.: See—Harper, William H.; Peace, Charles R.; and Keller, Jake B., 3,730,396.  
 Keller, Kalus. Method of treating workpieces in a glow discharge. 3,730,863, Cl. 204-164,000.  
 Kelley, Carl S.; and Thorn, Frank H., to Phillips Petroleum Company. Separation of gases. 3,729,944, Cl. 62-39,000.  
 Kelley, Jerry O., to Arvin Industries, Inc. Finger between flexible disc and backing plate. 3,731,292, Cl. 340-174,10e.  
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 Chesky, Sheldon R., 3,730,338.  
 McWhorter, Daniel M., 3,730,168.  
 Kennedy, William S., to Aerotherm Corporation. Photometric detector and measuring system. 3,730,633, Cl. 356-156,000.  
 Kent, Robert L., to Damon Corporation. Signal processor. 3,730,627, Cl. 356-205,000.  
 Kerchner, Charles F., Jr.; and Ball, David A., to Kalgio Electronic Co., Inc. Radiant heating apparatus. 3,731,055, Cl. 219-349,000.  
 Kerr, Glenn D.: See—Brinkley, Max D.; and Kerr, Glenn D., 3,730,510.  
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 Shannon, John Martin; and Kerr, John Anthony, 3,730,778.  
 Kerr, William C., to Eastman Kodak Company. Method for treating a web. 3,730,753, Cl. 117-34,000.  
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 Kesling, Peter C. Lock ring for edgewise bracket. 3,729,826, Cl. 32-14,00a.  
 Ketley, Arthur Donald; Kehr, Clifton Leroy; and Touchette, Jennie Lee, to Grace, W. R., & Co. Process for forming silverless continuous tone photographic image with polythiol polymers. 3,730,715, Cl. 96-35,100.  
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 Key, Edward H., to Thomas & Betts Corporation. Jumper for interconnecting dual-in-line sockets. 3,731,254, Cl. 339-17,00f.  
 Keyes, Mark C.: See—Patashnik, Max; and Keyes, Mark C., 3,730,728.  
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 King, Joseph W., to Cleveland Technical Center, Inc. Hot box alarm system. 3,731,087, Cl. 246-169,00d.  
 King, William R., to Sandoz-Wander, Inc. Switching mechanism for nebulizer-humidifiers. 3,730,225, Cl. 137-625,480.  
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 Kirk, Frank: See—

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 Kirkman, Wayne V. Paraplegic bed. 3,729,751, Cl. 5-66,000.  
 Kiscaden, Roy W., to Westinghouse Electric Corporation. Fuel control system for a gas turbine. 3,729,929, Cl. 60-39,28r.  
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 Kjoanaas, Manley, to Atlantic Richfield Company. Corrosion inhibiting compositions. 3,730,895, Cl. 252-18,000.  
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 Klein, Hugo, to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H. Corrugated paperboard cutting apparatus. 3,730,810, Cl. 156-353,000.  
 Klein, John M.: See—Manning, Jim L.; and Manning, Richard D., 3,730,141.  
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 Klug, Henry G. Flow metering system for liquid wastes. 3,729,994, Cl. 73-194,00e.  
 Knapp, Heinrich, to Bosch, Robert, G.m.b.H. Fuel injection apparatus for spark plug-ignited internal combustion engines. 3,730,155, Cl. 123-119,00r.  
 Knebel, Alfred, to Fried. Krupp Gesellschaft mit beschränkter Haftung. Driving arrangement for rail vehicles, especially high output self-propelled rail vehicles. 3,729,933, Cl. 60-102,000.  
 Knemeyer, Siegfried. Stability augmentation system for light aircraft providing pilot assist and turn. 3,730,461, Cl. 244-77,00e.  
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 Kobayashi, Tatsuo; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Dual light responsive automatic exposure control apparatus. 3,730,063, Cl. 95-10,00t.  
 Koch, Paul Joseph; and Lapham, Julie Ann, to Allied Chemical Corporation. Flame retardant polyamide compositions containing certain sulfanilamides. 3,730,939, Cl. 260-37,00n.  
 Koch, Roland G.: See—King, John L., Jr.; and Koch, Roland G., 3,730,540.  
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 Koehler, Albert M., to Brown & Root, Inc. Offshore tower. 3,729,940, Cl. 61-46,500.  
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 Komendowski, Henry, to Automatic Liquid Packaging, Inc. Plastic container. 3,730,372, Cl. 215-32,000.  
 Komiya, Sampo. Swash plate type compressor for automobile air-conditioning. 3,730,648, Cl. 417-269,000.  
 Komoda, Tsutomu, to Hitachi Ltd. Electron gun device of field emission type. 3,731,095, Cl. 250-49,50a.  
 Kondo, Kenichiro: See—Hayashi, Isao; and Kondo, Kenichiro, 3,730,486.  
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Mina, Ramses R.: See—  
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Mine Safety Appliances Company: See—  
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Mining and Exploration, Company, mesne: See—  
Milly, George H., 3,730,683.

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Minto, Horace G., to Bay Mechanical Company. Fluid distribution control device. 3,730,429, Cl. 236-94.000.

Misenheimer, Ernest Luther, III, to U.S. Plywood Champion Paper Inc. Furniture with assembly-disassembly feature. 3,730,601, Cl. 312-108.000.

Mitchell, John O.; Roberts, Spencer D.; and van Pelt, Richard W., to International Business Machines Corporation. Deceleration and stop-lock motor control apparatus. 3,731,176, Cl. 318-619.000.

Mitchell, John S., to Dow Chemical Company, The. Demountable optical tooling scale fixture. 3,730,470, Cl. 248-274.000.

Mitchell, Wallace F., to Ammco Tools Inc. Hydraulic brake system bleeder. 3,730,307, Cl. 188-352.000.

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Mitsubishi Chemical Industries, Ltd.: See—  
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Mitsubishi Jukogyo Kabushiki Kaisha: See—

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Mitsubishi Paper Mills, Ltd.: See—  
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Miyajima, Masayoshi: See—  
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Miyake, Tokiaki: See—  
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Miyamoto, Mitsugu, to Victor Company of Japan, Limited. Combination 4-channel 2-channel stereophonic endless cartridge tape player. 3,730,532, Cl. 274-4.00g.

Miyata, Yoshihiko; and Katoh, Noritada, to Hitachi, Ltd. Implosion-proof cathode-ray tube. 3,730,990, Cl. 178-7.800.

Mizoguchi, Suteru. Boring head. 3,730,636, Cl. 408-169.000.

Mizuno, Masaya: See—  
Kono, Yoshinori; Iwasaki, Norio; Sato, Toshio; Mizuno, Masaya; and Takeuchi, Jikko, 3,730,975.

Mizutani, Nagao; and Nojima, Masamitsu, to Citizen Watch Co., Ltd. Starting device for a vibrating element for time measuring means. 3,731,167, Cl. 318-114.000.

Mobil Auto Crushers Corporation of America: See—  
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Moeller, Richard E.: See—  
Simoneau, Edward T.; Moeller, Richard E.; and Holdstock, Norman G., 3,730,931.

Moen, Alfred M. Single lever mixing valve. 3,730,222, Cl. 137-625.170.

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Moisson-Franckhauser, Francois: See—  
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Molins Limited: See—  
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Moller, Ake: See—  
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Mollica, Richard J., Jr.; Hunter, Joseph E., Jr.; and Bladzik, Kenneth R., to General Motors Corporation. Method of producing stainless steel-low carbon steel composites. 3,729,805, Cl. 29-471.700.

Molloy, Leonard D., to International Telephone and Telegraph Corporation. Reduction of timing resolution in digital phase lock loops. 3,731,210, Cl. 328-155.000.

Monnerjahn, Walter. Gripper for unscrewing caps. 3,730,025, Cl. 81-3.400.

Monsanto Chemicals Limited: See—  
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Monsanto Company: See—  
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Montgomery, Lionel C., to Union Carbide Corporation. Boron nitride base evaporation vessel having a surface coating of titanium-silicon thereon. 3,730,507, Cl. 266-39.000.

Moody, Earl A., to Wagner Electric Corporation. Centrifugal governor. 3,731,024, Cl. 200-80.000.

Moore, Christopher John; and Barry, Brian, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defence in Her Britannic Majesty's Government of the. Fan or compressor for a gas turbine engine. 3,730,639, Cl. 415-119.000.

Moore, Harrington. Convertible bird house and feeder. 3,730,139, Cl. 119-23.000.

Mor-Fish-Ent, Inc.: See—  
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Morchand, Charles A., to Data-Plex Systems, Inc. Television transmission system for two classes of information. 3,730,986, Cl. 178-5.600.

Moreland, Fred E. Deep-sea dive suit and life support system. 3,730,178, Cl. 128-142.500.

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Johnson, Cameron D.; Mayer, Gerald M.; and Morency, Roger L., 3,729,980.

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Wykes, Robert D., 3,729,973.

Morgan, James E., to PPG Industries, Inc. Process for preparing silica pigment. 3,730,749, Cl. 106-288.00b.

Morgenroth, Henri. Carburetor for automotive engines with a metering suction partly derived from a laminar air flow matrix. 3,730,496, Cl. 261-23.00a.

Morii, Kokichi: See—  
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Morisawa, Nobuo, to K.K. Morisawa Shashin Shokujiki Seisakusho. Photo-typesetting apparatus for musical notes. 3,730,062, Cl. 95-4.50r.

Morita, Katsumi, to Hakamada Kinzoku Kogyo Kabushiki Kaisha. Hard chrome plated vibrating board of an ultrasonic-wave washer. 3,730,489, Cl. 259-72.000.

Moriyasu, Hiro, to Tektronix, Inc. Transmission line circuit having common delay for two signal paths of opposite direction. 3,730,993, Cl. 178-59.000.

Morozov, Alexandr Nikolaevich: See—  
Daiker, Artur Lvovich; Morozov, Alexandr Nikolaevich; Veis, Anatoly Ivanovich; Kushtuev, Boris Grigorievich; Novoselov, Nikolai Mikhailovich; Zhuravlev, Viktor Nikolaevich; Zinoviev, Alexei Fedorovich; Alfeev, Ivan Ivanovich; Nikitin, Viktor Ivanovich; Kocergin, Alexei Ilich; Matashkov, Vladimir Filipovich; Karelina, Nikolai Ivanovich; Volchematiev, Jury Venediktovich; Zaluzhentsev, Veniamin Fedorovich; and Morozov, Gennady Yakovlevich, 3,730,504.

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Murphy, Bernard Thomas; and Panousis, Peter Theodore, to Bell Telephone Laboratories, Incorporated. Method of fabricating semiconductor integrated circuits using deposited doped oxides as a source of dopant impurities. 3,730,787, Cl. 148-175.000.

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- Nagai, Kiyoshi, to Tokyo Shibaura Electric Co., Ltd. Van-atta array antenna device. 3,731,313, Cl. 343-854.000.
- Nagata, Masanori; and Osaki, Keisuke, to Omron Tateisi Electronics Co. System for preventing improper use of credit cards. 3,731,076, Cl. 235-61.70b.
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- Nakashima, Katsushi, to Aisin Seiki Company, Limited. Tandem master cylinder. 3,729,932, Cl. 60-54.60e.
- Nakashima, Shinichi; Inoue, Morio; and Iwasa, Hitoo, to Matsushita Electronics Corporation. Method of making germanium semiconductor device. 3,730,800, Cl. 156-8.000.
- Namon, Richard. Impedance related blood flow measuring device. 3,730,171, Cl. 128-2.05f.
- Namy, Philippe, to Creusot-Loire. Roller pair type continuous casting apparatus. 3,730,254, Cl. 164-268.000.
- Napoli, Louis Sebastian; and Hughes, John Joseph, to RCA Corporation. Frequency translator circuit. 3,731,180, Cl. 321-69.0nl.
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- Nesson, Israel; Palmer, Robert G.; Faris, Edwin E.; and Hertling, Charles J., to Berkey Photo, Inc. Device for use with self-developing film. 3,730,065, Cl. 95-13.000.
- Neubert, Edeltraud, nee Preischl. Device for transporting and storing yarn bobbins having bobbin tubes. 3,730,340, Cl. 206-654.000.
- Neubert, Gerhart, to Rheinstahl Wanheim Gesellschaft mit beschränkter Haftung. Apparatus for malting grain. 3,730,846, Cl. 195-129.000.
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- Eloranta, Vaito K., 3,731,080.
- Idelson, Elbert M., 3,730,725.
- Land, Edwin H.; Bloom, Stanley M.; and Farney, Leonard C., 3,730,716.
- Land, Edwin H.; and Bachelder, Albert J., 3,731,083.
- Poliak, Richard M.; and Rauch, Leslie D., to International Business Machines Corporation. Non-activated soldering flux. 3,730,782, Cl. 148-23.000.
- Polistina, Rocco Albert: See—  
Fargione, Peter Salvatore; and Polistina, Rocco Albert, 3,730,841.
- Pollitzer, Ernest L., to Universal Oil Products Company. Hydrocarbon conversion catalyst. 3,730,878, Cl. 208-143.000.
- Polytube Inc.: See—  
Ledewitz, William; and Twigg, Robert W., 3,730,393.
- Pompei, Jean; and Guiochon, Paul, to U.S. Philips Corporation. Cathode sputtering etching device with movable guard ring. 3,730,873, Cl. 204-298.000.
- Poor, John Gove; and Rynne, George Bernard, to Conversion Chemical Corporation. Method and composition for electroplating zinc. 3,730,855, Cl. 204-55.
- Popovitch, Ernst, to Nagele, Karl F., Dr., Feinmaschinenbau. Apparatus for manufacturing a continuous stringer for a sliding clasp fastener. 3,729,800, Cl. 29-207.50r.
- Porsche, Dr.-Ing. H.c.F., K.G., Firma: See—  
Porsche, Ferdinand Anton Ernst, 3,731,079.
- Porsche, Ferdinand Anton Ernst, to Porsche, Dr.-Ing. H.c.F., K.G., Firma. Swingable headlight for vehicles. 3,731,079, Cl. 240-7.10h.
- Porter, H. K., Company, Inc.: See—  
Springer, Arthur James, 3,730,310.
- Porth, Karl A., to Ski boot buckle. 3,729,779, Cl. 24-68.0sk.
- Potter, Patrick. Chimneys. 3,730,073, Cl. 98-60.000.
- Pounds, Thomas W.: See—  
Chao, Junn-Ling; Wicks, Moye, III; and Pounds, Thomas W., 3,729,987.
- PPG Industries, Inc.: See—  
Dahlberg, John R.; Oravitz, James L., Jr.; and Michalik, Edmund R., 3,730,408.
- Drummond, Warren W., 3,730,813.
- Kapalko, Erwin J.; and English, William H., 3,730,865.
- Morgan, James E., 3,730,749.
- Seymour, Samuel L., 3,730,697.
- Praitoni, Alberto: See—  
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Precision Sampling Corporation: See—  
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Premick, Michael C. Inflatable insulation for packaging. 3,730,240, Cl. 150-2.500.

Preston, Edward George, to Molins Limited. Cut-off devices for continuous rod-making machines. 3,730,034, Cl. 83-38.000.

Preston, Mark, to Litton Business Systems, Inc. Arc suppressor for dielectric apparatus. 3,731,105, Cl. 250-217.00r.

Prevati, Augusto, to Industrie Pirelli S.p.A. Curing apparatus for elongate elastomeric articles. 3,730,675, Cl. 432-60.000.

Prewitt, Cecil H.: See—  
Prewitt, Cecil H., 3,730,346.

Prewitt, Cecil H., to Skinner, Cortland, Glaze, Cecil K. and Prewitt, Cecil H. Skimming system. 3,730,346, Cl. 210-242.000.

Price, Ira Emmet. Sawing machine. 3,730,042, Cl. 83-471.300.

Price, Robert B.; and Stager, Francis W., to Jacobs Manufacturing Company. The. Gear drive assembly for anti-wheel lock-up control systems in motor vehicles. 3,730,006, Cl. 74-13.000.

Prichard, Harry A., Jr. Unitized metal-stud concrete form structure. 3,730,476, Cl. 249-191.000.

Pries, Erich E.; and Rossow, Rolf, to Otto, Dr. C., & Comp. G.m.b.H. Plural gas mains for independently operating low and high burners in alternative flue. 3,730,847, Cl. 202-139.000.

Prior, Josef, to Dynamit Nobel Aktiengesellschaft. Detonating fuse. 3,730,096, Cl. 102-27.00r.

Prisk, Bert C.; Erickson, Raymond Kenneth; and Wheatley, Marion E., to General Motors Corporation. Heat sealing die. 3,730,812, Cl. 156-380.000.

Prisk, Orford W., to Weber, Martin. Outlet valve for liquid supply receptacle. 3,730,224, Cl. 137-625.330.

Procor Limited: See—  
Deeks, Ronald G., 3,730,200.

Procter & Gamble Company, The: See—  
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Prohaska, Charles Anton, to Du Pont de Nemours, E. I., and Company. Computer controlled method of titration. 3,730,685, Cl. 23-230.00r.

Prokop, Josef F., to International Harvester Company. Shift mechanism for mechanical transmissions. 3,730,010, Cl. 74-477.000.

Proof Lock International Inc.: See—  
Hsu, Sam Shiao-Ming, 3,729,964.

Propach, Otto; Veittinger, Heinz; and Jauch, Karl, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Groove forming cold rolling tool. 3,729,970, Cl. 72-208.000.

Pryor, Leon D.: See—  
Lusk, Harold B.; Cooke, Herbert E.; and Pryor, Leon D., 3,729,916.

Pryor, Michael J.: See—  
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Gilham, (, Peter Thomas; and Weith, Herbert Lee, 3,730,844.

Purser, Josef, to Maschinenfabrik Fahr AG. Reversible transmission, especially for field harvesters. 3,730,037, Cl. 83-68.000.

Purser, Kenneth H., to Radiation Dynamics, Inc. Particle acceleration tube having improved beam focus control. 3,731,211, Cl. 328-233.000.

Quik, Willem C. J.; and van Weeren, Pieter A., to Shell Oil Company. Process for the preparation of base oils for the production of lubricating oil. 3,730,877, Cl. 208-143.000.

Quinlan, Joseph B., to United States of America, Army. Energetic protective coating for caseless ammunition. 3,730,094, Cl. 102-38.000.

Quintilian, Bartholomew F.; and Williams, Robert J. W., to Koppers Company, Inc. Method for installing multiples of dust collector plates. 3,729,815, Cl. 29-592.000.

Rabian, Laszlo: See—  
Ullmann, Werner; Panschow, Rudolf; Shur, Volker; Meyer, Wolfgang; Sieg, Arno; and Rabian, Laszlo, 3,731,043.

Ullmann, Werner; Rabian, Laszlo; Mattei, Silvano; Sieg, Arno; Suter, Peter; Tadini, Costantino; Panschow, Rudolf; Suhr, Volker; and Meyer, Wolfgang, 3,731,044.

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Radecke, Helmut, to Bosch, Robert, Fernschanlagen GmbH. Horizontal aperture correction with variable characteristic. 3,730,987, Cl. 178-7.100.

Rademaker, Leo C., to General Electric Company. Adjustable high voltage power supply with output polarity switching. 3,731,179, Cl. 321-15.000.

Radiation Dynamics, Inc.: See—  
Purser, Kenneth H., 3,731,211.

Raffenberg, Hermann-Josef, to BASF Wyandotte Corporation. Apparatus for continuously producing tubular bodies of foamed material. 3,730,660, Cl. 425-122.000.

Raleigh, Ronald George: See—  
Gilman, Paul Brewster, Jr.; Raleigh, Ronald George; and Koszelak, Thaddeus Donald, 3,730,723.

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Ramme, Hans Joachim. Tank containers. 3,730,384, Cl. 220-71.000.

Ramun, Michael: See—  
Marian, Daniel; and Ramun, Michael, 3,730,508.

Ramwell, Peter W.: See—  
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Randell, Donald Alan: See—  
Kunda, Wasy; and Randell, Donald Alan, 3,730,756.

Ransburg Electro-Coating Corporation: See—  
Scharfenberger, James A., 3,730,433.

Rapistan Incorporated: See—  
De Good, Maynard J., 3,730,330.

Rappeley, Frederick A., to Cougar, Inc. Protective helmet for football or the like. 3,729,744, Cl. 2-3.00r.

Rash, Caroline M. Orthopedic sling. 3,730,164, Cl. 128-94.000.

Rash, Kenneth E., Jr.; Colmey, John C.; and Zanzig, Charles E., to Foremost-McKesson, Inc. Confection and method of manufacture. 3,730,735, Cl. 99-134.00r.

Rath, Heinrich Bernhard, to Girling Limited. Disc brake caliper and circuit system. 3,730,306, Cl. 188-345.000.

Raths, Fred W.: See—  
Buckman, John D.; Raths, Fred W.; Boggs, Pamela P.; and Doner-son, Robert L., 3,730,888.

Ratti, Ferruccio, to Steiner Company Lausanne S.A. Dispensing apparatus. 3,730,409, Cl. 225-14.000.

Rauch, Constantin: See—  
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Rauch, Leslie D.: See—  
Poliak, Richard M.; and Rauch, Leslie D., 3,730,782.

Ray, James D., to Trailer Hitching coupler. 3,730,559, Cl. 280-513.000.

Rayfield, Harry F., to Terminal Data Corporation. Retrieval code. 3,731,276, Cl. 340-146.30z.

Raymond, Robert E., to International Basic Economy Corporation. Heat exchanger apparatus for hydraulic system. 3,730,260, Cl. 165-27.000.

Raytheon Company: See—  
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Napoli, Louis Sebastian; and Hughes, John Joseph, 3,731,180.

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Reece, Robert L. High pressure fluid control valve. 3,730,223, Cl. 137-625.230.

Reed, Edwin E.; and Kleinmann, Earl E., to Phillips Petroleum Company. Fluid containment system. 3,730,375, Cl. 220-9.0lg.

Reese, William R.: See—  
Pamona, William Erby; and Reese, William R., 3,730,115.

Reeve, Paul H.: See—  
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Reeves, Robert E., to Inland Container Corporation. Apparatus for forming containers. 3,729,887, Cl. 53-194.000.

Reichhold-Albert-Chemie Aktiengesellschaft: See—  
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Reilly, John J., Jr., to Binary Systems, Inc. Optical card reader drive. 3,731,062, Cl. 235-61.11e.

Reimer, William A.: See—  
Krylow, Konstanty E.; and Reimer, William A., 3,730,264.

Reimer, William A., to GTE Automatic Electric Laboratories, Incorporated. Printed wiring card guide shelf and method for manufacture thereof. 3,731,157, Cl. 317-101.0dh.

Reinfeld, Kurt; and Gauye, Emmanuel V., to Koppers Company, Inc. Apparatus for bending continuous cast slabs. 3,730,256, Cl. 164-282.000.

Reinsburg, Alexandr Mironovich: See—  
Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Tkach, Khaim Berkovich; Nazarov, Nikolai Grigorovich; Malbert, Petr Eduardovich; Lavron, Nikolai Sergeevich; Alkasarov, Jury Innokentievich; Legeche, Nikolai Leontievich; Golbinsh-tein, Alexanr Iavovich; Reinsburg, Alexandr Mironovich; Bursh-tein, Mikhail Vladimirovich; Mikuashin, Dmitry Pavlovich; Ter-skov, Alexei Danilovich; and Belov, Leonid Stepanovich, 3,730,283.

Reisch, Franz S., to Honeywell Inc. Illuminated indicator for high and low ambient light environments. 3,731,077, Cl. 240-1.0el.

Renfro, James C.: See—  
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Republic Rubber Industries (Proprietary) Limited: See—  
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Research Corporation: See—  
Gerst, Carl W.; Hair, Hugh A.; Hiller, Robert G.; Simpson, Charles G.; and Worden, Robert A., 3,731,217.

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Reynolds, R. J., Tobacco Company: See—  
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Reynolds, Verne J. Sew-in urethral catheter. 3,730,187, Cl. 128-349.00r.

Rha, Chokyun: See—  
Teng, James; Rha, Chokyun; Scallet, Barry L.; and Stubits, Mar-cella C., 3,730,693.

Rhee, Dong Woo, to GTE Sylvania Incorporated. Television horizontal transistor oscillator and AFC network. 3,730,989, Cl. 178-7.50r.

Rhein Stahl Wanheim Gesellschaft mit beschränkter Haftung: See—  
Neubert, Gerhart, 3,730,846.

Schultz, Rolf, 3,730,845.

Rhode, Wilmer A., to Reynolds, R. J., Tobacco Company. Tobacco product. 3,730,189, Cl. 131-17.00r.

Rhodes, Peter: See—  
Frank, Josef Tadeusz; and Rhodes, Peter, 3,730,381.

Rhone-Poulenc S.A.: See—  
Xavier, Marze, 3,730,872.

Ricciello, Salvatore R.; and Parker, John A. Intumescent composition, foamed product prepared therewith, and process for making same. 3,730,891, Cl. 252-8.100.

Rice, Alvin S.; Pedersen, Herbert C.; and Iverson, Vincent L., to United Aircraft Corporation. Seal ring for gas turbine. 3,730,640, Cl. 415-117.000.

Rich, John P.: See—  
Stirk, Sidney E.; Rich, John P.; and Holt, Russell E., 3,730,079.

Richard, David D. Ice fishing apparatus for signalling the biting of a fish. 3,729,849, Cl. 43-17.000.

Richard, Robert, to Aktiengesellschaft Brown, Boveri & Cie. Shock absorbing mountings for apparatus. 3,730,463, Cl. 248-22.000.

Richards, George B., to Fluid Device Corporation. Liquid level control system and carbonator. 3,730,500, Cl. 261-140.000.

Richards, Reynold B.: See—  
Richards, Reynold B.; O'Brien, William P.; and Cannon, Peter (said O'Brien and said Cannon assor. to said), 3,730,796.

Richards, Reynold B.; O'Brien, William P.; and Cannon, Peter, said O'Brien and said Cannon assor. to said Richards, Reynold B. Building construction and method of manufacture. 3,730,796, Cl. 156-173.000.

Richardson, Edwin A.; and Scheuerman, Ronald F., to Shell Oil Company. Plugging solution precipitation time control. 3,730,272, Cl. 166-294.000.

Richardson, Frederick Denys: See—  
Richardson, Frederick Denys; and Rogers, Philip Sydney, 3,730,698.

Richardson, Frederick Denys; and Rogers, Philip Sydney, to Metallurgic Hobben-Overpelt, RST International Metals, Limited and Richardson, Frederick Denys. Sealing of joints in refractory devices with silicate coating. 3,730,698, Cl. 65-43.000.

Richardson, Harry L., to Chemical Construction. Removal of entrained matter from gas streams. 3,729,898, Cl. 55-7.000.

Richardson, Robert, to Brunswick Corporation. Bowling ball, bag and shoe rack. 3,730,241, Cl. 150-52.00a.

Richter, Ulf, to Dynamit Nobel AG. Composite for explosive bonding. 3,730,415, Cl. 228-3.000.

Ride-Rite Corporation: See—  
Thaxton, Ellis B., 3,730,548.

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Rife, William J.: See—  
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Rigby, Francis Lloyd, to Haas, John I., Inc. Stable and emulsifiable hop extract. 3,730,730, Cl. 99-50.500.

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Risbeck, John S.: See—  
Neumeier, Leander A.; and Risbeck, John S., 3,730,781.

Rising, Donald B.: See—  
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Rittenbach, Otto E., to United States of America, Army. Operating proximate radars with interlaced spectral lines. 3,731,310, Cl. 343-17.10r.

Ritter, Gerhard: See—  
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Ritter, Herman O.; and Weber, Karl, to Singer Company, The, meane. Even feeding attachment for sewing machines. 3,730,117, Cl. 112-212.000.

Ritter, Josef: See—  
Ritter, Klaus; Gott, Hans; Ritter, Gerhard; and Ritter, Josef, 3,731,042.

Ritter, Klaus; Gott, Hans; Ritter, Gerhard; and Ritter, Josef, to EVG Entwicklungs- und verwertungsgesellschaft m.b.H. Welding machine for manufacture of wire mesh. 3,731,042, Cl. 213-62.3-.

Rively, Clair M.; and Petro, James, to Westinghouse Electric Corporation. Method and apparatus for manufacturing beaded filament-coil components for electric lamps. 3,729,787, Cl. 29-25.180.

Rixson-Firemark, Inc.: See—  
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Roberts, Bruce W.: See—  
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Roberts, Frank D.: See—  
Crane, Burke J.; D'Hooge, Richard E.; and Roberts, Frank D., 3,729,771.

Roberts, George Wavell, to Gravoki Systems Limited. Fluid pressure devices. 3,730,652, Cl. 417-568.000.

Roberts, John A.; Roberts, Peter R.; and Danzey, Lee B., to Brunswick Corporation. Orifice structure. 3,730,227, Cl. 138-40.000.

Roberts, Peter R.: See—  
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Rossmy, Gerd: See—  
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Rosso, John B.; and Ross, Robert H. Method and means for monitoring the quantity of dispersed oil in water with means for wiping the sample cell. 3,731,091, Cl. 250-43.50r.

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Royal Development Company, Inc.: See—  
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Royal Medical Corporation: See—  
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RST International Metals, Limited: See—  
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Runtz, Jean W., to North American Philips Corporation. Multi-position switch with improved wafer switch contact arrangement. 3,731,017, Cl. 200-11.00d.

Russell, Winfield P. Combination pack and cot. 3,730,407, Cl. 224-9.000.

Rustan, B., A/S: See—  
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Rynne, George Bernard: See—  
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Sack, John J.; and Acs, Steven, to Allied Chemical Corporation. Irreversible energy absorbing air bag system. 3,730,551, Cl. 280-150.00b.

Sadel, Hans. Radio frequency measurements. 3,731,186, Cl. 324-57.00n.

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- Smith, Aubrey H. Regulated power supply with diode capacitor matrix. 3,731,112, Cl. 307-109.000.
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- Smith, Clyde, to Columbia Broadcasting System. Method and apparatus for automatic video distortion correction. 3,730,984, Cl. 178-6.000.
- Smith, Frank, to Imperial Chemical Industries Limited. Coating of metals. 3,730,761, Cl. 117-131.000.
- Smith, Geoffrey Allan; and Laidlaw, Alan James, I/3 to Dawson, Joseph, (Holdings) Limited. Dye transferring method. 3,730,676, Cl. 8-2.500.
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- Smith, Horace L., Jr., to Smitherm Industries, Inc. Roasting method for particulate solids. 3,730,731, Cl. 99-68.000.
- Smith, Howard John Leonard, to Dzus Fastener Co., Inc. Friction locks. 3,730,243, Cl. 151-41.500.
- Smith, Jay, III; Schmidt, Gerald W.; and Jones, Lawrence T., to California R&D Center. Gurgling baby bottle. 3,729,859, Cl. 46-1.00d.
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- Smith, Joseph E.; and de Troyer, Georges D., to Wolverine-Pentronix, Inc. Powder dispenser for a powder compacting press. 3,730,659, Cl. 425-78.000.
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- Smith, Willis R., to General Signal Corporation. Railroad vehicle control system. 3,731,086, Cl. 246-63.00c.
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- Spira, Nathan, to Controls Bailey Societe Anonyme. Transfer checking device for analog data acquisition system. 3,731,296, Cl. 340-248.00a.
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Terakov, Alexei Danilovich: See—  
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Terzian, Leon. Tape applicator. 3,730,815, Cl. 156-527.000.

Teti, John; and Violette, Jerome Carlton, to Du Pont de Nemours, E. I., and Company. Microporous particulate thermoplastic polymer composition. 3,730,918, Cl. 260-2.50m.

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Texaco Inc.: See—  
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Thakore, Kaushik H., to Bendix Corporation. The Transistorized ignition system for gas turbine engines. 3,731,143, Cl. 315-209.00r.

Thaxton, Ellis B., to Ride-Rite Corporation. Vehicle air-spring. 3,730,548, Cl. 280-124.00f.

Thaxton, Ellis B., to Ride-Rite Corporation. Air-spring assembly for vehicles. 3,730,550, Cl. 280-124.00f.

Theby, Edward A.: See—  
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Thomas, Roy Leander, Jr., to Supper, Charles, Company. Method and apparatus for eliminating spot doubling in precession X-ray crystallography. 3,731,097, Cl. 250-51.500.

Thompson, Palmer B., to United States Gypsum Company. Demountable partition assemblies and the studs therefor. 3,729,883, Cl. 52-481.000.

Thomson-CSF: See—  
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Thorn, Frank H.: See—  
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Thornton, Craig Edward: See—  
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Thrumond, James A. Foldable, readily-transportable seat. 3,730,294, Cl. 182-20.000.

Thum, Oskar. Spreading bandage for children having dislocated hip bones. 3,730,177, Cl. 128-80.00a.

Thur, Klaus, to Telesco Brophy Limited. Umbrella and sheath. 3,730,199, Cl. 135-20.00r.

Tidwell, Eracy Clinton. Vehicle body tool for twisting doors. 3,729,974, Cl. 72-292.000.

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Pointu, Pierre; and Tran, Trach Lan, 3,730,696.

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Trapasso, Louis E.; and Stackman, Robert W., to Celanese Corporation. Basic dyed polyester fiber modified with a dihydroxyalkoxypropyl or butyl sulfonate. 3,730,681, Cl. 8-168.000.

Trasen, Ben; and Rising, Donald B., to Millipore Corporation. Filter support and filter unit construction. 3,730,353, Cl. 210-455.000.

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Tripp, Terence Gordon, to Monsanto Chemicals Limited. Production of alkoxides. 3,730,857, Cl. 204-59.00r.

Trocme, Claude M., to Eaton Yale & Towne, Inc. Anti-skid brake control and actuator assembly. 3,730,053, Cl. 91-469.000.

Trub, Hannes. Tubular-shaped ozonizer possessing cooled inner electrode. 3,730,874, Cl. 204-321.000.

Trubisky, Leonard G.: See—  
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True, Thomas T., to General Electric Corporation. Light valve projector with improved image detail and brightness. 3,730,992, Cl. 178-5.4bd.

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Uffner, Melville W., to Air Products and Chemicals, Inc. Dye compositions comprising a fluorocarbon, pigment, bonding agent and dispersant. 3,730,924, Cl. 260-8.000.

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Ullmann, Werner; Rabian, Laszlo; Mattei, Silvano; Sieg, Arno; Suter, Peter; Tadini, Costantino; Panschow, Rudolf; Suhr, Volker; and Meyer, Wolfgang, to Agie, A.G. fur industrielle Elektronik. Circuit for an electro-eroding machine for the control of the relative movement between at least one electrode and at least one workpiece. 3,731,045, Cl. 219-69.00v.

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Victor Company of Japan, Limited: See—  
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Wagner Electric Corporation: See—  
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Wagner, Friedrich. Skiboat. 3,729,841, Cl. 36-2.5al.

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Walding, Rowland Trevor. Cardboard blanks and boxes formed therefrom. 3,729,786, Cl. 27-3.000.

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Wolcott, John R.; and Wiggins, MacDonald J., to Martin-Marietta Corporation. Electronic distance measuring method and apparatus. 3,730,628, Cl. 356-5.000.

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Yerouchalmi, David: See—  
Aubin, Gerard; and Yerouchalmi, David, 3,730,911.  
Yeshiva University: See—  
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Yokobayashi, Yasuyuki: See—  
Sugimoto, Kaname; Hirao, Mamoru; Yoshida, Mikihiro; Shiosaka, Makoto; and Yokobayashi, Yasuyuki, 3,730,840.  
York, Jesse Louis. Gas-liquid separator. 3,729,904, Cl. 55-457.000.  
York, Kenneth C., to General Dynamics Corporation. Inertia switch with manually adjustable conductive spring arm assembly. 3,731,020, Cl. 200-61.45r.  
Yoshida Kogyo Kabushiki Kaisha: See—  
Fukuroi, Takeo, 3,729,781.  
Yoshida, Mikihiro: See—  
Sugimoto, Kaname; Hirao, Mamoru; Yoshida, Mikihiro; Shiosaka, Makoto; and Yokobayashi, Yasuyuki, 3,730,840.  
Yoshimatsu, Morio: See—  
Numakura, Toshihiko; and Yoshimatsu, Morio, 3,730,983.  
Young, Byron A., to Varian Associates. Method and apparatus for eliminating count scatter introduced by phase-locked loop frequency multipliers. 3,731,196, Cl. 324-50e.  
Young, Homer F.: See—  
Perricone, Alphonse C.; and Young, Homer F., 3,730,900.  
Young, John E., to Armco Steel Corporation. Sheet truck and the like. 3,730,547, Cl. 280-116.000.  
Yuki, Yoshiyuki, to Nippon Gakki Seizo Kabushiki Kaisha. Pickup arm device for canceling biasing forces of stylus. 3,730,536, Cl. 274-23.00r.  
Yuminaka, Takeo: See—  
Inuzuka, Isao; Watanabe, Kikuo; Yuminaka, Takeo; Iwasaka, Tatsuo; and Ochi, Toshio, 3,730,299.  
Zahnradfabrik Friedrichshafen AG: See—  
Bauknecht, Otto; and Horl, Adolf, 3,729,967.  
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Zall, David M.: See—  
Ventriglio, Frank J.; Zall, David M.; Stockhausen, Cyril J.; and Decker, Donald R., Jr., 3,729,902.  
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Daiker, Artur Lvovich; Morozov, Alexandr Nikolaevich; Veis, Anatoly Ivanovich; Kushtuev, Boris Grigorievich; Novoselov, Nikolai Mikhailovich; Zhuravlev, Viktor Nikolaevich; Zinoviev, Alexei Fedorovich; Alfeev, Ivan Ivanovich; Nikitin, Viktor Ivanovich; Kocergin, Alexei Ilich; Matashkov, Vladimir Filipovich; Karelin, Nikolai Ivanovich; Volchematiev, Jury Venediktovich; Zaluzhentsev, Veniamin Fedorovich; and Morozov, Gennady Yakovlevich, 3,730,504.  
Zanner, Johann: See—  
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Zanzig, Charles E.: See—  
Rash, Kenneth E., Jr.; Colmey, John C.; and Zanzig, Charles E., 3,730,735.  
Zawadzki, George Z., to Von Duprin, Inc. Latch bolt retractor mechanism. 3,730,574, Cl. 292-92.000.  
Zbikowski, Theodore H., to Tonka Corporation. Wheel and tire assembly for toy vehicles. 3,730,594, Cl. 301-63.00w.  
Zebarth, Ralph S. Method for removing excess moisture from water-bath chilled poultry carcasses. 3,730,741, Cl. 99-194.000.  
Zega, Frank J. Golf swing practice device. 3,730,531, Cl. 273-191.00a.  
Zeller, Josef: See—  
Bollig, Georg; Zeller, Josef; and Simons, Willi, 3,730,255.  
Zellweger Ltd.: See—  
Schwanemann, Manfred, 3,731,178.  
Zemek, Albert W.; Holmes, Robert H.; and Orzelek, Frank J., to Universal Instruments Corporation. Axial lead dispenser head. 3,730,041, Cl. 83-278.000.  
Zenith Radio Corporation: See—  
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Zhuravlev, Viktor Nikolaevich: See—  
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Ziemek, Gerhard: See—  
Weichardt, Helmut; Glander, Fritz; Ziemek, Gerhard; Schuppe, Walter; Meyer, Hans; and Eilhardt, Bernd, 3,729,919.

Zievers, James F.; and Novotny, Charles J., to Industrial Filter & Pump Mfg. Co. Sugar recovery method. 3,730,770, Cl. 127-46.00b.  
Zimmer, George A.: See—  
Mead, Robert H.; and Zimmer, George A., 3,730,009.  
Zimmer, George A., to Borg-Warner Corporation. One-way clutch. 3,730,316, Cl. 192-41.00a.  
Zimmerer, Arthur L.; Zimmerer, Bernard J.; and Zimmerer, Paul B., to Lindsay Manufacturing Co. Towable drive tower for center pivot irrigation systems. 3,730,435, Cl. 239-213.000.  
Zimmerer, Bernard J.: See—  
Zimmerer, Arthur L.; Zimmerer, Bernard J.; and Zimmerer, Paul B., 3,730,435.  
Zimmerer, Paul B.: See—  
Zimmerer, Arthur L.; Zimmerer, Bernard J.; and Zimmerer, Paul B., 3,730,435.  
Zimmermann, Ernest F., to Ampex Corporation. Apparatus for shearing webs. 3,730,043, Cl. 83-502.000.  
Zink, Robert L.: See—  
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Ivanovich; Kocergin, Alexei Ilich; Matashkov, Vladimir Filipovich; Karelin, Nikolai Ivanovich; Volchematiev, Jury Venediktovich; Zaluzhentsev, Veniamin Fedorovich; and Morozov, Gennady Yakovlevich, 3,730,504.  
Zitron, Benjamin C.: See—  
Dancis, Douglas E.; Dorfuss, Gerald E.; and Zitron, Benjamin C., 3,731,282.  
Zollinger, Henry, Jr.: See—  
Motzer, Alfred E.; and Zollinger, Henry, Jr., 3,729,977.  
Zuck, Daniel R. Airplane with floating wing and reverse propeller thrust. 3,730,459, Cl. 244-48.000.  
Zucker, Frederic E., to Pitney-Bowes, Inc. Coded document. 3,731,065, Cl. 235-61.20n.  
Zunderdorp, Henricus J.; and Berkhout, Augustinus J., to Shell Oil Company. Method and means for dynamically stationing a floating vessel. 3,730,126, Cl. 114-144.00b.  
Zyalyaev, Vagiz Murzakhanovich: See—  
Maksutov, Rafkhat; Asfandiyarov, Khalim Akhmetovich; Pashin, Vasily Fedorovich; Gubarev, Yakov Fedorovich; Sadykov, Rifgat Suleimanovich; Akhunov, Albert Musagitovich; Vakhitov, Gadel Galyautdinovich; Graifer, Valery Isaakovich; Zyalyaev, Vagiz Murzakhanovich; Kostriukov, Gennady Vasilievich; and Efanov, Boris Fedorovich, 3,729,803.



## LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM  
DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 1ST DAY  
OF MAY, 1973

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Blount, William W., Jr. Electroplatable Polypropylene or polyallomer composition. T910,001, 5-1-73, Cl. 280-23.  
Coles, Robert F., to Minnesota Mining and Mfg. Co. Blue anthraquinone dyes for radiographic film base. T910,004, 5-1-73, Cl. 96-87.  
Hercules Inc.: See—  
Klug, Eugene D. T910,003.  
Hodges, Wilbur C.: See—  
Rasch, Arthur A., and Hodges. T910,005.  
Hotter, Lynn R. Photographic bleach compositions. T910,002, 5-1-73, Cl. 96-60.  
Klug, Eugene D., to Hercules Inc. Paint remover compositions. T910,003, 5-1-73, Cl. 252-717.  
Minnesota Mining and Mfg. Co.: See—  
Coles, Robert F. T910,004.  
Rasch, Arthur A., and W. C. Hodges. Radiation sensitive polyacetylenic compositions for fluorescent images. T910,005, 5-1-73, Cl. 96-27.

## LIST OF REISSUE PATENTEEES

TO WHOM  
PATENTS WERE ISSUED ON THE 1ST DAY OF MAY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AB Penta: See—  
Bergstedt, Karl A. Re. 27,633.  
Bergstedt, Karl A., to AB Penta. Hydraulic mechanisms for boats with tiltable propeller housing. Re. 27,633, 5-1-73, Cl. 115-41.  
Berney, Joseph C. Foldable case setup apparatus. Re. 27,631, 5-1-73, Cl. 93-53.  
Cypher, James H., to PPG Industries, Inc. Method and apparatus for bending and tempering glass sheets. Re. 27,634, 5-1-73, Cl. 65-104.  
Dainihon Bungu Kabushiki Kaisha: See—  
Horie, Yukio. Re. 27,636.  
Graf, Edward D., and J. G. Kuhn. Abatement of active soil slides. Re. 27,630, 5-1-73, Cl. 61-35.  
Horie, Yukio, to Dainihon Bungu Kabushiki Kaisha. Ball-point pen for water-soluble ink. Re. 27,636, 5-1-73, Cl. 401-217.  
Kopaska, Larry A. Coupling device. Re. 27,635, 5-1-73, Cl. 137-614.5.  
Kuhn, Jason G.: See—  
Graf, Edward D., and Kuhn. Re. 27,630.  
Newton, Albert E., and P. G. Rumball, to USM Corp. Fire explosive tools. Re. 27,628, 5-1-73, Cl. 227-8.  
PPG Industries, Inc.: See—  
Cypher, James H. Re. 27,634.  
Plackett, Anthony G. Engine cooling and passenger compartment heating apparatus for motor vehicles. Re. 27,632, 5-1-73, Cl. 237-2.  
Rumball, Paul G.: See—  
Newton, Albert E., and Rumball. Re. 27,628.  
Shionogi & Co. Ltd.: See—  
Tanida, Hiroshi, and Tsuji. Re. 27,629.  
Tanida, Hiroshi, and T. Tsuji, to Shionogi & Co. Ltd. Tri-azoline derivatives. Re. 27,629, 5-1-73, Cl. 260-308.  
Tsuji, Teruji: See—  
Tanida, Hiroshi, and Tsuji. Re. 27,629.  
USM Corp.: See—  
Newton, Albert E., and Rumball. Re. 27,628.

## LIST OF PLANT PATENTEEES

Anderson, Frederick W., to Reedley Nursery, Inc. Nectarine tree. 3,325, 5-1-73, Cl. 41.  
Armstrong, David L., to Armstrong Nurseries, Inc. Rose plant. 3,322, 5-1-73, Cl. 15.  
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Armstrong, David L. 3,323.  
Conard-Pyle Co., The: See—  
Molina, Maria. 3,321.  
Molina, Maria, to The Conard-Pyle Co. Rose plant. 3,321, 5-1-73, Cl. 20.  
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Sperka, Marie S. Sterile dicentra plant. 3,324, 5-1-73, Cl. 68.

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Aladdin Industries, Inc.: See—  
Bridges, John A. 226,830.  
American Supply Corp.: See—  
Madalin, William A. 226,817.  
Ames, John B. Dispensing container. 226,802, 5-1-73, Cl. D9-71.  
Arens, John B., to Westinghouse Electric Corp. Post top colonial luminaire. 226,820, 5-1-73, Cl. D48-31.  
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French, Lawrence C. Ornamental skate-board. 226,813, 5-1-73, Cl. D34-15.  
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Tat, Choy C. 226,812.  
Hannon, William J.: See—  
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Gaylord, Leonard R. 226,814.  
Johnson, Andrew. Portable cushion. 226,795, 5-1-73, Cl. D6-201.  
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Mann, Samuel J., to Westinghouse Electric Corp. Can opener. 226,798, 5-1-73, Cl. D8-36.  
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Neval, Bela B., to Nevco Products Co., Inc. Package of mugs. 226,805, 5-1-73, Cl. D9-193.  
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Neval, Bela B. 226,805.  
Peters & Co., Inc.: See—  
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Rollins, Richard W., to Nash Bros. Co. Trailer hitch plate. 226,808, 5-1-73, Cl. D14-6.  
Rumble, Raymond M., to Michigan Hanger Co., Inc. Beam clamp body. 226,799, 5-1-73, Cl. D8-235.  
Rumble, Raymond M., to Michigan Hanger Co., Inc. Beam clamp body. 226,800, 5-1-73, Cl. D8-235.  
Rumble, Raymond M., to Michigan Hanger Co. Beam clamp body. 226,801, 5-1-73, Cl. D8-235.  
Schaller, Eleanor R. Hat. 226,791, 5-1-73, Cl. D2-251.  
Schneider, Marshall C., to Charles D. Barnes Co. Combined display cube and stand therefor. 226,797, 5-1-73, Cl. D6-235.  
Shinnick, Richard L. Picture frame. 226,796, 5-1-73, Cl. D6-234.  
Staub, David E., to Concept, Inc. Ophthalmic slit lamp. 226,824, 5-1-73, Cl. D57-1.  
Staub, David E., to Concept, Inc. Corneal rust ring remover. 226,829, 5-1-73, Cl. D83-12.  
Stensager, Norman H. Resuscitating device. 226,828, 5-1-73, Cl. D83-1.  
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Haynes, Julian R. 226,822.  
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Tixier, Michel, to Regie Nationale des Usines Renault. Vehicle body. 226,807, 5-1-73, Cl. D14-3.  
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Welton, Gerry D. Chair. 226,794, 5-1-73, Cl. D6-68.  
Wernicke, Kenneth G., to Textron Inc. Tilt rotor convertiplane. 226,826, 5-1-73, Cl. D71-1.  
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Mann, Samuel J. 226,798.  
Arens, John B. 226,820.  
Winfrey, Ralph. Gun carrier. 226,810, 5-1-73, Cl. D22-13.  
Wood, Frank E. Bottle. 226,803, 5-1-73, Cl. D9-139.



**ISSUED MAY 1, 1973**

NOTE.—First number, class; second number, subclass; third number, patent number.

|       |          |           |        |           |          |          |           |           |      |           |
|-------|----------|-----------|--------|-----------|----------|----------|-----------|-----------|------|-----------|
| 3R    | CLASS 2  | 3,729,744 | 116AD  | 3,729,788 | CLASS 46 | 54.5P    | 3,729,931 | 3,729,996 | 59MT | 3,730,061 |
| 9     |          | 3,729,745 | 148.4S | 3,729,789 | ID       | 54.6E    | 3,729,932 | 3,729,997 |      | CLASS 95  |
|       |          | 3,729,746 | 156.6B | 3,729,790 | 47       |          | 3,729,933 | 3,729,998 | 4.5R | 3,730,062 |
| 114   |          | 3,729,747 | 157C   | 3,729,792 | 59       | 226R     | 3,729,934 | 3,729,999 | 10CT | 3,730,063 |
|       | CLASS 4  |           |        | 3,729,793 | 79       |          | 3,729,937 | 3,730,000 | 10C  | 3,730,064 |
| 6     |          | 3,729,748 | 157R   | 3,729,791 | 92       | 256      | 3,729,935 | 3,730,002 | 13   | 3,730,065 |
| 113   |          | 3,729,749 | 159.01 | 3,729,795 | 105      | 274      | 3,729,936 | 3,730,001 | 31R  | 3,730,066 |
| 187   |          | 3,729,750 | 182.1  | 3,729,794 | 116      | 298      | 3,729,937 | 3,730,004 | 44C  | 3,730,067 |
|       |          |           | 200A   | 3,729,798 | 216      |          |           | 3,730,003 | 44R  | 3,730,068 |
|       | CLASS 5  |           | 200P   | 3,729,797 |          | CLASS 48 | 35        | 3,730,009 | 98   | 3,730,069 |
| 2R    |          | 3,729,753 | 203MM  | 3,729,796 | 213      |          | Re.27.630 | 3,730,005 |      | CLASS 96  |
| 66    |          | 3,729,751 | 204    | 3,729,799 |          | CLASS 49 | 41A       | 3,730,006 | 1SD  | 3,730,707 |
| 93R   |          | 3,729,752 | 207.5R | 3,729,800 |          |          | 43        | 3,730,008 | 1R   | 3,730,710 |
|       |          |           | 243.53 | 3,729,801 | 98       |          | 46.5      | 3,730,007 | 1.2  | 3,730,708 |
|       | CLASS 8  |           |        | 3,729,809 | 489      |          | 72.3      | 3,730,011 | 1.4  | 3,730,709 |
| 2.5   |          | 3,730,676 | 254    | 3,729,802 | 504      |          | 72.4      | 3,730,012 | 1.5  | 3,730,711 |
| 10.2  |          | 3,730,677 | 421    | 3,729,803 |          | CLASS 51 | 22        | 3,730,013 |      | 3,730,712 |
| 149.1 |          | 3,730,678 | 427    | 3,729,806 |          |          | 39        | 3,730,009 | 1.7  | 3,730,714 |
| 151   |          | 3,730,679 | 432    | 3,729,804 | 17       |          | 39        | 3,730,014 | 3    | 3,730,713 |
| 151.2 |          | 3,730,680 | 471.1  | 3,729,812 | 348      |          | 40        | 3,730,016 | 27R  | 3,730,717 |
| 168   |          | 3,730,681 | 471.7  | 3,729,805 | 358      |          | 51        | 3,730,015 | 29D  | 3,730,718 |
|       | CLASS 9  |           | 473.1  | 3,729,807 | 399      |          | 60        | 3,730,017 | 29R  | 3,730,716 |
| 8R    |          | 3,729,755 | 493    | 3,729,810 |          | CLASS 52 | 64        | 3,730,010 | 35.1 | 3,730,715 |
|       |          | 3,729,756 | 527.2  | 3,729,813 | 78       |          | 149       | 3,730,018 | 36.1 | 3,730,719 |
|       | CLASS 10 |           | 577    | 3,729,814 | 79       |          | 259       | 3,730,019 | 38.3 | 3,730,720 |
| 86A   |          | 3,729,757 | 578    | 3,729,811 | 81       |          | 427       | 3,730,020 | 48PD | 3,730,721 |
| 1R    |          |           | 592    | 3,729,815 | 109      |          | 428       | 3,730,021 | 56.3 | 3,730,722 |
|       | CLASS 11 |           | 593    | 3,729,816 | 126      |          |           | 3,730,022 | 64   | 3,730,723 |
|       |          |           | 610    | 3,729,817 | 173      |          | 9A        | 3,729,953 | 74   | 3,730,724 |
|       | CLASS 12 |           | 625    | 3,729,819 | 232      |          |           | CLASS 65  | 81   | 3,730,725 |
| 10.5  |          | 3,729,758 | 627    | 3,729,820 | 264      |          | 2         | 3,730,695 | 84R  | 3,730,726 |
| 114.4 |          | 3,729,759 | 630    | 3,729,818 | 280      |          | 30        | 3,730,696 | 95   | 3,730,727 |
| 120.5 |          | 3,729,760 |        |           | 300      |          | 43        | 3,730,698 | 115R | 3,730,734 |
|       | CLASS 13 |           | 34.1   | 3,729,821 | 481      |          | 104       | Re.27.634 |      | CLASS 98  |
| 9     |          | 3,730,961 | 391    | 3,730,239 | 646      |          | 105       | 3,730,697 | 2.04 | 3,730,070 |
| 31    |          | 3,730,962 | 394    | 3,729,822 | 663      |          | 237       | 3,730,699 | 40D  | 3,730,071 |
|       |          |           |        | 3,729,823 | 747      |          |           |           |      | 3,730,072 |
|       | CLASS 15 |           |        |           |          | CLASS 53 | 86        | 3,729,954 | 60   | 3,730,073 |
| 21B   |          | 3,729,763 |        |           |          |          | 89        | 3,729,955 | 121  | 3,730,074 |



|           |           |        |           |       |           |           |           |        |           |       |           |
|-----------|-----------|--------|-----------|-------|-----------|-----------|-----------|--------|-----------|-------|-----------|
| 199CB     | 3,730,104 | 266    | CLASS 126 | 1.5   | 3,730,778 | 2R        | CLASS 169 | 66     | 3,730,312 | 143   | 3,730,877 |
| 215C      | 3,730,105 | 350R   | 3,730,165 | 6.3   | 3,730,783 | 212       | CLASS 172 | 3.3    | 3,730,315 | 210   | 3,730,878 |
| 253       | 3,730,106 | 386    | 3,730,167 | 6.35  | 3,730,779 | 581       | 3,730,280 | 12C    | 3,730,313 | 213   | 3,730,880 |
| 1         | CLASS 106 | 19     | CLASS 127 | 11.5R | 3,730,781 | 48        | CLASS 173 | 41A    | 3,730,314 | 122   | CLASS 209 |
| 57        | 3,730,743 | 46B    | 3,730,768 | 23    | 3,730,782 | 13        | CLASS 174 | 84R    | 3,730,317 | 164   | 3,730,341 |
| 110       | 3,730,744 | 2F     | 3,730,769 | 101   | 3,730,784 | 107M      | 3,730,965 | 95     | 3,730,319 | 6     | CLASS 210 |
| 287SE     | 3,730,745 | 2S     | 3,730,770 | 142   | 3,730,785 | 134       | 3,730,966 | 107M   | 3,730,320 | 7     | 3,730,881 |
| 288B      | 3,730,747 | 2.05F  | 3,730,771 | 175   | 3,730,787 | 27        | 3,730,967 | 134    | 3,730,296 | 15    | 3,730,882 |
| 309       | 3,730,748 | 2.05M  | 3,730,772 | 1     | 3,730,788 | 52S       | 3,730,968 | 9T     | 3,730,321 | 30    | 3,730,883 |
| 39        | 3,730,749 | 2.08   | 3,730,773 | 19    | 3,730,792 | 68B       | 3,730,969 | 1.7    | 3,730,835 | 37    | 3,730,884 |
| 108       | 3,730,750 | 6      | 3,730,774 | 22    | 3,730,789 | 73R       | 3,730,970 | 28N    | 3,730,836 | 45    | 3,730,885 |
| 156       | 3,730,751 | 25R    | 3,730,775 | 44    | 3,730,790 | 94R       | 3,730,972 | 28R    | 3,730,837 | 52    | 3,730,886 |
| 25        | 3,730,752 | 66     | 3,730,776 | 46    | 3,730,791 | 4.51      | 3,730,282 | 29     | 3,730,838 | 68    | 3,730,887 |
| 29        | 3,730,753 | 80A    | 3,730,777 | 2.5   | 3,730,240 | 53        | 3,730,283 | 31R    | 3,730,839 | 152   | 3,730,888 |
| 8R        | 3,730,754 | 94     | 3,730,778 | 52A   | 3,730,241 | 92        | 3,730,284 | 63     | 3,730,840 | 231   | 3,730,889 |
| 18R       | 3,730,755 | 142.5  | 3,730,779 | 41.5  | 3,730,242 | 220       | 3,730,285 | 103.5R | 3,730,841 | 266   | 3,730,890 |
| 79R       | 3,730,756 | 145.6  | 3,730,780 | 41.7  | 3,730,243 | 320       | 3,730,286 | 30     | 3,730,842 | 274   | 3,730,891 |
| 121.15    | 3,730,757 | 152    | 3,730,781 | 323   | 3,730,244 | 30        | 3,730,832 | 37     | 3,730,843 | 281   | 3,730,892 |
| 212       | 3,730,758 | 173    | 3,730,782 | 352   | 3,730,245 | 37        | 3,730,833 | 129    | 3,730,844 | 321   | 3,730,893 |
| 30        | 3,730,759 | 213    | 3,730,783 | 356   | 3,730,246 | 45        | 3,730,834 | 36     | 3,730,845 | 332   | 3,730,894 |
| 5R        | 3,730,760 | 287    | 3,730,784 | 367   | 3,730,247 | 2R        | CLASS 178 | 82     | 3,730,846 | 455   | 3,730,895 |
| 20        | 3,730,761 | 303    | 3,730,785 | 379   | 3,730,248 | 3         | 3,730,973 | 36     | 3,730,322 | 38    | 3,730,354 |
| 53        | 3,730,762 | 303.14 | 3,730,786 | 1     | 3,730,799 | 5.1       | 3,730,974 | 82     | 3,730,323 | 59    | 3,730,355 |
| 106       | 3,730,763 | 325    | 3,730,787 | 5     | 3,730,800 | 5.2R      | 3,730,975 | 24     | 3,730,324 | 1BC   | 3,730,356 |
| 144B      | 3,730,764 | 349R   | 3,730,788 | 8     | 3,730,801 | 5.4BD     | 3,730,976 | 33AD   | 3,730,325 | 6DK   | 3,730,357 |
| 201       | 3,730,765 | 17R    | 3,730,789 | 96    | 3,730,802 | 5.4CD     | 3,730,977 | 33R    | 3,730,326 | 16.4A | 3,730,358 |
| 218       | 3,730,766 | 11     | 3,730,790 | 98    | 3,730,803 | 5.4CK     | 3,730,978 | 37     | 3,730,327 | 38D   | 3,730,359 |
| 47A       | 3,730,767 | 73.6   | 3,730,791 | 112   | 3,730,804 | 5.4ST     | 3,730,979 | 44     | 3,730,328 | 63    | 3,730,360 |
| 47R       | 3,730,768 | 2      | 3,730,792 | 169   | 3,730,805 | 5.4P      | 3,730,980 | 127R   | 3,730,329 | 85    | 3,730,361 |
| 51        | 3,730,769 | 10     | 3,730,793 | 173   | 3,730,806 | 5.4R      | 3,730,981 | 189    | 3,730,330 | 140   | 3,730,362 |
| 72        | 3,730,770 | 41     | 3,730,794 | 182   | 3,730,807 | 5.6       | 3,730,982 | 213    | 3,730,331 | 302   | 3,730,363 |
| 104R      | 3,730,771 | 138    | 3,730,795 | 201   | 3,730,808 | 6         | 3,730,983 | 219    | 3,730,332 | 512   | 3,730,364 |
| 131       | 3,730,772 | 5A     | 3,730,796 | 205   | 3,730,809 | 6.8       | 3,730,984 | 4      | 3,730,333 | 518   | 3,730,365 |
| 139.5CO   | 3,730,773 | 16     | 3,730,797 | 272   | 3,730,810 | 7.1       | 3,730,985 | 5A     | 3,730,334 | 653   | 3,730,366 |
| 201       | 3,730,774 | 20R    | 3,730,798 | 331   | 3,730,811 | 7.5R      | 3,730,986 | 11D    | 3,730,335 | 674   | 3,730,367 |
| 217       | 3,730,775 | 50     | 3,730,799 | 332   | 3,730,812 | 7.8       | 3,730,987 | 11R    | 3,730,336 | 9     | 3,730,370 |
| 239       | 3,730,776 | 83R    | 3,730,800 | 345   | 3,730,813 | 69.5TV    | 3,730,988 | 11R    | 3,730,337 | 32    | 3,730,372 |
| CLASS 117 | 3,730,777 | 100R   | 3,730,801 | 353   | 3,730,814 | 1HS       | 3,730,989 | 11R    | 3,730,338 | 7.5   | 3,730,373 |
| 11        | 3,730,778 | 131    | 3,730,802 | 367   | 3,730,815 | 1VC       | 3,730,990 | 11R    | 3,730,339 | 10.49 | 3,730,374 |
| 34        | 3,730,779 | 6      | 3,730,803 | 380   | 3,730,816 | 144B      | 3,730,991 | 11R    | 3,730,340 | 10.55 | 3,730,375 |
| 36.2      | 3,730,780 | 30     | 3,730,804 | 381   | 3,730,817 | 8R        | 3,730,992 | 11R    | 3,730,341 | 10.79 | 3,730,376 |
| 47A       | 3,730,781 | 83R    | 3,730,805 | 382   | 3,730,818 | 15AL      | 3,730,993 | 11R    | 3,730,342 | 56    | 3,730,377 |
| 47R       | 3,730,782 | 100R   | 3,730,806 | 383   | 3,730,819 | 15BS      | 3,730,994 | 11R    | 3,730,343 | 62    | 3,730,378 |
| 51        | 3,730,783 | 131    | 3,730,807 | 384   | 3,730,820 | 18FH      | 3,730,995 | 11R    | 3,730,344 | 69V   | 3,730,379 |
| 72        | 3,730,784 | 6      | 3,730,808 | 385   | 3,730,821 | 27FF      | 3,730,996 | 11R    | 3,730,345 | 181   | 3,730,380 |
| 104R      | 3,730,785 | 30     | 3,730,809 | 386   | 3,730,822 | 84R       | 3,730,997 | 11R    | 3,730,346 | 192   | 3,730,381 |
| 131       | 3,730,786 | 83R    | 3,730,810 | 387   | 3,730,823 | 100.2CH   | 3,730,998 | 11R    | 3,730,347 | 195C  | 3,730,382 |
| 139.5CO   | 3,730,787 | 100R   | 3,730,811 | 388   | 3,730,824 | 100.2MD   | 3,730,999 | 11R    | 3,730,348 | 195P  | 3,730,383 |
| 201       | 3,730,788 | 131    | 3,730,812 | 389   | 3,730,825 | 100.2C    | 3,730,100 | 11R    | 3,730,349 | 224   | 3,730,384 |
| 217       | 3,730,789 | 6      | 3,730,813 | 390   | 3,730,826 | 100.2S    | 3,730,101 | 11R    | 3,730,350 | 245   | 3,730,385 |
| 239       | 3,730,790 | 30     | 3,730,814 | 391   | 3,730,827 | 100.4IK   | 3,730,102 | 11R    | 3,730,351 | 252   | 3,730,386 |
| CLASS 118 | 3,730,791 | 83R    | 3,730,815 | 392   | 3,730,828 | 167       | 3,730,103 | 11R    | 3,730,352 | 298   | 3,730,387 |
| 2         | 3,730,792 | 100R   | 3,730,816 | 393   | 3,730,829 | 175.31R   | 3,730,104 | 11R    | 3,730,353 | 321   | 3,730,388 |
| 6         | 3,730,793 | 131    | 3,730,817 | 394   | 3,730,830 | 1.5       | 3,730,851 | 11R    | 3,730,354 | 45.31 | 3,730,389 |
| 16        | 3,730,794 | 6      | 3,730,818 | 395   | 3,730,831 | CLASS 160 | 3,730,852 | 11R    | 3,730,355 | 47B   | 3,730,390 |
| 325       | 3,730,795 | 30     | 3,730,819 | 396   | 3,730,832 | CLASS 161 | 3,730,853 | 11R    | 3,730,356 | 63.2R | 3,730,391 |
| CLASS 119 | 3,730,796 | 83R    | 3,730,820 | 397   | 3,730,833 | CLASS 162 | 3,730,854 | 11R    | 3,730,357 | 65V   | 3,730,392 |
| 2         | 3,730,797 | 100R   | 3,730,821 | 398   | 3,730,834 | CLASS 163 | 3,730,855 | 11R    | 3,730,358 | 84    | 3,730,393 |
| 6         | 3,730,798 | 131    | 3,730,822 | 399   | 3,730,835 | CLASS 164 | 3,730,856 | 11R    | 3,730,359 | 106   | 3,730,394 |
| 16        | 3,730,799 | 6      | 3,730,823 | 400   | 3,730,836 | CLASS 165 | 3,730,857 | 11R    | 3,730,360 | 145   | 3,730,395 |
| 325       | 3,730,800 | 30     | 3,730,824 | 401   | 3,730,837 | CLASS 166 | 3,730,858 | 11R    | 3,730,361 | 166   | 3,730,396 |
| CLASS 120 | 3,730,801 | 83R    | 3,730,825 | 402   | 3,730,838 | CLASS 167 | 3,730,859 | 11R    | 3,730,362 | 254   | 3,730,397 |
| 2         | 3,730,802 | 100R   | 3,730,826 | 403   | 3,730,839 | CLASS 168 | 3,730,860 | 11R    | 3,730,363 |       |           |
| 6         | 3,730,803 | 131    | 3,730,827 | 404   | 3,730,840 | CLASS 169 | 3,730,861 | 11R    | 3,730,364 |       |           |
| 16        | 3,730,804 | 6      | 3,730,828 | 405   | 3,730,841 | CLASS 170 | 3,730,862 | 11R    | 3,730,365 |       |           |
| 325       | 3,730,805 | 30     | 3,730,829 | 406   | 3,730,842 | CLASS 171 | 3,730,863 | 11R    | 3,730,366 |       |           |
| CLASS 121 | 3,730,806 | 83R    | 3,730,830 | 407   | 3,730,843 | CLASS 172 | 3,730,864 | 11R    | 3,730,367 |       |           |
| 2         | 3,730,807 | 100R   | 3,730,831 | 408   | 3,730,844 | CLASS 173 | 3,730,865 | 11R    | 3,730,368 |       |           |
| 6         | 3,730,808 | 131    | 3,730,832 | 409   | 3,730,845 | CLASS 174 | 3,730,866 | 11R    | 3,730,369 |       |           |
| 16        | 3,730,809 | 6      | 3,730,833 | 410   | 3,730,846 | CLASS 175 | 3,730,867 | 11R    | 3,730,370 |       |           |
| 325       | 3,730,810 | 30     | 3,730,834 | 411   | 3,730,847 | CLASS 176 | 3,730,868 | 11R    | 3,730,371 |       |           |
| CLASS 122 | 3,730,811 | 83R    | 3,730,835 | 412   | 3,730,848 | CLASS 177 | 3,730,869 | 11R    | 3,730,372 |       |           |
| 2         | 3,730,812 | 100R   | 3,730,836 | 413   | 3,730,849 | CLASS 178 | 3,730,870 | 11R    | 3,730,373 |       |           |
| 6         | 3,730,813 | 131    | 3,730,837 | 414   | 3,730,850 | CLASS 179 | 3,730,871 | 11R    | 3,730,374 |       |           |
| 16        | 3,730,814 | 6      | 3,730,838 | 415   | 3,730,851 | CLASS 180 | 3,730,872 | 11R    | 3,730,375 |       |           |
| 325       | 3,730,815 | 30     | 3,730,839 | 416   | 3,730,852 | CLASS 181 | 3,730,873 | 11R    | 3,730,376 |       |           |
| CLASS 123 | 3,730,816 | 83R    | 3,730,840 | 417   | 3,730,853 | CLASS 182 | 3,730,874 | 11R    | 3,730,377 |       |           |
| 2         | 3,730,817 | 100R   | 3,730,841 | 418   | 3,730,854 | CLASS 183 | 3,730,875 | 11R    | 3,730,378 |       |           |
| 6         | 3,730,818 | 131    | 3,730,842 | 419   | 3,730,855 | CLASS 184 | 3,730,876 | 11R    | 3,730,379 |       |           |
| 16        | 3,730,819 | 6      | 3,730,843 | 420   | 3,730,856 | CLASS 185 | 3,730,877 | 11R    | 3,730,380 |       |           |
| 325       | 3,730,820 | 30     | 3,730,844 | 421   | 3,730,857 | CLASS 186 | 3,730,878 | 11R    | 3,730,381 |       |           |
| CLASS 124 | 3,730,821 | 83R    | 3,730,845 | 422   | 3,730,858 | CLASS 187 | 3,730,879 | 11R    | 3,730,382 |       |           |
| 2         | 3,730,822 | 100R   | 3,730,846 | 423   | 3,730,859 | CLASS 188 | 3,730,880 | 11R    | 3,730,383 |       |           |
| 6         | 3,730,823 | 131    | 3,730,847 | 424   | 3,730,860 | CLASS 189 | 3,730,881 | 11R    | 3,730,384 |       |           |
| 16        | 3,730,824 | 6      | 3,730,848 | 425   | 3,730,861 | CLASS 190 | 3,730,882 | 11R    | 3,730,385 |       |           |
| 325       | 3,730,825 | 30     | 3,730,849 | 426   | 3,730,862 | CLASS 191 | 3,730,883 | 11R    | 3,730,386 |       |           |
| CLASS 125 | 3,730,826 | 83R    | 3,730,850 | 427   | 3,730,863 | CLASS 192 | 3,730,884 | 11R    | 3,730,387 |       |           |
| 2         | 3,730,827 | 100R   | 3,730,851 | 428   | 3,730,864 | CLASS 193 | 3,730,885 | 11R    | 3,730,388 |       |           |
| 6         | 3,730,828 | 131    | 3,730,852 | 429   | 3,730,865 | CLASS 194 | 3,730,886 | 11R    | 3,730,389 |       |           |
| 16        | 3,730,829 | 6      | 3,730,853 | 430   | 3,730,866 | CLASS 195 | 3,730,887 | 11R    | 3,730,390 |       |           |
| 325       | 3,730,830 | 30     | 3,730,854 | 431   | 3,730,867 | CLASS 196 | 3,730,888 | 11R    | 3,730,391 |       |           |
| CLASS 126 | 3,730,831 | 83R    | 3,730,855 | 432   | 3,730,868 | CLASS 197 | 3,730,889 | 11R    | 3,730,392 |       |           |
| 2         | 3,730,832 | 100R   |           |       |           |           |           |        |           |       |           |



## CLASSIFICATION OF PATENTS

|           |           |           |           |           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 17.7      | 3,731,309 | CLASS 352 | CLASS 356 | 239       | 3,730,637 | 475       | 3,730,650 | 131       | 3,730,662 |
| 1121C     | 3,731,312 | 72        | 3,730,613 | 5         | 3,730,628 | 554       | 3,730,651 | 222       | 3,730,663 |
| 717       | 3,731,314 | 91        | 3,730,614 | 28        | 3,730,625 | 568       | 3,730,652 | 259       | 3,730,665 |
| 854       | 3,731,313 | 109       | 3,730,615 | 74        | 3,730,629 | CLASS 415 | 3,730,638 | 338       | 3,730,664 |
|           | 3,731,315 | 166       | 3,730,616 | 101       | 3,730,630 | 117       | 3,730,640 | 405H      | 3,730,666 |
|           | 3,731,316 | 244       | 3,730,617 | 150       | 3,730,631 | 199A      | 3,730,641 | 445       | 3,730,667 |
| CLASS 346 |           | CLASS 353 |           | 156       | 3,730,632 | CLASS 416 | 3,730,643 | CLASS 431 |           |
| 107R      | 3,731,317 | 19        | 3,730,618 | 205       | 3,730,633 | 8         | 3,730,644 | 10        | 3,730,668 |
| 145       | 3,731,318 | 26        | 3,730,619 | 217       | 3,730,627 | 95        | 3,730,645 | 93        | 3,730,669 |
| CLASS 350 |           | CLASS 355 |           | CLASS 401 | Re.27,636 | 12        | 3,730,646 | 256       | 3,730,670 |
| 160LC     | 3,730,607 | 8         | 3,730,620 | CLASS 408 | 122       | 3,730,647 | 3         | 264       | 3,730,672 |
| 160R      | 3,730,608 | 9         | 3,730,621 | 22        | 3,730,634 | 269       | 3,730,648 | 274       | 3,730,671 |
| 161       | 3,730,609 | 14        | 3,730,622 | 46        | 3,730,635 | 40R       | 3,730,649 | 278       | 3,730,673 |
| 162SF     | 3,730,610 | 16        | 3,730,623 | 168       | 3,730,636 | 424       | 3,730,642 | 288       | 3,730,674 |
| 288       | 3,730,611 | 132       | 3,730,624 |           |           |           |           | CLASS 432 |           |
| 305       | 3,730,612 |           |           |           |           |           |           | 60        | 3,730,675 |

## CLASSIFICATION OF DESIGNS

|      |     |         |      |     |         |      |         |         |         |         |         |         |         |         |         |         |         |
|------|-----|---------|------|-----|---------|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| D 2— | 251 | 226,791 | D 8— | 36  | 226,798 | 193  | 226,805 | D34—    | 226,812 | D48—    | 24      | 226,818 | D57—    | 226,824 |         |         |         |
|      | 311 | 226,792 |      | 235 | 226,799 | 275  | 226,806 |         | 15      | 226,813 |         | 27      | 226,819 | D66—    | 226,825 |         |         |
| D 6— | 20  | 226,793 |      |     | 226,800 | D14— | 3       | 226,807 |         | 226,814 |         | 31      | 226,820 | D71—    | 226,826 |         |         |
|      | 66  | 226,794 |      |     | 226,801 |      | 6       | 226,808 | D44—    | 1       | 226,815 | D49—    | 6       | 226,821 | D76—    | 226,827 |         |
|      | 201 | 226,795 | D 9— | 71  | 226,802 |      |         | 226,809 |         |         |         |         |         |         |         |         |         |
|      | 234 | 226,796 |      | 139 | 226,803 | D22— | 13      | 226,810 |         | 10      | 226,817 |         | 17      | 226,822 | D83—    | 226,828 |         |
|      | 235 | 226,797 |      | 186 | 226,804 | D26— | 14      | 226,811 |         |         | 226,830 | D55—    | 1       | 226,823 |         | 12      | 226,829 |

## DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

|     |              |             |              |      |              |      |              |
|-----|--------------|-------------|--------------|------|--------------|------|--------------|
| 96— | 27R T910,005 | 60 T910,002 | 87R T910,004 | 252— | 717 T910,003 | 260— | 23H T910,001 |
|-----|--------------|-------------|--------------|------|--------------|------|--------------|

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(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

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## PATENTS

|               |           |           |               |           |           |
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| 1 : 3,729,998 | 3,730,131 | 3,730,735 | 8 : 3,729,752 | 3,731,023 | 3,729,862 |
| 2 : 3,730,105 | 3,730,134 | 3,730,760 | 3,729,900     | 3,731,057 | 3,730,361 |
| 4 : 3,729,879 | 3,730,141 | 3,730,776 | 3,730,064     | 3,731,064 | 3,730,444 |
| 3,729,901     | 3,730,145 | 3,730,788 | 3,730,225     | 3,731,065 | 3,730,471 |
| 3,729,909     | 3,730,150 | 3,730,792 | 3,730,268     | 3,731,068 | 3,730,622 |
| 3,729,948     | 3,730,160 | 3,730,793 | 3,730,270     | 3,731,070 | 3,730,741 |
| 3,729,990     | 3,730,172 | 3,730,815 | 3,730,337     | 3,731,107 | 3,730,937 |
| 3,730,127     | 3,730,181 | 3,730,835 | 3,730,580     | 3,731,163 | 3,731,295 |
| 3,730,132     | 3,730,182 | 3,730,842 | 3,730,603     | 3,731,205 | 3,730,174 |
| 3,730,234     | 3,730,186 | 3,730,889 | 3,730,772     | 3,731,218 | 3,730,187 |
| 3,730,425     | 3,730,191 | 3,730,891 | 3,730,791     | 3,731,253 | 3,730,556 |
| 3,730,890     | 3,730,194 | 3,730,893 | 3,730,849     | 3,731,261 | 3,730,559 |
| 3,731,181     | 3,730,203 | 3,730,897 | 3,731,001     | 3,731,293 | 3,730,592 |
| 5 : 3,730,590 | 3,730,208 | 3,730,898 | 3,731,176     | 3,731,294 | 3,730,763 |
| 6 : Re.27,630 | 3,730,214 | 3,730,909 | 3,731,208     | 3,731,298 | 3,731,274 |
| 3,729,757     | 3,730,223 | 3,730,922 | 3,731,289     | 3,731,685 | 3,729,744 |
| 3,729,774     | 3,730,224 | 3,730,947 | 3,730,717     | 3,730,717 | 3,729,745 |
| 3,729,775     | 3,730,247 | 3,730,985 | 3,729,797     | 3,730,918 | 3,729,770 |
| 3,729,778     | 3,730,267 | 3,731,010 | 3,729,848     | 3,731,101 | 3,729,771 |
| 3,729,796     | 3,730,273 | 3,731,020 | 3,729,860     | 3,731,102 | 3,729,772 |
| 3,729,801     | 3,730,277 | 3,731,026 | 3,729,977     | 3,731,102 | 3,729,782 |
| 3,729,802     | 3,730,281 | 3,731,051 | 3,729,980     | 3,730,120 | 3,729,804 |
| 3,729,809     | 3,730,292 | 3,731,059 | 3,730,006     | 3,730,543 | 3,729,836 |
| 3,729,817     | 3,730,311 | 3,731,061 | 3,730,015     | 3,730,789 | 3,729,845 |
| 3,729,850     | 3,730,352 | 3,731,062 | 3,730,052     | 3,729,751 | 3,729,847 |
| 3,729,856     | 3,730,358 | 3,731,075 | 3,730,077     | 3,729,768 | 3,729,881 |
| 3,729,859     | 3,730,387 | 3,731,090 | 3,730,084     | 3,729,855 | 3,729,882 |
| 3,729,868     | 3,730,391 | 3,731,098 | 3,730,112     | 3,729,906 | 3,729,885 |
| 3,729,870     | 3,730,394 | 3,731,099 | 3,730,193     | 3,730,122 | 3,729,894 |
| 3,729,874     | 3,730,399 | 3,731,103 | 3,730,229     | 3,730,139 | 3,729,897 |
| 3,729,878     | 3,730,431 | 3,731,104 | 3,730,322     | 3,730,171 | 3,729,911 |
| 3,729,883     | 3,730,432 | 3,731,106 | 3,730,392     | 3,730,179 | 3,729,922 |
| 3,729,884     | 3,730,438 | 3,731,116 | 3,730,424     | 3,730,189 | 3,729,936 |
| 3,729,899     | 3,730,443 | 3,731,133 | 3,730,434     | 3,730,195 | 3,729,959 |
| 3,729,935     | 3,730,457 | 3,731,146 | 3,730,499     | 3,730,198 | 3,730,005 |
| 3,729,951     | 3,730,459 | 3,731,165 | 3,730,531     | 3,730,371 | 3,730,010 |
| 3,729,965     | 3,730,470 | 3,731,196 | 3,730,539     | 3,730,429 | 3,730,016 |
| 3,729,987     | 3,730,483 | 3,731,209 | 3,730,552     | 3,730,436 | 3,730,018 |
| 3,730,002     | 3,730,496 | 3,731,221 | 3,730,555     | 3,730,469 | 3,730,029 |
| 3,730,013     | 3,730,553 | 3,731,233 | 3,730,576     | 3,730,512 | 3,730,043 |
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| 3,730,091     | 3,730,572 | 3,731,276 | 3,730,732     | 3,731,174 | 3,730,104 |
| 3,730,093     | 3,730,578 | 3,731,283 | 3,730,779     | 3,731,200 | 3,730,148 |
| 3,730,108     | 3,730,612 | 3,731,291 | 3,730,841     | 3,731,306 | 3,730,149 |
| 3,730,111     | 3,730,613 | 3,731,292 | 3,730,848     | 3,731,307 | 3,730,157 |
| 3,730,123     | 3,730,633 | 3,731,304 | 3,730,855     | 3,729,761 | 3,730,168 |
| 3,730,125     | 3,730,684 | 3,731,305 | 3,730,919     | 3,729,763 | 3,730,176 |
|               | 3,730,703 | 3,731,311 | 3,730,979     | 3,729,857 | 3,730,184 |



|            |            |            |           |           |           |
|------------|------------|------------|-----------|-----------|-----------|
| 3,730,209  | 3,729,912  | 3,730,301  | 3,730,308 | 3,730,316 | 3,729,971 |
| 3,730,239  | 3,729,979  | 3,730,304  | 3,730,374 | 3,730,324 | 3,730,011 |
| 3,730,264  | 3,730,045  | 3,730,305  | 3,730,382 | 3,730,398 | 3,730,042 |
| 3,730,280  | 3,730,085  | 3,730,315  | 3,730,388 | 3,730,453 | 3,730,086 |
| 3,730,285  | 3,730,088  | 3,730,330  | 3,730,390 | 3,730,454 | 3,730,099 |
| 3,730,307  | 3,730,092  | 3,730,347  | 3,730,397 | 3,730,465 | 3,730,102 |
| 3,730,314  | 3,730,098  | 3,730,357  | 3,730,421 | 3,730,475 | 3,730,110 |
| 3,730,328  | 3,730,121  | 3,730,366  | 3,730,452 | 3,730,493 | 3,730,151 |
| 3,730,331  | 3,730,281  | 3,730,420  | 3,730,492 | 3,730,495 | 3,730,215 |
| 3,730,332  | 3,730,502  | 3,730,451  | 3,730,511 | 3,730,573 | 3,730,217 |
| 3,730,335  | 3,730,683  | 3,730,462  | 3,730,524 | 3,730,577 | 3,730,222 |
| 3,730,338  | 3,730,705  | 3,730,481  | 3,730,528 | 3,730,584 | 3,730,246 |
| 3,730,355  | 3,730,715  | 3,730,498  | 3,730,566 | 3,730,595 | 3,730,260 |
| 3,730,370  | 3,730,882  | 3,730,540  | 3,730,606 | 3,730,597 | 3,730,303 |
| 3,730,372  | 3,730,910  | 3,730,541  | 3,730,629 | 3,730,604 | 3,730,320 |
| 3,730,376  | 3,730,951  | 3,730,551  | 3,730,654 | 3,730,620 | 3,730,325 |
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| 3,730,393  | 3,731,096  | 3,730,575  | 3,730,702 | 3,730,623 | 3,730,365 |
| 3,730,416  | 3,731,114  | 3,730,581  | 3,730,714 | 3,730,624 | 3,730,379 |
| 3,730,466  | 3,731,122  | 3,730,583  | 3,730,719 | 3,730,637 | 3,730,380 |
| 3,730,468  | 3,731,198  | 3,730,653  | 3,730,744 | 3,730,707 | 3,730,414 |
| 3,730,477  | 3,731,232  | 3,730,659  | 3,730,787 | 3,730,708 | 3,730,446 |
| 3,730,482  | 3,731,315  | 3,730,674  | 3,730,803 | 3,730,713 | 3,730,461 |
| 3,730,487  | 3,731,316  | 3,730,686  | 3,730,881 | 3,730,721 | 3,730,507 |
| 3,730,500  | Re. 27,628 | 3,730,691  | 3,730,894 | 3,730,723 | 3,730,508 |
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| 3,730,527  | 3,729,756  | 3,730,742  | 3,730,908 | 3,730,727 | 3,730,517 |
| 3,730,535  | 3,729,764  | 3,730,743  | 3,730,912 | 3,730,736 | 3,730,547 |
| 3,730,545  | 3,729,777  | 3,730,807  | 3,730,920 | 3,730,751 | 3,730,549 |
| 3,730,593  | 3,729,794  | 3,730,812  | 3,730,923 | 3,730,753 | 3,730,557 |
| 3,730,615  | 3,729,872  | 3,730,839  | 3,730,927 | 3,730,765 | 3,730,598 |
| 3,730,740  | 3,729,895  | 3,730,866  | 3,730,929 | 3,730,774 | 3,730,647 |
| 3,730,770  | 3,729,953  | 3,730,867  | 3,730,935 | 3,730,782 | 3,730,658 |
| 3,730,809  | 3,729,973  | 3,730,915  | 3,730,939 | 3,730,786 | 3,730,672 |
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| 3,731,003  | 3,730,244  | 3,731,067  | 3,730,960 | 3,730,868 | 3,730,773 |
| 3,731,017  | 3,730,265  | 3,731,080  | 3,730,969 | 3,730,931 | 3,730,798 |
| 3,731,025  | 3,730,353  | 3,731,158  | 3,730,972 | 3,730,932 | 3,730,821 |
| 3,731,077  | 3,730,407  | 3,731,171  | 3,730,977 | 3,730,938 | 3,730,822 |
| 3,731,078  | 3,730,410  | 3,731,197  | 3,730,991 | 3,730,944 | 3,730,832 |
| 3,731,081  | 3,730,449  | 3,731,213  | 3,730,995 | 3,730,946 | 3,730,833 |
| 3,731,113  | 3,730,473  | 3,731,260  | 3,731,000 | 3,730,954 | 3,730,834 |
| 3,731,157  | 3,730,479  | 3,731,290  | 3,731,002 | 3,730,962 | 3,730,861 |
| 3,731,187  | 3,730,484  | 3,731,253  | 3,731,014 | 3,730,964 | 3,730,862 |
| 3,731,230  | 3,730,488  | 3,731,230  | 3,731,015 | 3,730,984 | 3,730,865 |
| 3,731,259  | 3,730,544  | 3,731,259  | 3,731,037 | 3,730,986 | 3,730,945 |
| 3,731,299  | 3,730,571  | 3,731,299  | 3,731,058 | 3,730,989 | 3,731,040 |
| 3,731,317  | 3,730,627  | 3,731,317  | 3,731,073 | 3,730,992 | 3,731,050 |
| 3,731,326  | 3,730,693  | 3,731,326  | 3,731,109 | 3,730,999 | 3,731,087 |
| 3,731,337  | 3,730,716  | 3,731,337  | 3,731,124 | 3,731,006 | 3,731,202 |
| 3,731,344  | 3,730,725  | 3,731,344  | 3,731,131 | 3,731,008 | 3,731,248 |
| 3,731,353  | 3,730,737  | 3,731,353  | 3,731,152 | 3,731,012 | 3,731,300 |
| 3,731,378  | 3,730,775  | 3,731,378  | 3,731,160 | 3,731,086 | 3,731,300 |
| 3,731,385  | 3,730,794  | 3,731,385  | 3,731,180 | 3,731,127 | 3,731,300 |
| 3,731,396  | 3,730,831  | 3,731,396  | 3,731,183 | 3,731,136 | 3,731,300 |
| 3,731,400  | 3,730,885  | 3,731,400  | 3,731,186 | 3,731,138 | 3,731,300 |
| 3,731,428  | 3,730,965  | 3,731,428  | 3,731,192 | 3,731,143 | 3,731,300 |
| 3,731,433  | 3,730,967  | 3,731,433  | 3,731,194 | 3,731,144 | 3,731,300 |
| 3,731,480  | 3,731,005  | 3,731,480  | 3,731,223 | 3,731,145 | 3,731,300 |
| 3,731,574  | 3,731,083  | 3,731,574  | 3,731,224 | 3,731,156 | 3,731,300 |
| 3,731,589  | 3,731,097  | 3,731,589  | 3,731,234 | 3,731,159 | 3,731,300 |
| 3,731,641  | 3,731,110  | 3,731,641  | 3,731,237 | 3,731,184 | 3,731,300 |
| 3,731,642  | 3,731,137  | 3,731,642  | 3,731,251 | 3,731,191 | 3,731,300 |
| 3,731,692  | 3,731,175  | 3,731,692  | 3,731,266 | 3,731,203 | 3,731,300 |
| 3,731,844  | 3,731,189  | 3,731,844  | 3,731,278 | 3,731,210 | 3,731,300 |
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| 3,731,956  | 3,731,226  | 3,731,956  | 3,731,308 | 3,731,215 | 3,731,300 |
| 3,731,979  | 3,731,235  | 3,731,979  | 3,731,310 | 3,731,217 | 3,731,300 |
| Re. 27,635 | 3,731,236  | Re. 27,635 | 3,731,311 | 3,731,222 | 3,731,300 |
| 3,729,926  | 3,731,244  | 3,729,926  | 3,731,312 | 3,731,247 | 3,731,300 |
| 3,730,095  | 3,731,263  | 3,730,095  | 3,731,313 | 3,731,249 | 3,731,300 |
| 3,730,192  | 3,731,317  | 3,730,192  | 3,731,314 | 3,731,252 | 3,731,300 |
| 3,730,242  | 3,729,779  | 3,730,242  | 3,731,315 | 3,731,267 | 3,731,300 |
| 3,730,296  | 3,729,805  | 3,730,296  | 3,731,316 | 3,731,275 | 3,731,300 |
| 3,730,472  | 3,729,808  | 3,730,472  | 3,731,317 | 3,731,280 | 3,731,300 |
| 3,731,048  | 3,729,818  | 3,731,048  | 3,731,318 | 3,731,282 | 3,731,300 |
| 3,729,908  | 3,729,823  | 3,729,908  | 3,731,319 | 3,731,287 | 3,731,300 |
| 3,729,947  | 3,729,833  | 3,729,947  | 3,731,320 | 3,731,287 | 3,731,300 |
| 3,730,056  | 3,729,864  | 3,730,056  | 3,731,321 | 3,731,287 | 3,731,300 |
| 3,730,107  | 3,729,867  | 3,730,107  | 3,731,322 | 3,731,287 | 3,731,300 |
| 3,730,153  | 3,729,880  | 3,730,153  | 3,731,323 | 3,731,287 | 3,731,300 |
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| 3,731,013  | 3,729,937  | 3,731,013  | 3,731,325 | 3,731,287 | 3,731,300 |
| 3,730,213  | 3,729,960  | 3,730,213  | 3,731,326 | 3,731,287 | 3,731,300 |
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| 3,730,439  | 3,730,021  | 3,730,439  | 3,731,329 | 3,731,287 | 3,731,300 |
| 3,730,440  | 3,730,022  | 3,730,440  | 3,731,330 | 3,731,287 | 3,731,300 |
| 3,730,602  | 3,730,027  | 3,730,602  | 3,731,331 | 3,731,287 | 3,731,300 |
| 3,731,256  | 3,730,040  | 3,731,256  | 3,731,332 | 3,731,287 | 3,731,300 |
| 3,729,861  | 3,729,877  | 3,729,861  | 3,731,333 | 3,731,287 | 3,731,300 |
| 3,730,205  | 3,729,891  | 3,730,205  | 3,731,334 | 3,731,287 | 3,731,300 |
| 3,730,282  | 3,729,949  | 3,730,282  | 3,731,335 | 3,731,287 | 3,731,300 |
| 3,730,389  | 3,730,154  | 3,730,389  | 3,731,336 | 3,731,287 | 3,731,300 |
| 3,730,445  | 3,730,156  | 3,730,445  | 3,731,337 | 3,731,287 | 3,731,300 |
| 3,730,663  | 3,730,210  | 3,730,663  | 3,731,338 | 3,731,287 | 3,731,300 |
| 3,730,928  | 3,730,212  | 3,730,928  | 3,731,339 | 3,731,287 | 3,731,300 |
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| 3,729,783  | 3,730,221  | 3,729,783  | 3,731,341 | 3,731,287 | 3,731,300 |
| 3,729,815  | 3,730,251  | 3,729,815  | 3,731,342 | 3,731,287 | 3,731,300 |
| 3,729,853  | 3,730,293  | 3,729,853  | 3,731,343 | 3,731,287 | 3,731,300 |
| 3,729,902  | 3,730,298  | 3,729,902  | 3,731,344 | 3,731,287 | 3,731,300 |

|           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|
| 3,730,094 | 3,730,561 | 3,731,121 | 3,730,689 | 3,730,746 | 3,730,884 |
| 3,730,130 | 3,730,565 | 3,731,135 | 3,730,888 | 3,730,799 | 3,730,892 |
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| 3,730,180 | 3,730,611 | 3,731,150 | 3,729,851 | 3,730,869 | 3,730,310 |
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| 3,730,256 | 3,730,669 | 3,731,185 | 3,729,941 | 3,730,900 | 3,729,985 |
| 3,730,257 | 3,730,673 | 3,731,193 | 3,729,962 | 3,730,914 | 3,730,054 |
| 3,730,258 | 3,730,697 | 3,731,254 | 3,729,986 | 3,731,054 | 3,730,346 |
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| 3,730,262 | 3,730,720 | 3,731,285 | 3,730,008 | 3,731,082 | 3,730,520 |
| 3,730,263 | 3,730,758 | 3,731,303 | 3,730,078 | 3,731,119 | 3,730,558 |
| 3,730,278 | 3,730,785 | 3,731,312 | 3,730,173 | 3,731,172 | 3,730,728 |
| 3,730,289 | 3,730,808 | 3,729,852 | 3,730,228 | 3,731,188 | 3,730,730 |
| 3,730,295 | 3,730,813 | 3,729,854 | 3,730,236 | 3,731,269 | 3,731,100 |
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| 3,730,342 | 3,730,823 | 3,730,290 | 3,730,272 | 3,731,297 | 3,729,886 |
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| 3,730,369 | 3,730,916 | 3,729,822 | 3,730,286 | 3,730,017 | 3,730,164 |
| 3,730,373 | 3,730,921 | 3,729,910 | 3,730,313 | 3,730,069 | 3,730,219 |
| 3,730,378 | 3,730,924 | 3,729,958 | 3,730,321 | 3,730,165 | 3,730,250 |
| 3,730,383 | 3,730,933 | 3,730,129 | 3,730,367 | 3,731,243 | 3,730,317 |
| 3,730,401 | 3,730,941 | 3,730,230 | 3,730,396 | 3,731,318 | 3,730,400 |
| 3,730,408 | 3,730,957 | 3,729,835 | 3,730,537 | 3,730,001 | 3,730,497 |
| 3,730,418 | 3,730,971 | 3,729,974 | 3,730,548 | 3,730,080 | 3,730,738 |
| 3,730,441 | 3,731,018 | 3,730,047 | 3,730,550 | 3,730,201 | 3,730,739 |
| 3,730,474 | 3,731,022 | 3,730,115 | 3,730,570 | 3,730,406 | 3,730,805 |
| 3,730,503 | 3,731,055 | 3,730,422 | 3,730,591 | 3,730,680 | 3,731,032 |
| 3,730,506 | 3,731,088 | 3,730,427 | 3,730,651 | 3,730,731 | 3,731,084 |
| 3,730,529 | 3,731,092 | 3,730,625 | 3,730,694 | 3,730,804 | 3,731,112 |

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| Chemical . . . . .                                                             | 603   |
| Electrical . . . . .                                                           | 653   |
| Design Patents Granted . . . . .                                               | 712   |
| Index of Patentees . . . . .                                                   | PI 1  |
| Indices of Applicants of Defensive Publications, Reissues, Plants, and Designs | PI 38 |
| Classification of                                                              |       |
| Patents (Including Reissues) . . . . .                                         | PI 41 |
| Designs, Plants, and Defensive Publications . . . . .                          | PI 43 |
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| Designs, Plants, and Applicants of Defensive Publications . . . . .            | PI 46 |

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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# PATENT OFFICE NOTICES

## TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

### Chapter I—Patent Office, Department of Commerce

#### PART I—RULES OF PRACTICE IN PATENT CASES

##### Implementation of Inventor's Certificate Legislation Serial Number and Filing Date

A proposal was published at 37 FR 25172 to add a new paragraph (c) to § 1.55 (37 CFR 1.55(c)). Pursuant to this notice, comments have been received from interested persons. Full consideration has been given to all matter presented. The proposed amendment is hereby adopted without change and is set forth below.

The new paragraph implements Public Law 92-358, dated July 28, 1972, which accords rights of priority under certain conditions to a U.S. patent application where the claims for priority are based on an earlier filed application for an inventor's certificate. It would insure that the right of priority would be granted for an inventor's certificate involving subject matter for which an applicant in the country of earlier filing has an option to file for either a patent or an inventor's certificate, as required by the new legislation.

**Effective date.**—This regulation shall be effective on the date when Articles 1-12 of the Paris Convention of March 20, 1883, for the Protection of Industrial Property, as revised at Stockholm, July 14, 1967, come into force with respect to the United States and shall apply only to applications thereafter filed in the United States.

Dated April 2, 1973.

ROBERT GOTTSCHALK,  
Commissioner of Patents.

Approved April 6, 1973.

RICHARD O. SIMPSON,  
Acting Assistant Secretary for  
Science and Technology.

##### § 1.55 Serial number and filing date of application.

(c) An applicant may under certain circumstances claim priority on the basis of an application for an inventor's certificate in a country granting both inventor's certificates and patents. When an applicant wishes to claim the right of priority as to a claim or claims of the application on the basis of an application for an inventor's certificate in such a country under 35 U.S.C. 119, last paragraph (as amended July 28, 1972), the applicant or his attorney or agent, when submitting a claim for such right as specified in paragraph (b) of this section, shall include an affidavit or declaration including a specific statement that, upon an investigation, he has satisfied himself that to the best of his knowledge the applicant, when filing his application for the inventor's certificate, had the option to file an application either for a patent or an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority.

[FR Doc. 73-7172; Filed 4-12-73; 8:45 am]

Published in 38 F.R. 9297; Apr. 13, 1973

#### Mail Delays and Petitions to Revive

Since applications that become abandoned unintentionally present burdens to both the Patent Office and the applicant or his representatives, a simplified procedure has been devised to alleviate these burdens when the abandonment results from a delay in the mails. This procedure provides for an automatic petition to revive or petition to accept the delayed payment of issue fee.

It is suggested that when a communication, complying with the circumstances enumerated below, is mailed to the Patent Office more than three calendar days prior to the due date, a conditional petition be attached to the communication. If the communication is received in the Patent Office

after the due date and the application becomes abandoned, the conditional petition will become effective, subject to the following requirements. The petition must include (1) an authorization to charge a deposit account for any required fees, including the petition fee (35 U.S.C. 41(a) 7), and (2) an oath or declaration signed by the person mailing the communication and also signed by the applicant or his registered representative stating that the communication and petition were either placed in the United States mail as first class or air mail, or placed in the mail outside the United States as air mail. Since mail handled in this manner may reasonably be expected to reach the Patent Office within three days of posting, any mail delays beyond such time will be considered to constitute unavoidable delay and sufficient cause to grant a petition to revive (35 U.S.C. 133) or a petition to accept delayed payment of an issue fee (35 U.S.C. 151).

The circumstances under which this procedure may be used are those where the communication, if timely filed, (1) would be a proper and complete response to an action or request by the Patent Office, and (2) would stop a period for response from continuing to run. Accordingly, this procedure would be appropriate for:

1. A response to a non-final Office action.
2. A response to a final Office action in the form of an amendment that cancels all rejected claims or otherwise prima facie places the application in condition for allowance.
3. A notice of appeal and requisite fee.
4. An appeal brief, in triplicate, and requisite fee.
5. A base issue fee.
6. A balance of issue fee.

Examples of which this procedure would not be appropriate and will not apply include:

1. Application papers.
2. A response to a final Office action other than that indicated in categories 2 and 3, above.
3. Extensions of time.
4. Petitions for delayed payment of either the issue fee or balance of issue fee.
5. Amendments under Rule 312.
6. Priority documents.

Normal petition practices are not affected in those situations where this procedure is either not elected or appropriate.

A suggested format for the conditional petition is shown below:

Applicant(s) ----- ☐ Petition to revive  
Serial No. ----- ☐ Petition to accept delayed payment of issue fee  
Date Filed -----  
For -----

I hereby certify that the attached communication is being deposited in

- ☐ the United States mail as first class or air mail  
☐ the mail outside the United States as air mail

in an envelope addressed to: Commissioner of Patents, Washington, D.C. 20231, on -----, which date is more than three (3) calendar days prior to the due date from -----, by ----- (Name of Individual)

In the event that such communication is not timely filed in the United States Patent Office, it is requested that this paper be treated as a petition and that the:

- ☐ delay in prosecution be held unavoidable—35 U.S.C.133.  
☐ delayed payment of the fee be accepted—35 U.S.C. 151.

The petition fee required by 35 U.S.C. 41(a) 7 is authorized to be charged to Deposit Account No. ----- in the name of -----

The undersigned declare further that all statements made herein are true, based upon the best available information;

MAY 8, 1973

U. S. PATENT OFFICE

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and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date -----  
(Signature of applicant or signature and registration number of Registered Representative)  
And  
Date -----  
(Signature of person mailing, if other than the above)

April 13, 1973.

WILLIAM FELDMAN,  
Deputy Assistant Commissioner for Patents.

#### Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,129,332, D. Mastini, TELEPHONE SYSTEM, filed July 27, 1961, D.C., S.D.N.Y., Doc. 61-C-2677, *Domenico Mastini v. General Telephone and Electronics Corporation*. Order, action is dismissed for lack of prosecution, Oct. 20, 1972.

2,441,090, Te Grotenhuis and Frost, METHOD OF MAKING A MIX OF CARBON BLACK AND A SYNTHETIC RUBBERY POLYMER OF A CONJUGATED DIOLFIN, filed Oct. 28, 1966, D.C., N.D. Ohio (Cleveland), Doc. C666-774, *Theodore A. Te Grotenhuis v. The Firestone Tire & Rubber Company*. Stipulation and order dismissing case with prejudice, Nov. 13, 1972.

2,507,347, R. R. Myers, Jr., METHOD OF PRODUCING ARCTIC PRINTING PLATES; 2,800,856, same, METHOD OF MAKING PRINTING PLATES; 2,814,990, same, METHOD OF PRODUCING PRINTING PLATES; 3,062,139, same, METHOD OF AND MEANS FOR PRODUCING PRINTING PLATES, filed Dec. 15, 1970, D.C., W.D.N.Y. (Buffalo), Doc. C-1970-585, *Printing Plate Supply Co. v. Arcata Graphics Corporation*. Decree and judgment filed Oct. 2, 1972.

2,784,955, C. E. Compton, ROTARY MINING MACHINE CUTTER HEAD WITH REAR HELICALLY EXTENDING TRANSVERSE OPENING; 2,935,300, V. J. McCarthy, MINING MACHINE HAVING INDEPENDENTLY OPERABLE SKIDS, filed May 16, 1969, D.C., S.D. W. Va. (Huntington), Doc. 2578, *The Salem Tool Company v. Charles E. Compton, Joy Mfg. Co., and Republic Corporation*. Action dismissed by agreement of the parties, order entered Oct. 19, 1972.

2,800,856. (See 2,507,347.)

2,814,990. (See 2,507,347.)

2,935,300. (See 2,784,955.)

3,062,139. (See 2,507,347.)

3,141,872, Natta, Pino and Mazzanti, POLYMERIZATION CATALYST AND STEREOSPECIFIC POLYMERIZATION OF PROPYLENE THEREWITH, filed Nov. 16, 1972, D.C. Del. (Wilmington), Doc. 4517, *Montecatini Edison, S.p.A. v. Enjay Chemical Co.*

3,236,390, H. F. J. Sprengel, SHIP'S CARGO BOOM WITH PENDULUM PURCHASE BLOCK FITTING, filed Jan. 9, 1967, D.C. Md. (Baltimore), Doc. 17959-W, *Blohm & Voss AG v. Grace Line, Inc.* Judgment, claims 1, 2, 3, 14, 15 and 18 valid. Defendant infringes claims 14, 15 and 18; defendant's counterclaims are dismissed, Nov. 13, 1972.

3,262,027, Zaleske and Churchill, SOLENOID STRUCTURE AND MOUNTING MEANS THEREFOR, filed Nov. 3, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2786, *Automatic Switch Company v. Emerson Electric Co.*

3,304,199, Faber, Francis, Holmes and Boykin, ELECTRICAL RESISTANCE ELEMENT, filed Nov. 10, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72-2702-FW, *Bourns, Inc. v. OTS Corporation*.

3,316,574, R. L. Pare, ROAD EXPANSION JOINT; Re. 28,733, J. A. Welch, ELASTOMERIC EXPANSION JOINT, filed Nov. 9, 1972, D.C., W.D.N.Y. (Buffalo), Doc. C-1972-592, *Watson-Bowman Associates, Inc. v. The General Tire & Rubber Company*.

3,405,268, D. C. Brunton, RADIANT ENERGY ABSORPTION GAGE FOR MEASURING THE WEIGHT OF A BASE MATERIAL AND THE CONTENT OF A MATERIAL SORBED BY THE BASE MATERIAL, filed Aug. 23, 1972, D.C., D.C. Doc. 1691-72, *Brum Sensor Systems, Inc. v. Sybron Corporation*.

3,421,752, A. S. Folino, PROCESS OF PRINTING NUMBERS ON FORMS, filed Nov. 13, 1972, D.C., S.D. Ohio (Dayton), Doc. 4338, *Arthur S. Folino v. Reynolds & Reynolds*.

3,498,215, L. D. Brinkman, LAMINATING DEVICE; 3,513,521, A. L. Fritz, APPARATUS FOR ASSEMBLING AND SECURING T-EDGING, filed Oct. 21, 1971, D.C. Ariz. (Phoenix), Doc. C-71-585 PHX, *Royal Industries, Inc. v. Unique Machine Tool Co., Inc. et al.* Complaint and counterclaims are dismissed with prejudice as to past acts only, Nov. 7, 1972.

3,513,521. (See 3,498,215.)

3,540,229, P. H. Buntin, AIR COOLING APPARATUS, filed May 11, 1972, D.C., S.D. Fla. (Miami), Doc. 71-1154-C-EC, *Paul H. Buntin and Repco Products Corporation v. Weathermatic Corporation*. Court finds the patent invalid, Nov. 16, 1972.

3,565,063, S. J. Popell, METHOD FOR SETTING HAIR, filed Mar. 9, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c591, *Popell Brothers, Inc. v. Sperry Rand Corporation*. Order complaints in 70c295, 71c979, 71c591 and 71c1352 dismissed, Nov. 17, 1972.

3,605,178, E. E. Hoffmann, LOIN PULLING KNIFE, filed Nov. 14, 1972, D.C. Minn. (St. Paul), Doc. 3-72-C-313, *Edwin E. Hoffmann v. Swift & Company*.

3,608,646, E. C. Ryan, ROTARY HOE, filed Nov. 9, 1972, D.C., N.D. Ohio (Cleveland), Doc. C72-1215, *Western Litho Plate & Supply Co. v. National Machine Company*.

3,675,247, J. O. Ferrell, METHOD FOR FABRICATING PANTY HOSE, filed Oct. 13, 1972, D.C., W.D.N.C. (Charlotte), Doc. C-C-72-234, *Tights, Inc. v. Chaddourn, Inc.*

3,696,813, R. M. Wallach, CRYOSURGICAL INSTRUMENT, filed Nov. 7, 1972, D.C., S.D. Fla. (Miami), Doc. 72-1765-C-PF, *Cryomedics, Inc. v. Gynemed, Inc.*

Re. 26,733. (See 3,316,574.)



## Certificates of Correction for the Week of May 8, 1973

|            |           |           |           |
|------------|-----------|-----------|-----------|
| PP. 3,054  | 3,660,901 | 3,666,649 | 3,695,737 |
| D. 224,204 | 3,661,296 | 3,686,879 | 3,695,779 |
| D. 225,063 | 3,661,941 | 3,686,949 | 3,696,014 |
| D. 225,322 | 3,663,251 | 3,687,102 | 3,696,069 |
| Re. 27,440 | 3,663,803 | 3,687,186 | 3,696,083 |
| 3,502,766  | 3,665,242 | 3,687,272 | 3,696,273 |
| 3,516,060  | 3,666,518 | 3,687,920 | 3,696,409 |
| 3,555,306  | 3,671,085 | 3,688,031 | 3,696,631 |
| 3,567,688  | 3,671,159 | 3,688,073 | 3,696,635 |
| 3,573,838  | 3,673,881 | 3,688,130 | 3,696,810 |
| 3,575,062  | 3,674,157 | 3,688,132 | 3,697,043 |
| 3,583,576  | 3,674,665 | 3,688,278 | 3,697,265 |
| 3,591,058  | 3,674,749 | 3,688,525 | 3,697,417 |
| 3,591,667  | 3,677,420 | 3,688,633 | 3,697,821 |
| 3,594,164  | 3,677,713 | 3,688,732 | 3,697,843 |
| 3,594,165  | 3,677,949 | 3,688,971 | 3,697,947 |
| 3,599,357  | 3,678,157 | 3,689,152 | 3,697,961 |
| 3,604,472  | 3,678,399 | 3,689,474 | 3,698,004 |
| 3,608,717  | 3,678,828 | 3,689,495 | 3,698,479 |
| 3,609,158  | 3,679,393 | 3,689,507 | 3,698,820 |
| 3,610,904  | 3,679,745 | 3,689,523 | 3,698,860 |
| 3,612,865  | 3,679,942 | 3,689,553 | 3,699,057 |
| 3,613,330  | 3,680,195 | 3,689,602 | 3,699,384 |
| 3,614,269  | 3,680,738 | 3,689,648 | 3,699,753 |
| 3,615,916  | 3,680,772 | 3,689,664 | 3,699,910 |
| 3,615,975  | 3,680,914 | 3,689,775 | 3,700,013 |
| 3,616,450  | 3,681,287 | 3,690,113 | 3,700,098 |
| 3,619,503  | 3,681,372 | 3,690,451 | 3,700,438 |
| 3,620,947  | 3,681,374 | 3,690,601 | 3,700,515 |
| 3,622,631  | 3,681,533 | 3,690,954 | 3,700,599 |
| 3,623,442  | 3,681,738 | 3,691,169 | 3,700,656 |
| 3,624,016  | 3,682,019 | 3,691,192 | 3,700,675 |
| 3,624,392  | 3,682,136 | 3,691,277 | 3,700,687 |
| 3,627,459  | 3,682,243 | 3,691,315 | 3,700,739 |
| 3,631,585  | 3,682,349 | 3,691,456 | 3,701,135 |
| 3,632,310  | 3,682,423 | 3,691,759 | 3,701,158 |
| 3,632,467  | 3,682,497 | 3,691,668 | 3,701,275 |
| 3,635,666  | 3,682,545 | 3,692,840 | 3,701,289 |
| 3,636,748  | 3,682,964 | 3,692,382 | 3,701,504 |
| 3,637,073  | 3,682,995 | 3,692,522 | 3,701,804 |
| 3,637,446  | 3,683,175 | 3,692,531 | 3,702,028 |
| 3,637,646  | 3,683,399 | 3,692,663 | 3,702,118 |
| 3,640,155  | 3,683,490 | 3,692,774 | 3,702,175 |
| 3,640,829  | 3,683,559 | 3,692,889 | 3,702,345 |
| 3,640,968  | 3,683,755 | 3,692,896 | 3,702,499 |
| 3,641,358  | 3,683,871 | 3,692,971 | 3,702,616 |
| 3,641,792  | 3,683,939 | 3,693,109 | 3,702,640 |
| 3,642,587  | 3,684,067 | 3,693,411 | 3,702,716 |
| 3,645,522  | 3,684,379 | 3,693,479 | 3,702,781 |
| 3,647,519  | 3,684,501 | 3,693,511 | 3,703,014 |
| 3,649,664  | 3,684,505 | 3,693,914 | 3,703,153 |
| 3,650,093  | 3,684,508 | 3,693,916 | 3,703,734 |
| 3,651,334  | 3,684,509 | 3,694,191 | 3,703,741 |
| 3,651,999  | 3,684,517 | 3,694,237 | 3,704,068 |
| 3,653,393  | 3,684,521 | 3,694,330 | 3,704,602 |
| 3,654,109  | 3,684,637 | 3,694,357 | 3,705,121 |
| 3,655,375  | 3,684,676 | 3,694,390 | 3,705,183 |
| 3,655,388  | 3,684,719 | 3,694,555 | 3,705,216 |
| 3,655,683  | 3,685,373 | 3,694,998 | 3,705,417 |
| 3,656,246  | 3,685,520 | 3,695,099 | 3,705,421 |
| 3,657,190  | 3,685,652 | 3,695,406 | 3,705,583 |
| 3,657,324  | 3,685,706 | 3,695,422 | 3,705,759 |
| 3,657,471  | 3,685,723 | 3,695,423 | 3,705,845 |
| 3,659,284  | 3,686,047 | 3,695,468 | 3,706,146 |
| 3,659,958  | 3,686,347 | 3,695,478 | 3,706,894 |
| 3,660,677  | 3,686,365 | 3,695,501 |           |
| 3,660,678  | 3,686,628 | 3,695,627 |           |

## Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Relasue Patent No. 25,695, M. A. Cook and H. E. Farnam, Jr., EXPLOSIVE COMPOSITION COMPRISING AMMONIUM NITRATE AND HEAT-PRODUCING METAL, decided May 29, 1969, Interference No. 95,416, claim 9.

Patent No. 3,287,224, W. B. Loewenstein, LARGE FAST NUCLEAR REACTOR, decided Nov. 30, 1972, Interference No. 97,345, claims 1 and 3.

Patent No. 3,389,404, R. A. Koster, CONTROL/DISPLAY APPARATUS, decided Nov. 7, 1972, Interference No. 96,980, claim 1.

Patent No. 3,402,223, J. B. L. Hollingsworth, HIGH MOLECULAR WEIGHT ETHYLENE COPOLYMER AND LOW MOLECULAR WEIGHT ETHYLENE-VINYL ACETATE COPOLYMER BLEND, decided Nov. 1, 1972, Interference No. 97,285, claims 3, 6 and 7.

Patent No. 3,405,394, J. F. Dirac, CONTROLLED REGISTER ACCESSING, decided Nov. 7, 1972, Interference No. 97,295, claims 1, 2, 3, 4, 5, 6, 8, 9, 10, 11 and 13.

Patent No. 3,489,370, B. Moussie, SELF-THREADING CINEMATOGRAPHIC PROJECTOR WITH FILM-MAGAZINE, decided Jan. 18, 1973, Interference No. 97,930, claims 1 and 3.

## National Technical Information Service

## GOVERNMENT-OWNED INVENTIONS

## Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for licensing in accordance with the GSA patent licensing regulations.

Copies of patent applications, either paper (PC) or microfiche (MF), can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22151, at the prices cited. Requests for copies of patent applications must include the patent application number and the title. Inquiries and requests for licensing information should be directed to the address cited on the first page of each copy of the patent application.

Paper copies of patents cannot be purchased from NTIS but are available from the Commissioner of Patents, Washington, D.C. 20231, at \$0.50 each. Inquiries and requests for licensing information should be directed to the "Assignee" as indicated on the copy of the patent.

DOUGLAS J. CAMPION,  
Patent Program Coordinator,  
National Technical Information Service.

## U.S. DEPARTMENT OF THE INTERIOR

Patent application 316,216, Electrolytic Preparation of Zirconium and Hafnium Diborides Using a Molten, Cryolite-Base Electrolyte. Filed December 18, 1972. PC \$3/MF \$0.95.

Patent application 316,217, Electrolytic Preparation of Titanium and Zirconium Diborides Using a Molten, Sodium Salt Electrolyte. Filed January 18, 1972. PC \$3/MF \$0.95.

## NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Patent application 197,183, Airfoil Shape for Flight at Supersonic Speeds. Filed November 9, 1971. PC \$3.50/MF \$0.95.

Patent application 318,152, Metabolic Analyzer. Filed December 26, 1972. PC \$3.75/MF \$0.95.

Patent application 306,652, Capacitance Multiplier and Filter Synthesizing Network. Filed November 15, 1972. PC \$3.25/MF \$0.95.

Patent application 322,998, Measuring Probe Position Recorder. Filed January 12, 1973. PC \$3/MF \$0.95.

Patent application 266,771, A Manual Actuator. Filed June 27, 1972. PC \$3/MF \$0.95.

[FR Doc. 73-6857; Filed 4-10-73; 8:45 am]

## Dedication

2,949,292.—Carl F. Abasi, Vestal, N.Y. PERFORATING APPARATUS. Patent dated Aug. 16, 1960. Dedication filed Aug. 4, 1972, by the assignee, International Business Machines Corporation.

Hereby dedicates to the Public the remaining term of said patent.

## Corrected Dedication

3,283,800.—Franz Ischinger, Katharinenberg, Georg Behrmann, Katzwang, and Karl Linzenkirchner, Ingolstadt, Germany. WHEEL FOR PNEUMATIC TIRES. Patent dated Nov. 8, 1966. Dedication filed Nov. 29, 1972, by the assignee, Zweirad Union AG.

Hereby dedicates to the Public the portion of the term of the patent subsequent to Nov. 14, 1972.

## Patents Available for Licensing or Sale

D. 222,363. DECORATIVE HANGING INCLUDING SKELETAL FRAMEWORK. Clifton Bullard, 310 Prescott Place, Plainfield, N.J., 07063.

3,082,571. TOY. John E. Lewis, ASSN, San Francisco, Calif., 96307.

3,465,373. HOSPITAL BED. Harriet A. Wilson, 115 Hilltop Road, Waverly, Pa., 16471.

3,696,619. ANTISMOG DEVICE FOR CLEANING, BURNING AND MUFFLING THE EXHAUST GASES AND ENGINE COMPARTMENT FUMES OF INTERNAL COMBUSTION ENGINES. Juan Rosa, Box 165, New York, N.Y., 10036.

3,712,626. BARREL POOL APPARATUS, INCLUDING SPRING PROJECTOR. John Rondeau, 306 Avalon Ave., Santa Cruz, Calif., 95060.

3,714,734. TOY AIRCRAFT. John E. Livingston, 502 Camp Ave., New Albany, Ind., 47150.

The following 3 patents are offered by: Fred E. Sanders, 11612 Saywell Ave., Cleveland, Ohio, 44108.

3,488,473. ELECTRIC BEVERAGE HEATER.

3,514,579. ELECTRIC SYRUP WARMER.

3,624,350. TURBO ELECTRIC FURNACE.

General Motors Corporation is prepared to grant non-exclusive licenses under the following 5 patents upon reasonable terms.

Application for license may be addressed to: The Director, Patent Section, General Motors Bldg., 3044 W. Grand Blvd., Detroit, Mich., 48202.

3,537,353. CIRCUIT FOR AUTOMATICALLY OPERATING THE BREECH OF A LARGE CALIBER GUN.

3,588,790. POWER TRAIN.

3,589,920. LOGIC SPEED SWITCH CIRCUITRY.

3,543,588. ACCESSORY INSTALLATION.

3,558,237. VARIABLE TURBINE NOZZLES.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 20 patents.

Inquiries respecting licenses under the following patents should be addressed to RCA Corporation, Staff Vice President, Domestic Licensing, 1133 Avenue of the Americas, New York, N.Y., 10036.

D. 226,274. INDOOR ANTENNA OR SIMILAR ARTICLE.

3,714,709. METHOD OF MANUFACTURING THICK-FILM HYBRID INTEGRATED CIRCUITS.

3,715,212. PHOTOCHROMIC DISPLAY AND STORAGE DEVICE AND METHOD OF OPERATION THEREOF.

3,715,464. HIGH VOLTAGE HOLD-DOWN CIRCUIT.

3,715,477. VIDEO SIGNAL NOISE-LIMITING APPARATUS.

3,715,485. RADIATION SENSING AND SIGNAL TRANSFER CIRCUITS.

3,715,486. SHUTTERING APPARATUS FOR TELEVISION CAMERAS.

3,715,492. HIGH VOLTAGE PROTECTION CIRCUIT.

3,715,493. SERVICE SWITCH ARRANGEMENT FOR IMPROVED INTERLACE PERFORMANCE.

3,715,498. SCANNING SYSTEM WHICH INCLUDES MEANS FOR CONTROLLING PICTURE SAMPLING DENSITY.

3,715,499. DUAL MODE AUTOMATIC FREQUENCY CONTROLLED OSCILLATOR SYSTEM.

3,715,603. THRESHOLD GATE CIRCUITS EMPLOYING FIELD-EFFECT TRANSISTORS.

3,715,621. TRANSISTOR DEFLECTION CIRCUITS UTILIZING A CLASS B, PUSH-PULL OUTPUT STAGE.

3,715,686. PAIRED NONLINEAR ACTIVE ELEMENTS IN A WAVEGUIDE CAVITY ADAPTED TO SUPPORT ORTHOGONAL TE SUB 10 MODE WAVES AND TE SUB 01 MODE WAVES.

3,715,688. TM SUB 01 MODE EXCITER AND A MULTI-MODE EXCITER USING SAME.

3,716,206. NUTATION DAMPER.

3,716,429. METHOD OF MAKING SEMICONDUCTOR DEVICES.

3,716,688. COLOR TELEVISION RECORDER-REPRODUCER SYSTEM.

3,716,723. DATA TRANSLATING CIRCUIT.

3,717,821. CIRCUIT FOR MINIMIZING THE SIGNAL CURRENTS DRAWN BY THE INPUT STAGE OF AN AMPLIFIER.

The General Electric Company is prepared to grant non-exclusive licenses under the following 85 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following patent may be addressed to: Division Patent Counsel, Space Division, General Electric Co., P.O. Box 8555, Philadelphia, Pa., 19101.

3,714,782. GASEOUS NUCLEAR ROCKET ENGINE.

Applications for license under the following 5 patents may be addressed to: Patent Counsel Major Appliance Business Group, General Electric Co., Appliance Park, Louisville, Ky., 40226.

3,320,761. SINGLE EVAPORATOR, SINGLE FAN COMBINATION.

3,324,678. SINGLE EVAPORATION COMBINATION REFRIGERATOR.

3,466,900. AUTOMATIC ADDITIVE DISPENSER.

3,548,444. DOOR CLOSURE DEVICE WITH TIME DELAY MEANS.

3,700,856. HINGED SURFACE HEATING UNIT SYSTEM.

Applications for license under the following 9 patents may be addressed to: General Electric Co., Division Patent Counsel, Automation Business Div., 40 Federal St., Lynn, Mass., 01910.

3,211,967. SOLION WITH GRAPHITE SEPARATORS AND ELECTRODES.

3,211,968. SOLION CELL COMPRISING A POROUS CATHODE ON EACH SIDE OF THE ANODE.

3,273,025. SOLION CELL WITH ELECTRODES ENGAGING CONTRAINER WALL FOR PREVENTING ION-DRIFT.

3,273,026. SOLION CELL HAVING ELECTRODES COLD-SEALED WITH CONTAINER WALL.

3,289,677. ELECTRICAL READOUT INTEGRATOR HAVING POROUS INSULATORS AND SPACED ELECTRODES IN AN ELECTROLYTE.

3,315,236. ELECTROLYTIC SYSTEM FOR SAMPLING AND STORING INFORMATION.

3,377,520. LOW DRIFT, HIGH TEMPERATURE SOLION CELLS.

3,373,268. PROCESS CONTROLLER HAVING ELECTROCHEMICAL CELL INTEGRATING MEANS.

3,377,521. SOLION CELLS HAVING ELECTROLYTE FOR LOW-TEMPERATURE OPERATION.

Applications for license under the following 10 patents may be addressed to: Francis K. Richwine, Patent Counsel, Ordnance Systems Dept., General Electric Co., 100 Plastics Ave., Pittsfield, Mass., 01201.

3,292,499. POWER SYSTEM CONTROL.

3,324,740. POWER SYSTEM CONTROL.

3,588,655. MOTOR CONTROL SYSTEM WITH UNIJUNCTION TRIGGERING CIRCUIT TO COMPENSATE FOR THE NONLINEARITY OF AN SCR AMPLIFIER.

3,601,079. METHOD AND APPARATUS FOR APPLYING DRAG REDUCING ADDITIVES.

3,648,483. OVERLOAD FRICTION COUPLING.

3,649,801. FILM RESISTOR TRIMMER.

3,665,168. ADAPTIVELY CONTROLLED POSITION PRE-DICTION SYSTEM.

3,685,501. HYDROMECHANICAL LEAD-LAG CONTROL DEVICE.

3,694,631. TWO-RESOLUTION, STRAPPED DOWN INERTIAL REFERENCE SYSTEM.

3,700,986. CO-ORDINATED VOLTAGE CONTROL FOR INDUCTION SERVO MOTORS.

Applications for license under the following 12 patents may be addressed to: Patent Counsel, LSTG-I & MT Divisions, General Electric Co., 1 River Road, Bldg. No. 41, Schenectady, N.Y., 12305.

3,403,892. FULL ARC-PARTIAL ARC TRANSFER SYSTEM FOR ELECTROHYDRAULIC TURBINE CONTROL.

3,519,670. BOROSILICONE MATERIALS.

3,519,671. SILICONE MODIFIED BORATE COMPOSITION AND EPOXY RESINS CURED THEREWITH.

3,670,479. MOMENTUM SLOT CENTRIFUGAL TYPE SEPARATOR.



- 3,677,905. COMBINED STEAM POWER PLAN AND WATER DISTILLATION SYSTEM.
- 3,687,872. BOROSILICONE MATERIALS AND EPOXY RESINS CURED THEREWITH.
- 3,688,872. COMBINED BEARING LUBRICATION-HYDRO-GEN SEAL SYSTEM FOR GENERATOR.
- 3,691,416. FLEXIBLE SUPPORT STRUCTURE FOR END WINDING CONNECTIONS.
- 3,693,036. LIQUID COOLED SERIES LOOP CONNECTOR.
- 3,697,383. FEEDWATER HEATED AND STRAINER ARRANGEMENT FOR MULTI-EFFECT THIN FILM DESALINATION PLANT.
- 3,702,561. SYSTEM FOR CHECKING THE PERFORMANCE OF A DYNAMOELECTRIC MACHINE OVERHEATING DETECTOR.
- 3,702,719. INTEGRATED JOURNAL AND THRUST BEARING.

Applications for license under the following 13 patents may be addressed to: Division Patent Counsel, Electronic Systems Division, General Electric Company, Bldg. 3, Rm. 216, Electronics Park, Syracuse, N.Y., 13201.

- 3,012,244. RECEIVING SCANNING SYSTEM.
- 3,488,656. RADIO FREQUENCY HOLOGRAMS.
- 3,493,352. MAGNETO OPTICAL DISPLAY DEVICE WITH LAYERS NICKEL-CHROMIUM AND GOLD.
- 3,495,191. MICROWAVE PHASE SHIFTER.
- 3,500,303. SIGNAL GENERATOR FOR PRODUCING A SET OF SIGNALS OF COMMON FREQUENCY AND ADJUSTABLE PHASE SLOPE.
- 3,508,262. RADAR SYSTEM.
- 3,509,577. TANDEM SERIES-FEED SYSTEM FOR ARRAY ANTENNAS.
- 3,515,879. OPTICAL SENSOR SYSTEM.
- 3,522,545. DETECTION OF WEAK SIGNALS FROM AMID NOISE.
- 3,532,906. FAST RECOVERY PULSE CIRCUIT UTILIZING CAPACITOR CHARGED THROUGH SILICON CONTROLLED SWITCH AND DISCHARGED THROUGH TRANSISTOR.
- 3,534,291. APPARATUS FOR IMMERSION OF FACE PUMPED LASER DEVICES.
- 3,535,608. BATTERY MAINTENANCE CIRCUIT FOR USE WITH UNRELIABLE CHARGING SOURCES.
- 3,535,628. MICROWAVE REFLECTOMETER INCLUDING SWEEP GENERATOR DRIVEN AT CONTROLLED NONLINEAR SWEEP RATE AND SPECTRUM ANALYZER SYNCHRONIZED THERETO.

Applications for license under the following 13 patents may be addressed to: Patent Counsel, Contractor Equipment Business Division, General Electric Company, 1285 Boston Ave., Bldg. 21ES, Bridgeport, Conn., 06602.

- 3,621,453. ELECTROFLUIDIC DELAY LINE OSCILLATOR.
- 3,623,053. LEAK DETECTING APPARATUS.
- 3,625,063. PRESSURE RATIO TRANSDUCER.
- 3,628,372. FLUIDIC ANGULAR POSITION SENSOR.
- 3,628,552. FLUIDIC AMPLIFIER TORSIONAL SPEED REFERENCE.
- 3,654,943. VORTEX FLUID AMPLIFIER CIRCUIT FOR CONTROLLING FLOW OF ELECTRICALLY CONDUCTIVE FLUID.
- Re. 27,352. FLUID CONTROL SYSTEM.
- 3,672,231. CLOSED-LOOP FLUIDIC ANALOG ACCELEROMETER.
- 3,672,388. SENSOR AND CONTROL SYSTEM FOR CONTROLLING GAS PARTIAL PRESSURE.
- 3,673,413. TIME AND LIGHT CONTROLLED SWITCHING CIRCUIT.
- 3,678,752. TESTING MEANS FOR FLUIDIC CIRCUIT ELEMENTS.
- 3,678,881. DEVICE FOR INDICATING CONTAMINATION OF A FLUID SUPPLY TO A FLUIDIC CIRCUIT.
- 3,678,953. FLUIDIC LEAD-LAG FREQUENCY RESPONSIVE CIRCUIT.

Applications for license under the following 21 patents may be addressed to: General Electric Co., Bldg. 43, Rm. 529, 100 Woodlawn Ave., Pittsfield, Mass., 01201.

- 2,930,941. SEALING ARRANGEMENT FOR ELECTRICAL INSULATING BUSHINGS.
- 2,937,359. POWER FACTOR TAP FOR HIGH VOLTAGE BUSHING.
- 3,101,386. REDUCED HEIGHT ELECTRICAL INSULATING BUSHING WITH SIGHT GLASS.
- 3,195,087. ELECTRICAL SHUNT REACTOR.
- 3,229,023. THERMAL UPGRADING OF ELECTRICAL APPARATUS.
- 3,387,243. INDUCTIVE DISK WINDING WITH IMPROVED IMPULSE VOLTAGE GRADIENT.
- 3,445,726. PROTECTIVE SYSTEM FOR GAS-FILLED ELECTRICAL APPARATUS.
- 3,451,503. SOUND REDUCING HOUSE FOR ALTERNATE CURRENT ELECTRICAL APPARATUS.
- 3,467,931. CONTINUOUS DISK WINDING AND INTEGRAL RADIAL COIL CONNECTOR FOR ELECTRIC TRANSFORMER AND THE LIKE.
- 2,873,432. WINDING FOR ELECTRICAL APPARATUS.
- 2,912,658. TURBULENCE PROMOTERS FOR FLUID COOLED ELECTRICAL APPARATUS.
- 2,937,349. STATIONARY INDUCTION ELECTRICAL APPARATUS.
- 2,942,213. WINDING ARRANGEMENT FOR ELECTRICAL APPARATUS.
- 3,059,043. FLUID DUCT FOR ELECTRICAL APPARATUS.
- 3,137,829. ELECTRICAL APPARATUS.
- 3,143,699. ELECTRICAL REACTANCE BALANCING APPARATUS.
- 3,144,628. TRANSFORMER WITH WINDING SECTIONS CONNECTED IN SERIES OR PARALLEL.
- 3,156,886. MULTIPLE UNIT POWER TRANSFORMER WITH WINDINGS CONNECTED IN PARALLEL.
- 3,252,119. STATIONARY INDUCTION APPARATUS.
- 3,270,305. SHIELDED HOUSING WITH VIBRATION CONTROL.
- 3,291,900. STRAIN INSULATOR FOR DEAD ENDING.

#### Disclaimers

Design No. 205,737.—John D. Braught, Northbrook, Ill. WASTE RECEPTACLE. Patent dated Sept. 13, 1966. Disclaimer filed June 22, 1971, by the assignee, United States Steel Corporation.

Hereby enters this disclaimer to claim 1 of said patent.

Design No. 220,256.—Louis J. Jenn, Indianapolis, Ind. MULTIPLE UNIT HOUSING STRUCTURE. Patent dated Mar. 23, 1971. Disclaimer filed Oct. 22, 1970, by the inventor.

Hereby disclaims the portion of the term of the patent subsequent to Mar. 23, 1984.

Design No. 222,651.—Dianne B. Ainslie, Rochester, N.Y. COMBINED MOTION PICTURE PROJECTOR AND CARRYING CASE THEREFOR. Patent dated Nov. 23, 1971. Disclaimer filed Apr. 26, 1971, by the assignee, Eastman Kodak Company.

Hereby disclaims the portion of the term of the patent subsequent to July 28, 1984.

3,647,762.—Shigeyoshi Hara, Masao Senoo, Tsunemasa Yoshida, and Moriya Uchida, Tokyo, Japan. COPOLYAMIDEIMINE AND COPOLYAMIDEIMIDAZOLE AND PROCESSES FOR THEIR PREPARATION. Patent dated Mar. 7, 1972. Disclaimer filed Aug. 30, 1971, by the assignee, Teijin Limited.

Hereby disclaims the portion of the term of the patent subsequent to June 30, 1987.

## PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner  
WILLIAM FELDMAN, Deputy Assistant Commissioner

### CONDITION OF PATENT APPLICATIONS AS OF APRIL 17, 1973

| PATENT EXAMINING GROUPS                                                                                                                                                                                                                                                                                                                                                                 | Actual Filing Date of Oldest New Case Awaiting Action |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| <b>CHEMICAL EXAMINING GROUPS</b>                                                                                                                                                                                                                                                                                                                                                        |                                                       |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director.....                                                                                                                                                                                                                                                                                                          | 1-27-72                                               |
| Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.                                                                                                                       |                                                       |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director.....                                                                                                                                                                                                                                                                                                                           | 4-03-72                                               |
| Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.                                                                                                                                                                    |                                                       |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director.....                                                                                                                                                                                                                                                                                                  | 12-15-71                                              |
| Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.                                                       |                                                       |
| COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director....                                                                                                                                                                                                                                                                                           | 1-07-72                                               |
| Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.                                                                                                                                                                             |                                                       |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director..                                                                                                                                                                                                                                                                                             | 12-10-71                                              |
| Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. |                                                       |
| <b>ELECTRICAL EXAMINING GROUPS</b>                                                                                                                                                                                                                                                                                                                                                      |                                                       |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director.....                                                                                                                                                                                                                                                                                                | 9-06-72                                               |
| Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.                                                                                                                                                               |                                                       |
| SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director.....                                                                                                                                                                                                                                                                                                                    | 7-10-72                                               |
| Ordnance, Firearms and Ammunition; Radar, Underwater Signaling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.                                                                                                                                                                      |                                                       |
| INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director.....                                                                                                                                                                                                                                                                                                   | 7-03-72                                               |
| Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices; and Related Arts.                                                                                                                                                                                                                                                     |                                                       |
| RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director..                                                                                                                                                                                                                                                                                           | 12-22-71                                              |
| Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.                                                                                                                                                                       |                                                       |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director.....                                                                                                                                                                                                                                                                                                        | 1-05-72                                               |
| Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.                                                                                                                                                                                                                         |                                                       |
| DESIGNS, GROUP 290—R. L. CAMPBELL, Director.....                                                                                                                                                                                                                                                                                                                                        | 6-28-71                                               |
| Industrial Arts; Household, Personal and Fine Arts.                                                                                                                                                                                                                                                                                                                                     |                                                       |
| <b>MECHANICAL EXAMINING GROUPS</b>                                                                                                                                                                                                                                                                                                                                                      |                                                       |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director.....                                                                                                                                                                                                                                                                                                                     | 4-10-72                                               |
| Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.                                           |                                                       |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director.....                                                                                                                                                                                                                                                                                                 | 2-07-72                                               |
| Manufacturing Processes; Assembling; Combined Machines; Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.                    |                                                       |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director.....                                                                                                                                                                                                                                                                                                | 4-10-72                                               |
| Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletary; Printing; Typewriters; Stationery; Information Dissemination.                                                                                                              |                                                       |
| HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director.....                                                                                                                                                                                                                                                                                                               | 3-06-72                                               |
| Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.                                                         |                                                       |
| MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director.....                                                                                                                                                                                                                                                                                                 | 3-06-72                                               |
| Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.                                                                         |                                                       |

Expiration of patents: The patents within the range of numbers indicated below expire during May 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,743,442 to 2,748,387, inclusive  
Plant Patents..... Numbers 1,472 to 1,480, inclusive



# DEFENSIVE PUBLICATIONS

PUBLISHED MAY 8, 1973

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

**T910,006**  
**METHODS FOR PREPARATION OF INSULATION MATERIALS FROM ALUMINA-SILICA FIBERS**  
Leonard J. Schuman, Parsippany, Richard P. Brookman, Ridgewood, and Raymond T. Ertle, Pompton Plains, N.J., assignors to Continental Oil Company, Ponca City, Okla.

Filed Jan. 6, 1972, Ser. No. 215,921

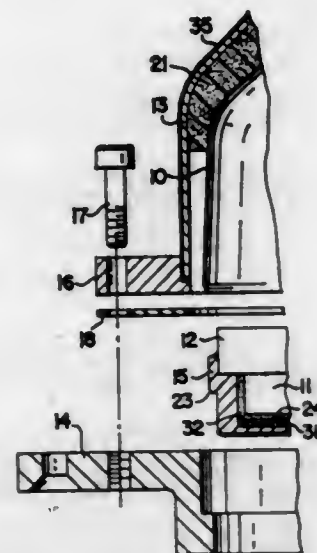
Int. Cl. D21h 3/66

U.S. Cl. 162-152

No Drawing, 6 Pages Specification

An improved method for preparing insulation material from alumina-silica fibers which comprises contacting said fibers with an aqueous binder solution containing dispersible alumina and halogenated organic acid in the amounts of 8-12 wt. percent and 0.8-1.2 wt. percent based on the weight of the solution respectively and said halogenated organic acid is monochloroacetic acid.

**T910,007**  
**HOUSING FOR RADIATION DETECTOR**  
Harry Suscheck, Euclid, and Julius M. Menefee, Novelty, Ohio, assignors to Bkron Corporation, Newbury, Ohio  
Filed Feb. 9, 1972, Ser. No. 224,660  
Int. Cl. G01t 1/20  
U.S. Cl. 250-71.5 R  
1 Sheet Drawing, 8 Pages Specification



A metallic protective housing for a radiation detector or the like that includes a scintillation crystal for receiving short wave length radiation, such as gamma radiation, and converting it to a longer-wave-length, visible light image, a photomultiplier tube 10 for converting the visible light image to an electrical signal, and an optical window 12 interposed between the scintillation crystal 11 and the photomultiplier tube. The housing 13 supports the above components in assembled, optically aligned relation and has a layer of impervious chrome plating 35 deposited thereon to provide a surface that may be easily cleaned of any harmful radioactive material.

The accompanying drawing figure is an exploded fragmentary sectional view illustrating the above listed components of the housing and their manner of assembly.

**T910,008**  
**ALUMINA FILTRATION**  
Bruce E. Leach and William C. Ziegenhain, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Mar. 29, 1972, Ser. No. 240,317

Int. Cl. B01d 37/02

U.S. Cl. 210-54

No Drawing, 8 Pages Specification

An improvement in the filtration of aqueous alumina slurries is achieved by the addition of a compound selected from the group consisting of modified polyacrylamides and hydrolyzed copolymers of ethylene and maleic anhydride. Desirable results have been achieved wherein up to about 0.10 weight percent of the hydrolyzed copolymers of ethylene and maleic anhydride was added and wherein up to about 0.25 weight percent modified polyacrylamide was added. Lesser concentrations result in less improvement in filtration while higher concentrations tend to thicken the slurry and make filtration and other process operations difficult. The alumina slurry to be filtered may vary widely from trace amounts of alumina to semi-solid slurries, and any suitable filtration method known to the art may be employed.

**T910,009**  
**SINC/COSINC TRANSFORM—A CONTINUOUS FOURIER TRANSFORM**  
Robert F. Abramson, Arvada, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed July 3, 1972, Ser. No. 268,334  
Int. Cl. G06f 7/38, 15/34  
U.S. Cl. 444-1

10 Sheets Drawing, 57 Pages Specification

The Fourier transform of a non-periodic wave is calculated by programmed computer using matrix multiplication. The non-periodic wave to be transformed is converted to a staircase waveform where the amplitude of each step in the staircase waveform is the average amplitude of the original wave. Walsh coefficients of the staircase waveform are then computed by matrix multiplication of the Walsh matrix times sample values for the wave where the sample values are the various amplitudes of the staircase wave during separate step or sample intervals. Thereafter, the continuous Fourier transform of a non-periodic wave is calculated by computing the Fourier transform of the Walsh functions. The latter computation is simplified by multiplying the Walsh coefficients by a sinc array and a cosinc (defined hereinafter) array. A further and ultimate simplification of the entire process is accomplished by multiplying the Walsh matrix by an intermingling of the sinc and cosinc arrays. The result is a matrix consisting mostly of zeroes and hereinafter defined as the sinc matrix. Multiplication of the input wave values by the sinc matrix will yield directly sine/cosine coefficients of the Fourier sine/cosine

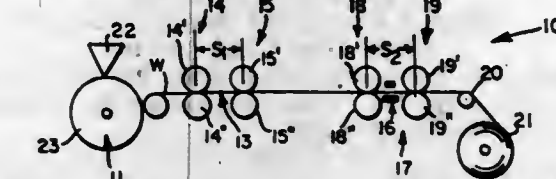
MAY 8, 1973

U. S. PATENT OFFICE

409

transforms for the staircase waveform that simulates the input wave. With the coefficients of the Fourier sine/

**T910,010**  
**METHOD OF AND APPARATUS FOR ORIENTING POLYMERIC FILM**  
Randolph M. Clark, Circleville, Ohio, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.  
Continuation of application Ser. No. 113,851, Feb. 9, 1971. This application July 12, 1972, Ser. No. 270,959  
Int. Cl. B29d 7/24  
U.S. Cl. 264-210 R  
2 Sheets Drawing, 7 Pages Specification



A method of orienting a web of polyethylene terephthalate film including the steps of:  
casting a molten polymer and quickly quenching it to a temperature at or below its glass transition temperature to produce a web of substantially amorphous film;  
first stretching the web of substantially amorphous film at a first stretching temperature between the glass transition temperature and approximately 10° C. above the glass transition temperature by application of a first stretching stress to the web in its direction of movement to partially orient and crystallize the web;  
applying a second stretching stress to the partially oriented and crystallized web in the direction of movement thereof; and  
heating the web by noncontacting second heating means after application of the second stretching stress to a second stretching temperature substantially greater than 10° C. above the glass transition temperature to orient the web; and  
wherein the web of polyethylene terephthalate film is first stretched to between 1.5 and 4.0 times its initial dimension in the direction of movement at a stretching temperature from 80° C. to 90° C., and is then stretched in the same direction to a total up to 7.0 times at a temperature between 150° C. and just below the crystal melting point of the web.

cosine transforms defined, the Fourier transform at any frequency may be computed.



# REISSUES

MAY 8, 1973

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,637

## PIPETTING SYSTEM

William J. Roach, 187 Shooting Star Isle,  
Foster City, Calif. 94404

Original No. 3,494,201, dated Feb. 10, 1970, Ser. No.  
753,268, Aug. 16, 1968. Application for reissue Sept.  
7, 1971, Ser. No. 178,515

Int. Cl. B011 3/02

U.S. Cl. 73-425.6

18 Claims



A hollow cylindrical body has an apertured lower end portion for frictionally attaching removable tips. A movable piston, within the body, extends into the lower end portion. A collar is fixed to the upper portion of the piston and moves within a calibrating cup. The calibrating cup also moves within the body. Depressing a knob attached to the upper end of the piston will overcome the tension in a primary spring, which is interposed between a portion of the piston and the body, until the calibrating collar strikes the bottom of the calibrating cup constituting the calibration movement of the piston. An over-shoot of travel by the piston may be accomplished by further depressing the knob against the action of a relatively stiff secondary spring interposed between the bottom of the cup and the body.

27,638

## ALTERNATOR RECTIFIER AND VOLTAGE REGULATOR

Michael J. Pliteo, Enfield, Conn., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Original No. 3,439,253, dated Apr. 15, 1969, Ser. No.  
628,679, Apr. 5, 1967. Application for reissue Mar.  
15, 1971, Ser. No. 124,121

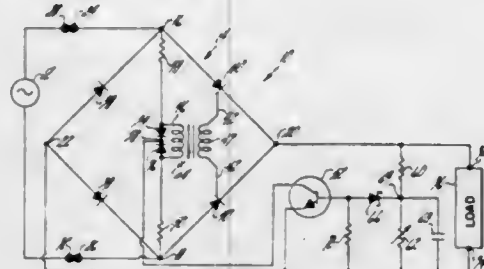
Int. Cl. H02m 7/20

U.S. Cl. 321-18

5 Claims

A voltage regulator-rectifier for producing a regulated voltage direct current output from an alternator includes a bridge rectifier having two arms containing diodes and two other arms containing silicon controlled rectifiers. The two silicon controlled rectifiers are switched between non-conducting and conducting states in accord-

ance with the value of the rectifier output voltage by a gate control circuit utilizing a transformer having its secondary winding connected at its opposite ends to the gate terminals of both of the silicon controlled rectifiers so that a forward gate current applied to one silicon con-



trolled rectifier results in a reverse gate current applied to the other. The primary winding of the transformer is connected across the rectifier input terminals and a shunt circuit controlled by the output voltage controls the conduction through the primary winding.

27,639

## MOVING BED PROCESS USING SIEVE CATALYST TO MAKE XYLENES BY TOLUENE DISPROPORTIONATION AND TRANSALKYLATION WITH C<sub>7</sub>-C<sub>10</sub> ALKYL BENZENES

Owen H. Thomas, South Holland, Thomas A. Beck, Park Forest, and Robert F. Wickman, Dolton, Ill., assignors to Atlantic Richfield Co., New York, N.Y.

No Drawing. Original No. 3,551,509, dated Dec. 29, 1970, Ser. No. 798,185, Feb. 10, 1969, which is a continuation-in-part of Ser. No. 747,840, July 26, 1968. Application for reissue Nov. 16, 1971, Ser. No. 199,338

Int. Cl. C07c 3/62

U.S. Cl. 260-672 T

12 Claims

There is disclosed a process for catalytically disproportionating toluene to benzene and xylenes. The toluene is disproportionated over a rare-earth and hydrogen-exchanged crystalline aluminosilicate catalyst at about atmospheric pressure and a temperature of about 700 to 1100° F. Methylaromatics of 9 to 10 carbon atoms and 1 to 4 methyl groups may also be introduced into the reaction zone to increase the xylene/benzene ratio in the product.

27,640

## INFLATABLE FLOAT BOOM

Campbell F. Logan, 530 Goodwin St.,  
Jacksonville, Fla. 32204

Original No. 3,494,132, dated Feb. 10, 1970, Ser. No.  
757,849, Sept. 6, 1968. Application for reissue Sept.  
25, 1970, Ser. No. 75,556

Int. Cl. E02b 15/04

U.S. Cl. 61-1 F

17 Claims

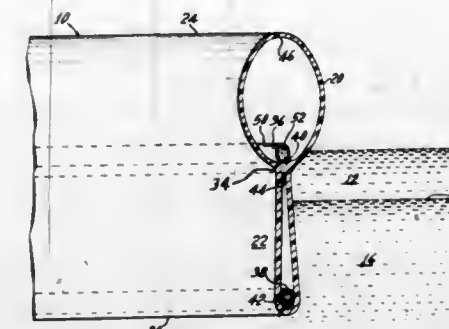
An inflatable float boom having a pair of elongated selectively inflatable tubes connected throughout their lengths by a joining web and a pair of elongated hollow members filled with particulate solids are disposed within respective tubes, such members being free to fall into the lower side portions of respective tubes. A separate gas valve is connected to each tube so that one tube can be inflated to float the boom on the surface of the liquid

MAY 8, 1973

U. S. PATENT OFFICE

411

and the deflated tube functioning as a depending skirt therefore. A sleeve is provided between the end portions



of the tubes to bridge the gap and to surround the releasable connectors therebetween.

27,641

## DIGITAL READOUT DEVICE WITH LIGHT GUIDES

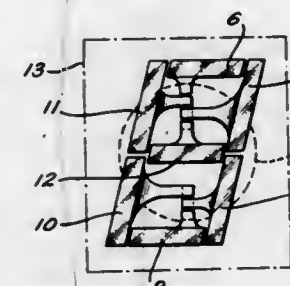
Gerald Raymond Hosker, London, Ontario, Canada, assignor to American Gage and Machine Co., Chicago, Ill.

Original No. 3,467,960, dated Sept. 16, 1969, Ser. No.  
519,596, Jan. 10, 1966. Application for reissue Dec. 1,  
1971, Ser. No. 203,920

Int. Cl. G08b 5/36

U.S. Cl. 340-378 R

7 Claims



A digital readout device associated with a condition responsive apparatus wherein a plurality of light guides define rectangular outer faces and are arranged in the configuration of the numeral 8 and are separated so that different numbers can be displayed depending upon which of the light guides are illuminated. A source of light is provided for the light guides, and a shutter is interposed between the light source and the opposite ends of the light guides. Apertures are defined by the shutter, and the shutter is connected to the condition responsive device so that movements imparted to the shutter will change the position of the apertures whereby different ones of the light guides will be illuminated.

27,642

## HIGH TRACTION VEHICLE

Carl E. Enos, Chico, Calif., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Original No. 3,426,720, dated Feb. 11, 1969, Ser. No.  
585,640, Oct. 10, 1966. Application for reissue May  
18, 1970, Ser. No. 38,285

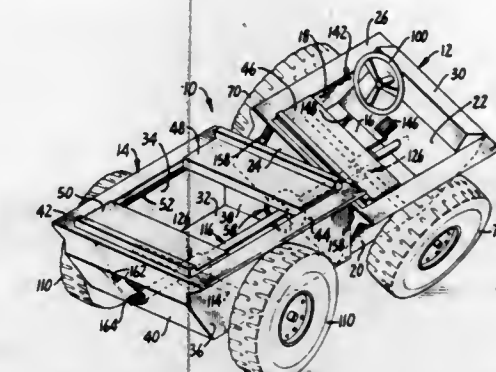
Int. Cl. B60f 3/00

U.S. Cl. 115-1 R

8 Claims

An amphibious vehicle comprised of a pair of hull-like body sections coupled together in longitudinally aligned end-to-end relationship for pivotal movement relative to

each other about a longitudinal extending axis. Each section is provided with a pair of drive wheels driven by an axle extending transversely through and within the confines of the section. Power is supplied to the axles by a drive shaft extending longitudinally through and be-



tween the sections in substantially coaxial relationship with the longitudinally extending axis about which the sections are adapted to pivot relative to each other. The drive shaft is driven by an engine mounted in one of the sections.

27,643

## PROCESS AND APPARATUS FOR COLLECTION OF METAL CONTAINERS

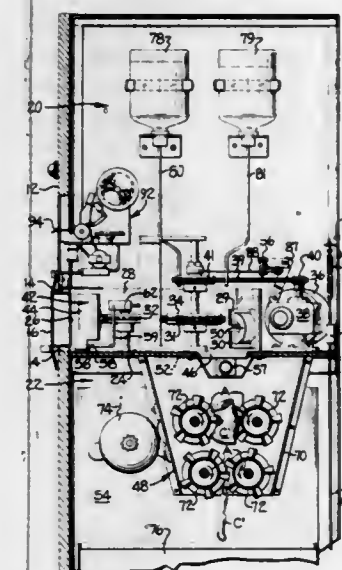
Joseph D. Myers, P.O. Box 384, Hickory, N.C. 28601

Original No. 3,412,837, dated Nov. 26, 1968, Ser. No.  
655,789, July 25, 1967. Application for reissue Aug.  
10, 1969, Ser. No. 62,535

Int. Cl. G07f 1/06

U.S. Cl. 194-4 C

15 Claims



A process and apparatus for collecting and storing used metallic containers and automatically dispensing tokens for containers collected, wherein a plurality of collected containers are moved along a generally horizontal trackway, nonmagnetic containers therein gravitationally separated from the trackway, crushed, and stored while a token is automatically dispensed for each nonmagnetic metallic container stored, and wherein magnetic containers remaining on the trackway are thereafter separately stored in a suitable receptacle of the apparatus.



# PLANT PATENTS

GRANTED MAY 8, 1973

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,326

## CHRYSANTHEMUM PLANT

Barrie John Machin, Chichester, England, assignor to Framptons Nurseries Limited, Worthing, Sussex, England

Filed May 18, 1971, Ser. No. 144,695  
Int. Cl. A01h 5/00

U.S. Cl. Plt.—77

1 Claim

1. A new and distinct variety of *Chrysanthemum morifolium* Bailey, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a vigorous plant of strong, upright habit, with 8-16 pale flowers per main stem, said flowers having an average of 200-250 double petals, said plant having a response time of nine weeks and tolerating a night temperature of 55-60° F. without loss of ability to initiate and develop flowers or pinking of florets.

3,327

## CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Sept. 3, 1971, Ser. No. 177,885  
Int. Cl. A01h 5/00

U.S. Cl. Plt.—79

1 Claim

1. A new and distinct cultivar of chrysanthemum characterized particularly as to its uniqueness when compared to the parent cultivar Tally Ho by its light bronze color.

3,328

## NECTARINE TREE

Frederic W. Anderson, Merced, Calif., assignor to Reedley Nursery, Inc., Reedley, Calif.

Filed Sept. 30, 1971, Ser. No. 185,456  
Int. Cl. A01h 5/03

U.S. Cl. Plt.—41

1 Claim

A nectarine tree, of medium size, which is vigorous, spreading, open, and very productive of large to medium size, globose to oblong, uniform, symmetrical, freestone fruit having yellow skin completely overspread with red at maturity, and yellow flesh with red at the surface of the pit cavity streaked into the flesh; the fruit being slightly

larger, having a brighter red exterior color, and ripening about ten days later, than the fruit of the Sun Grand nectarine (United States Plant Patent No. 974).

3,329

## NECTARINE TREE

Frederic W. Anderson, Merced, Calif., assignor to Arthur Bright, Le Grand, Calif.

Filed Sept. 29, 1971, Ser. No. 184,968  
Int. Cl. A01h 5/03

U.S. Cl. Plt.—41

1 Claim

A nectarine tree, of genetic dwarf type, which is of medium size with a mature height of five to eight feet, medium vigorous, spreading, dense, and productive of large to medium size uniformly globose freestone fruit having yellow skin substantially overspread with red and yellow flesh, the surface of the pit cavity being red, and the stone being brown; the fruit averaging somewhat larger than, and being in harvest over a month before, the Golden Prolific nectarine (United States Plant Patent No. 2,193), and in harvest approximately with the Red Haven peach (unpatented).

3,330

## NECTARINE TREE

Frederic W. Anderson, Merced, Calif., assignor to Stark Bro's Nurseries and Orchards Co., Louisiana, Mo.

Filed Sept. 27, 1971, Ser. No. 184,060  
Int. Cl. A01h 5/03

U.S. Cl. Plt.—41

1 Claim

A genetically dwarf nectarine tree, with short internodes, which is of medium size, very vigorous, spreading, dense, foliated with large lanceolate, acutely pointed leaves, flowered with self-fertile bloom, and is a regular and very productive bearer of uniform, symmetrical, medium size, globose fruit having yellow skin substantially overspread with red, and firm, crisp, yellow flesh with red at the surface of the pit cavity; the fruit—which is glossy—ripening about a month earlier than the Golden Prolific (United States Plant Patent No. 2,193), being clingstone instead of freestone, and having globose instead of reniform glands.

# PATENTS

GRANTED MAY 8, 1973

## GENERAL AND MECHANICAL

3,731,319

### COMBINATION DRY AND WET SUIT

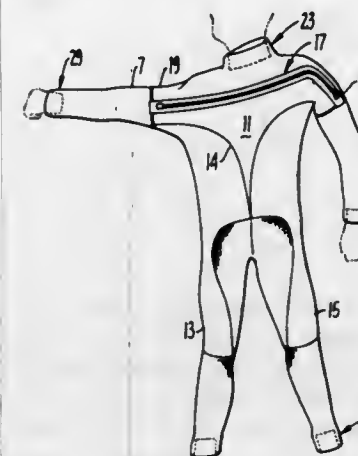
Jack E. O'Neill, 1071-41st Avenue, Santa Cruz, Calif.

Filed Aug. 4, 1971, Ser. No. 168,968

Int. Cl. A62b 17/00; B63c 11/04

U.S. Cl. 2—2.1 R

4 Claims



A suit for surfing, diving, sailing, marine survival and the like is provided wherein the suit is provided with tight intumed seals at the neck, ankles, and wrists so that it is substantially water tight. An inflater valve is provided so that buoyancy can be given to the suit if this is desired. The suit is made in one piece with a single zipper across the back of the shoulders extending from arm to arm.

3,731,320

### EAR DEVICE ADAPTIVE LINER

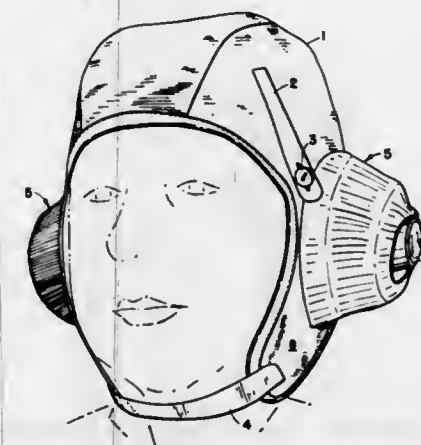
Robert F. White, Sturbridge; John F. Tavares, Dudley, both of Mass., and Bernard M. Gann, Baltimore, Md., assignors to American Optical Corporation, Southbridge, Mass.

Filed Dec. 23, 1971, Ser. No. 211,186

Int. Cl. A42b 1/04

U.S. Cl. 2—205

6 Claims



A liner type cap for use with ear operative devices. A support member is adapted to closely fit the wearer's head and has depending ear portions. The ear portions contain apertures which register with the ear operative device. A substantially tubular resilient band has one end circumferentially at-

tached to the periphery of the ear portion aperture. When the liner is worn with the ear operative device, this tubular resilient band has an upper internal annular face which fits around and frictionally embraces the exterior surfaces of the device.

3,731,321

### GARMENT HAVING PLEATED APPEARANCE

Flora Dycbe, 310 West End Avenue, 17 B, New York, N.Y.

Filed Dec. 15, 1971, Ser. No. 208,221

Int. Cl. A41d 1/14

U.S. Cl. 2—211

2 Claims



Apparatus including wearing apparel which imparts the illusion of a fully pleated garment, such as a dress or skirt, in which only a small portion of the garment has the flexibility of pleats.

3,731,322

### IMPLANTABLE ARTIFICIAL HEART WITH EXTERNALLY WORN FLUID PRESSURE ENERGY TRANSMITTER

Heinz Kresse, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

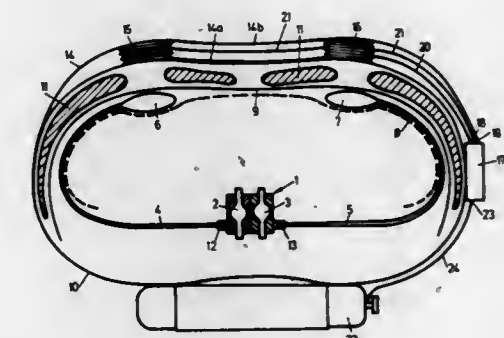
Filed Jan. 8, 1971, Ser. No. 104,857

Claims priority, application Germany, April 8, 1970, P 20 16 651.2

Int. Cl. A61f 1/24

U.S. Cl. 3—1

1 Claim



An artificial heart has an implanted pneumatic or hydraulic blood pump as well as an also implanted energy receiver serving as a source of energy for the blood pump, energy being transmitted from the outside through the undamaged skin of the patient. The invention is particularly characterized by the provision of at least one compressible elastic bag serving as



the energy receiver, filled with liquid or gas, connected with the blood pump and preferably implanted between the peritoneum and the fascia transversalis; it is subjected to pressure change acting from the outside.

3,731,323

**ORTHOTIC-PROSTHETIC TRANSVERSE ROTATOR**

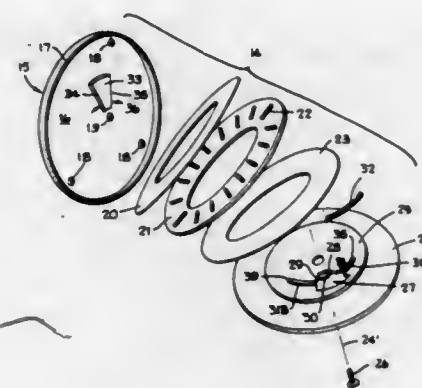
John J. Glancy, 6280 Dean Road, Indianapolis, Ind.

Filed Aug. 26, 1971, Ser. No. 175,254

Int. Cl. A61F 1/08, 5/00

U.S. Cl. 3—2

10 Claims



A transverse rotator for an orthotic and/or prosthetic limb. The rotator has a mount connectable to the limb with a ground engageable means being rotatably connected to the mount. A projection and a first and second stop are provided in the rotator to limit the rotation of the ground engageable means with respect to the mount. Means bearingly space the mount and ground engageable means apart. A spring is provided to return the ground engageable means to the normal position. The amount of rotation of the ground engageable means may be varied. A pair of racer plates are positioned on either side of the means which bearingly space the mount and ground engageable means apart.

3,731,324

**WATER SAVING APPARATUS FOR WATER CLOSETS**

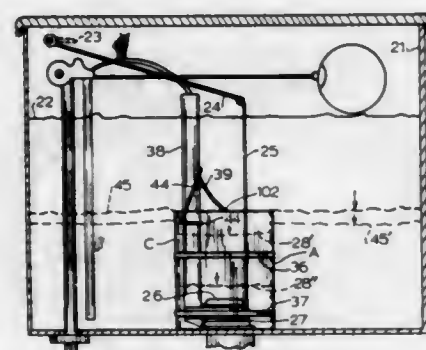
Jacob R. Moon, Hillsborough, N.C., assignor to Moon Water Saver, Inc., Hillsborough, N.C.

Filed Jan. 8, 1971, Ser. No. 105,032

Int. Cl. E03d 1/20, 1/22, 1/30

U.S. Cl. 4—18

3 Claims



The amount of water used for bowl evacuation of a water closet is substantially reduced by an apparatus and method dependent on modifying the water tank construction above and around the valve seat either in its original design or by employment of an auxiliary structure whereby the water employed for evacuation and bowl washing is caused to collect as a rather shallow depth rectangular body of water rather than as the usual relatively deep rectangular body of water inherent to the conventional deep, rectangular water tank but without substantially affecting the normal velocity or quality of flow.

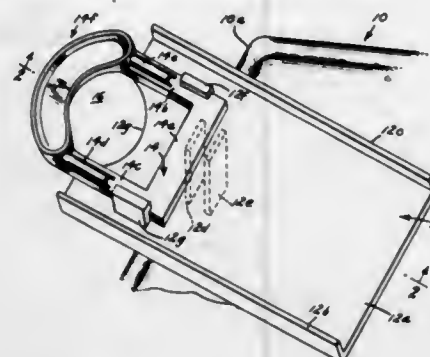
3,731,325  
**PORTABLE HAIR WASH SINK ATTACHMENT**  
Joseph S. Guarrasi, 39 Buckingham Road, Brooklyn, N.Y.

Filed April 21, 1971, Ser. No. 136,025

Int. Cl. A47k 3/12; A61h 35/00

U.S. Cl. 4—159

9 Claims



A portable hair wash sink attachment having a board section and a neck yoke section. The board section can be attached to the front wall of a sink basin and extends outwardly and upwardly therefrom. The yoke section can slide along the board and fits around the neck of a user whose hair is being washed. The front of the yoke section includes a dish which is placed under the chin of the user so that any drainage which does not fall directly on the board is collected in the dish, channels being provided for allowing the drainage collected by the dish to flow to the board, and then down the board and into the sink.

3,731,326

**POP-UP BALL ROD CONSTRUCTION**

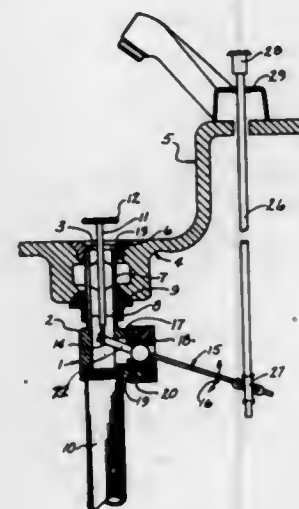
William E. Politz, Delphi, Ind., assignor to Stephen A. Young, Monticello, Ind.

Filed June 25, 1971, Ser. No. 156,849

Int. Cl. E03c 1/22

U.S. Cl. 4—203

5 Claims



There is disclosed what is known as a pop-up fitting, commonly used in the domestic plumbing art for regulation of outflow from lavatories or similar fixtures, in this case the pop-up including certain usual elements to mount the same in the drain outlet of such a fixture, and including a plunger member which is operable to regulate flow through the seat portion of said member, one of the problems solved hereby being the relatively corrosive effects of soapy water used in the lavatory and having a detrimental effect upon the operating means known as the ball rod of such a pop-up by reason of build-up of chemical materials and other types of material which would adversely affect the construction by corroding the ball rod in

such a manner as to make the same inoperable, the concept herein residing in the enclosing of the portion of the operating device in the water passage by a material not affected by corrosive elements, and at the same time having the necessary lubricating qualities to facilitate easy operation.

3,731,327

**BED CONSTRUCTION**

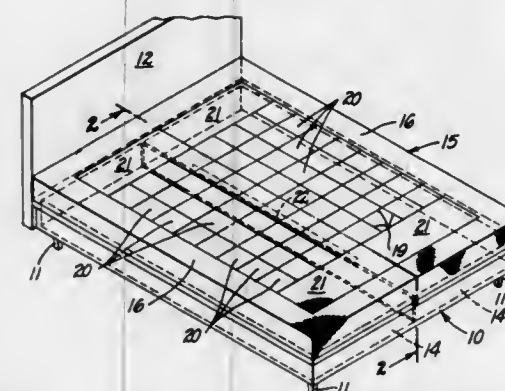
Louis Elliott Frey, 1271 East Sixth Street, Los Angeles, Calif.

Filed Aug. 6, 1971, Ser. No. 169,651

Int. Cl. A47c 23/00

U.S. Cl. 5—345

7 Claims



A bed construction comprising a unitary frame member within which are removably mounted a pair of separate box spring units. A mattress mounted on the spring units is provided with a slit along its longitudinal axis which is aligned with the dividing line between the spring units. The bed appears to be unitary, but functions like a pair of separate beds, with each half being responsive to the body weight and movements of its occupant without affecting the other half or its occupant. A foldable frame member is provided for a king size bed.

3,731,328

**WATER SKI WITH VENTURI CHANNEL AND MEANS FOR SECURING FOOT RETAINERS**

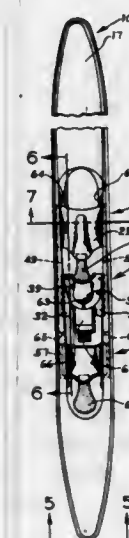
George E. Russell, 2708 Taylor Road, Columbus, Ind.

Filed June 7, 1971, Ser. No. 150,389

Int. Cl. A63c 15/06

U.S. Cl. 9—310 AA

6 Claims



A water ski having a venturi channel formed on its bottom surface with means for securing foot retainers provided on its

top surface. A converging venturi channel extending approximately two-thirds the length of the ski is formed on the bottom surface of the ski. A rib integrally attached to the bottom of the ski extends through the venturi channel and is positioned in the center of the channel. A rudder attached to the bottom of the ski is also positioned in the center of the channel. The top surface of the ski is depressed forming two pairs of channels. The front foot retainer has beaded edges along the sides and length of the foot retainer which extend into one pair of the channels being secured therein by plates. An adjustable cup assembly is slidable within the channels and is lockable to the top surface of the ski. A back foot retainer has beaded edges extending along the sides and length of the foot retainer which extend into the second pair of channels being secured therein by plates. Non-skid surfaces are integrally formed in the top surface of the channel for receiving the skier's feet.

3,731,329

**DIE HEAD**

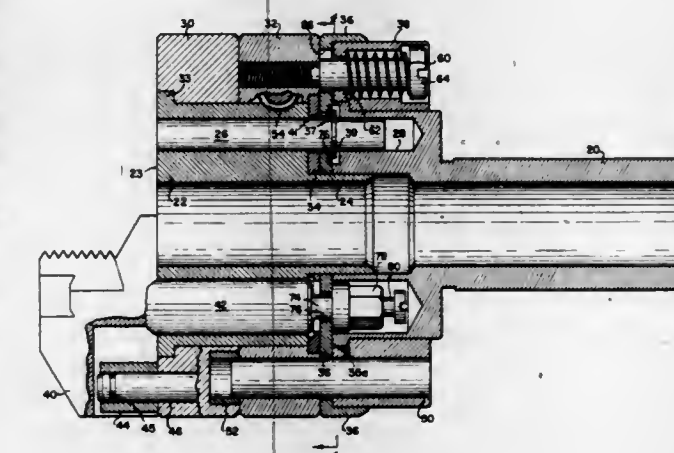
Donald E. Youtz, and Edwin M. Eigenbrode, both of Waynesboro, Pa., assignors to Teledyne, Inc., Los Angeles, Calif.

Filed Dec. 11, 1970, Ser. No. 97,065

Int. Cl. B23g 1/28, 5/10

U.S. Cl. 10—121

1 Claim



A die head for cutting threads on a workpiece incorporating means permitting replacement of the cutting tools without disassembly of the die head and without removal of the head from the machine tool upon which it is mounted for operation.

3,731,330

**BOOK BINDING**

Lionel John Bryant Rushent French, London, England, assignor to The Sulby Engineering Development Company Limited, London, England

Filed Feb. 25, 1971, Ser. No. 118,672

Int. Cl. B42c 19/00

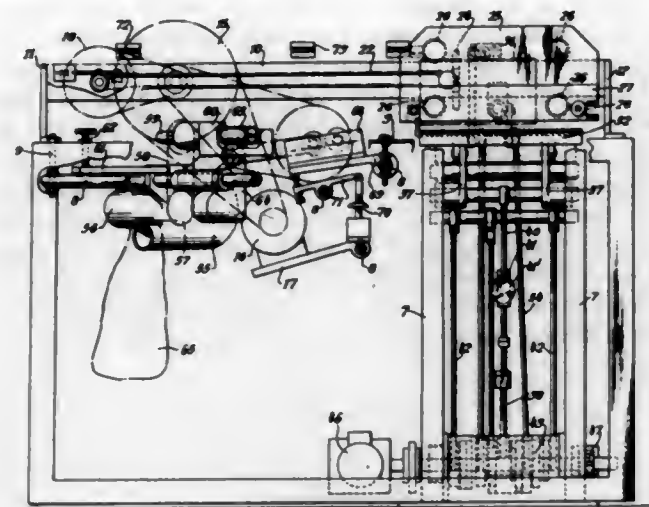
U.S. Cl. 11—1 AD

7 Claims

A bookbinding machine in accordance with the invention comprises a device for applying a cover to a book back, a device for preparing the back by cutting or abrading, and a device for applying adhesive to the prepared book back. These three devices are arranged in a straight line and are so disposed that a book commences its outwardly travel from the



cover-applying device passes over the adhesive-applying device which is rendered inoperative. The book returns from



the preparing device and over the operative adhesive-applying device. The cover is then applied.

3,731,331

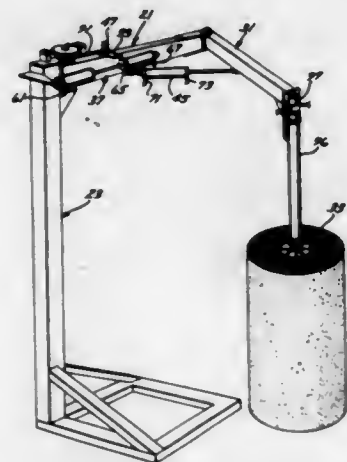
**HIGH SPEED OVERHEAD CAR WASH APPARATUS**  
David M. Haley, Glendale, and Richard P. Bergantzel, Granada Hills, both of Calif., assignors to Allen Electric and Equipment Company, Melville, Long Island, N.Y.

Filed Jan. 19, 1972, Ser. No. 218,997

Int. Cl. B60s 3/06

U.S. Cl. 15—21 D

8 Claims

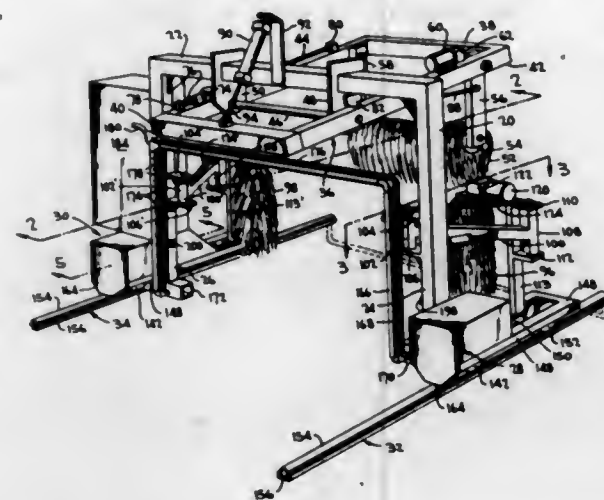


High speed overhead car wash apparatus including an overhead primary arm supported on one end from a support structure disposed on one side of the path of a car to be washed and normally projecting transversely over such car path. A secondary arm is pivotally supported on one end from the free extremity of the primary arm and normally projects rearwardly along such car path and angles to such one side thereof. A rotary brush is suspended from the free end of the secondary arm and is normally disposed centrally in the car path. Drive means is provided for rotating the brush and control means is connected with the arms and is responsive to engagement of the brush by the front of the car to fold the secondary arm on the primary arm and move the brush to such one side of the car path and to then move the primary arm rearwardly along such car path and is further responsive to such brush clearing the rear corner of the car to move such primary arm forwardly as the secondary arm unfolds to thereby carry such brush forwardly and inwardly across the rear of the car and to continue forward movement of the primary arm beyond its normal position to wash at least one half of the rear of such car.

3,731,332  
**AUTOMATIC CAR WASH APPARATUS**  
Robert P. Bernardi, Dauphin County, Pa., assignor to Bernardi Brothers, Inc., Harrisburg, Pa.  
Filed Sept. 11, 1969, Ser. No. 857,027  
Int. Cl. B60s 3/06

U.S. Cl. 15—21 E

14 Claims

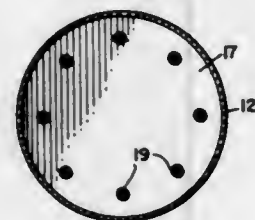


Automatic vehicle washing apparatus including a movable frame adapted to pass over a vehicle to be washed, a pair of side brushes and a top brush disposed on the frame to wash the vehicle as the frame passes over the vehicle a first time and to rinse the vehicle as the frame passes over the vehicle a second time, each side brush being arranged to wash more than half of the front end and rear end of the vehicle, and control means for controlling the sequence of operation of the apparatus with respect to the position of the frame relative to the vehicle.

3,731,333  
**MOP HOLDER**  
William T. Davis, 1834 Columbia Rd. N.W., Washington, D.C.  
Filed July 15, 1971, Ser. No. 162,940  
Int. Cl. A47I 13/51

U.S. Cl. 15—257

4 Claims



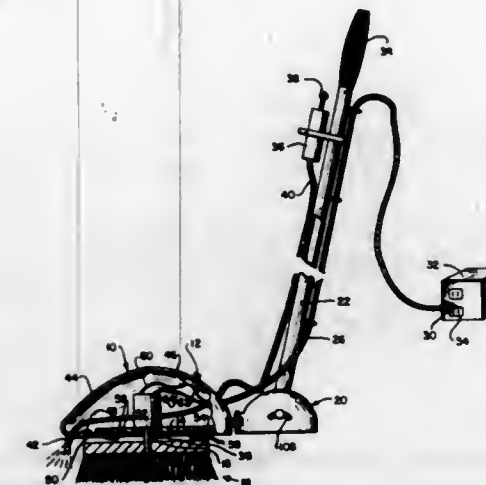
This specification discloses a mop holder which may be readily made from a conventional garbage can and its lid. The holder comprises a can body having a slight taper, a dolly on which the body is mounted, an intermediate partition or shelf in the body and having a series of apertures therein and a lid having a peripheral flange that is wedged into the open top of the body and a series of openings in alignment with the openings in the partition. The body is formed with an outlet just above its bottom and a curved baffle is positioned opposite to the outlet to direct water thereto. The outlet is controlled by a pet cock.

The present invention relates to mop holders and is concerned primarily with a mop holder which supports mops in vertical positions with the mop heads uppermost and which accommodates water that drains from the mop heads.

3,731,334  
**BATHTUB SCRUBBER**  
Marlene Carbonell, 300 Knowles Avenue, Apt. 302, Winter Park, Fla.  
Filed June 11, 1971, Ser. No. 152,175  
Int. Cl. A47I 11/283

U.S. Cl. 15—50 R

7 Claims

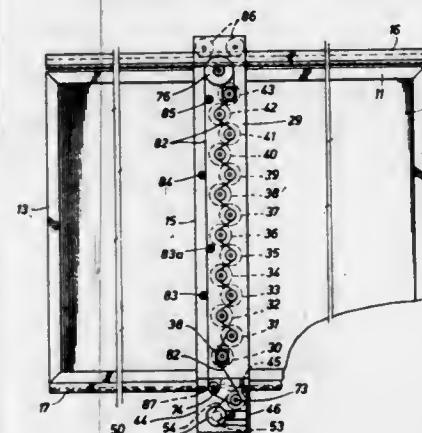


A bathtub or sink scrubber is provided with an electric motor for rotating a brush or other polishing member. The motor is contained within a first dome-like housing and supported by a rigid support member. A second dome-like housing is provided in movable relation to the first dome-like housing and the second housing has a handle member extending therefrom which is adjustable about an axis within the second housing permitting the bathtub scrubber to be universally positioned in relation to the handle.

3,731,335  
**AUTOMATIC CHALKBOARD ERASING APPARATUS**  
Billie R. Chriap, Rt. 1 Box 199-F, Magnolia, Tex.  
Filed July 7, 1971, Ser. No. 160,402  
Int. Cl. B43I 21/00

U.S. Cl. 15—97 R

2 Claims

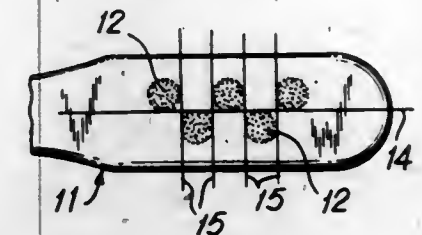


An automatic chalkboard eraser consists of a body which spans the board and has bearings running along the top and bottom thereof, a plurality of erasers rotatably mounted in the body and bearing against the board, an electric motor carried by the body, and drive means connecting the motor, the erasers, and traverse means. Manual and automatic switches provide for operation of the device in either direction within limits.

3,731,336  
**TOOTHBRUSH**  
James M. Rubin, 141 West 17th Street, New York, N.Y.  
Filed May 3, 1971, Ser. No. 139,471  
Int. Cl. A46b 9/04

U.S. Cl. 15—167 R

7 Claims



A toothbrush having a single row of tufts spaced along the longitudinal axis of the toothbrush so as to minimize interference between adjacent tufts as the tufts are deflected during the brushing operation.

3,731,337  
**MAGNETIC WINDOW CLEANING DEVICE**  
John S. Doyel, 404 W. 20th St., New York, N.Y.  
Filed Dec. 3, 1971, Ser. No. 204,515  
Int. Cl. A47I 1/08

U.S. Cl. 15—220 A

13 Claims



A magnetic window cleaning device comprising a master unit and a slave unit adapted to maintain with respect to each other an operative position in which the units are held by mutual magnetic attraction opposite each other across a windowpane and in which the slave unit follows the master unit as the master unit is manually moved along the windowpane. Each of the units comprises a rigid frame which holds an annular multipole permanent magnet and which has a flat surface facing the windowpane and a raised edge and a glide pin for spacing the flat surface from the windowpane. A cleaning pad such as a paper towel is held by a hinged pad holder over the flat surface and over the raised edge. The portion of the pad over the raised edge constitutes a primary cleaning surface and the portion of the pad which is over the flat frame surface constitutes a secondary cleaning surface, with the primary cleaning surface exerting greater pressure on the windowpane than the secondary cleaning surface. The annular magnets are magnetized in a plurality of circumferentially alternating poles and allow placing the master and slave units at different angles with respect to each other to facilitate cleaning of areas which may be difficult to reach otherwise.

3,731,338  
**MECHANICAL PAINT SCRAPER**  
Vincent T. Walsh; Erik Henningsen, both of Milwaukee, and Frederick B. Burns, South Milwaukee, all of Wis., assignors to E Z Paints Corporation, Milwaukee, Wis.  
Filed March 31, 1971, Ser. No. 129,764  
Int. Cl. A47I 13/02

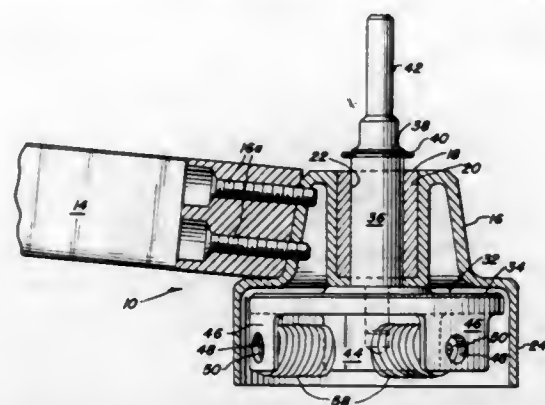
U.S. Cl. 15—236 R

12 Claims

A mechanical paint remover of the type having a base and a shaft for connection to a power tool to rotate the base, charac-



terized by the provision of threaded abrading elements rotatably secured to the underside of the base for rotation about an axis which is generally parallel to the base and the



work surface with which the tool is to be used with the rotatable axis being at a slight angle relative to the axis rotation of the base.

3,731,339

**SCRAPER ASSEMBLY FOR PROCESS VESSELS**

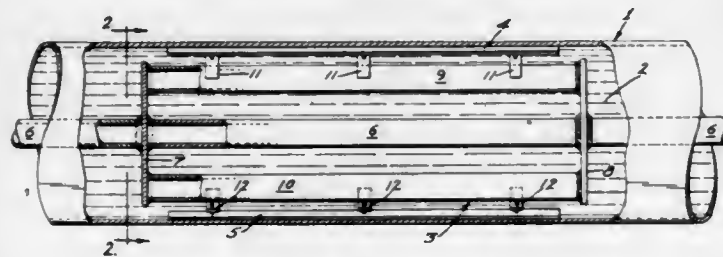
Christopher D. Addison, Media, Del., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Sept. 29, 1971, Ser. No. 184,862

Int. Cl. F28g 3/12

U.S. Cl. 15—246.5

4 Claims



A rotating scraper blade, for use in a process vessel containing liquid, is driven by a hollow shaft whose ends are sealed off from the liquid, thereby to entrap air in the hollow interior of the shaft and provide a buoyant effect on the scraper assembly. There may be additional supports for the blade, in the form of pipes whose ends are similarly sealed off from the liquid, and secured to the driving shaft.

3,731,340

**MOTOR VEHICLE BRAKE DRUM CLEANING APPARATUS**

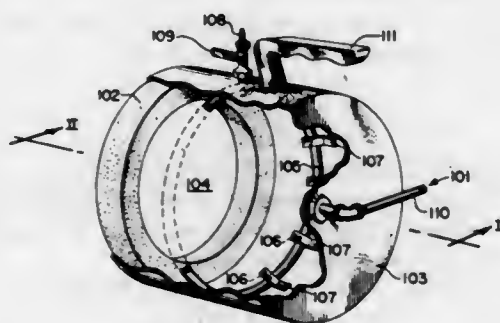
Horace R. Pitre, Sr., 144 Atkinson, Baton Rouge, La.

Filed Aug. 9, 1971, Ser. No. 170,069

Int. Cl. A47i 5/14

U.S. Cl. 15—345

3 Claims



An apparatus for cleaning motor vehicle brake drum assemblies and other objects which apparatus has no moving parts

and utilizes fixed air streams to being cleaned while at the same time preventing the dust and other particles from contaminating the cleaning work area.

3,731,341

**DOOR BLOCKING DEVICE**

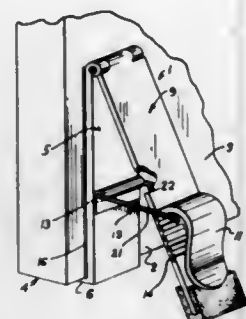
Howard W. Woodruff, 7231 Sycamore, Kansas City, Mo.

Filed Oct. 26, 1971, Ser. No. 192,518

Int. Cl. E05f 5/02

U.S. Cl. 16—82

5 Claims



A door blocking device for engaging a lower edge portion of an inner side of a door and the floor to prevent forced opening movement of the door. The blocking device includes a bracket having portions engageable with a lower edge and a lower edge portion of the inner side of the door and a stop member hingedly connected to the bracket and adapted to incline downwardly and away from same with a floor engaging foot on the free end thereof. A latch member is connected by a link to the bracket, said latch member being selectively engaged with the stop member to hold same at selected inclination and to prevent opening movement of the door.

3,731,342

**ARTICULATION FOR ADJUSTMENT OF INCLINATION OF A SEAT BACK REST ESPECIALLY FOR MOTOR VEHICLE SEATS**

Maurice Claude Cousin, Orne, France, assignor to A. & M. Cousin et Cie, Etablissements Cousin Freres, Orne, France

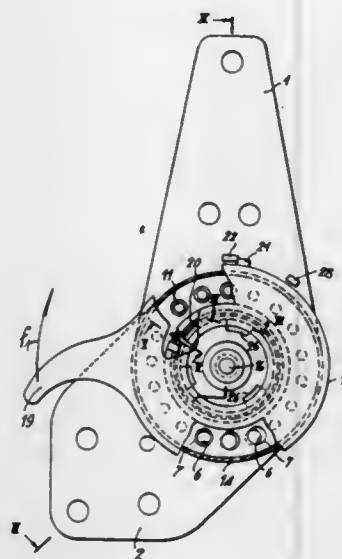
Filed Aug. 6, 1971, Ser. No. 169,659

Claims priority, application France, Aug. 6, 1970, 7029061

Int. Cl. E05d 11/10

U.S. Cl. 16—144

13 Claims



Linkage for adjusting a seat back rest especially for motor vehicles characterized thereby that two bearing brackets or plates are provided on a bearing sleeve and have holes therewith in circular rows upon equal diameters, whereby the

rows of holes relative to each other provide a difference of at least one hole and whereby one of the bearing brackets or plates carries one of the bolts axially slidably guiding a disc or plate and whereby the bolts are covered by a rotatable housing which operates together with a loose pivotal disc and running-off surface with a lateral shifting. A return guidance of the bolts is effected by the running-off surfaces and loose pivotal disc and effective from each individual bolt having elastic elements provided therewith in those holes engaged by the two bearing brackets or plates which are covered in sufficient measure so that the heads of the bolts can be received thereby.

3,731,343

**FURNITURE HINGE**

Christoph Naske, 8111 Froschhausen, Germany, assignor to WHB-Anbaumobel von Poschinger K. G., Murnau, Germany

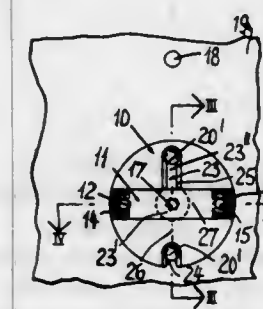
Filed April 24, 1970, Ser. No. 31,584

Claims priority, application Germany, July 8, 1969, P 19 34 581.4

Int. Cl. E05d 3/06

U.S. Cl. 16—163

11 Claims



A furniture hinge consisting of a cup-shaped fitting and an arm which is pivotably connected thereto and may be removably secured to a plate which by means of a pair of elongated apertures therein may be plugged on the headed projecting ends of a pair of pins which may be mounted in bores in a furniture wall, and the plate may then be shifted in a perpendicular direction and will thereby be wedged tightly against the furniture wall.

3,731,344

**IN-FEED FOR AUTOMATIC CUT-UP SAW**

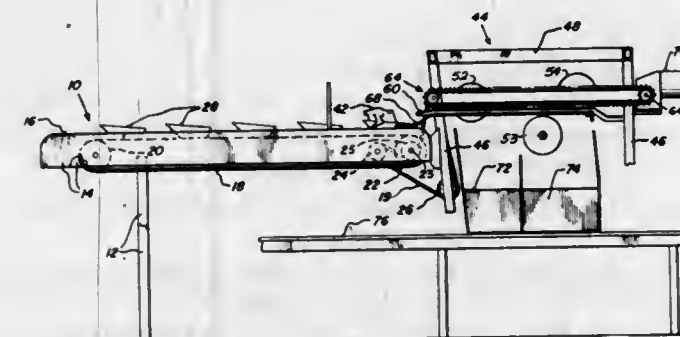
Michael W. Phares, Phoenix, Ariz., and Paul E. Young, Cedar Falls, Iowa, assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Feb. 1, 1971, Ser. No. 111,470

Int. Cl. A22c 21/00

U.S. Cl. 17—11

7 Claims



A poultry wing and breast saw is constructed of laterally spaced parallel longitudinally extending chain conveyors for transporting poultry past a plurality of blades employed for removing wings as well as for subdividing the bird longitudinally.

inally. Poultry is introduced into the inlet end thereof by the provision of a feed mechanism consisting of an endless feed conveyor composed of a chain provided with longitudinally spaced poultry supporting fixtures or buckets positioned to travel toward the inlet of the saw assembly. Each bucket includes side members which support the body of the bird such that the wings are in the proper position to enter the saw mechanism and a pusher plate at the rearward end thereof for transferring the poultry pieces into the saw assembly.

3,731,345

**CHARGING APPARATUS**

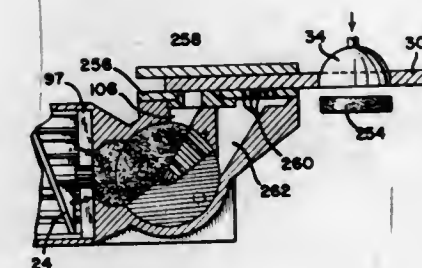
Donald Alvin Brackman, Englewood, Ohio, assignor to The Hobart Manufacturing Company, Troy, Ohio

Filed Oct. 12, 1971, Ser. No. 188,146

Int. Cl. A22c 7/00

U.S. Cl. 17—32

12 Claims



Apparatus for charging the cavity in the mold plate of a patty machine with a food product, such as a meat product to form hamburger patties. The charging apparatus includes a cylinder having a first opening for receiving the food product and a second opening, peripherally displaced from the first opening, through which the product is discharged from the cylinder into the mold plate cavity. A piston is rotatably mounted in the cylinder and conveys the food product from the first opening to the second as the piston rotates about the longitudinal axis of the cylinder.

3,731,346

**STUFFING METHOD AND APPARATUS**

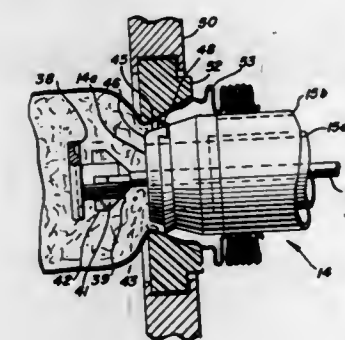
Vytautas Kupcikevicius, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 23,934, March 30, 1970, Pat. No. 3,659,317. This application May 1, 1972, Ser. No. 248,896

Int. Cl. A22c 11/06

U.S. Cl. 17—49

4 Claims



Apparatus and method are disclosed for stuffing a conglomerate meat mass into a flexible container which comprises a stuffing means, shut-off and/or severing means mounted on the outlet end of said stuffing means comprising a member mounted on the outlet end of the stuffing means and a cooperating moving member adjacent to and aligned with



said mounted member and means for advancing and retracting said cooperating moving member into and out of positive engagement with said mounted member wherein such engagement seals said outlet end of the stuffing means, severs product protruding therefrom and stops passage of product therefrom.

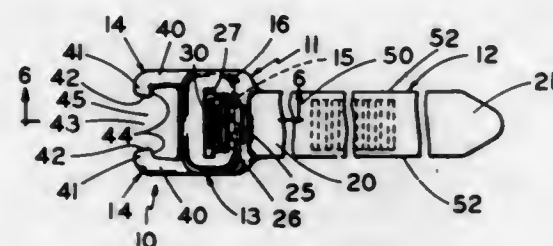
### 3,731,347 CABLE TIE

Jack Edward Caveney, Chicago; Roy A. Moody, Flossmoor, and John Jean Bulanda, New Lenox, all of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed March 16, 1971, Ser. No. 124,724  
Int. Cl. B65d 63/00

U.S. Cl. 24—16 PB

9 Claims



A cable tie and several embodiments thereof are disclosed herein and include generally an elongated strap having a retaining head and a tongue portion. The retaining head is provided with first and second strap receiving means to respectively retain the strap in a looped condition and to position the tongue end portion of the strap adjacent the looped portion thereof.

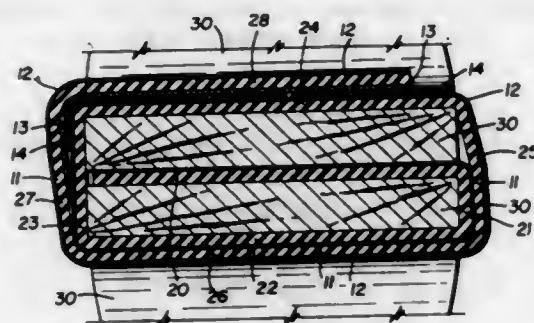
### 3,731,348 SKI TYING STRAP

Wolfgang Luehne, 1760 E. 114th Place, North Glen, Colo.

Filed March 16, 1972, Ser. No. 235,199  
Int. Cl. B65d 63/00

U.S. Cl. 24—16 PB

4 Claims

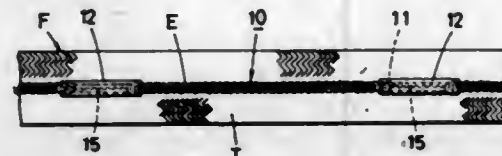


A ski tying strap for firmly tying together the skis of a pair, comprising a resilient elastic strap consisting of a spacer portion at one end designed to lie between the facing surfaces of skis of a pair, and a wrap-around portion which extends nearly twice around the non-facing surfaces of a pair of skis when the strap is stretched longitudinally. The wrap-around portion of the strap is provided with "Velcro" type fastening means applied to one side near one end of the strap and second fastening means applied to the opposite side intermediate the first fastening means and the spacer portion. The strap is made of two layers, one of which is foam rubber and the other nylon bonded to the rubber layer.

3,731,349  
ZIP FASTENER CHAIN  
Fumio Terada, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan  
Filed March 29, 1972, Ser. No. 239,140  
Claims priority, application Japan, April 5, 1971, 46/25118  
Int. Cl. A44b 19/12

U.S. Cl. 24—205 R

2 Claims



A zip fastener chain comprised of a pair of stringer tapes of substantially endless length each having along their longitudinal edges alternate groups of fastener elements and element-free selvage portions. The groups of fastener elements are interconnected by a strip of water-soluble film, the arrangement being such that there may be provided a space or element-free portion on an individual fastener without having to remove those fastener elements off the tapes as in conventional practice.

### 3,731,350 LACE TENSIONING DEVICE FOR SHOES, BOOTS AND THE LIKE

Fritz Diebold, Asylstrasse 92, Zurich, Switzerland

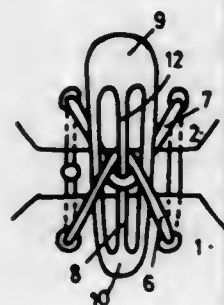
Filed Aug. 18, 1971, Ser. No. 172,859

Claims priority, application Switzerland, Aug. 19, 1970, 12441/70

Int. Cl. A43b 11/00

U.S. Cl. 24—140

9 Claims



A device for tensioning a lace joining pairs of eyelets on facing flaps of a shoe comprises a member which, in the loose position, passes under a first section of lace joining a pair of eyelets on one flap and over a second section of lace joining a pair of eyelets on the other flap. By lifting a grip piece adjacent said first section, the first section is brought close to the other side and under the member, while the second section is brought close to the one side and over the member, the flaps being pulled together and the member locked in this position by engagement with said one flap.

### 3,731,351 PROCESS OF MANUFACTURING TIGHTLY WOVEN ACRYLIC FABRIC

Witold R. Kocay, Creve Coeur, Mo., and Mario L. Fillippelli, Jr., Athens, Ala., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 12, 1970, Ser. No. 80,167

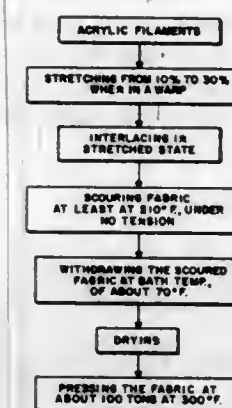
Int. Cl. D06c 27/00, 29/00

U.S. Cl. 28—76 R

5 Claims

The invention relates to a method using polyacrylonitrile filaments having a tensile strength less than 50,000 psi and an

elongation between 20 and 50 percent for weaving a fabric structure having a very restricted network of interstitial



openings of such a nature that there is a marked resistance to the passage of solar radiation and particles in a fine state of subdivision.

3,731,352  
METHOD OF MANUFACTURING A FIBROUS SHEET  
Miyoshi Okamoto, Osaka; Koji Watanabe, Otsu; Kellchi Ashida; Toyohiko Hikota, both of Kyoto; Shungi Mizuguchi, and Makoto Kounosu, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan  
Filed June 15, 1970, Ser. No. 46,410  
Int. Cl. D04h 18/00

U.S. Cl. 28—72.2 R

13 Claims



A method of manufacturing a fibrous sheet including an application of a locational cutting operation to one or more superimposed fibrous webby masses at a stage preceding the usual needle punching operation thereon and a fibrous sheet manufactured thereby having an internal configuration wherein numerous fine fibers are three-dimensionally entangled with each other. The known islands-in-a-sea type synthetic filaments are advantageously used in the formation of the fibrous webby masses with later elimination of the sea component.

### 3,731,353 METHOD OF MAKING ELECTROLUMINESCENT DEVICES

Aron Vecht, 95 Corringham Rd., London, England

Continuation of Ser. No. 6,419, Jan. 28, 1970, abandoned.

This application April 24, 1972, Ser. No. 247,218

Claims priority, application Great Britain, Feb. 16, 1972, 4,566/72

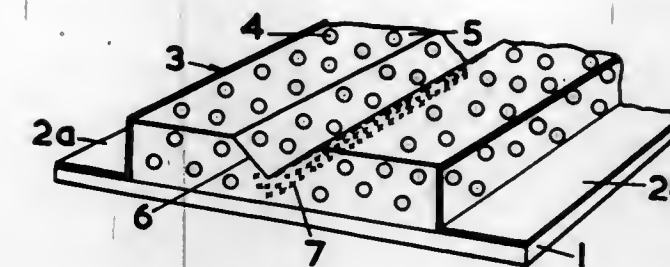
Int. Cl. H01J 9/00

U.S. Cl. 29—25.13

9 Claims

pg.1 A process for making an electroluminescent device comprising a particle-bearing matrix of phosphor particles in a transparent binder wherein the particles are a compound of an

element of Group IIb and an element of the group consisting of sulphur and selenium with an admixture of an activator and a coating of a Group Ib element. A layer of particle-bearing matrix is arranged between two electrodes and a direct cur-



rent is passed therethrough until a high electrical resistance has been formed in a predetermined region of the layer, whereby in subsequent service the predetermined region produces a high electroluminescence.

### 3,731,354 METHOD OF MAKING A MULTILAYER PLASTIC CHIP CAPACITOR

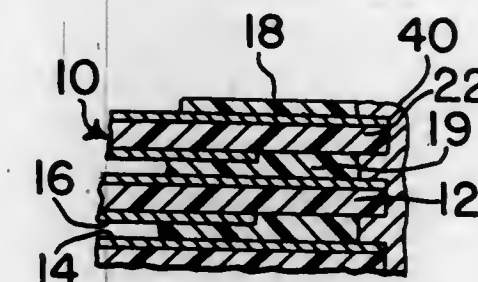
Charles C. Rayburn, Falls Church, Va., assignor to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 40,012, May 25, 1970, Pat. No. 3,654,532. This application March 10, 1972, Ser. No. 233,825

Int. Cl. H01g 13/00

U.S. Cl. 29—25.42

13 Claims



Multilayer chip capacitors and method of making whereby two-side metalized plastic strip material is wound in annular hoop form and opposite sides of hoop are pressed together to bond layers together. The metalized plastic strip is pre-coated with a very thin coating of a heat sealable material such as plastic which functions as a capacitor dielectric and also as a bonding agent. The marginal edges of the pressed hoop are sprayed with molten aluminum at high velocity which makes contact with the edges of the thin metalized layers and penetrates the plastic coating to also provide contact with marginal portions of the metalized electrode coatings. The flattened hoop is then sliced into a plurality of capacitors which can be made to have any value desired over a large range by cutting them to a particular width. Values can be controlled very precisely by first cutting and testing one capacitor and then altering the width of later cut capacitors relative to the tested one. The uncut capacitors can be stored and cut to value as needed.

### 3,731,355 ROLLER BURNISHING TOOL

Heinz H. Rottleuthner, Neu Isenburg, Germany, assignor to Amtel, Inc., Providence, R.I.

Continuation-in-part of Ser. No. 21,807, March 23, 1970. This application Sept. 27, 1971, Ser. No. 183,982

Int. Cl. B24b 39/00

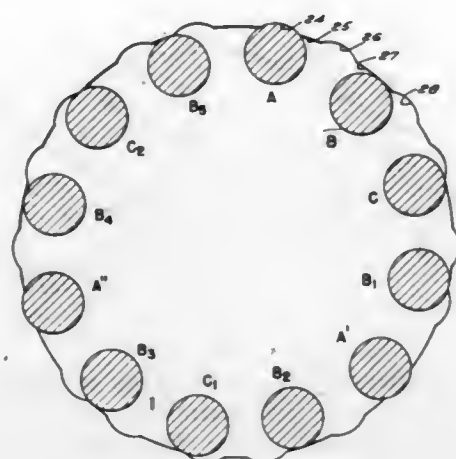
U.S. Cl. 29—90

12 Claims

A roller burnishing tool having a series of processing rolls mounted in a cage which rolls are actuated radially outward or



radially inward as the case might be, the rollers operating against a work piece. The mandrel is constructed in a fashion whereby it not only creates a surface against which the rollers



are pressed but is also fashioned to periodically force the rollers against the surface to be processed so as topeen the surface and also to press against the surface during another part of their rotation about the mandrel.

3,731,356

## CUTTING TOOL

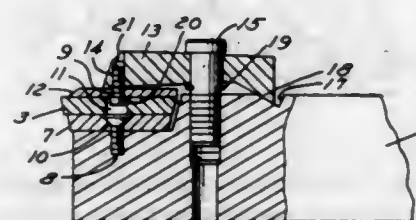
Thomas W. Gowanlock, Rochester, Mich., assignor to General Electric Company, New York, N.Y.

Filed June 18, 1971, Ser. No. 154,551

Int. Cl. B26d 1/00

U.S. Cl. 29—96 R

2 Claims



A cutting tool of the type having a recess or pocket at one axial end thereof in which a disposable cemented carbide cutting insert is held by an overhead clamp which also acts to pull the insert back into the pocket. A separate chip breaker plate is releasably attached to the clamp. The means for attachment of the chip breaker plate to the clamp extends through the chip breaker to the clamp and contains a projection below the chip breaker plate which fits within the hole in the insert, so that tightening of the clamp pulls the insert simultaneously toward the shoulder and the base of the recess to firmly clamp the insert in the recess of the shank.

3,731,357

## APPARATUS FOR ADJUSTING THE ALTITUDE OF THE CHORD OF AN EXPANDING ROLL

Masayuki Shirai, Osaka, Japan, assignor to Yamauchi Rubber Industry Co., Ltd., Osaka, Japan

Filed June 16, 1971, Ser. No. 153,519

Claims priority, application Japan, June 15, 1970, 45/55524

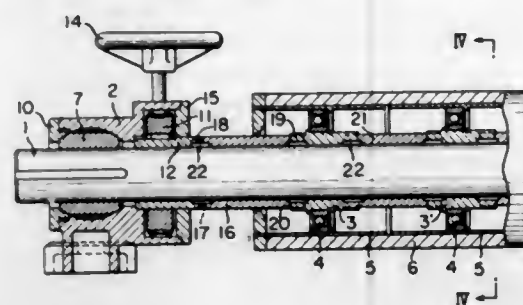
Int. Cl. B21b 13/02

U.S. Cl. 29—116 AD

5 Claims

An apparatus for adjusting the altitude of the chord of an expanding roll characterized in comprising; a central shaft

bent in an arc-shape with the amount of its radial deflection increasing progressively toward the middle thereof from an imaginary straight line corresponding to the axis of an unbent central shaft; a plurality of eccentric discs or bushes rotatably fitted around said shaft and being spaced lengthwise along the axis thereof, said bushes having the their eccentricities increasing progressively toward the middle of said central shaft; a plurality of sleeves, in which said bushes are rotatably



disposed respectively; a rubber roll covering said sleeves and integrated therewith to form a single rotatably unit; a plurality of tubular coupling members rotatably fitted around said central shaft between said bushes and coupling with adjacent bushes; rotating means fixedly disposed on an outwardly extending portion of the central shaft for the purpose of rotating said tubular coupling members; and a bearing journaling said central shaft so as to keep said central shaft fixed thereto and, in case of need, to permit said shaft to turn round therein.

3,731,358

## ROLL FOR PRESSURE FUSING TONER AT ELEVATED TEMPERATURES

Kenneth M. Artl, Williamson, N.Y., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed May 20, 1971, Ser. No. 145,563

Int. Cl. B21b 31/08

U.S. Cl. 29—132

2 Claims

A silicone rubber roll for pressure fusing of electrostatically produced and toned images at elevated temperatures. The roll inherently prevents offset of the image by supplying a release material to the surface of the roll. When the release material is depleted the roll can be restored by impregnation with silicone oil.

3,731,359

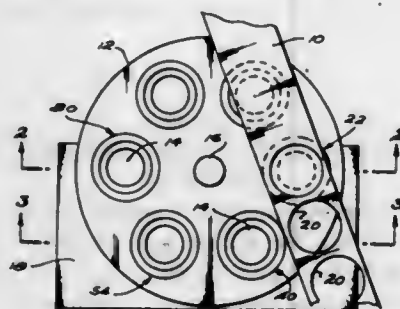
## APPARATUS AND PROCESS FOR MAKING HOLLOW BALL BEARINGS

Edward R. Glenn, 2300 Laurel Place, Newport Beach, Calif. Division of Ser. No. 23,218, March 27, 1970, Pat. No. 3,660,880. This application Feb. 24, 1972, Ser. No. 229,111

Int. Cl. B23p 11/00, 19/04; B21d 39/02

U.S. Cl. 29—148.4 B

15 Claims



The apparatus and process for making hollow ball bearings which comprises means to stamp round metal blanks from flat

metal stock, stamping round metal blanks, forming means to form the blanks, drawing and forging the blanks to establish pairs of concavo-convex hemispheres, spaced relatively shiftable welding electrodes with hemisphere receiving welding seat, arranging the pairs of hemispheres between two electrode welding seats with their concaved surfaces in opposed relationship, urging the rim portions of the opposed hemispheres into pressure engagement with each other and welding them together to form hollow ball bearings.

3,731,360

## METHOD OF MAKING A COMPOSITE BLADE WITH AN INTEGRALLY ATTACHED ROOT THEREON

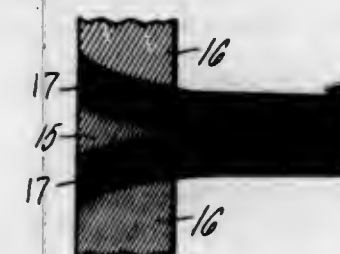
Hilton F. Stone, Jr., Glastonbury, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed April 7, 1971, Ser. No. 131,967

Int. Cl. B23p 15/04; B21k 3/04

U.S. Cl. 29—156.8 B

8 Claims



A method of making a composite blade with an integral root thereon in a single compacting and bonding operation thereby to assure a secure attachment of the blocks to the fiber layers and the fiber layers together.

3,731,361

## APPARATUS FOR INSTALLING IN OR REMOVING AN INSERT FROM A PIPE CARRYING FLUID UNDER PRESSURE

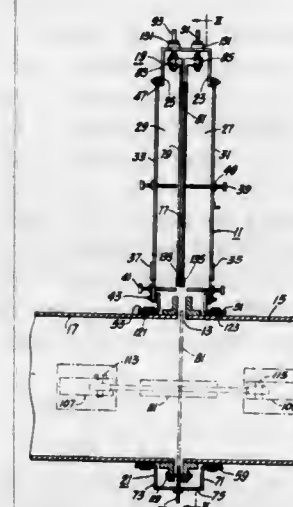
Benjamin F. Tatterson, Pittsburgh, and Ward F. Gidick, West Newton, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Nov. 10, 1971, Ser. No. 197,320

Int. Cl. B23p 19/00; B22d 19/10

U.S. Cl. 29—200 D

6 Claims



First and second cooperating enclosures surround a flanged joint in a conduit with means coacting with the enclosures and with the conduit to make the enclosure gas tight. An insert movably supported in the first enclosure is movable into position between the flanges when they are separated. Means is provided to separate the flanged joint and such means is also available to move the flange toward each other and into contact with the insert.

3,731,362  
NUT RUNNING MACHINES

Julien Carminat, 13 Avenue de Thiou, 74 Annecy, France

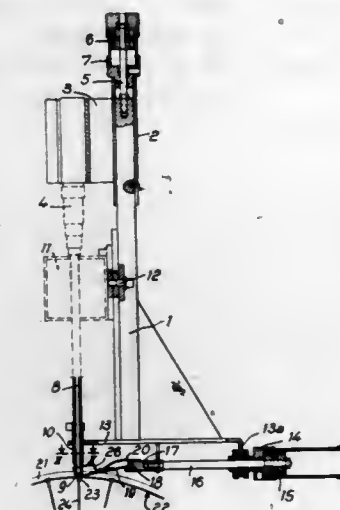
Filed Dec. 20, 1971, Ser. No. 209,647

Claims priority, application France, Jan. 7, 1971, 71000397

Int. Cl. B23p 19/00, 19/04

U.S. Cl. 29—200 P

3 Claims



This invention relates to nut runners, particularly for running nuts on to bicycle wheels. Such machines conventionally comprise a running or driving head having a screw-driver blade engageable with the nut to be run and mounted in a telescopic guide sleeve caused to slide under the action of a jack over a support member, along the axis of a spoke placed opposite the blade by means of a step-wise movement of the wheel. The wheel is moved by means of a catch which is operated by a second jack in a direction substantially perpendicular to the movement of the head, which movement is synchronized with the advancing movement of the catch. In accordance with this invention, the catch is provided with means for positioning the blade with respect to a nut on a spoke during the nut running operation.

3,731,363

## PRINTED CIRCUIT BOARD MANUAL ASSEMBLY DIRECTOR DEVICE

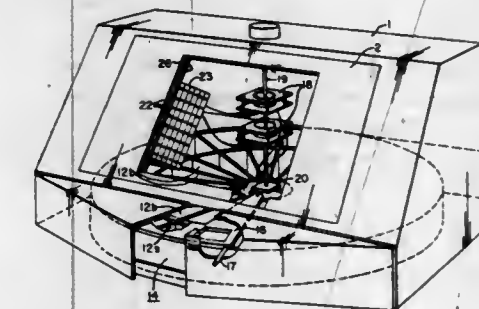
Richard L. Hall, Baltimore, and Carl F. Miller, Crofton, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 11, 1971, Ser. No. 123,257

Int. Cl. H01r 43/04

U.S. Cl. 29—203 B

5 Claims



A printed circuit board manual assembly director device including: a compartmented rotary component tray having selectively accessible radial and circumferential compartments; drop-in modules each containing a system of light pipes and having a readout panel with component-lead-accom-



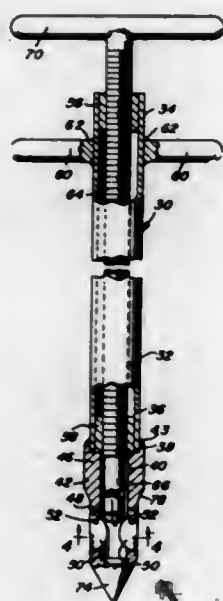
modating through holes for registry with the lead holes of a particular printed circuit board, and adjacent director-light through holes into which output ends of the light pipes extend; and, an illumination control system for the input ends of the module's light pipes to control their illumination selectively in accord with component tray compartment accessibility.

3,731,364

**BROKEN SPRINKLER STANDPIPE REMOVING TOOL**  
Antonio S. Romero, Santa Fe, N. Mex., assignor to Boston E. Witt, Santa Fe, N. Mex., a part interest  
Filed Oct. 5, 1970, Ser. No. 78,097  
Int. Cl. B23p 19/04

U.S. Cl. 29—240

1 Claim



A torque transfer tool including an elongated shank provided with a handle at one end and retractable gripping jaws at its other end. The other end of the shank is adapted to be telescoped into the broken end of a broken pipe section having its other end threadedly engaged with a supporting fitting and the tool jaws are extendable generally radially outwardly of the other end of the shank and supported therefrom for rotation therewith, whereby after insertion of the other end of the shank into the broken pipe section the jaws may be extended so as to frictionally grip the inner surfaces of the broken pipe section and the tool may be subsequently rotated about its longitudinal axis in order to unthread the broken pipe section from its supporting fitting.

3,731,365

**APPARATUS FOR THREADING A HINGE PIN THROUGH INTERDIGITATED LOOPS OF BELT FASTENERS**  
Leslie Alva Fryatt, Huncoat, England, assignor to Mastabar Beltfasteners Limited, Lancashire, England  
Filed July 22, 1969, Ser. No. 843,601

Claims priority, application Great Britain, July 26, 1968, 35,695/68; Dec. 17, 1968, 59,907/68  
Int. Cl. B23p 19/04

U.S. Cl. 29—241

10 Claims

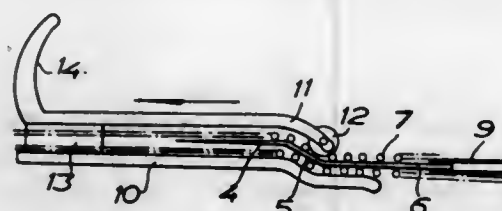
An object of the invention is to provide a guide means for propelling a threading member for a flexible hinge pin through the interdigitated loops of belt fasteners in order to join belt ends together.

A further object of the invention is to provide a method of threading the flexible hinge pin through the loops of the fasteners.

One form of guide means for achieving these objects comprises a support plate for the underneath of the fasteners and a

roller for contacting the top surface of the fasteners so as to act on an abutment on the threading member and so propel it through the loops, the roller being mounted at the trailing end of the guide means on an arm which is fixed to the support plate at the leading end of the guide means.

Another form of guide means comprises one or more rollers for supporting the underneath of the fasteners and one or



more rollers for contacting the top surface of the fasteners so as to act on the abutment of the threading member, the rollers being mounted at or adjacent to the trailing end of the guide means on arms extending from a body portion of the guide means.

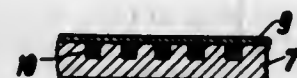
The guide means may be arranged to interdigitate the loops in advance of the threading member.

3,731,366

**METHOD OF MAKING FOUNTAIN PEN**  
Heinz Gunther Herrring, Hamburg-Fuhlsbittel, Germany, assignor to Montblanc-Simplo G.m.b.H., Hamburg, Germany  
Division of Ser. No. 839,228, July 7, 1969, abandoned. This application March 15, 1971, Ser. No. 123,954  
Int. Cl. B23p 17/00

U.S. Cl. 29—423

10 Claims



A method of making a writing pen with capillary passages, which includes the steps of: providing a metal sheet at those areas thereof which are intended to contain capillary passages with grooves open at the top, filling the thus made grooves with a filling material adapted to be evaporated, covering up the thus filled grooves with another material the melting temperature of which is higher than the evaporation temperature of said filling material, removing the filling material by evaporation at a temperature lower than the melting point of said metal sheet and of said covering-up material, and finish-shaping and slotting the pen. Thus liquid ink is conveyed from an ink container through a capillary section to a gap leading to the writing tip of the pen while the foil forming the writing pen is covered and capillary passages lead into the pen gap, which passages have their opposite ends communicating with the ink container.

3,731,367

**METHOD OF ASSEMBLING COMPOUND BODY**  
Friedrich Laussermaier and Karl Motz, both of Munich, Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich, Germany  
Filed Aug. 26, 1970, Ser. No. 67,100  
Claims Priority, application Germany, Aug. 28, 1969, P 19 43 820.1

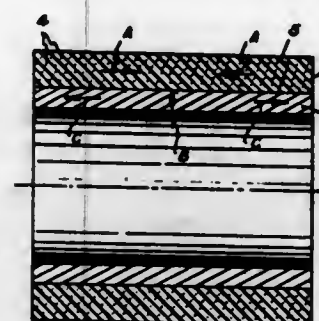
Int. Cl. B23p 11/02

U.S. Cl. 29—447

2 Claims

An outer cylindrical body composed of a fiber reinforced thermal setting synthetic resin and a cylindrical inner metal

body are separately immersed in a bath of cryogenic liquefied inert gas. The metal body shrinks and is then inserted in the



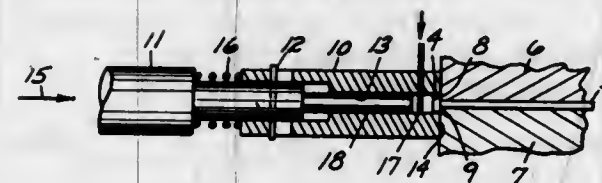
outer body. Upon being removed from the bath and heated, the metal body expands and becomes firmly bonded to the outer body to form the compound body.

3,731,368

**METHOD OF MAKING LEAD AND SOLDER PREFORM ASSEMBLY**  
Francis E. Dieteman and Nello Coda, both of Erie, Pa., assignors to Erie Technological Products, Inc., Erie, Pa.  
Division of Ser. No. 848,456, Aug. 8, 1969, Pat. No. 3,616,981.  
This application June 1, 1971, Ser. No. 148,455  
Int. Cl. B23k 21/00

U.S. Cl. 29—470.1

1 Claim



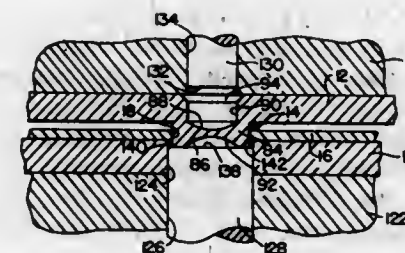
Leads for electronic components are provided with solder preforms by a method and apparatus which first cuts off a length of solder wire and then forms the wire into a preform and cold welds it to the lead.

3,731,369

**METHOD AND APPARATUS FOR FORMING AND SETTING RIVETS INTEGRAL WITH A LAYER**  
Verner A. Johnson, Livonia, Mich., assignor to Johnson Die & Engineering Co., Detroit, Mich.  
Filed Oct. 27, 1971, Ser. No. 193,076  
Int. Cl. B21d 39/00; B23p 11/00

U.S. Cl. 29—509

12 Claims



An assembly of two layers of metallic material conjoined by an extruded elongated rivet formed in and from one layer, and

further extruded over and about the perimeter of an opening in the second layer, is disclosed. The second extrusion results in a lateral deformation conditioned by the first extrusion. The extruded elongated rivet form is developed through an extrude punch operation leaving a blind hole cavity in the rivet form with a depression at the base of the cavity and a depression on the exposed outer side of the rivet form, axially aligned and in opposing relationship with the cavity depression. Conjunction is obtained with the second perforated layer when the two layers are conjunctively arranged and the rivet form is further extruded. The inventive tooling and process for forming the extruded rivet form and for conjoining the two layers are also disclosed.

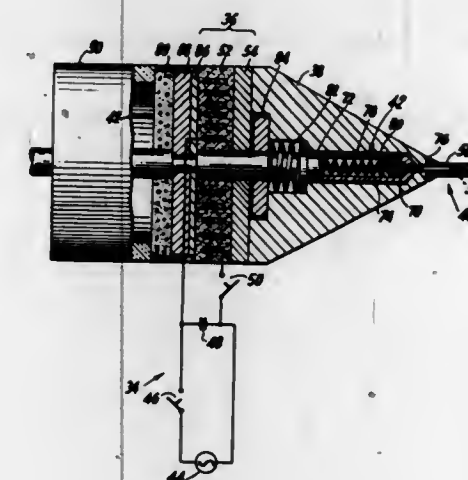
3,731,370

**METHOD AND APPARATUS FOR DEFORMING A METAL WORKPIECE FOR UPSETTING RIVETS AND FOR BLIND RIVETING**

Basil P. Leftberis, Northport, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, Long Island, N.Y.  
Division of Ser. No. 87,483, Nov. 6, 1970, Pat. No. 3,646,791.  
Continuation-in-part of Ser. No. 863,045, Oct. 2, 1969. This application March 6, 1972, Ser. No. 231,952  
Int. Cl. B21d 39/00; B21j 15/36

U.S. Cl. 29—509

4 Claims



Method and apparatus for deforming a metal workpiece, for upsetting rivets, and for blind riveting which is accomplished by passing a stress wave through the metal workpiece or rivet sufficient to render it momentarily plastic and simultaneously forming it. The apparatus is basically comprised of means for generating a stress wave and a stress wave focussing device or amplifier. In operation, a workpiece is placed in a die or shaping means. The stress wave amplifier is then arranged to direct or focus the stress wave to the metal workpiece. Next, a stress wave is generated and passed through the stress wave focussing device, imparting a momentary state of plasticity to the metal workpiece. The momentarily plastic metal workpiece is then formed or shaped as desired.

3,731,371

**SOLID ELECTROLYTIC CAPACITORS AND PROCESS**  
John Piper, and Roger J. Raschiotto, both of Greenville, S.C., assignors to Union Carbide Corporation, New York, N.Y.  
Division of Ser. No. 15,410, March 2, 1970, Pat. No. 3,611,054. This application March 22, 1971, Ser. No. 127,008  
Int. Cl. B01j 17/00

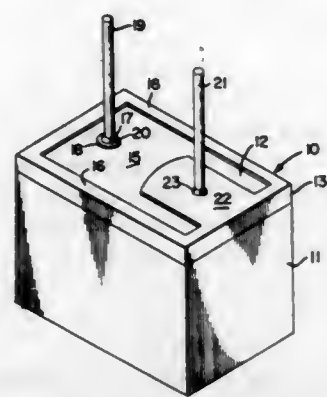
U.S. Cl. 29—570

10 Claims

The fabrication of hermetically sealed, radially leaded solid electrolytic capacitors by first forming a high temperature hermetic seal between a metallized ceramic header and a metal



sleeve, and then inserting a solid electrolytic capacitor having a first lead wire welded to the capacitors anode lead in the sleeve with the nickel lead wire extending through a metal-



lized opening in the header, solder sealing the other end of the metal sleeve, bonding the first nickel wire to the header as an anode lead and bonding a second nickel wire to the header as a cathode lead.

3,731,372

# METHOD OF FORMING A LOW-OHMIC CONTACT TO A SEMICONDUCTOR DEVICE

Wolfgang Kraft, Freiburg i. Br., Germany, assignor to ITT Industries, Inc., New York, N.Y.

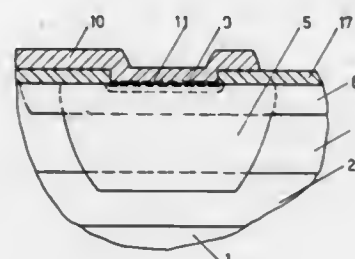
Filed March 15, 1971, Ser. No. 124,094

Claims priority, application Germany, April 10, 1970, P 20 17 228.5

Int. Cl. B01J 17/00

U.S. Cl. 29—590

9 Claims



A low ohmic contact for a semiconductor device is made to a p-conductivity type region by diffusing some n conductivity type phosphorous into said region before the contact metal is applied to said region. The amount of phosphorous is kept at a minimum to prevent the formation of an unwanted pn junction.

3,731,373

# MANUFACTURING AN OPTICAL SHAFT ENCODER HAVING A HOLOGRAPHIC CODE DISK

Richard N. Johnson, Gaithersburg, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 21, 1971, Ser. No. 210,415

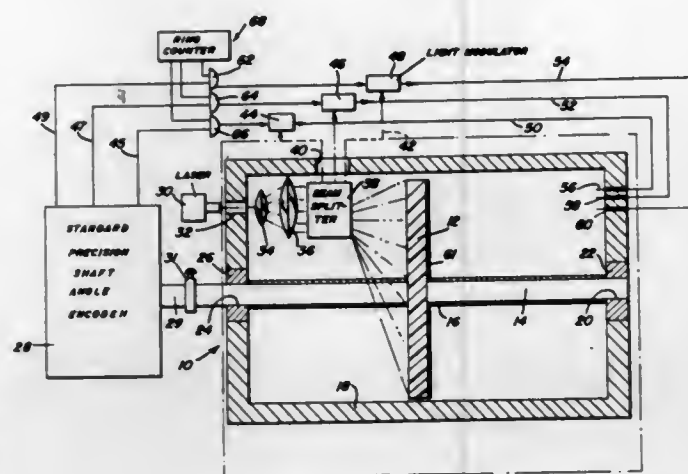
Int. Cl. H01s 4/00; G02b 27/00

U.S. Cl. 29—592

1 Claim

A constant laser beam is directed toward a photosensitive code disk. A beam splitter diverts some light from the laser beam to drive first inputs of light modulators. The shaft of a standard reference shaft encoder is concentrically fixed to the disk and the encoder output bit lines are individually connected to second inputs of respective light modulators for selectively modulating the passage of light thereby generating light bit equivalents. The light bits are individually transmitted

through fiber optics to projecting positions near the opposite side of the disk. By subjecting the disk to constant laser light on one side and changing bit light on the other side as the shaft



turns, a diffraction grating is formed on the disk as a latent image. The photosensitive disk is developed and forms a permanent optical encoder disk for future use.

3,731,374

# METHOD OF FABRICATING A HARD INTERMETALLIC SUPERCONDUCTOR BY MEANS OF DIFFUSION

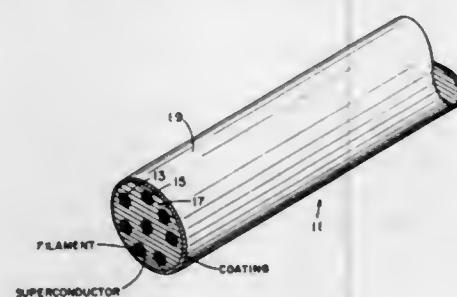
Masaki Suenaga, Mastic Beach; William B. Sampson, Bellport, and David H. Gurinsky, Center Moriches, all of N.Y., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed July 20, 1971, Ser. No. 164,362

Int. Cl. H01v 11/00

U.S. Cl. 29—599

6 Claims



Method of providing fine superconductors in a metal matrix wherein solid-state diffusion of a selected component from the matrix takes place and is "enhanced" by an externally added component to provide a desired superconductor alloy in the matrix.

3,731,375

# MONOLITHIC INTEGRATED STRUCTURE INCLUDING FABRICATION AND PACKAGING THEREFOR

Benjamin Agusta; Paul H. Bardell; Paul P. Castrucci, all of Poughkeepsie; Robert A. Henle, Hyde Park, and Raymond P. Pecoraro, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 539,210, March 31, 1966, Pat. No. 3,508,209. This application April 16, 1970, Ser. No. 33,127

Int. Cl. B01J 17/00; H01I 1/16

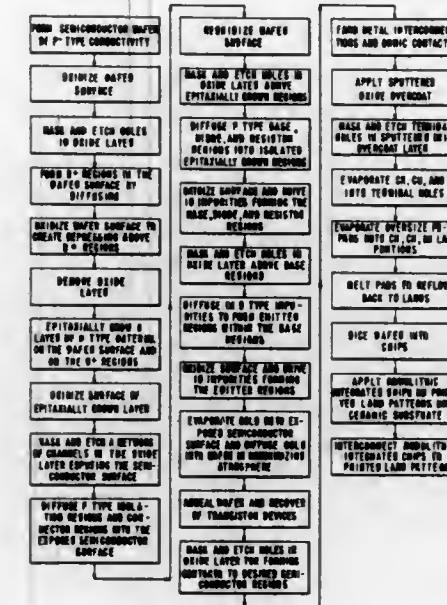
U.S. Cl. 29—577

1 Claim

A method of making a monolithic integrated semiconductor structure that has a plurality of functionally isolated individual cells that are electrically interconnected. Each of the cells is an object of mirror image cell that is vertically, horizontally

and diagonally displaced from the object cell. The plurality of cells provide a memory array with electrical components of each memory cell composed of active and passive semiconductor devices. Other importance aspects of the structure in-

the polarity of the electricity in the electromagnet windings and controlling the power applied to these windings. The core of the electromagnet is maintained in a demagnetized state by switching the electrical polarity of the windings. The method comprises the steps of applying a magnetically permeable substance to the dice, attaching each of the dice to the elec-



clude underpass connections and active devices in a common portion of the structure which are electrically interconnected at the same node potential by means of a highly doped buried region within the common portion of the structure.

3,731,376

# METHOD OF MAKING A CATHETER

Bernard Ackerman, Metuchen, N.J., assignor to Electro-Catheter Corporation, Rahway, N.J.

Division of Ser. No. 718,434, April 3, 1968, Pat. No. 3,590,822. This application Jan. 22, 1971, Ser. No. 108,742

Int. Cl. H01b 13/00

U.S. Cl. 29—624

13 Claims



Electro-conductive catheters and methods of manufacture thereof.

3,731,377

# METHOD FOR HANDLING BEAM-LEAD AND ODD-SHAPED SEMI-CONDUCTOR DEVICES

William L. Muckelroy, P.O. Box 9685, Washington, D.C.

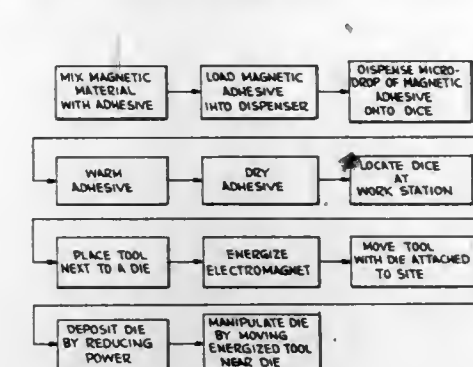
Filed Aug. 19, 1971, Ser. No. 173,186

Int. Cl. H05k 3/30

U.S. Cl. 29—626

13 Claims

An apparatus and method for manipulating monolithic microelectronic dice are provided. The apparatus comprises a probe-like electromagnet which uses a variety of different shaped tips to change the configuration of the magnetic field. The magnetic field at the tip is further adjusted by reversing



tromagnet using the force of the magnetic field, moving the attached die to a preferred location and orientation and releasing said die. Said magnetically permeable substance may comprise a fluid adhesive with a magnetically permeable insulated powder mixed therein, a permeable metal formed in beam-leads, or a permeable metal formed into bumps on the surface of flip-chips.

3,731,378

# METHOD OF ASSEMBLING SWEEP RIGHT ANGLE CONNECTOR

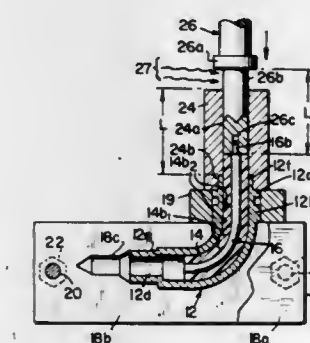
Joseph R. Toma, Colonia; Oliver C. Johnson, Irvington; Amelia M. Miltreuter, Colonia, and Charles C. Ward, Brielle, all of N.J., assignors to Astralab, Inc., Linden, N.J.

Filed April 29, 1971, Ser. No. 138,648

Int. Cl. H02g 15/00

U.S. Cl. 29—629

14 Claims



A method is disclosed for constructing a right angle connector having a curved sweep instead of the conventional sharp or mitred corner. The connector includes a main curved shell, an internal notched insulator or dielectric and a central contact assembly. The contact assembly, which can take the form of a narrow conductor having a pointed tip, is inserted in a central bore in the insulator. The insulator is then lodged within the internal chamber of the connector body by inserting the insulator into a guide block through the bore of which an extrusion-type plunger is then forced, thereby driving the insulator and central conductor into the connector body. Because of its partially notched surface, the insulator maintains its structural integrity as it is compressed around the curve of the connector body and assumes the dimensions of that curve. The connector is thereby formed with all internal elements exhibiting the desired smooth sweep, and the connector may be adapted to receive a variety of fittings and terminations.

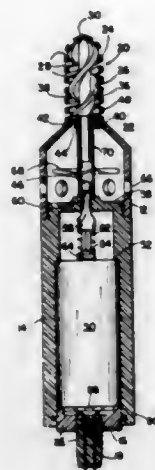


### 3,731,379 HAIR CUTTING APPARATUS

Reed F. Williams, 4522 East Chapman, Orange, Calif.  
Filed Dec. 17, 1971, Ser. No. 209,164  
Int. Cl. B26b 19/06

U.S. Cl. 30—29.5

5 Claims



This invention relates to improvements in apparatus for cutting hair. The invention employs a novel hair cutting means which in the embodiment illustrated comprises a pair of cutting blades, one formed as a sheath within which the other blade is contained. Perforations in the wall of the sheath blade are arranged to admit the ends of the hairs to be cut into the interior of the sheath where the second blade, which has helical cutting edges, cooperates with the sheath to effect a shearing action.

### 3,731,380 CHAIN-SAW EXTENSION POLE

Robert G. Mathiesen, 2200 Canehill Avenue, Long Beach, Calif.

Filed Dec. 20, 1971, Ser. No. 210,003  
Int. Cl. B27b 17/02; A01g 3/08

U.S. Cl. 143—32 L

6 Claims



An extension pole for a chain saw with an elongate handle with front and rear ends and occurring in a common vertical plane with the center of gravity of the saw and an axis concentric with the designed longitudinal axis of rotation for the saw, said pole having mounting means releasably engageable with the saw handle with the axis of the pole substantially concentric with and projecting rearwardly from the handle. Manually operable throttle control means carried by the mounting means to engage a throttle trigger carried by the handling and including an operating line extending longitudinally of the pole. The mounting means engaging only the handle of the saw and being releasably secured with the saw without engagement of fasteners in and with the saw structure.

### 3,731,381 ROTATABLE WELD CUTTING TOOL

Scott R. Penfield, Jr., and Warren W. Roberts, both of Chattanooga, Tenn., assignors to Combustion Engineering Inc., Windsor, Conn.

Filed Nov. 18, 1970, Ser. No. 90,510  
Int. Cl. B25f 3/00; B26b 1/00, 3/00

U.S. Cl. 30—124

7 Claims



Apparatus is disclosed for detaching seal-welded heater elements from assembly with the pressurizer of a pressurized water nuclear power system. The heater elements are of the type that are connected to the pressurizer by both a seal weld and a mechanical back-up connection. The disclosed arrangement involves the use of the nut that forms part of the back-up connection as means for connecting a rotary weld cutter to its drive motor. A weld cutter of particular design capable of removing the seal weld without damaging the heater element is also described.

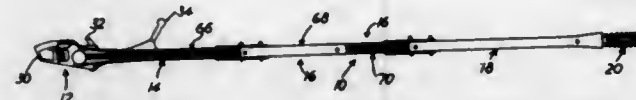
### 3,731,382 EXTENSIBLE CHAIN SAW

Dwight W. Wroe, 6530 Hugo Road, Grants Pass, Oreg.

Filed June 1, 1971, Ser. No. 148,620  
Int. Cl. B27b 17/02

U.S. Cl. 30—381

7 Claims



Provision is made of light but strong and rigid, optionally usable, sectional means, adapted to be interposed between the motor unit and the cutting chain unit of a conventional chain saw, for extending the saw to different selected lengths, whereby a man standing on the ground may cut through branches of substantial thickness, located at substantial distances above the ground.

### 3,731,383 DENTAL CHAIR

Kazuo Hayashi, Kyoto, Japan, assignor to Kaubshiki Kaisha Morita Seisakusha, Fushimi-ku, Kyoto, Japan

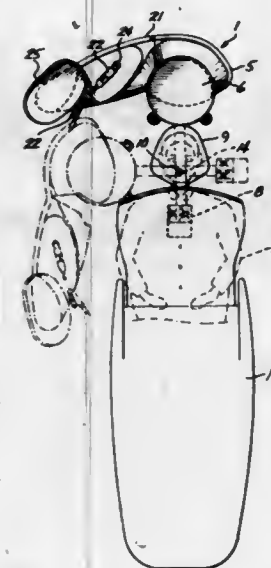
Filed March 8, 1971, Ser. No. 121,730

Claims priority, application Japan, March 23, 1970, 45/24225

U.S. Cl. 32—22

Int. Cl. A61c 19/02

7 Claims



A dental chair comprising a chair body for a dentist to be seated in while performing treatment and a wing connected to one side of said chair body swingably relative thereto and having means for detachably holding therein various instruments used for dental treatment.

### 3,731,384 MEDICAL INSTRUMENT

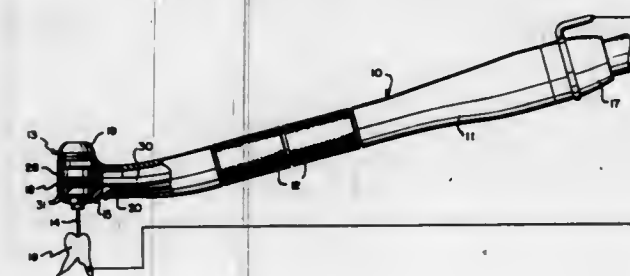
Bernard Brooks, Belle Harbor, N.Y.; Jerome Farber, Cherry Hill, and Theodore Roseman, Westmont, both of N.J., assignors to Electro-Dent, Inc., Cherry Hill, N.J.

Filed April 22, 1971, Ser. No. 136,518

Int. Cl. A61c 1/10

U.S. Cl. 32—27

9 Claims



A medical device is disclosed, which employs a form of electric desensitization in connection with the use of pain-producing medical tools. The device is particularly useful in connection with dental drilling operations and includes, in the preferred embodiment, a coil mounted within a dental hand-piece and a rotating permanent magnet mounted so that its magnetic flux overlaps the coil windings. Rotation of the magnet induces an electric current in the coil which flows through the drill and into the tooth to desensitize the nervous system of the tooth upon contact.

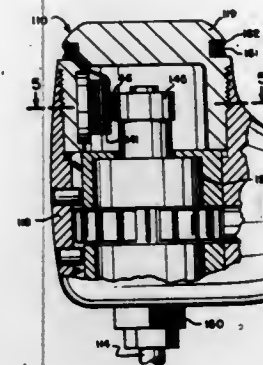
### 3,731,385 DRILLING APPARATUS

Jerome Farber, Cherry Hill, and Theodore Roseman, Westmont, both of N.J., assignors to Electro Dent, Inc., Cherry Hill, N.J.

Filed April 15, 1971, Ser. No. 134,295  
Int. Cl. A61c 1/10

U.S. Cl. 32—27

3 Claims



A medical device is disclosed, which employs a form of electric desensitization in connection with the use of pain-producing medical tools. The device is particularly useful in connection with dental drilling operations and includes, in the preferred embodiment, a coil mounted within a dental hand-piece and a rotating permanent magnet mounted so that its magnetic flux overlaps the coil windings. Rotation of the magnet includes an electric current in the coil which flows through the drill and into the tooth to desensitize the nervous system of the tooth upon contact. An improved turbine bearing assembly is included, having an elongated substantially tubular hub interconnectable with an elongate collet to form a rotary chuck, preferably adapted to be used in a dental drilling hand-piece. The invention also includes apparatus for manipulating this rotatable chuck.

### 3,731,386 MEASURING DEVICE FOR DETERMINING THE ANGULAR POSITION OF A CAM

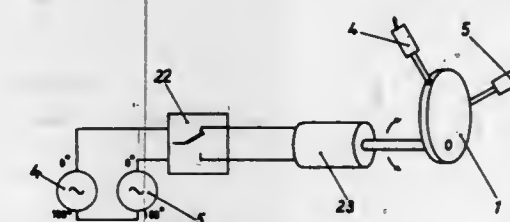
Kurt Kreiensen, Königsberger Str. 5a, Villingen, and Karl Hutter, Lerchenweg 195, Mühlhausen, both of Germany

Filed Oct. 23, 1970, Ser. No. 83,405

Int. Cl. G01b 5/24

U.S. Cl. 33—1 PT

9 Claims



The invention relates to a measuring device for determining the angular position or orientation of a cam, with an electrical length measuring follower, the pin of which bears radially on the rotary cam and produces a measurement voltage representative of the radial measurement of the cam at any given moment.

### 3,731,387 STOCK MARKET CHARTING APPARATUS

John W. Slemmons, 19142 Glen Albyn, Orange, Calif.

Filed Sept. 9, 1969, Ser. No. 856,359

Int. Cl. B43i 7/00

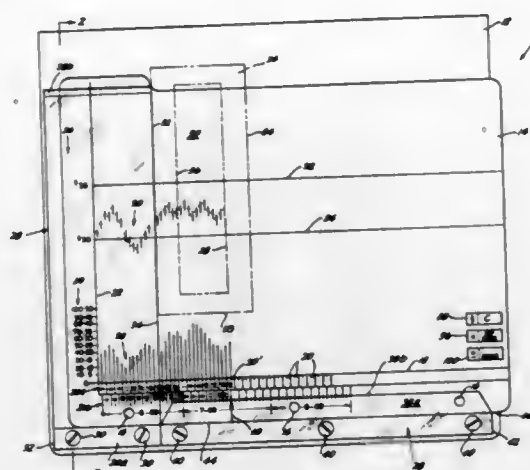
U.S. Cl. 33—76 R

15 Claims

Apparatus for plotting stock market data. Included is a rectangular rule having along the edges of a central rectangu-

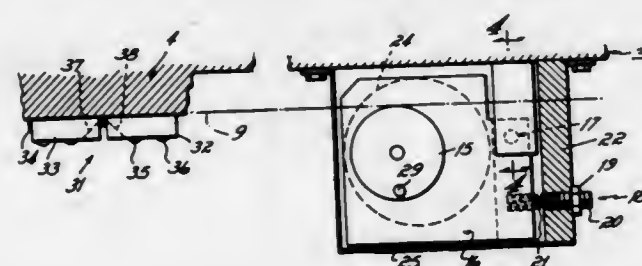


lar opening a plurality of scales of different incremental spacing. A charting sheet is positioned with an edge against a chart guide and with a selected point on the abscissa aligned with an index mark on the chart guide. When the rule is placed against a rule guide, a scale edge of the rule is lined up with the



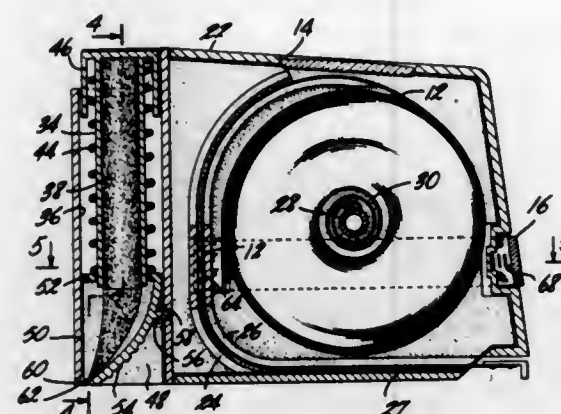
selected point, thereby facilitating easy entry of prices, volume or other data. In one embodiment the chart and rule guides are mounted on a notebook cover; in another embodiment the guides are combined in a unitary member adapted to engage an edge of the charting sheet.

**3,731,388**  
**MEASURING METHOD AND APPARATUS**  
Robert K. Burroughs, Batavia, and Timothy A. Wakefield, Cincinnati, both of Ohio, assignors to R. K. LeBlond Machine Tool Company, Cincinnati, Ohio  
Filed Nov. 3, 1970, Ser. No. 86,488  
Int. Cl. G01b 3/12; B23a 15/00  
U.S. Cl. 33—125 M 24 Claims



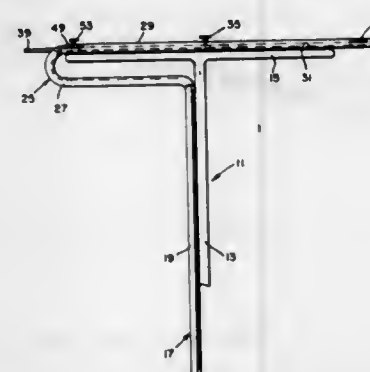
A method and apparatus for measuring movement of one element relative to another as, for example, a machine tool slide relative to a bed. The measurement is effected by rolling a disc over a flat reference surface. The disc in turn controls an electrical signal generator such as a resolver or an encoder which generates an electric signal indicative of the displacement of the disc relative to the reference surface. The effective rolling diameter of the disc is accurately controlled by preloading the disc into frictional engagement with the reference surface. A pin secured in an eccentric position on the disc is periodically passed over or through a synchronizing or rezeroing element so as to periodically and automatically synchronize or reset the disc relative to the reference surface and thereby eliminate cumulative error which might otherwise result from slippage or diametral errors between the two friction bearing surfaces.

**3,731,389**  
**TAPE MEASURING DEVICE**  
Bernard King, 130 Madison Avenue, New York, N.Y.  
Filed May 7, 1970, Ser. No. 35,391  
Int. Cl. B43I 9/04  
U.S. Cl. 33—189 13 Claims



Disclosed herein is a tape measuring device comprising a measuring tape coiled within a casing, and having a spring actuated return device for recoiling the tape when it has been withdrawn from the casing. A brake device is spring loaded within the casing to counter balance the return force so that the measuring tape will remain withdrawn until the brake is released to permit the return device to re-coil the tape. The brake device includes a U-shaped member having fingers projecting inwardly in a face-to-face manner from the free ends of the U-shaped member for pressing the tape against an internal wall of the casing under the force of a coil spring disposed between the casing and inner face of the bight portion of the U-shaped member. The tape measuring device also comprises a marking mechanism, disposed within the casing at the ends thereof opposite the end at which the tape is withdrawn, and including a marking element which is spring biased upwardly, but which may be depressed to place a mark on the surface being measured. The indicia on the tape are read through a window in the top of the casing, and the reading is arranged to correspond exactly with the distance between the marking element and the free end of the tape.

**3,731,390**  
**LAYEROUT GAUGE**  
John L. Sloan, 1669 Loma Avenue, Long Beach, Calif., and Palmer B. Peters, 2825 Knode Street, Torrance, Calif.  
Filed Nov. 1, 1971, Ser. No. 194,720  
Int. Cl. B23b 49/02; G01b 5/14  
U.S. Cl. 33—189 8 Claims



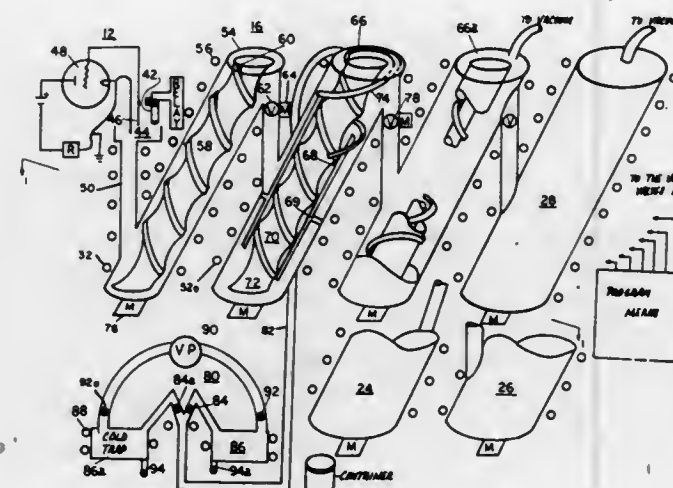
A tool for use by structural steel layerout men which allows the simultaneous marking of beam shear lines and hole positions in both the flange and web of the beam, the tool including a unitary broad strip frame member formed with a flat web portion to lie adjacent the beam's web and a U-shaped flange portion fitted over the beam's flange, the web portion and a

flange portion mounted movable flange gauge strip both include a plurality of gauge slots for respectively laying out the web and flange of a structural beam while shear lines perpendicular to the elongate outer surface of the beam's flange may be marked off on the beam's web along the parallel side edges of the web portion of the tool.

**3,731,391**  
**METHOD OF DRYING PIGMENTS**  
Hans R. Schweizer, Reinach, Basel-Land, Switzerland, assignor to Eastman Kodak Company, Rochester, N.Y.  
Filed April 22, 1971, Ser. No. 136,583  
Int. Cl. F26b 5/06  
U.S. Cl. 34—5 11 Claims

A process for drying a wet mass of finely divided and dispersed pigment particles comprising forming a mixture of a suitable organic solvent and the pigment particles, freezing the mixture, and thereafter subliming the organic solvent from the pigment particles under a reduced pressure. The resulting dried pigment is finely divided, has a soft texture and a low apparent density, and is easily dispersed in either hydrophobic or hydrophilic media.

**3,731,392**  
**CONTINUOUS FREEZE DRYER**  
Herbert Gottfried, 3441 5th St., Ocean Side Long Island, N.Y.  
Filed Feb. 25, 1971, Ser. No. 118,934  
Int. Cl. F26b 5/06  
U.S. Cl. 34—5 12 Claims

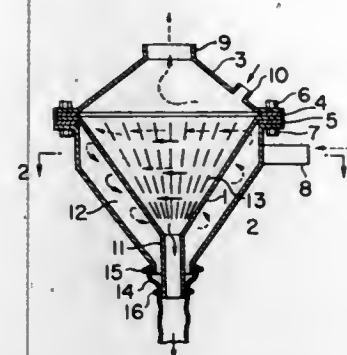


Arrangement for continuously and automatically lyophilizing material comprising freezing the material, pulverizing the frozen material, circulating the material along a screw conveyor while exhausting the ambient gas to heat the material and expose particles of material to heat, regulating the heat supplied by reversible refrigeration, alternately exhausting said ambient gas in first and second cold traps, sequentially finishing partially treated material in at least first and second finishing zones and discharging the material into containers without breaking the vacuum.

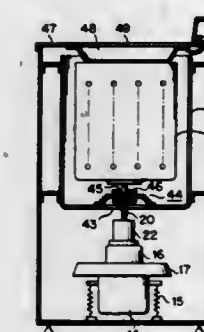
**3,731,393**  
**METHOD OF AND APPARATUS FOR FLUIDIZING PARTICULATE SUBSTANCE**  
Katsuto Okada, Tokyo, and Fumio Kato, Kawasaki, both of Japan, assignors to Morinaga Nyugyo Kabushiki Kaisha, Tokyo, Japan  
Filed June 9, 1971, Ser. No. 151,363  
Claims priority, application Japan, June 13, 1970, 45/50903  
Int. Cl. F26b 3/08  
U.S. Cl. 34—10 8 Claims

A fluidized bed of solid particles, for instance of spray dried milk, is formed along a funnel wall by conveying the particles

supplied to the upper funnel edge from above along the wall or by a body of gas which is introduced through a plurality of slits in the wall preferably in a direction substantially tangential to the circular cross section thereof to form a gas vortex. The gas vortex is preferably so distributed that its velocity is in direct proportion to the diameter of the conical wall.



**3,731,394**  
**CENTRIFUGAL DEHYDRATOR**  
Masayuki Onishi, Nagoya, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan  
Filed Dec. 13, 1971, Ser. No. 207,389  
Claims priority, application Japan, Dec. 11, 1970, 45/124629  
U.S. Cl. 34—58 7 Claims



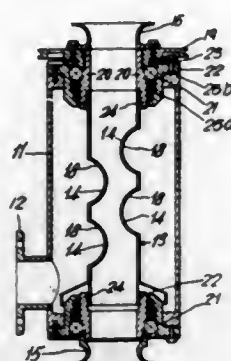
A centrifugal dehydrator wherein the drive of a motor is transmitted to a rotatable support through a drive transmission mechanism which renders a brake mechanism inoperable and rotates a spin basket and when the motor is brought to stop by the inertia of the spin basket the brake mechanism is actuated and rotatable support is disconnected from the drive transmission mechanism thereby to immediately stop the rotation of the spin basket.

**3,731,395**  
**APPARATUS FOR EXTRACTING LIQUID FROM CLOTH**  
Gentaro Watanabe, Kyoto, Japan, assignor to Uenoyama Kiko Co., Ltd., Kyoto, Japan  
Filed Dec. 4, 1970, Ser. No. 95,243  
Claims priority, application Japan, Dec. 12, 1969, 44/100405; Dec. 13, 1969, 44/100343; April 8, 1970, 45/33855  
U.S. Cl. 34—92 4 Claims

This invention provides a method and apparatus which may be used for vacuum extraction of liquids. The method comprises applying a radially outwardly directed vacuum suction force to cloth in rope form which has been treated with any desired solution and has said liquid content absorbed thereon. The apparatus comprises a vacuum vessel, a pipe body in-



stalled in and across said vacuum vessel and having a plurality of slits or openings formed in the peripheral wall thereof to establish communication between the interior and exterior of



the pipe body, and means whereby cloth in rope form treated with any desired solution and having said liquid content absorbed thereon is moved through said pipe body at a suitable speed.

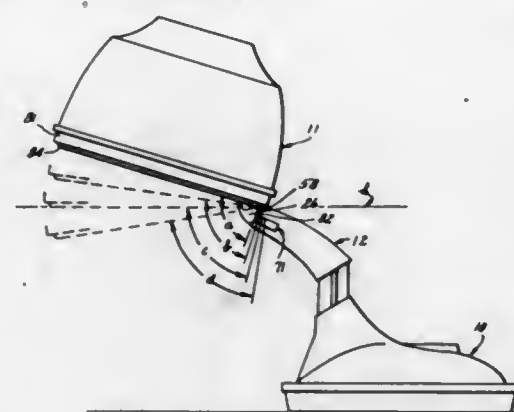
3,731,396

**HAIR DRYER WITH SELECTIVE TILTABLE HOOD**  
James O. McLean, Milford, Conn., assignor to General Electric Company, Bridgeport, Conn.

Filed Jan. 28, 1972, Ser. No. 221,748

Int. Cl. A45d 20/24

U.S. Cl. 34—99



A hair dryer that may be collapsed for carrying and erected for operation, including a base assembly, a rigid tiltable hood assembly to be positioned about the head of the user for distributing heated air to the head and a strut assembly for supporting the rigid hood assembly elevated from the base assembly. The strut assembly includes two members hingedly attached to each other with one of the members being secured to the hood assembly. One of the members has a support shoulder and the other member has an opening in the walls. A resiliently mounted depressible limiter member having a step-like portion is located in the wall opening and protrudes through the opening such that the limiter member cooperates with the support shoulder to apply supporting force to the hood assembly at various tilt positions.

3,731,397

**CEMENT CLINKER COOLER**

Karl-Heinz Kayatz, Hamburg-Nienstedten, and Paul Schreiner, Papenwisch, both of Germany, assignors to Fuller Company, Catasauqua, Pa.

Filed Oct. 14, 1970, Ser. No. 80,731

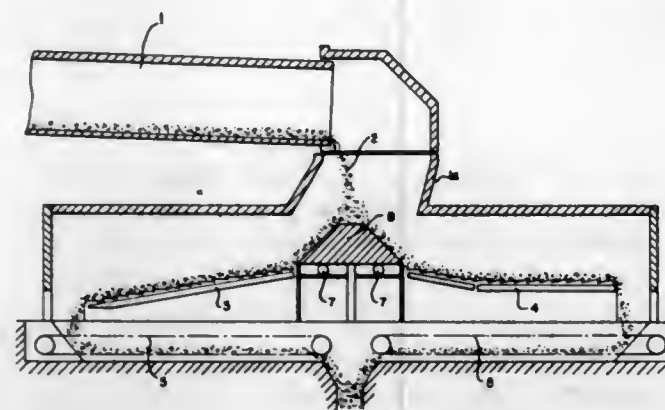
Claims priority, application Germany, Oct. 17, 1969, P 19 52 324.1

Int. Cl. F27b 7/38

U.S. Cl. 263—32 R

Cement clinker cooler apparatus which includes a pair of grate type clinker coolers with opposite working directions.

The hot clinker from the kiln is deposited on a distributor which directs the clinker in desired proportions to the two



coolers. The distributor is adjustable to control the proportion of clinker supplied to each cooler. Several distributor configurations are disclosed.

3,731,398

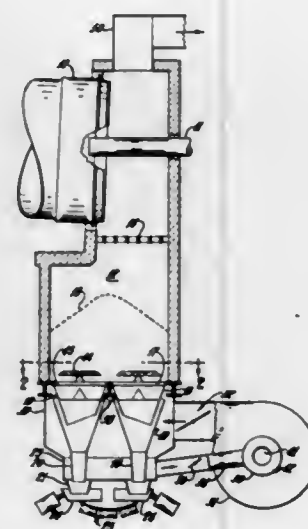
**APPARATUS FOR COOLING PARTICLES**

Lee H. Niems, 2702 Brassie, Flossmoor, Ill.

Filed May 10, 1971, Ser. No. 141,667

Int. Cl. F27b 7/00

9 Claims U.S. Cl. 34—169



Apparatus for cooling heated pieces of matter and particularly calcined lime pebbles or particles in which cooling air is introduced under positive pressure into a downwardly moving mass of particles which is adjustable for uniform cooling throughout. This is accomplished by providing air inlets adjustably positionable horizontally within the bed, dependent upon the horizontal cross-sectional shape of the bed and the pattern of particle size distribution therein. Uniformity of cooling is further promoted by positioning each air inlet along a line which coincidentally divides its section of bed symmetrically into like horizontal cross-sectional shapes as well as like patterns of particle size distribution.

3,731,399

**DEVICE AND METHOD FOR BRIDGE INSTRUCTION**

Edward L. Gordy, and Laura Jane Gordy, both of 424 1/2 Brazilian Avenue, Palm Beach, Fla.

Filed June 18, 1971, Ser. No. 154,643

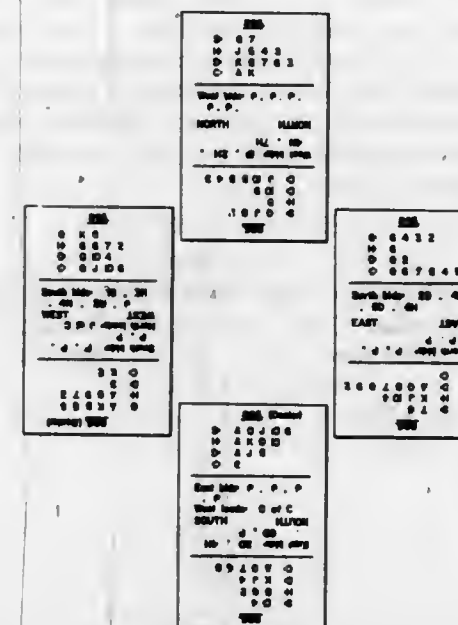
Int. Cl. G09b 19/22

8 Claims U.S. Cl. 35—8 B

This disclosure described an instructional device and method for teaching the proper bidding and opening leads in

the game of bridge. The device includes a set of four bidding charts, e.g., on separate cards, one for each player. Each bidding chart includes an identification of the playing cards of the bridge hand for the particular player and an identification of the seating position for that player, i.e., north, east, south or west. Each chart also includes a bidding sequence showing the correct sequence of bids for the next preceding bidder. One of the charts, that of a player other than the opening leader, will indicate the correct opening lead against the correct final contract.

In teaching bridge with this device each player is given his bidding chart and the player selects the proper playing cards



indicated on his chart for his bridge hand from a deck of playing cards. The players bid their hands in accordance with the normal sequence of bidding used in the game of bridge and if any player makes an incorrect bid, the next succeeding bidder can consult his bid chart and inform the prior bidder whether or not he has made an incorrect bid. The prior bidder can then try again to make the correct bid or eventually be told what the bid should be. Once the bidding is complete, the opening leader selects his lead and if the lead is incorrect he can be corrected by the player on whose chart the opening lead is indicated, usually the declarer.

3,731,400

**SPINAL NERVE TRACER**

Donald L. Pile; Charles E. Grandell; Arthur H. Flye, and Henry R. Scheuermann, Sr., all of Topeka, Kans., assignors to said Pile, by said Grandell, Flye, and Scheuermann

Filed Jan. 24, 1972, Ser. No. 220,262

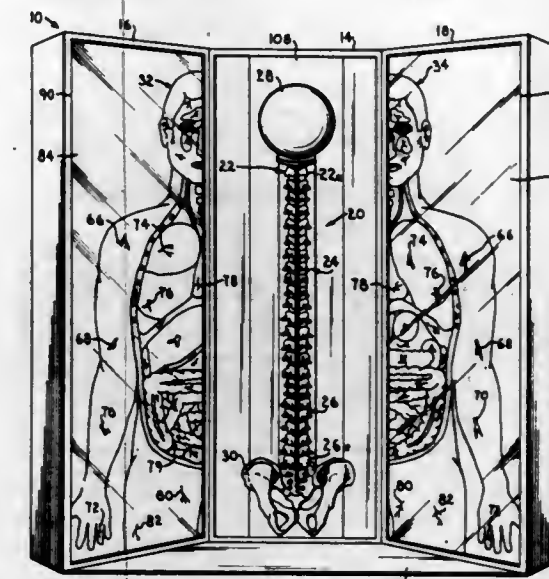
Int. Cl. G09b 23/32

U.S. Cl. 35—17

10 Claims

Display apparatus for instructional and demonstrative purposes and for use by practitioners in the healing arts. The apparatus employs a simulated, erect human spine having a series of vertebrae, each rotatable to the left or right or shiftable out of proper lateral alignment to simulate a misalignment condition. Pictorial illustrations of the left and right sides of the human anatomy in frontal views flank the spine on opposite sides thereof, and have transparent zones at selected terminal nerve endings of the spinal nerves. Electric lamps are disposed behind the illustrations adjacent the respective zones. As a particular vertebra is rotated or shifted out of

proper alignment, the appropriate lamp or group thereof are energized to illuminate the corresponding zone or zones to thereby visually indicate the organ, muscle, bone or tissue structure affected by interference with the spinal nerve



emanating from the displaced vertebra. In this manner, nerve impulses are traced from the emission of particular spinal nerve at the intervertebral foramen level to the affected nerve endings.

3,731,401

**ABACUS INSTRUCTION DEVICE**

Tsuneji Kojima, No. 65, Higashi-Sugi-Machi, 2-chome, Kitaku, Nagoya-shi, Japan

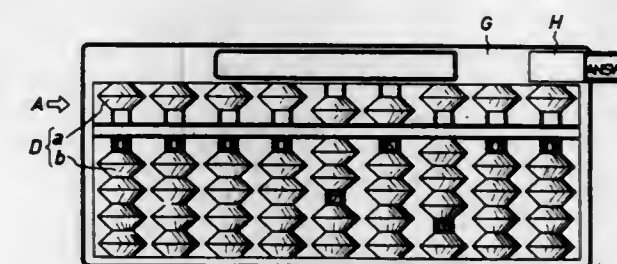
Filed Feb. 11, 1972, Ser. No. 225,518

Claims priority, application Japan, May 21, 1971, 46/41194

Int. Cl. G06c 1/00

U.S. Cl. 35—33

1 Claim



An abacus instruction device, which enables answer numerals to be exposed below the moved beads, being effective as instruction device for pupils and foreigners.

3,731,402

**EDUCATIONAL DEVICE**

Gertrude M. Paul, 98 Lakeview Lane, Chagrin Falls, Ohio

Filed March 8, 1971, Ser. No. 121,816

Int. Cl. G09b 11/04

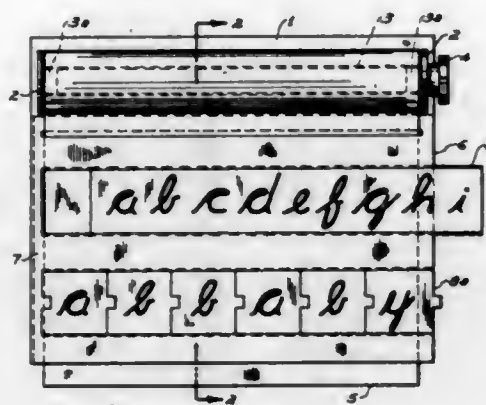
U.S. Cl. 35—37

12 Claims

An educational device including a base plate, a front frame having its left edge secured to the left edge of the base plate and a roll having paper thereon secured to the upper end of the base plate which roll is provided with a knob which a pupil may rotate with one hand while he pulls the free end of the paper downwardly between the base plate and the frame. The front frame is provided with an elongated opening for receiv-



ing a slide having letters or numerals stencilled therein. The slide maybe formed of a single piece or a plurality of connected segments which slide is held stationary within the frame by suitable means, such as by bevelled edges which engage bevelled edges at the openings in the front frame. The stencil is preferably formed of a plastic material having a



thickness of 0.05 to 0.06 of an inch so that in forming letters or numerals, the pencil will follow a definite pattern. If desired, small numerals may be etched or printed upon the stencil adjacent each letter or numeral to show the progressive strokes of the pencil which are utilized in forming the letters or numerals.

3,731,403

## PROGRAMMED TEACHING DEVICE

Arye L. Mandelbaum, 8 Weitzbard St., Rishon-Le-Zion, Israel

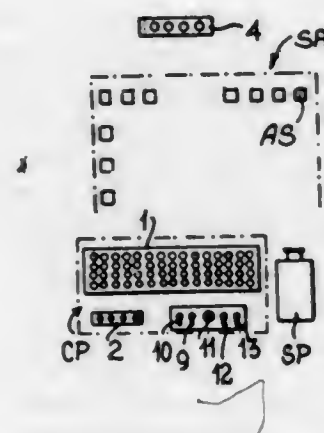
Filed June 19, 1972, Ser. No. 264,270

Claims priority, application Israel, June 29, 1971, 37179

Int. Cl. G09b 7/06

U.S. Cl. 35—48 R

7 Claims



A programmed teaching apparatus for use with a slide projector for teaching a group of students, comprises a magazine for holding a plurality of slides each containing a question and multiple-choice answers, an answer selector for each student, a control panel having a student answer display for each student, a correct answer display on the control panel viewable only by the instructor, and a program plate attached to the slide magazine so as to be automatically advanced with it. The program plate includes a field for each slide recorded in accordance with the correct multiple-choice answers of the respective slide. A second correct answer display is provided so as to be viewable by the students, and a switch under the control of the instructor selectively connects the latter display to the instructor's correct answer display.

3,731,404

## TESTING FORM AND SYSTEM

Albert C. Masterson, 1048 Montview Road, Fort Collins, Colo.

Filed April 19, 1971, Ser. No. 135,364

Int. Cl. G09b 1/00

U.S. Cl. 35—48 R

1 Claim

A testing form and system for testing the ability of a person to comprehend and carry out or follow written instructions. A test problem or set of instructions is printed on a photosensitive surface, preferably by a contact printing technique, and the form is then light sealed, as by placing it in an opaque envelope or detachably bonding a layer of opaque material over the photosensitive surface. The photosensitive characteristics of the surface on which the problem is printed are such that when the light shielding material is removed by the person being tested, the consequent exposure of the surface to light will cause the problem to become illegible within a predetermined period of time. Where the problem is printed by a contact printing technique, the period of legibility of the printed problem upon exposure to light may be varied by varying the printing exposure time.

3,731,405

## TEE SETTING ACCESSORY FOR A GOLF SHOE

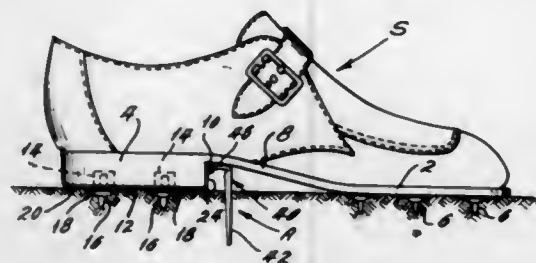
William C. Kincaid, 1345 Cardinal Lane, Florissant, Mo.

Filed June 2, 1972, Ser. No. 259,204

Int. Cl. A43b 00/00

U.S. Cl. 36—2.5 AH

11 Claims



A tee setting accessory for a golf shoe includes a setting spike which is attached to the heel of the golf shoe by means of a base plate and when so attached is capable of folding between extended and retracted positions. When in the retracted position the setting spike lies above the traction spikes on the golf shoe and does not interfere with normal use of the shoe. When in the extended position the setting spike projects downwardly from the underside of the shoe a distance greater than the projection of the traction spikes, and when so extended it may be forced into the ground to form a pilot hole to facilitate setting a golf tee.

3,731,406

## SPORT SHOE WITH QUICKLY REMOVABLE SPIKES

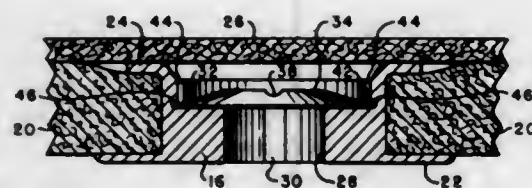
Robert F. Young, 322 E. Central Avenue, Pearl River, N.Y.

Filed April 13, 1972, Ser. No. 243,612

Int. Cl. A43c 15/00

U.S. Cl. 36—67 D

12 Claims



The spikes are quickly released from their connection with the sport shoe by a one-quarter turn rotation, and then an

axial withdrawal. Replacement spikes, or stub spikes adapting the shoe for street use, can then be quickly installed by reversing the above steps.

3,731,407

## POWER SNOW SHOVEL

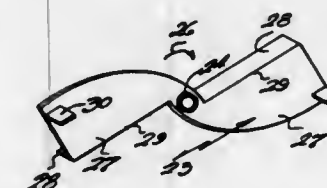
Harry Indzeoski, 729 Scotland Avenue, Winnipeg, Manitoba, Canada

Filed Feb. 7, 1972, Ser. No. 223,953

Int. Cl. E01h 5/00

U.S. Cl. 37—43 B

2 Claims



A powered snow shovel includes a single handle and is mounted on skids. The rotating blade includes breaker lugs extending at right angles from each of the blade portions adjacent the leading edge thereof in order to break up the snow prior to its being engaged by the blower portion of the blades.

3,731,408

## CENTRIFUGALLY DISCHARGING SCOOP SHOVEL ASSEMBLY

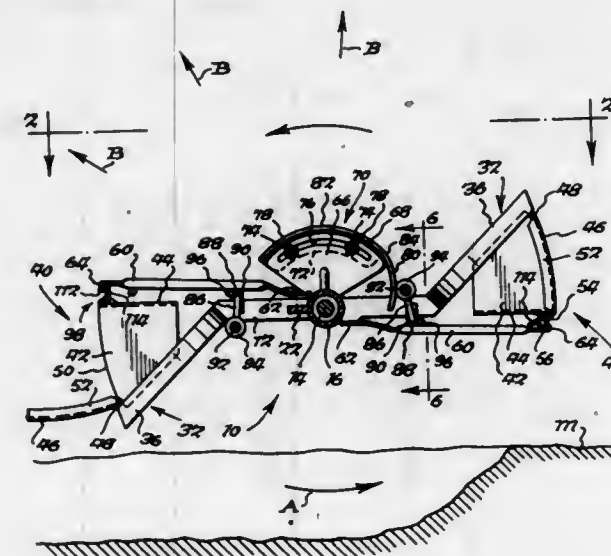
Frank C. Neal, 14 Lincoln St., Cattaraugus, N.Y.

Filed April 21, 1971, Ser. No. 136,028

Int. Cl. E02f 5/08

U.S. Cl. 37—91

9 Claims



A scoop shovel assembly having a rotatable arm carrying shovels at the opposite ends thereof. Each shovel has a pivotable bottom wall held in the closed position by a resilient latch member. Means are provided on the shovel for disabling each latch member at a predetermined point in the path of rotation of the associated shovel enabling the bottomwall to swing open by centrifugal forces.

3,731,409

## BALLAST COMPACTING AND LEVELING APPARATUS

Ludwig Schenkir, and Josef Dultinger, both of Perchtoldsdorf, Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

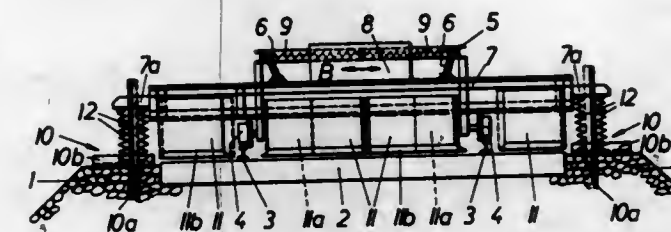
Filed July 27, 1971, Ser. No. 166,493

Claims priority, application Austria, Aug. 20, 1970, 7550/70

Int. Cl. E01b 37/00

U.S. Cl. 37—104

8 Claims



A pair of ballast compactors arranged for compacting the two outer lateral portions of a ballast bed and a ballast leveler arranged to level the central ballast bed portion are carried by a common vibratory cross beam. The vibrator for the beam is arranged centrally thereof.

3,731,410

## MOTOR GRADER WITH DEVICE FOR GUIDING VEHICLE ALONG A PAIR OF PARALLEL RAILS

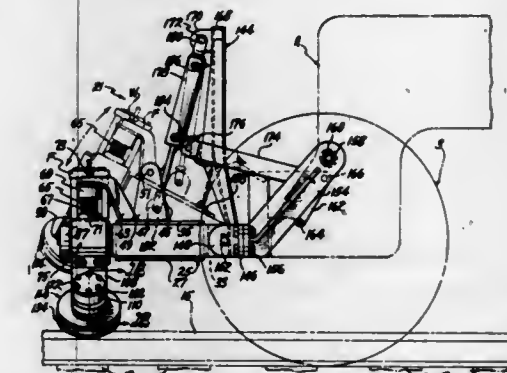
Gordon L. Cripe, Boise, Idaho, assignor to Morrison Knudsen Company, Inc., Boise, Idaho

Filed April 21, 1971, Ser. No. 136,156

Int. Cl. E02f 5/22; B61f 1/00

U.S. Cl. 37—104

25 Claims



An equalizer bar carrying a guide roller at either end thereof, is pivotally connected at its midportion on a ballast support member which is mounted on one end of a road vehicle. The ballast support member and the equalizer bar are movable vertically between a lowered operative position with the guide rollers in engagement with parallel rails and a raised inoperative position by power means such as a hydraulic cylinder controlled by the operator of the vehicle. A similar device is mounted at the other end of the vehicle for guiding it as it moves in either a forward or rearward direction.

3,731,411

## PROCESS FOR PRODUCING DURABLE PRESS TEXTILES

Richard P. Barber, and Glen R. Moses, both of Mooresville, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed June 11, 1971, Ser. No. 152,428

Int. Cl. D06m 13/54, 13/40

U.S. Cl. 38—144

8 Claims

Disclosed herein is a process for producing a durable press cellulosic textile fabric comprising to the fabric applying an



aqueous mixture of a thermosetting durable press textile reactant, and a crosslinking acrylic polymer, a crosslinking catalyst, making the fabric into a garment or article and subsequently pressing and curing said mixture on the article.

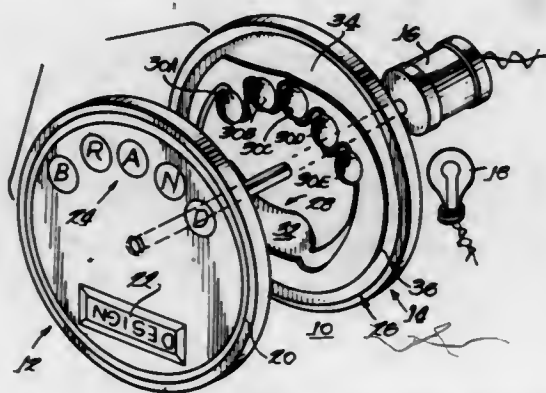
3,731,412  
DISPLAY APPARATUS

Frank Thomas Winslow, 4611 S. Whipple Avenue, Chicago, Ill., and Robert Bernard Stanish, 3023 S. Farrell, Chicago, Ill.

Continuation-in-part of Ser. No. 865,925, Oct. 13, 1969, Pat. No. 3,638,342. This application Feb. 8, 1971, Ser. No. 113,311  
Int. Cl. G09f 13/24

U.S. Cl. 40—106.21

8 Claims



Art work formed as colored translucent lines and areas on a design pane is illuminated to provide a changing display as a passageway panel between the design pane and a source of light rotates with the design pane to cause liquid in the passageway panel to flow from a passageway that is between the art work and the source of light to another passageway in the passageway panel where it does not block light from the art work. The art work may be illuminated progressively in any direction and at different speeds and locations by properly positioning the passageways. In the alternative, the liquid may flow from the passageway behind the art work to a separate movable container that is raised by a motor above the passageway and then lowered beneath the passageway while the design pane and passageway panel remain stationary.

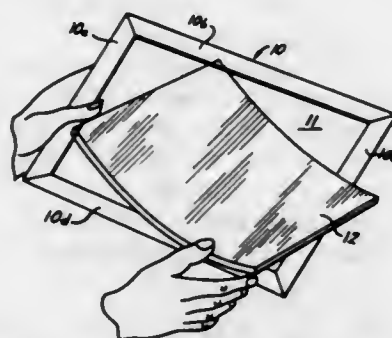
3,731,413  
SELF-ALIGNING PICTURE FRAME

William A. Hooper, Jr., 6901 Sycamore, Kansas City, Mo.  
Filed Oct. 15, 1970, Ser. No. 80,971

Int. Cl. G09f 11/12

U.S. Cl. 40—152

2 Claims



A picture frame construction includes an integrally attached backing to the picture frame. The inner peripheral edge of the frame is slotted with one side of the slot being coincident with the forward surface of the backing. Spring biased picture positioning members resiliently engage preselected edges of a picture being inserted through the face of the frame to automatically align the picture for proper display purposes within the peripheral slot.

3,731,414  
ANIMAL EAR TAGS AND APPLICATORS THEREFOR

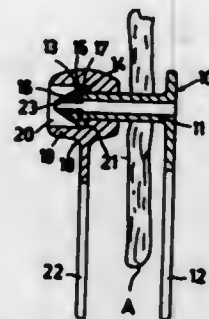
Brian Egmont Murphy, Mangawhere Road, Kaponga, Taranaki, and John Reginald Burford, 604 Main Street, Palmerston North, both of New Zealand  
Filed April 29, 1971, Ser. No. 138,575

Claims priority, application New Zealand, Feb. 5, 1971, 162709

Int. Cl. G09f 3/12

U.S. Cl. 40—301

9 Claims



An animal ear tag comprising two components formed of a plastics or other resilient material, a first component having a hollow stem with a flanged end which has a spike of hard plastic or other rigid material shaped from its back end with a hole for the reception of a guide pin of a reusable back plate, and the second component having a boss with a hole for fitting over such end whereby with each component detachably mounted on a jaw of a pliers-like applicator and the pin of the backplate inserted through the hollow stem of the first component and into the hole of the rigid spike, on a closing of the jaws of the applicator, the spike and stem of the first component is forced through the ear of an animal, and through the hole in the second component, and on an opening of the jaws of the applicator, the rigid pin and its backplate is left within the hollow stem of the first component, and the second component retained on the hollow stem and the spike on the end of the first component, the reusable backing plate with the pin being now withdrawn from the applied tag.

3,731,415  
DESK APPLIANCE

Sidney X. Shore, Roslyn, N.Y., assignor to Souvenir/Inc., Cedar Rapids, Iowa

Filed Feb. 23, 1971, Ser. No. 118,018

Int. Cl. B43m 17/00

U.S. Cl. 40—358

1 Claim



A desk appliance of elemental simplicity incorporates a magnetic paper clip dispenser having a cylindrical lateral wall and an annular magnet at the top for holding paper clips in readiness for use. The bottom of the container is removable for refilling the container, and the same bottom has an integral cylindrical extension telescopically disposed over the cylindrical wall of the container. The extension is a mask or frame that exposes a selected group of seven columns of numerals out of thirteen columns of day-of-the-month numerals, and over the seven selected columns the mask has seven day-of-the-week.

characters. The bottom of the container and its extension forms a unit that is rotatable, thereby to provide a perpetual calendar.

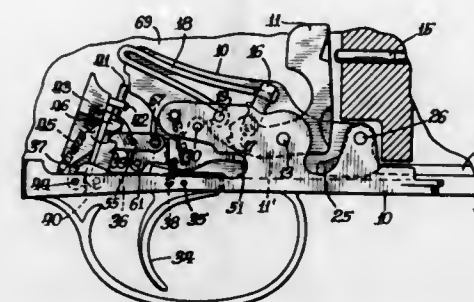
3,731,416  
GUN MECHANISM WITH DISABLING SEAR

Harry F. Semple, 998 Leahy Circle East, Des Plaines, Ill.  
Filed Feb. 1, 1971, Ser. No. 111,570

Int. Cl. F41c 19/00

U.S. Cl. 42—42 R

2 Claims



A double-barrel shotgun has two hammers operated by a single trigger. The operating mechanism includes a sear for each hammer. When the gun is cocked a first pull of the trigger always operates one of the sears to release a corresponding hammer and a second pull of the trigger operates the second sear to release the second hammer. The one sear is in two parts pivotally connected and lockable in two alternative positions, one of which renders the sear ineffective and in the other of which the sear is effective.

3,731,417  
FIREARMS

Tilo Moller, Oberndorf, and Dieter Ketterer, Oberndorf, (Neckar), both of Germany, assignors to Heckler & Koch GmbH, Oberndorf/Neckar, Germany

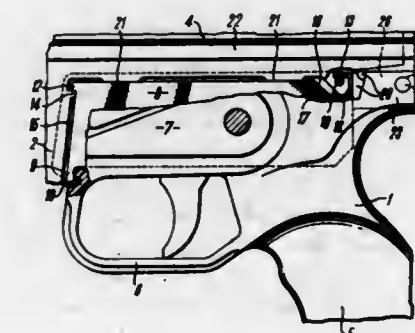
Filed May 12, 1971, Ser. No. 142,607

Claims priority, application Germany, May 14, 1970, P 20 23 545.4

Int. Cl. F41c 27/00

U.S. Cl. 42—75 C

7 Claims



An automatic hand firearm includes a unit comprising a trigger box and a hand grip which are in mutual engagement in the firearm casing by hook and pin engagement means, such engagement being maintained by a projecting part of the shoulder support, the latter being held by means of a detachable pin and on removal the shoulder support releases the unit which can then be withdrawn with a rearward disengagement movement.

3,731,418  
SMALL FIREARMS WITH EXCHANGEABLE BARREL

Manfred Birkenhagen, Eckernforde, Germany, and Manfred Birkenhagen, Eckernforde, Germany, assignors to J. P. Sauer & Sohn GmbH, Eckernforde, Germany

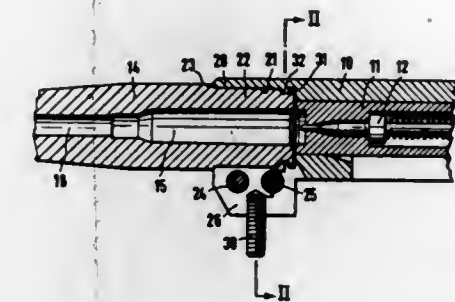
Filed March 22, 1971, Ser. No. 126,441

Claims priority, application Germany, Nov. 25, 1970, P 20 57 995.7

Int. Cl. F41c 21/00, 23/00

U.S. Cl. 42—75 B

12 Claims



An apparatus for detachably securing a firearm barrel with a receiver flange of a receiver assembly and characterized in that the receiver flange is longitudinally slit so as to permit the flange to be circumferentially constricted into clamping engagement with the barrel.

3,731,419  
HEADER-SPOON WITH FLEXIBLE TRAILING BAIT

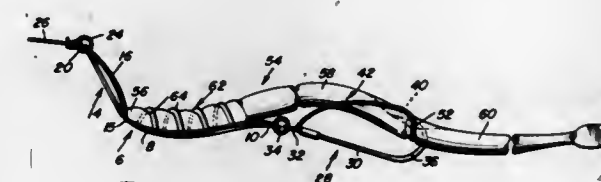
William R. Candy, R.D. No. 3 Upper Terrace Street, Montpelier, Vt.

Filed Aug. 27, 1971, Ser. No. 175,610

Int. Cl. A01k 85/00

U.S. Cl. 43—42.28

4 Claims



An anti-fouling fishing lure for use in any normal aquatic environment characterized, generally stated, by a one piece spoon, a fishhook hingedly linked to the tail portion of the spoon, and a trailing bait having forward and median portions connected to featured portions of the spoon and hook, respectively. The hook embodies a novel constructed resilient-type weed guard. The trailing bait comprises a suitable bait (usually a plastic worm) of requisite length and cross-section. The self-contained facilities permit the worm to be rigged on the spoon and hook in a manner which assures weight and balance and makes for easy casting without encountering exasperating fouling on the cast, troll or retrieve.

3,731,420  
DOLL SWING CARRYING CASE

Dorland L. Crossman, Glen Ridge, N.J., assignor to Remco Industries, Inc., Harrison, N.J.

Filed May 31, 1972, Ser. No. 258,439

Int. Cl. A63h 33/00

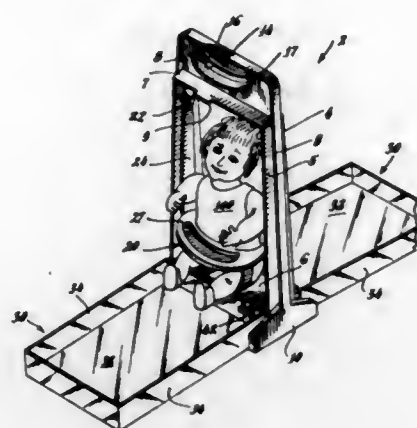
U.S. Cl. 46—1 R

5 Claims

A light-weight toy swing carrying case having hinged covers which are positionable from their closed location to an open



placement where they serve as counterbalances and maintain the upright swing stable preventing it from tipping during stick-like in nature with alternate transversely arranged portions designed to matingly engage with each other so that



swing motion. The swing case is a container for the swing and any toy figure seated therein and may be conveniently carried by a handle stored in place by stacking.

several such members may be assembled together in different geometric forms and patterns.

3,731,421

## TOY ROTARY DIGGER AND CONVEYOR

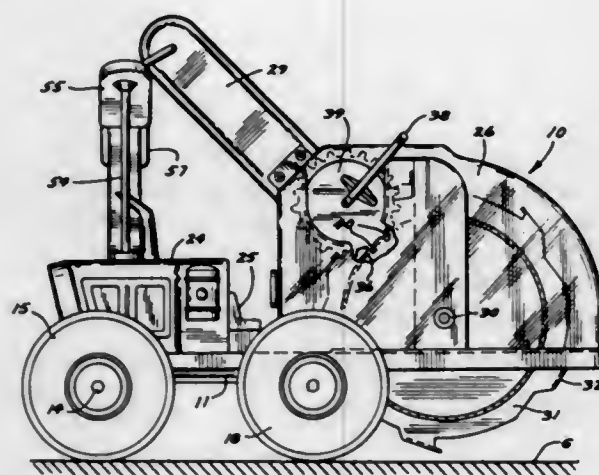
Gerald A. Cuhel, Glencoe, Minn., assignor to Tonka Corporation, Minneapolis, Minn.

Filed March 15, 1972, Ser. No. 234,903

Int. Cl. A63h 33/30

U.S. Cl. 46—40

3 Claims



A toy sand or gravel digger having a chassis mounted on ground wheels with a digger wheel journaled for rotation on the chassis and having a plurality of circumferentially spaced scoop buckets thereon adapted to scoop earth from a ground surface and carry it upwardly to a point where it is dumped onto a conveyor which in turn carries the earth upwardly and discharges it into a chute which directs it into a receptacle such as a toy truck box and wherein the digger wheel is operated by a common manual control. Spring means yieldably retain the chassis in a position wherein the buckets are spaced above the ground surface.

3,731,422

## ELEMENTS HAVING ALTERNATING MUTUALLY PERPENDICULAR FORMATIONS PERMITTING INTERFITTING

Norman T. McFarland, Urbana, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 10, 1971, Ser. No. 114,148

Int. Cl. A63h 33/08

U.S. Cl. 46—28

4 Claims

A construction hobby set of a plurality of identical interfitting members, each member being generally elongate and

## TOY AIRCRAFT AND CONTROL THEREFOR

Burton C. Meyer, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Oct. 28, 1971, Ser. No. 193,388

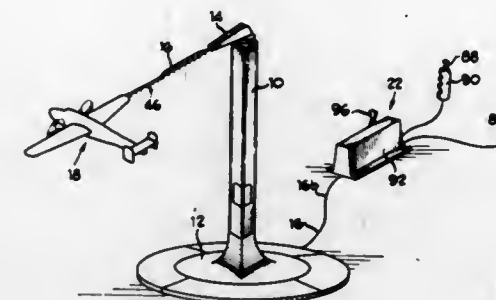
Int. Cl. A63h

U.S. Cl. 46—77

25 Claims

An amusement device which includes a craft, such as a model airplane, attached by a power cable and a tethering line to a control means which includes an upright generally hollow

support pylon for tethered "flying" of the craft about the pylon. The tethering line is threaded for free movement through the hollow pylon, extends from the top thereof for connection to the craft, and extends from the bottom thereof for manipulation whereby the flight of the craft may be controlled simply by pulling in or paying out the tethering line. In one embodiment of the invention a motor in the craft is connected through the power cable to battery type power means in the pylon. A switch for the power means is operatively associated with the tethering line and is actuated as a function of the amount of tension in the line. The motor is removably



mounted in a recess on the exterior of the craft and a power plug is connected to the end of the power cable and is removably received in a socket on the craft. A reel type assembly is provided for paying out and reeling in the tethering line. The assembly has a single lever and control handle arrangement for controlling both the speed of the craft motor and the paying out and reeling in of the tethering line. Lost motion means is provided in the connection between the lever and the reel to prevent entanglement of the line on the reel during rapid paying out of the line. The reel itself has a double core to provide space between the cores for excess tethering line to further prevent entanglement thereof on the reel.

3,731,425

## HOOP ROLLER GAME APPARATUS

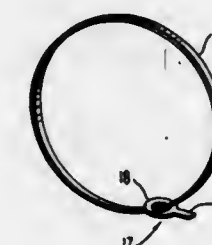
Willie L. Streeter, 2121 H Street, N.W., Washington, D.C.

Filed Oct. 29, 1971, Ser. No. 193,859

Int. Cl. A63h 33/02

U.S. Cl. 46—220

2 Claims



Apparatus for the playing of a game is disclosed. The apparatus includes a ring member and an elongated rod for controlling the ring so that the ring may be rolled along the ground or other suitable surface. The end of the rod which engages the ring is formed in the shape of a notch for the purpose of providing an enclosure, open on one side, into which the ring may be fitted. The rod provides a means of controlling both the speed and direction of rotation of the ring member. A brake may be attached to the ring member for actuation by the rod when it is desired to stop the motion of the ring.

3,731,426

## SHAPE-CHANGING FIGURE TOY

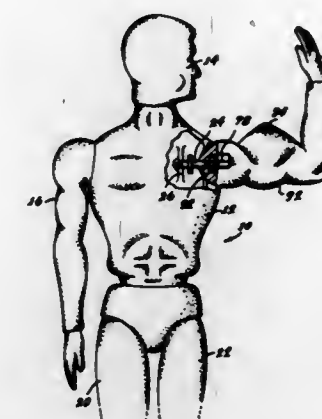
J. Stephen Lewis, Pacific Palisades; John T. Benson, Encino; Denis V. Bosley, Pismo Verdes Peninsula, and Jurgis Sapkus, Manhattan Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Oct. 12, 1971, Ser. No. 188,403

Int. Cl. A63h 33/00

U.S. Cl. 46—119

11 Claims



A figure toy has a skeleton-like body member, such as an armature, covered with a flexible covering material beneath which a mechanical shape-changing mechanism is movably mounted for movement from a normal position to a material-bulging position where the shape of a selected area, such as a simulated bicep, is changed from a first condition to a second, bulged condition.

3,731,427

## OBJECT-HOLDING HANDS FOR DOLLS

J. Stephen Lewis, Pacific Palisades; Jurgis Sapkus, Manhattan Beach, and Armando P. Villasana, Los Angeles, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

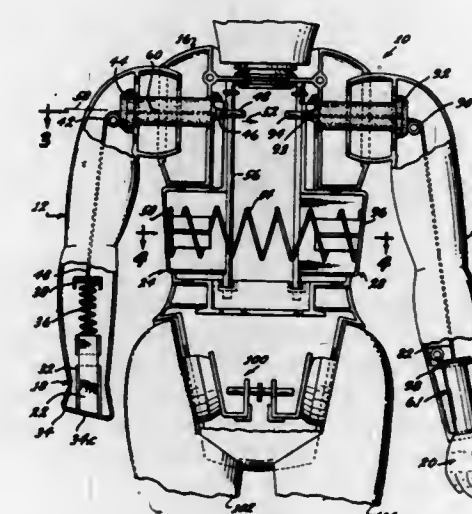
Division of Ser. No. 163,202, July 16, 1971, Pat. No.

3,696,553. This application June 5, 1972, Ser. No. 259,999

Int. Cl. A63i 33/26

U.S. Cl. 46—239

7 Claims



A doll which can be operated to hold and release objects when a child depresses a lever in the doll body, one of the doll hands including a magnet that can slide therein to magnetically attract and release objects. The doll is especially entertaining when used with accessories of the type found in a supermarket, one accessory being a price tag constructed of magnetically attractable material and attached to a toy package, to enable the doll to magnetically hold and release the package.



3,731,428

## REMOTELY POWERED TOY SET

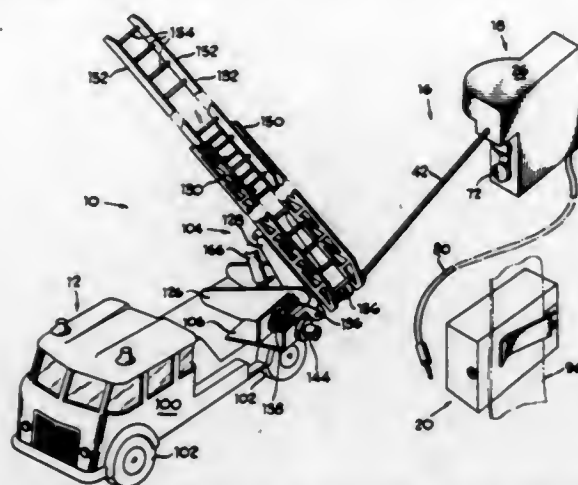
Marvin I. Glass, Chicago; Howard J. Morrison, Highland Park, and Donald F. Nix, Des Plaines, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Aug. 9, 1971, Ser. No. 170,105

Int. Cl. A63h 33/26

U.S. Cl. 46-243 LV

10 Claims



A combination toy vehicle and accessories for use therewith and drive means for the vehicles and accessories. The vehicles have auxiliary implements associated with drive transfer means and the accessories also have drivable elements associated with drive transfer means, with the drive means being separate and external to the vehicles and accessories and including a driven output shaft for engagement with the drive transfer means.

3,731,429

## TOMATO VINE SUPPORT

Henry K. Orthman, Lexington, Nebr., assignor to Orthman Manufacturing Inc., Lexington, Nebr.

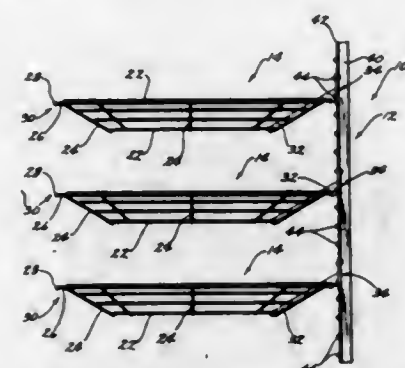
Filed Dec. 16, 1970, Ser. No. 98,687

Int. Cl. A01g 17/14

U.S. Cl. 47-47

9 Claims

U.S. Cl. 49-420



A plurality of vertically spaced apart concentric ring assemblies are adjustably and removably cantilevered to a post. Each of the ring assemblies includes a plurality of vertically spaced apart concentric rings defining a frusto conical shape. A ledge is provided outwardly of the top ring. A bracket on the cantilever engages a pair of vertically spaced apart shoulders on the face of the cross of a T-shaped post.

3,731,430

## WINDOW UNIT

Dominique Dallaire, and Raymond Dallaire, both of St. David, Quebec, Canada, assignors to P. H. Plastics Inc., Lanzon, Quebec, Canada

Filed Jan. 13, 1971, Ser. No. 106,203

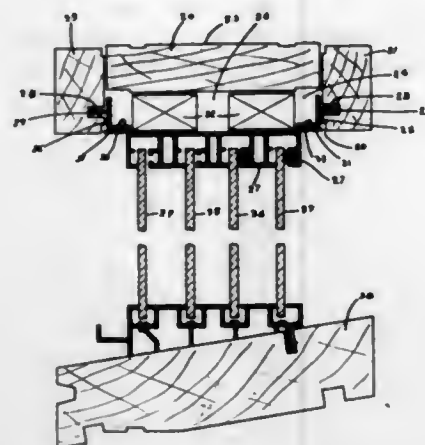
Int. Cl. E06b 1/04

U.S. Cl. 49-419

6 Claims

In a single or double glazed horizontal or vertical sliding type window unit, a removable header or jamb track structure

is disclosed wherein detent means having a plurality of outwardly projecting serrations which are inserted into grooves located in the flanges of a channel-shaped window frame member to retain by means of a lip the movable pane receiving members within the opening in the channel-shaped win-



3,731,431

## SLIDING-DOOR CORNER JUNCTION AND SUPPORT STRUCTURE

Joseph Banner, Whittier, Calif., assignor to Anjac Mfg. Co., Inc., El Monte, Calif.

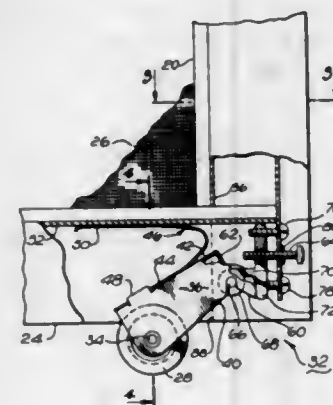
Filed Sept. 24, 1971, Ser. No. 183,485

Int. Cl. E05d 13/02

9 Claims

U.S. Cl. 49-420

2 Claims



A sliding-door structure is disclosed incorporating a corner device which affixes linear frame members together in a lapped corner joint and further provides a spring-biased threshold-engaging roller, the "stop" or loaded position of which is adjustable as a result of a screw member that is accessible at the stile of the door. A corner block matingly engages transverse apertures in a frame rail and is affixed, as by screws, to the lapping end of a stile. The block also provides a pivot post for a carrier which in turn supports a roller. The carrier is affixed to a spring for maintaining the roller engaged with a threshold rail, and an adjustment is provided through the block by a screw which abuts the carrier.

3,731,432

## APPARATUS FOR REMOVING WUSTITE SCALE CENTRIFUGAL BLASTING

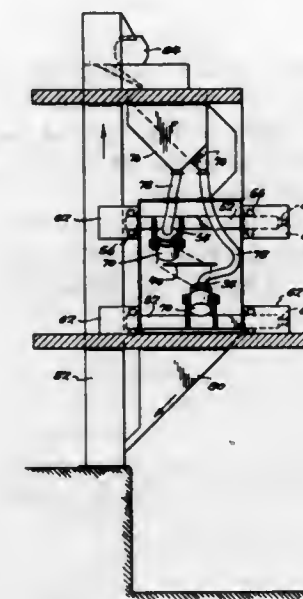
James H. Carpenter, Jr., and Don B. Nalley, both of Hagerstown, Md., assignors to The Carborundum Company, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 46,961, June 17, 1970, abandoned. This application Jan. 5, 1972, Ser. No. 215,616

Int. Cl. B24c 3/14

U.S. Cl. 51-9

15 Claims



Wustite scale is removed from iron or steel products by blasting fine grit from a centrifugal blast wheel which rotates at low speed, against the product at an angle thereto with the grit having sharp edges.

3,731,433

## APPARATUS FOR GRINDING TOOTHED FACED MEMBERS

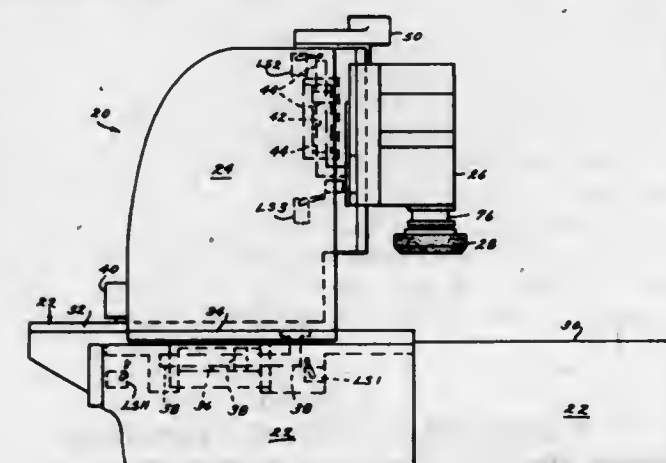
James F. Clarke, and Thomas A. Deprez, both of Rochester, N.Y., assignors to The Gleason Works, Rochester, N.Y.

Division of Ser. No. 803,683, March 3, 1969, Pat. No. 3,640,030. This application Nov. 17, 1970, Ser. No. 90,440

Int. Cl. B24b 19/00

U.S. Cl. 51-34 K

13 Claims



The present invention includes provision of the use of an adaptive gauging process in connection with tooth slot forming operations wherein a gauge probe from a control system is inserted into a tooth slot that is already cut, and any deviations from the proper tooth size, as indicated by the reading taken by the probe, will be taken into account in connection with cutting the next tooth slot. Thus, the feeding movements between the tool and workpiece will be modified through the control system under the control of the gauging probe after

the latter takes a reading of the size of the previously cut tooth slot. Also, a precision, intermittently operating work indexing mechanism utilizing a control system is provided for operating in conjunction with the gauging probe to further improve the precision of the finished product.

The present invention further comprises an orientation of machine parts wherein the work table is arranged to mount a workpiece for rotary movement about a vertical axis, and the grinding wheel is adjustably carried above the workpiece, and for rotation about a vertical axis.

3,731,434

## GRINDING MACHINE

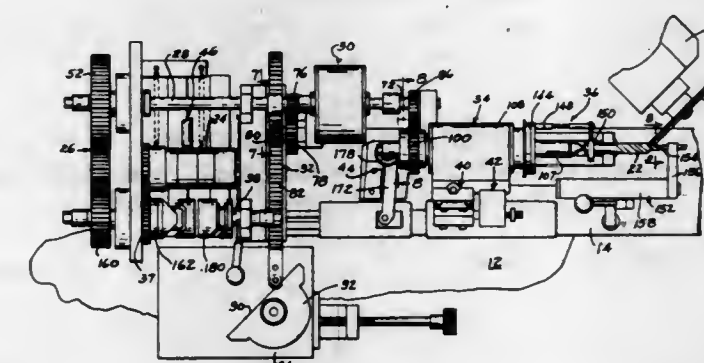
Gerhard E. Karwinski, Mount Prospect, Ill., assignor to CTR, Inc., Elk Grove Village, Ill.

Filed April 12, 1971, Ser. No. 133,224

Int. Cl. B24b 3/26

U.S. Cl. 51-95 LH

20 Claims



A grinding machine for forming a helical cutting surface on a tool, especially a tool such as a stepped twist drill. The grinding machine generally includes a rotary grinding wheel, which grinding wheel is fixedly positioned relative to a frame, and a table movably mounted on the frame adjacent to the grinding wheel. A power source rotatably drives a drive shaft mounted on the table. The power source is connected through the drive shaft to an epicyclic-gear train also mounted on the table. A drive housing is pivotally mounted on the table, with a work piece drive shaft slideably and rotatably mounted in the drive housing. The work piece drive shaft is driven by the epicyclic-gear train. Connected to the work piece drive shaft is a work piece holder, which supports a work piece in position for engagement with the grinding wheel. The epicyclic-gear train is connected to a control device for controlling movement of the work piece relative to the grinding wheel to generate a helical surface on the work piece as the work piece is carried by the table past the grinding wheel. A cam shaft is driven by the power source, and the cam shaft's rotation is synchronized with that of the drive shaft. A first cam affects axial movement of the work piece drive shaft and the work piece relative to the grinding wheel, and a second cam on the cam shaft regulates pivotal movement of the drive housing to affect the peripheral engagement of the work piece with the grinding wheel to affect the depth of the cut to be taken in the work piece by the grinding wheel.

3,731,435

## POLISHING MACHINE LOAD PLATE

Stephen A. Boettcher, Deerfield; Joseph V. Cesna, Niles, and Raymond E. Dumentat, Roselle, all of Ill., assignors to Speedfam Corporation, Des Plaines, Ill.

Filed Feb. 9, 1971, Ser. No. 114,023

Int. Cl. B24b 7/04

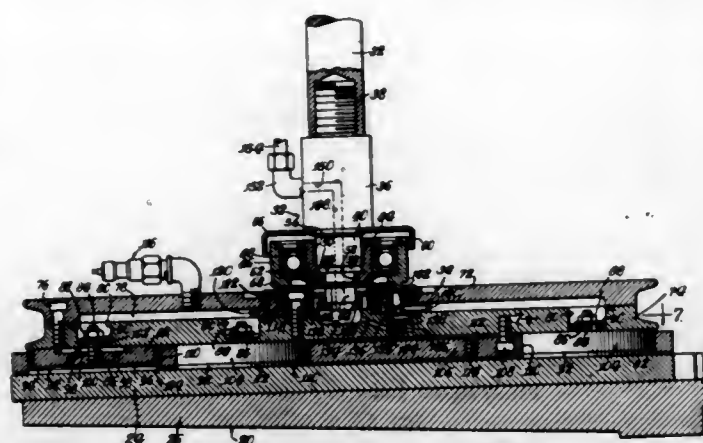
U.S. Cl. 51-129

19 Claims

A load plate having depending pedestals with vacuum passage means communicating with the lower surfaces of the pedestals, and valve means for effecting a negative pressure on work pieces mounted on the pedestals for retaining the work



pieces thereon during finishing. A mask plate establishes work piece receiving pockets with the pedestals, and sealing means



maintain the negative pressure mounting and prevent leakage between the work pieces and the pedestal mounting surfaces.

3,731,436

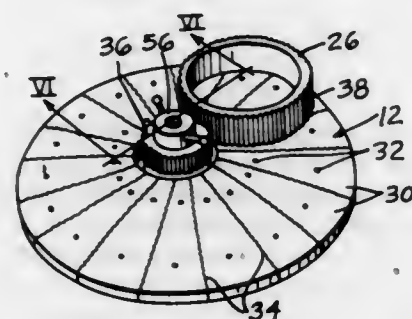
## FREE ABRASIVE MACHINE

Frederick G. Krafft, 2975 Fox Hollow Road, Springfield, Ohio  
Filed March 5, 1971, Ser. No. 121,264

Int. Cl. B24b 7/04

U.S. Cl. 51—209 DL

5 Claims



A free abrasive machine in which the rotary back up wheel has the gaps between adjacent sectors thereof which are non-linear. The rings resting on the wheel have external teeth and a pinion gear on the axis of the wheel meshes with the teeth. A tooth type coupling between the back up wheel and the pinion gear selectively couples the pinion gear to the wheel or releases it therefrom.

3,731,437

## ROTARY ABRASIVE TOOL

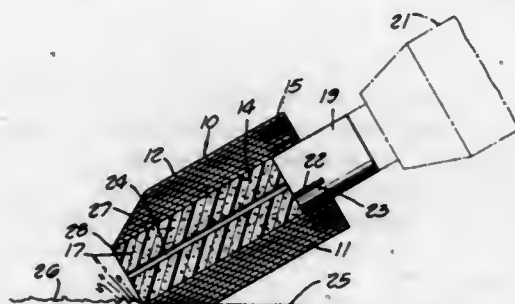
Joseph R. Ewell, 471 West Montocito Avenue, Sierra Madre, Calif.

Continuation-in-part of Ser. No. 68,407, Aug. 31, 1970, abandoned. This application June 30, 1971, Ser. No. 158,419

Int. Cl. B24d 17/00

U.S. Cl. 51—361

15 Claims



A rotary abrasive tool employs a spiral-wound abrasive strip having successive wraps bonded together at least at one end

by an adhesive to form a tube of generally cylindrical shape. A short driver is fixed by adhesive at one end of the tube and a portion thereof may project a short distance into the tube. The tube may also comprise a plurality of short length tubular segments having adhesive material on each end face and bonded together end-to-end. The hollow center of the tube may be filled with friable material bonded to the inner surface of the tube to provide an abrasive core, and also to provide the inner wrap of the tube with self-trimming capability when the tube is rotated in oblique frontal contact with a work piece.

3,731,438

## BUILDING PANEL ENCLOSURES FOR VALLEY AND HIP STRUCTURES

John K. Kough, Morgan Hills; Otis M. Martin, San Jose, and Silas N. Miller, Saratoga, all of Calif., assignors to Ditz-Crave, San Francisco, Calif.

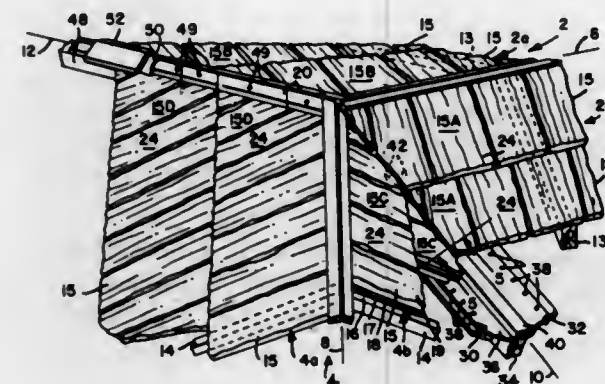
Division of Ser. No. 856,235, Aug. 7, 1969, Pat. No. 3,696,570.

This application Dec. 20, 1971, Ser. No. 210,039

Int. Cl. E04b 7/02; E04d 1/20, 13/00

U.S. Cl. 52—13

3 Claims



Prefabricated enclosure tip panels and a method of manufacturing the tip panels for enclosing valley and/or hip areas. The tip panel at one longitudinal end is beveled at an angle "a" which angle is dependent upon the relative angle between the two sections at the valley and/or hip joint. The other longitudinal end is adapted for interengagement with a standard panel. A method of manufacturing the tips include segmenting a standard panel at the angle "a" to form a first valley tip panel and a first hip tip panel. A second standard panel is then segmented at an angle (180°-a) to form a second valley tip panel complementary to the first valley tip panel and a second hip tip panel complementary to the first hip tip panel. The tip panel segments are adapted to be joined in combination along the valley line and/or hip line to form a complete valley and/or hip construction and to engage standard panels. A valley flashing may be positioned along the valley center line and extend laterally relative to the center line beneath the valley tip panels to provide a hidden run-off path for water on the roof.

3,731,439

## WATER DAM FLASHING FOR ROOF WALL

John B. Hickman, Birmingham, Mich., assignor to W. P. Hickman Company, Inc., Troy, Mich.

Filed April 19, 1971, Ser. No. 135,079

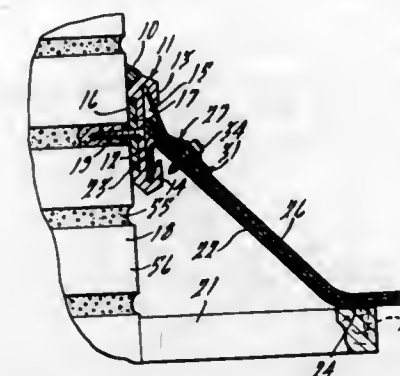
Int. Cl. E04d 13/14, 13/15

U.S. Cl. 52—61

7 Claims

A reglet is constructed to be supported on the inner face of a parapet, firewall or the like which extends above the roof deck of a building. The reglet is an extrusion or a formed strip having supporting means by which it is sealed to the face of the parapet or wall. The reglet is positioned a predetermined distance from the roof deck so that it can support a cant on which the marginal portions of the roof material can be sup-

ported. A flashing strip is then secured to the material and cant by screws which apply pressure to the flashing strip to



secure the roofing material to the cant and provides a seal with the inner surface of the reglet.

3,731,440

## COLLAPSIBLE PREFABRICATED BUILDING

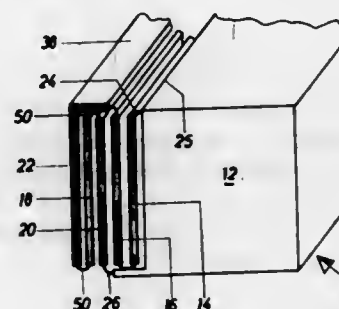
Hans-Joachim Welz, Hindenburgstr. 56, Kornthal, Germany

Filed April 13, 1971, Ser. No. 133,626

Int. Cl. E04b 1/343

U.S. Cl. 52—71

16 Claims



A collapsible prefabricated building is composed of walls some or all of which may be made up of plate sections connected by ropes or hinges in such a manner that they can be folded together to make a package composed of the superimposed stacked plate sections, with the building being erectable simply by folding the plates apart and having them assume their predetermined relative positions.

3,731,441

## FACING WALLS OF BUILDINGS

Jack Kenneth Dixon, 23, Dunstan road, London, N.W. 11, England

Filed March 15, 1972, Ser. No. 234,773

Claims priority, application Great Britain, March 16, 1971, 7038/71

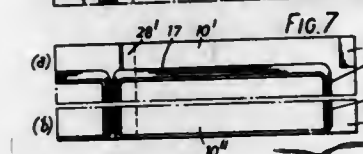
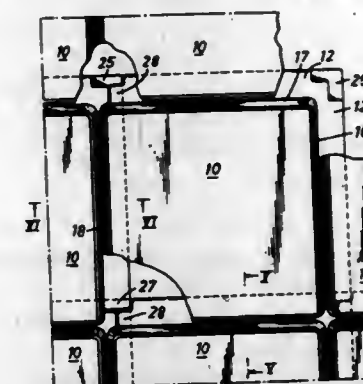
Int. Cl. E04f 13/08; E04c 2/22

U.S. Cl. 52—204

20 Claims

A panel wall in which each panel has a substantially rectangular body provided with a flange extending along the top and down one side edge of the body, the front face of the flange, except for a portion of the corner thereof, lying in a plane through the rear edge of the body of the panel and the corner portion being set back rearwardly so that its front face lies in a plane through the rear face of the remainder of the flange. Each panel comprises a shell moulded in glass fiber reinforced polyester and fitted with an internal frame of wood or alternatively filled with concrete. The panels are arranged in a regular formation aligned horizontally and vertically with the body of each panel overlapping the flanges of adjacent panels. At the corner junction between four contiguous panels, the end of the flange on the lower right panel overlaps part of the corner portion of the lower left panel, the end of the flange on the upper left panel overlaps another part of the corner por-

tion of the lower left panel, and the body of the upper right panel overlaps the flanges on the lower right and upper left panels including the ends thereof which overlap parts of the corner portion of the lower left panel. The panels are secured



together by bolts extending through the flange and overlapping body of each pair of adjacent panels.

3,731,442

## HEAT AND SMOKE VENT

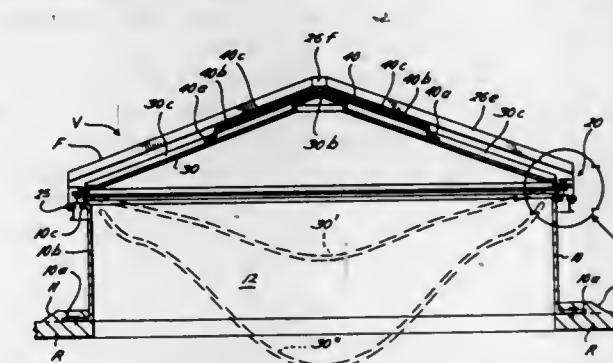
Sandow Kiyoshi, Houston, Tex., assignor to Plasteco, Inc.

Filed Oct. 28, 1970, Ser. No. 84,577

Int. Cl. E04c 2/02; E04d 1/30

U.S. Cl. 52—232

9 Claims



A heat and smoke vent for the roof of a building or other structure having a cover which deforms and disengages from its mounting when heated by a fire in the building notwithstanding rain falling thereon, and thereby automatically releasing the heat and smoke from the building.

3,731,443

## CARVED DOORS

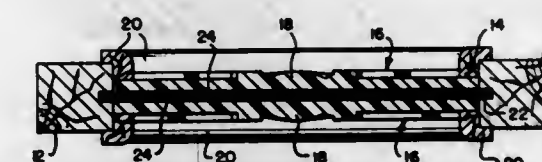
Fred E. Zaroor, Muskogee, Okla., assignor to Indian Capitol Plastics, Inc., Muskogee, Okla.

Filed Dec. 29, 1971, Ser. No. 213,356

Int. Cl. E06b 3/70

U.S. Cl. 52—309

10 Claims



Methods are provided for economically producing doors having decorative carvings thereon. After selecting a prefabricated wooden door frame with one or more openings therein for receiving decorative carved panels, which openings have disposed therein thin plywood panels providing



decorative panel insert areas, "carved" panels of polyurethane structural foam are formed by injection molding expandable plastic into a mold of a configuration of the final "carved" design. The formed foamed panels are subsequently adhered to one or both sides of the surfaces of the plywood panels. Subsequently, the combined wood-polyurethane doors are specially treated to provide an integrated, "all wood" appearing door having appropriately configured carvings disposed on the surface thereof. Also, disclosed herein are the new doors produced by the new methods.

3,731,444

# RAISED PANEL DOOR AND METHOD OF MANUFACTURE

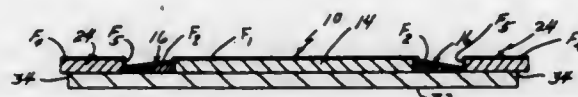
Robert O. Tobin, Marshfield, Mass., assignor to Frank W. Woodman, Marshfield, Mass.

Filed March 24, 1972, Ser. No. 237,750

Int. Cl. E06b 3/70

U.S. Cl. 52-316

11 Claims



A raised panel door has a center panel surrounded by four inner border members which in turn are surrounded by four outer border members. Said panel and border members have a plastic face sheet and a relatively thick backer of inexpensive material. The said center panel is rabbeted around its periphery, and the four inner border members taper in thickness from the latter outwardly, the thicker edge portions extending into the center panel rabbets and the thinner edge portions extending into rabbets formed in the outer border members. A flat support is attached to the assembled center panel and said border members, forming a unitary whole.

3,731,445

# JOINDER OF FLOOR TILES

Rudolf Hoffmann, Laudenbach/Bergstrasse, and Wolfgang Winkler, Mannheim, both of Germany, assignors to Carl Freudenberg, Postfach, Germany

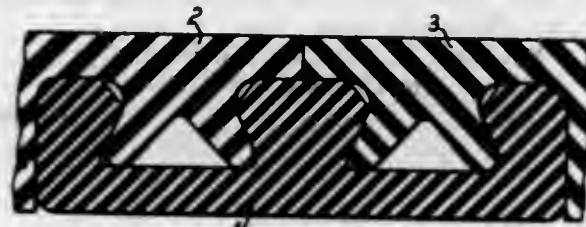
Filed Aug. 3, 1970, Ser. No. 60,232

Claims priority, application Germany, May 2, 1970, P 20 21 503.6

Int. Cl. E041 13/08

U.S. Cl. 52-391

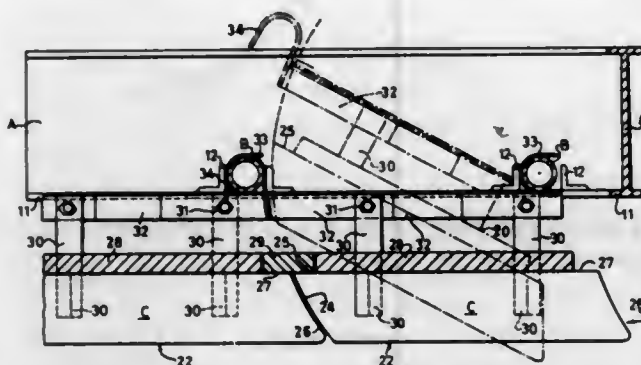
2 Claims



Floor tiles are joined by cutting away material along the edges so as to leave undercut projections extending downwardly from the bottom of the tiles. Joining of tiles is effected by using a strip provided with a pair of parallel channels into which extend the projections from two different tiles. The undercut configurations prevent the tiles from being removed by a simple vertical pull.

3,731,446  
ROOF AND WALL STRUCTURES MORE PARTICULARLY OF HEAT ENCLOSURES  
Robert Wallace, North Wales, England, assignor to Rotablock Limited, North Wales, England  
Filed Feb. 5, 1971, Ser. No. 112,912  
Claims priority, application Great Britain, April 28, 1970, 20,238/70; Oct. 9, 1970, 48,196/70  
Int. Cl. E04b 5/57; F27d 1/02, 1/08  
U.S. Cl. 52-486

5 Claims



The present invention relates more particularly to furnace enclosures and provides a suspended roof or wall system, and blocks thereof, which permits of the pivoting of individual blocks of the system into and out of installed position without disturbing fellow blocks.

3,731,447

# WALLBOARD ATTACHMENT

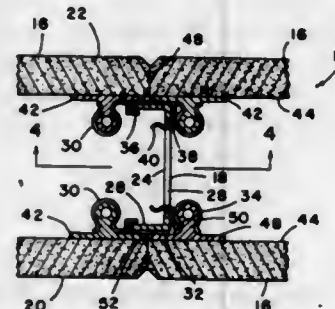
Jack A. Dawdy, Kenmore, and Donald G. Hamme, Tonawanda, both of N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed Feb. 25, 1972, Ser. No. 229,295

Int. Cl. E04b 2/28, 2/76

U.S. Cl. 52-489

10 Claims



An elongate rigid plastic extrusion, adhered to the back face of gypsum wallboard along the vertical edges, with an elongate tubular portion, projecting rearwardly, lockingly engaged in a plurality of spring clips which are clipped onto the two opposite faces of a steel stud.

3,731,448

# DUCT TERMINATOR

Herbert S. Leo, Los Angeles, Calif., assignor to Formex Manufacturing, Inc., Santa Monica, Calif.

Continuation-in-part of Ser. No. 853,727, Aug. 28, 1969, abandoned. This application Dec. 3, 1971, Ser. No. 204,426

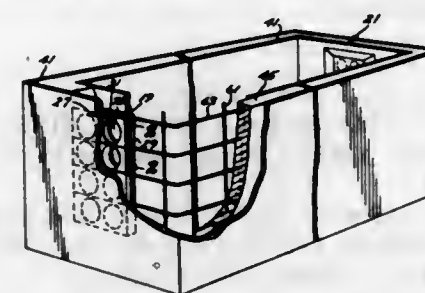
Int. Cl. E04c 1/39; E041 17/08

U.S. Cl. 52-594

15 Claims

A duct terminator for use in the concrete wall of an underground vault, or the like, for housing electrical equipment, such terminator including a pair of barrier walls spaced apart at a distance substantially corresponding to the thickness of the concrete wall. A plurality of spaced receptacles extend between the barrier walls to form through passages for receipt

of the extremities of a plurality of respective ducts whereby the terminator may be positioned in the concrete form for the vault wall and concrete poured thereinto to provide a plurality of spaced passages in the vault wall for receipt of the extremi-



ties of such ducts. The terminator may be made in modular form and may be formed with interlocking flanges whereby a plurality of modules may be assembled for forming a composite receptacle pattern of any desired configuration.

3,731,449

# STRUCTURAL PANEL

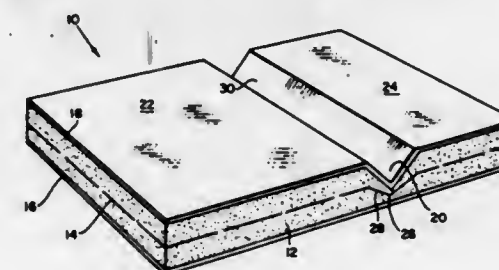
Jonn W. Kephart, Jr., 1115 Norsam Road, Gladwyne, Pa.

Filed June 8, 1971, Ser. No. 151,113

Int. Cl. E04c 2/18, 2/40

U.S. Cl. 52-631

2 Claims



A structural panel is provided with a core comprising a thick layer of urethane foam. The core is reinforced by a sheet of metal wire fabric embedded in and effectively bonded to the urethane foam whereby to reinforce the same. Lining each of the oppositely facing surfaces of the core is a urethane sheet also bonded to the urethane foam. Extending into one surface of the panel and along one edge thereof is a wide angle, V-shaped groove of a depth sufficient to sharply reduce the thickness of the core to a thickness approximately corresponding to that of said metal wire fabric, whereby the panel is divided into main body and flange parts interconnected by a hinge formation consisting of the area of said wire fabric embedded in the area of said core sharply reduced in thickness by said groove, and of the associated areas of said sheets of urethane.

3,731,450

# METAL STRUCTURE AND SECTIONS

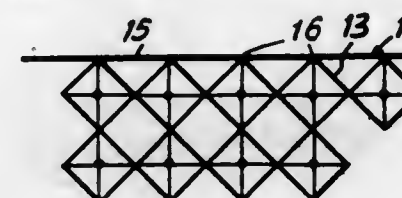
Stephane Du Chateau, 180, rue de la Porte Jaune, 92 Saint-Cloud, France

Filed Aug. 14, 1969, Ser. No. 850,022

Int. Cl. E04h 12/08

U.S. Cl. 52-648

2 Claims



The method of assembling pyramid elements in order to obtain a metallic space structure consists in joining the trun-

cated corners of the basic frames of the pyramid elements, these frames being regular polygons, each joint being effected by means of one single bolt.

3,731,451

# FILTER PLUG FORMING AND BAGGING MACHINE

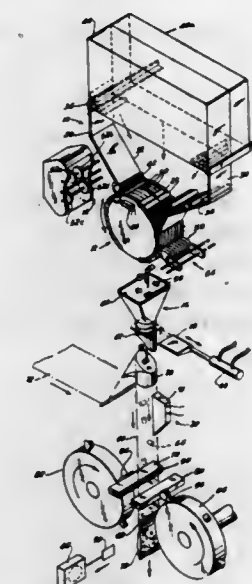
John H. Sextone, Middletown, and Wolfgang H. Grimm, Louisville, both of Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed June 2, 1971, Ser. No. 149,177

Int. Cl. B65b 19/34

U.S. Cl. 53-23

17 Claims



Filter rods of predetermined length are placed in a hopper and fed to a slitting drum. This drum contains flutes divided into four groups, two of which are separated and their flutes are open whereas the other two groups of flutes are closed. The rods are received in the open flutes and there they are cut by a series of rotary knives into equal sections to provide filter plugs. The adjacent group of closed flutes in the path of rotary travel of the drum permits the cut filter plugs to be directed to a bagging station at which they are enclosed in a bag before the next group of cut filter plugs are permitted to pass through to the bagging station. As the cut filter plugs leave the slitting drum, they are directed into a funnel which has associated therewith a gate. The gate closes off the base of the funnel until the preceding group of cut filter plugs are completely enclosed in a bag. Thereafter, the gate is opened to permit the collected plugs to pass through to the bagging station. At this station a web of heat sealable wrapping material is fed into a tube former which forms the wrapping material into a tube which extends vertically. A heat sealer seals the overlapped marginal side edges of the tube of wrapping material. A pair of opposed and reciprocal heat sealers operates to heat seal and close the lower end of the tube at which the group of cut plugs collect. When the predetermined number of cut filter plugs is collected, the pair of reciprocal heat sealers are reciprocated to heat seal and close the tube above the group of collected plugs. This upper heat sealed zone is cut along an intermediate section to thereby produce a severed bag of filter plugs and at the same time provides the heat sealed and closed lower end of the next bag to be formed. The filled and severed bags are then permitted to drop and be collected in a suitable receptacle.

3,731,452

# PROCESS AND APPARATUS FOR CONTINUOUS PACKAGING OF PRODUCTS AND OBJECTS

Jean Claude Rias, Maisons, France, assignor to Cogar Corporation, Wappinger Falls, N.Y.

Filed Jan. 12, 1971, Ser. No. 105,931

Claims priority, application France, Jan. 12, 1970, 7000974

Int. Cl. B65b 9/14, 57/12

U.S. Cl. 53-29

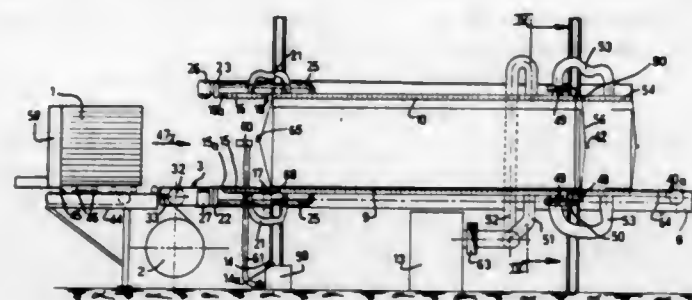
8 Claims

A method and machine is disclosed for the continuous



packaging of products, particularly in a six-sided parallelepipedal package, employing a heat-weldable and heat-shrinkable plastic material in special tubular sheath form, which involves continuously feeding of the sheath, transversely welding the same and feeding the sheath in flat condition a specified distance. Principal sections of the apparatus apply

the vial is filled with hydrocolloid impression material, the stopper is moved into the vial a sufficient distance to accommodate expansion of the impression material when the vial is heated to 212° F. to condition the material for further use. Following this step the rim portion of the vial is closed with a needle permeable cap.



vacuum to the upper and lower surfaces of the flat sheath to open the sheath in a specified manner for the reception of the products to be packaged, after which the open end of the tubular sheath is closed and welded by special means to complete the package which is then moved out of the machine for shrinkage heating.

3,731,453

# METHOD FOR PREPARING SYRINGE TYPE VIALS OF HYDROCOLLOID IMPRESSION MATERIAL

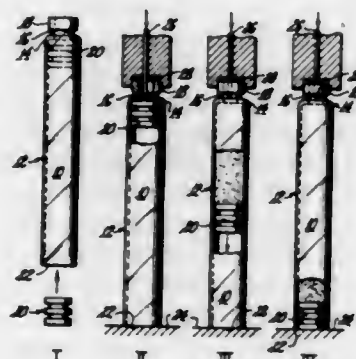
Don D. Porteous, 3780 Selby Avenue, Los Angeles, Calif.

Filed Jan. 26, 1971, Ser. No. 109,771

Int. Cl. B65b 3/04

U.S. Cl. 53—37

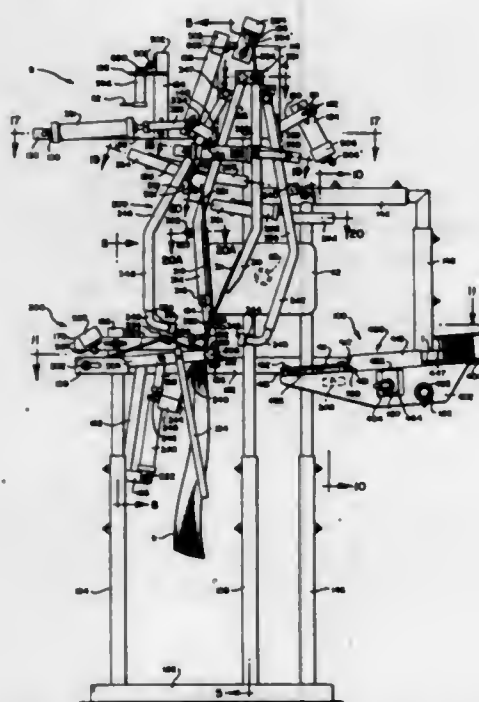
4 Claims



A method is provided for preparing an enclosed vial of reversible hydrocolloid dental impression material which includes the step of positioning a stopper a sufficient distance within the vial to permit expansion of the impression material upon subsequent heating of the vial without ejecting the stopper from the vial. The vial, which may take the form of an open ended tube having an enlarged portion terminating at one end in shoulder, neck and rim portions, is initially loaded by a multi-step process which includes (a) inserting a stopper through the enlarged portion until it engages the shoulder portion, (b) placing the open end of the enlarged portion in abutment with a substantially flat surface and (c) filling the vial through the rim and neck portions with hydrocolloid under sufficient pressure to move the stopper through the enlarged portion and into abutment with the substantially flat surface.

In a second embodiment, the aforementioned vial is initially loaded by a multi-step process which includes (a) inserting a stopper into the enlarged portion until the rearward end of the stopper is substantially aligned with the lip of the enlarged portion, (b) placing the closed end of the enlarged portion in abutment with a substantially flat surface, (c) inserting a filling tip through the rim portion until it is in juxtaposition to the stopper and (d) filling the vial through the filling tip while simultaneously withdrawing the filling tip from the vial. After

3,731,454  
AUTOMATIC BAGGING MACHINE  
Jasper R. Crabb, Yakima, Wash., assignor to Ag-Pak Inc., Gasport, N.Y.  
Continuation of Ser. No. 78,762, Oct. 7, 1970, abandoned.  
This application Feb. 28, 1972, Ser. No. 230,163  
Int. Cl. B65b 57/04, 57/12, 43/36  
U.S. Cl. 53—55 37 Claims



An automatic bagging machine for produce or the like, includes bag feeding, holding and tying devices and an electro-pneumatic control system for actuating and deactuating such devices in timed sequence to feed and open the bags to be filled, as well as to close and tie the filled bags. In combination with an automatic weighing machine the two machines are especially adapted to operate together and thereby form an automatic weighing and bagging system, with each machine controlling the operation of the other.

3,731,455  
MOBILE MACHINE FOR DEPOSITING AND STORING USED RAIL FASTENING MEANS PARTS IN RECEPTACLES

Josef Theurer, Vienna I, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H., Vienna, Austria

Filed Nov. 17, 1971, Ser. No. 199,531

Claims priority, application Austria, Dec. 17, 1970, A 11 352

Int. Cl. B65b 67/00

U.S. Cl. 53—391

10 Claims



A succession of receptacles are mounted on the underside of a mobile machine frame in the direction of track elongation

for receiving and storing removed used rail fastening means parts. A conveyor band is mounted on the machine frame above the receptacles and extends in the same direction. The conveyor band has a receiving end adjacent a working station where removed used rail fastening means parts may be placed on the conveyor and two lateral edges extending above the open tops of the receptacles. Deflecting means are mounted in the range of the receptacles and are operable to contact the conveyor band surface for selective deflection of the parts on the conveyor band to respective receptacles.

3,731,456

# ANIMAL HALTER

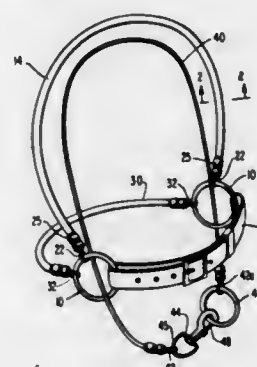
Richard S. Hill, 302 W. Steadman, Sherman, Tex.

Filed May 4, 1971, Ser. No. 140,105

Int. Cl. B68b 01/02

U.S. Cl. 54—24

13 Claims



An animal halter including generally cylindrical cables of small diameter made from relatively hard, self-supporting material, and extending across the pole of the animal's neck and the bridge of the animal's nose to apply direct pressure thereon for controlling or training the animal when the halter is stressed during use.

3,731,457

# PROCESS FOR SCRUBBING GASES

Virgilio Stocchi, Mestre; Antonio Cavarero, Porto Marghera; Carlo Morsiani, Saronno, and Dario Vio, Porto Marghera, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Division of Ser. No. 873,822, Nov. 4, 1969, Pat. No. 3,611,592.

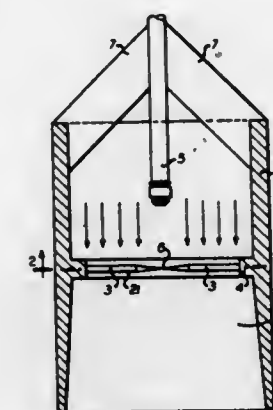
This application July 15, 1971, Ser. No. 163,032

Claims priority, application Italy, Nov. 7, 1968, 23393 A/68; Sept. 29, 1969, 22639 A/69

Int. Cl. B01d 53/00

U.S. Cl. 55—64

1 Claim



Scrubbing process for separating vapors, liquid and solid particles from gas by a scrubbing liquid. A spout directs a full stream of the scrubbing liquid at a grid which comprises a multiplicity of spaced apart rods for forming films of the scrubbing liquid. The plane of the grid is transversely disposed with

respect to the gas stream to be purified. The gas stream is passed through the films of scrubbing liquid for cleaning.

3,731,458

# VEHICLE GAS DRYER PURGING SYSTEM AND METHOD

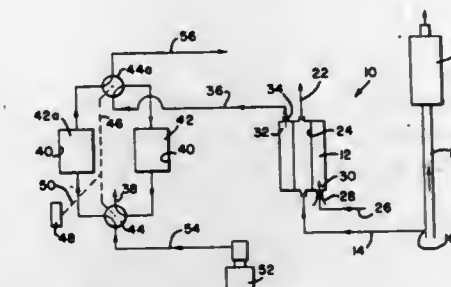
William F. McGrath, Jr., Pine City, N.Y., assignor to Ingersoll-Rand Company, New York, N.Y.

Filed Jan. 20, 1971, Ser. No. 108,047

Int. Cl. B01d 53/04

U.S. Cl. 55—33

7 Claims



A system and method for purging gas dryers, such as compressed air dryers, for use with a vehicle in which the gas is used for the vehicle's systems, such as the air brake system. The invention heat exchanges the exhaust gases of the vehicle with the input ambient air to heat the latter, and reactivates or purges drying towers with the purge gas product resulting therefrom.

3,731,459

# METHOD AND APPARATUS FOR TREATING POLLUTED AIR ALONG AUTO TRAFFIC ARTERIES

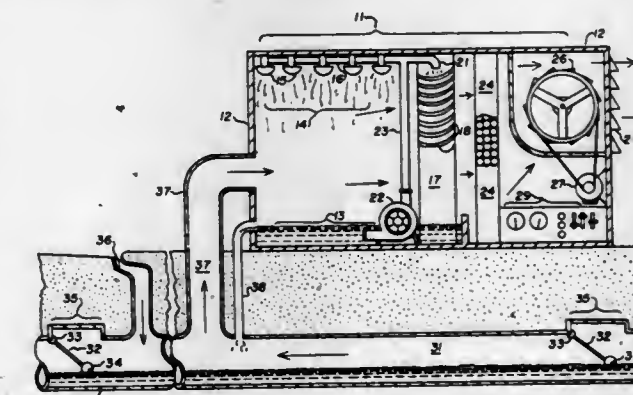
Chester L. Foster, 404 Nelray, Austin, Tex.

Filed Dec. 31, 1970, Ser. No. 103,060

Int. Cl. B01d 53/14

U.S. Cl. 55—94

5 Claims



Method and apparatus for collecting polluted air along crowded automobile thoroughfares channeling said polluted air through unused but controlled portions of existing storm sewers used as air passageways, together with apparatus for scrubbing, washing and filtering said collected air in area air treatment plants and recirculating the purified air back to sidewalk areas along the streets affected by heavy auto traffic and air pollution.

3,731,460

# REGENERATIVE FILTRATION APPARATUS

Natsuo Narumi, Kobe City, Japan, assignor to Mitsubishi Jukogko Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1970, Ser. No. 98,590

Int. Cl. B01d 53/04

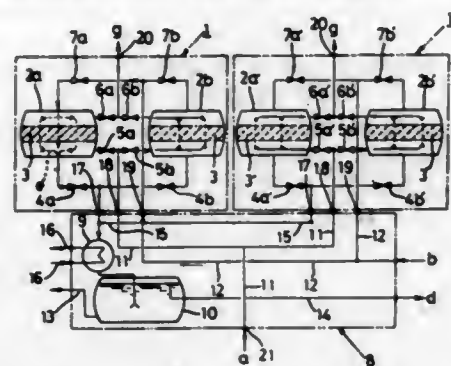
U.S. Cl. 55—179

5 Claims

A regenerative filtration apparatus comprising at least one filter unit having the rein casings and valves to switch the flow



direction of a fluid to be filtered, and a regenerative unit having therein separate passageways for the fluid to be filtered and the regenerated fluid, said units being provided with com-



municating means which are adapted to be connected together to form passageways between said units for guiding said fluids therebetween.

3,731,461

### DRIFT ELIMINATORS FOR ATMOSPHERIC COOLING TOWER

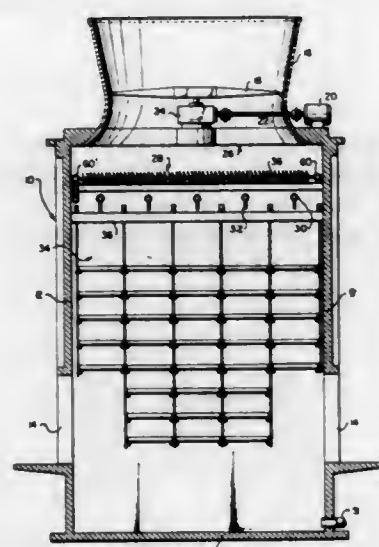
Maurice Hamon, Brussels, Belgium, assignor to Societe Hamon Sobelco S.A., Brussels, Belgium

Filed April 7, 1970, Ser. No. 26,317

Int. Cl. B01d 45/06

U.S. Cl. 55-222

5 Claims



To reduce or eliminate droplet formation in the plume issuing from a cooling tower, a layer of finned tubes is provided to heat the moist air prior to its issuance from the tower. The fins have a shape similar to conventional drift eliminator blades and thus the blades, at the same time, function to eliminate droplets from the gas stream.

In addition, the above-mentioned tubes can be fitted with vertical outlet tubes or nozzles such that the finned tubes fulfill the following functions:

- collect the water droplets contained in the air leaving the cooling tower;
- warm up the air leaving the tower; and
- distribute the water to be cooled in the cooling tower, over the heat transfer section.

3,731,462

### AIR PURIFICATION SYSTEMS

Nino F. Costarella, and Anthony A. Giuffre, both of Milwaukee, Wis., assignors to Nino's, Inc., Milwaukee, Wis.

Division of Ser. No. 839,383, July 7, 1969, Pat. No. 3,628,311.

This application Sept. 30, 1971, Ser. No. 185,202

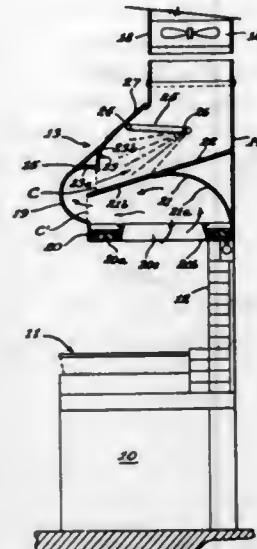
Int. Cl. B01d 47/06

U.S. Cl. 55-228

6 Claims

A ventilating hood and duct structure for stoves wherein a baffle and water spray arrangement within the hood forces the

smoke to pass through successive water curtains. Grease and



other impurities are drained from the hood structure through a rectangular trough which overlies the fire area.

3,731,463

### STRIP CYCLONE

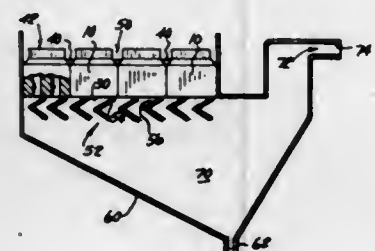
Christian Doerschlag, Columbus, Ohio, assignor to American Van Tongeren Corporation, Columbus, Ohio

Filed Sept. 20, 1971, Ser. No. 181,804

Int. Cl. B01d 47/06

U.S. Cl. 55-238

6 Claims



This invention relates to a strip cyclone configuration. Each strip comprises a plurality of chambers within an integral strip medium. Each of the chambers comprises a substantially cylindrical portion. Each of the cylindrical portions in each chamber is parallel with the cylindrical portion of each of the other chambers. Each chamber has a snail-like helical portion for inlet of gas having liquid suspended therein. The inlet portion of each chamber and the cylindrical portion of each chamber is separated by a wall of a portion of the integral medium from each of the other inlet portions and each of the other cylindrical portions, respectively, of each of the other chambers.

3,731,464

### CONTINUOUS AEROSOL CONCENTRATOR

Allen D. Brumbaugh, and Stanford A. Mumford, both of Frederick, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 19, 1971, Ser. No. 107,765

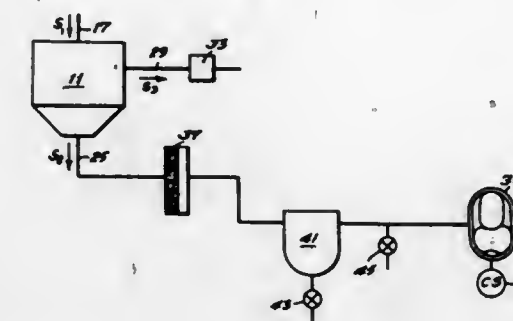
Int. Cl. B01d 45/06

U.S. Cl. 55-270

1 Claim

An airborne particle monitoring device comprising a housing suitably contoured to form a chamber, inlet, outlet and exhaust means connecting with said chamber. In operation, a vacuum power source is applied to the outlet and exhaust

means to conduct a particle containing air stream into the chamber where it is suspended and concentrated in a stream reduced pressure. Reduced pressure GLC will allow the sample mixtures to be resolved at lower temperatures, thus avoid-



of stagnant air. A second stream of air conducts the concentrated particles to a suitable collection device.

3,731,465

### ELECTRIC VACUUM CLEANER

Mitsuo Ohira; Kouiti Sagawa; Ikuro Hata, and Goro Sasai, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

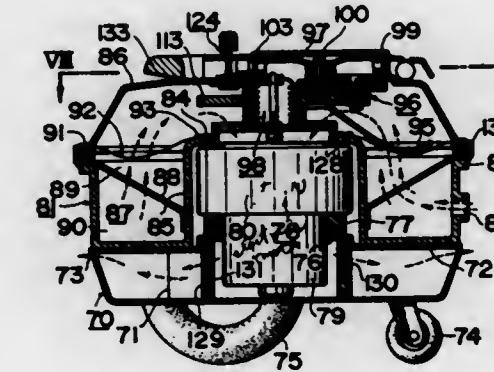
Filed Jan. 15, 1971, Ser. No. 106,816

Claims priority, application Japan, Jan. 19, 1970, 45/4444; May 13, 1970, 45/40106

Int. Cl. B01d 46/00

U.S. Cl. 55-299

4 Claims



An electric vacuum cleaner wherein a first air passageway for a dust-containing air flow and a second air passageway for an air flow to rotate an air turbine which drives a dust removing device, are formed upstream of an electrically operated fan within the body of the vacuum cleaner, and the first and second air passageways are selectively switched from one another, whereby the normal cleaning operation and an operation to remove the dust deposited on a dust filter disposed in the first air passageway are selectively obtained.

3,731,466

### CONTINUOUS FLOW MULTIPLE TRAP FOR LOW TEMPERATURE REDUCED PRESSURE GAS CHROMATOGRAPHY

Chester E. Kunsman, and Richard L. Coleman, both of Winter Haven, Fla., assignors to The United States of America as represented by the Secretary of Agriculture

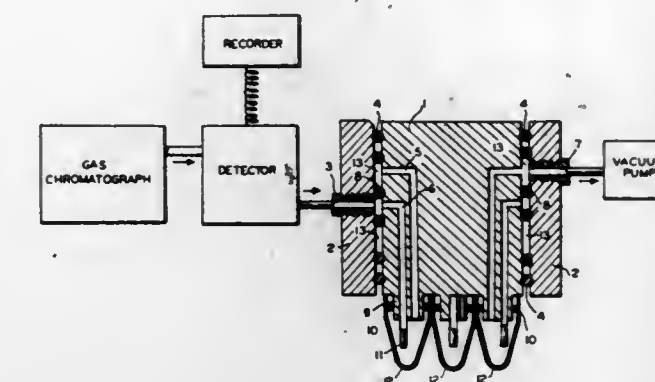
Filed July 14, 1971, Ser. No. 162,461

Int. Cl. B01d 15/08

U.S. Cl. 55-386

1 Claim

A continuous flow multiple trapping system has been designed for reduced pressure, low temperature gas chromatographic analysis. This device allows many samples to be collected without breaking the flow of carrier gas through the detector. It was specifically designed to operate under



ing thermal rearrangement caused by relatively high temperature GLC separations.

3,731,467

### GAS AND LIQUID SEPARATOR

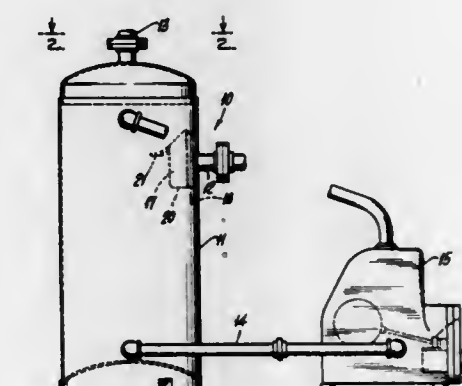
Irving C. Jennings, c/o The Nash Engineering Co., South Norwalk, Conn.

Continuation of Ser. No. 1,725, Jan. 9, 1970, abandoned. This application March 20, 1972, Ser. No. 236,516

Int. Cl. B01d 45/12

U.S. Cl. 55-459

2 Claims



A separator is provided for separating the liquid and gaseous components of a fluid stream. The separator is comprised of a cylindrical tank, a fluid stream inlet pipe for radially introducing the fluid stream into the cylindrical tank and a baffle mounted within the cylindrical tank for changing the flow path of the radially introduced fluid stream to substantially tangentially strike the interior wall surface of the cylindrical tank whereby the fluid stream flows around the interior wall surface. The liquid and gaseous components of the fluid stream therefore become separated and are removed from the cylindrical tank through separate gas and liquid outlet channels respectively.

3,731,468

### SWATH TREATING APPARATUS

Harold Blumhardt, Fredonia, N. Dak.

Filed Sept. 1, 1971, Ser. No. 176,847

Int. Cl. A01d 43/00

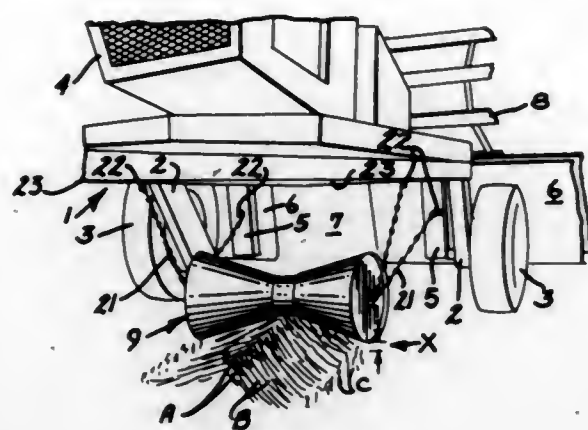
U.S. Cl. 56-1

2 Claims

A crop swath roller including a pair of axially aligned frustoconical sections having adjacent axially inner ends of relative-



ly small diameter and axially outer ends of relatively large diameter. The roller is supported from a mobile frame for feeder house so that as the crop-gathering unit pivots with respect to the feeder house, the bottom edge of the crop



rolling movement longitudinally over a swath or windrow of cut crop.

3,731,469

**CONVERTIBLE GANG LAWN MOWER**

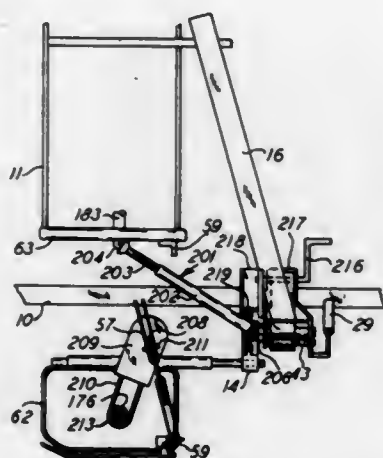
Sahag C. Akgulian; Donald G. Haffner, both of Racine, Wis., and Sherman C. Heth, Sturtevant, Wis., assignors to Jacobson Manufacturing Company, Racine, Wis.

Filed Jan. 24, 1972, Ser. No. 220,193

Int. Cl. A01d 75/30

U.S. Cl. 56—7

7 Claims



A convertible gang lawn mower having a supporting vehicle and a plurality of lawn mowers pivotally mounted on the vehicle to be raised and lowered thereon. A drive connection exists between a driving mower and a driven mower, and a limit connector is also attached between the mowers for limiting the relative motion therebetween. Storage supports are included in the machine for storing the drive connector and the limit connector when they are disconnected between the mowers so that only the driving mower is left in mowing position and the driven power is placed in the stored or transport position on the machine. Hydraulic lift cylinders are on the machine for lifting the mowers, and an additional crank-type lift is also on the machine for lifting one of the lowers when the hydraulic cylinders are not in use.

3,731,470

**SELF-LEVELING COMBINE**

George Kent Cornish, and Melvin Louis Knollman, both of East Moline, Ill., assignors to Deere & Company, Moline, Ill.

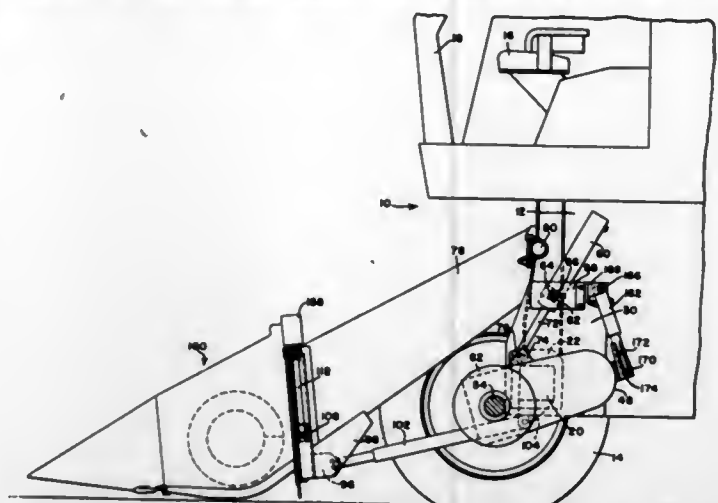
Filed Feb. 14, 1972, Ser. No. 225,874

Int. Cl. A01d 67/00

U.S. Cl. 56—10.4

19 Claims

The crop-gathering unit of a self-leveling combine is connected to the combine feeder house for movement about either one of a pair of pivots positioned at opposite sides of the



discharge opening in the crop-gathering unit is never below the bottom edge of the crop-receiving opening in the feeder house.

3,731,471

**SAFE STARTING SYSTEM FOR LAWN AND GARDEN EQUIPMENT**

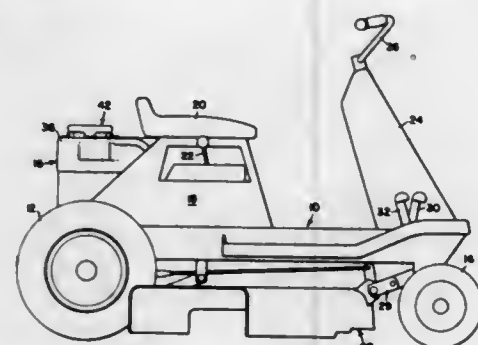
Curtis Reinhard Bening, Burnett, Wis., assignor to Deere & Company, Moline, Ill.

Filed March 22, 1972, Ser. No. 236,909

Int. Cl. A01d 75/18

U.S. Cl. 56—10.5

10 Claims



A riding mower has an internal combustion engine with a magneto type ignition system and a recoil starter. A mower is suspended from the tractor and driven from the engine through a belt drive, which includes a clutch, while the traction wheels are driven through a different drive system, which also includes a clutch. A pair of parallel connected switches are respectively connected to the clutches so that they close when the clutches are engaged, and the switches are connected to the magneto primary coil and a normally closed centrifugal switch, which is disposed between the engine flywheel and the recoil starting mechanism and opens only when the engine reaches a predetermined speed. When the centrifugal switch is closed and either of the clutch switches are closed, the magneto primary is shorted to ground, preventing the starting of the engine when either of the clutches is engaged. When the engine reaches the predetermined speed, the centrifugal switch opens, so that either clutch can be engaged without shorting out the magneto primary coil.

3,731,472

**ROTARY MOWER SPINDLE BRAKE**

Igor Kamlukin, Mequon, Wis., assignor to Simplicity Manufacturing Company, Inc., Port Washington, Wis.

Filed March 27, 1972, Ser. No. 238,387

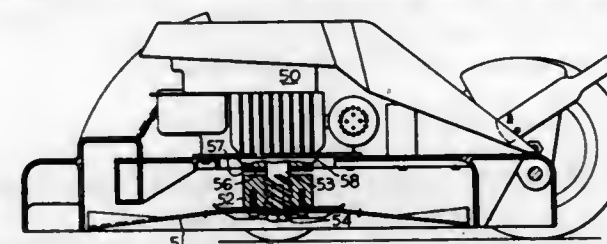
Int. Cl. A01d 35/26

U.S. Cl. 56—11.3

6 Claims

A braking mechanism for use with rotary lawnmowers utilizing a vertically extending spindle having a lower end

upon which is attached a mower blade and having an upper end mounting a driven sheave. Such sheave being provided with a surface spaced from a stationary surface and being provided with a friction lining separating the two surfaces. Such



sheave being threadably engaged with a collar splined to said spindle so that upon termination of power to said spindle, said sheave rotates relative to said collar bringing such surfaces into frictional engagement with said friction lining for decelerating said spindle.

3,731,473

**HARVESTING MACHINE**

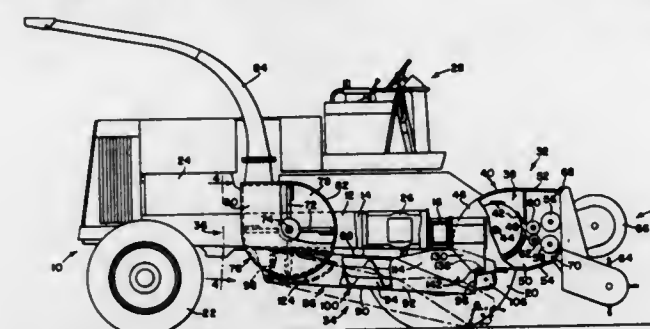
John Joseph Hennen, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Nov. 4, 1971, Ser. No. 195,630

Int. Cl. A01d 45/02

U.S. Cl. 56—14.4

4 Claims



A self-propelled forage harvester having a forwardly mounted cutterhead unit for reducing crop material, a blower unit spaced rearwardly from the cutterhead unit for blowing the reduced crop material into an adjacent receptacle, and a longitudinally extending conveyor unit for conveying the reduced crop material from the cutterhead unit to the blower unit. The conveyor unit extends beneath various operating components on the harvester and is quickly removable to gain service access to these components.

3,731,474

**CHARGING CIRCUIT FOR WRIST WATCH HAVING SOLAR BATTERY**

Yuki Tsuruishi, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

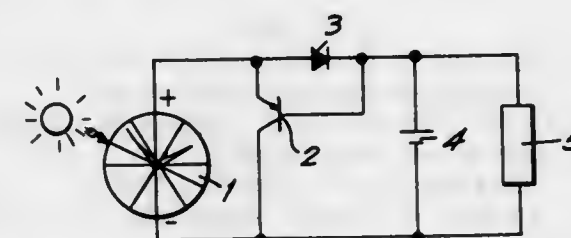
Filed Dec. 27, 1971, Ser. No. 212,297

Claims priority, application Japan, Dec. 29, 1970, 45/128116; Feb. 18, 1971, 46/7157

Int. Cl. G04c 3/00; H01J 39/12

U.S. Cl. 58—23 C

8 Claims



In a wristwatch having therein a solar battery and a secondary battery charged by said solar battery, a charging circuit

prevents too high a current from flowing when the solar battery is strongly illuminated. Provision is also made for preventing overcharge of the secondary battery.

3,731,475

**AGRICULTURAL LEAF PICKING MACHINE**

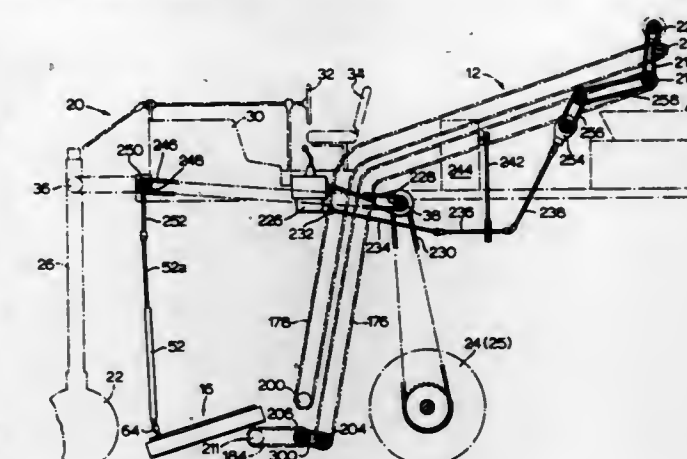
John Balthes, Port Burwell, Ontario, Canada, assignor to Balthes Farm Equipment Manufacturing Limited, Tillsonburg, Ontario, Canada

Filed Nov. 17, 1969, Ser. No. 877,361

Int. Cl. A01d 45/16

U.S. Cl. 56—27.5

12 Claims



Tobacco priming machine which is especially adapted for mounting on a self propelled tobacco harvester. The tobacco priming heads operate in pairs so that the tobacco plant enters between a pair of heads; and the heads are tilted with rearward moving spaced knives between the heads so that the relative speed of any one rearward moving knife and the tobacco stalk is zero but so that the knives move upwards on the stalk as the heads move past it. The conveyors are mounted to carry the tobacco leaves to the rear of the machine where an air-blast delays their free fall off the end of the conveyor into a chute sufficiently so that the heavy, butt-end of each leaf turns downward and so that all leaves falling through the chute and into a bin are oriented in the same stem-first direction.

3,731,476

**HEDGE TRIMMER**

Oakley B. Burgess, Salem, Ill., assignor to Alvin L. Shook, Salem, Ill.

Filed Feb. 14, 1972, Ser. No. 225,929

Int. Cl. A01d 55/00

U.S. Cl. 56—237

6 Claims



A hedge trimmer has a wheel mounted carriage adapted to be moved parallel to a hedge and supporting an upstanding telescopic shafting which hingedly carries at its upper end a



tubular support within which the handle of an electric clipper is lodged. The clipper, through the hinge connection and the shafting, is adjustable in curvilinear paths about horizontal and vertical axes relative to the upstanding shafting and the carriage and is positionable, through the telescopic shafting, at various heights. It is also rotatably adjustable within the tubular support so as to position its cutter bars at various angular positions relative to the support.

3,731,477

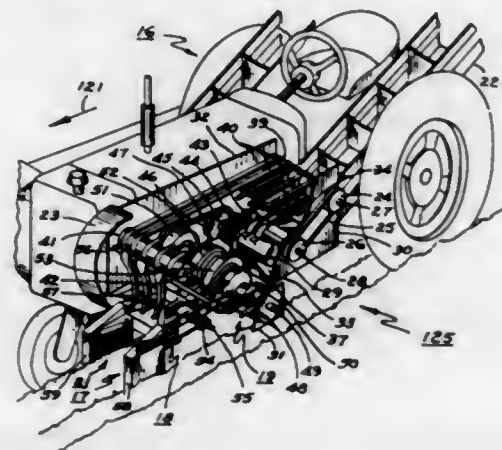
**HARVESTER FOR HEADED VEGETABLES**

James G. Coon, 68 Madrid Plaza, Mesa, Ariz.

Filed Jan. 24, 1972, Ser. No. 219,975

Int. Cl. A01d 45/26

U.S. Cl. 56—327 R



A high speed lettuce harvesting machine comprising a vehicle adapted to move along vegetable rows to be harvested, a pair of vegetable head-engaging sensing arms mounted on said vehicle, a plurality of sensor belts mounted on said arms, the sensor belts being adapted to be deflected by the circumference of said vegetable head to guide and actuate a cutting blade toward the stem of the vegetable head so as to sever only fully grown heads and to transport them to a conveyor.

3,731,478

**AIR OPERATED YARN THREADING MECHANISMS IN A TEXTILE YARN PROCESSING MACHINE**

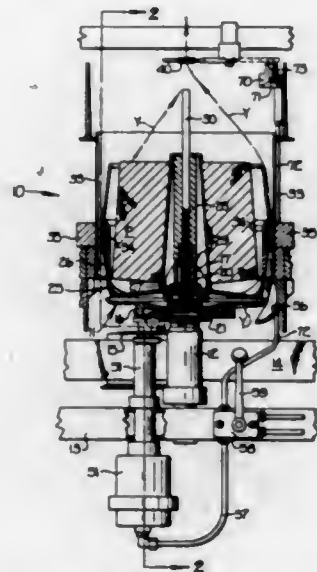
Gustav Franzen, Neersen, Germany, assignor to Palitex Project Company, Krefeld, Germany

Filed July 7, 1971, Ser. No. 160,358

Claims priority, application Germany, July 15, 1970, P 20 25 025.8

Int. Cl. D01h 7/86, 1/10

U.S. Cl. 57—58.7



The combination in textile yarn processing machines, such as twistors or the like, of automatic yarn threading

mechanisms including air operated aspirating nozzles forming a part of the rotor mechanism of the machine and positioned in other locations for pulling the yarn in and pushing the yarn out of the nozzle mechanisms and deflection means positioned at various locations for deflecting the air streams and the yarn from the nozzle mechanisms in the proper paths of travel through the machine for threading of the machine.

3,731,479

**YARN HANDLING APPARATUS FOR TEXTILE YARN PROCESSING MACHINE**

Thad T. Flowers, Fort Mill, and William I. Stuart, Chester, S.C., assignors to Springs Mills, Inc., Fort Mill, S.C.

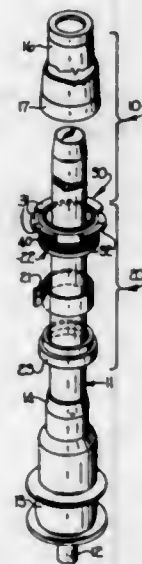
Continuation-in-part of Ser. No. 34,428, May 4, 1970,

abandoned. This application Oct. 27, 1971, Ser. No. 193,043

Int. Cl. D01h 7/08

U.S. Cl. 57—131

11 Claims



The improvements, in a yarn processing machine including elongate rotating spindles for receiving hollow yarn carrying bobbins and a magnetic seater device for magnetically seating the bobbins on the spindles in non-friction fitting association, of apparatus for receiving, guiding and holding yarn during bobbin doffing, bobbin replenishment and yarn processing start-up procedures of the yarn processing machine comprising a horizontal protruding lip extending outwardly from the magnetic bobbin seater devices around the spindles and defining a plurality of separate segments slightly spaced from each other for forming generally V-shaped grooves between each of the segments. The improved apparatus may also include means for holding the last few wraps of the yarn prior to doffing of the full bobbins from the spindles and means for cutting off the loose tails of yarn extending from the bottom of the spindles as a result of bobbin doffing operations.

**ERRATUM**

For Class 58—23 see:  
Patent No. 3,731,474

3,731,480

**WATCH PALLET LEVER HAVING INTEGRAL PROJECTION DETERMINING SWING**

Hirohisa Kurita, Takaki, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 27, 1971, Ser. No. 212,495

Claims priority, application Japan, Dec. 28, 1970, 45/132724

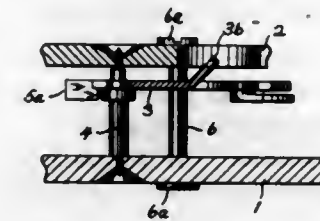
Int. Cl. G04b 15/00

U.S. Cl. 58—116 R

7 Claims

A watch pallet lever formed of sheet material has an integral

tab bent up to form a projection engageable with opposite



edges of a notch or opening in a bridge plate to define the operational region of the pallet lever.

3,731,481

**TIME-SETTING DEVICE FOR ELECTRIC TIMEPIECE**

Yasuaki Nakayama, Higashikurume-shi, Tokyo, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

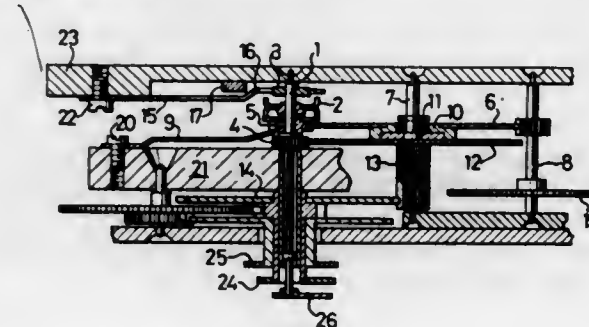
Filed March 24, 1972, Ser. No. 237,680

Claims priority, application Japan, March 27, 1971, 46/21819

Int. Cl. G04c 9/00

U.S. Cl. 58—34

4 Claims



A time-setting mechanism in an electronic timepiece fitted with a seconds hand-locking device and a seconds-hand arbor, characterized in that the seconds-hand arbor is provided with a clutch and a locking cam, said clutch being adapted for on-off control of a seconds hand pinion relative to the arbor.

3,731,482

**DEVICE FOR FASTENING A DIAL TO A WATCH MOVEMENT**

Werner Glanzmann, Bettlach, and Roland Zaugg, Grethen, both of Switzerland, assignors to A. Schild S.A., Grenchen (Canton of Soleure), Switzerland

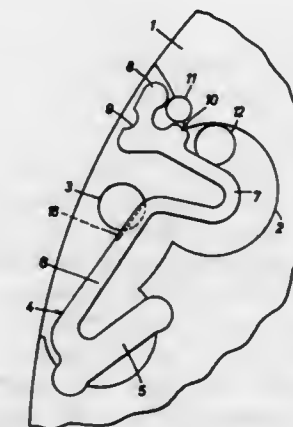
Filed Nov. 8, 1971, Ser. No. 196,372

Claims priority, application Switzerland, Nov. 26, 1970, 17505/70

Int. Cl. G04b 19/06

U.S. Cl. 58—127 B

8 Claims



A mechanism for connecting the dial to the plate of a watch movement in which the plate has holes in it and feet from the

dial protrude into these holes. In the plane of the plate there is a spring normally biased to intersect the plate holes through which the dial feet protrude. It is possible to hold the spring away from its normal position to permit installation of the dial feet and then to release it to lock the dial in position.

3,731,483

**FREE POWER GAS TURBINE ENGINE WITH AERODYNAMIC TORQUE CONVERTER DRIVE**

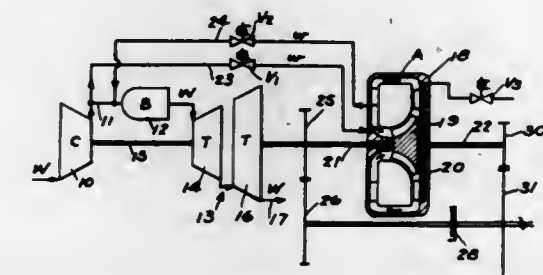
Charles C. Hill, La Jolla, Calif., assignor to Power Technology Corporation, Bloomfield Hills, Mich.

Filed Dec. 29, 1971, Ser. No. 213,437

Int. Cl. F02c 7/02

U.S. Cl. 60—39.16 R

4 Claims



A gas turbine engine including a first turbine stage and a second turbine stage, the first turbine stage being connected directly to the compressor and the second turbine stage being unconnected thereto, combined with an aerodynamic torque converter. The aerodynamic torque converter has an input shaft connected to the second stage of the turbine and an output shaft which can be selectively connected to the second stage of the turbine to provide for drive thru the aerodynamic torque converter or through the turbine and bypassing the aerodynamic torque converter.

3,731,484

**APPARATUS FOR REGULATION OF AIRFLOW TO FLAME TUBES FOR GAS TURBINE ENGINES**

Squire Ronald Jackson; Kenneth Greenwood, both of Burnley; Alban Heaton, Blackburn, and Alwin Harrison, Burnley, all of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

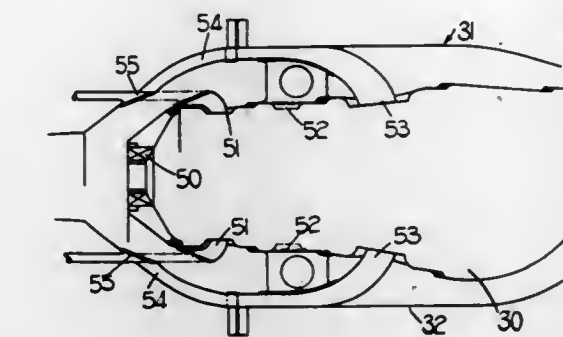
Division of Ser. No. 783,009, Dec. 11, 1968, Pat. No. 3,577,878.

This application Oct. 29, 1970, Ser. No. 85,178

Int. Cl. F02c 3/06

U.S. Cl. 60—39.23

1 Claim



An annular flame tube for a gas turbine engine includes a primary combustion air inlet, a plurality of secondary combustion air inlets and a plurality of dilution air inlets, and variable flow restricting means associated with at least some of the said inlets so as to vary the ratio of secondary combustion air to dilution air, the inlets being formed as nozzles to provide deep penetration of secondary combustion air and dilution air into the flame.



3,731,485

## OPEN-CYCLE GAS TURBINE PLANT

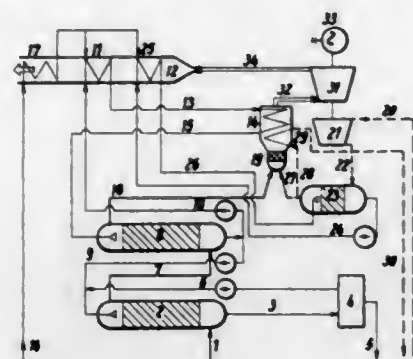
Paul Rudolph, Bad Homburg, and Ernst Kapp, Frankfurt am Main, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany  
Filed Feb. 1, 1971, Ser. No. 111,349

Claims priority, application Germany, Feb. 7, 1970, P 20 05 656.1

Int. Cl. F02g 3/00

U.S. Cl. 60—39.05

9 Claims



In a process of operating an open-cycle gas turbine plant supplied with gaseous fuels and combustion air, wherein the gas turbine is immediately supplied with the gases departing from the combustion chamber and the gaseous fuels and/or the combustion air are enriched with water vapor lowering the temperature of the gases departing from the combustion chamber, the improvement of sprinkling the flowing gaseous fuel and/or the combustion air immediately before entering the combustion chamber with circulating water which has been heated with waste heat thus saturating the fuel and/or combustion air with steam. The pressure of the circulating water is equal to the pressure of the fuel or of the combustion air and the temperature of the circulating water is lower than the boiling temperature under the pressure of the circulating water.

3,731,486

## GAS TURBINES

Jean Armand Poulain, Montfermeil, and Jacques Pierre Chaboseau, Limeil-Brevannes, both of France, assignors to Societe Rateau, Paris, France

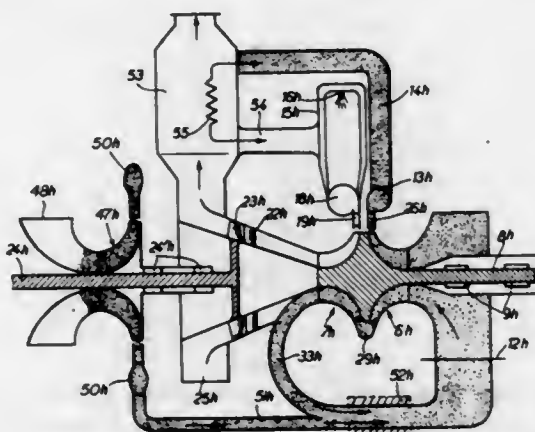
Continuation-in-part of Ser. No. 73,895, Sept. 21, 1970, abandoned. This application May 24, 1971, Ser. No. 146,145

Claims priority, application France, April 20, 1971, 7113925

Int. Cl. F02c 7/02

U.S. Cl. 60—39.51 R

21 Claims



A gas turbine unit comprising a turbine fed with hot gas through a furnace to which air is fed by a compressor. The turbine rotor blading is discontinuously cooled by alternating passage into a hot flow and a cold flow. To this end, the turbine comprises separate feed sector areas respectively receiving

the hot gas flow emerging from the furnace and a colder flow. The colder flow is a flow of air which is fed directly from the compressor rotor blading to the turbine rotor blading.

3,731,487

## MASTER CYLINDER

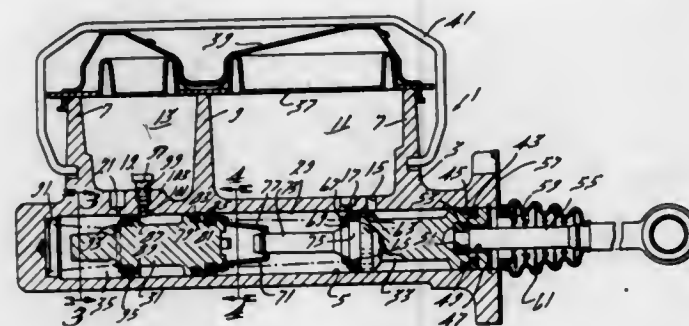
Norman H. Beyer, Royal Oak, and Joseph Zuk, Hamtramck, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Continuation-in-part of Ser. No. 33,994, May 4, 1970, abandoned. This application Aug. 23, 1971, Ser. No. 174,251

Int. Cl. F15b 7/00

U.S. Cl. 60—54.6 E

1 Claim



Master cylinder for automotive hydraulic brake system. Two pistons are slideable in a bore in a cylinder body and provide two chambers which communicate with front and rear brake circuits. Two stops are provided for limiting the outward movement of the pistons.

3,731,488

## METHOD OF CONDENSING TURBINE EXHAUST AT THE POWER PLANT

Tetsugoro Sasakura, Nishinomiya, and Seishi Moriya, Kobe, both of Japan, assignors to Sasakura Engineering Co., Ltd., Osaka, Japan

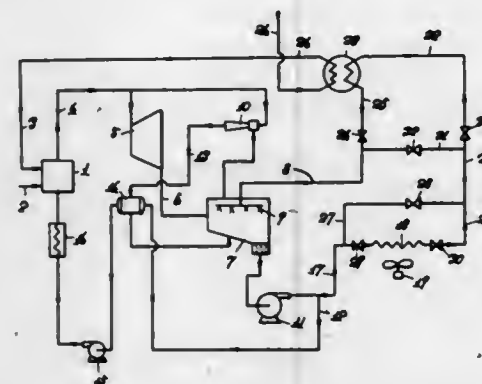
Filed June 25, 1971, Ser. No. 156,718

Claims priority, application Japan, June 30, 1970, 45/57535

Int. Cl. F01k 9/00

U.S. Cl. 60—95

1 Claim



A method of condensing the turbine exhaust at a power plant, characterized in that the turbine exhaust is introduced into a direct-contact type condenser which works under a vacuum condition and is condensed by its direct contact with cooling water. Mixed water of the cooling water and condensed water is drawn out of said condenser, a part of the mixed water is cooled by an air-cooled heat exchanger and is further cooled by a heat exchange with liquefied gas down below a temperature corresponding to the degree of vacuum of said condenser for circulation and use as cooling water for said condenser. The remainder is returned to the feed water system of the boiler and the gas vaporized by the aforementioned heat exchange is used as boiler fuel.

3,731,489

## THRUST DEFLECTOR FOR A GAS TURBINE ENGINE

William Thomas Monaghan, Sandiacre, and Leonard John Rodgers, Spondon, both of England, assignors to Rolls-Royce Limited, Derby, England

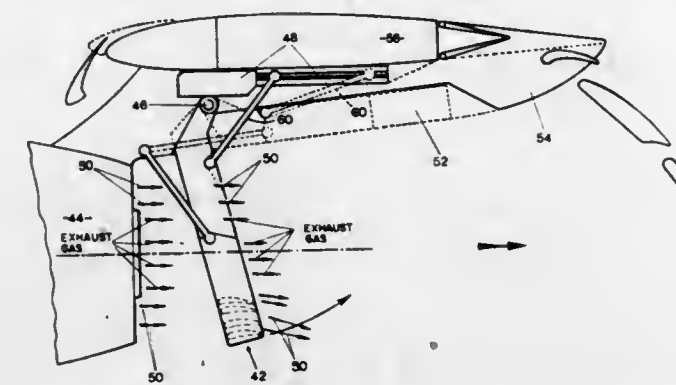
Filed May 20, 1971, Ser. No. 145,395

Claims priority, application Great Britain, May 22, 1970, 24,833/70

Int. Cl. F02k 3/06

U.S. Cl. 60—226 A

4 Claims



Vectorable engines for aircraft have thrust deflecting apparatus which tends to lose efficiency by causing one portion of the gas efflux to partially cancel the deflecting effect of the apparatus on the remainder of the gas efflux. Thus the present invention deflects half of the gas efflux away from the remainder and that efflux not deflected tends to assist the provision of thrust in the desired direction, by virtue of its natural flowpath.

3,731,490

## DUAL WASTE DISPOSAL SYSTEM AND METHOD

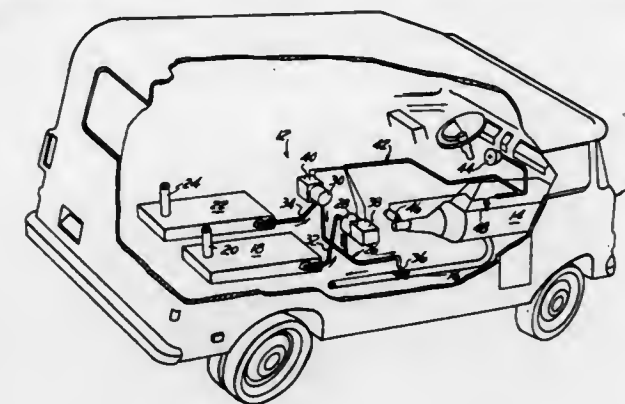
Charles L. Sargent, Ypsilanti, and John A. Hoffman, Brighton, both of Mich., assignors to Thermasan Corporation, Ann Arbor, Mich.

Filed Jan. 13, 1972, Ser. No. 217,585

Int. Cl. F01n 3/02; B07b 3/00

U.S. Cl. 60—317

12 Claims



Apparatus for and method of disposing of liquid and organic waste materials through the exhaust system of an internal combustion engine wherein the waste materials are collected in two holding tanks from which the materials are metered by two pumps into the exhaust gases from the engine only under controlled conditions. One of the holding tanks is arranged to receive waste materials from a toilet, and the other holding tank is arranged to receive waste materials from sinks, and the like. The pumps are interconnected electrically or mechanically so that they operate simultaneously, and the second pump connected to the second holding tank is arranged to feed substantially greater volumes of waste materials to the exhaust system than the first pump which is connected to the holding tank for the waste materials from the toilet. Pump control means operate the two pumps only in accordance with

3,731,491

## OIL CONTAINMENT BOOM

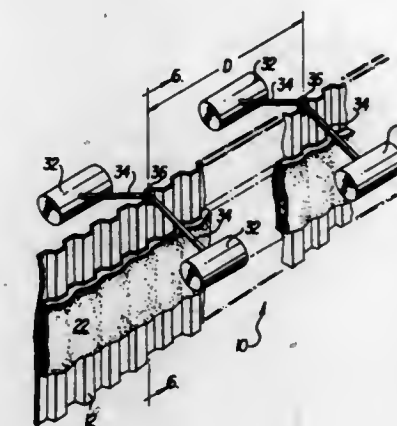
Arthur L. Markel, and J. Robert R. Harter, both of Miami, Fla., assignors to Reynolds Submarine Services Corporation, Miami, Fla.

Filed Oct. 12, 1971, Ser. No. 188,324

Int. Cl. E02b 15/04

U.S. Cl. 61—1 F

1 Claim



An oil containment boom comprising an elongated strip of corrugated metal which is formed from a plurality of sections secured together end-to-end. The corrugated metal is disposed substantially vertically in a body of water and floated therein with suitable flotation means. In one form of the invention, the flotation means comprises a strip of plastic material adhesively secured to the corrugated metal. In another form of the invention, the previously described flotation means is supplemented with the aid of outrigger or stabilizer floats which extend generally laterally outwardly from the corrugated metal strip. Weights may be attached to the corrugated metal strip to vary the freeboard height of the floating boom.

3,731,492

## METHOD OF FORMING STRUCTURES BY DEPOSITION

Georgy Sergeevich Ageev; Ivan Pavlovich Kuptsov, and Lev Veniaminovich Jusim, all of Moscow, U.S.S.R., assignors to Vsesojuzny Gosudarstvenny Ordena Lenina Proektny Institut Teploelektroproekt, Moscow, U.S.S.R.

Filed April 1, 1971, Ser. No. 130,324

Int. Cl. E02b 7/04, 11/00

U.S. Cl. 61—30

2 Claims



A method of forming structures by deposition from a pulp, comprising placing drainage means at the base portion of the structure to be formed, the drainage means being associated with means for adjusting the rate of water outflow therefrom, depositing pulp directly on the ground above the drainage means so that water in the pulp outflows through the drainage means while solids in the pulp accumulate above the drainage means and form a deposited structure with upper inclined surfaces. The intensity of the outflow of water from the drainage means is controlled in the course of the depositing operation so as to progressively diminish outflow in the direction from the periphery of the structure being deposited toward the central portion thereof.



3,731,493

## WATER REPELLENT SAND

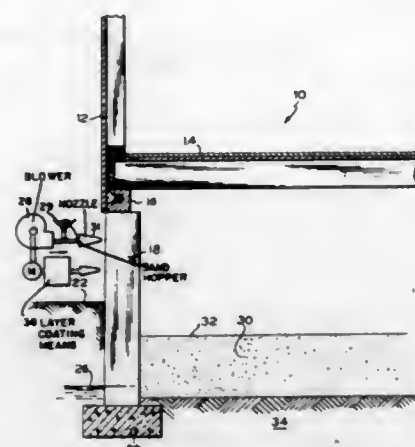
Clarence L. Stevens, Hampton, Va., assignor to W. Gary Archer, Richmond, Va.

Filed April 26, 1971, Ser. No. 137,343

Int. Cl. E02d 3/00

U.S. Cl. 61—35

2 Claims



Earth-supported layer of water repellent sand for moisture control, the layer of sand disposed in bulk over a section of ground, the upper surface of the sand extending above the residual ground water level and being essentially level and smooth throughout, and the sand having each particle thereof essentially coated with a layer of silicone resin for eliminating the characteristic of capillary action. Where the sand is placed by blowers or the like in crawl spaces or under houses and other edifices, the moisture level under such edifices is maintained substantially in a dry condition. The sand may be blown into place and the silicone resin may be applied by spraying or blowing simultaneously with the blowing of the sand into the space, or the sand may be separately treated with silicone resin and dried, as above, and then blown under houses or edifices. The moisture control provided by the water repellent sand in part provides an insulating structure layer for eliminating heat loss into cool and damp ground.

3,731,494

## CONTROL APPARATUS FOR MILK COOLER

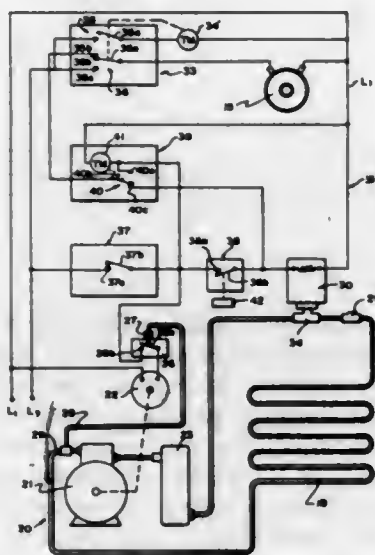
George J. Fleck, White Bear Lake, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed July 8, 1971, Ser. No. 160,682

Int. Cl. F25d 29/00

U.S. Cl. 62—157

9 Claims



An improved control apparatus for use with a milk cooler such as a farm bulk milk cooler including means for agitating milk in the tank of the cooler. The development permits

manual control of the agitating function such as during milk pickup, milk addition, and cooler washing. The control is coordinated with other control elements providing different cooler functions.

3,731,495

## PROCESS OF AND APPARATUS FOR AIR SEPARATION WITH NITROGEN QUENCHED POWER TURBINE

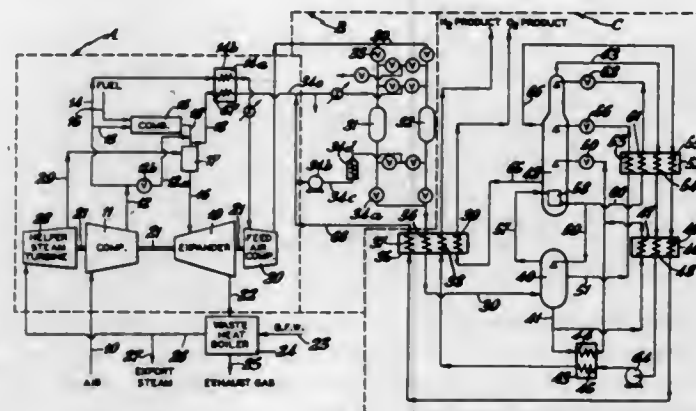
Joseph Francis Coveney, North Tonawanda, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,992

Int. Cl. F25j 3/04, 3/00

U.S. Cl. 62—39

22 Claims



Air is separated by low temperature rectification using a 150-400 psia. column and a 45-140 psia. column, with nitrogen-rich gas from the latter quenching hot combustion gas prior to work expansion of the resulting intermediate temperature gas mixture.

3,731,496

## PHOTOELECTRIC ICE LEVEL SENSOR

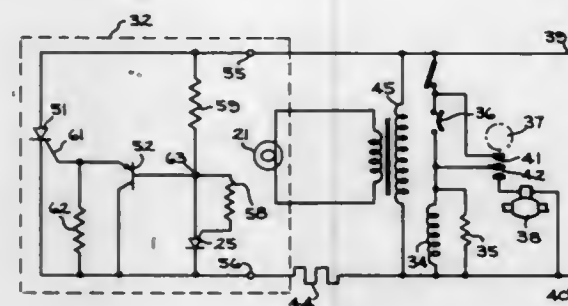
Lauren L. Frazier, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 31, 1972, Ser. No. 222,177

Int. Cl. F25c 7/00

U.S. Cl. 62—137

5 Claims



A control circuit for a current activated thermostatic appliance control switch is presented. Current from an AC voltage source is provided through a main SCR, the gate terminal of which is connected through the emitter-base junction of an intermediate transistor to the common terminal of a low voltage rated trigger SCR and voltage dropping resistor connected in series across the AC supply. During the positive half cycle of the AC supply when the normally conducting trigger SCR is switched off in response to a predetermined external condition, current flows to the main SCR gate through the transistor emitter-base junction operating in the zener region to maintain low voltage across the trigger SCR. During negative half cycles of the AC supply the diode action of the transistor's collector base junction connected across the trigger SCR similarly maintains low voltage thereacross. The trigger SCR is shown as a light activated SCR.

3,731,497

## MODULAR HEAT PUMP

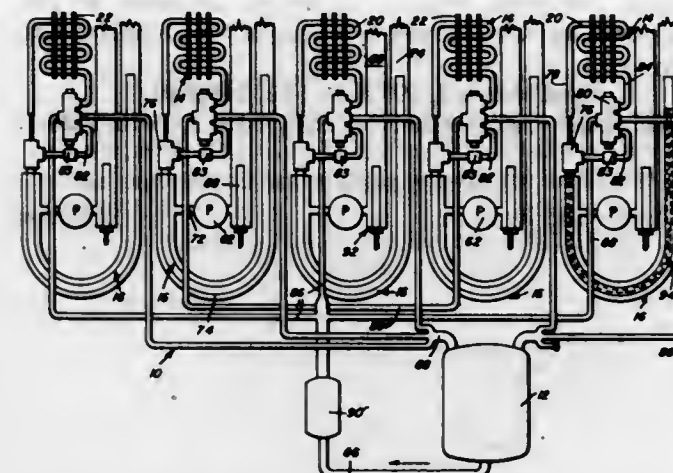
James O. Ewing, P. O. Box 6037, Nashville, Tenn.

Filed June 30, 1971, Ser. No. 158,219

Int. Cl. F25b 13/00

U.S. Cl. 62—160

12 Claims



A heat pump assembly including multiple modular heat exchange units associated with a single refrigerant compressor motor unit with each heat exchange module including two heat exchange units which are alternatively and selectively employed as an evaporative heat exchange unit or a condenser heat exchange unit. One heat exchange unit in each module being associated with an ambient air circulating fan for use of the air as a heat exchange medium and the other heat exchange unit in each module associated with a liquid circulating pump system so that the liquid is used as a heat exchange medium.

3,731,498

## AUTOMATIC EXPANSION VALVE, PAD MOUNTED, NON-PILOTED

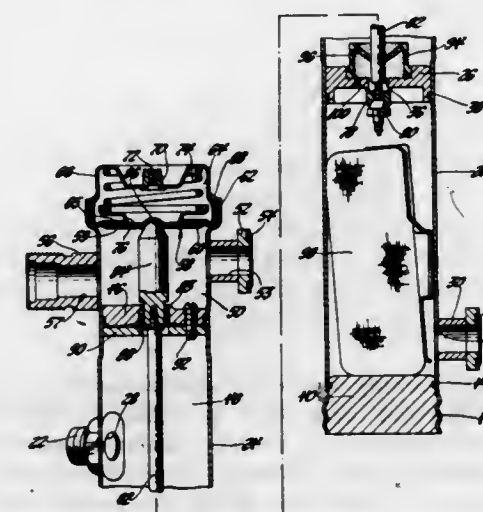
Paul K. Beatenbough, Medina; Gary E. Nichols, Gasport, and Carl A. Scherer, Clarence Center, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed July 19, 1971, Ser. No. 163,593

Int. Cl. F25b 41/04

U.S. Cl. 62—225

3 Claims



A pressure responsive expansion valve including a tubular member connected to the inlet and outlet of an evaporator. A wall member supported within the tubular member which separates its interior into a control chamber portion adjacent the evaporator outlet and a metering chamber portion adjacent the evaporator inlet. A diaphragm in the control portion having one side exposed to the evaporator outlet pressure and another side exposed to atmosphere and operably connected to a valve member within the metering position by a

valve rod which extends through a diaphragm like seal supported by the wall member. The diaphragm is moved in response to increasing refrigerant pressure and causes the valve rod and valve member to move toward a closed position restricting refrigerant flow into the inlet of the evaporator. Likewise, the diaphragm moves in response to decreasing pressure to cause the valve member to move toward an open position thus increasing the flow of refrigerant to the evaporator inlet to maintain the evaporator pressure at a substantially constant level.

3,731,499

## FLEXIBLE COUPLINGS

Jean Morlon, 92 Bourg-La-Reine, France, assignor to Paulstra, Levallois-Perret, France

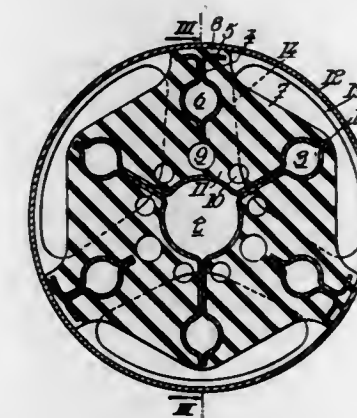
Filed July 12, 1971, Ser. No. 161,538

Claims priority, application France, Aug. 5, 1970, 7028949

Int. Cl. F16d 3/00

U.S. Cl. 64—11 R

19 Claims



The couplings are for interposing between two shafts and comprise essentially an elastically deformable block positioned between bushes rigidly fixed to the shafts. The elastic unit includes rubber cushions adhered to a plurality of radial reinforcing elements some of which are fixed together in the form of a star while the others are radially movable or floating. This unit is mounted with precompression inside a drum rigidly fixed to stiffening arms. The coupling is especially useful for vehicle engines.

3,731,500

## UNIVERSAL JOINT COUPLING

Karl-Dieter Schlums, 3301 Volkmarode, Germany, assignor to Braunschweigische Maschinenbauanstalt, Am alten Bahnhof, Germany

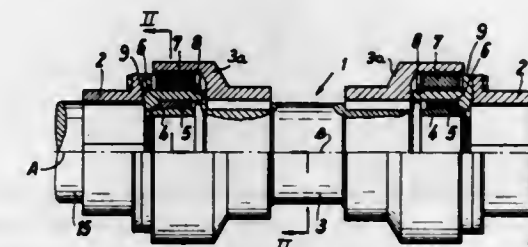
Filed June 1, 1971, Ser. No. 148,649

Claims priority, application Germany, June 4, 1970, P 20 27 349.8

Int. Cl. F16d 3/64

U.S. Cl. 64—14

11 Claims



The present universal joint coupling permits a tilting movement of two shafts relative to each other and relative to an intermediate connecting piece or vice versa through first and second coupling means preferably arranged mirror symmetrically relative to each other, wherein each coupling means includes cooperating gear teeth with flanks which are suffi-



ciently spaced from each other in the torque transmitting direction for locating a so called vibration mount between adjacent flanks of each torque transmitting flank pair whereby all vibration mounts are rigidly connected to their respective flanks for preventing a relative longitudinal displacement between the flanks and the vibration mounts.

3,731,501

## SYNCHRONOUS UNIVERSAL JOINT

Hajo Pickel, Friedrichstrasse 15, Hachenburg, Germany

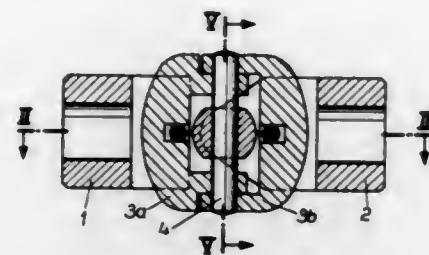
Filed March 4, 1971, Ser. No. 120,973

Claims priority, application Germany, April 1, 1970, P 20 15 459.0

Int. Cl. F16d 3/26

U.S. Cl. 64—17 R

3 Claims



A synchronous universal joint is used for inelastic, homokinetic transmission of torsional moments between angularly intersecting shafts. The coupling halves of these shafts are connected by transmission elements consisting of two hinge-like disk halves. Each of these disk halves is pivotally mounted on a pin, the pins being located at the same distance from the center. The disk halves are swingably connected by a shaft extending vertically to the pins. The invention is particularly characterized in that the disk halves have oblong holes so that they can slide on the pins. A centering device is used to align the coupling halves in said center and to fix the disk halves in a central position so that the swiveling axis of the shaft always extends through said center which is the point of intersection of the center lines of the coupling halves.

3,731,502

## RELEASEABLE LOCKING ASSEMBLY

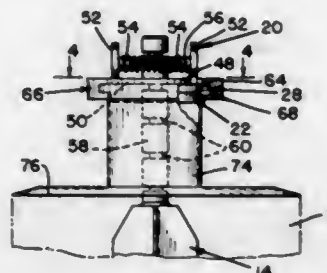
John M. Stearns, Greensboro, N.C., and Albert Dautricourt, Beersel, Belgium, assignors to Macon Machine Company, High Point, N.C.

Filed Feb. 24, 1972, Ser. No. 228,911

Int. Cl. B05c 11/00, 11/122

U.S. Cl. 68—198

13 Claims



A locking assembly for releasably retaining yarn packages on a support spindle includes a pair of displaceable latch parts adapted to form an opening for receiving the end of a spindle when in one position and adapted to lockingly engage a recess in the spindle in another position. The latch plates also lockingly engage a collar having a yarn package engaging flange secured thereto when locked to the spindle. Coil springs located intermediate two handles normally bias the latch parts into engagement with the spindle and the collar. Alternatively, the flange may be spring biased for displace-

ment relative to the latch parts and axially of the package support for applying pressure to the packages.

3,731,503

## APPARATUS FOR TEXTILE DYEING

Valentin Appenzeller, Kempen/Niederrhein, and Ferdinand Lelfeld, Tonisvorst, both of Germany, assignors to Textilaustrustungs-Gesellschaft Schroers &amp; Co., Krefeld, Germany

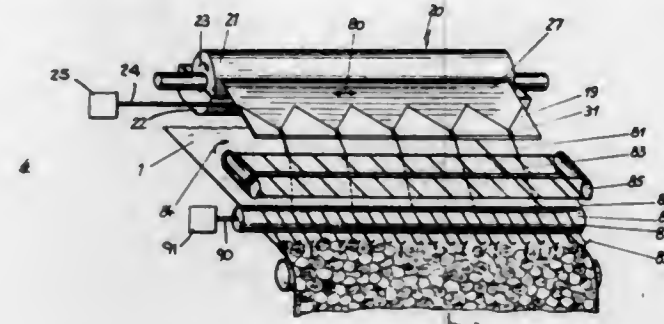
Filed March 1, 1971, Ser. No. 119,540

Claims priority, application Germany, May 3, 1970, P 20 10 343.9

Int. Cl. B05b 13/04

U.S. Cl. 68—205 R

9 Claims



This application is directed to a device and method for applying dye to fabric. The device includes an oscillatory wiper blade which channels dye into streams; the falling streams are divided by a moving wire member supported on a circulating band. A portion of the dye may then be distributed onto the teeth of an adjustable comb-like device from which the dye finally drips upon the fabric to form an irregular pattern. The remainder of the dye falls directly onto the fabric, after being subdivided by the circulating band.

3,731,504

## LOCKING DEVICE FOR SECURING AN OUTBOARD MOTOR TO A BOAT

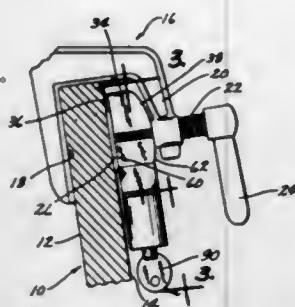
Jack S. Belknap, 714 E. Robinson, Knoxville, Iowa

Filed April 30, 1971, Ser. No. 139,001

Int. Cl. E05b 73/00; F16b 41/00

U.S. Cl. 70—58

6 Claims



An improved locking device is disclosed herein for preventing the unauthorized removal of an outboard motor from a boat. The device comprises a first support element having a threaded, semi-circular opening formed therein which threadably embraces one side of the outboard motor clamp bolt between the boat transom and the motor clamp arm. A pair of stud elements are secured to and extend from the first support element on opposite sides of the semi-circular opening. A second support element is slidably mounted on the stud elements on the other side of the clamp bolt and has a threaded, semi-circular opening formed therein which threadably engages the other side of the clamp bolt. A pair of nuts are threadably mounted on the stud elements to maintain the two support elements on the clamp bolt. A cap is slidably mounted on the stud elements and has countersunk openings

formed therein which receive the nuts. A key actuated lock is slidably mounted on the stud elements with its lock bolt engaging a notch in at least one of the stud elements to prevent the disassembly of the components of the locking device. The device prevents the clamp bolt from being rotated thereby preventing unauthorized removal of the outboard motor from the boat transom.

3,731,505

## ONE-OUT-OF-TWO LOCK SYSTEM

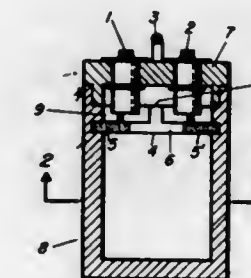
Max Rosenberg, Parsippany, and Andrew J. Marhefka, Port Morris, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 16, 1971, Ser. No. 208,773

Int. Cl. E05b 65/52

U.S. Cl. 70—63

8 Claims



A One-out-of-two lock system comprising: a container having a first mating means within its interior surface, and also having a release channel within said surface; a cover assembly having peripheral dimensions suitable for effecting a flush fit of said cover assembly over the open end of said container; a first lock located within said cover assembly, said lock having a first engagement member, said engagement member disposed proximate to said first mating means and said engagement member having a retractable second mating means complementary to said first mating means, said second mating means lying within said first mating means only when said first lock is in a locked mode; and a second lock located within said cover assembly having a second engagement member, said second member disposed proximate to said first mating means, and said second member having a retractable third mating means complementary to said first mating means, said third mating means lying within said first mating means only when said second lock is in a locked mode, wherein said cover assembly is secured to said container by said second and third mating means both held within said first mating means whereby the actuation of either of said locks from a locked mode to an open mode will cause a retraction of that lock's mating means, thereby permitting a user to remove said cover assembly by moving said assembly until the unopened lock's mating means, which remains in its initial, unretracted position, is aligned with said release channel, and then by lifting said cover assembly up along the axis of said release channel.

3,731,506

## THEFT-PREVENTIVE ATTACHMENT FOR LOCKS

Oscar Greene, deceased, late of 115 E. 86th St., New York, N.Y. (Robert S. Greene, executor), and Robert L. Pelz, executor, 230 Park Ave., New York, N.Y.

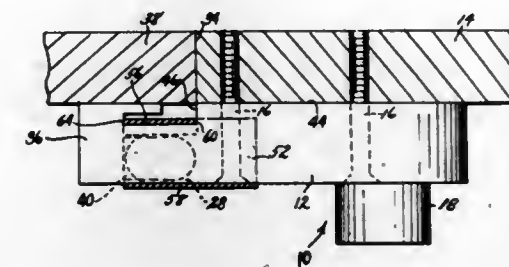
Filed May 10, 1971, Ser. No. 141,572

Int. Cl. E05b 65/08

U.S. Cl. 70—97

4 Claims

A theft-preventive attachment for locks of the rim type which are mounted on sliding doors and movable into engagement with a keeper mounted on the door jamb, both lock and keeper having interfitting bolting fingers or projections. The attachment is in the form of a tube which fits snugly around the projections on the lock body and is carried thereby toward the keeper as the door is slid closed. When the door is closed



front of the lock and cannot be tampered with. The front wall of the attachment also extends beyond the tube and covers over the mounting bolts of the lock body.

3,731,507

## CYLINDER LOCK

Heinz Wolter, Cologne-Lindenthal, Germany, assignor to Firma Josef Voss K.G., Cologne, Germany

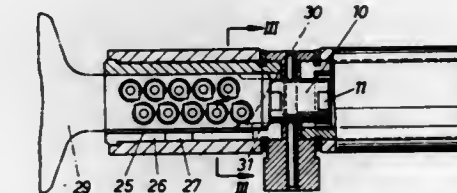
Filed April 7, 1972, Ser. No. 242,083

Claims priority, application Germany, April 10, 1971, P 21 17 736.6

Int. Cl. E05b 15/14, 27/06

U.S. Cl. 70—358

3 Claims



A cylinder lock which comprises a key to be inserted into a key slot of a core and arranging tumblers with cavities provided with wide faces of the key. A housing has a flange projecting radially to the core. At least two rows of non-rotatable tumbler pins are arranged in the flange and sit set-off to each other due to a non-round cross-section and uniform bearing bore. One of the wide faces of the key slot is pointing in symmetric cross position towards the flange. The tumbler pins have a cylindrical jacket face, and the latter leads tangentially into two abutting planes at an edge pointing towards the longitudinal center plane of said flange, and one of said planes extending crosswise to the longitudinal direction of said flange and the other of said planes extending in the longitudinal direction of said flange.

3,731,508

## ROLLING OF STRIP OR PLATE MATERIAL

Bruno Sabatini, Roma, Italy, and Mahmoud Tarokh, London, England, assignors to The British Iron and Steel Research Association, London, England

Filed Sept. 1, 1970, Ser. No. 68,716

Claims priority, application Great Britain, Sept. 3, 1969, 43,645/69

Int. Cl. B21b 37/02

U.S. Cl. 72—9

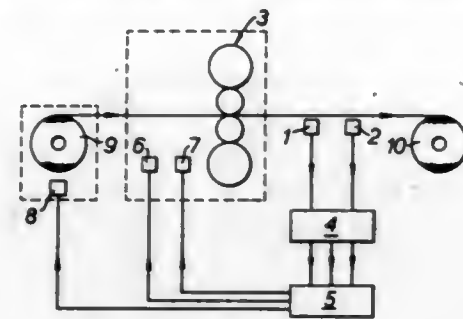
20 Claims

Strip or plate material being rolled under symmetrical rolling conditions is simultaneously corrected for gauge and shape errors in a single integrated gauge and shape control system, by detecting its gauge and shape upon leaving the rolling mill; expressing detected shape as a defined combination of different curves and deriving defined error signals from



coefficients of the curves; deriving an error signal from detected gauge; translating said error signals into defined control

the ends of the dies. Each roller is provided with an arcuate insert or additional support piece which extends over the



signals; and feeding each control signal to a respective one of a plurality of different rolling mill control means.

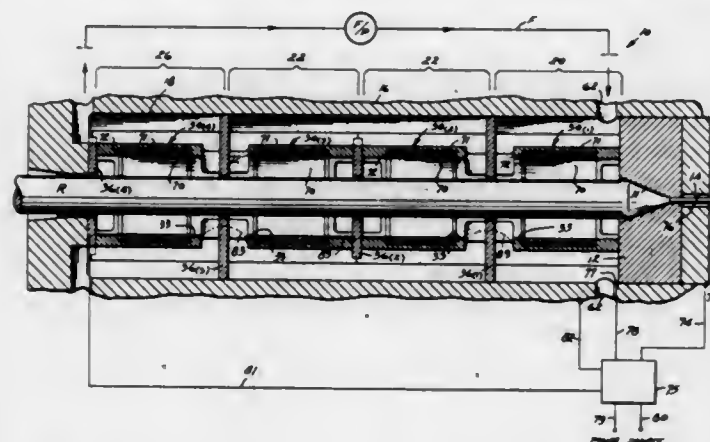
3,731,509

### CONTINUOUS MATERIAL FEEDING AND DEFORMATION PROCESS

Francis J. Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y. Division of Ser. No. 876,940, Nov. 14, 1969, Pat. No. 3,667,267, which is a continuation-in-part of Ser. No. 794,488, Jan. 28, 1969. This application Oct. 4, 1971, Ser. No. 186,368

Int. Cl. B21c 31/00  
U.S. Cl. 72-60

10 Claims



Disclosed herein is a process in which flowing fluids are utilized to apply viscous drag forces to a rod of indefinite length and advance it continuously through an extrusion die, to produce a continuous product, for example, a wire. The flowing fluids also control the axial and radial stresses in the rod, sealing it into and out of a treating environment so that undesirable rod pinch-off, bulging, or tension failure is avoided. The temperature, and hence viscosity, of the flowing fluids may be adjusted to control viscous drag forces.

3,731,510

### CROSS-ROLLING MACHINE HAVING WORKPIECE BLANK SUPPORT

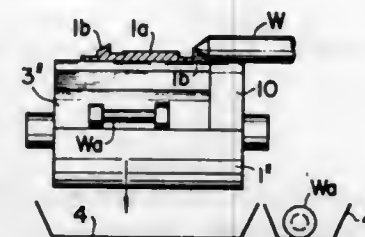
Hidehiko Tsukamoto, and Nobutaka Maeda, both of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 21, 1971, Ser. No. 154,837  
Claims priority, application Japan, June 25, 1970, 45/54779  
Int. Cl. B21h 9/00

U.S. Cl. 72-71

A cross-rolling machine comprises a pair of spaced apart rollers having outwardly extending wedge-shaped blades or dies on the periphery which engage a workpiece positioned between the rollers to form the workpiece. The rollers carry cutters at the ends of the dies which engage the workpiece to separate from the workpiece blank and the workpiece falls into a receiving notch defined in the periphery of the rolls at

complete notch area at the workpiece feeding end and it provides a support for the workpiece blank after the workpiece has been severed therefrom.



3,731,511

### MACHINE AND METHOD FOR ROLLING CONICAL WORKPIECE

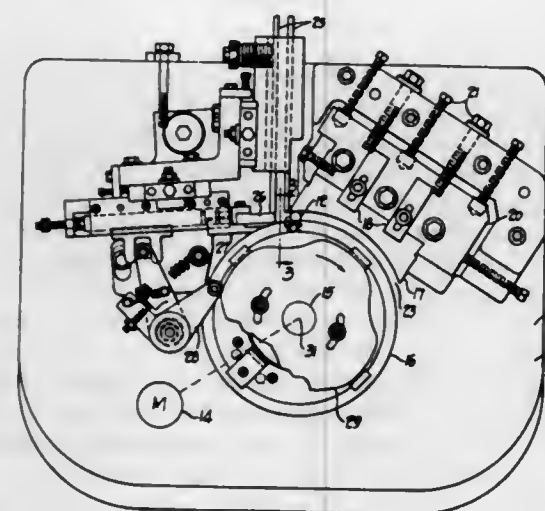
Ronald J. Matej, Parma, and Edward A. Prutton, Parma Heights, both of Ohio, assignors to Prutton Corporation, Cleveland, Ohio

Filed March 15, 1971, Ser. No. 124,302

Int. Cl. B21h 1/14

U.S. Cl. 72-92

31 Claims



A machine and method for rolling a conical workpiece is disclosed wherein relatively rotatable die means rotate a workpiece therebetween in planetary motion. A shoulder on one die urges the workpiece in one axial direction and a shoulder on the other die acts on the workpiece in an opposite axial direction to form roll thereon a crowned surface on the large end of the workpiece. The tilting or skewing of the workpiece relative to the dies helps establish this crowned end on the workpiece.

3,731,512

### ROLLING MILL CUTTING APPARATUS AND METHOD

Ralph A. Vogel, Three Rivers, Mich., and Kenneth F. Edwards, Lancaster, Ohio, assignors to Essex International, Inc., Fort Wayne, Ind.

Filed May 7, 1971, Ser. No. 141,153

Int. Cl. B21b 1/00

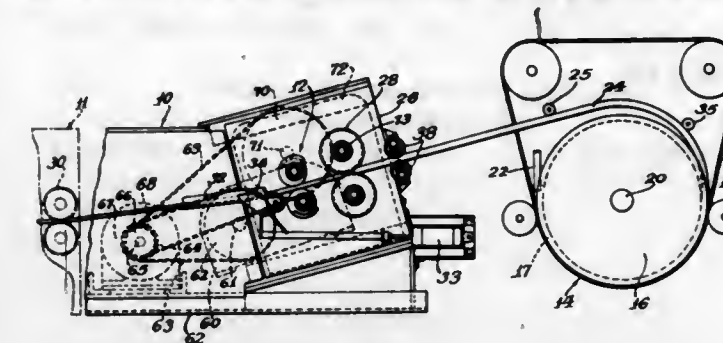
U.S. Cl. 72-203

5 Claims

A method and apparatus for selectively cutting a continuously moving cast metal bar in a rolling mill. The cast metal bar is fed from a continuous casting wheel through a pair of rollers for a first reduction in its cross-sectional area. Rotating helical cutters are located immediately after the first set of rollers for cutting the cast metal bar at an acute angle relative to the central longitudinal axis of the bar, so as to provide a substantially pointed leading edge for the cast metal bar. Immediately following the rotating cutters, a second set of rollers

are provided for a second reduction in the cross-sectional area

member movable in parallel relation to and in the same guideway as one of the punches. The apparatus is also particu-



of the cast metal bar. The cutters are selectively activated for severing or cutting the bar when desired.

3,731,513

### METHOD AND APPARATUS FOR BENDING AN ELONGATED OBJECT

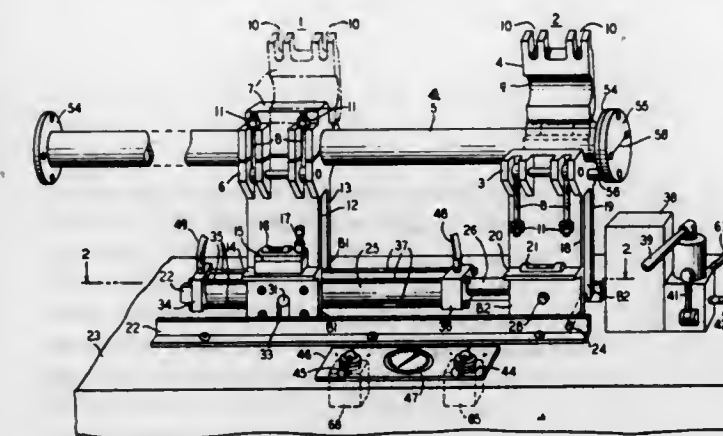
Wilfred Julius Kindermann, Chatham, and Emil David Knab, Whippany, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 8, 1971, Ser. No. 160,782

Int. Cl. B21d 11/02

U.S. Cl. 72-295

3 Claims



Method and apparatus for bending an elongated object. The method comprises gripping at least two portions of the object with rigid instrumentalities, which are spaced apart by a predetermined distance, and then tilting the instrumentalities simultaneously in opposite directions to a calculated extent. The apparatus includes at least two clamping devices for retaining respectively different portions of the object. The clamping devices have base portions which are connected together by means having an extensible portion. Means are provided for lengthening the extensible portions and for thereby forcibly increasing the spacing between the base portions.

3,731,514

### CLEAT BENDER

Albert J. Delbele, Jr., 616 Paine Street, Kell, Wis.

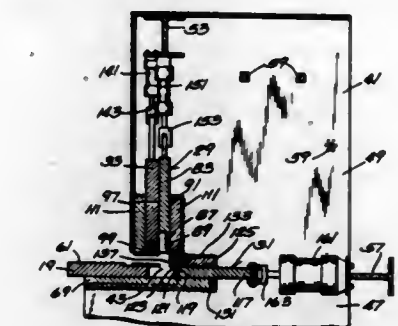
Filed Feb. 7, 1971, Ser. No. 104,644

Int. Cl. B21d 41/00

U.S. Cl. 72-306

11 Claims

Disclosed herein is a sheet metal cleat, together with a method and apparatus for forming material such as sheet metal into U-shaped cleats. The sheet metal cleat includes a planar edge margin having an outer or free edge which is spaced at a uniform distance from the unbent portion of the sheet metal. The method involves bending of the sheet metal around the end of a die of uniform thickness. The apparatus includes a single die and a pair of metal forming members which are movable along paths at right angles to each other and relative to the die so as to bend the sheet metal around an end of the die into a U-shape. Also included is a clamping



3,731,515

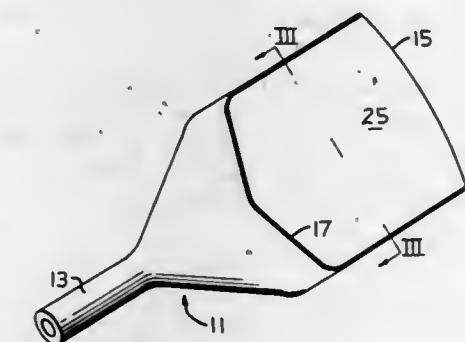
### METHOD OF FORMING AN INTEGRAL BLADE AND TRUNNION UNIT FROM A TUBULAR MEMBER

Ralph E. Master, Washington; Richard D. Phillipsen, Peoria; Kenneth E. Starr, Manito, and Herbert C. Unkrich, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 813,081, April 3, 1969, abandoned. This application Sept. 8, 1970, Ser. No. 70,328  
Int. Cl. B21d 3/00

U.S. Cl. 72-367

6 Claims



For a reversible fan, a blade is manufactured from a tubular member of a proper gage and diameter by spreading or flattening one end into a blade shape and swaging the other end of the tubular member to a reduced diameter to form an integral trunnion. The tubular member may be first slotted to aid in spreading the blade portion into the proper blade configuration. At the distal end of the trunnion of the integral blade and trunnion unit, a portion of the trunnion can be upset to provide a shoulder for retaining and positioning the integral blade and trunnion in a fan hub in one of two positions for reversing air flow. Springs can be employed to bias each integral blade and trunnion radially outwardly so that the position of these units will be maintained by engagement with complementary indexing structure in the associated hub. As an alternative to upsetting the end of the trunnion, a washer member may be secured on its distal end and a blade indexing mechanism provided by the washer member and cooperating hub assembly.

3,731,516

### METHOD FOR MAKING BEVEL GEAR

Fritz Dohmann, 851 Furth; Karl Gulden, and Willy Lehner, both of 85 Nurnberg, all of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte A.G., Hannover, Germany  
Filed June 29, 1971, Ser. No. 158,011

Claims priority, application Germany, July 9, 1970, P 20 34 043.6

Int. Cl. B21j 5/12

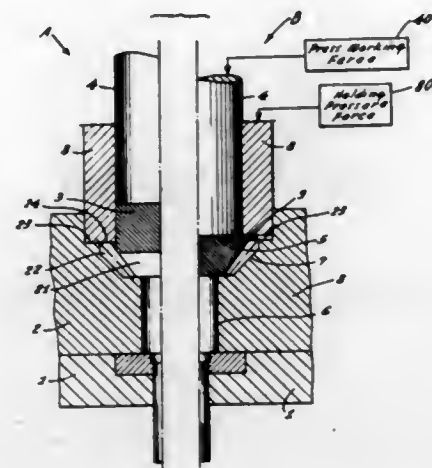
U.S. Cl. 72-354

3 Claims

Apparatus for making bevel gear using a die having contour and profile for obtaining a bevel gear upon pressing a blank



into the die cavity, a first press punch has a working surface smaller than the largest outer diameter of the bevel gear to be made for pressing the blank into the die cavity, and a second press punch disposed coaxial to and surrounding the first



punch and being independently axially movable relative thereto, the second punch having an annular face disposed adjacent that part of the die establishing the teeth of largest diameter of the bevel gear.

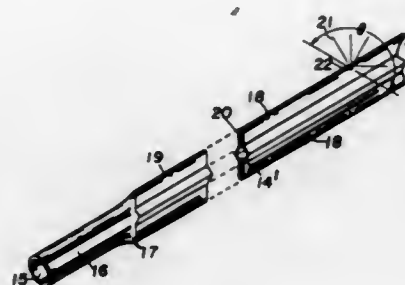
3,731,517

# METHOD OF FABRICATING A FLUID DISPERSION NOZZLE

William H. Johnson, Raleigh, N.C., assignor to Patent and Development of North Carolina, Inc., Raleigh, N.C.  
Division of Ser. No. 787,974, Dec. 30, 1968, Pat. No. 3,584,786. This application June 12, 1970, Ser. No. 57,866  
Int. Cl. B21d 3/00, 53/26

U.S. Cl. 72-467

4 Claims



A single element fluid dispersion nozzle for achieving unusually fine atomization of liquids and a wide angle flat-fan dispersion of both liquids and gases uniformly and over a wide range of capacity and pressure. These features, heretofore unavailable commercially in a single element, have been achieved in practice by a unique design that: (1) minimizes the diameter of the orifice aperture down to about 0.001 inch, (2) maximizes the dispersion angle up to at least 180 degrees, (3) assures a uniformly curved corona orifice cavity at its outer extremity, (4) allows extensible lengths with multiple apertures therein and, (5) provides equi-pressure among apertures.

The long tube-like structure has a main feed cavity with at least one fluidly connected corona orifice cavity extending outwardly therefrom. The inner edge of a section thru the corona orifice cavity would be an arc, approximating a circle, having a diameter as minute as 0.001 inch. The simplicity of this structure and the unique and easily varied relationship of the cavities, in combination with the technique of intersection to produce minimum orifice areas and maximum dispersion angles results in outstanding improvements in performance, manufacturing and economy.

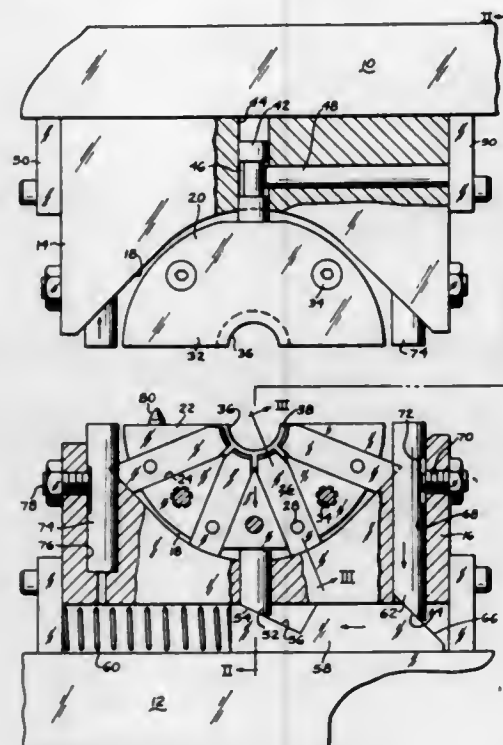
## 3,731,518 CRIMPING DIE ARRANGEMENT

Glen L. Blocher, 1517 Sunset Drive, Box 326, North Manchester, Ind.

Filed May 26, 1971, Ser. No. 146,975  
Int. Cl. B21d 41/00

U.S. Cl. 72-402

10 Claims



The specification discloses a crimping device, especially for crimping fittings on high pressure hoses and the like, in which a separable die is made up of a pair of die bodies having registering cavities to receive the fittings to be crimped. The die bodies have radially disposed crimping fingers which are all actuated inwardly toward the center of the cavity simultaneously in a positive manner, thereby to effect uniform crimping of the fitting on the hose, or the like, so that the crimped off fitting will be capable of holding high pressures and will be perfectly round in the crimped region thereof.

3,731,519

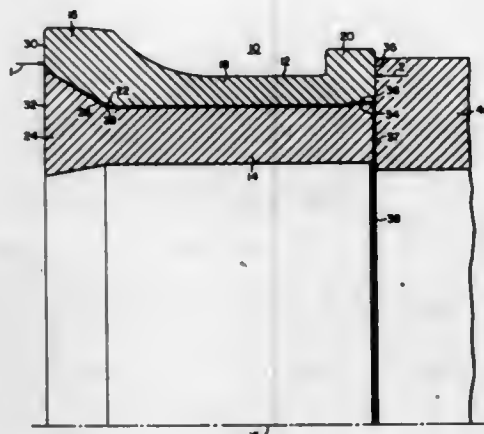
## TWO PIECE FLEXING DIE HOLDER

Maurice W. Mahns, and Clark O. Stockdale, Jr., both of Pittsburgh, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed July 29, 1971, Ser. No. 167,321  
Int. Cl. B21c 3/06; B21d 37/04

U.S. Cl. 72-468

4 Claims



A two piece die holder comprising an inner annular member (for holding an extrusion die) concentrically mounted and axi-

ally movable within an outer annular member. The outer annular member has a thickness dimension and configuration which allows the forward portion thereof to expand in a radially outward direction as the forward portion is forced against material to be extruded under extrusion pressure. With termination of the extrusion pressure, the outer annular member contracts so that the die holder and die can be withdrawn in tact through an extrusion cylinder or container at the completion of the extrusion cycle.

3,731,520

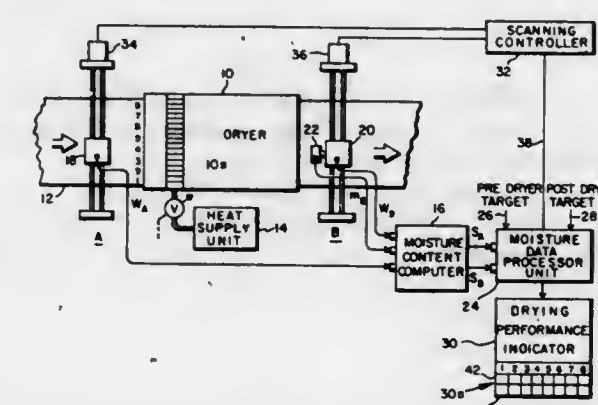
## DRYER PERFORMANCE INDICATOR

Richard W. Hickman; Antoni A. Rocheleau, and David A. Spitz, all of Columbus, Ohio, assignors to Industrial Nucleonics Corporation, Columbus, Ohio

Filed Oct. 5, 1967, Ser. No. 673,129  
Int. Cl. G01n 5/02

U.S. Cl. 73-73

22 Claims



A cross-machine dryer performance indicator wherein the deviation in the pre-dryer moisture content of a material from the average cross-machine moisture is compared at multiple locations across the width of the dryer with a deviation in the post-dryer moisture content of the material from the average cross-machine moisture of the material leaving the dryer. The sense of the pre-dryer moisture deviation is compared with the sense of the post-dryer deviation to indicate the drying performance of the dryer. The width of the material is scanned to measure the average moisture in the material both before and after drying to provide an indication of the performance profile of the dryer. A readout of dryer performance profile indicates whether the dryer's performance is good, poor or indeterminate across its width.

3,731,521

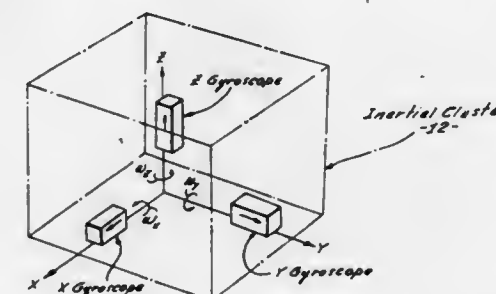
## SYSTEM AND METHOD FOR MONITORING THE PERFORMANCE OF A DUAL PLATFORM INERTIAL NAVIGATION SYSTEM

Edwin G. Solov, Wayne, and Frank J. Pasquariello, Paterson, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Sept. 8, 1971, Ser. No. 178,669  
Int. Cl. G01c 21/00

U.S. Cl. 73-1 E

6 Claims



An improved monitoring system and method is provided for comparing the orientations of two inertial platforms in an in-

ertial navigation system so as to determine whether or not any of the gyroscopes in either platform has failed and, if so, to identify the failed gyroscope. The two inertial platforms are positioned so that the inertial cluster of one is skewed relative to the inertial cluster of the other. The two clusters will change their relative orientations if a gyroscope in either begins to drift. In the monitoring system of the invention, the synchro read-outs from the platforms are introduced to a computer which transforms the cluster coordinates into body coordinates. The computer then computes the relationship between the two cluster coordinates, and provides a particular read-out for variations in the relationship. This read-out identifies the particular gyroscope in the particular inertial platform which is malfunctioning.

3,731,522

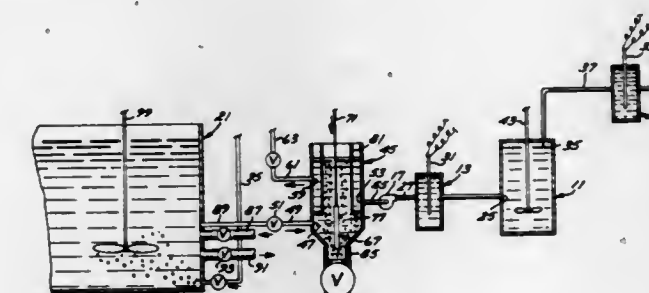
## METHOD AND APPARATUS FOR DETERMINING OXYGEN CONSUMPTION RATE IN SEWAGE

Ritchie D. Mikesell, Anaheim, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Sept. 30, 1970, Ser. No. 77,266  
Int. Cl. G01n 27/26

U.S. Cl. 73-19

9 Claims



A continuous respirometer apparatus for measuring the rate at which oxygen in a fluid, such as sewage, is consumed to thereby obtain an indication of the respiration rate of the bacterial population included in such sewage. The apparatus includes a closed air-tight container having an inlet and an outlet. Inlet oxygen sensing means is provided for sensing the amount of dissolved oxygen in the fluid entering the container and outlet oxygen sensing means is provided for sensing the amount of oxygen in the sewage exhausted out the outlet. Pump means is provided for circulating the sewage through the closed container at a constant flow rate whereby the amount of dissolved oxygen in the sewage may be determined at both the inlet and outlet to thereby enable the operator to determine the rate at which such oxygen is consumed or respired by the bacteria included in the sewage.

3,731,523

## HYDROGEN ACTIVITY METER

Donald R. Vissers, Naperville; John T. Holmes, Downers Grove, and Paul A. Nelson, Wheaton, all of Ill., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Feb. 23, 1971, Ser. No. 117,990  
Int. Cl. G01n 7/10

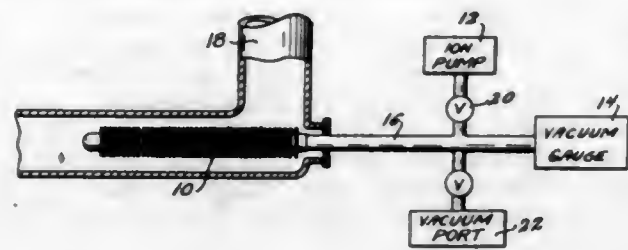
U.S. Cl. 73-19

8 Claims

A device for and method of measuring the hydrogen concentration in liquid sodium. A thin-wall, tubular, annealed nickel probe in contact with liquid sodium is connected to an ion pump and a vacuum gauge. A vacuum is created within the nickel probe by the ion pump, which thereafter is isolated from the remainder of the device. Hydrogen atoms in the liquid sodium diffuse through the wall of the probe and into the interior thereof until an equilibrium between hydrogen atoms within the probe and hydrogen atoms in the liquid sodium is obtained. Such diffusion by hydrogen atoms into the probe results in a pressure change within the probe. The pressure change occurring between the time of initial probe



evacuation and the time equilibrium of the hydrogen atoms is obtained is measured by the vacuum gauge, and this pressure



change is indicative of the hydrogen concentration in the liquid sodium.

3,731,524

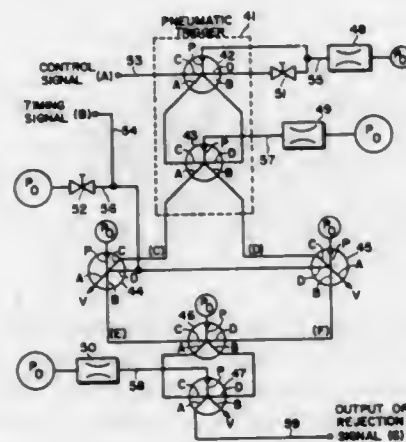
## FLUIDIC CONTROL CIRCUIT

Lawrence W. Langley, and Gilbert Alexander Cotta, both of Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

Filed Dec. 13, 1966, Ser. No. 601,490  
Int. Cl. G01m 3/26; F15c 1/08

U.S. Cl. 73-45.1

22 Claims



A fluidic control circuit for monitoring a fluid signal and providing a fluid output pulse when the amplitude of the monitored signal falls below a predetermined threshold level, the phase of the output pulse being delayed with respect to the time at which the monitored signal falls below the threshold level. When the monitored signal is a train of fluid pulses, there is provided a train of fluid timing pulses having the same frequency as the monitored signal. A pneumatic trigger and NOR gate are combined in a circuit receiving the monitored signal and timing signal to provide an output pulse, the width of which is determined by the width of a timing pulse and the phase of which is determined by the time occurrence of the timing pulse. The addition of a second NOR gate and a fluid flip-flop to the control circuit permits the generation of an output pulse having a width determined by the time between two successive timing pulses, thus providing the control circuit with memory.

3,731,525

## PRESSURE TESTING APPARATUS

Walter Suter, Willoughby Hills, Ohio, assignor to United States Steel Corporation, Pittsburgh, Pa.

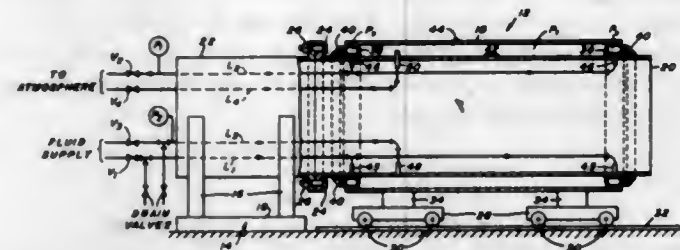
Filed May 13, 1971, Ser. No. 142,868  
Int. Cl. G01m 3/28

U.S. Cl. 73-49.5

14 Claims

Apparatus for pressure testing a hollow body at a predetermined testing pressure for areas of weakness is disclosed. The apparatus has frame and a core member mounted on the frame. The hollow body is disposed either about or within the core member. A first sealing member and a second sealing

member are mounted on one member of the core member and the hollow body between the core member and the hollow body and define, when pressurized to a predetermined sealing pressure, with the core member and the hollow body a test



volume for a test area in the hollow body to be tested for areas of weakness. A first pressurizing means inflates the first sealing member and the second sealing member to the predetermined sealing pressure and a second pressurizing means pressurizes the test volume to the predetermined testing pressure.

3,731,526

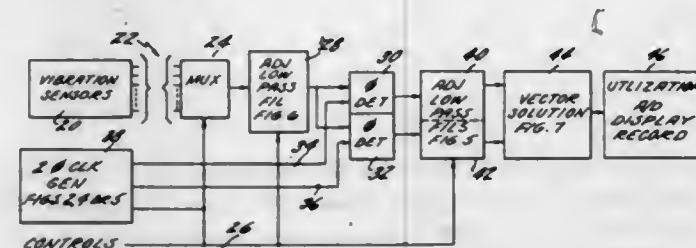
## VARIABLE CENTER FREQUENCY FILTER

John E. Games, Granby, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 5, 1971, Ser. No. 169,391  
Int. Cl. G01d

U.S. Cl. 73-71.4

4 Claims



A system for analyzing the frequency response of apparatus such as rotary machinery includes a plurality of vibration sensors which are multiplexed to apparatus utilizing amplitude sensitive phase detection with a two phase clock operating at a selected frequency at which the analysis is to be performed. The two phase-detected waves are passed through vector solution apparatus which provides the summation of the rectified waves and a weighted rectified difference in the rectified waves. Various two phase clock controls and filters are disclosed.

3,731,527

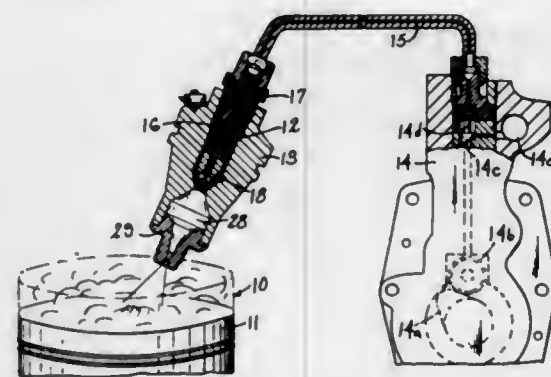
## FUEL INJECTION TRANSDUCER AND TIMING SYSTEM

Preston R. Weaver, Rocky Hill, Conn., assignor to UMC Electronics Company, North Haven, Conn.

Filed Nov. 27, 1970, Ser. No. 93,199  
Int. Cl. G01m 15/00

U.S. Cl. 73-119 A

15 Claims



This disclosure relates to an apparatus for detecting the time of fuel injection into an internal combustion engine and

the use of such intelligence in timing the engine. A transducer is mounted in relation to the fuel injection nozzle to sense and detect a shock or sonic wave resulting from opening of the nozzle at the time of injection.

3,731,528

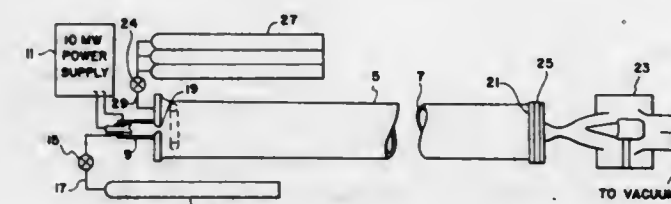
## APPARATUS AND METHOD FOR GENERATING LARGE MASS FLOW OF HIGH TEMPERATURE AIR AT HYPERSONIC SPEEDS

William B. Boatright, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed March 9, 1972, Ser. No. 233,098  
Int. Cl. G01m 9/00

U.S. Cl. 73-147

14 Claims



High temperature, high mass flow and a high Reynolds number test air flow in the Mach number 8-10 regime of adequate test flow duration is attained by pressurizing a ceramic-lined storage tank with air to a pressure of about 100 to 200 atm. The air is heated to temperatures of 7,000°R to 8,000°R prior to introduction into said tank by passing said air through an electric arc heater. The air cools to 5,500°R to 6,000°R while in the tank and then it is rapidly released through a Mach number 8-10 nozzle.

As an embodiment of the invention cold air or hot driver gas under pressure is injected simultaneously with the release of said pressurized hot air and regulated to enter the tank at the same rate the hot air is leaving. This holds pressure in the tank constant during the test. Alternatively, the driver gas is introduced into the tank prior to the discharge of the hot air to thereby increase the pressure in the tank and permit tests at higher pressures than can be handled by the arc heater.

3,731,529

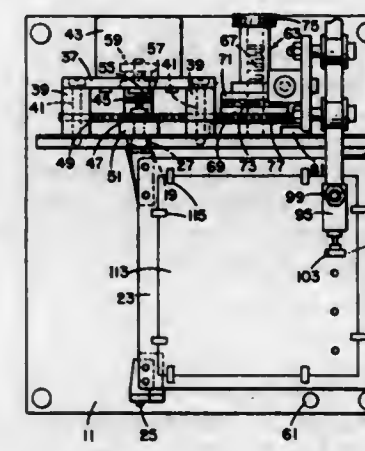
## APPARATUS FOR DETERMINING COATING ADHESION PROPERTIES OF HYDROPHOBIC SURFACES

Carl R. Pepmeyer; David C. Burke, and Allen P. Jones, all of Fredericksburg, Va., assignors to FMC Corporation, Philadelphia, Pa.

Filed April 26, 1972, Ser. No. 247,822  
Int. Cl. G01n 33/26

U.S. Cl. 73-150

6 Claims



Apparatus for determining the gravitational component of an angle at which a drop of liquid begins to flow down along a surface of a hydrophobic material as such material is urged

3,731,530

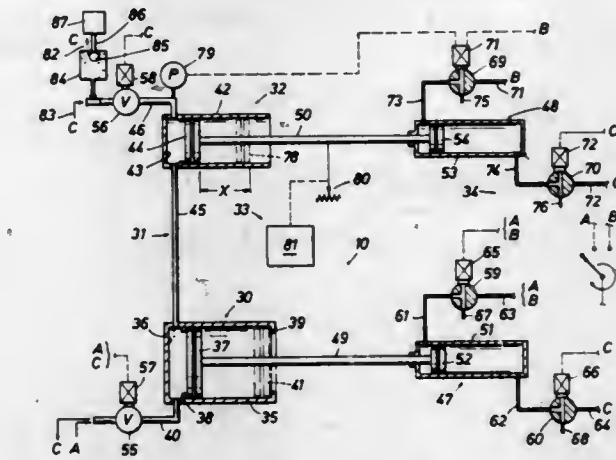
## APPARATUS FOR DETERMINING THE GAS CONTENT OF DRILLING MUDS

Denis R. Tanguy, and Joseph F. Kishel, both of Clarks Summit, Pa., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed March 20, 1972, Ser. No. 236,414  
Int. Cl. E21b 49/00

U.S. Cl. 73-153

20 Claims



In the representative embodiment of the apparatus of the present invention disclosed herein, first and second selectively-movable pistons are respectively arranged within complementary first and second cylinders having their working chambers in fluid communication with one another to define an expandable sample chamber. Suitable control devices are provided to selectively extend the first piston for inducting a predetermined volume of drilling mud into the sample chamber and thereafter extend the second piston for reducing the pressure in the sample chamber to a predetermined reduced pressure which is preferably somewhat greater than the saturation pressures of any gases which might possibly be entrained in the entrapped mud sample. A suitable measuring device is cooperatively arranged for measuring the extension or displacement volume of the second piston for accurately determining the gas content of the entrapped sample.

3,731,531

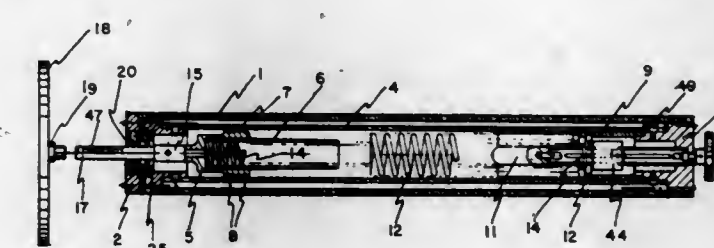
## MAXIMETERS (PEAK WIND SPEED ANEMOMETERS)

John W. Kaufman; Dennis W. Camp, and Robert E. Turner, all of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 27, 1971, Ser. No. 212,165  
Int. Cl. G01w 1/04

U.S. Cl. 73-189

9 Claims



An instrument for measuring peak wind speeds under severe environmental conditions comprising an elongated cylinder housed in an outer casing. The cylinder contains a piston attached to a longitudinally movable guided rod having







magnetic suspension system which, in combination with a feedback control loop, acts to measure the desired component or combination of components of the gravity gradient in a manner described. The gradiometer incorporates a highly precise thermal control sub-system and an extremely sensitive internal balancing arrangement. One or more gradiometers is employed in an inertially stabilized system so as to measure the desired components or combinations of components of the gravity gradient from a moving vehicle.

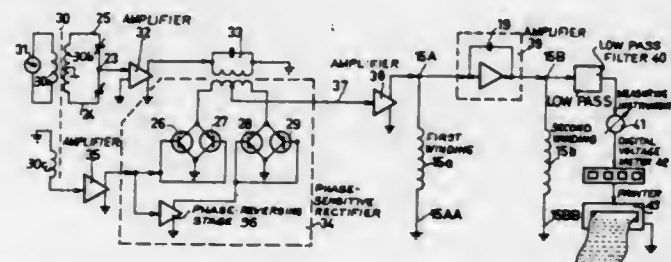
### 3,731,538 GRAVIMETER

Hans-Dieter Jacoby, Berlin, Germany, assignor to Continental Elektroindustrie Aktiengesellschaft, Berlin-Mariendorf, Germany

Filed Feb. 10, 1970, Ser. No. 10,230  
Claims priority, application Germany, Feb. 14, 1969, P 19 08 232.7

Int. Cl. G01v 7/16  
U.S. Cl. 73-382

5 Claims



A compensating arrangement acts on the mass and is connected to the input of the integral transfer unit of a gravimeter system. The measuring indicator is connected to the output of the integral transfer unit via the compensating arrangement and a low pass filter whereby a signal proportional to the position of the mass is transferred to the compensating arrangement in a manner which compensates for the measuring force in the sense of a negative feedback thereby suppressing the short period accelerating forces acting on the gravimeter system and preventing such accelerating forces from affecting the indication of the measuring indicator.

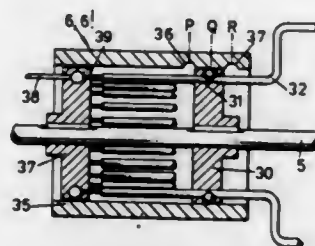
### 3,731,539 APPARATUS FOR THE COLLECTION AND ANALYSIS OF SAMPLES

Kenneth Walter Brittan, 126 Meadow Lane, Coalsville, and James Ephraim Lovelock, Bowerchalke, near Salisbury, both of England

Filed April 29, 1971, Ser. No. 138,678

Int. Cl. G01n 1/22  
U.S. Cl. 73-421.5 R

6 Claims



An apparatus for the automatic collection and analysis of fluid samples and particularly for the monitoring of atmospheric pollutants. The apparatus comprises a plurality of traps for the collection of samples and which are in turn exposed for a pre-determined time interval to the atmosphere. Thereafter the traps are transferred to an analysis station where pollutant contained in the traps is expelled for analysis into an analytical instrument.

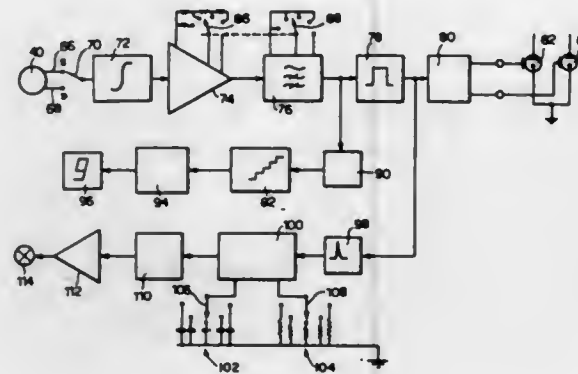
### 3,731,540 APPARATUS FOR STATIC AND DYNAMIC WHEEL BALANCING

Giovanni Emanuel, and Lucio Bertoni, both of Turin, Italy, assignors to Emanuel-Fis.mec. S.p.A. and Ferom S.n.c. di Bertoni Lucio e Ferretti Mario, Turin, Italy

Filed Oct. 14, 1971, Ser. No. 189,115  
Claims priority, application Italy, Oct. 27, 1970, 53728 B/70

Int. Cl. G01m 1/22, 1/28  
U.S. Cl. 73-457

5 Claims



Wheel balancing apparatus capable of performing static and dynamic wheel balancing in a single operation is disclosed. The apparatus has two mutually perpendicular transducers in a sensor which is readily attachable to the suspension of the wheel by means of a magnet or a clamp. The outputs of the sensors are selectively coupled to an amplifier and to an adjustable circuit which provides a stroboscopic illumination triggered by the vibration of the wheel, a visual display of the amount of imbalance of the wheel indicating the weight required to compensate for the imbalance, and an alarm signal if the speed at which the wheel is driven during testing exceeds a preselected maximum value to which the apparatus has been set by the operator.

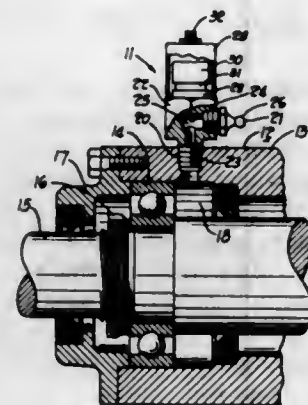
### 3,731,541 COMBINATION FITTING

Elmer E. Rabek, Westerville, Ohio, assignor to Reliance Electric Company

Filed Jan. 24, 1972, Ser. No. 220,196

Int. Cl. G01h 1/00  
U.S. Cl. 73-493

20 Claims



An accelerometer and grease fitting is combined in a single body and has a male pipe thread fitting to thread into the threaded aperture on a machine for a normal grease fitting. In this way a combined accelerometer and grease fitting replaces a normal grease fitting without the need for providing a special mounting of the accelerometer.

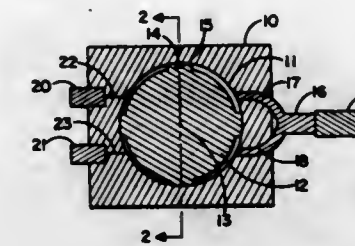
### 3,731,542 OPTICAL ACCELEROMETER

John D. Forsberg, Wayzata, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed March 26, 1971, Ser. No. 128,260

Int. Cl. G01p 15/08  
U.S. Cl. 73-516 R

6 Claims



An accelerometer for providing digital output signals indicative of predetermined levels of acceleration in either direction along a sensitive axis therein. A mass is displaced a defined distance whenever a predetermined acceleration is experienced. This displacement aligns an optical fiber path contained by the mass between a light source and a light sensor causing the light sensor to produce an output signal. Different levels of acceleration can be detected by the use of a plurality of optical fiber paths within the mass.

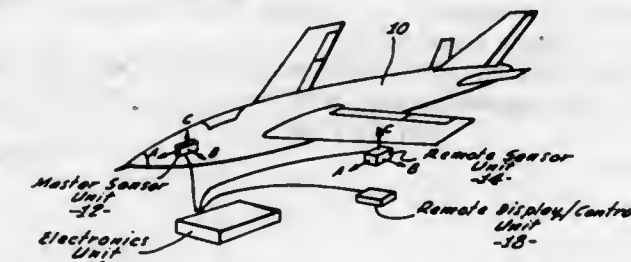
### 3,731,543 GYROSCOPIC BORESIGHT ALIGNMENT SYSTEM AND APPARATUS

Robert L. Gates, Littleton, Colo., assignor to The Singer Company, Little Falls, N.J.

Filed Jan. 28, 1972, Ser. No. 221,694

Int. Cl. G01c 19/02  
U.S. Cl. 73-504

7 Claims



An improved system is provided for determining boresight misalignments of equipment, such as guns, radar antennas, cameras, gunsights, rocket launch rails, and the like, of carrier-based aircraft. The system of the invention utilizes inertial sensors which respond to the rotational rates of the aircraft carrier itself, and which use such rates as signal sources for the determination of angular boresight misalignments with respect to the armament data reference line of the particular aircraft. The system of the invention comprises a master sensor unit which contains two gyroscopes, and which is mounted on the aircraft during the test in position to extend along the armament data reference line. The system also includes a remote sensor unit which contains a single gyroscope, and which is mounted during the test on the actual equipment whose boresight misalignment is to be measured with respect to the aforesaid armament data reference line. The system of the invention compares the angular rates of the aircraft at the data line and at the equipment boresight axis to determine any misalignments of the boresight axis with respect to a parallel relationship with the armament data line.

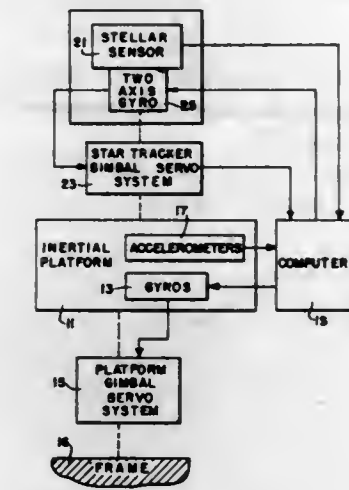
### 3,731,544 STAR TRACKER SYSTEM

Robert H. Acker, Packanack Lake, and Francis H. Murphy, Butler, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed March 31, 1971, Ser. No. 129,750

Int. Cl. G01c 19/02; G01j 1/20  
U.S. Cl. 74-5.22

6 Claims



In a star tracker system a two axis gyroscope is fixed to the stellar sensor with its spin axis aligned with the line of sight with the stellar sensor. The stellar sensor is mounted on an inertial platform by gimbals which are controlled in response to the output signals of the two axis gyroscope to maintain the line of sight of the stellar sensor aligned to an inertial reference frame. The line of sight of the stellar sensor is changed to a new position by torquing the gyroscope.

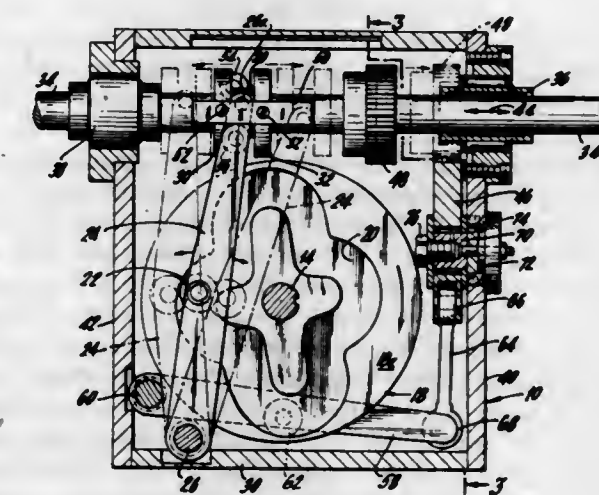
### 3,731,545 DEVICE FOR TRANSMITTING ACCURATE TRANSLATIONAL AND ROTARY MOVEMENTS

Earl F. Beezer, One Andrea Boulevard, Saddle Brook, N.J.

Filed May 4, 1971, Ser. No. 140,134

Int. Cl. F16h 27/04  
U.S. Cl. 74-24

18 Claims



A device for transmitting accurate translational and rotary movements includes a rotary input shaft on which is mounted a rotary driving cam which is engaged with a pivotal follower carried on a first lever member intermediate its length. The first lever member is pivoted at its lower end in the housing containing the cam, and its upper end is engaged with the output shaft. The output shaft is guided in rotary roller bearings and linear ball bearings and it is shifted laterally, backwardly, and forwardly by pivotal movement of the first lever as its follower rides in the cam. A second gear control lever is pivotally mounted in the housing to extend transversely in respect to the first lever and it includes a follower which is also engaged



in a groove of the cam and this causes the pivotal movement of the second lever. The outer end of the second lever is pivotally connected to a connecting rod which in turn is connected to a gear member in the form of a quadrant through a universal joint connection. The gear member or quadrant meshes with a gear carried on the output shaft to rotate the output shaft. Meshing engagement is only effective when the output shaft moves a predetermined distance transversely so that meshing engagement with the quadrant can be easily effected.

3,731,546

**POWER OPERABLE PIVOT JOINT**

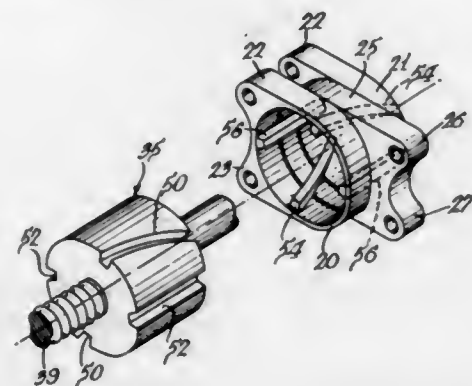
J. G. Fraser MacDonald, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 1, 1971, Ser. No. 203,532

Int. Cl. F16h 21/12

U.S. Cl. 74—63

31 Claims



A power operable pivot joint for mounting and actuating a trailing edge flap or the like on an airplane wing, including a pair of laterally spaced bearing rings having outwardly projecting support arms adapted to be secured to an airplane wing, an annular member pivotally mounted on the bearing rings for movement about a pivot axis and having an outwardly projecting arm adapted to be attached to a wing flap, a set of angularly spaced keys disposed in the bearing rings and secured thereto, a set of angularly spaced keys disposed in the pivoted member and secured thereto, an actuator disposed in the bearing rings and pivoted member and having angularly spaced guide grooves respectively cooperating with said keys, one of the sets of keys and cooperating grooves being helical about the pivot axis so that axial movement of the actuator causes pivotal movement of the pivoted member, housing means secured to the bearing rings and enclosing the actuator, and means mounted in the housing and connected for moving the actuator axially of the pivot axis. In one embodiment, a screw shaft is mounted in the housing means against bearings for absorbing the axial thrust of the shaft, and the actuator is threadably mounted on the shaft for movement of the actuator on rotation of the shaft. In another embodiment, the housing includes means defining expansible fluid chambers at opposite ends of the actuator for receiving fluid under pressure to move the actuator back and forth. In another embodiment, there are dual actuators controlled by oppositely threaded portions on a single screw shaft. An important aspect of each construction resides in the utilization of angularly spaced keys and cooperating grooves at the outer surface of the actuator, all having the same pitch radius about the pivot axis for even distribution of the loads.

3,731,547

**TRAVERSING MECHANISMS**

Douglas Joseph Fullbrook, Aldershot, England, assignor to National Research Development Corporation, London, England

Filed Sept. 21, 1970, Ser. No. 74,103

Claims priority, application Great Britain, Sept. 22, 1969, 46,470/69; Dec. 2, 1969, 58,802/69

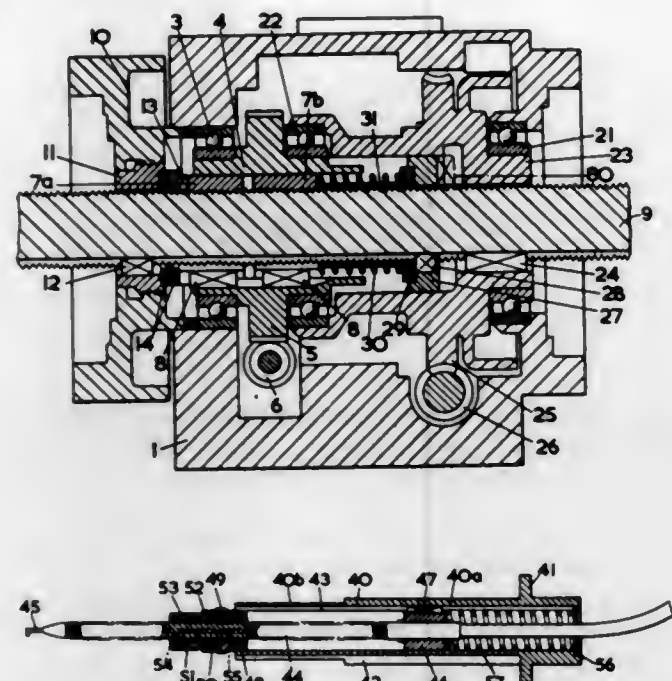
Int. Cl. F16h 27/02

U.S. Cl. 74—89.15

22 Claims

A traversing mechanism is capable of traversing any one of

a number of differently sized leadscrews, which may carry probes, maintaining an accuracy which is substantially constant relative to the size of the traverse. One leadscrew is installed directly in the mechanism, others are contained in cartridges which are installed in the mechanism and are con-



3,731,548

**LINEAR DISPLACEMENT AMPLIFICATION DEVICE AND DEFLECTION TRANSDUCER EMBODYING SAME**

Ronald W. Bocksrucker, Los Angeles, Calif., assignor to TRW, Inc., Redondo Beach, Calif.

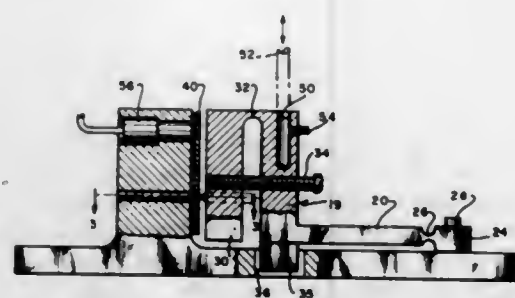
Division of Ser. No. 034,459, May 4, 1970, Pat. No. 3,617,964.

This application May 3, 1971, Ser. No. 139,832

Int. Cl. F16h 21/44

U.S. Cl. 74—96

5 Claims



A linear displacement amplification device having fulcrum means rockably engaging opposite sides of a lever in a common plane normal to the longitudinal axis of the lever and restrained against sliding movement along the lever, and means supporting one fulcrum, means for movement lengthwise of the lever relative to the other fulcrum means in response to a linear input displacement. This relative movement of the fulcrum means causes lateral displacement of one end of the lever proportional to but substantially greater than the input displacement. A deflection transducer embodying the linear displacement amplification device for producing an electrical output representing the amplified input displacement.

3,731,549

**INFINITELY VARIABLE TRANSMISSION**

Wilhelm Kaiser, Angermund; Wolfgang Meurer, Buderich, and Georg Muller, Dusseldorf, all of Germany, assignors to Jagenberg-Werke AG, Dusseldorf, Germany

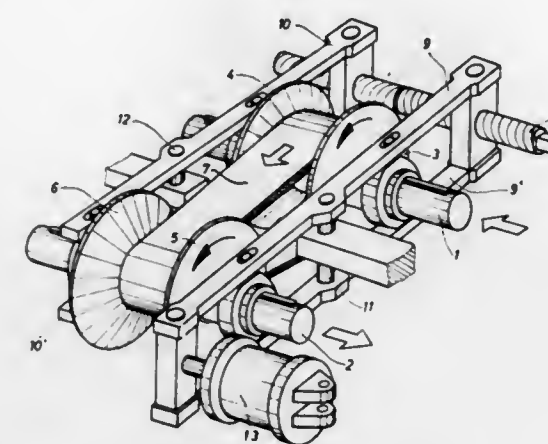
Filed June 7, 1971, Ser. No. 150,328

Claims priority, application Germany, June 19, 1970, P 20 30 184.2; Dec. 17, 1970, P 20 62 170.9

Int. Cl. F16h 9/00

U.S. Cl. 74—230.17 A

7 Claims



In an infinitely variable speed transmission comprising a pair of transmission shafts one of which drives and the other of which is driven, two pairs of conical disks respectively carried on said pair of shafts, a transmission chain operatively connecting said pair of disks, and means for adjusting the spacing between the disks of each pair and thereby infinitely vary the transmission ratio, there is provided a piston-cylinder which applies a counter-force either against the transmission chain or the means for adjusting the spacing between a pair of disks. The counter-force is controlled by the load on the driven transmission shaft and is especially intended to ensure constant transmission ratio as is needed in cutting machines wherein the length of material between cuts must be identical.

3,731,550

**BELT SHIFTER FOR A VARIABLE SPEED DRIVE**

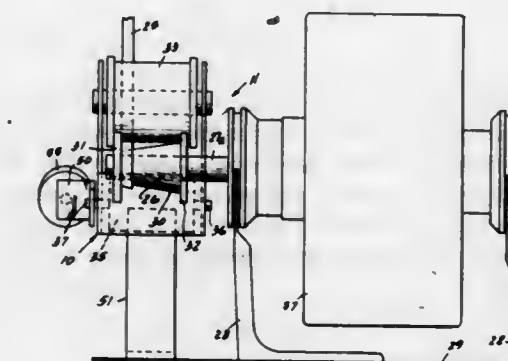
Ronald J. Malecki, Milwaukee, Wis., and Kenneth J. Grall, Stevensville, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 3, 1972, Ser. No. 214,757

Int. Cl. F16h 7/08, 7/18

U.S. Cl. 74—242.3

10 Claims



A belt shifting device used with a variable speed drive system for a clothes dryer. The drive system has a drive pulley with an axially extending tapered drive surface and a belt engaging the drive surface and extending around an external surface of the dryer drum. The belt shifter utilizes a guide roller which frictionally engages the belt and is movable between

two oblique positions on opposite sides of a line extending perpendicular to an edge of the belt with movement between the two positions causing the belt to shift positions on the drive pulley to change the linear speed of the belt and therefore the speed of rotation of the dryer drum.

3,731,551

**LUBRICATION SEAL FOR A CRAWLER TRACK**

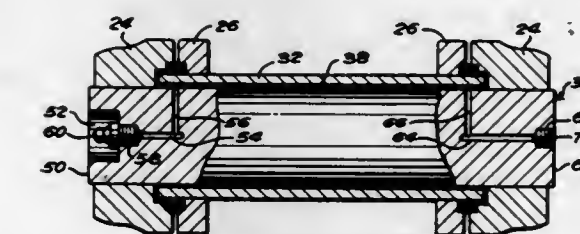
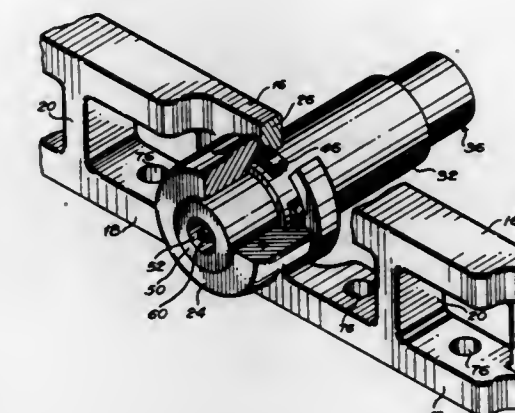
Bill W. Nelson, P.O. Box 212, Wasilla, Alaska

Filed May 6, 1971, Ser. No. 140,701

Int. Cl. F16g 13/02

U.S. Cl. 74—257

14 Claims



A track for a crawler vehicle comprises track assemblies. The adjacent or successive track assemblies are connected together by a bushing and a pin in the bushing. The bushing and pin are free to rotate with respect to each other.

The bushing and pin, because of their relative movement with respect to each other, wear. The metal to metal contact of the bushing and pin wear each other. Also, the track in a crawler vehicle moves over and through dirt, mud and in muddy water. The dirt, mud and silt and the muddy water work in between the bushing and the pin. As a result, there is considerable wear between the bushing and the pin. Consequently, there is a shortened life for the track.

This invention is directed to a lubrication system for the bushing and the pin. This lubrication system decreases the wear between the bushing and the pin and, consequently, lengthens the life of the track.

3,731,552

**DIFFERENTIAL GEAR MECHANISMS**

Cecil Goodacre, Basingstoke, England, assignor to Lansing Bagnall Limited, Basingstoke, England

Filed Feb. 10, 1972, Ser. No. 225,184

Claims priority, application Great Britain, Feb. 12, 1971, 4,578/71

Int. Cl. F16h 35/02

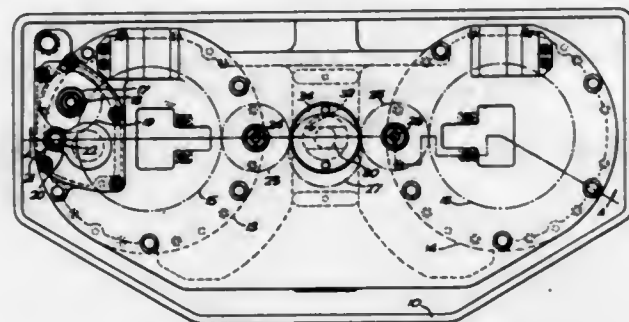
U.S. Cl. 74—393

6 Claims

A differential gear mechanism comprises two spaced gear wheels in mesh with an intermediate gear wheel disposed between them, the intermediate gear wheel being arranged, so



it rotates, to move laterally between the gear wheels so as to effect differential rotation of the gear wheels. The intermediate gear wheel is elliptical, the minor axis of the ellipse lying along a line joining the centers of the gear wheels when the intermediate gear wheel is symmetrically disposed between them. The eccentricity of the ellipse is such that as



the intermediate gear wheel moves laterally the increase in the distance apart of the portions of the gear wheels with which it meshes is substantially compensated for by the increase in the effective diameter of the intermediate gear wheel between those portions, as a result of its rotation, so that the intermediate gear wheel remains in mesh with the gear wheels during its lateral movement.

3,731,553

**BALL NUT ASSEMBLY**

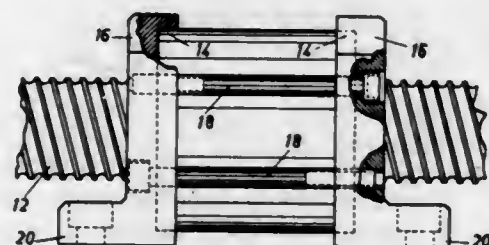
Sven Walter Nilsson, Partille, Sweden, assignor to SKF Industrial Trading and Development Company N.V., Overtoom, Amsterdam, Netherlands

Filed March 1, 1971, Ser. No. 119,658

Int. Cl. F16h 55/22, 1/18

U.S. Cl. 74-459

11 Claims



In order to make possible a simplified manufacture of a ball nut assembly with special consideration to a desire to reduce the number of types necessary for inclusion in machineries of various kinds, the nut is produced in three main parts, viz: a nut body provided with ball recirculating means and two end pieces. The latter can easily be designed in various ways to suit the intended use, but the complicated component, i.e. the nut body can remain the same and thus be manufactured as a standardized unit.

The components are secured together by means of stay bolts in such a manner that a turning of the nut body in relation to the end pieces is prevented.

3,731,554

**GEARSHIFT ARRANGEMENT FOR A MOTOR VEHICLE CHANGE-SPEED GEAR**

Rolf Renk, Russelsheim, Main, Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 24, 1971, Ser. No. 201,796

Claims priority, application Germany, Dec. 19, 1970, P 20 62 691.9

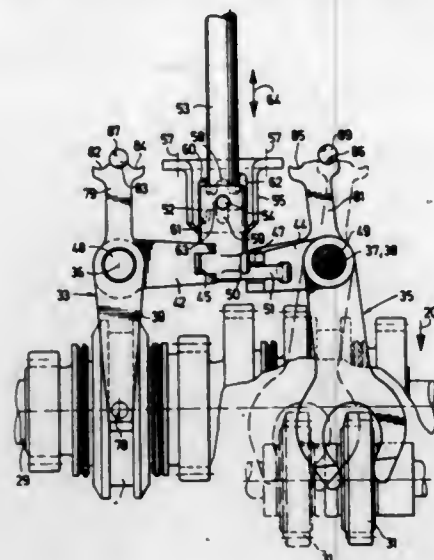
Int. Cl. G05g 9/12

U.S. Cl. 74-477

8 Claims

A gearshift arrangement for a motor vehicle change-speed gear, primarily for use with a transversely mounted engine, in-

cludes a manual gearshift lever articulated to a selector shaft that is mounted for selective longitudinal displacement and rotary movement. Shift forks are effecting movement of slidable



shift coupling sleeves or a slidable pinion are formed as angled pivotal shift forks having free lever ends which, during a gearshift, are engaged directly by selector fingers that effectively form part of the selector shaft.

3,731,555

**VALVE CONTROL LINKAGE**

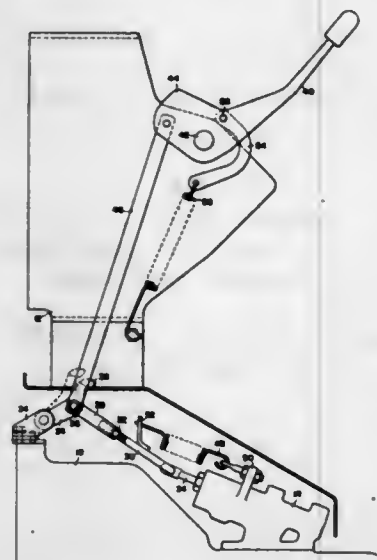
Karl Heinz Fresmann, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed April 7, 1972, Ser. No. 242,163

Int. Cl. G05g 1/00

U.S. Cl. 74-491

7 Claims



A valve rigidly mounted on a tractor chassis is controlled, through an over center linkage, by a lever pivotally mounted on a cab which is resiliently mounted on the tractor chassis. The over center linkage and a pair of springs which act on the over center linkage and lever prevent the valve from sensing or being affected by relative movement between the cab and chassis.

3,731,556

**DYNAMIC BALANCING APPARATUS**

Jacob Decker, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Nov. 17, 1971, Ser. No. 199,435

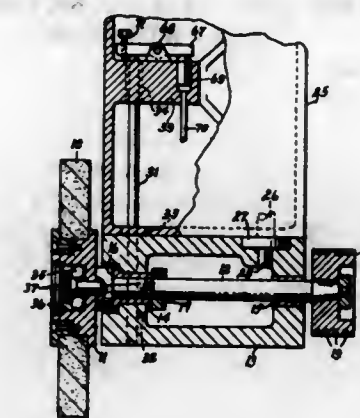
Int. Cl. F16f 15/32

U.S. Cl. 74-573

8 Claims

A dynamic balancing apparatus for a rotary member, such as a grinding wheel, supported for rotation on a spindle jour-

naled in a spindle housing. The spindle housing is pivoted on a support for rocking movement under the control of a resilient restraining means. Balancing is effected by the release of self-



adjusting weights operating in a raceway on the spindle adjacent the rotary member. After balancing, the housing is clamped tightly to the support.

3,731,557

**PLANETARY TRANSMISSION**

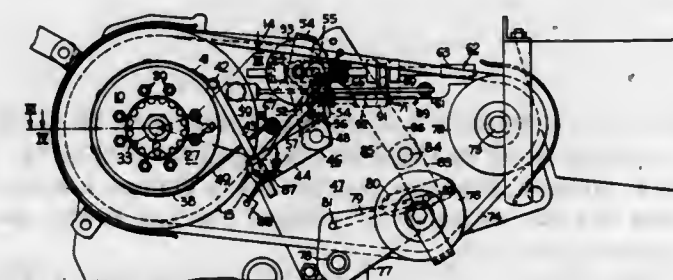
Igor Kamukin, Mequon, and Peter P. Konyha, Port Washington, both of Wis., assignors to Simplicity Manufacturing Company, Inc., Port Washington, Wis.

Filed March 29, 1972, Ser. No. 239,245

Int. Cl. F16h 57/10, 15/00, 11/02

U.S. Cl. 74-792

8 Claims



This invention is concerned with the combination of a spur gear planetary transmission and a split sheave power input clutched by a V-belt.

3,731,558

**LINE PRESSURE REGULATING SYSTEM FOR AUTOMATIC POWER TRANSMISSION**

Koji Enomoto, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Kanagawa-ku, Yokohama, Japan

Filed Dec. 14, 1971, Ser. No. 207,749

Claims priority, application Japan, Dec. 18, 1970, 45/113221

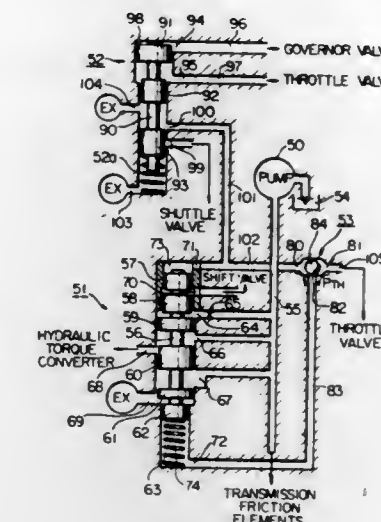
Int. Cl. B60k 21/00; F16h 57/10

U.S. Cl. 74-867

8 Claims

A line pressure regulating system for an automatic power transmission of a motor vehicle, which system comprises a regulator valve having an axially movable spool and adapted to regulate the output pressure of an engine driven fluid pump, a modulator valve responsive to governor pressure and throttle valve pressure for providing a modulator valve pressure to the regulator valve, and a ball valve responsive to the throttle valve pressure and modulator valve pressure for furnishing the regulator valve with the higher one of the throttle valve pressure and modulator valve pressure. The modulator valve pres-

sure is kept at zero level at low vehicle speeds and in speed of "R," but is maintained at a level equal to the throttle valve pressure in position "D" and to the line pressure in any of "1", "2" and "3" both at high vehicle speeds. During the drive position "D," when the transmission upshifts to the fourth forward drive ratio, the line pressure is applied to an additional



port of the regulator valve exerting a force on the spool in such a direction as to reduce the line pressure. With this arrangement, the line pressure decreases with the increase of vehicle speed. When the selector lever is moved from "D" to any of "1", "2" and "3" during high speed running, the line pressure is immediately maintained at an increased level to augment the effect of engine braking.

3,731,559

**UNITARY DUAL-WRENCH TOOL**

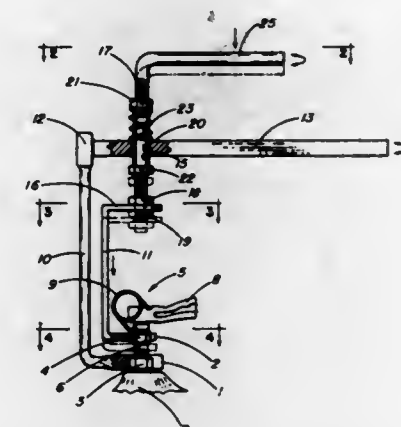
Richard V. Krupke, 17 West 18th Street, Merced, Calif.

Filed Dec. 27, 1971, Ser. No. 212,589

Int. Cl. B25b 9/00, 13/48

U.S. Cl. 81-3 F

7 Claims



A hand tool including superposed open-end wrenches adapted for ready and effective engagement—at the same time, and in clearance relation to adjacent obstructions—with the lock nut and valve clearance adjustment nut, respectively, of a rocker arm assembly of an overhead cam engine; the tool providing, in unitary combination with the wrenches, hand-manipulated parts by means of which the wrenches are selectively and independently operated from a point a distance thereabove.



3,731,560

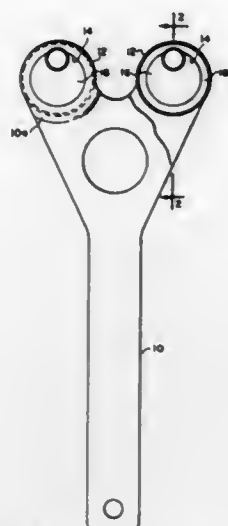
## ADJUSTABLE SPANNER WRENCH

James D. Bares, Gates Mills, Ohio, assignor to Milbar Corporation, Chagrin Falls, Ohio

Filed Oct. 20, 1971, Ser. No. 190,754

Int. Cl. B25b 13/00

U.S. Cl. 81—90 C



A spanner wrench has a Y-shaped body with a pair of rotatable members disposed in the legs of the Y. Each member has a pin carried thereby spaced from the axis. Upon rotation of the members the spacing between the pins is changed to enable them to engage in holes differently spaced from each other.

3,731,561

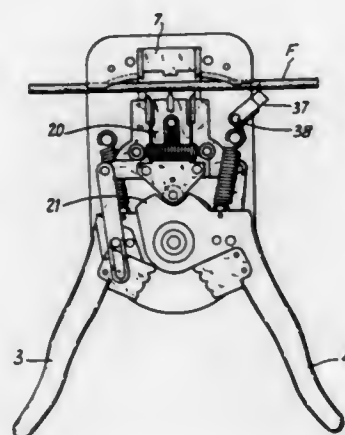
## MECHANISM FOR SEVERING AND SIMULTANEOUSLY STRIPPING WIRES COVERED BY A SHEET

Emile R. Mongredien, Epinay-sur-Seine, France, assignor to La Telemecanique Electrique, Marechal Joffre Namterre (Hauts-de-Seine), France

Filed May 25, 1971, Ser. No. 146,757

Int. Cl. H02g 1/12

U.S. Cl. 81—9.5 A



The invention discloses a mechanism, for incorporation into a hand-operated tool, for severing, and stripping the ends of, a sheath-covered wire, e.g. an insulated electric conductor. Two cammed handles push a movable block towards a stationary block, the former having a central severing blade and two lateral stripping knives registrable with lateral knives on the stationary block. After cutting the sheath, a lost-motion connection between the handles and the movable block causes the movable knives to pivot outwardly and to expel the stripped ends of the severed wire. The invention enables the simultaneous severing, and stripping the severed ends of, a wire anywhere along its length.

3,731,562

## RECESSING TOOL

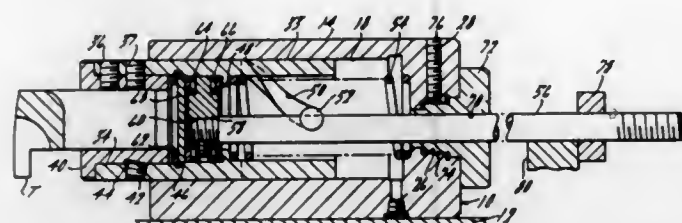
Helmut C. Heuser, Birmingham, Mich., assignor to Bokum Tool Company, Inc., Madison Heights, Mich.

Filed April 5, 1971, Ser. No. 130,883

Int. Cl. B23b 41/00

7 Claims U.S. Cl. 82—1.2

3 Claims



A recessing tool for forming an annular recess within a cylindrical opening in a workpiece, intended for use on an automatic screw machine, having a holder, a cam body carried by said holder for relative angular movement about an axis parallel to but displaced from the axis of relative rotation between the holder and work piece and for relative axial movement between the holder and cam body. Cam means are interposed between said holder and cam body effective upon relative axial displacement therebetween to produce relative angular movement therebetween, and means for effecting longitudinal movement of the holder to project a recessing tool carried by the cam body into a cylindrical opening in a work piece. A drawbar is connected to the cam body and abutment means acting between the drawbar and the support for the holder arrests forward movement of the cam body while the holder continues to move in a direction parallel to the axis of the bore in the work piece. This displaces a recessing tool carried by the cam body outwardly of the axis of relative rotation between the holder and work piece, due to the eccentric relationship of the cam body relative to such axis.

3,731,563

## HYDROSTATIC SPOOL BEARING FOR USE IN TRACER ASSEMBLY OF PATTERN CONTROLLED MACHINE

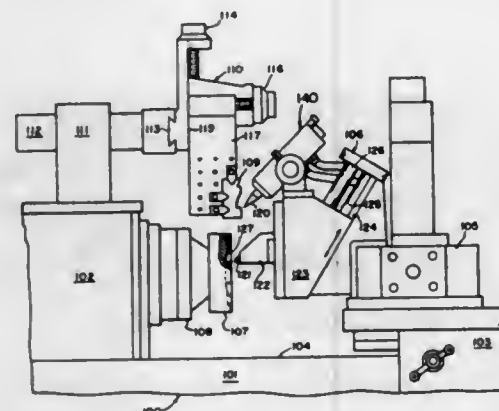
Alan F. Williams, Palo Alto, and Edward H. Phillips, Los Altos, both of Calif., assignors to Tydeman Machine Works, Inc., Redwood City, Calif.

Division of Ser. No. 859,985, Sept. 22, 1969, abandoned. This application Nov. 4, 1971, Ser. No. 195,883

Int. Cl. B23b 3/28

U.S. Cl. 82—14 A

2 Claims



A spool bearing for cartridge spindles and the like has a hollow tubular barrel with a central fluid inlet and a spool shaft mounted in the hollow barrel for rotation. The spool shaft has a relieved central portion adjacent to the fluid inlet into the barrel and a pair of stepped lands on its opposite ends whereby

pressurized fluid from the inlet will flow generally in an axial direction over the lands at opposite ends of the spool shaft and support it on a fluid film bearing within the barrel. A hydrostatic thrust bearing can be incorporated on one end of the spool shaft for resisting the axial loadings induced on the shaft spool by tools mounted on its other end.

3,731,564

## MACHINE TOOL

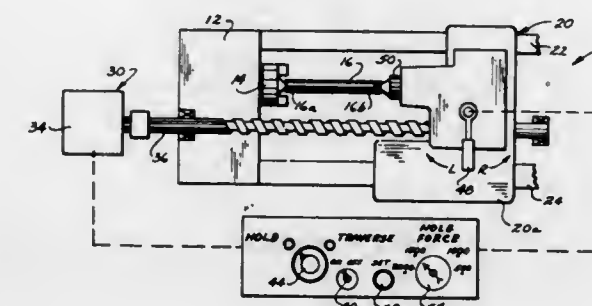
Robert E. Diener, Shaker Heights, and Warren E. Dowling, Cleveland, both of Ohio, assignors to The Warner and Swasey Company, Cleveland, Ohio

Filed Dec. 21, 1970, Ser. No. 100,248

Int. Cl. B23b 23/00

U.S. Cl. 82—31

14 Claims



An improved machine tool has a tailstock which is moved along a bed by a drive assembly which includes a screw driven by an electrical torque type motor. A relatively large setting or jamming force is used to initially lock a workpiece in the machine tool. During operation of the machine tool, the motor is maintained in a stalled condition in which it produces a holding torque which urges the tailstock against the workpiece to thereby clamp the workpiece in the machine tool. The torque which the motor produces in the stalled condition is selectively adjustable by varying the voltage applied to the motor.

3,731,565

## TOOLHOLDER

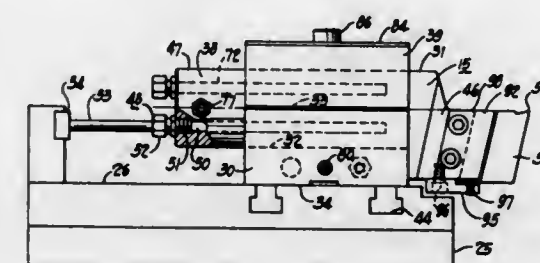
Ernest F. Barkhurst, Euclid, Ohio, assignor to Acme-Cleveland Corporation, Cleveland, Ohio

Filed Aug. 31, 1970, Ser. No. 68,109

Int. Cl. B23b 25/06

U.S. Cl. 82—34 R

21 Claims



A standard toolholder is disclosed to be mounted on any one of the several cross-slides of an automatic screw machine having uniform distance between the slide mounting surface and the cutting plane parallel thereto. The toolholder assembly includes a holder base receiving a cylindrical shank of a tool-holder on the front of which is mounted any one of a variety of tools, such as dovetail, circular, flat, cut-off, shaving, knurling, burnishing, stenciling, single roll threading, recessing and boring tools. Such toolholder assembly provides

3,731,566

## REST APPARATUS FOR PREVENTING BENDING OF A WORKPIECE

Mikishi Kurimoto, Nagoya; Kenji Nomura, and Hiromichi Onouchi, both of Aichi, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariyashi, Aichi-ken, Japan

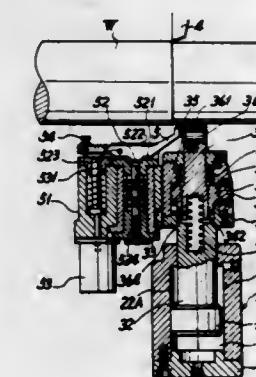
Filed Dec. 22, 1971, Ser. No. 210,732

Claims priority, application Japan, Dec. 22, 1970, 45/124239

Int. Cl. B23b 25/00

U.S. Cl. 82—38 R

6 Claims



A rest apparatus for supporting a workpiece of any diameter to prevent bending thereof during a machining operation features a rest shaft engageable with the workpiece and a piston for moving the rest shaft being telescopically arranged therewith. The position of the piston is controlled by a servo-valve actuated by a solenoid-operated stylus which may engage the workpiece. When a preselected relationship between the stylus and the servo-valve is properly established, the rest shaft is tightly clamped while engaging the workpiece so that the workpiece may be positively supported thereby.

3,731,567

## METHOD AND A MACHINE FOR CUTTING OPEN ENDED OR BLIND CAVITIES

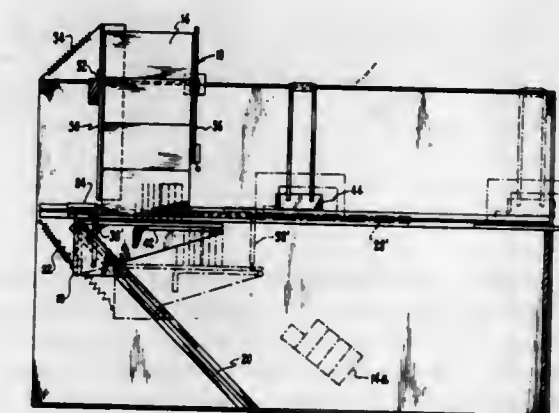
Cray L. Ross, 309 Jackson Road, Enfield, Conn.

Filed Oct. 21, 1971, Ser. No. 191,383

Int. Cl. B26d 3/00

U.S. Cl. 83—1

6 Claims



A method and a machine for cutting open ended or blind cavities in a block of material to fit merchandise having an irregular shape, by using a heated wire die to be inserted into, move laterally within and removed from block of the material.



3,731,568

**METHOD AND APPARATUS FOR PROCESSING MOLDED BODIES**

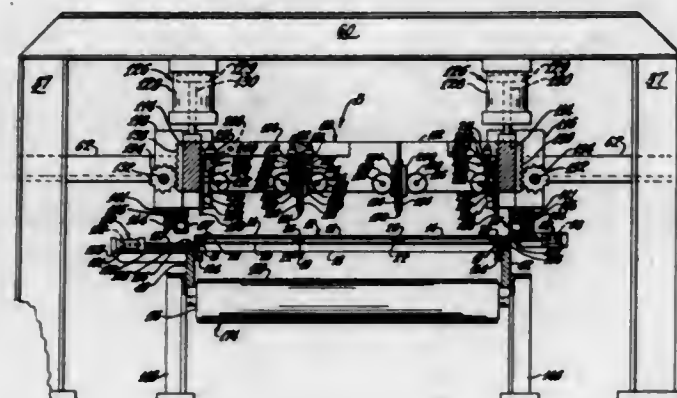
Gregory C. Brock, Jr., and Ulysses T. Gambill, both of Granville, Ohio, assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Jan. 26, 1971, Ser. No. 109,873

Int. Cl. B26d 7/06, 7/18

U.S. Cl. 83—23

21 Claims



The disclosure embraces a method of and apparatus for processing a plurality of molded bodies and involves feeding a plurality of connected bodies, such as bodies of mineral fibers and a portable mounting support therefor to a facility arranged to strip or separate the bodies by severing connections joining the bodies and detaching and removing the severed discrete bodies from the mounting support.

3,731,569

**HARVESTING MACHINE**

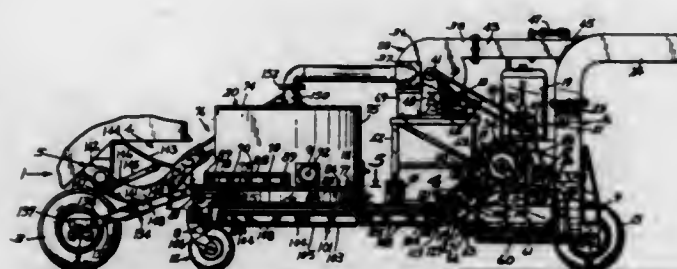
John W. Quanrud, 1538 5th Avenue N.W., Jamestown, N. Dak.

Filed May 13, 1971, Ser. No. 143,132

Int. Cl. A01d 55/00, 57/00; B26d 5/20

U.S. Cl. 83—356.3

8 Claims



A harvesting machine for attachment to the discharge end of a mobile agricultural implement for common traveling movement therewith and for reception of material from the implement. A mobile frame has a receiver pivotally mounted thereon on a vertical axis, the receiver including a hood having a top wall and a peripheral wall defining an open front. A draft frame is utilized to pivotally connect the mobile frame to the implement through the receiver and permits vertical movements of the frame and parts carried thereby relative to the implement while holding the receiver against pivotal movements on said vertical axis relative to the implement.

3,731,570

**TRIM TENSIONING LIMITER**

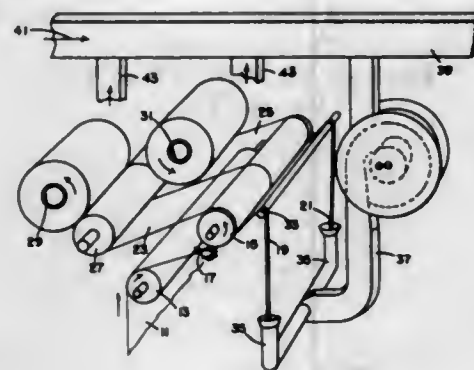
Seddon C. Nelson, Fredericksburg, Va., assignor to FMC Corporation, Philadelphia, Pa.

Filed Oct. 4, 1971, Ser. No. 185,961

Int. Cl. B26d 5/38

U.S. Cl. 83—370

10 Claims



Apparatus for conveying continuous web edge trim under tension, with means for severing such trim when it is subjected to longitudinal tensions above a predetermined value to thereby prevent the travel of excessive tensions back to locations at which web trimming is being effected.

3,731,571

**ADJUSTABLE GUIDE TABLE FOR STRIP APPROACHING A CROSS-CUT SHEAR**

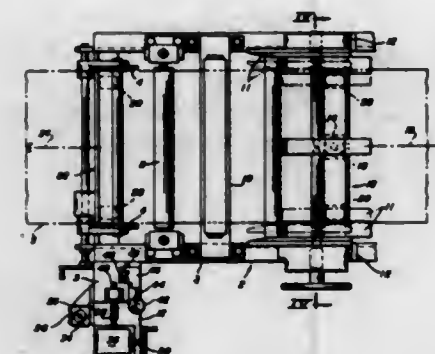
Robert W. Larson, McKeesport, and Glen E. Morris, Elizabeth Township, Allegheny County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1971, Ser. No. 211,516

Int. Cl. B26d 7/06

U.S. Cl. 83—420

4 Claims



Apparatus includes a strip guide table mounted on a fixed base frame for pivotal movement about a pivot point at its discharge end intermediate its sides toward a cross-cut shear in a strip processing line. Means are connected with the entry end of the table for pivoting the table to correct for camber or other irregularity in the strip shape so that the strip approaches the cross-cut shear at right angles after it leaves the guide table. An indicator means is mounted on the base frame in engagement with the guide frame. The indicator mean is calibrated to indicate the variation of the longitudinal centerline of the guide table from the longitudinal centerline of the processing line so that it can be ascertained when the guide table is in proper position for correcting for the amount of camber or other irregularity in the strip and to cause the strip to approach the cross-cut shears at right angles thereto.

3,731,572

**MITER BOX**

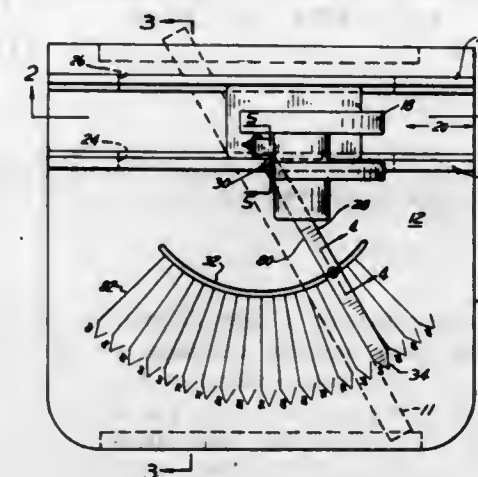
Richard S. Crooks, 2277 Newman Dr., Trenton, Mich.

Filed Sept. 28, 1970, Ser. No. 75,900

Int. Cl. B27b 27/08

U.S. Cl. 83—471.3

7 Claims



The invention relates to an improved miter box. It comprises a board for supporting a work piece that is underneath the work piece; an arm rotatable on the plane of the board; a pair of parallel rails fixed to the board for guiding a circular saw; slots in the rails through which the work piece passes; the work piece being guided along the arm towards the saw; means on the board for designating the angle of the arm with the path of the saw; and means fixing this angle by selectively maintaining a rigid connection between the arm and the board.

3,731,573

**SAFETY GUARD FOR FABRICATING APPARATUS**

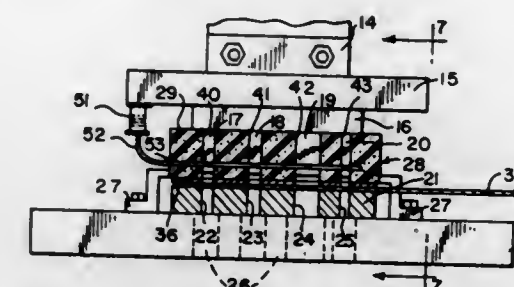
Earl M. Jahnke, 188 Berkley Avenue, Elmhurst, Ill., and Robert Miller, 63 W. 73rd St., Darien, Ill.

Filed Feb. 22, 1972, Ser. No. 227,912

Int. Cl. B26d 5/08

U.S. Cl. 83—544

10 Claims



A safety guard for a power press is provided, the press including a conventional ram and upper and lower plates defining a tool and die containing space. The guard comprises a block of sponge rubber or other resilient material which substantially occupies the space and within which the tool and die elements are contained. The block is suitably apertured so that work may be passed through the space and the space is completely enclosed to prevent access by the operator.

3,731,574

**APPARATUS FOR CUTTING LENGTHS OF CONVOLUTED PICKET WIRE FROM A CONTINUOUS STRAND THEREOF**

Paul McCarthy, and John F. Nelson, both of Concord, Calif., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 6, 1971, Ser. No. 208,718

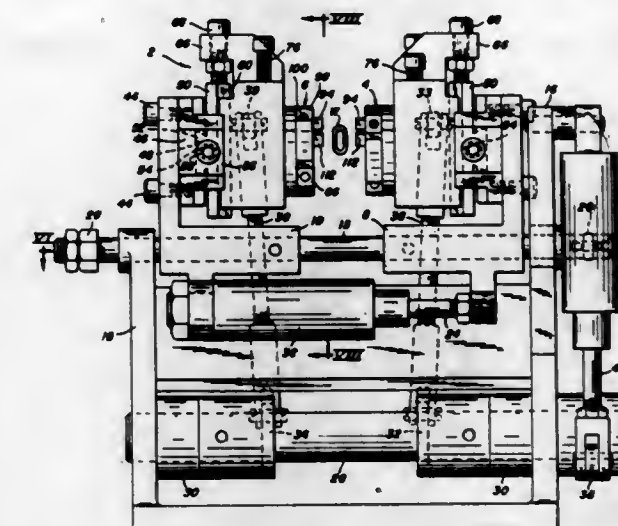
Int. Cl. B26d 5/02

U.S. Cl. 83—558

11 Claims

Apparatus includes a pair of shear heads mounted astride a continuous length of convoluted picket wire for linear move-

ment toward and away from the strand. Each of said shear heads being provided with a rotatable cutting blade and a fixed cutting blade positioned to engage a common convolution of the strand at two separate points and cutting away a



portion of the convolution to cut away a length of picket wire from the strand when the rotatable cutting blades are rotated. Such cutting operation simultaneously forming a tail end on the length of wire cut away from the continuous strand and a head end on the leading end of the continuous strand.

3,731,575

**CHOPPER FOR LINEAR MATERIAL**

Robert J. Gelin, Newark, Ohio, assignor to Owens-Corning Fiberglass Corporation

Continuation of Ser. No. 850,780, Aug. 18, 1969, abandoned.

This application Nov. 8, 1971, Ser. No. 196,660

Int. Cl. B23d 25/12; C03b 37/02

U.S. Cl. 83—344

8 Claims



Apparatus for severing continuous linear material into discontinuous lengths where the apparatus urges two rolls toward each other into cutting engagement and includes a stopping arrangement limiting the extent of movement of the rolls toward each other.



3,731,576

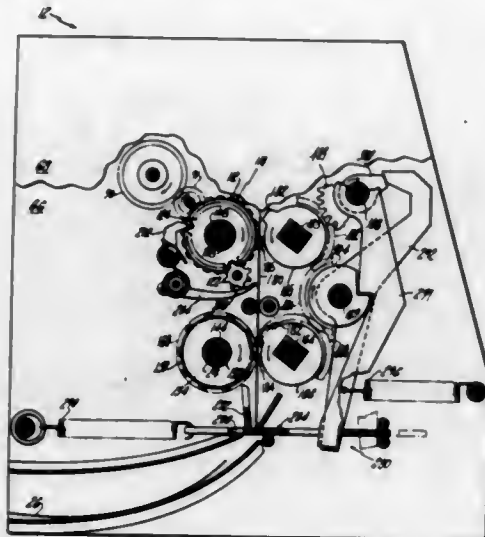
## SHEARING MECHANISM

Bruno S. Smilgys, Hartford, Conn., and Robert C. Ritchie, Feeding Hills, Mass., assignors to Veeder Industries Inc., Hartford, Conn.

Continuation of Ser. No. 80,260, Oct. 13, 1970, Pat. No. 3,668,375. This application June 2, 1972, Ser. No. 259,284  
Int. Cl. B26d 5/08

U.S. Cl. 83—587

7 Claims



A spring actuated reciprocable shearing member having a spring biased actuator for resetting the shearing member in a retracted position and a latch for holding the shearing member in the retracted position. In the cutting operation, the actuator is first withdrawn against the bias of its spring and then the shearing member is actuated by its spring upon release of the latch.

3,731,577

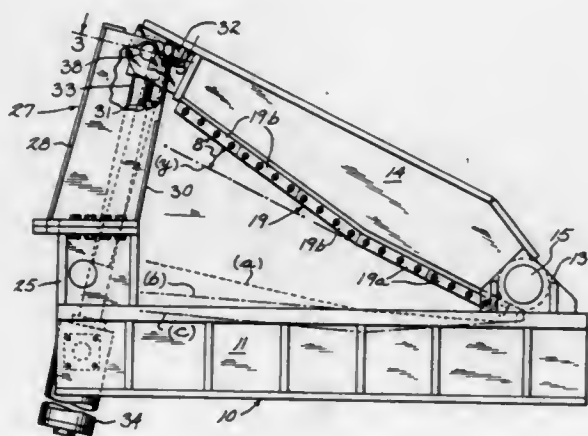
## ALLIGATOR SHEARS

Albert G. Swint, Jr., Cordele, Ga., assignor to Julius L. Chazen, Chattanooga, Tenn.

Filed March 15, 1971, Ser. No. 123,992  
Int. Cl. B26d 5/12

U.S. Cl. 83—599

1 Claim



An alligator shear for large scrap has a bed with widely spaced sets of horizontally disposed anvil blades. A wide jaw pivoted to the bed has shearing blades on opposite sides, which blades extend at a predetermined angle for part of the length of the knife beam and at a greater angle for the remainder of the length of the beam for coaction with the spaced sets of anvil blades on the bed to provide a double cut, there being fluid pressure operated cylinders pulling down on the jaw and there being a closed U-shaped guide for the front end of the jaw resisting thrust from either direction.

3,731,578

## SAWING SYSTEM FOR SAWING OF LOGS SORTED TO DIAMETER CLASS

Bo Ingemar Ackerfeldt, Ascona, Switzerland, assignor to U.S. Natural Resources, Inc., Portland, Oreg.

Filed Dec. 10, 1971, Ser. No. 206,788  
Int. Cl. B27b 15/05, 29/08

U.S. Cl. 83—731

12 Claims



Log infeed apparatus for a sawmill includes log-holding arms depending from separate carriages on an overhead trackway. The trackway is positioned so that the lower, log-gripping portions of the arms move the log in the feeding line for the saws. A first endless drive line moves connected carriages at a first speed along the trackway, and a second endless drive line moves connected carriages at a second speed greater than the first speed along the trackway to facilitate the gripping and release of logs by the arms. Each log-holding arm has both a fore log-gripping device facing in the infeed direction and a rear log-gripping device facing in the opposite direction so that a single arm can support opposite ends of two longitudinally adjacent logs in the feeding line.

3,731,579

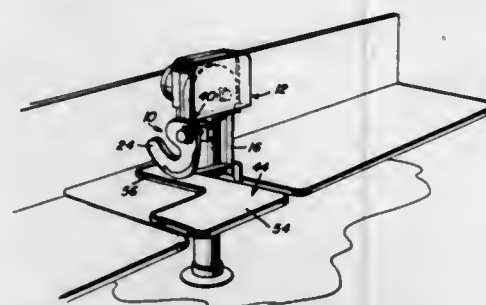
## TRIMMING GUIDE FOR MEAT

Herman F. Russell, 13900 Cherrylawn, Detroit, Mich.

Filed April 13, 1971, Ser. No. 133,662  
Int. Cl. B26d 1/46

U.S. Cl. 83—802

8 Claims



A vertically orientated plate-like member pivotally mounted on a meat saw so as to be vertically adjustable within the path of movement of meat being cut and swingable vertically in response to meat passing thereunder. The member is mounted for lateral adjustment toward and away from the blade of the machine and is adapted to ride along the lean line of the meat so as to act as a guide along which the meat can be moved to insure the retaining of a predetermined amount of fat thereon. The plate-like member, positioned laterally of the blade, also effectively acts as a guard against accidental contact with the blade by the meat handler.

3,731,580

## TONE BAR FIXING STRUCTURE FOR A METAL TONE BAR TYPE PERCUSSION MUSICAL INSTRUMENT

Shigeo Suzuki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Nov. 25, 1970, Ser. No. 92,801

Claims priority, application Japan, Nov. 28, 1969, 44/112653

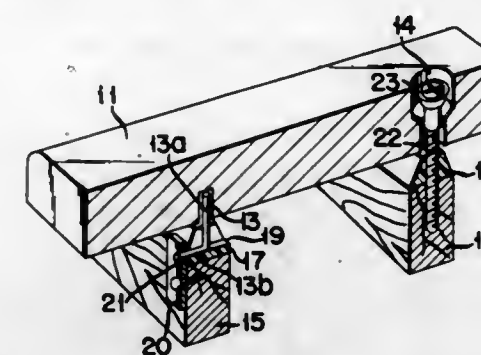
Int. Cl. G01d 13/08

U.S. Cl. 84—403

13 Claims

A metal tone bar type percussion musical instrument comprises a plurality of metallic tone bars arranged side by side on

a pair of spaced apart support members. Each tone bar has at one nodal point a generally L-shaped engagement member including a vertical section and a horizontal section extending, respectively, perpendicular and parallel to the tone bar and has a through hole at the other nodal point. The tone bar is



fixed to one of the support members by means of the L-shaped engagement member with the engagement member being mounted to the lower side of the tone bar, and to the other of the support members by driving a screw or nail thereinto through the hole.

3,731,581

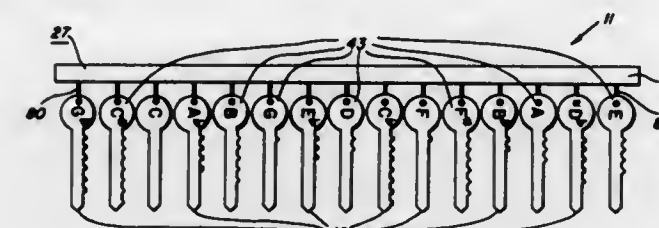
## MUSIC TEACHING AID

Lucy E. Griffin, 3661 Charleswood, Memphis, Tenn.

Filed Aug. 10, 1971, Ser. No. 170,469  
Int. Cl. G09b 15/02

U.S. Cl. 84—471

4 Claims



A device or aid used for teaching key signatures in music. The device includes a plurality of key-shaped members, one for each key signature having indicia thereon indicating the music key, and the device includes a hanger to removably hang the key-shaped members adjacent one another for selection by the pupil. The key-shaped members representing key signatures composed of sharps are provided with pointed protrusions representing the number of sharps in the key signature, and the key-shaped members representing key signatures composed of flats are provided with squared protrusions representing the number of flats in the key signature.

3,731,582

## SIGHT AND SOUND TEACHING AID FOR KEYBOARD INSTRUMENTS

Cecil F. Gullickson, 2018 Foggate Drive, Winter Park, Fla.

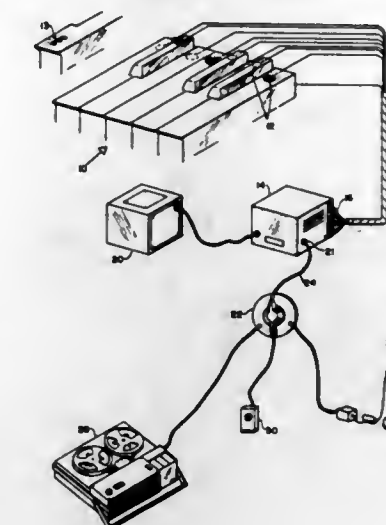
Filed July 14, 1970, Ser. No. 54,733  
Int. Cl. G09b 15/08

U.S. Cl. 84—478

1 Claim

A sight and sound instructional arrangement for use in conjunction with a keyboard instrument, involving the use of illumination means associated with certain keys of the keyboard instrument, in conjunction with means sensitive to certain frequencies and connected to turn on the illumination means upon these certain frequencies being received by the frequency-sensitive means. This arrangement is particularly suitable for use by a beginning musician inasmuch as by the use of this

invention, he or she can see certain keys illuminated at such time as the frequency-sensitive means receives the preascertained frequencies. One preferred embodiment of this inven-



tion involves the use of instructional tapes containing voice instruction for the beginning musician as well as tones or frequencies for causing keys appropriate to the instruction to be illuminated at the proper time.

3,731,583

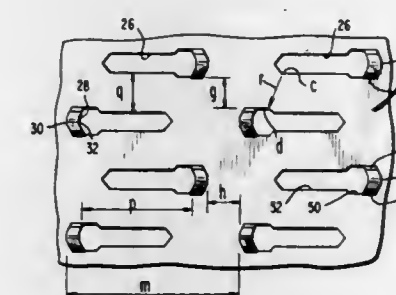
## CONNECTOR PLATE

John Calvin Jureit, Coral Gables, Fla., assignor to Automated Building Components, Inc., Miami, Fla.

Filed July 30, 1971, Ser. No. 167,374  
Int. Cl. F16b 15/00

U.S. Cl. 85—13

8 Claims



The connector plate has a plurality of nail-like teeth struck to project at right angles to the plate for embedment into adjoining wooden members of the hard wood variety. The teeth are struck in longitudinal rows, the teeth in each row being staggered relative to the teeth of next adjacent rows. The slots in next adjacent rows of teeth extend from the associated teeth in opposite directions. Each tooth has lateral shoulders projecting from the opposite edges of the tooth adjacent its base portion. The slot portions left in the plate by the shoulder portions lie opposite the metal portion of the plate between adjacent slots in next adjacent longitudinal rows thereby preserving net section. Increased back-to-back spacing of the teeth in next adjacent rows is provided to preclude cutting and slicing the wood upon insertion of the teeth into the wooden members of the joint. Also, the tips of the teeth are substantially blunt with the lateral edges defining each tooth tip forming an included angle of about 100 degrees whereby the tendency of the wood to split in particularly hard woods is substantially reduced.



3,731,584

**AUTOMATIC PROPELLANT FEED SYSTEM**

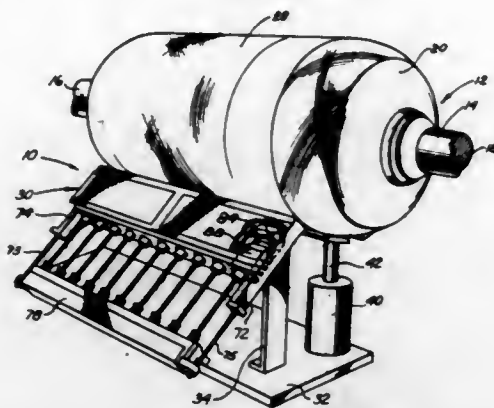
Bruce Gilbert, Waco, Tex., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed June 13, 1967, Ser. No. 648,528

Int. Cl. B31c 1/00; F42b 33/10

U.S. Cl. 86—1

12 Claims A/70



Apparatus and process for making filament reinforced solid propellant grains by automatically extruding uncured propellant and winding filaments onto a rotating grain-forming mandrel. Heatable compactor blades, underlying the mandrel, spread the propellant evenly and lower its viscosity if necessary as the propellant is applied from a plurality of extruders. The compactor blades and extruders are interconnected to simultaneously move toward and away from the mandrel.

3,731,585

**CONTAINER FOR EXPLOSIVES**

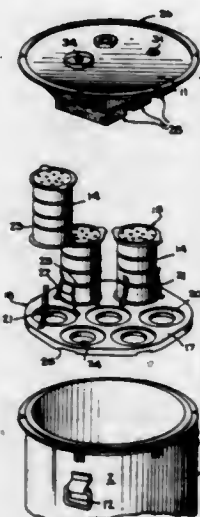
Edmund Demberg, Wharton, and Sylvestro Ruffini, Budd Lake, both of N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed Dec. 4, 1970, Ser. No. 95,175

Int. Cl. C06b 21/02

U.S. Cl. 86—1

5 Claims



An improved storage container is disclosed for the safe storage of materials such as sensitive explosives and pyrotechnic mixtures. The container is fluid tight with a removable cover and an internal support means in which the sensitive material is held while immersed in a desensitizing liquid. Gauging means are provided for monitoring the level of the desensitizing liquid and filling and pressure control means are included for maintaining the liquid level and for preventing a pressure build-up within the container as well as for providing for a controlled pressure release during storage or when the container is to be opened.

The invention described herein may be manufactured used and licensed by or for the Government for Governmental purposes without the payment to us of any royalties thereon.

3,731,586

**CAMERA CASE WITH RETRACTABLE VIEWFINDER**

Roberto Meazza, Milan, Italy, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

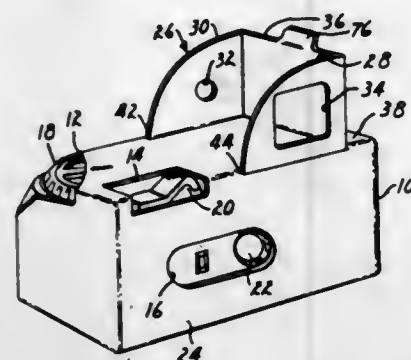
Filed Oct. 18, 1971, Ser. No. 190,176

Claims priority, application Italy, Oct. 16, 1970, 54097

Int. Cl. G03b 13/04; A45c 11/38

U.S. Cl. 88—1.5 R

3 Claims



A camera case which includes a retractable view finder having substantially parallel plate members with opposed, view-finding orifices therein, the plate members being retractable through slots in the case to assume positions between adjacent walls of the camera and the case.

3,731,587

**PROJECTILE EXTRACTION APPARATUS**

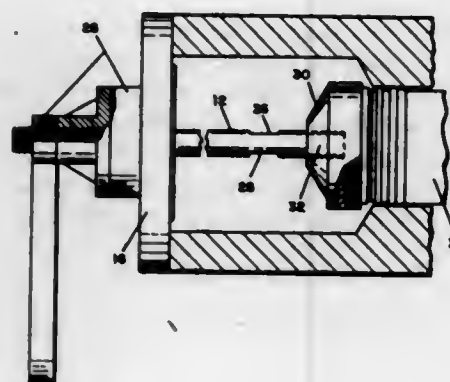
Andrew A. Digiacomo, West Caldwell, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 8, 1970, Ser. No. 96,210

Int. Cl. F41f 17/16

U.S. Cl. 89—1 R

2 Claims



An apparatus for the extraction of a jammed artillery projectile from the bore of an artillery piece, comprising in combination, a first cooperative attachment means, said means depending from the breech end of an artillery projectile; a second cooperative attachment means, said second means being complementary and attachable to said first means, said second means disposed at the end of an extension rod; the extraction of the jammed projectile being attained by the insertion of said extension rod into the breech of the artillery piece, followed by the securing of said second means to said first means and the subsequent removal of the jammed shell by the pulling of the extraction apparatus, with attached projectile, out through the breach of the artillery piece.

3,731,588

**MACHINE GUN HAVING TRIGGER GROUP**

George F. Curtis, East Longmeadow, and Henry J. Tatro, Jr., Westfield, both of Mass., assignors to Colt Industries Operating Corp., Hartford, Conn.

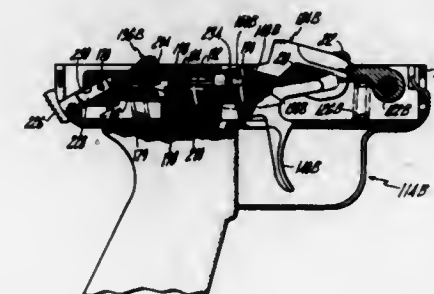
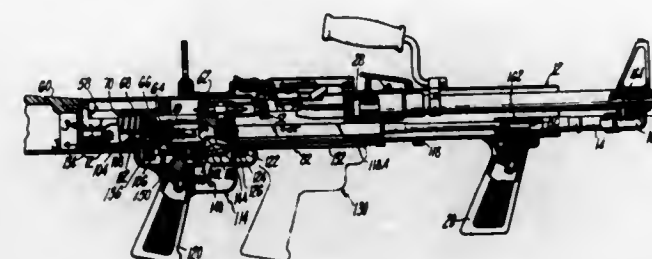
Continuation-in-part of Ser. No. 857,479, Sept. 12, 1969, Pat. No. 3,688,641. This application Nov. 22, 1971, Ser. No.

200,686

Int. Cl. F41d 11/02

U.S. Cl. 89—1 K

24 Claims



The machine gun of this invention features a bolt assembly reciprocally mounted within a receiver and removably maintained within the receiver by a single latch mechanism, and a fire control group supported for reciprocation on the receiver between a forward charging position and a rear firing position, the fire control group including a sear releasably holding the bolt assembly in cocked condition, the fire control group having a releasable latch and a trigger pivot shaft mounted for movement laterally of the receiver and serving as a safety when the fire control group is in rear firing position.

3,731,589

**METHOD OF AND APPARATUS FOR AUTOMATICALLY CLEARING A DIRECTIVE GUN FROM OBSTACLE**

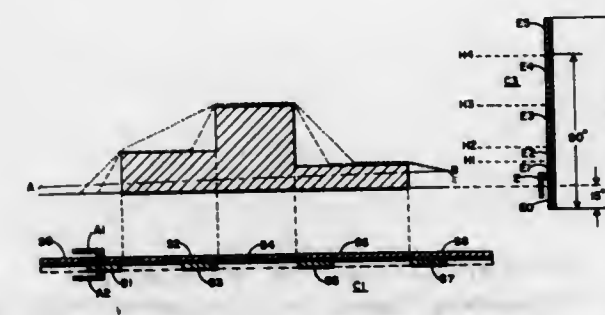
Rolf D. Pfeiffer, and Wolf D. Gruenberg, both of Doernagheim, Germany, assignors to Honeywell G.m.b.H., Frankfurt am Main, Germany

Filed April 3, 1969, Ser. No. 814,890

Int. Cl. F41g 5/14

U.S. Cl. 89—41 C

9 Claims



A method of clearing a biaxially directive gun from obstacles lying at a fixed position in relation to the gun position. The method is used in conjunction with guns which are positioned by a gunner operated sight via a selsyn. The normal

control signals transmitted from the gunner operated sight to the gun director circuits are interrupted at predetermined azimuth and elevation positions corresponding to an obstacle location, and preset azimuth and elevation signals are interposed to avoid the obstacle. An example of logic circuitry and other apparatus for implementing the method of the invention is disclosed.

3,731,590

**IMPROVEMENTS IN RECIPROCATING SLIDE TYPE HANDGUN AUTOMATIC FIREARMS**

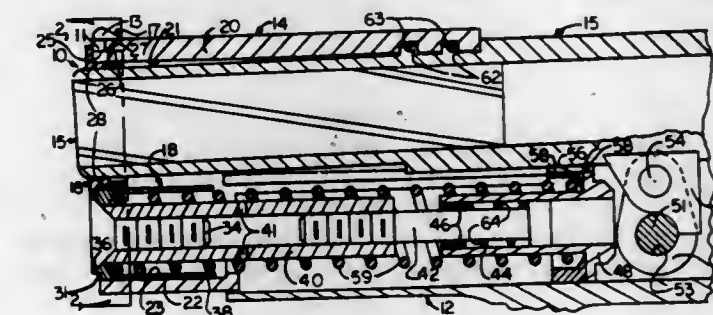
John G. Zimmerman, Jr., 19894 Woodward, Mount Clemens, Mich.

Filed Oct. 5, 1970, Ser. No. 78,016

Int. Cl. F41d 11/00

U.S. Cl. 89—163

13 Claims



A reciprocating slide type handgun automatic firearm is disclosed comprising a slide, a recoil mechanism comprising front and rear spring guides and recoil compression spring means operative therebetween, and take-up means holding said spring guides slidable in respect to each other so that all parts of said recoil mechanism are held together as a subassembly without loose parts, said slide having means for holding the front end of said recoil mechanism, an internal radial slot formed in said slide on opposite sides of the vertical axis thereof, said slot being open at opposite ends thereof, a barrel bushing having spaced apart protuberant lock means thereon disposed in said slot, said barrel bushing rotatable in respect to said slide to facilitate assembly of said recoil mechanism in said firearm, said protuberant lock means holding said barrel bushing axially fast in the front end of said slide, said barrel bushing having means thereon for pushing upon the front end of said recoil mechanism during recoil of said firearm.

3,731,591

**GEAR SHAVING MACHINE**

Richard W. Tersch, Grosse Pointe Woods, and Arthur B. Bassoff, Oak Park, both of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Nov. 29, 1971, Ser. No. 202,886

Int. Cl. B23f 9/04, 5/12

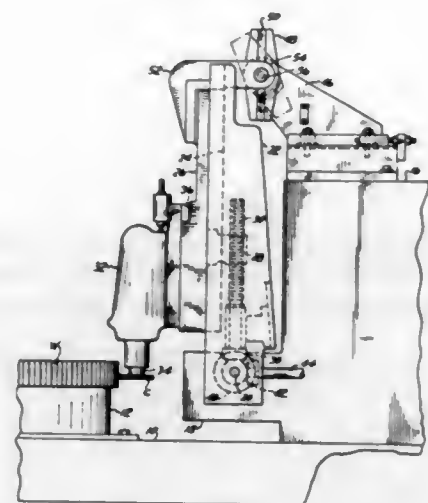
U.S. Cl. 90—1.6

10 Claims

A machine for shaving the teeth of a relatively large gear and simultaneously imparting a longitudinally crowned formation thereto, comprising a tiltable guide member, a cutter



head slide movable along the tiltable guide member, and cam means interconnecting the cutter head slide and a stationary



frame portion to control tilting of the guide member in accordance with movement of the cutter head slide therealong.

3,731,592

# VALVING MECHANISM FOR HYDRAULIC STORAGE MEANS, ESPECIALLY FOR HYDRAULIC TESTING APPARATUS

Heinz Kreiskorte, Post Dortmund-Hoerder, Germany, assignor to Carl Schenck Maschinenfabrik GmbH, Darmstadt, Germany

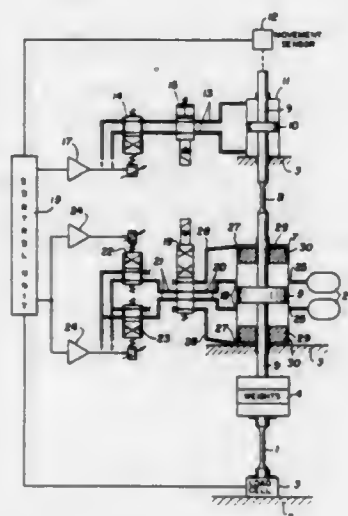
Filed Dec. 8, 1971, Ser. No. 205,957

Claims priority, application Germany, Oct. 28, 1971, P 21 53 749.5

Int. Cl. F15b 11/16, 13/06

U.S. Cl. 91-411 A

6 Claims



The present valving mechanism forms part of the load piston cylinder means, for example, of a hydraulic testing apparatus. The load cylinder is provided with a first control inlet at each end thereof and a second control inlet substantially at each end of the resonant stroke of the piston. Storage means are connected to the load cylinder also substantially at each end of said resonant stroke. Further, control ring pistons are slideably arranged on the piston rod on each side of a piston which is fixed to the rod. The control ring pistons close or open the ports to said storage means.

## 3,731,593 AXIAL PISTON PUMP

Ilie Chivari, Bochum, Germany, assignor to Vulkan Kupplungs-u. Getriebebau Bernhard Hackforth, Wanne-Eickel, Germany

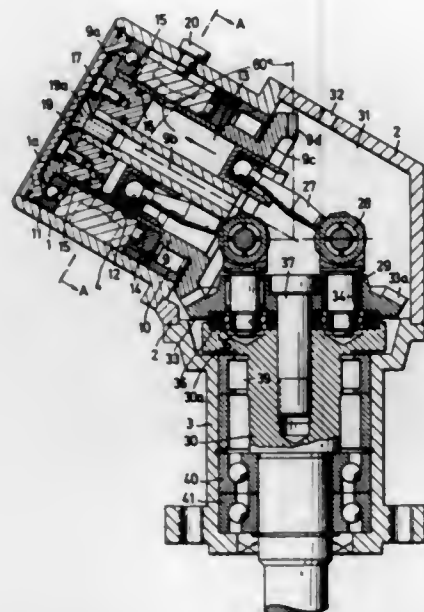
Filed March 10, 1970, Ser. No. 18,183

Claims priority, application Germany, March 13, 1969, P 19 12 634.2

Int. Cl. F01b 13/04

U.S. Cl. 91-487

6 Claims



A pump comprises a rotary cylinder block which contains a number of axially reciprocating pistons and the axis of rotation of which is inclined to the axis of rotation of a driving shaft of the pump; the cylinder block is driven by the driving shaft through bevel gears having a 1:1 ratio. The cylinder block rotates in bearings in a pump housing and the pistons are connected to a driving flange on the driving shaft by connecting rods which extend between universal joints at their ends. Each cylinder is connected through a port in the cylinder wall to an inlet duct during substantially half of each revolution of the cylinder block and to an outlet duct during substantially the remaining part of each revolution. The inlet and outlet ducts are situated on opposite sides of the plane which contains the axes of rotation of both the cylinder block and the driving shaft. The bearings in which the cylinder block rotates extend around the periphery of the cylinder block and the bevel gears are external, the driving bevel gear extending around the periphery of the driving flange and the driven bevel gear extending around the periphery of the cylinder block. The ports are directed outwards from the cylinders towards inlet and outlet ducts arranged between the cylinder block and the internal peripheral wall of the housing and these ducts connect with further inlet and outlet ducts through the housing itself.

3,731,594

# FUNCTION GENERATOR TRANSDUCER

George C. Rannenber, Canton, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 25, 1971, Ser. No. 118,718

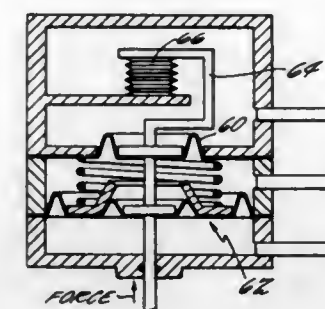
Int. Cl. G011 7/08

U.S. Cl. 92-36

6 Claims

A force equal to a function of a sensed pressure is obtained

by combining a stroking and nonstroking piston by use of pistons associated therewith. The cylinders and pistons diaphragms sensing a pressure. One of the pistons carries a cooperating to form two pressure chambers. The appropriate



variable area surface which varies the effective area of the diaphragm forming a part of the other piston.

3,731,595

# CYLINDRICAL BELLOWS SEAL FOR EXTENSIVE AXIAL MOVEMENT

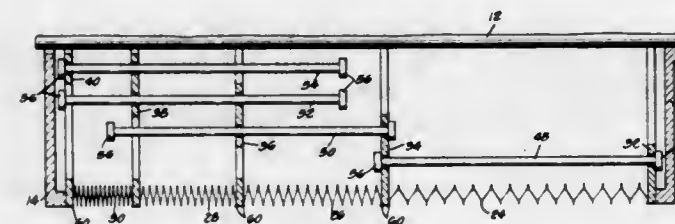
Robert Seabury Wentworth, Jr., Wilmington, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 1, 1971, Ser. No. 203,620

Int. Cl. F01b 19/00; F16j 3/00

U.S. Cl. 92-37

10 Claims



A composite cylindrical bellows seal including a plurality of cylindrical bellows seal segments each hermetically connected at each axial end to respective annular limit discs. Certain of the limit discs are commonly connected between two adjacent bellows segments to form the composite bellows seal. Limit rods are connected between the limit discs in a manner permitting unrestrained contraction of each bellows segment while limiting the expansion of each bellows segment to within an appropriate limit selected for the respective bellows segment. The limit disc at one end of the composite seal is adapted to be hermetically connected to a movable actuator rod or shaft and the limit disc at the other end of the composite seal is adapted to be connected to the housing or body which receives the actuator rod.

3,731,596

# TWO-CIRCUIT WHEEL CYLINDER

Jochen Burgdorf, Odenwaldring, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed April 5, 1971, Ser. No. 131,195

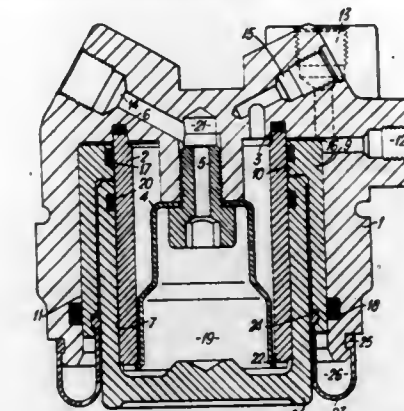
Claims priority, application Germany, April 30, 1970, P 20 21 208.2

Int. Cl. F01b 1/02

U.S. Cl. 92-52

14 Claims

There is disclosed various embodiments of a two-circuit wheel cylinder including two concentric cylinders and two



surfaces of the two pistons are separately sealed to cooperating surfaces of the two cylinders so that a leak in either seal arrangement may be readily detected externally.

3,731,597

# ROTARY OPERATOR

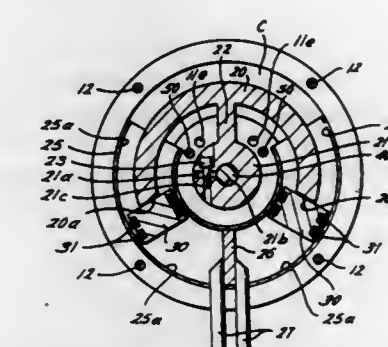
Glen D. Payne, Houston, Tex., assignor to The Arcas Company, Houston, Tex.

Continuation-in-part of Ser. No. 42,240, June 1, 1970, abandoned. This application Feb. 16, 1972, Ser. No. 226,834

Int. Cl. F01c 9/00; F16j 1/10

U.S. Cl. 92-120

6 Claims



A rotary operator for operating a valve or the like by rotating same a partial revolution in either rotational direction, wherein the operator has a pair of self-centering floating pistons movable by an arcuately curved piston rod in a tubular insert assembly mounted in a housing, and wherein each piston has a double O-ring seal which prevents misalignment and resultant binding of pistons during arcuate floating movement controlled by fluid pressure introduced into the insert assembly. The tubular insert assembly is made from conventional tubing which is bent to an arcuate shape so as to eliminate machining and other relatively expensive manufacturing costs.

3,731,598

# FLUID PRESSURE OPERATED MOTOR OR GENERATOR

Andre Brignon, Saint Maur, and Michel Georges Durand, Villeparisis, both of France, assignors to Compagnie Des Freins et Signaux Westinghouse, Freinville-Sevran, France

Filed July 7, 1971, Ser. No. 160,452

Claims priority, application France, Aug. 13, 1970, 7029786

Int. Cl. F01c 9/00

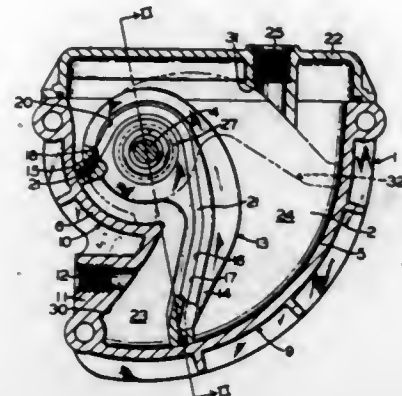
U.S. Cl. 92-125

5 Claims

A fluid pressure operable rotary motor or generator characterized by a pressure blade fixed to a shaft for effecting limited angular rotation of the shaft about its axis in opposite

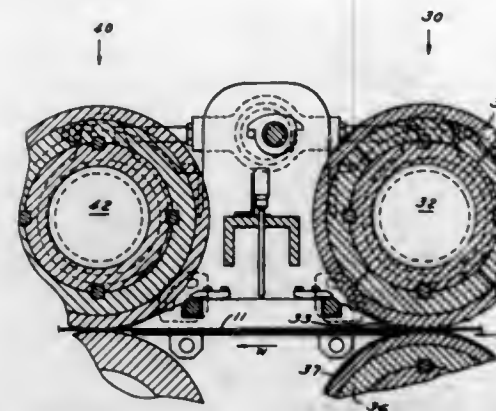


directions, the direction of said rotation being determined by the dominant pressure of two opposing pressures acting on respective opposite sides of said blade which is mounted in a single-piece casing section to accommodate said limited angu-



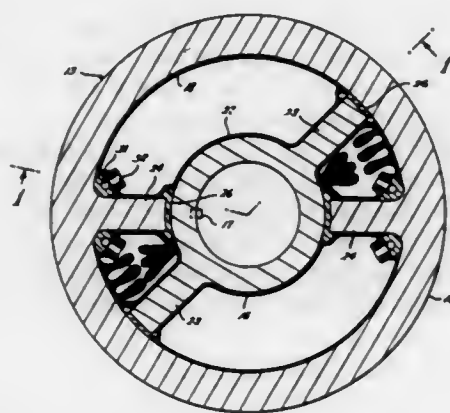
lar rotation of the blade, said blade having peripherally disposed sealing means thereon for making sealing contact with the inner surface of said casing section thereby sealingly isolating said opposite sides of the blade.

**3,731,600**  
**RESILIENT FEMALE SCORING**  
James F. Earp, Clearwater, Fla., assignor to Ex-Cello-O Corporation, Detroit, Mich.  
Filed March 16, 1971, Ser. No. 124,698  
Int. Cl. B31b 1/14  
U.S. Cl. 93-58.1 2 Claims



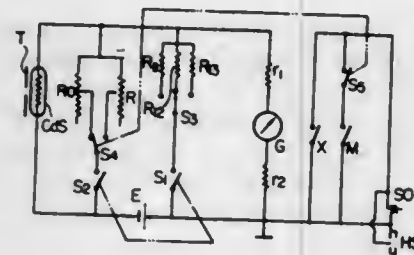
A paperboard scoring arrangement for a rotary converter unit utilizing a typical male scoring roll in conjunction with resilient blanketed scoring roll of narrow cross-section and mounted on a metal backing cylinder.

**3,731,599**  
**ROTARY OPERATOR**  
Herbert Allen, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.  
Filed March 8, 1971, Ser. No. 122,063  
Int. Cl. F01c 9/00  
U.S. Cl. 92-122 3 Claims



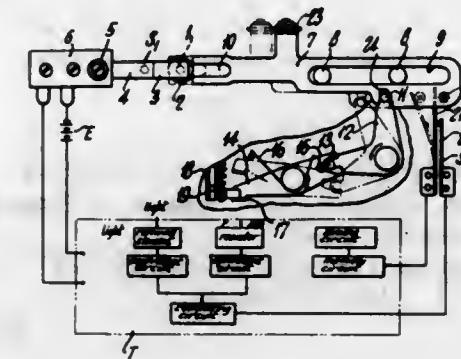
There is disclosed an operator in which flexible bags are disposed between adjacent vanes and fixed walls on a rotatable shaft and a housing, respectively, which extend across an annular chamber formed by the shaft and housing and arranged concentrically about the shaft. Pressure fluid is selectively admitted to bags on one side of the vanes while being exhausted from bags on the other sides of the vanes so as to cause the vanes to rotate between alternate positions within the chamber.

**3,731,601**  
**FLASH SYNCHRONIZING DEVICE**  
Seichiro Matsuzaki, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan  
Filed April 21, 1971, Ser. No. 135,927  
Int. Cl. G03b 7/16  
U.S. Cl. 95-10 CE 4 Claims



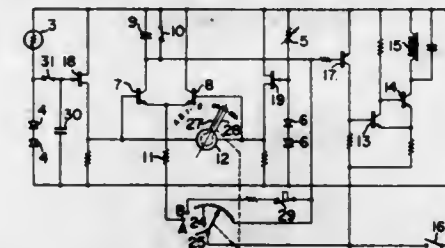
Flash synchronizing device of a photographic camera having an automatic exposure control device and a programming shutter for synchronizing a flash bulb used with the camera so as to obtain the proper exposure. The device comprises M-contacts coupled with the shutter so as to be closed at about the moment the shutter blades begin to be opened, and a variable resistor connected to the automatic exposure control device of the camera and coupled with a distance setting ring of the camera so that the resistance of the variable resistor is varied as the distance set in the distance setting ring is varied. The resistance characteristics of the variable resistor is so determined that the aperture of the programming shutter is increased by the resistance of the variable resistor beyond the aperture normally obtainable by the automatic exposure control device thereby permitting the decrease in the light quantity received through the shutter due to the non-synchronization of the peak of radiation of the flash bulb with the full aperture of the shutter controlled by the automatic exposure control device to be compensated for to attain the proper exposure.

**3,731,602**  
**REFLEX CAMERA AUTOMATIC SHUTTER TIMING MECHANISM**  
Yukio Umemura, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan  
Filed Nov. 26, 1971, Ser. No. 202,360  
Claims priority, application Japan, Feb. 22, 1971, 46/10386  
Int. Cl. G03b 7/08, 19/12  
U.S. Cl. 95-10 CT 4 Claims



A single lens reflex camera includes a shutter control network connected through a first normally open switch to an energizing battery and containing a light measuring circuit and an adjusting circuit connected to a computer circuit whose output is connected through a normally closed second switch to a memory circuit which controls a shutter timing circuit. The partial depression of the shutter release button closes the first switch and a mirror retraction member, before release of the shutter, actuates a member which locks the button in its depressed position and opens the second switch. The return of the mirror retraction member retracts the locking member to close the second switch and release the shutter release button which returns to its retracted position and opens the first switch.

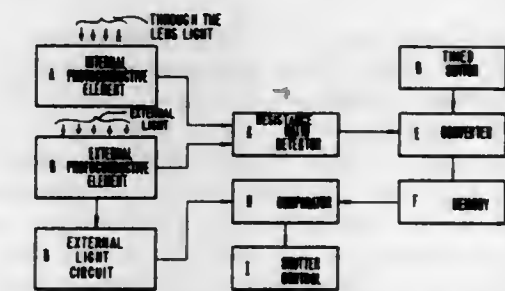
**3,731,603**  
**AUTOMATIC EXPOSURE TIME CONTROL DEVICE FOR CAMERAS**  
Shigei Ono, Yokohama-shi, and Ichiro Hamaguchi, Tokyo, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan  
Continuation of Ser. No. 13,078, Feb. 20, 1970, abandoned.  
This application June 15, 1971, Ser. No. 156,956  
Claims priority, application Japan, Feb. 26, 1969, 44/13980  
Int. Cl. G03b 7/08  
U.S. Cl. 95-10 CT 4 Claims



An improved automatic exposure time control device for cameras is composed of mechanical and electrical parts. A means is provided for converting the brightness of the object to be photographed into the control current including a photosensitive element and a capacitor wherein a differential amplifier is integrated, one input of said amplifier is subjected to a voltage proportional to logarithm of the brightness of the object and the other is subjected to a voltage in response to the exposure factors. Further an indicator is connected between said input terminals and another manually adjustable resistor is provided for manual control. The control current

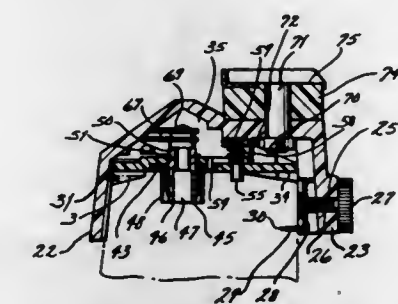
which sets exposure time is compensated for automatically by the circuit including the differential amplifier and the indicator with regard to the characteristics of the photosensitive element. When the mechanism is switched to manual control the measuring circuit having the indicator also acts as the interlocked exposure meter, and the exposure time may selectively coincide with either the indicated optimum value or the arbitrary deviated under-or over-exposure value.

**3,731,604**  
**ELECTRIC SHUTTER OPERATING CIRCUIT FOR CAMERAS**  
Masaya Fujii, Tokyo, and Osamu Ichihashi, Hamamatsu, both of Japan, assignors to Yashica Company, Ltd., Tokyo, Japan  
Filed June 10, 1971, Ser. No. 151,719  
Claims priority, application Japan, June 12, 1970, 45/50521  
Int. Cl. G03b 7/08, 9/62  
U.S. Cl. 95-10 CT 5 Claims



A ratio detector detects the ratio between the resistances of internal and external photoconductive elements. The output of the ratio detector is converted to a corresponding resistance value, and current determined by the ratio is applied during a definite interval to a first charge capacitor, acting as a memory for the ratio. A second capacitor is charged through the external photoconductive element concurrently with the opening of the shutter of the camera. The outputs from the first and second capacitors are compared to produce an output pulse when these two outputs coincide and to close the shutter.

**3,731,605**  
**ELECTRONIC FLASH ADAPTER FOR PERCUSSION-IGNITABLE FLASH CAMERAS**  
Keisuke Kitagawa, Tokyo, Japan, assignor to Kalimar, Inc., St. Louis, Mo.  
Filed June 25, 1971, Ser. No. 156,887  
Claims priority, application Japan, May 11, 1971, 46/030873; May 11, 1971, 46/036983  
Int. Cl. G03b 19/02  
U.S. Cl. 95-11 R 9 Claims



A device for adapting electronic flash units for use with cameras designed for use with percussion-ignitable flash lamps. The adapter includes a body member having a socket connector which engages the camera flash bulb receiving socket. The body also includes a support for engaging the pedestal of an electronic flash unit; within the body, contacts are provided for closing the electronic flash unit circuit upon operation of the camera shutter release.



3,731,606

## PROCESS AND APPARATUS FOR THE TAKING OF PHOTOGRAPHS IN RELIEF

Marcel Geoffroy, 10 rue Lenotre, Rillieux, France

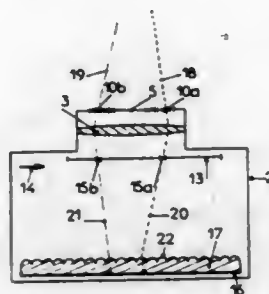
Filed April 27, 1971, Ser. No. 137,865

Claims priority, application France, April 29, 1970, 7015597

Int. Cl. G03b 35/08

U.S. Cl. 95—18 P

5 Claims



Method and apparatus for taking photographs in relief. Light from the object being photographed is first passed through an opaque diaphragm having a plurality of pairs of spaced slots therein, then a lens disposed behind the diaphragm, next a movable shutter having two spaced apart slots therein separated a distance equal to the separation of a pair of slots in the diaphragm disposed behind the lens, and finally a lenticulated screen disposed behind the shutter whereby an image of the object is focused in relief on a selected segment of a film.

3,731,607

## STEREOSCOPIC CAMERA ARRANGEMENT

Klaus Rudolf Mandler, Nestorstrasse 11, Berlin, Germany

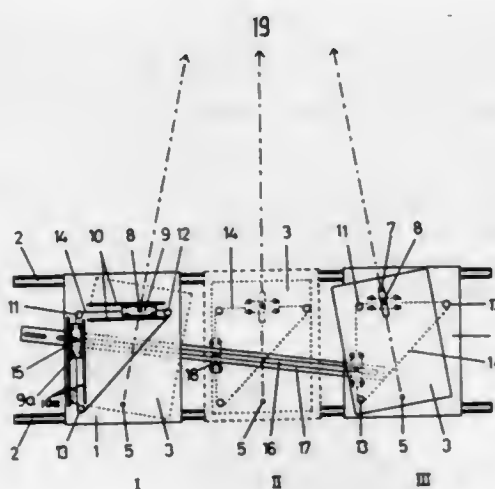
Filed Aug. 6, 1971, Ser. No. 169,688

Claims priority, application Germany, Aug. 11, 1970, P 20 40 952.3

Int. Cl. G03b 35/02

U.S. Cl. 95—18 P

8 Claims



An arrangement for taking stereographic photographs with a movably mounted single lens camera. The camera is pivotally mounted by means of a hollow cylindrical member on a carriage which is laterally movable on a pair of parallel rails with respect to the object to be photographed. The pivot axis of the camera is located in the plane of the lenticular screen, respectively film of the camera. A pair of guide means are slidably mounted in the carriage of the camera and are normally movably mounted with respect to each other on said carriage by being connected to an endless cable which is mounted around at least three rotatable support rollers extending from said carriage. The pair of guide means are con-

nected by means of pin and slot connections to the base of the camera. A guide member having a guide slot which is substantially coextensive with the lateral movement of the camera, is adjustably mounted underneath the carriage and a pin of a first one of said pin and slot connections is slidably movable in the guide slot thereof. A pin of the second one of said pin and slot connections extends into a slot in the base of the camera. A guide rail, being also substantially coextensive with the lateral movement of the camera is mounted underneath the carriage. A vertically movable shaft is coaxially movably mounted in the hollow cylindrical member and its movement is controlled by the guide rail for coaction with a pivotable lever mounted in the camera which actuates the screen moving mechanism and shutter mechanism of the camera.

3,731,608

## REFLEX CAMERA WITH MOTOR DRIVE

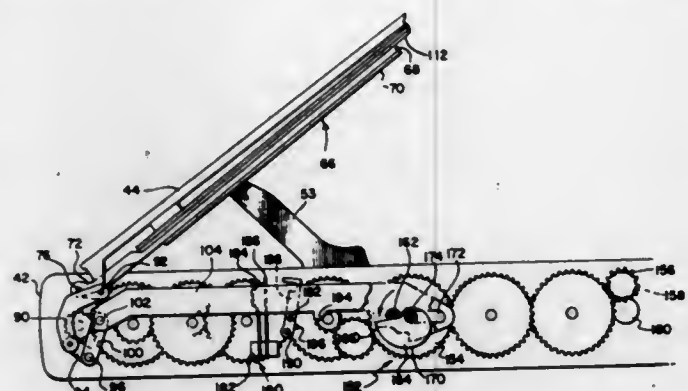
Edwin K. Shenk, Littleton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed April 16, 1971, Ser. No. 134,725

Int. Cl. G03b 19/12

U.S. Cl. 95—42

40 Claims



A single lens reflex camera having an electric motor which is energized twice during a photographic cycle. The first energization of the motor occurs for a short interval and functions to release a reflex operator assembly to convert the camera from a viewing to an exposure mode. A subsequent energization of the motor returns the operator assembly to its initial cocked position while simultaneously powering the rolls of a film processing system.

3,731,609

## MIRROR MECHANISM FOR A SINGLE-LENS REFLEX CAMERA

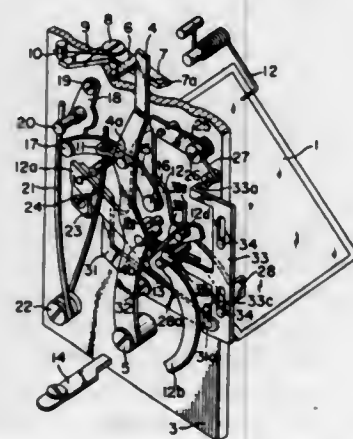
Norio Kobayashi, Kawasaki-shi, and Akihiko Sato, Setagaya-ku, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed July 12, 1972, Ser. No. 271,193

Int. Cl. G03b 19/12

U.S. Cl. 95—42

4 Claims



A mirror mechanism for a single-lens reflex camera whose lens aperture is stopped down with the mirror fixed at its

upper position through manual operation comprises a mirror drive lever 12 and a diaphragm-interlocking lever 28 both rotatably journaled to a mirror box by means of a common shaft. A pressure spring 30 is provided between the two levers to urge them into mutual engagement. A mirror lifting-fixing lever 31 is rotatably journaled to the mirror box for lifting and fixing the mirror. A mirror actuator member 33 for actuating the mirror lifting-fixing lever and the diaphragm-interlocking lever is vertically slidably mounted to the body of the camera. The mirror actuator member is formed with a retainer portion 33a for releasing the engagement between the mirror drive lever and the pressure spring when the mirror is lifted and fixed.

3,731,610

## ELECTRO-OPTICAL PRINTER WITH VARIABLE SPACING AND WIDTH CONTROL

Derek J. Kyte, Chorleywood, England, assignor to Linotype-Paul Limited, London, England

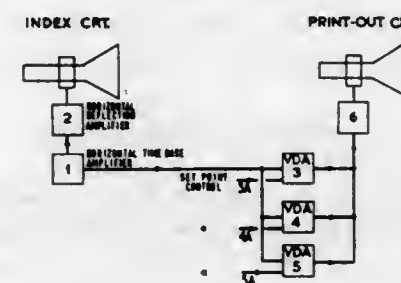
Filed March 5, 1970, Ser. No. 16,913

Claims priority, application Great Britain, March 17, 1969, 13,979/69

Int. Cl. B44b 19/04

U.S. Cl. 95—4.5

8 Claims



An electro-optical system for printing a line of characters from appropriate matrices of the characters comprises a cathode ray tube for successively scanning the matrices, and means for translating the modulated light signals thus obtained into electrical signals which are transmitted to print-out means comprising a cathode ray tube producing a raster comprising successive parallel trace lines and optical means for projecting the trace lines on a film in spaced parallel relationship. The print-out cathode ray tube comprises means for deflecting the light spot in a first direction to form a trace line and means for deflecting it incrementally in a second direction perpendicular to the first between successive trace lines to adjust the spacing between trace lines. It is thereby possible to control the width and spacing between printed characters and to obtain an overlap of characters when desired.

3,731,611

## EXPOSURE CONTROL SYSTEM FOR REPRODUCTION DEVICES

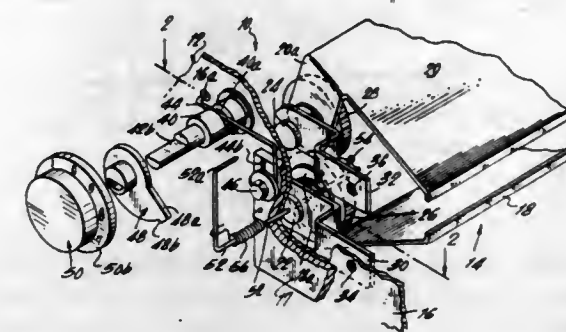
Torulf F. Ansen, Philip Kiernan, and Bernard Mogil, all of Hollywood, Fla., assignors to Copystatics Manufacturing Corporation, Miami Lakes, Fla.

Filed Feb. 11, 1972, Ser. No. 225,481

U.S. Cl. 95—62

7 Claims

An exposure control system is provided for adjusting the opening between a pair of rotatable exposure shutters to control the amount of light to which each section of a copy paper or film is exposed as it passes the shutter opening. The shutter opening is adjusted by selectively rotating the exposure shutters toward or away from each other through actuation of a



which may be manipulated to a selected dial position in accordance with the desired shutter opening and exposure. A single retaining and friction spring locks the exposure control shaft to prevent it from moving in an axial direction and also provides sufficient friction to maintain the exposure control shaft and actuating cam at the selected dial position and shutter opening.

3,731,612

## PHOTOGRAPHIC DEVELOPING DEVICE

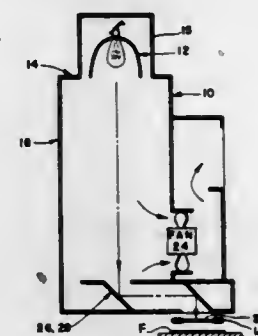
Frederick W. Schmidt, Bedford Heights, and William P. Hamilton, Cleveland, both of Ohio, assignors to Horizons Incorporated, a division of Horizons Research Incorporated, Cleveland, Ohio

Filed Sept. 22, 1971, Ser. No. 182,642

Int. Cl. G03d 13/00

U.S. Cl. 95—89 R

3 Claims



An apparatus for optical development of images in non-silver organic free radical photosensitive media. The apparatus provides uniform high intensity radiation of desired wavelengths without accompanying heat or infrared (IR) radiation which is detrimental to the apparatus and to the photosensitive medium.

3,731,613

## APPARATUS FOR CONTINUOUSLY PRODUCING RAW JUICE BY DIFFUSION, ESPECIALLY FOR THE PRODUCTION OF SUGAR

Reinhard Wolff, and Walter Dietzel, both of 3300 Braunschweig, Germany, assignors to Braunschweigische Maschinenbauanstalt, Braunschweig Am Alten Bahnhof, Germany

Filed Jan. 19, 1972, Ser. No. 219,067

Int. Cl. B01d 33/24

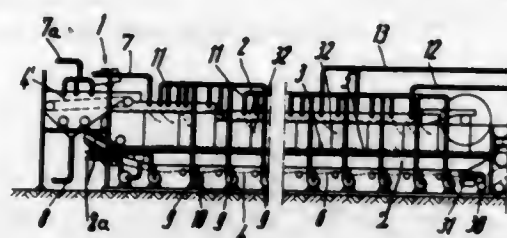
U.S. Cl. 99—275

10 Claims

A raw juice producing apparatus originally designed for the leaching of sugar cane raw material is adapted for use with



sugar cane raw material and/or with sugar beet raw material. For this purpose a substantially horizontally travelling conveyor, the upper run of which travels over a sieve or screen bottom in a trough, is provided with an endless cover made of a fabric or netting that is permeable to liquid. Preferably, the



total length of the cover comprises a plurality of fabric or netting sections secured to carrier members of the travelling conveyor. Cleaning means are arranged for cooperation with the lower run of the conveyor for maintaining the liquid permeability of the fabric or netting.

3,731,614

## APPARATUS FOR COOKING FOOD PRODUCTS

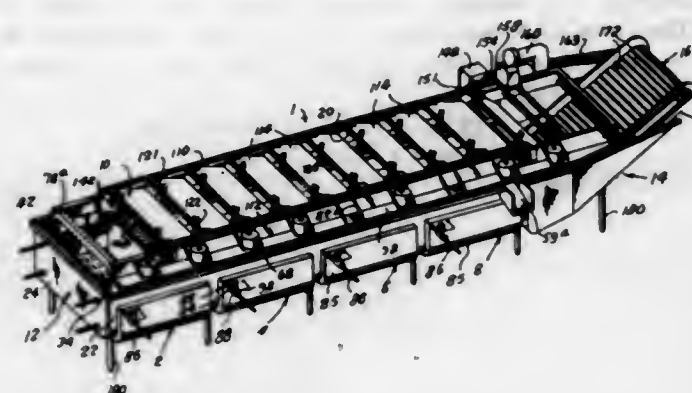
Donald Paul Smith, 4530 Woodfin Drive, and Raymond E. Booth, P.O. Box 34568, both of Dallas, Tex.

Filed Dec. 17, 1971, Ser. No. 209,132

Int. Cl. A47J 37/12

U.S. Cl. 99-404

8 Claims



A method and apparatus for cooking food products wherein a plurality of spaced pumps are arranged to circulate fluid over heating elements of different temperatures spaced in successive planes longitudinally of a cooking trough through which the food product is moved. Jets of heated fluid are introduced into the cooking trough to impinge surfaces of the product, the heated fluid being removed from the cooking trough at spaced locations intermediate ends thereof and circulated across the heating elements for introduction back into the trough such that distinct heating zones of different temperature are formed longitudinally of the trough through which the product is moved at a continuous controlled rate. Floating fat and debris pass into an overflow trough extending longitudinally of the cooking trough for delivery to a drain opening.

3,731,615

## CHERRY PITTING

John L. Margaroli, Oakland, and Fred J. Clumperman, San Lorenzo, both of Calif., assignors to Vistam Corporation, San Leandro, Calif.

Filed Oct. 5, 1970, Ser. No. 77,961

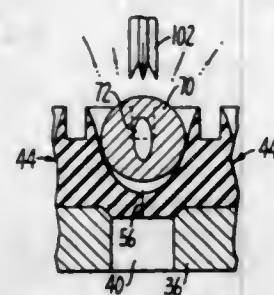
Int. Cl. A23n 3/00

U.S. Cl. 99-559

13 Claims

Apparatus and method for removing pits from fruit such as cherries or the like wherein a moveable conveyor is adapted to

convey the fruit to pitting knife means. The conveyor has a plurality of open-topped fruit pockets formed therein, each of said fruit pockets being adapted to have disposed therein individual specimens of said fruit. Normally closed slits are provided in the bottoms of said pockets for retaining water therein so that said fruit may orient itself under the influence of gravity while floating. A plurality of slots are formed in the conveyor with at least one of the slots in communication with



the interior of each of the fruit pockets. Stem positioning means is disposed adjacent to the path of movement of the conveyor for engaging the stems of the fruit disposed in the fruit pockets as the fruit is being conveyed to the pitting knife means. The stem positioning means positions each fruit stem in a slot which is in communication with the interior of the pocket within which the fruit specimen is disposed. During the actual pitting of the fruit the knife means passes through the fruit forcing the pits thereof through the slits.

3,731,616

## REFUSE COMPACTOR

David R. Ligh, 193 Main Street, Madison, N.J.

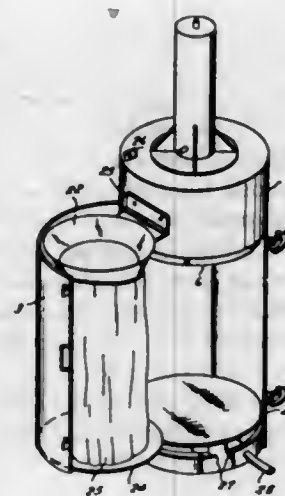
Division of Ser. No. 800,220, Feb. 18, 1969, Pat. No.

3,602,136. This application May 19, 1971, Ser. No. 144,892

Int. Cl. B30b 9/04

U.S. Cl. 100-126

6 Claims



A refuse compactor has an upright housing whose internal compacting chamber is accessible by a door provided in its circumferential wall. The door has a refuse-supporting platform extending from its lower edge and the platform is supported on the lower endwall of the housing when the door is closed. A compacting head fills the cross section of the chamber and is guidedly slidable in axial direction thereof. A power source and motion-transmitting arrangement are provided for advancing the compacting head towards an end wall of the housing to thereby compact refuse between the end wall and the compacting head, and for subsequently withdrawing the compacting head in direction away from the one end wall for enabling removal of the compacted refuse. Drain means drains off any liquid which may be expressed from the refuse.

3,731,617

## BOOK NIPPING APPARATUS

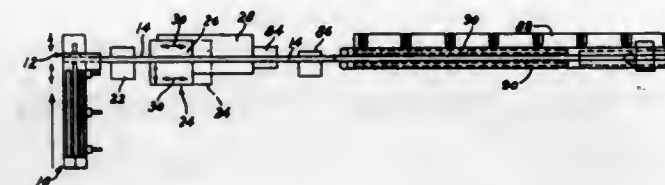
Lewis William Hall, Lancaster, Pa., assignor to The Maple Press Company, York, Pa.

Filed Aug. 2, 1971, Ser. No. 168,057

Int. Cl. B30b 15/30

U.S. Cl. 100-215

14 Claims U.S. Cl. 101-4



Apparatus and a process used in book manufacture to nip or clamp a group of folded and sewn signatures which are assembled in preliminary manner, side by side, with the folded edges in a common plane to form the spine of the book, the nipping being accomplished by a two-stage jaw mechanism which initially clamps the signatures above the folds with firm pressure adequate to prevent slippage between adjacent signatures so as to prevent what is known as camel-backing in the completed book, while tightly compressing the folded ends of the signatures between jaws spaced a slightly greater distance apart to accommodate the slightly greater thickness of the assembled folded edges to effect a final folded set in said signatures.

3,731,618

## REFUSE COMPACTING APPLIANCE

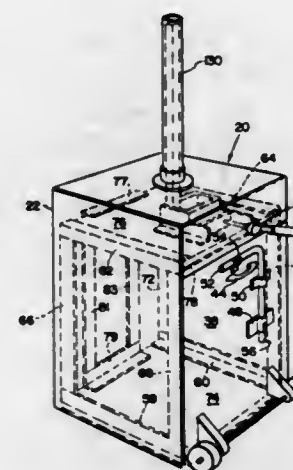
Arthur L. Leman, 28 Rudon Circle, N. Attleboro, Mass.

Filed Nov. 17, 1971, Ser. No. 199,639

Int. Cl. B30b 1/22

U.S. Cl. 100-229 A

7 Claims



A refuse compacting appliance comprises a housing having top and bottom portions that are secured to each other by reinforcing metal ties, a forward open panel through which a refuse receptacle can be stored in the housing when at least partly empty and withdrawn from the housing when full, and a pressure applying mechanism, which incorporates a pressure plate in registration with the receptacle, a rotatable hand crank in association with a double ratchet mechanism that facilitates operation of the pressure plate, and a worm and gear reduction transmission for providing the necessary mechanical advantage for the exertion of a large force on the pressure plate. The arrangement is such that extremely high compacting pressures can be generated manually, trouble free operation can be prolonged despite such high pressures, and compacted refuse can be removed from the receptacle readily.

3,731,619

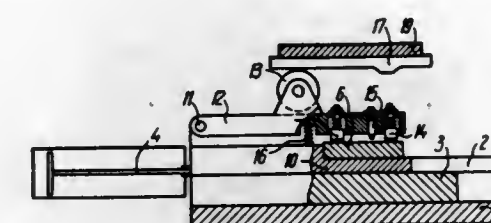
## DEVICE FOR MARKING FLAT SURFACES OF ARTICLES

Efim Lvovich Petrikovsky, Prospekt imeni Lenina, 45, Kv. 34, Chelyabinsk, U.S.S.R.

Filed Dec. 23, 1971, Ser. No. 211,392

Int. Cl. B41f 17/36

1 Claim



A marking tool is secured on a longitudinally swivelling lever which is connected with a reciprocating slide. In the slide, on its side facing the lever a longitudinal slot is made to locate therein the article to be marked. Mounted on said lever is a roller which interacts with a templet bar immovably fixed on the housing of the device to cause marking of an article.

3,731,620

## HYDRAULIC MEANS FOR ADJUSTING EMBOSSEMENT CYLINDERS IN A ROTARY EMBOSSE

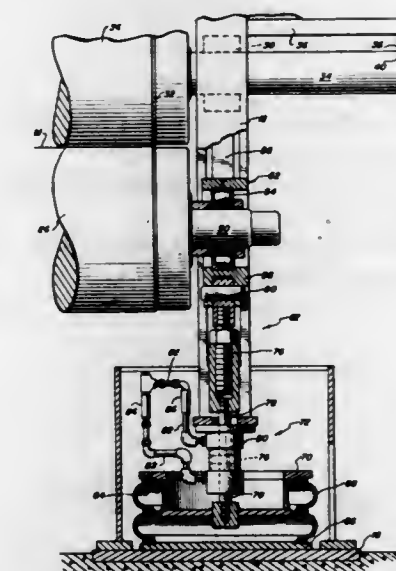
Paul J. Klemmer, Lakeland, Fla., assignor to Appleton Machine Company, Appleton, Wis.

Filed Feb. 8, 1971, Ser. No. 113,371

Int. Cl. B44b 5/00; B30b 3/04

U.S. Cl. 101-23

3 Claims



A roll-type embossing machine in which a pair of material processing rolls are supported on a machine frame. One of the rolls is movable relative to the other and relative to the machine frame by a hydraulic-pneumatic power lift device connected to opposite ends of the movable roll supporting shaft. The other roll is fixed in relation to the machine frame and is provided with an engraved material processing sleeve which can be readily removed and replaced on the machine by means of a swingable bearing support means connected to the roll shaft at one end of the roll and a support bracket or fixture attached to the machine frame adjacent the opposite end of the fixed roll and positioned in close proximity to the roll shaft.



3,731,621

## TAPE PRINTER APPARATUS

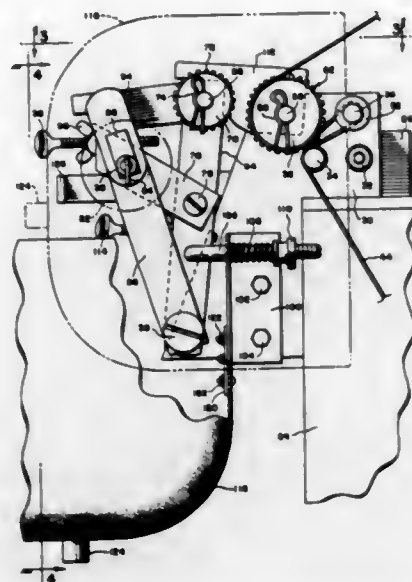
Edmund N. Neckel, Cincinnati, Ohio, assignor to Natmar, Inc., Cincinnati, Ohio

Filed Oct. 14, 1970, Ser. No. 80,668

Int. Cl. B411 47/46; B411 1/40

U.S. Cl. 101-92

20 Claims



A tape printing apparatus for sequentially printing tapes is disclosed. The tape printer apparatus provides for the pre-marking of a standard tape before the addition of the usual identification coding is applied. A print roll and ink means are pivotally interconnected by adjoining levers and the print roll is pivotally connected to be engagable with a backup roll over which the tape passes. Each element is respectively disengageable from the next element. The tape printer apparatus may use cartridges of different colors which make the apparatus adaptable to a wide variety of identification systems. Adjustment means are provided to allow the tape printer apparatus to accept and print tapes of different widths.

3,731,622

## INTERMITTENT TYPE DRUM ADVANCING MEANS IN A HIGH SPEED PRINTER

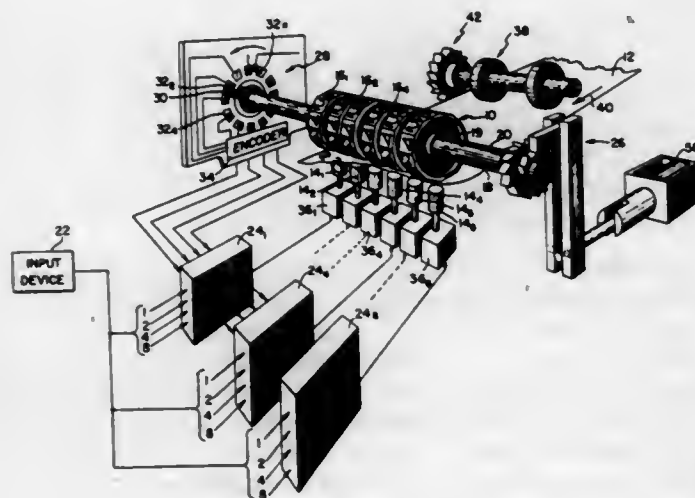
Albert J. Baranoff, c/o California Electro Scientific, 2203 S. Grand Ave., Santa Ana, Calif.

Filed March 18, 1970, Ser. No. 20,647

Int. Cl. B41j 7/48, 1/48

U.S. Cl. 101-93 C

18 Claims



A line printer comprising a set of type wheels that intermittently rotate in unison on a common shaft.

3,731,623

## GLIDER PRESS

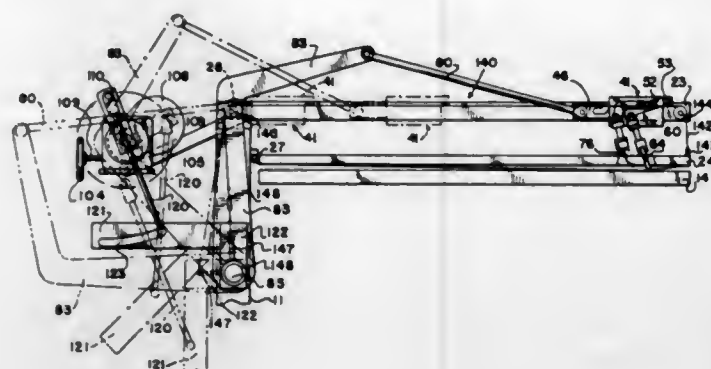
Henry J. Bubley, Deerfield, and Claude H. Oltra, Chicago, both of Ill., assignors to American Screen Process Equipment Company, Chicago, Ill.

Filed Oct. 26, 1970, Ser. No. 83,800

Int. Cl. B411 15/00

U.S. Cl. 101-114

20 Claims



A stencil screen printing press is illustrated having a peeling means which elevates the screen from the surface being printed immediately behind the squeegee for "off-contact" printing. The peeling means elevates the screen faster when the squeegee is at the center of the screen than when the squeegee is at either end to compensate for stretching of the fabric. A novel registration means operating in conjunction with the peeling means is also illustrated. A simplified mechanical drive arrangement permits the press to be of universal design, allowing it to be scaled up or down in width and length to any desired size. A novel carriage assembly to support the squeegee and flood bar is also shown, having a captivated cam arrangement which shifts the squeegee and flood bar at the end of the stroke. Quick change from flood to non-flood condition is also provided.

3,731,624

## ETCHING SOLUTION APPLICATION DEVICE FOR OFFSET PRINTING MACHINES

Tamaki Kaneko, and Katsumi Mizuno, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

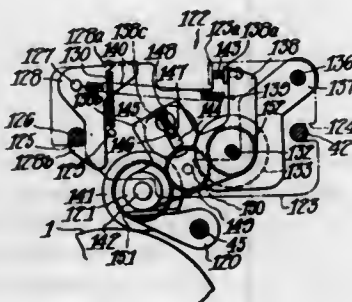
Filed Sept. 10, 1970, Ser. No. 71,172

Claims priority, application Japan, Sept. 15, 1969, 44/73074

Int. Cl. B41f 7/32, 35/06; B411 25/16

U.S. Cl. 101-142

8 Claims



An etching solution application device comprising an etching solution application roller for applying an ink-repellent etching solution to a master plate mounted on a master cylinder of an offset printing machine which device operates such that an etching solution can be supplied to the etching solution application roller before it presses against a master plate on a master cylinder. The device also operates such that the etching solution application roller is rendered inoperative

during steps other than the etching step in which the etching solution application roller presses against the master plate on the master cylinder to apply the etching solution to the master plate and the master plate discharge step in which the master plate on the master cylinder is removed and discharged from the master cylinder, or during the inking step and duplication step.

3,731,625

## PACKAGED EXPLOSIVE

Frank E. Slawinski, Tamaqua, Pa., assignor to ICI America Inc.

Filed May 14, 1971, Ser. No. 143,328

Int. Cl. F42b 3/00

U.S. Cl. 102-24 R

15 Claims



A skin-tight explosive not having an air space or sag, and a method of making it. An explosive containing a plasticizer-extractor is placed in a flexible polyvinyl chloride bag which has been plasticized with an extractable plasticizer. The air space or sagging bag which would normally form is eliminated due to the shrinkage of the bag.

3,731,626

## NON-STRETCHING EXPLOSIVE CORD

Bobby W. Grayson, Oildale, Calif., assignor to Sellers and Brace, Pasadena, Calif.

Continuation-in-part of Ser. No. 27,214, April 10, 1970, Pat. No. 3,572,245. This application Nov. 9, 1970, Ser. No. 87,727

Int. Cl. C06c 5/00

U.S. Cl. 102-27 R

9 Claims



An explosive cord embodying high strength non-stretching means extending therealong and effective to prevent longitudinal stretching of the cord and thereby preventing malfunctioning and propagation failure due to interference with the continuity of the explosive charge. The stretch control filaments may be incorporated in the protective shroud for the cord or applied to the cord independently of the shroud. Additionally the invention cord may include a heat shield exteriorly of the enclosing tube for the explosive material and effective to retard the passage of heat through the latter under higher temperature ambient conditions as in deep earth bores.

3,731,627

## GRENADE PROJECTILE

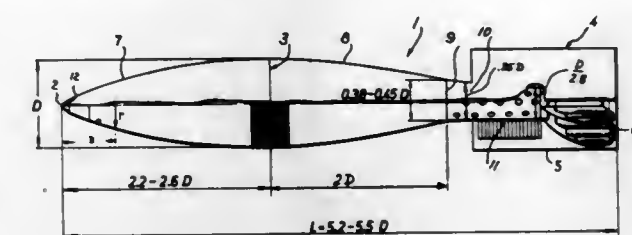
Frederic Arno Donner, Helsinki, and Tapio Kullervo Kronholm, Tampere, both of Finland, assignors to Etablissement Salgad, Vaduz, Liechtenstein

Filed Dec. 21, 1970, Ser. No. 99,772

Int. Cl. F42b 13/22

U.S. Cl. 102-49.2

5 Claims



A projectile for grenade launchers and mortars in which the projectile includes a body portion and a tail or stabilizing portion. The maximum diameter of the projectile is at the band portion of the body and is represented by D. Improved range and accuracy are obtained by shaping the body to conform with a Karmann profile, locating the band so it is 2.2D-2.6D from the nose of the body, using a projectile of an overall length L in a range of from 5.2-5.5D, and terminating the inwardly tapering Karmann profile at the rear of the body at an ogival form with a diameter of approximately 0.35D which merges with a straight trailing portion. The usual sleeve and stabilizing fin arrangement is provided at the rear of the projectile.

3,731,628

## GRAIN SUPPORT FOR SOLID PROPELLANT ROCKET MOTOR

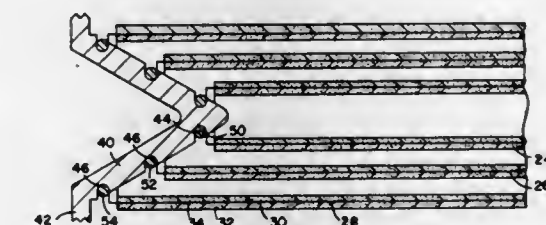
Robert H. Fink, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 1, 1971, Ser. No. 185,494

Int. Cl. F02k 9/04

U.S. Cl. 102-49.3

2 Claims



A solid propellant rocket motor having a plurality of propellant sheets supported in a manner that the sheets can be burned from both sides without blowing the propellant sheets out of the nozzle at the rear of the rocket motor.

3,731,629

## TEMPERATURE DISCRIMINATING DUAL IGNITER ROCKET IGNITION SYSTEM

Charles A. Lombardi, Rockaway, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 27, 1971, Ser. No. 110,286

Int. Cl. F42c 19/12

U.S. Cl. 102-49.7

2 Claims

An igniter system for solid propellant type rockets and is designed to ignite the propellant over a wide range of tem-



perature conditions. The system consists of a pair of igniters in circuitry with a power source. A thermostatic switch in the fir-



ing circuit acts upon a low temperature condition to permit firing of both igniters and upon high temperature, only one igniter.

3,731,630

**HIGH-EXPLOSIVE ARMOR-PIERCING SHELL**

Kurt Muller, 8157 Dielsdorf, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

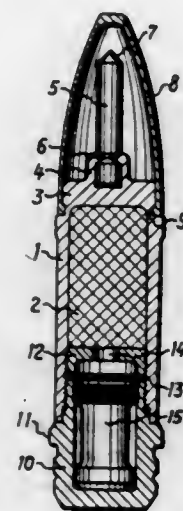
Filed July 29, 1970, Ser. No. 59,136

Claims priority, application Switzerland, Aug. 5, 1969, 11861/69

Int. Cl. F42b 13/06

U.S. Cl. 102-52

6 Claims



A munition and munition for delivery of a payload to a target site wherein the munition has no protuberance to affect the flight of the munition in transit to the target site or true roll of the munition at the target site.

3,731,632

**INCENDIARY GRENADE**

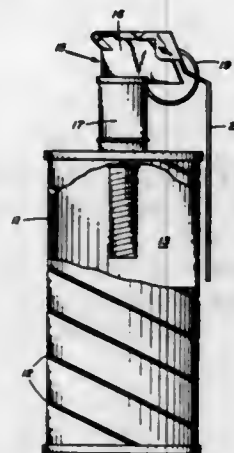
John H. Stevens, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 30, 1970, Ser. No. 64,917

Int. Cl. F42b 27/04

U.S. Cl. 102-65

5 Claims



An incendiary grenade having a canister provided with scored sides, a burster-igniter assembly positioned at the center of the canister and a gelled fuel substantially filling the canister. The burster-igniter assembly comprises a fuse fitted into a burster well or cylinder which is scored to provide a good ignition burst. The grenade expels material which is hot enough to dry and set fire to rain soaked thatched roofs, etc.

3,731,633

**AIR-TO-SURFACE MISSILE**

Dale M. Davis, Freeport, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 5, 1966, Ser. No. 584,943

Int. Cl. F42b 13/48

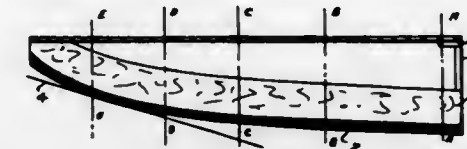
U.S. Cl. 102-67

6 Claims

A high explosive armor piercing shell having a shell body containing an explosive charge. A sabot is formed at the front end of the body and a hard core projects from the front end of the body with which the sabot cooperates. The hard core is in the shape of a bolt having an end portion secured to the sabot. The front end of the body is in the form of a plate integral with the shell body. The hard core is located in a ballistic cap secured to the front end of the body. The hard core has a peripheral groove cut into its rear portion, and the front end of the body has a beaded edge which engages the groove.

An improved missile, which when in stabilized flight is constituted of upper and lower longitudinal casing portions, a

warhead including explosive material confined to the lower casing portion and forming part of the last-mentioned casing portion, the outer surface of the warhead being fragmentized and at its front end, takes the shape broadly of a semicylinder which tapers down in depth (as measured from the horizontal axis of the semicylinder) along the length of the warhead to a



curved shape at the rear end but having less depth than at the front end. The same thickness of explosive material is contained in the warhead throughout its length. Thus, the outer surface of the warhead projects upwardly toward said horizontal axis as its rear end is approached to cause the exploded fragments to leave in a direction rearwardly of the warhead in order to increase the lethal effect of the missile.

3,731,634

**WATERPROOFING MORTAR AMMUNITION**

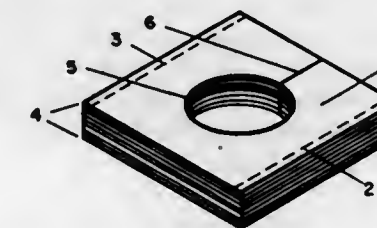
Sydney Axelrod, New York, N.Y., assignor to The United States of America as represented by the Secretary of the Army

Filed Sept. 17, 1971, Ser. No. 181,508

Int. Cl. F42b 1/00, 13/22

U.S. Cl. 102-103

4 Claims



Mortar ammunition comprising a bundle of superimposed sheets of gun-cotton is waterproofed by coating the edges of the bundle with a coating composition of nitrocellulose containing between 10.9 and 11.2 percent by weight nitrogen dissolved in a solvent which does not dissolve guncotton. On removal of the solvent a tough, tight-fitting film of said nitrocellulose is formed, which completely seals the edges of the bundle against water penetration between the sheets and is completely combustible, leaving no residue when the ammunition is fired. The coating composition has no adverse effect on ballistic properties.

3,731,635

**RAIL PULLING APPARATUS**

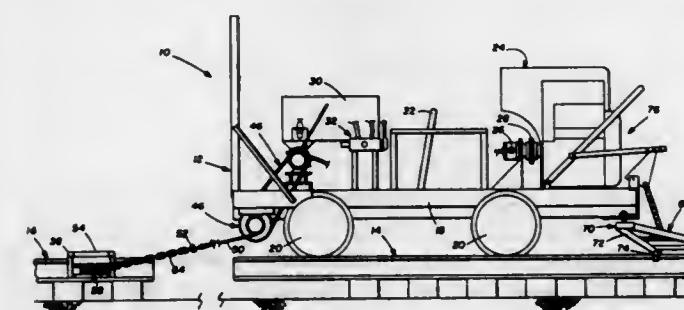
Lester N. Hambrick, Irving, Tex., assignor to Trakwork Equipment Company, Irving, Tex.

Filed Aug. 9, 1971, Ser. No. 169,985

Int. Cl. E01b 31/02

U.S. Cl. 104-1 R

17 Claims



In a rail pulling apparatus, a vehicle is equipped for self-propelled movement along a trackway. The vehicle supports a

hydraulic winch, and a cable extends from the winch to a rail clamp adapted to grip a severed rail in the trackway. The vehicle also supports an A-shaped anchoring member which extends from a point on the vehicle aligned with the severed rail into engagement with spaced points on a rail on the opposite side of the trackway.

3,731,636

**CONVEYOR**

Alfred Reimer, 2048 Rebecca St., Oakville, Ontario, Canada

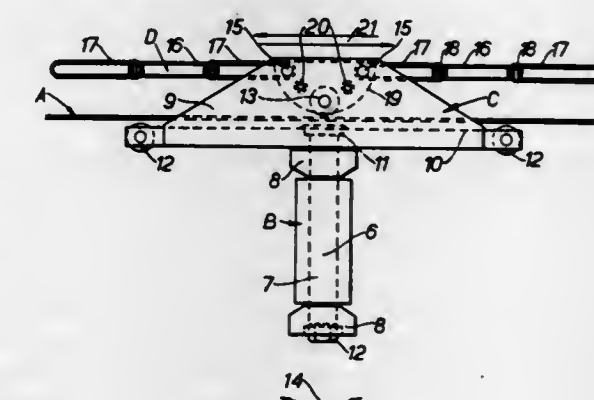
Filed June 1, 1970, Ser. No. 42,034

Claims priority, application Canada, June 5, 1969, 053563

Int. Cl. B65g 39/20

U.S. Cl. 104-172 B

4 Claims



A device for moving a wheeled vehicle along a predetermined path having a track alongside the path with pusher means operating slidably along the track and arranged to push against the wheel of a vehicle in the path to move the vehicle along the path and mechanism to move the pusher means slidably along the track.

3,731,637

**PUSHER DEVICE**

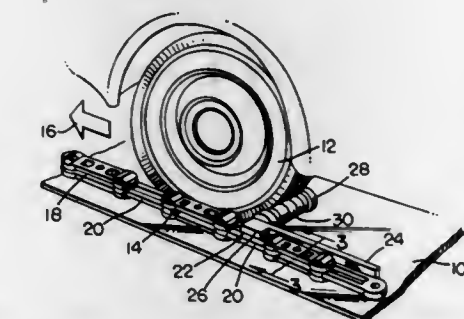
Niels S. Hansen, Fort Wayne, Ind., assignor to Foundation and Bridge Corp., Fort Wayne, Ind.

Filed June 3, 1971, Ser. No. 149,463

Int. Cl. B65g 19/00

U.S. Cl. 104-172 B

1 Claim



The specification discloses a pusher device for use with the conveyor chain of a car washing installation, or the like, in which the pusher device includes a bracket adapted for manual engagement with and disengagement from the chain and having support rollers rolling on the vehicle wheel support surface and pusher rollers rollingly engageable with a wheel of a vehicle passing through the installation.

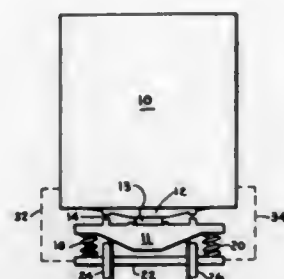


3,731,638

**RESILIENTLY FRICTIONALLY SWAY STABILIZED RAILWAY CAR**

Carl E. Tack, 157 Linden St., Elmhurst, Ill.  
 Filed Jan. 28, 1970, Ser. No. 6,473  
 Int. Cl. B61f 5/14, 5/24; F16c 17/04  
 U.S. Cl. 105—199 A

13 Claims



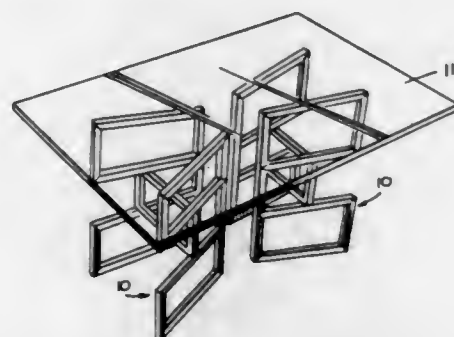
Swaying or rolling motion of a railroad car body is damped by a form of energy-absorbing coupling between each side of the track-following portion of the car and the corresponding side of the spring-supported portion, providing substantial energy-dissipative force opposing approach motion at the respective sides of the car but with separation substantially unimpeded. Stabilization of the body against oscillatory motion at the resonant frequency of the springs is obtained without substantially increasing the hazard of derailment on curves in any range of speeds. A simple form of construction of an energy-absorber for installation on existing conventional cars is described.

3,731,639

**TABLE ASSEMBLY**

Louis F. Schlemann, and Jerome E. Borgos, both of 418 W. 25th St., New York, N.Y.  
 Filed April 23, 1971, Ser. No. 136,738  
 Int. Cl. A47b 3/06  
 U.S. Cl. 108—157

6 Claims



A table assembly formed by one or more base modules and a slab supported thereby. The base module is adjustable to assume a variety of lattice-like or fretted patterns. The modules are constituted by a pair of leg elements, each formed by a post having a foot frame and head frame extending laterally from the lower and upper sections of the post to define an intermediate region occupied by a body frame whose corners are pivotally connected to the midpoints of the foot and head frames, whereby each leg element is rotatable about its midpoint axis and may therefore assume different angular configurations in which the foot frames rest on the floor and the head frames support the slab.

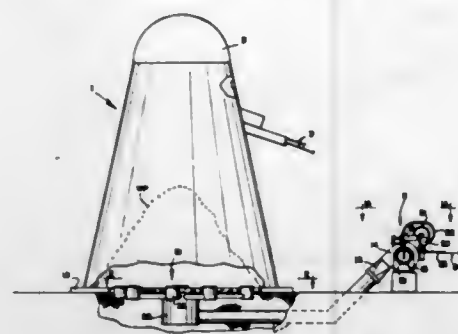
3,731,640

**VENTILATION DUCT STRUCTURE FOR A WOOD WASTE BURNER**

John D. Stutz, 96 E. Hatton Ave., Eugene, Oreg.  
 Filed March 20, 1972, Ser. No. 236,036  
 Int. Cl. F23g 7/00

U.S. Cl. 110—18 R

6 Claims



A duct structure centrally disposed below a wood waste burner providing combustion supporting air to the interior of a waste pile formed within the burner interior. A central main plenum and a supply conduit therefor are in tangential communication to provide a circular, upward flow of air through intake and exhaust zones of the plenum. Secondary plenums are located outwardly from the main plenum at the ends of lateral conduits which are in upstream communication with the exhaust zone of the main plenum. Air flow within each of the secondary plenums is in a circular, upward direction and ultimately discharged vertically, upwardly in a forceful manner into the base of the waste pile. A blower assembly, exterior of the burner structure, provides a burner temperature regulated flow of pressurized air to the main plenum.

3,731,641

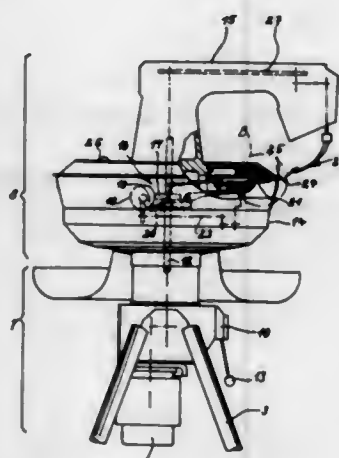
**LOOPER**

Erhard Muller, Kempton, and Harry Wittki, Buchenberg, both of Germany, assignors to X. Fendt and Co. Maschinen-und Schlepperfabrik Postfach, Marktoberdorf, Germany  
 Filed Nov. 19, 1970, Ser. No. 91,106  
 Claims priority, application Germany, Nov. 19, 1969, P 19 58 049.5

U.S. Cl. 112—25

Int. Cl. D05b 7/00

10 Claims



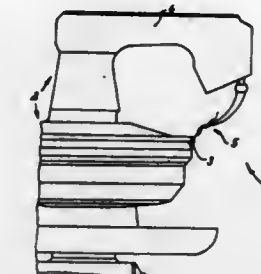
A looping machine wherein a sewing needle engages in a groove on the underside of the row needles on the side corresponding to the downwardly hanging section of material into the looping material for the purpose of stitch formation. The entire drive for the sewing needle is disposed below the crown of the row needles.

3,731,642

**LOOPING MACHINE WITH SPRING BEARD NEEDLE**  
 Harry Wittki, 8961 Buchenberg, and Ludwig Weinmuller, 8961 St. Mang, both of Germany, assignors to Kempfener Maschinenfabrik GmbH, Kempton/Allgau, Germany  
 Filed Dec. 24, 1970, Ser. No. 101,250  
 Int. Cl. D05b 7/00

U.S. Cl. 112—25

16 Claims



A looping machine with a continuously advancing needle row bed of individual row needles with grooves extending in the longitudinal direction. The looping material to be joined is transferred onto these row needles stitch-by-stitch and row-by-row, and the looping seam is formed by a spring beard needle having a central, downwardly pointing tip in cooperation with a thread feeder. The spring beard needle has a hook with boundary surfaces inclined to the vertical line of symmetry of each row needle as well as parallel to each other. The base of the hook is disposed substantially at right angles to the axis of symmetry of the needle shaft.

3,731,643

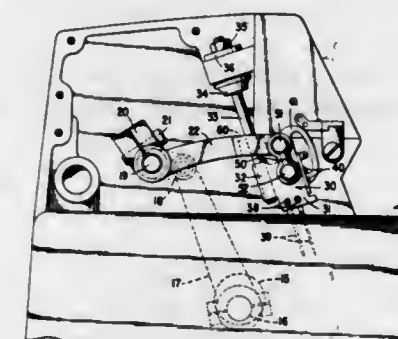
**NEEDLE RECIPROCATING MECHANISM FOR SEWING MACHINES**

Herbert Middlebrook, Appleton, England, assignor to The Singer Company, New York, N.Y.  
 Filed Dec. 6, 1971, Ser. No. 204,879  
 Claims priority, application Great Britain, Aug. 6, 1971, 36,978/71

U.S. Cl. 112—221

Int. Cl. D05b 55/14

2 Claims



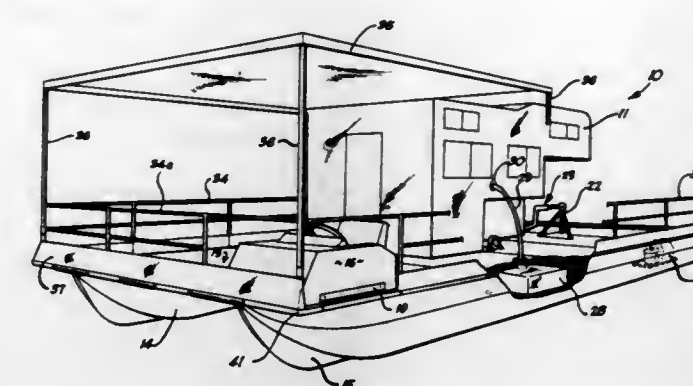
A mechanism for imparting linear endwise reciprocatory movement to a sewing machine needle from an oscillating drive arm by way of a pivotally connected drive link arranged so that at the extreme top and bottom of the stroke of oscillation of the drive arm, the axes of each of the pivotal connections of the drive link intersects the line parallel to the path of linear movement of the needle and passing through the center of mass of the needle carrier.

3,731,644

**CATAMARAN VESSEL AND SYSTEM FOR LOADING AND UTILIZING A CAMPER OR TRAILER THEREON**  
 Robert D. Bradt, 7274 Canyon Crest, Whittier, Calif.  
 Filed May 12, 1971, Ser. No. 142,669  
 Int. Cl. B63b 1/00

U.S. Cl. 114—61

9 Claims



A catamaran vessel adapted to receive a pickup truck camper body or a house trailer is provided with a detachable bow ramp and a stern pylon. A winch supporting dolly is connected to the socket hitch of the trailer or a wheeled frame supporting a camper. The winch cable is attached to the pylon and the winch used to pull the camper or trailer up the detachable bow ramp onto the deck. The forward control podium of the vessel swings out of the way during such loading. The socket hitch then is connected directly to the pylon to maintain the camper or trailer in place, and utility modules on the vessel are connected to the camper or trailer to allow it to be utilized while on board. These modules include, within one catamaran hull, a waste water holding tank which also serves as ballast if the camper or trailer is located off-center of the vessel. The fiberglass hulls of the vessel include outwardly flanged upper edges to which are bolted deck panels comprising a polyurethane core sandwiched between fiberglass or laminated wood sheets.

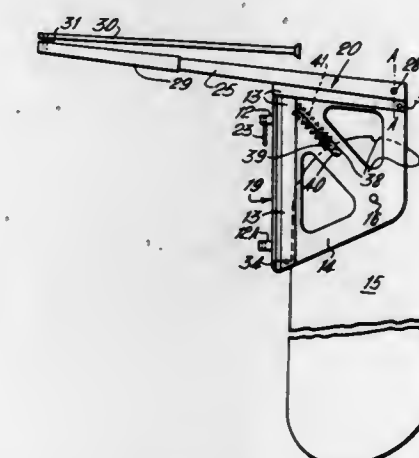
3,731,645

**SAILING CRAFT RUDDERS**

Terry Kenneth Pearce, 25 Hall Park Avenue, Westcliff-on-Sea, England  
 Filed Aug. 13, 1971, Ser. No. 171,695  
 Int. Cl. B63h 25/06

U.S. Cl. 114—162

7 Claims



The disclosure is of a sailing craft rudder of the kind comprising a rudder stock to which are fitted a tiller and a rudder blade, the rudder stock comprising a forepart formed of a length of extruded bar with a guideway receiving substantially T-shaped attachment portions of gudgeon brackets, and preferably this length of bar also has flanges and channels for the attachment of cheek plates and a cap or tiller.



3,731,646

**EXPLOSIVE EMBEDMENT ANCHOR PROJECTILE**

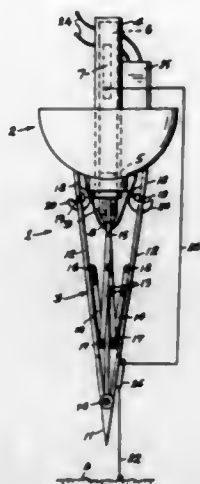
Henry C. Mayo, Fairfax County, Va., assignor to The United States of America as represented by the Secretary of the Army

Filed Aug. 6, 1970, Ser. No. 61,567

Int. Cl. B63b 21/28

U.S. Cl. 114—206 A

5 Claims



An explosive embedment anchor for use in all types of ocean bottom sediments except consolidated rock. The anchor forms the projectile which is fitted to the gun barrel. The assembly is lowered to the ocean floor and a charge in the gun is detonated by contact therewith to drive the anchor into the sediment. The anchor is provided with a pair of hinged flukes having keying flaps on their upper edges and riser cables. Holding power is achieved by an upward pull on the riser cables causing the keying flaps to wedge against the wall of the crater formed by the anchor's entry and the flukes open to provide maximum pullout resistance.

3,731,647

**APPARATUS FOR PROCESSING CONTAINERS**

Louis J. Mimbiolo, Jr., Detroit; Chester G. Clark, Grosse Pointe Woods, and John W. Neumann, Birmingham, all of Mich., assignors to Oxy Metal Finishing Corporation, Warren, Mich.

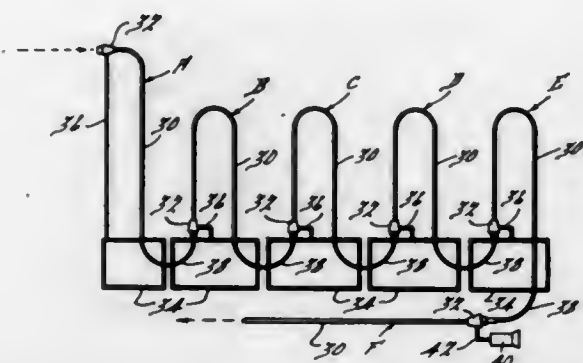
Division of Ser. No. 774,761, Nov. 12, 1968, Pat. No.

3,620,813. This application April 5, 1971, Ser. No. 130,977

Int. Cl. B05c 11/10, 11/12

U.S. Cl. 118—5

25 Claims



An apparatus for simultaneously treating and conveying container-like workpieces in which the workpieces are introduced and entrained in aligned orientation in a confined stream of a selected treating fluid and are subsequently extracted therefrom and whereafter, if desired, the workpieces are successively introduced into separate succeeding confined streams of alternative selected treating fluids to effect a multiple stage treatment thereof.

3,731,648

**DEVICE FOR APPLYING SUBSTANCE TO A SHEET OF MATERIAL**

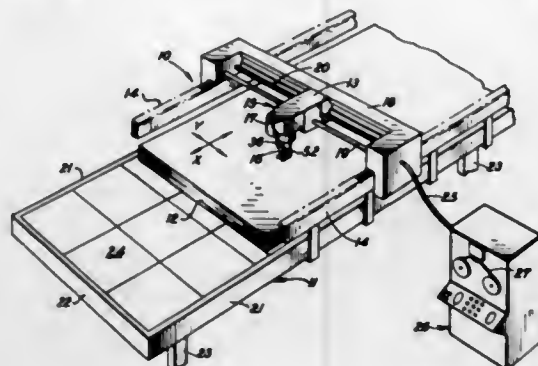
Heinz Joseph Gerber, and David Raymond Pearl, both of West Hartford, Conn., assignors to Gerber Garment Technology, Inc., East Hartford, Conn.

Filed Jan. 15, 1971, Ser. No. 106,685

Int. Cl. B05c 11/00

U.S. Cl. 118—6

6 Claims



A hollow needle member is used to apply a substance to a sheet of material for marking same or for applying a fluid material along a cut edge of the sheet material. The hollow needle member is mounted for reciprocation along its axis thereof. A controller receives coded input information and converts the input information into two-dimensional directional command pulses and a needle action command pulse. The needle member is moved in response to the two-dimensional directional command pulses over a sheet of material to which the substance is to be applied so that the needle member is disposed in a preselected location over the sheet of material. The needle member is reciprocated in response to the needle action command pulse so that the needle member is contiguous to the sheet of material. Marking material or fluid material which prevents edge fray or bonds edges of several sheets of material is ejected through the hollow needle member to the sheet material. Various specific embodiments of the device include specific needle member moving means and response mechanisms. One specific embodiment is directed to a combination of a hollow needle member mounted for reciprocation along with a cutting mechanism both of which are automatically controlled through the use of a controller.

3,731,649

**RIBBON-INKING MACHINE**

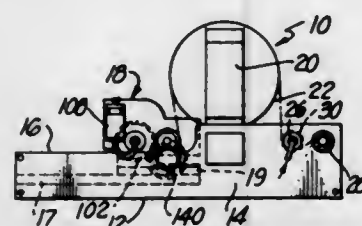
Frank F. Anderson, Montebello, and Albert J. Castro, Cudahy, both of Calif., assignors to Westates Space-Era Products Inc., El Monte, Calif.

Continuation-in-part of Ser. No. 869,465, Oct. 27, 1969, abandoned. This application June 25, 1971, Ser. No. 156,863

Int. Cl. B05c 11/10

U.S. Cl. 118—6

8 Claims



A ribbon-inking machine is disclosed which includes feed means for holding a ribbon so that it may be unwound from a core member, take-up means for winding a ribbon supplied by said feed means, ironing means for ironing a ribbon passing

from the feed means to the take-up means and inking means for supplying ink to a ribbon passing from said feed means prior to such a ribbon being ironed by the ironing means. Preferably the inking and ironing means contact the entire width of the ribbon being processed, also the ironing means used preferably applies heat uniformly to all parts of a ribbon across its width and the inking means used preferably is capable of applying ink to a ribbon in accordance with its ability to take up ink into its internal structure.

3,731,650

**GAS DISTRIBUTOR FOR CASTING MOLD MANUFACTURE**

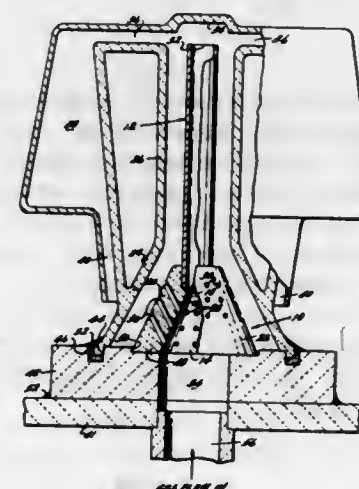
Wilbur H. Schweikert, and John S. Mosler, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 3, 1971, Ser. No. 195,284

Int. Cl. C23c 13/08

U.S. Cl. 118—48

1 Claim



A gas distributor for use in a mold cup and main sprue of a casting mold to be coated internally with a pyrolytic coating includes a gas receiving and distributing nozzle and a main sprue conduit. The nozzle delivers gas to the cup through a plurality of discharge holes and the conduit delivers gas to the base of the main sprue. Hole outlets deliver such gas angularly along the cup toward the main sprue to avoid turbulent flow.

3,731,651

**REACTOR SEAL**

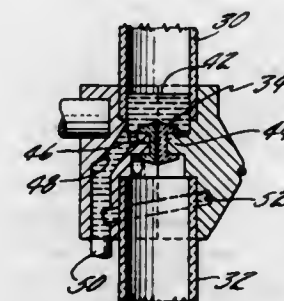
Donald K. Kuehl, Manchester, Conn.; Harry A. Nutter, Longmeadow, Mass., and Raymond C. Smart, Hazardville, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 14, 1970, Ser. No. 97,697

Int. Cl. C23c 13/10

U.S. Cl. 118—49.5

5 Claims



In a vertical reactor wherein vapor deposition is effected on a moving filamentary substrate, a reactor seal is provided to isolate the reactant gases within the tube from the atmosphere. The reactor seal comprises an orificed fitting containing a well of liquid metal through which the filament is

drawn, the liquid metal being held in the well at the orifice by surface tension forces. The orifice is established as a groove between abutting antipodal inserts which are removable in opposite directions and the liquid metal supporting surface of the well is sloped downwardly to provide complete drainage for rethreading.

3,731,652

**COATING DOCTOR APPARATUS**

Imants Reba, Vancouver, Wash., and Edward C. Wolthausen, Oaklawn, Ill., assignors to The Black Clawson Company, Hamilton, Ohio

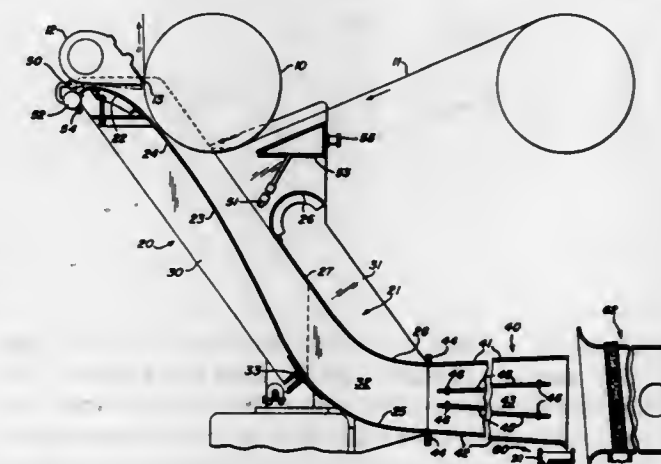
Continuation of Ser. No. 28,741, April 15, 1970, abandoned.

This application Jan. 24, 1972, Ser. No. 220,192

Int. Cl. B05c 11/06

U.S. Cl. 118—63

11 Claims



In coating doctor apparatus in which an air doctor is used to remove coating from a freshly coated web trained about a backing roll, internal baffles are eliminated and the contours of the coating return chamber are designed using flow control principles so that strong vortices and attendant misting are avoided in the coating return chamber, while at the same time subambient pressures generated along the curved surfaces of the chamber cause strong entrainment of air through the spaces between the edges of the coating chamber and the backing roll and air doctor and prevent coating material from escaping from the coating system.

3,731,653

**COATING RATE CELL**

James F. Leland, Detroit; William S. Russell, Warren, and James G. Mabarak, Grosse Pointe, all of Mich., assignors to Oxy Metal Finishing Corporation, Warren, Mich.

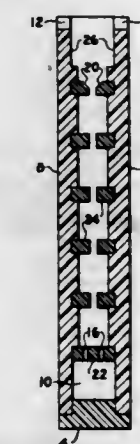
Division of Ser. No. 650,844, July 3, 1967, Pat. No. 3,597,284.

This application April 7, 1971, Ser. No. 132,240

Int. Cl. B05c 3/04

U.S. Cl. 118—429

1 Claim



An open top coating cell defining a slot. A plurality of opposed ribs are disposed on the inner side walls of the cell to form expansion chambers whereby turbulence is imparted to treating liquid passing through said cell.



3,731,654

## STENCIL DEVICE WITH MEANS TO CLEAN

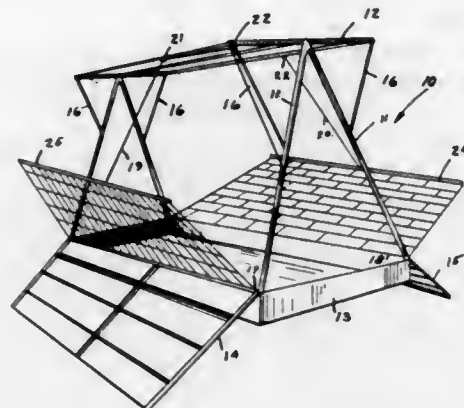
Albert Kirsch, Erie, Pa., assignor to Instant Brick Enterprise, Inc., Erie, Pa.

Filed Feb. 28, 1972, Ser. No. 229,637

Int. Cl. B05b 15/04

U.S. Cl. 118—504

6 Claims



A machine is disclosed for manufacturing finished wall panels. The machine is made up of a rigid fixed frame provided with a water tank at the center. Stencils are hinged to the frame at the edge of the water tank to swing from a position over wall supporting panels to be manufactured to a position in the tank to be washed. The stencils may be made of a rigid material such as one-eighth inch steel cut out in the form of the pattern desired on the article to be prepared. When the stencils are swung down over a panel, such as a 4 x 8 piece of plywood, the stencil rests on the plywood. Thus a plaster material may be sprayed over the stencil and into the spaces between the pattern and the stencil may then be swung up into the tank leaving a brick panel where the margins of the cutout portions forming simulated plaster joints and the excess plaster may be washed off in the tank of water.

3,731,655

## APPARATUS FOR MARKING INSULATED ELECTRICAL CONDUCTORS

Otto Griesser, Stuttgart, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

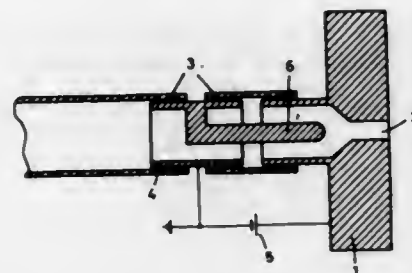
Filed Feb. 24, 1971, Ser. No. 118,240

Claims priority, application Germany, March 14, 1970, P 20 12 175.9

Int. Cl. B05c 5/02

U.S. Cl. 118—624

6 Claims



The deflection of color band marking material applied to cable is controlled by applying an electrical charge to the material. A direct voltage is applied between a nozzle and an annular electrode within the color material supply line to prevent variations of the sinusoidal deflection of different materials and of the same material at different times.

3,731,656

## TRANSPORT DEVICE FOR PHOTOGRAPHIC DEVELOPMENT APPARATUS

Karel Frans De Troeyer, B 2000 Antwerpen, Belgium, assignor to Gevaert-Agfa N.V., Mortsel, Belgium

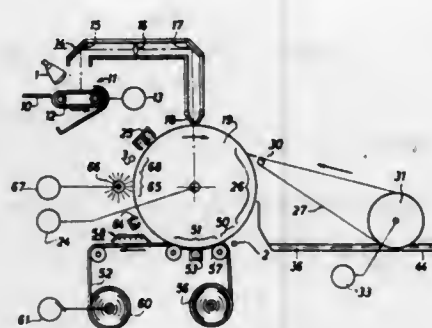
Filed March 30, 1971, Ser. No. 129,333

Claims priority, application Great Britain, March 31, 1970, 15,195/70

Int. Cl. G03g 13/00

U.S. Cl. 118—637

13 Claims



A transport device for upwardly transporting toner from a holder to an applicator station in an electrophotographic development apparatus. The transport device comprises an endless belt, a lower and an upper roller to determine a path for the belt which extends from the holder to the applicator station. The diameter of the upper roller being smaller than that of the lower roller. The belt is driven at a velocity which is sufficient to remove by inertia and/or centrifugal force at least part of the toner which has been picked-up from the holder and transported by the belt, at the locus where the belt performs a sharp curvature.

3,731,657

## ANIMAL CAGE

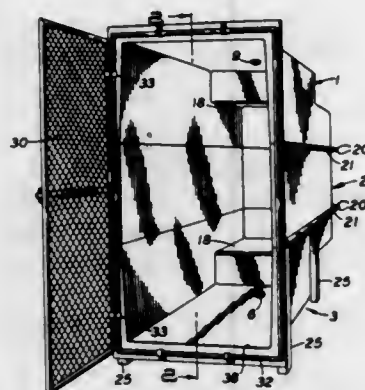
Eugene T. Alessio, 20 Harmony Hills Road, Akron, Ohio

Filed April 1, 1971, Ser. No. 130,210

Int. Cl. A01k 01/02

U.S. Cl. 119—17

16 Claims



At least the lower part of an exercise cage for an animal such as a dog, monkey, etc. is molded of reinforced plastic so that there are no cracks in which fecal matter, bacteria, etc. can collect. The cage is made with a shelf that the animal can get onto while the cage is being flushed out. A drain is provided in the floor.

In addition to the bottom portion, there may be other portions of various constructions. In a preferred cage the walls and roof are solid or made of wire and the cage is provided with a fan in the upper part for ventilation so that air flushed from the cage can be removed from the cage environment. The only opening into this cage is advantageously a single door at the opposite end of the cage from the fan.

In a preferred form of the invention, top and bottom portions of the cage are identical and can be nested for shipment or storage.

Various modifications are disclosed.

3,731,658

## DISPOSABLE PET AND ANIMAL DISH

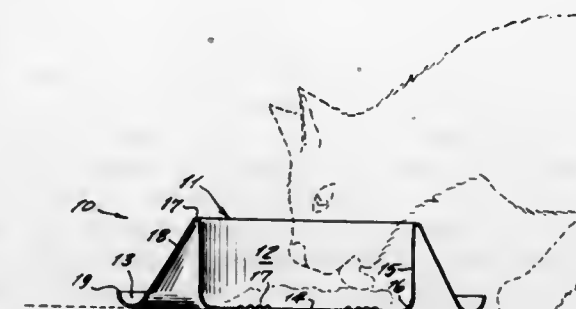
Keith Livermore, and Donna Livermore, both of P.O. Box 575, Moscow, Idaho

Filed Aug. 17, 1971, Ser. No. 172,437

Int. Cl. A01k 5/00

U.S. Cl. 119—61

1 Claim



A dish for containing foods served to household pets or other animals, the dish being made of inexpensive material so that after a single use it can be discarded so to eliminate the need to wash dishes of pets, and the dish being designed so that it will not tip as well as having other advantageous features.

3,731,659

## ELECTRONIC FUEL INJECTION SYSTEM HAVING DECELERATION FUEL CONTROL

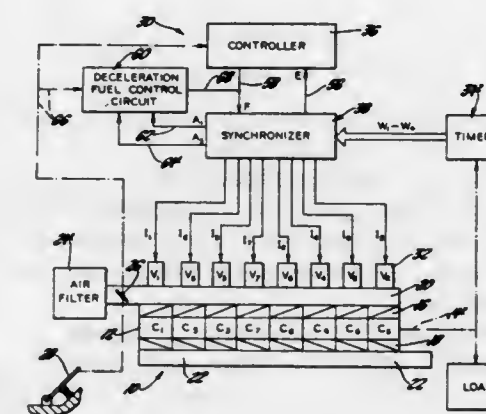
Paul N. Barr; Lester Wilkinson, both of Kokomo, and Stuart M. Neal, Sheridan, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 7, 1971, Ser. No. 178,271

Int. Cl. F02m 51/00

U.S. Cl. 123—32 EA

4 Claims



Fuel is completely withheld from an internal combustion engine in response to a decrease in the demand for power from the engine when the engine speed is above the idle speed of the engine.

3,731,660

## VAPOR-COOLED INTERNAL COMBUSTION ENGINE

Charles B. Leffert, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 29, 1971, Ser. No. 213,446

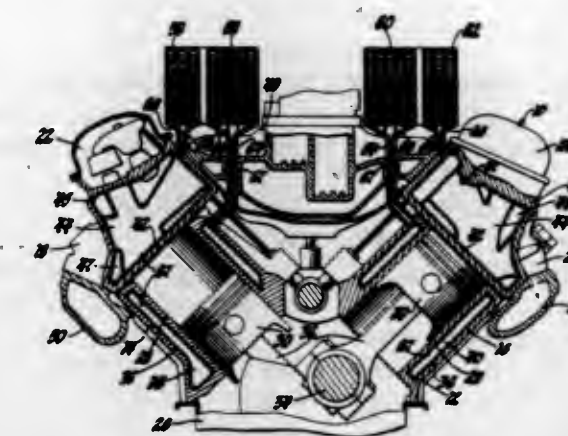
Int. Cl. F01p 3/00

U.S. Cl. 123—41.42

7 Claims

An internal combustion engine is provided with separate sealed cooling systems for each of the cylinder block and

cylinder head coolant cavities, each system having its own vapor condenser. The condensers are connected with their respective coolant cavities, the connections including wick means to aid the return of liquid coolant to additional wick means within the cavity for vaporization, which occurs on the heated walls, such as the cylinder walls and combustion walls of the cylinder heads. An open flow path is maintained adjacent the wicks for passage of coolant vapor from each coo-



lant cavity to its respective condenser, where it is cooled and returned to liquid form. In a specific embodiment, four rows of condensing means are longitudinally disposed above and between the banks of a V-type engine, forming separate sealed cooling systems for the cylinder block coolant cavity of each bank and the cylinder head coolant cavity of each bank. An engine driven blower directs air through suitable ducts to pass longitudinally through the four condenser rows so as to dissipate heat therefrom.

3,731,661

## ROTARY ENGINE APPARATUS

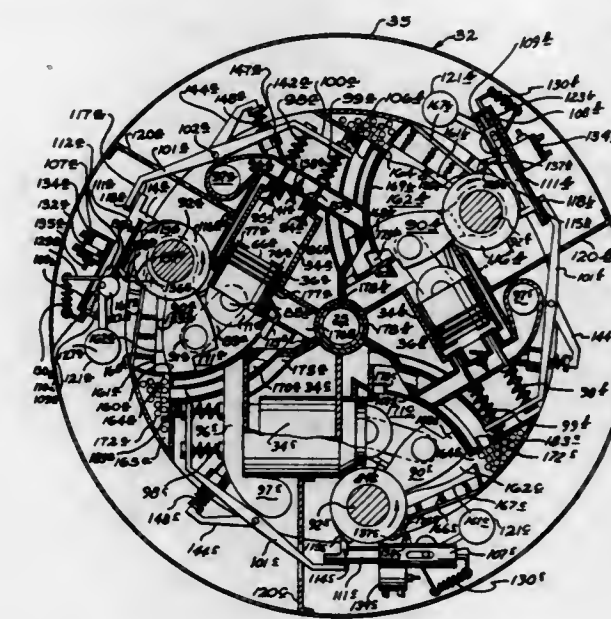
Thomas J. Hatfield, 39536 Sundale Drive, and Gus C. Robertson, 4346 Cambria Street, both of Fremont, Calif.

Continuation-in-part of Ser. No. 856,244, Aug. 11, 1969, abandoned. This application Dec. 27, 1971, Ser. No. 212,168

Int. Cl. F02b 59/00, 41/10, 37/00

U.S. Cl. 123—43 C

12 Claims



Rotary engine apparatus of the internal combustion type in which the reciprocable displacements of the respective pistons within the cylinders therefor impart rotatory motion to a variety of engine components from which output torque is delivered to a power shaft. The rate at which the piston-cylinder structures fire is selectively variable at any engine



operating speed so that the power delivered by the engine at any speed thereof can be specifically related to the contemporary value of the load on the engine. The stroke length of each reciprocable piston is also selectively variable for load-accommodating purposes; and the rotatory components of the apparatus may be used directly to drive an output power shaft selectively in opposite angular directions, thereby obviating the necessity of providing transmission mechanism for this purpose.

3,731,662

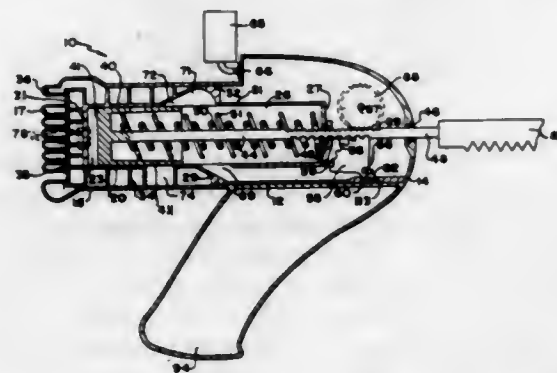
**INTERNAL COMBUSTION TWO-STROKE POWER UNIT**  
Helmut E. Fandrich, Vancouver, British Columbia, Canada, assignor to Dueck Building Supplies Ltd., British Columbia, Canada

Filed Feb. 18, 1971, Ser. No. 116,339

Int. Cl. F02b 59/00

U.S. Cl. 123—50 B

36 Claims



An internal combustion, two-stroke power unit having a cylinder element mounted for reciprocation in a base and a piston element mounted for reciprocation in the cylinder element, said elements reciprocating relative to each other in opposite directions; interconnecting means between the two elements to cause them to reciprocate in phase with each other, power take-off means connected to one of these elements, and an arrangement for automatically throttling the unit when it is operating under partial- and no-load conditions.

3,731,663

**VEHICLE ENGINE FUEL CONTROL ACCELERATOR OVERRIDE**

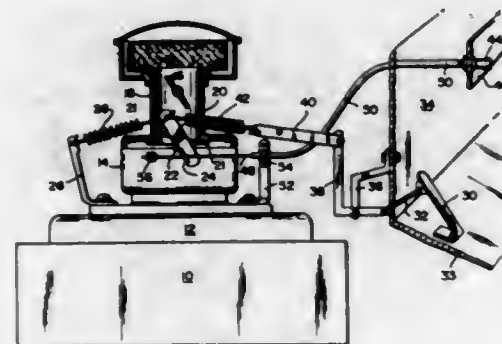
Jesse R. Hollins, One Chester Drive, Great Neck, N.Y.

Filed Jan. 8, 1971, Ser. No. 104,990

Int. Cl. F02d 11/02

U.S. Cl. 123—98

16 Claims



Apparatus for controlling the position of an accelerator control element of a vehicular engine when the mechanism conventionally employed for moving the same has frozen. The apparatus includes a resilient member in a first kinematic train between said element and the accelerator pedal or like element usually employed by the vehicle operator to regulate the engine speed. The resilient member is connected to said ele-

ment directly or through non-freezable components. A return resilient means which is substantially weaker than the resilient member biases the accelerator control element to an idle position. A second kinematic train is so arranged that when actuated by the vehicle operator it will positively move the accelerator control element toward its idling speed operating position. In normal use a force is applied through the first kinematic train and resilient member to move the accelerator control element in an engine speed-up direction while storing up energy in the return resilient means whereby as such force is reduced the engine speed will slow down. If the control element or any part of the first kinematic train is frozen the operator can, through the second kinematic train move the control element against the bias of the resilient member toward its idling speed operating position and in this manner either slow down the engine to idling speed or regulate it to any speed between idling and the speed corresponding to engine speed at which the first kinematic train was frozen. The resilient member is weak enough to be elastically deformed by the force applied by an operator through the second kinematic train.

3,731,664

**CONTROL VOLTAGE GENERATOR FOR ELECTRICAL FUEL CONTROL SYSTEM**

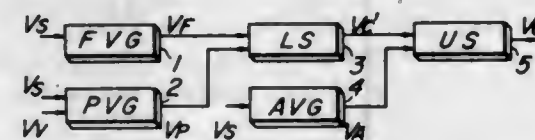
Yoshihiko Tsuzuki, Kariya, and Nobuhito Hobo, Inuyama, both of Japan, assignors to Nippondenso Co., Ltd., Aichi-ken, Japan

Filed March 10, 1971, Ser. No. 122,661

Int. Cl. F02m 51/00

U.S. Cl. 123—102

1 Claim



A control voltage generator for receiving input signals representing the various operating conditions of a diesel engine, that is, the rotational speed of the engine and the degree of depression of an accelerator pedal etc., so as to generate control voltages corresponding to the fuel injection quantity characteristics required for the engine.

3,731,665

**INTERNAL COMBUSTION ENGINE, MORE PARTICULARLY FOR MOTOR VEHICLES, AND MEANS FOR LIMITING THE EMISSION OF UNBURNED GASES**  
Giampaolo Garcea, 18 Milan, Italy, assignor to Alfa Romeo S.P.A., Milan, Italy

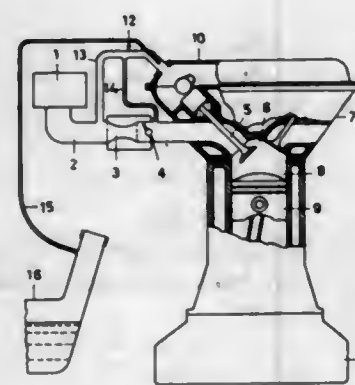
Filed Nov. 23, 1970, Ser. No. 92,084

Claims priority, application Italy, Jan. 24, 1970, 19766 A/70

Int. Cl. F02m 25/08

U.S. Cl. 123—136

1 Claim



A system for diminishing atmospheric pollution due to the discharge of unburned gases and volatile fuels from motor cars

in which an internal combustion engine already equipped with ducts connecting the base chamber of the engine with the intake manifold and the fuel tank has the end portion of the duct which connects the fuel tank to the inside chamber of the engine base is joined to the end portion of the duct connecting the intake manifold with the chamber. Hence, when the engine is not running, all the gases and vapors are stored in the interior chamber of the engine base, whereas, as soon as the engine runs, all gases and vapors are sucked by the engine cylinders to be burned therein.

3,731,666

**FLAME STARTING INSTALLATION FOR AN AIR-COMPRESSING INJECTION INTERNAL COMBUSTION ENGINE**

Herbert Langen, Altbach, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

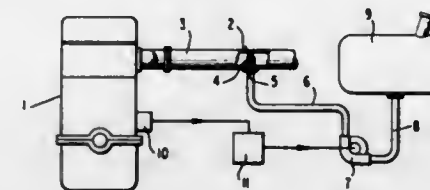
Filed Nov. 4, 1970, Ser. No. 86,784

Claims priority, application Germany, Nov. 4, 1969, P 19 55 379.8

Int. Cl. F02m 31/04

U.S. Cl. 123—179 H

5 Claims



A flame-starting installation for an air-compressing injection internal combustion engine with a feed of the fuel by an electrically driven feed pump, in which the fuel rate feed of the fuel pump is a nonlinear function of the engine rotational speed over at least a portion of the entire rotational speed range of the engine.

3,731,667

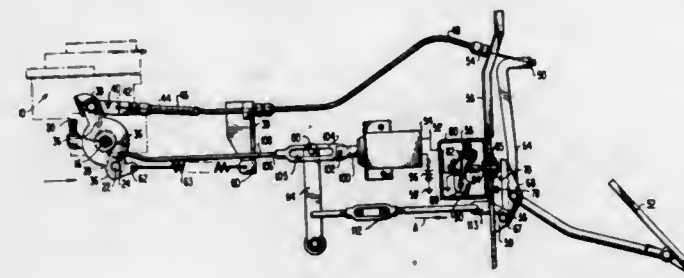
**FAIL-SAFE THROTTLE CONTROL**

Charles W. MacMillan, 3400-20th St. Ct., Rock Island, Ill.  
Continuation-in-part of Ser. No. 88,450, Nov. 10, 1970, Pat. No. 3,626,919. This application June 15, 1971, Ser. No. 153,330

Int. Cl. F02b 77/00

U.S. Cl. 123—198 DB

23 Claims



The invention relates to a fail-safe throttle control mechanism which is positioned between an accelerator pedal of a motor vehicle and the linkage extending to the carburetor thereof and includes a sensing mechanism for disengaging the accelerator pedal from the throttle valve so that the engine of the motor vehicle can instantly return to an idle condition irrespective of any impairment in the carburetor linkage or blockage of the accelerator pedal. There are disclosed various embodiments for achieving this fail-safe throttle control through electrical as well as mechanical mechanisms.

3,731,668

**CATALYTIC HEATER**

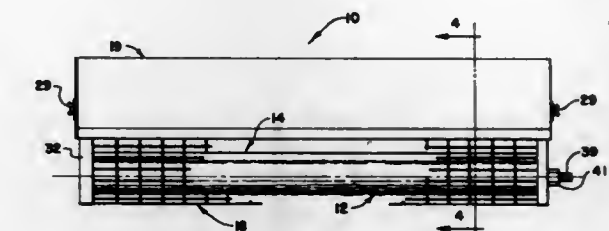
Jay N. Smith, Wichita, Kans., assignor to Impala Industries, Inc., Wichita, Kans.

Filed May 19, 1971, Ser. No. 144,895

Int. Cl. F24c 3/04

U.S. Cl. 126—92 R

8 Claims



The invention is a tubular shaped gas operated thermocatalytic heating element formed of a ceramic fiber with a pair of adjustable reflector wings to direct the radiating energy in varying directions. The catalyst impregnated fibrous element, plugged at both ends, is axially supported on a hollow rod which also acts as a manifold for evenly dispersing the gaseous fuel through the porous element; the coupling at one end, between the rod and element, allows longitudinal movement therebetween so that expansion of the support rod is not transmitted to the element.

3,731,669

**EXTERNAL IMPLANTATION OF ENERGY TO POWER INTERNAL DEVICES**

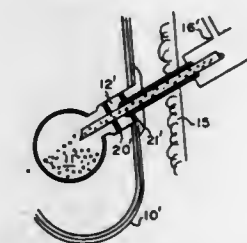
Joseph J. Fitzgerald, Winchester, Mass., assignor to Sander Nuclear Corporation, Nashua, N.H.

Filed Oct. 16, 1970, Ser. No. 81,432

Int. Cl. A61b 06/00, 19/00

U.S. Cl. 128—1 R

15 Claims



A means and method is used to permit injection and/or extraction of radioisotopic energy source material to or from an energy source implanted in the body. Radioisotope injections are used to maintain energy sources for prosthetic organs and the like at desired energy outputs over long time periods thereby permitting minimization in size of implanted energy sources and maximization of economy. Preferably the radioisotopic material is thulium 171 in the form of microspheres.

3,731,670

**CORPOREAL FLUID CONTROL USING BISTABLE MAGNETIC DUCT VALVE**

James M. Loe, Willow Grove, Pa., assignor to David Roy Pressman, Philadelphia, Pa., a part interest

Filed May 3, 1971, Ser. No. 139,711

Int. Cl. A61b 19/00

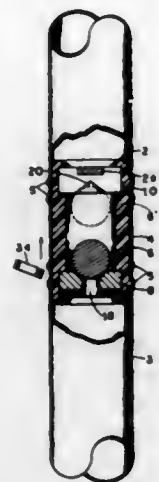
U.S. Cl. 128—1 R

24 Claims

A binary duct valve comprising a tubular housing containing a magnetically sensitive closure member (e.g., a spheroid) small enough to move freely in said housing, and a pair of magnetized valve seats positioned at the respective ends of said housing, one seat having an aperture therethrough which



is shaped to become sealed, thereby to occlude said housing when said closure member sits thereon, the other seat being shaped so that it does not occlude said housing, even when said closure member sits thereon. The valve is operated by directing the closure member to a selected seat by means of magnetic force from an external source. The valve may be used advantageously in conjunction with an extracorporeal



magnetic source for binary control of fluid flow. Preferably a valve is mounted to both vasa deferentia or fallopian tubes to serve as a contraceptive or selective fertility control device, but it may also be mounted, inter alia, in the urethra for controlling urinary incontinence, in penile veins to selectively induce tumescence, or in any duct or tube in which fluid flow is to be controlled by means essentially entirely without said duct or tube.

3,731,671

## LOW-FRICTION CATHETER GUIDE

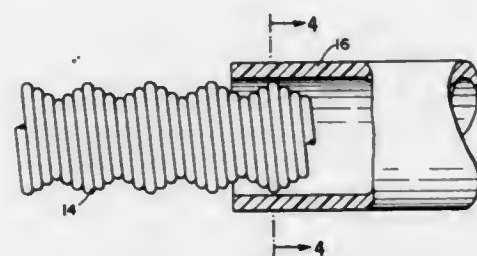
Nelson H. Mageoh, 3301 N.E. 5th Avenue, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Oct. 21, 1971, Ser. No. 191,186

Int. Cl. A61m 23/00; A61b 5/02, 17/00, 5/10

U.S. Cl. 128-2.05 R

7 Claims



A low-friction catheter guide for facilitating the insertion of catheters into the vascular system of human beings or animals, especially where insertion through relatively long lengths of blood vessels is involved. Friction is minimized by forming a catheter guide over which the lumen of the enclosing catheter passes and contact between the two is reduced to a series of point contacts. The guide is formed in such a fashion that a series of radial extensions or protuberances constitute the contact areas. A preferred method of forming the guide is by winding a wire upon a non-circular mandrel and permitting the coil to unwind slightly after it is removed from the mandrel. The unwinding or springback results in adjacent convolutions of the coil being rotated slightly with respect to each other.

3,731,672  
HEART MONITORING APPARATUS FOR A MOTOR VEHICLE

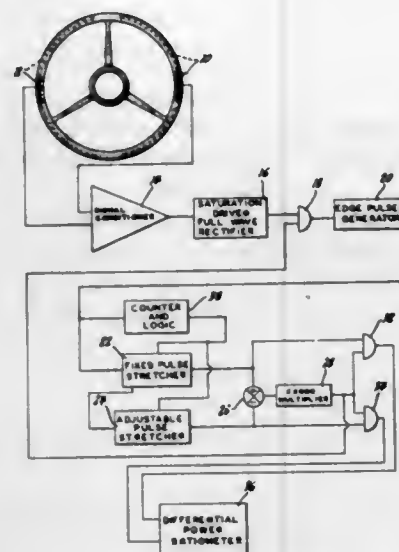
Duane E. McIntosh, Palmyra, Wis., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 4, 1971, Ser. No. 185,942

Int. Cl. A61b 5/04

U.S. Cl. 128-2.06 A

3 Claims



The EKG signal of the vehicle operator is sensed through electrodes mounted in the steering wheel and conditioned by amplifying and band pass filtering means to produce a signal which is substantially the QRS complex of the EKG signal. The width of the QRS complex is continually compared with the nominal width for the vehicle operator and an indication of whether the width is narrower or wider is provided to the operator.

3,731,673

## SELF-RETAINING MUSCLE RETRACTOR

William X. Halloran, 440 Fair Drive, Costa Mesa, Calif.

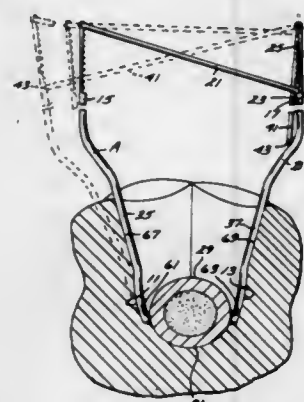
Continuation-in-part of Ser. No. 773,750, Nov. 6, 1968,

abandoned. This application March 29, 1971, Ser. No. 128,954

Int. Cl. A61b 17/02; A61m 29/00

U.S. Cl. 128-20

12 Claims



A self-retaining muscle retractor including a pair of elongated members formed on their respective one extremities with bone-engaging portions and on their respective opposite extremities with lever arms. One of the lever arms has one end of a rigid brace pivotally connected thereto and the free end of such brace is engageable with a latching element included on the other lever arm whereby the bone-engaging portions may be inserted in an incision and engaged on opposite sides of a bone, the lever arms spread apart to retract the muscles away from such bone and the free end of the brace engaged with the latching element to maintain the incision open for convenient access to the bone.

3,731,674  
SHOE WITH NERVE AND MUSCLE RELAXANT

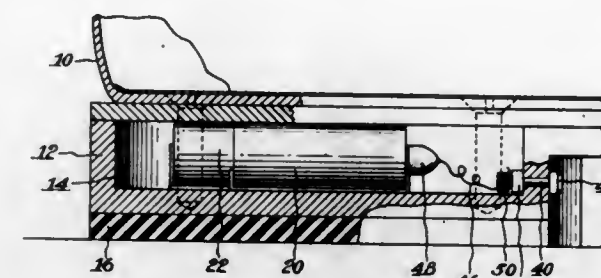
Don M. Parvin, P.O. Box 724, Defiance, Ohio

Filed Aug. 3, 1971, Ser. No. 168,586

Int. Cl. A61h 1/02

U.S. Cl. 128-25 B

4 Claims



The heel of a shoe contains a battery and electrically powered motor means connected in circuit by a manually operated on-off switch. When the switch is closed, the means produces vibrations transmitted through the feet of the wearer to the rest of the body, promoting a relaxing action on nerves and muscles.

3,731,675

## DENTAL CLEANING APPARATUS

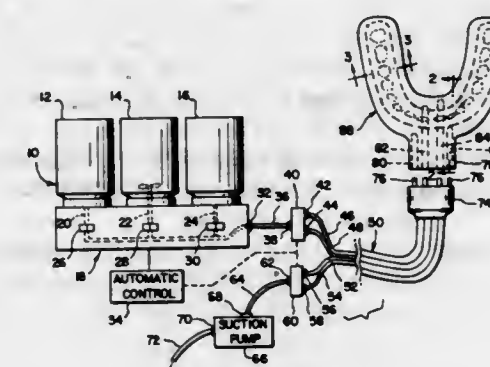
James J. Kelly, Box 551, Fort Clayton, Canal Zone

Filed May 3, 1971, Ser. No. 139,692

Int. Cl. A61h 7/00

U.S. Cl. 128-62 A

13 Claims



Apparatus for cleaning and polishing teeth and particularly the interproximal surfaces and gingival crevices thereof wherein a mouthpiece adapted to fit over at least a portion of the dentition and sealably engage the gums includes a plurality of interiorly disposed spaced inlet and exhaust ports in communication with a source of fluid or other cleansing material and an evacuation pump, respectively, such that the cleansing material is turbulently drawn against, between and around the teeth by suction to remove small food particles, bacteria and bacterial plaque, bacterial matt or organized bacteria and polish all exposed tooth surfaces to promote recalcification by normal defense mechanisms of the body without the cleansing materials and foreign matter being forced into or entrapped under the soft tissues of the mouth.

3,731,676

## PORTABLE COMPACT ELECTRIC DOUCHE

Jerome E. Rebold, Timonium Md., assignor to Leonard Bloom, Baltimore, Md., part interest

Filed May 6, 1971, Ser. No. 140,912

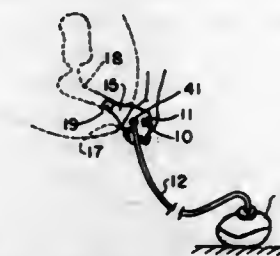
Int. Cl. A61h 9/00

U.S. Cl. 128-66

17 Claims

A portable compact electric douche is intended to be held directly in the user's hand and has means thereon intended for insertion directly into the vagina. The electric douche is small,

lightweight, convenient to hold, battery-powered for electrical safety, and is designed for mass production. Stopper means are provided for optional engagement with the vaginal lips,



thereby allowing the vaginal tract to be substantially filled with douching fluid, whereupon the user may remove the electric douche and allow the fluid to pass out of the vagina.

3,731,677

## FACE LIFTING TECHNIQUE

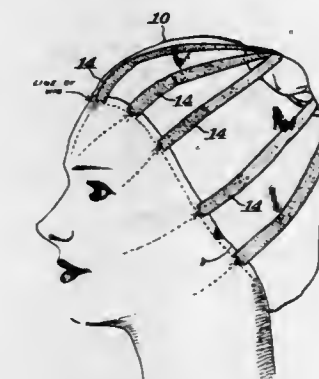
Mary Salvati, 611 Maplewood, Peekskill, N.Y.

Filed May 10, 1971, Ser. No. 141,804

Int. Cl. A61h 5/08

U.S. Cl. 128-76 B

3 Claims



A stocking cap is placed over the head of a user with all hair tucked thereunder. Strips of adherent tape are then secured both to the cap and to the face in regions where facial uplift is desired. The stocking cap is close-fitting and the loose end at the top is strapped down with tape. Make up is then applied as needed and finally a wig is fitted over the cap.

3,731,678

## SMOKE INHALATION PROTECTOR

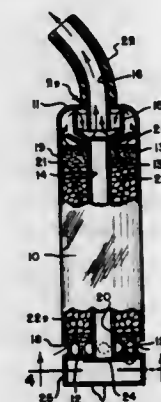
Robert Pyzel, New York, N.Y., assignor to Phyllis Pyzel, New York, N.Y., a part interest

Filed March 5, 1971, Ser. No. 121,447

Int. Cl. A62b 7/10, 23/00

U.S. Cl. 128-147

12 Claims



A respirator for removing or reducing the smoke and noxious fumes content of air comprises an outer casing having a



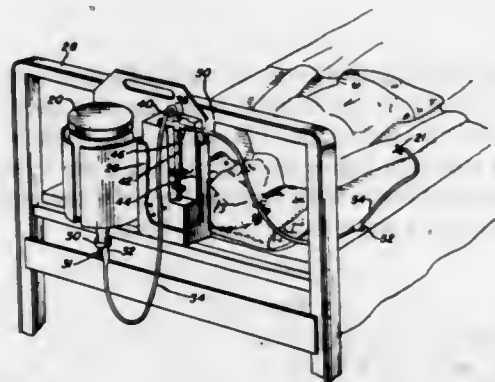
tubular nozzle that extends through an opening formed in the top of the casing downwardly a short distance into the upper end portion of the casing. An inner conduit is disposed within the outer casing, the upper end of the conduit being spaced a short distance away from the lower end of the nozzle and the lower end of the conduit coinciding with an opening formed in the bottom of the casing. A funnel-shaped baffle is disposed within the casing so that the lower inner end of the nozzle extends into the enlarged upper end of the baffle coincides and so that the small bottom opening of the baffle coincides with the open upper end of the inner conduit. A filter retaining member is disposed in the casing between the casing and the upper of the inner conduit. The lower end of the outer casing and the filter retaining member are each formed with a plurality of small air passage openings, and the space between the outer casing and the inner conduit is filled with air distribution means and an air purification material. When the user of the respirator inhales through the nozzle of the device inhalation valve means automatically open and exhalation valve means automatically close so that air is drawn through the air passage openings formed in the filter retaining member, and when the user exhales the inhalation valve means automatically close and the exhalation valve means automatically open so that moisture laden air is expelled directly into the inner conduit and thence to the atmosphere.

### 3,731,679 INFUSION SYSTEM

Jack L. Wilhelmson, Fenton; Theodore E. Weichselbaum, St. Louis, and Vernon F. Braun, Berkeley, all of Mo., assignors to Sherwood Medical Industries Inc., Hazelwood, Mo.  
Filed Oct. 19, 1970, Ser. No. 81,926  
Int. Cl. A61m 05/00

U.S. Cl. 128—214 F

10 Claims



A portable infusion system uses a disposable piston type syringe as a positive displacement pump. The syringe piston is reciprocally driven by a bidirectional DC motor under control of a battery powered circuit. Different selectable rates of pumping are maintained by controlling the width of bidirectional DC pulses coupled to the DC motor and by monitoring the motor back EMF during the off-time of the pulses. A disposable two-way valve connects the syringe pump with a fluid source and a catheter. Safety circuits protect against deleterious conditions such as the passage of an air bubble or an over-pressure condition.

### 3,731,680 PRESSURE REGULATING CONTROLLER

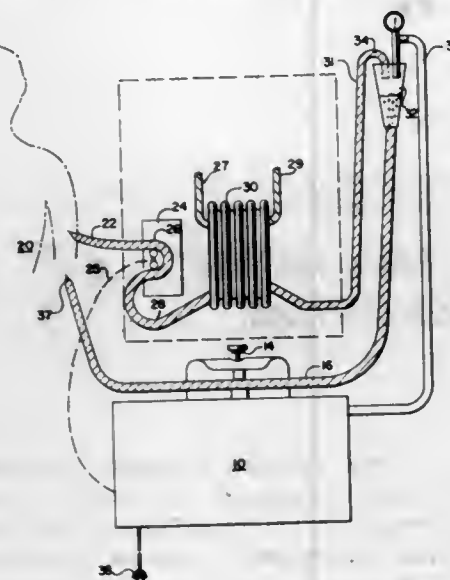
Floyd A. Wright, 3132 Bonanza Road, Charleston, S.C., and Thomas S. Hargest, 1078 Winslow Drive, Charleston, S.C.  
Filed Oct. 21, 1971, Ser. No. 191,307  
Int. Cl. B01d 31/00, 13/00; A61b 19/00, 5/02

U.S. Cl. 128—214 E

7 Claims

The invention disclosed is for a pressure monitor and con-

trol device having particular utility in medical technology where constant monitor of hydro-static pressure is required.



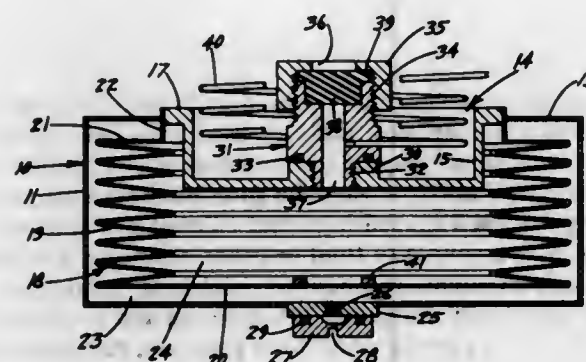
The disclosed device is especially useful in a method for effecting extra-corporeal hemodialysis.

### 3,731,681 IMPLANTABLE INFUSION PUMP

Perry J. Blackshear, Mahtomedi; Frank D. Dorman, St. Paul; Perry L. Blackshear, Jr., Mahtomedi; Henry Buchwald, Edina, and Richard L. Varco, St. Paul, all of Minn., assignors to The Regents of the University of Minnesota, Minneapolis, Minn.  
Continuation of Ser. No. 38,356, May 18, 1970, abandoned.  
This application Jan. 14, 1972, Ser. No. 217,879  
Int. Cl. A61m 05/00

U.S. Cl. 128—214 F

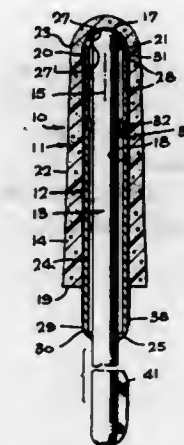
17 Claims



An implantable pump for infusing drugs or other chemicals or solutions into the body at a uniform slow flow rate. The pump comprises a housing divided into two chambers separated by a bellows, diaphragm or other pressure communicating interphase. A volatile liquid partially filling one chamber provides a constant pressure energy source to act upon the interphase to force liquid infusate from the other chamber through a capillary tube or other flow-regulating resistance element to the infusion site. The infusate chamber is closed as by means of a self puncture sealing refill stopper. The pump is implanted with the refill stopper disposed under the skin and the pump is refilled periodically by injection through the skin.

3,731,682  
VAGINAL TREATMENT ASSEMBLY  
Sol B. Fielding, 11930 Kearsarge Street, Los Angeles, Calif.  
Filed Aug. 9, 1971, Ser. No. 170,218  
Int. Cl. A61b 19/00; A61m 3/00, 7/02  
U.S. Cl. 128—239

20 Claims

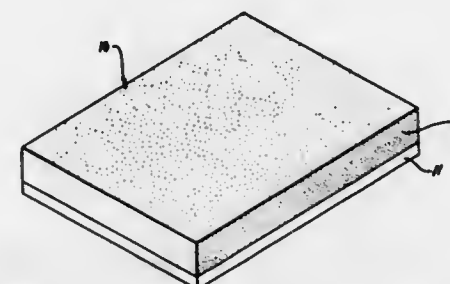


A vaginal treatment assembly including an outer cushion body dimensioned for reception within the human vaginal cavity, and containing an essentially tubular liner which projects into a passage in the cushion body and is withdrawable therefrom, together with an elongated member which projects into one end of the liner and extends through the interior of the liner and then through an opening at its opposite end, to engage an end wall of the cushion body in a relation retaining the latter against unwanted removal from the vaginal cavity while the liner is being withdrawn.

3,731,683  
BANDAGE FOR THE CONTROLLED METERING OF  
TOPICAL DRUGS TO THE SKIN  
Alejandro Zaffaroni, Atherton, Calif., assignor to Alza Corporation  
Continuation-in-part of Ser. No. 136,981, April 23, 1971. This application June 4, 1971, Ser. No. 150,085. The portion of the term of this patent subsequent to Aug. 10, 1988, has been disclaimed.  
Int. Cl. A61f 7/02

U.S. Cl. 128—268

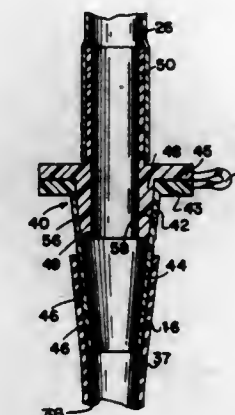
14 Claims



Bandage for the topical administration of controlled therapeutically effective quantities of topically active drugs has a backing member, a pressure-sensitive adhesive, and a reservoir layer containing a topically active drug confined within a wall member. The wall member is formed from drug release rate controlling material to continuously meter the flow of a therapeutically effective amount of the drug through the wall to the skin at a controlled and predetermined rate over a period of time.

3,731,684  
CLOSED IRRIGATION AND URINARY DRAINAGE  
SYSTEM APPARATUS  
Ronald E. Spiegel, Chicago, Ill., assignor to Cenco Medical Health Supply Corporation, Chicago, Ill.  
Filed April 8, 1971, Ser. No. 132,421  
Int. Cl. A61f 5/44  
U.S. Cl. 128—275

7 Claims



A closed irrigation and urinary drainage system apparatus having a catheter means for removing fluids from a patient and a drainage inlet tube which may be connected or disconnected from the catheter means by a hinged connector means for transferring such fluids into a distensible collection bag having an outlet tube for emptying it. The hinged connector means includes an upstream hollow socket portion insertable into the catheter means and a downstream adapter portion insertable into the drainage inlet tube and attached by a hinge means to the upstream portion. The system may be closed for drainage or opened to permit access for irrigation by swingably joining or separating the two portions of the connector means which, when joined, are held in fixed and sealed relationship by interior interlocking ring and groove means.

3,731,685  
MOISTURE INDICATING STRIP FOR DIAPERS AND  
SURGICAL DRESSINGS  
William Eldus, 2 Essex Lane, Suffern, N.Y.  
Filed April 1, 1971, Ser. No. 130,305  
Int. Cl. A61f 13/16

U.S. Cl. 128—284

19 Claims



A moisture indicating strip for use with diapers, surgical dressings and the like. One end of the strip is attached to the garment whose wet condition is to be detected. The other end of the strip is impregnated with a chemical which changes color when wet. The strip is capable of supporting capillary action so that moisture in the garment is transported to the chemical which then changes color so that the wet condition of the garment can be verified visually.



3,731,686

**FLUID ABSORPTION AND RETENTION PRODUCTS AND METHODS OF MAKING THE SAME**

Prondy Kumar Chatterjee, Spotswood, N.J., assignor to Personal Products Company, Milltown, N.J.

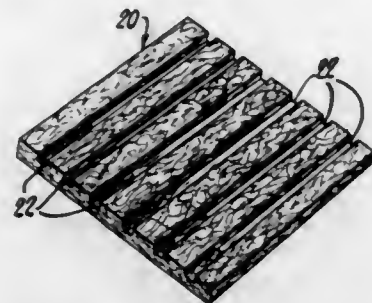
Continuation-in-part of Ser. No. 03, Feb. 10, 1969. This

application March 22, 1971, Ser. No. 126,743

Int. Cl. A61f 13/20

U.S. Cl. 128—285

9 Claims



Improved fluid absorption and retention products comprising fibrous carboxyalkyl cellulose having average degrees of substitution greater than 0.35, said fibrous carboxyalkyl cellulose having been heat-treated to render it water-insoluble and in compressed form to increase its fluid absorption and retention properties.

3,731,687

**CATAMENIAL TAMPON**

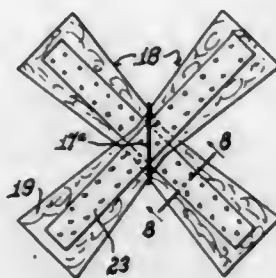
Jacob A. Glasman, 1680 Meridian Avenue, Miami Beach, Fla.

Filed July 16, 1971, Ser. No. 163,270

Int. Cl. A61f 13/20

U.S. Cl. 128—285

8 Claims



A catamenial tampon comprised of plural strips of moisture absorbent material, one of which may be highly compressed and arranged so that upon being wetted the tampon will forcibly expand to fill or substantially fill the vaginal passage to prevent spill-over and leakage.

3,731,688

**DISPOSABLE DIAPER**

Donald Litt, Scarsdale; David Jaroff, New York, and Amos Shamir, Riverdale, all of N.Y., assignors to Techmation Corporation, Long Island City, N.Y.

Filed June 30, 1971, Ser. No. 158,370

Int. Cl. A61f 13/16

U.S. Cl. 128—287

11 Claims



A disposable diaper comprises a rectangular absorbent pad which is longitudinally folded, at least at its crotch region, into

a box-pleat configuration, and a flexible, moisture impervious backing sheet underlying the pad and being secured to the latter along the opposite marginal side portions of the pad, the backing sheet being longitudinally folded independently of the pad, at least at its crotch region, into a Z-shaped fold which underlies the central portion of the pad and which reduces the effective width of the backing sheet substantially to the same extent that the box-pleat configuration reduces the effective width of the pad.

3,731,689

**DISPOSABLE DIAPER HAVING AN INTEGRAL CONTAINER AND MEANS FOR APPLICATION**

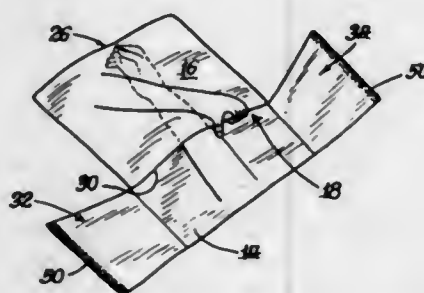
Charles H. Schaar, Lake Zurich, Ill., assignor to The Kendall Company, Walpole, Mass.

Filed Feb. 1, 1971, Ser. No. 111,188

Int. Cl. A61f 13/16

U.S. Cl. 128—287

8 Claims



An improved self-contained disposable diaper wherein a portion of the disposal pouch is slit so as to form integral, oppositely extending wings, the wings preferably having means thereon for completing the attachment of the diaper to an infant. A method is provided for forming the improved diaper featuring folding, slitting and refolding the portion thereof which is to define the pouch and wings.

3,731,690

**VENTING CRYOSURGICAL INSTRUMENT**

Michael D. Bryne, Vernon, Conn., assignor to Brymill Corporation, Vernon, Conn.

Continuation-in-part of Ser. No. 886,260, Dec. 18, 1969,

abandoned, which is a continuation-in-part of Ser. No.

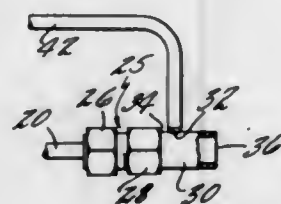
728,536, May 13, 1968, abandoned. This application Nov. 9,

1971, Ser. No. 197,079

Int. Cl. A61b 17/36

U.S. Cl. 128—303.1

4 Claims



A cryosurgical instrument comprises an applicator pressed into firm contact with tissue to be necrotized, a stream of liquified gas coolant (such as nitrogen) being delivered to the applicator. In one embodiment, the invention provides venting of vapors from the chambers through a vent-extending tube attached to the applicator. In one embodiment, the cryogenic application chamber comprises an open ended chamber connected to a source of pressurized coolant, the distal end of the chamber being open and adapted for application to a subject, the proximal end adapted for connection with the source, there being a vent tube through the wall of the chamber near the proximal end. Another embodiment employs a closed-wall chamber.

3,731,691

**ENDOTRACHEAL TUBE AND CONNECTOR UNIT**

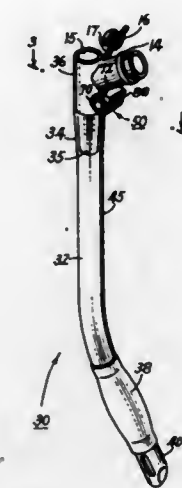
Allen Chen, Belleville, Mich., assignor to Lorton Laboratories, Ltd., New York, N.Y.

Filed Sept. 24, 1970, Ser. No. 75,163

Int. Cl. A61m 25/00

U.S. Cl. 128—351

16 Claims



A device for the endotracheal administration of a gaseous anesthetic has a flexible tube for insertion into the trachea, including an inflation cuff integrally joined with and surrounding the tube adjacent the distal portion thereof, and an inflation duct formed in the tube and isolated from the interior thereof, which duct extends from the cuff to proximal portions of the tube and through which inflation air may be supplied to the cuff. The proximal portions of the tube are integrally joined with a rigid connector having a valve member in air communication with the inflation duct for controlling the supply of inflation air to the cuff.

3,731,693

**MACHINE AND METHOD FOR MANIPULATING SHREDDED TOBACCO**

Frederick Pocock, Deptford, London, England, assignor to The Molins Organisation Limited, London, England

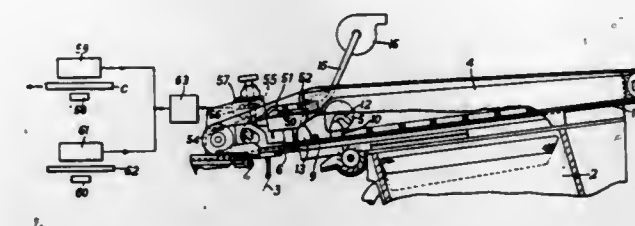
Filed May 9, 1961, Ser. No. 108,792

Claims priority, application Great Britain, May 10, 1960, 16,460/60

Int. Cl. A24c 05/34

U.S. Cl. 131—21 B

4 Claims



A method and machine for manipulating tobacco having a pneumatic system arranged to feed shredded tobacco upwardly on to the underside of a foraminous conveyor belt mounted below and adjacent to a horizontally elongated suction chamber in order to form a filler stream thereon which is later formed into a wrapped cigarette rod and cut into individual cigarettes. Tobacco is fed to the conveyor in excess of that required in the rod and the excess is removed by trimming in order to obtain uniformity in the rod. Inevitable variations in uniformity in the filler are reduced by controlling the degree of pneumatic compaction of the same by means of detectors which are arranged to manipulate a throttling or needle valve for controlling the degree of suction in the suction chamber thereby controlling the quantity of tobacco remaining between the trimming device and the conveyor and reducing variations in the filler when and if they should occur.

3,731,694

**ELECTRICALLY HEATED COMB AND CURLER**

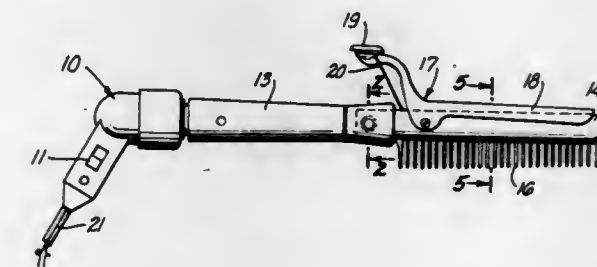
Michael David Moro, 152 South Brand Avenue, Glendale, Calif.

Filed Aug. 16, 1971, Ser. No. 172,178

Int. Cl. A45d 25/10

U.S. Cl. 132—118

9 Claims



An electrically heated combination hair comb and curling iron. An elongated handle is rotatably mounted with respect to a stationary grip. An elongated heat conductive base extends outwardly from the handle and contains electrically operated heating means. A heat conductive comb extends radially outwardly from the base. A clamp is pivotally mounted on the opposite side of the base from the comb. A section of hair is wound around the comb and base by rotating the handle and base toward the scalp while the hair section is held by the gripping portion of the clamp. The hair is then released by repeated pivotal movements of the clamp to give the hair section a gentle curl or curve. A modified embodiment can be used to straighten the hair.

3,731,692

**TRACHEOTOMY OR ENDOTRACHEAL TUBE CUFF**

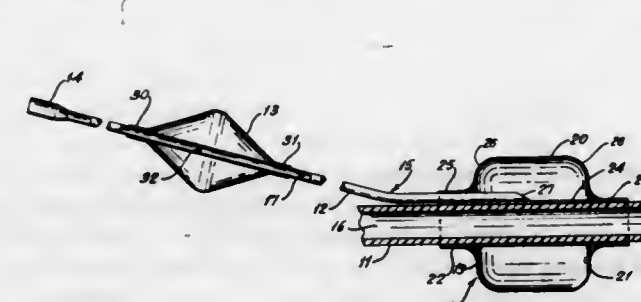
Chalmers M. Goodyear, Coopersburg, Pa., assignor to The Foregger Company, Inc., Smithtown, N.Y.

Filed March 19, 1971, Ser. No. 126,207

Int. Cl. A61m 25/00

U.S. Cl. 128—351

8 Claims



An inflatable cuff for use in combination with a ventilation tube inserted into the trachea of a patient, a major portion of the outer surface of the inflated cuff sealingly engages the trachea gently enough to avoid distortion of, or trauma to the sensitive trachea wall. The cuff is of flexible material having thickness between 0.005 and 0.01 inch and, when inflated outside the trachea, the cuff takes the shape of a right cylinder having essentially flat end walls with curved transition portions between the end walls and the straight cylindrical walls.



3,731,695

## COIN HOLDER AND COIN DISPENSER

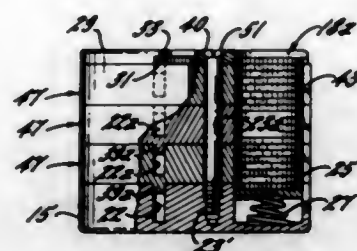
Leo Meljer, Green Bay, Wis., assignor to Synthetic Surfaces Inc., Green Bay, Wis.

Filed Oct. 9, 1970, Ser. No. 79,491

Int. Cl. G07d 1/00

U.S. Cl. 133-6

1 Claim



A coin holder and coin dispensing device which is of such size and shape that it will fit conveniently in the hand of the user, and of such construction that it permits the selective dispensing of coins from the holder by movement of the thumb of the hand which holds the dispensing unit. The mechanism consists of a generally circular, box-like base having radially-spaced, vertically-extending, cylindrical passageways formed therein for holding stacks of coins, and a top or cover element that is provided with dispensing slots of such shape that the coins normally are held securely in the device, while at the same time permitting convenient sidewise movement of the coins when dispensing is desired. The coins are held in the dispensing position by being pressed against inwardly extending ledges, provided at the edges of the dispensing slots in the top closure element, by a spring and piston disc arrangement operating in each of the passageways in which the coins are stacked.

3,731,696

## GLASS WASHING APPARATUS

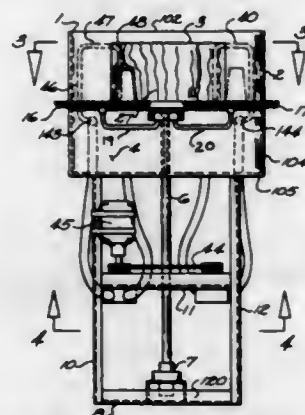
Seth L. Hackney, 203 Dale Lane, California, Mo.

Filed March 2, 1971, Ser. No. 120,113

Int. Cl. B08b 3/02

U.S. Cl. 134-80

5 Claims



In a washing apparatus, particularly an apparatus designed for the washing of glass tumblers, means are provided for washing the entire glass which includes a platform arranged to be rotated by a motor, the platform having a glass supporting surface containing a multiplicity of openings extending from and through said surface and a lower surface, spray nozzles directed to force liquid through the openings in the platform, and spray devices directed to force liquid down towards the inverted glasses which are placed on the platform, the spray nozzles and spray devices being connected via a conduit to an open-topped reservoir beneath the platform and positioned directly beneath the glass supporting surface, pumps connected to supply liquid from the reservoir to the spray devices and spray nozzles and an enclosure around and above the glass supporting platform. Rotary feed and discharge discs are frictionally driven by the platform.

3,731,697

## PAINT ROLLER CLEANING APPARATUS

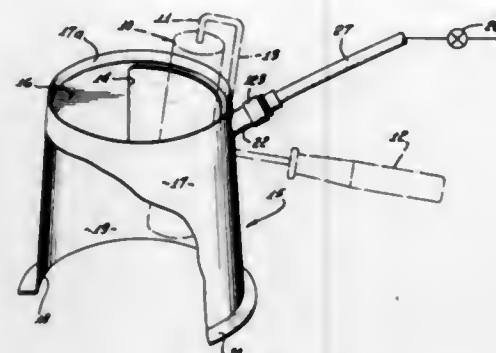
Albert J. Yost, 42326 North 55 Street West, Quartz Hill, Calif.

Filed Aug. 16, 1971, Ser. No. 172,134

Int. Cl. B08b 3/02

U.S. Cl. 134-138

6 Claims



A paint roller cleaning apparatus for paint rollers rotatably carried on a spindle comprising (a) an upright hood having a fluid passing lower opening, and an upper through opening sized to freely pass a paint roller endwise into a cleaning zone within the hood interior, (b) a nozzle carried by the hood to receive cleaning fluid under pressure, the nozzle having an orifice outlet formed to produce a fan shaped spray of fluid directed to spin the roller to effect centrifugal throw-out of removed paint and fluid to drain down the inside of the hood and through the lower opening, and (c) the spray locus being spaced from the upper opening so that the roller extent spinning in that space may be centrifugally freed of fluid prior to withdrawal from the upper opening.

3,731,698

## CANE OR CRUTCH TIP

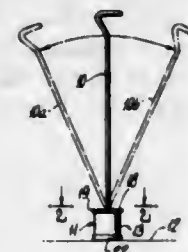
Gilbert Buchalter, 5551 Prospect Avenue, Newark, N.J.

Filed April 5, 1971, Ser. No. 131,261

Int. Cl. A45b 9/04

U.S. Cl. 135-62

4 Claims



Three embodiments of a tip or head for a cane or crutch are disclosed. The tip is formed from a cylindrical segment, the bottom surface of which is provided with an anti-slip device for engaging the ground. The upper extremity of the tip is provided with a resilient member securable to the bottom of the crutch or cane.

3,731,699

## SUPERSONIC POWER AMPLIFIERS

Charles E. Hallum, Irvine, Calif., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Filed Nov. 15, 1971, Ser. No. 198,840

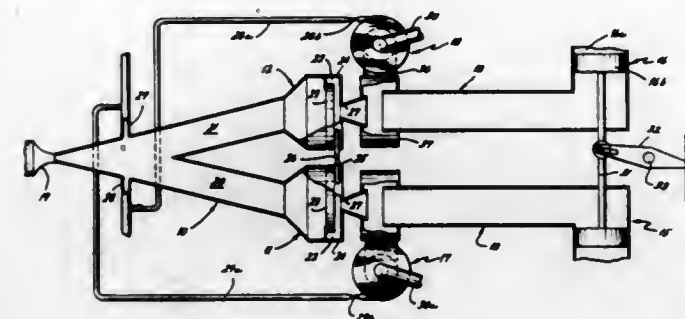
Int. Cl. F15c 1/16

U.S. Cl. 137-809

10 Claims

A two-way diverter valve and amplifier, for use with high velocity, high temperature gases in which relatively weak

pneumatic control signals are amplified, both as to pressure and flow rate, without the use of mechanically moved parts. A bistable fluid amplifier has its branches coupled to vortex fluid amplifiers which include secondary nozzles through which



fluid feeds two conduits each of which terminates in a pneumatic actuator. An additional pair of vortex amplifiers are provided which afford pneumatic pressure relief and prevent overpressure developing in the actuators.

3,731,700

## FLUIDIC INTEGRATED LOGIC CIRCUIT MODULE

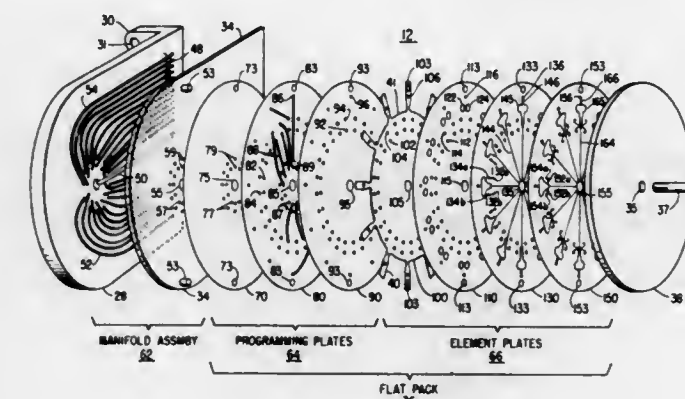
Kenneth W. Cohen, Chesterland, Ohio, assignor to Bailey Meter Company, Wickliffe, Ohio

Filed March 24, 1969, Ser. No. 809,763

Int. Cl. F15c 1/06

U.S. Cl. 137-833

1 Claim



A fluidic circuit module formed from a pack or stack of plate elements having aligned apertures for fluid communication therethrough. Some of the apertures in the plate elements form inter-connecting fluid passages between the plate elements, at least one of the plate elements also has some of its apertures intra-connected by fluid passages for programming the pack and at least one of the plate elements has intra-connected fluid passages forming a plurality of radially extending active fluidic elements supplied from a centrally located power input aperture.

The double mode NOR gate, an active fluidic element which may be used in the module, includes an interaction chamber separating an aligned input and output passage defining a path of laminar fluid flow and a control fluid inlet passage opening into the interaction chamber for establishing a control stream fluid flow which switches the power stream from laminar to turbulent flow. The interaction chamber has side walls which diverge from the input passage in the direction of the output passage, and this causes the turbulent flow to attach to one of the side walls and reduces the outlet pressure to substantially zero.

3,731,701

## SEPARATOR FOR FORCING FLUIDS BY PIPELINE

Koji Sugeno, Zama, Japan, assignor to Suzui Co., Ltd., Tokyo, Japan

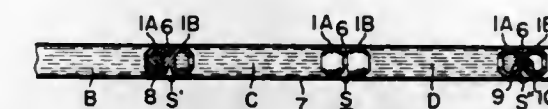
Filed July 2, 1971, Ser. No. 159,121

Claims priority, application Japan, July 25, 1970, 45/64779

Int. Cl. B08b 9/04

U.S. Cl. 137-268

8 Claims



A separator for use in a pipe for separating different fluids within different axial sections of the pipe while enabling the different fluids to be simultaneously moved through the pipe. The separator includes a pair of substantially spherical hollow elastic bodies which are fixedly connected together by intermediate resiliently flexible wall means for permitting the bodies to deflect or bend relative to one another when passing through a curved pipe section. The spherical bodies each have an opening for providing communication between the pipe and the interior of the body whereby the fluid within the pipe deforms the elastic bodies into slideable sealing engagement with the internal wall of the pipe.

3,731,702

## DEVICE FOR SUPPORTING THE VALVE BODIES OF TURBOMACHINES

Hans Bellati, Wettingen, and Peter Pfenkcher, Gebenstorf, both of Switzerland, assignors to Aktiengesellschaft Brown Boveri &amp; Cie., Baden, Switzerland

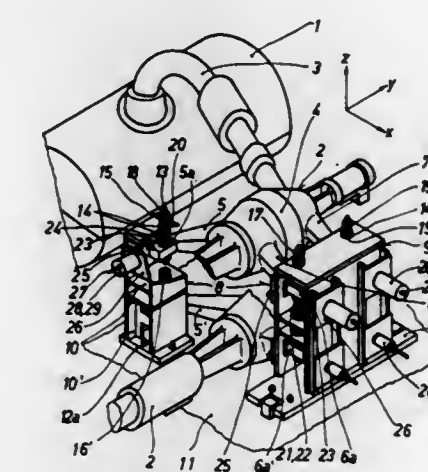
Filed Feb. 29, 1972, Ser. No. 230,275

Claims priority, application Switzerland, March 2, 1971, 3051/71

Int. Cl. F16f 15/00

U.S. Cl. 137-343

4 Claims



Apparatus for supporting the body of a valve for a turbomachine such as a steam turbine on its foundation which is so constructed as to permit displacement of the valve body in three different directions at right angles to each other as a result of stresses imposed upon it when in service. To this end, the valve body is provided with three laterally extending support arms, each arm being connected in a flexible manner with a rigid support frame anchored to the foundation which permits the three different directions of movement. In addition, the support frames are each provided with means by which the corresponding arms on the valve body can be adjusted under restraint in at least two different directions at right angles to each other during assembly and also during dismantling of the valve body when out of service.



3,731,703

**SHUT-OFF FUEL TAP FOR MOTOR VEHICLES OR THE LIKE**

Aloys Hubenthal, Hirschbergstrasse 19, Munich, Germany

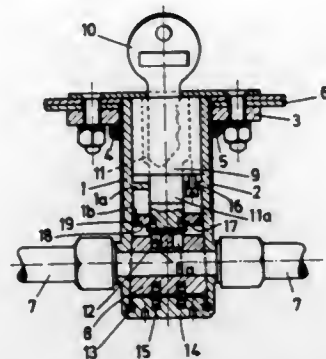
Filed May 10, 1971, Ser. No. 141,671

Claims priority, application Switzerland, May 13, 1970, 7076

Int. Cl. F16k 35/10

U.S. Cl. 137—384.2

9 Claims



A shut-off fuel tap which has a fuel plug interposed in the fuel line and which plug can be turned by a key insertable in a lock cylinder. The fuel tap includes sealing means between the shut-off plug and the lock cylinder which prevents escape of vapors or the like from the fuel line. The shut-off plug can be easily removed by means of an end plug in the fuel tap assembly and thereby facilitates cleaning and repair of the shut-off plug.

3,731,704

**RESERVE SWITCH FOR DIVING EQUIPMENT**

Hans Otto Lerris, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

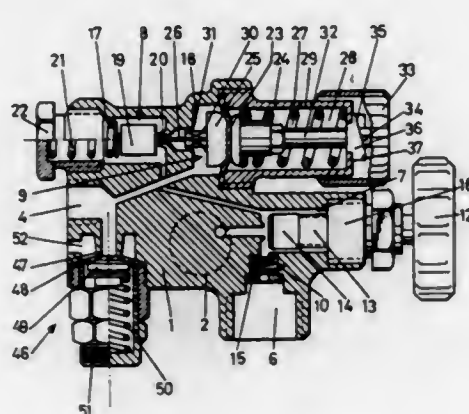
Filed April 7, 1971, Ser. No. 132,114

Claims priority, application Germany, April 16, 1970, P 20 18 147.9

Int. Cl. F16k 17/04

U.S. Cl. 137—612.1

7 Claims



The invention relates to a valve assembly for diving equipment having an air inlet to which a container bottle containing pressurized air may be attached and an air outlet to which the breathing equipment is attachable. Between the air inlet and air outlet is reserve valve means which is biased in an opening direction by pressurized air on the downstream said thereof and in a closing direction by valve actuator means which operates to close the reducing valve when the air pressure on the downstream side drops to a predetermined minimum pressure. First and second guide means are provided for the valve actuator means which actuator means has a range of movement relative to each of said guide means with said movement being automatic relative to the first guide means and manually controllable relative to the second guide means. The valve actuator means is transferable from the first guide means to the second guide means only at a point corresponding substantially to said minimum pressure.

3,731,705

**FLUID COUPLING**

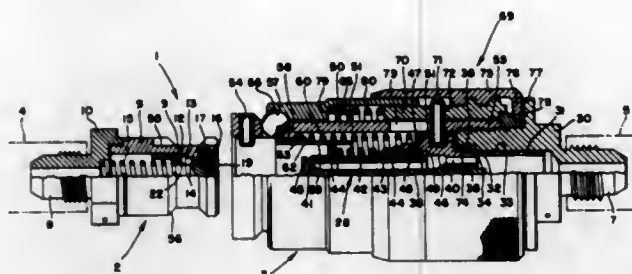
Joseph W. Butler, Elyria, Ohio, assignor to Lear-Siegler Inc., Maple Heights, Ohio

Filed May 6, 1970, Ser. No. 35,136

Int. Cl. F16l 29/00

U.S. Cl. 137—614.06

20 Claims



Fluid coupling consists of two separable coupling parts each containing a valve for controlling fluid flow therethrough. A single locking device locks the coupling parts together, and the fluid coupling operations are interlocked to permit only one operation at a time in the correct sequence preventing opening of the valves prior to locking the coupling parts together and requiring closing of the valves and breaking of the intercoupling seal prior to unlocking.

3,731,706

**VALVE WITH HYDRAULIC LOCK**

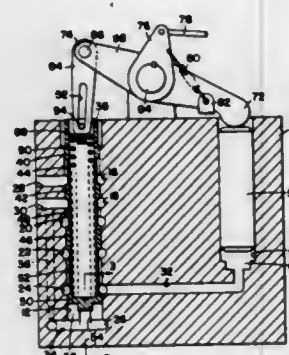
Richard Arlo Michael, Waterloo, Iowa, assignor to Deere &amp; Company, Moline, Ill.

Filed March 30, 1972, Ser. No. 239,450

Int. Cl. F16k 31/44

U.S. Cl. 137—624.27

6 Claims



A modulating valve is urged from its extreme closed position to its extreme open position by one end of a pivoted lever, and the modulating pressure is applied to a piston which acts on the other end of the pivoted lever to lock the modulating valve in its extreme open position until an external force is applied to the lever to move the modulating valve to its extreme closed position.

3,731,707

**CONTROL VALVE FOR ELASTIC PRESSURE FLUID**

Axel Gunnar Berle, Antwerpen; Lars Gunnar Nilsson, and Hans Kristoffer Olofsson, both of Wilrijk, all of Belgium, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed July 7, 1970, Ser. No. 52,868

Int. Cl. F16k 11/02

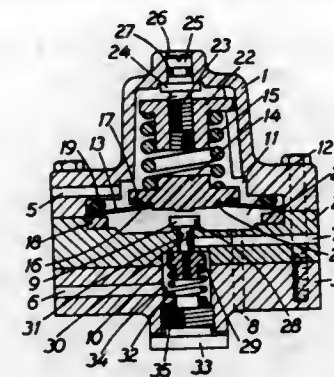
U.S. Cl. 137—625.66

5 Claims

A control valve for elastic pressure fluid comprises a housing with inlet and outlet passages in which a valve member is movable from a first position in which pressure fluid is vented from one outlet passage to a second position in which pressure fluid is supplied to said outlet passage. A diaphragm formed as

a cup shaped resilient disc divides the housing in two chambers, one of which being constantly vented to the atmosphere and the other being supplied with pressure fluid of varying

and outlet manifold structures which impart an orbital spin flow pattern to the liquid causing it to move in a circle about the axis of the major flow pattern. The manifolds as disclosed are somewhat flat members defining radially-extending peripheral shoulders which are ported to communicate with



pressure, the value of which causes the resilient disc to flex from a position in which the valve member is unaffected by the diaphragm to a position in which the valve member is moved from the one position to the other position.

3,731,708

**FLUIDIC DEVICE**

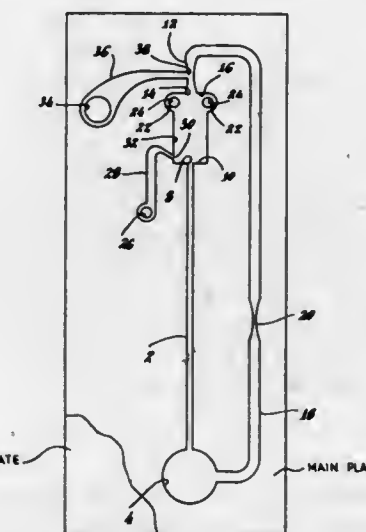
Robert F. O'Keefe, Trumbull, and Basil B. Beeken, New Haven, both of Conn., assignors to Automatic Switch Co., Florham Park, N.J.

Filed Nov. 5, 1970, Ser. No. 87,132

Int. Cl. F15c 1/18

U.S. Cl. 137—81.5

8 Claims



A device for isolating contaminated control signal fluids from fluidic control logic comprises a first emitter channel for directing a first laminar fluid jet through a vented interaction chamber for impact with a second fluid jet issuing through an orifice between the chamber and a second emitter channel. Control signal fluid is introduced into the chamber to render the first fluid jet turbulent and shift the jet impact plane from the vicinity of the orifice toward the opposite end of the chamber. The resultant reduction in fluid pressure in the second emitter channel is manifested at an output port communicating therewith.

3,731,709

**LIQUID PULSATION DAMPENER**

Robert C. Glover, Santa Paula, Calif., assignor to Fluid Kinetics Corporation, Ventura, Calif.

Filed June 1, 1971, Ser. No. 148,361

Int. Cl. F15d 1/06

U.S. Cl. 138—37

5 Claims

A dampener is disclosed for use in a pipeline, to reduce noise, vibration and peak pressures. A housing receives intake



3,731,710

**SPRAY FOAM INSULATED PIPE**

Richard H. Bauer, West Caldwell, and Richard Kilpert, Berkeley Heights, both of N.J., assignors to Esso Research and Engineering Company

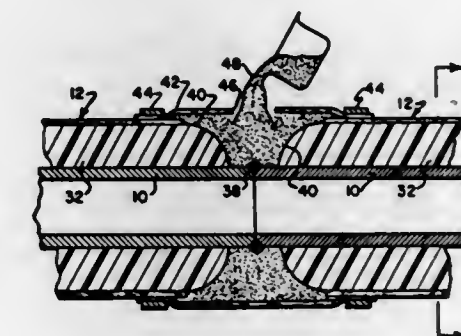
Division of Ser. No. 486,591, Aug. 27, 1965, Pat. No. 3,480,493, which is a continuation-in-part of Ser. No. 420,083, Dec. 21, 1964. This application March 1, 1971, Ser. No.

119,920

Int. Cl. F16l 9/14

U.S. Cl. 138—143

1 Claim



A method and apparatus for applying a spray plastic foam insulation to a pipe wherein the pipe is cleaned and preheated to at least 90°F. prior to spray application of foam. The cleaning and preheating assist in the foaming process and enhance the physical bond of the initial layer of sprayed foam to the pipe. A bitumastic and kraft paper vapor-barrier subsequently is applied thereon to the exterior surface of the insulation.

3,731,711

**CORRUGATED GONDUIT**

William J. Bauer, 422 South Park, La Grange, Ill.

Filed Dec. 17, 1968, Ser. No. 784,355

Int. Cl. F16l 9/02, 9/06; F17d 1/00

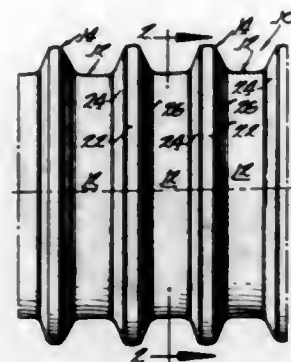
U.S. Cl. 138—178

11 Claims

Corrugated metal conduit is provided with inwardly projecting corrugations having smoothly arcuate broad inner crest surfaces which are substantially broader than the intervening trough bottoms and which are inclined shallowly outward at each edge whereby the fluid flow conforms thereto and the



eddy volume in the troughs is minimized to increase the flow efficiency of the conduit. Further, inwardly extending projec-



tions may be provided on the crests to generate vortices to assist in delaying the departure of the flow from the crest surfaces.

3,731,712

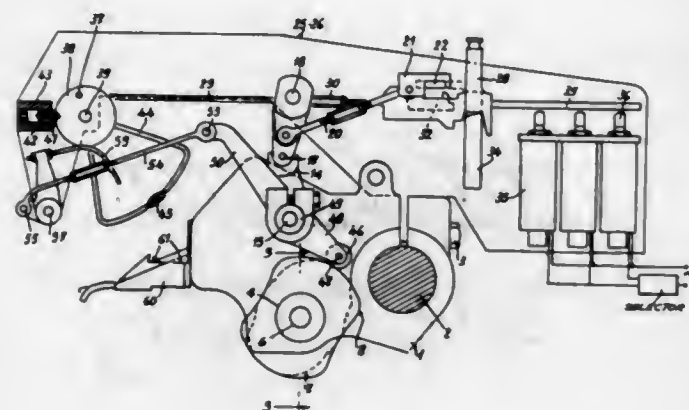
### WEFT DISTRIBUTOR AND SELECTOR FOR POWER LOOMS

Jacques Sermet, Bourgois-Jallieu, France, assignor to Ateliers Diederichs, Bourgois-Jallieu, France

Filed July 6, 1971, Ser. No. 159,634  
Int. Cl. D03d 47/38

U.S. Cl. 139—122 W

3 Claims



In a power loom a distributor-selector device for selecting multi-color wefts among a plurality of weft threads and presenting the selected weft thread to the insertion member. Each weft thread is engaged permanently in a guide independent of the guides receiving the other threads, all the guides being mounted in side by side relationship and adapted to oscillate about a common shaft, the oscillation of the selected guide resulting from the movement of a pull rod to which it is connected and which is adapted, when selected, to become locked to a blade to which a rectilinear reciprocating motion is imparted. The thread movement caused by the oscillation of its guide is completed by the downward pivotal movement of a fork bending said thread across the path of the insertion member. The selected pull rod is lifted by the thrust exerted directly against it by the core of an electromagnet so as to cause its locking engagement with said blade controlling the pull rod, this locking engagement being obtained by using a pivoted catch formed with a notch and responsive to a return spring.

3,731,713

### WATER JET LOOM

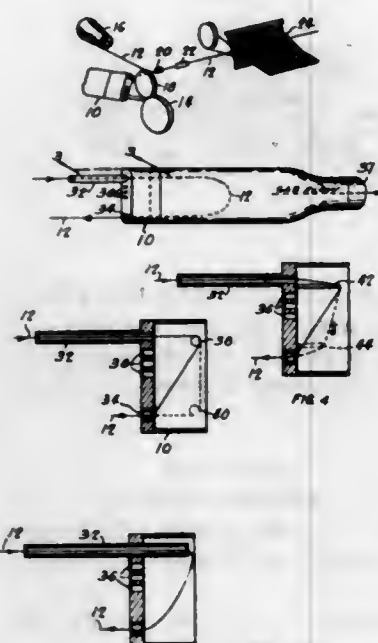
J. P. Benoit Lachapelle, 26 Des Tillards, and Joseph Majorique LaBranche, 562A Brock, both of Drummondville, Quebec, Canada

Filed April 19, 1971, Ser. No. 135,261

Int. Cl. D03d 47/34

U.S. Cl. 139—122 R

9 Claims



A suction tube to be used for the instant storage of yarn in a fluid jet loom and particularly between a yarn supply and a fluid feeding jet such as a water jet. For instance, it has been found that with this suction, fabric defects caused by gas turbulence in the suction tube may be eliminated and that the loom stops during loom operation and/or short picks may be substantially reduced. The suction tube comprises a portion to be adapted to a suction generating means, yarn inlet and yarn outlet. A gas passage between the yarn inlet and the yarn outlet cooperates with the suction generating means to provide sufficient gas movement so that a yarn located between said inlet and outlet be held suspended within the tube. Between the yarn inlet and the yarn outlet, guiding means are provided inside the suction tube to prevent entanglement, snarl or loop formation on a yarn while it is suspended.

3,731,714

### WEFT YARN CONTROL DEVICE

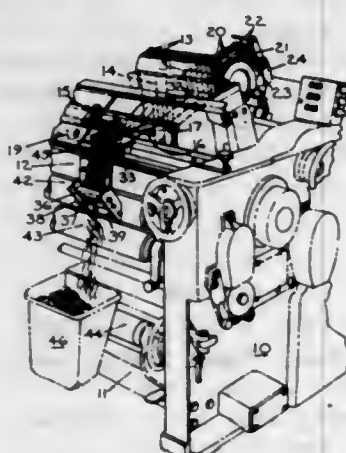
Merton C. Lyman, Jr., South Woodstock, Conn., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Sept. 24, 1971, Ser. No. 183,536

Int. Cl. D03d 49/70

U.S. Cl. 139—302

5 Claims



A device for shuttleless looms for receiving and gripping the ends of weft yarns extending from a shed of warp yarns into which they were inserted that permits advancement of the

gripped ends in the direction of movement of the fabric as it is formed and after severance of their connections to the edge of the fabric to strip from and dispose of the gripped ends held by the device.

3,731,715

### VOLUMETRIC FILLING APPARATUS

Louis M. Gageant, and William L. Greet, both of Cherry Hill, N.J., assignors to Campbell Soup Company, Camden, N.Y.

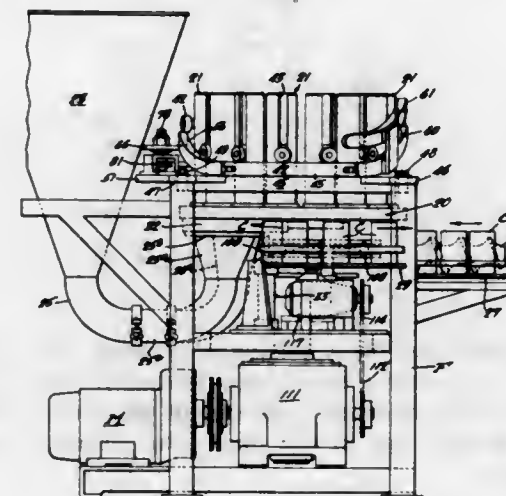
Continuation of Ser. No. 829,021, May 29, 1969, abandoned.

This application July 19, 1971, Ser. No. 164,009

Int. Cl. B65h 1/04, 3/04

U.S. Cl. 141—107

10 Claims



A multi-stage volumetric filler for a generally fluent food product including a rotary table which carries a series of piston-operated filling chambers. Separate components of a product to be dispensed into a container are fed upwardly from separate filling positions located beneath the rotary table. During rotary movement of the table, as a filling chamber passes over one filling position, the piston for that chamber is raised a predetermined amount allowing a predetermined quantity of one part of the product to be dispensed into the filling chamber. As the filling chamber passes over another filling position, the piston is raised further allowing the other part of the product into the filling chamber. Continued rotary movement of the table will cause the filled chamber to move to a discharge position over a container moving at the same speed as the table, at which time the piston is caused to move downwardly to discharge the product in the filling chamber into the container.

3,731,716

### DRAWBACK SLEEVE SLIDE VALVE

Joseph R. Darish, Plainfield, N.J., assignor to Cozzoli Machine Company, Plainfield, N.J.

Filed Jan. 22, 1971, Ser. No. 108,924

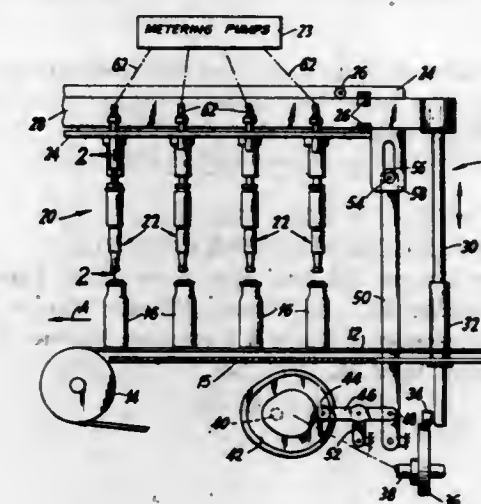
Int. Cl. B65b 3/04; B67c 3/02

U.S. Cl. 141—117

3 Claims

A drawback slide valve for liquid charging apparatus which delivers a measured quantity of liquid into a container. The drawback slide valve has a hollow spindle with two sections of different external diameters. The spindle has two lateral openings in the spindle which communicate with the bore or hollow interior of the spindle. The bore is closed by a plug between the lateral openings. The spindle is partially enclosed by a sleeve which is slidable on the spindle. The sleeve has different diameters at different portions thereof which mate with the different diameters of the two spindle sections. The sleeve also forms an annular chamber having a diameter exceeding that of the larger spindle section and extending between the lateral openings of the spindle. In a first position of the sleeve relative to the spindle, the annular chamber forms a passageway between the two lateral openings of the spindle to permit a flow of liquid through the spindle, and in a second position of the sleeve, the sleeve blocks the upper lateral

opening to block the flow of liquid through the spindle. The upper or upstream lateral opening is located on the larger diameter section of the spindle so that when the sleeve is shifted toward the second position to block the upstream opening, the available volume of the chamber between the sleeve and the spindle expands to create a negative pressure therein. The volume of the chamber is increased because the sleeve chamber is moved more along the smaller diameter sec-



tion of the spindle. With the diameter smaller, the chamber between the sleeve and the spindle increases in volume. The negative pressure due to the increasing volume and blocked entrance opening to the chamber functions to draw back liquid from the downstream lateral opening into the chamber and thereby prevent any drip from the valve after cut-off of the flow of liquid at the upstream lateral opening of the spindle.

3,731,717

### CANTEEN FOR USE WITH A GAS MASK

Norman Potash, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Army

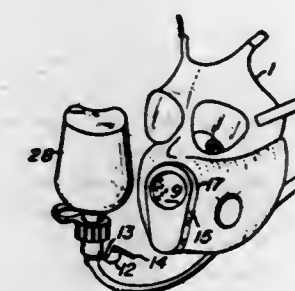
Division of Ser. No. 804,188, March 4, 1969, Pat. No.

3,635,217. This application Dec. 16, 1970, Ser. No. 98,514

Int. Cl. A62b 7/00

U.S. Cl. 141—379

1 Claim



An improved protective mask means having a drinking and resuscitation connection means to permit drinking and resuscitation while wearing the mask in a contaminated atmosphere.

3,731,718

### ADAPTER CONNECTOR

Harry A. Gramig, Culver City, Calif., assignor to Springer Company, Inc.

Filed March 3, 1971, Ser. No. 120,488

Int. Cl. B65h 1/04; B65i 3/04; B67c 3/00

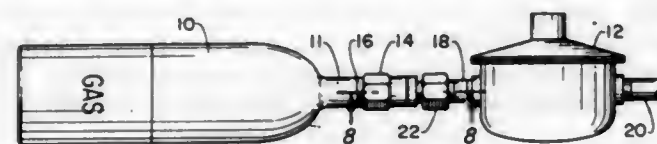
U.S. Cl. 141—384

8 Claims

Herein described is an adapter connector for use in connecting a reserve gas supply into a gas system. The connector includes a hollow chamber being threaded on both ends. One end of the chamber is adapted to engage the spud nut on a pressure regulator in the gas system. The other end of the



chamber is adapted to directly engage the reserve tank cylinder. A wall partitions the chamber and has a threaded opening therein to receive a protruding valve engaging finger



which is a cylindrical hollow member threaded into the opening in the wall. The finger is adapted to engage a needle valve in a valve stem disposed within the reserve tank.

3,731,719

## DELIMBING MACHINE CONTROLS

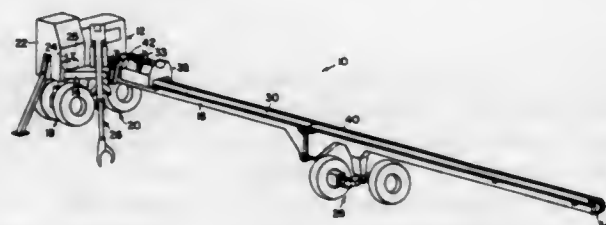
Victor Charles Pierrot, III, Dubuque, Iowa; Garn Farley Penfold, East Moline, Ill., and Thomas Wilmer Meyers, Davenport, Iowa, assignors to Deere & Company, Moline, Ill.

Filed April 26, 1971, Ser. No. 137,192

Int. Cl. A01g 23/08

U.S. Cl. 144-2.2

3 Claims



A delimbing machine includes an elongate horizontal platform having a track along which a knife carriage is driven. The knives on the carriage are openable and closable for respectively receiving and encircling a tree stem to be delimbed. Mounted adjacent one end of the track is a retainer-ejector including a clamp arm swingably mounted on a swingable bed for selectively holding tree stems on the bed when the latter is in a delimbing position over the platform and for releasing the delimbed tree stems to one side of the platform when the bed is in a tree-eject position at one side of the platform. A boom-mounted grapple is operable for positioning a tree stem on the platform and in the open clamp and delimbing knives. The delimbing knife carriage drive includes a reversible hydraulic motor and the clamping and ejecting functions of the retainer-ejector are respectively accomplished by first and second double-acting hydraulic cylinders. Three solenoid-operated valves respectively control the operation of the hydraulic motor and cylinders and a delimbing cycle is commenced by manually switching electric current for energizing the appropriate solenoids for causing the clamp arm to close on a tree stem and for causing the knife carriage to be driven along the tree stem. Once the delimbing cycle is commenced, an electrical logic circuit automatically controls the three valves to return the carriage to its starting position after its delimbing run is finished and to eject the delimbed tree and return the retainer-ejector clamp arm and bed to respective conditions for receiving the next tree stem to be delimbed. An override circuit is provided to permit the control of the valve solenoids by manually-actuated switches.

3,731,720

## SHEAR ASSEMBLY FOR TREE HARVESTERS

Raymond L. Moser, Tremont, and Edward J. Moyer, Morton, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed July 27, 1970, Ser. No. 58,466

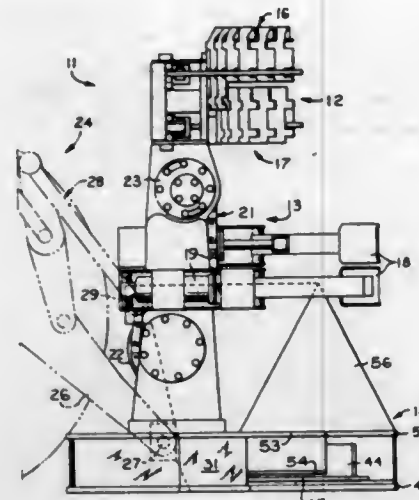
Int. Cl. A01g 23/08

U.S. Cl. 144-3.D

9 Claims

A tree harvester including a mechanism for gripping and axially moving the tree, a shear assembly and a delimbing assembly, the shear assembly having an outwardly facing anvil

secured to a frame, a rigid jaw and a pivotal blade extending outwardly from the frame on opposite sides of the anvil to form an outwardly facing opening for receiving a standing tree and a jack for pivoting the blade toward the jaw and anvil to



sever the tree, the blade having a vertical plate arcuately secured to the blade in spaced apart relation from its pivotal connection with the frame, one end of the vertical plate adjacent a cutting edge of the blade also forming a vertical cutting edge.

3,731,721

## WEDGE-CUTTING MACHINE INCLUDING TEMPLATE AND HOLD-DOWN

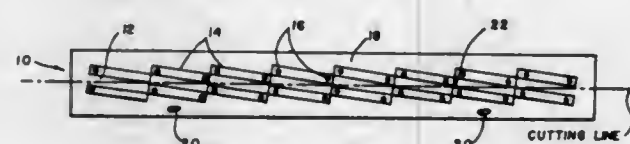
Albert W. Reese, RT. No. 2, Box 367A, Hampstead, Md.

Filed Sept. 15, 1970, Ser. No. 72,378

Int. Cl. B27b 25/10

U.S. Cl. 143-51 A

4 Claims



A wedge-cutting machine including a sliding wedge template having a base affixed with a series of diagonally staggered uprights forming a series of diagonally staggered wedge blank receiving slots longitudinally connected by a straight sawcut, and a co-acting combination hold-down and fence having cantilevered top for receiving therebeneath and guiding the wedge template, all disclosed in the context of use in combination with an overhead saw. A series-connected rubber-base template is described.

3,731,722

## KEEPER ACCESSORY FOR VARIOUS TYPES OF CONVENTIONAL TOOLS

Harry A. Carr, 2934 El Caminito, La Crescenta, Calif.

Filed Oct. 8, 1971, Ser. No. 187,685

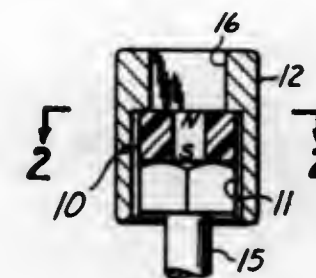
Int. Cl. B25b 15/00

U.S. Cl. 145-50 DA

19 Claims

A keeper accessory for use on typical, conventional tools of assorted types and sizes including socket, box, end wrenches, screw drivers, pliers, etc. The magnetic accessory is held in its normal operating position without need for alteration in the tool or interference with its use with the size of fastener for

which the tool was designed and relying on either an interference fit with a surface of the tool or finger pressure applied



3,731,725

## SELF STOPPING AND LOCKING SCREW

Alfred H. Brophy, 564 S. Monterey Pass Road, Monterey Park, Calif.

Filed July 6, 1971, Ser. No. 159,785

Int. Cl. F16b 39/30

U.S. Cl. 151-22

1 Claim

to wrap a soft metal tang firmly attached to the accessory about the tool or its handle.

3,731,723

## GUIDE STRIP AND NAIL COMBINATION

Francis Lemanchec, 134 rue Danton, Rueil-Malmaison, France

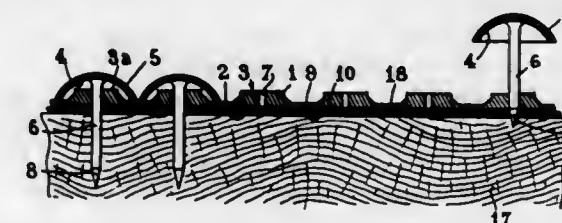
Filed March 3, 1971, Ser. No. 120,446

Claims priority, application France, March 5, 1970, 7007902

Int. Cl. B25b 29/00; E04c 1/34

U.S. Cl. 145-129

3 Claims



This guide is for driving bullen-nails. It consists of plastic material such as polyethylene, and comprises a plurality of aligned and spaced disks having a flat bottom face and an upper surface adapted to fit with more or less clearance into the lower hollow head of a bullen-nail, said disks being each formed with an axial through hole of a diameter slightly inferior to that of the nail point, said disks being furthermore interconnected at their bases by relatively thin, short and narrow lugs of such length that the distance between any pair of adjacent holes corresponds substantially to the diameter of the nail heads.

3,731,724

## SELF-LOCKING THREADED INSERT

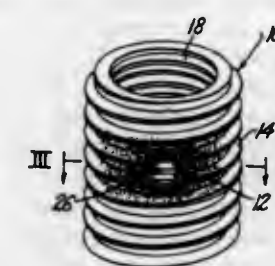
Max F. Dorfing, Huntington Beach, Calif., assignor to U & M Corporation, Boston, Mass.

Filed July 30, 1971, Ser. No. 167,689

Int. Cl. F16b 39/34

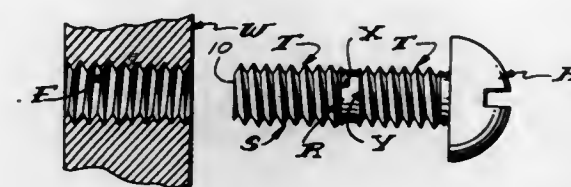
U.S. Cl. 151-7

8 Claims



A self-locking threaded sleeve insert having an external screw thread and an internal screw thread, an aperture

through a wall of the sleeve intermediate its ends, a body of normally hard tough resilient resin strongly adherent to the external thread surface in surface portions adjacent to the aperture and a body of normally hard tough resilient resin strongly adherent to the surface of the internal thread. The two bodies of resin may be formed by heating the sleeve and directing a stream of resin particles against the heated surface of the sleeve to deposit resin on the external thread surface adjacent the aperture and to pass through the aperture and deposit resin on the internal thread surface.



A self locking screw fastener comprising an elongate shank with front and rear ends and a tool engaging head, at the rear end of the shank, said shank having axially spaced front and rear threads roll formed thereon and a straight, cylindrical forming portion intermediate the threads, the front thread having a tapered female thread forming rear end portion diminishing circumferentially and rearwardly in the forward part of the forming portion and the rear thread having a tapered female thread forming front end portion diminishing circumferentially and forwardly in the rear part of the forming portion.

3,731,726

## METHOD OF CASTING BIMETALLIC JEWELLERY

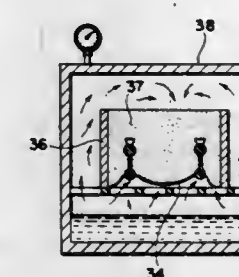
Otto Eugen Eberle, 421 Guildway Parkway, West Hill, Ontario, Canada

Filed June 28, 1971, Ser. No. 157,269

Int. Cl. B22c 9/04; B22d 25/02

U.S. Cl. 164-7

9 Claims



A method of casting jewellery of bimetallic construction, in which a first metallic part is embedded in a wax model of the second part and the combined metal part and wax model is then immersed in liquid investment, which investment is then allowed to harden in the conventional manner. The investment is then subjected to moderate heating, sufficient to melt the wax and cause the wax to run out of the cavities in the investment, but being insufficient to affect the finish on the metallic first part within the investment. A wax solvent then removes the last traces of wax and the investment is then placed in an oven and heated for an extended period at a moderate temperature, again being controlled so as to be insufficient to in any way affect the finish or form of the first metal part which remains trapped within the investment. The second metal in a molten state, is then poured into the cavities in the investment in such a way as to ensure rapid and



complete filling of the cavities. The molten second metal then envelops portions of the first metal part exposed within the cavity, and after hardening, the first and second metal parts are securely fastened together without any requirement for further soldering or other fastening.

3,731,727

# PRESSURE INTENSIFYING APPARATUS FOR A DIE CASTING MACHINE

Mitsuru Mitamura, and Mamoru Ozeki, both of Yokohama, Japan, assignors to Toshiba Machine Co., Ltd., Tokyo, Japan

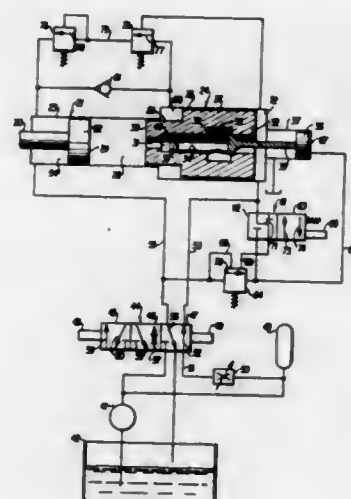
Filed Dec. 29, 1971, Ser. No. 213,629

Claims priority, application Japan, Dec. 29, 1970, 45/130288

Int. Cl. B22d 17/32; B22c 19/04

U.S. Cl. 164—154

9 Claims



A die casting machine for casting a molten metal in a mold includes a first piston-cylinder assembly which is operative to cause the molten metal to flow rapidly into the mold and a second piston-cylinder assembly which operates to apply an intensified fluid pressure on a piston surface of the first piston-cylinder assembly when the mold has been filled with the molten metal. The operation of both the first and second piston-cylinder assemblies may be selectively achieved by means of a control valve. The control valve has a piston located in a pressurized working fluid for causing the working fluid to move freely into the first piston-cylinder assembly to pour the molten metal rapidly into the mold during an initial casting process, but the same quickly closes an inlet of the working fluid to the first piston-cylinder assembly when a static pressure difference occurs between the front and rear surfaces of the piston of the control valve upon the mold becoming filled with molten metal, and then the control valve piston causes the working fluid pressure to effectively and quickly be applied on the functional surface of a piston of the second piston-cylinder assembly to generate the intensified pressure to be applied to the molten metal for making a uniform composition.

3,731,728

# MOLD APPARATUS FOR CONTINUOUS CASTING

Fred J. Webber, Orchard Lake, and Robert G. Williams, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 827,747, May 26, 1969, abandoned. This application Sept. 27, 1971, Ser. No. 184,297

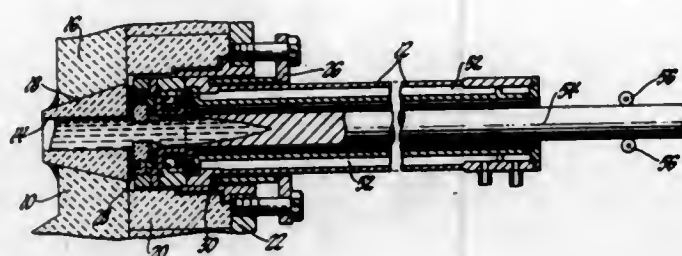
Int. Cl. B22d 11/10

U.S. Cl. 164—281

6 Claims

Apparatus for continuous casting including an open-ended mold with a first portion adjacent the inlet end having a low heat transfer capacity where no significant solidification of

metal takes place, a second portion adjacent the first portion adapted to effect initial skin layer solidification and a third



3,731,729

# SELECTOR/PROGRAMMER ASSEMBLY FOR AUTOMATIC TEMPERATURE CONTROL

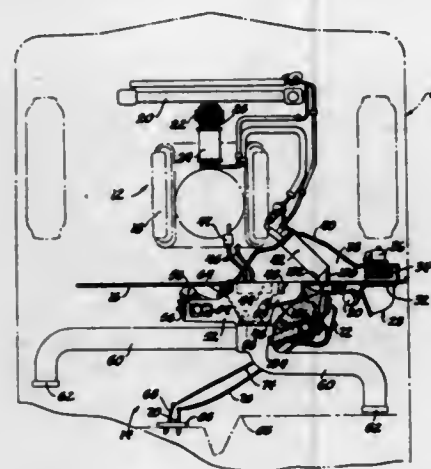
Paul K. Beatenbough, Medina; Lewis E. Dresch, North Tonawanda; Ward H. Hutchins, Lockport, and Walter W. Weiss, Tonawanda, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 7, 1972, Ser. No. 223,904

Int. Cl. B60h 1/02

U.S. Cl. 165—16

4 Claims



An automatic temperature control system for heating and cooling an automobile passenger compartment including temperature responsive means for positioning a heat regulating member, damper means in passages for directing air into the passenger compartment through alternate outlets, vacuum motors for moving said dampers between operative positions and an integral vacuum selector assembly for routing vacuum pressure to the vacuum motors. The vacuum selector assembly includes valves mounted upon a multilayered member formed of parallel plates fastened to one another and having vacuum passages therebetween formed by channels in the plates which are alternately interconnected in response to rotation of the vacuum selector valve. A multi-speed blower is controlled by several switches mounted upon a base which is spaced from the adjacent plates. Small vacuum actuators formed on one of the plates operate the electric switches to effect changes in the blower speed in response to rotation of the selector valves.

3,731,730

# MODULAR MULTIZONE, ZONE LOGIC CONTROL CENTER

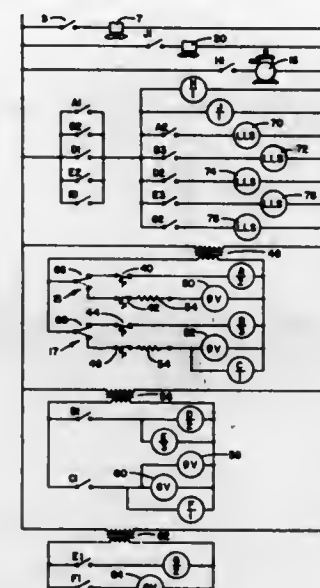
George G. Callahan, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed April 5, 1971, Ser. No. 131,153

Int. Cl. F24f 3/00

U.S. Cl. 165—22

3 Claims



A control system for utilizing a single, low voltage thermostat to actuate a plurality of heating means or a plurality of cooling means.

3,731,731

# TEMPERATURE CONTROL MEANS FOR BLOOD AND THE LIKE FLUIDS

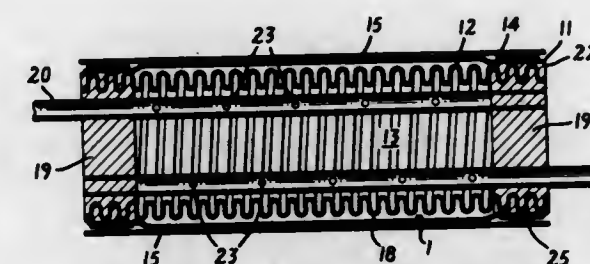
Erik Bach Kyvsgaard, Charlottenlund, and Christian Peter Simonsgaard, Holte, both of Denmark, assignors to Polystan ved E. Kyvsgaard, Herlev, Denmark

Filed May 4, 1971, Ser. No. 140,118

Int. Cl. F28f 7/00

U.S. Cl. 165—46

7 Claims



The invention relates to a device for adjusting the temperature of blood and the like fluids under sterile conditions, comprising a reservoir in the shape of a collapsible bag, in which the fluid is contacted with the outer surface of a temperature adjusting body through which a temperature adjusting medium flows, said temperature adjusting body comprising a substantially tubular rigid body passing through the collapsible bag in the assembly plane of the latter below the fluid inlet, a tight joint being provided between the bag and the tubular body at the ends of the latter.

3,731,732

# TUBE AND FIN HEAT EXCHANGER

Russell C. Ave, New Berlin; James C. Burton, and Thomas G. Blank, both of Racine, all of Wis., assignors to Modine Manufacturing Company, Racine, Wis.

Filed May 3, 1971, Ser. No. 139,737

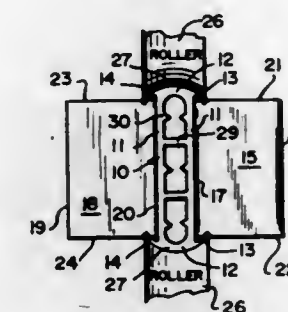
Int. Cl. F28f 1/20

U.S. Cl. 165—181

5 Claims

A tube and fin heat exchanger and method of making in which a tube includes a pair of spaced apart flanges projecting

outwardly from one side of the tube and a serpentine fin having coplanar crests on one side of the fin is in contact with the tube side between the flanges and with the opposite edges of the fin located between and against the flanges and the flanges being distorted toward each other thereby comprising means for securing the fin opposite edges to lock the fin in position



with the fin crests at the one side of the fin against the tube side preparatory to permanent bonding as by brazing. In the method the fin crests are located against the side of the tube and the opposite flanges on that side are then distorted toward each other to grasp securely the opposite edges of the serpentine fin.

3,731,733

# TUBE-GROUP HEAT EXCHANGERS

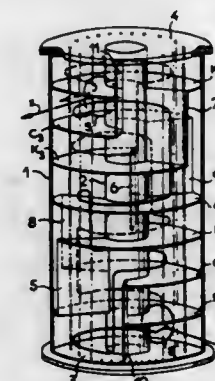
Georges Trepaud, 1 Rond Point Bugeaud, Paris, France

Filed June 1, 1971, Ser. No. 148,677

Int. Cl. F28f 9/22

U.S. Cl. 165—161

3 Claims



A cylindrical enclosure is provided with a central tubular nucleus and in between these, a first fluid flows following at least two parallel overlapping pseudo-helical paths which entirely occupy the volume between the enclosure and the nucleus. The paths are guided by vertical radial partitions and horizontal baffles. The baffles are interconnected by the radial partitions in twos (helical double-flow baffling) or in threes (helical triple-flow baffling) and have segmented cut-outs staggered in succession relative to one another. Also provided in the space between the enclosure and the nucleus and working in combination with the flow paths is a series of parallel tubes in which a second fluid flows, said tubes passing through the baffles. This exchanger allows not only a higher thermal performance as a result of better guidance of the fluid and at the same time a higher output, but also a considerable mechanical improvement by reduction of the range of the tubes of the tube-groups.



3,731,734

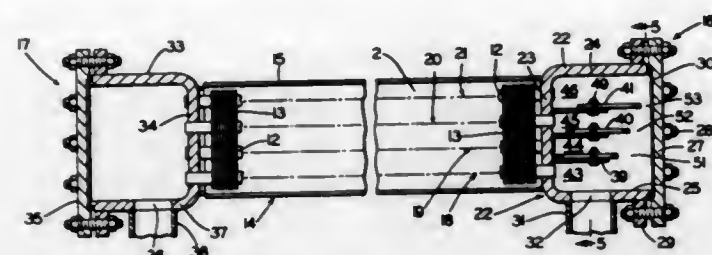
## ADJUSTABLE SELECTIVE ORIFICING STEAM CONDENSER

Kenneth B. Ris, Massillon, and Ferdinand V. Huber, Canton, both of Ohio, assignors to Ecodyne Corporation, Chicago, Ill.

Filed May 3, 1971, Ser. No. 139,371  
Int. Cl. F28f 13/00; F28b 1/06

U.S. Cl. 165—100

5 Claims



An air cooled steam condenser having adjustable plate means or a series of adjustable plates mounted within the steam intake header compartment. The plate means in effect form a series of interconnected subchambers, each of which communicates with a row of cooling tubes in which steam is condensed by a stream of cooling air flowing over, around and past the tubes. The rows of tubes extend transversely of the direction of airflow and the rows extend perpendicular to the direction of airflow at spaced intervals. An adjustable inlet passage is formed by each plate through which steam flows into the subchambers. The passages are smaller in area for each successive subchamber in the header through which the steam flows so that only that amount of steam that can be condensed effectively within the tubes in any row, enters such row, having regard to the tube length and the temperature difference at the particular row which determines the cooling effect of the airflow over the successive rows of tubes.

3,731,735

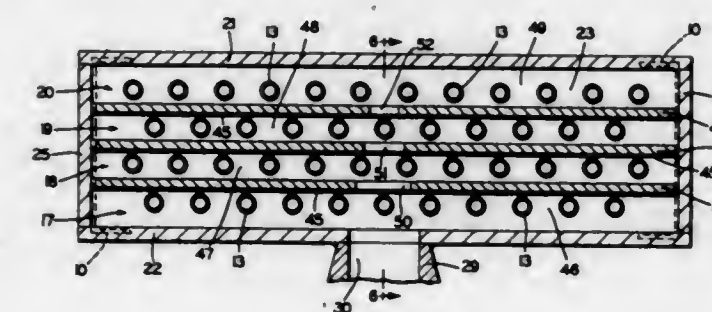
## SELECTIVE ORIFICING STEAM CONDENSER

Kenneth B. Ris, Massillon, Ohio, assignor to Ecodyne Corporation, Chicago, Ill.

Filed March 19, 1971, Ser. No. 126,174  
Int. Cl. F28f 13/00; F28b 1/06

U.S. Cl. 165—110

2 Claims



An air cooled steam condenser having plate means or a series of plates mounted within the steam intake header compartment. The plate means in effect form a series of interconnected subchambers, each of which communicates with a row of cooling tubes in which steam is condensed by a stream of cooling air flowing over, around and past the tubes. The rows of tubes extend transversely of the direction of airflow and the rows extend perpendicular to the direction of airflow at spaced intervals. An opening is formed in each plate through which steam flows between sub-chambers. The openings are smaller in area in successive plates in the header through which the steam flows so that only that amount of steam that can be condensed effectively within the tubes in any row, enters such row, having regard to the tube length and the temperature difference at the particular row which determines the cooling effect of the airflow over the successive rows of tubes.

3,731,736

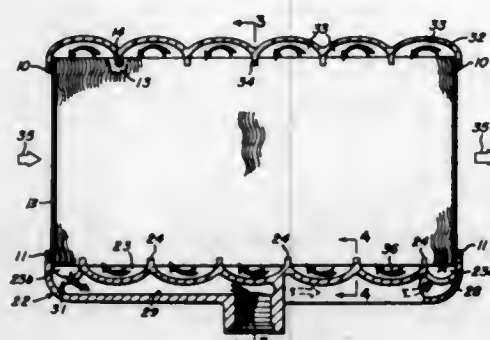
## PLATE AND FIN HEAT EXCHANGER

Joseph F. Fernandes, Centerville, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed June 7, 1971, Ser. No. 150,547  
Int. Cl. F28f 3/00

U.S. Cl. 165—166

5 Claims



A compact heat exchanger of the plate and fin type in which a manifolded core is constructed for multiple pass flow of at least one of the involved fluids. Manifold members have ribs achieving localized crushing engagement with the fin material providing for separation of adjacent flow passes without the use of dividing channel and like separable component parts.

3,731,737

## PLATE HEAT EXCHANGER

Sverre Knut Jensen, 133000 Saltjobaden, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

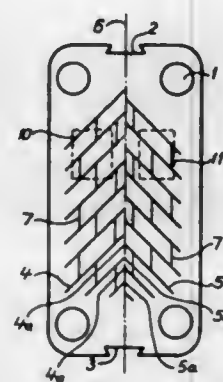
Filed March 10, 1969, Ser. No. 805,699

Claims priority, application Sweden, March 12, 1968, 3238/68

Int. Cl. F28b 3/08

U.S. Cl. 165—167

4 Claims



A plurality of identical heat exchange plates have respective heat exchange surfaces provided with protuberances acting as turbulence-effecting and spacing means between adjacent plates, such plates being adapted for assembly with marginal gaskets to form plate interspaces for throughflow of two heat exchange media along said surfaces at opposite sides (faces), respectively, of each plate. The plate interspaces are of the same depth, and at least one plate is turned 180° relative to the other plates around an axis extending in the plane of the turned plate, the protuberances of each plate being arranged unsymmetrically and so disposed that two different kinds of plate interspaces are formed by such turning of said one plate, thereby creating different flow conditions for the heat exchange media.

3,731,738

## TUBE FINS OF OUTWARDLY-ORGANIZED MATERIALS

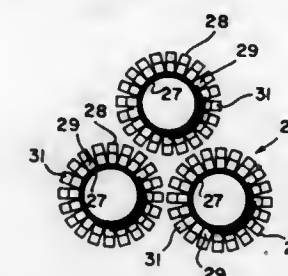
Herbert Wyane Cooper, 17 St. Lawrence Place, Jericho, N.Y.

Filed July 26, 1971, Ser. No. 165,945

Int. Cl. F28f 21/02

U.S. Cl. 165—180

7 Claims



This disclosure teaches a finned tube (or studded tube or the like) for convection sections of process heaters or boilers to improve heat transfer and reduce pressure drops of both process streams and flue gas. Tubes in this service are preferably of carbon steel which is, within this context, a relatively-high heat-conducting but relatively-low heat-resisting material. The finned tube is made of at least two materials organized proximally and distally relative to the tube wall to which it is connected and from which it projects outwardly. The distal portion is made of a relatively-high heat-resisting but relatively-low heat-conducting material such as stainless steel. The proximal portion may be of a material the same as that of the tube wall or it may be of a material with heat-conducting and heat-resisting properties intermediate those of the tube wall and of the distal portion.

3,731,739

## WASH OUT METHOD AND APPARATUS

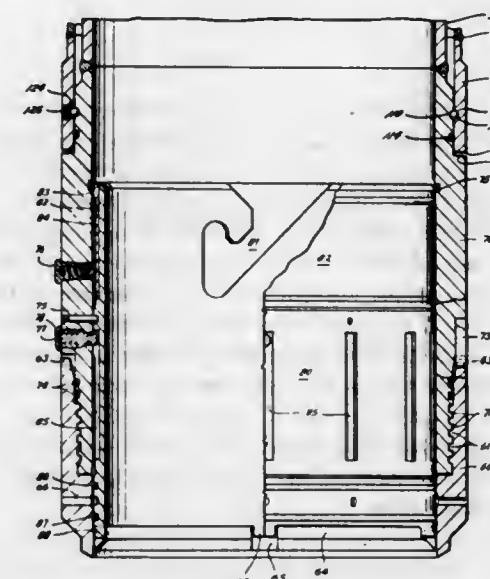
David P. Herd, Houston, Tex., assignor to Rockwell Manufacturing Company, Houston, Tex.

Filed Nov. 9, 1970, Ser. No. 87,783

Int. Cl. E21b 7/12, 43/01

U.S. Cl. 166—5

38 Claims



Method and apparatus for removing underwater well pipe connected below the mudline by washing out mud surrounding a portion of the pipe. The method utilizes a special joint which comprises two tubular members engageable with each other, one of which has wash out ports through its walls. A sleeve member is mounted in the tubular members for longitudinal movement from a first position where it blocks flow through the wash out ports to a second position where it permits such flow. The sleeve member when in the first position also locks the tubular members against disengagement but allows their disengagement when in the second position. The

3,731,740

## FLOATING PISTON FOR SELECTIVE HYDRAULIC PACKER

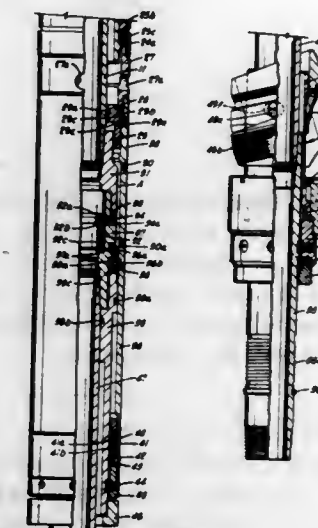
Bobby L. Douglas, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 24, 1971, Ser. No. 146,027

Int. Cl. E21b 23/04

U.S. Cl. 166—120

12 Claims



A well packer of the type which is set by hydraulic pressure injected through the tubing string, having a setting chamber between the pistons therein which actuate the packer, wherein one of the pistons is floating while the packer is being lowered to compensate for thermal expansion or contraction and pressure differentials encountered as the packer is lowered in the well in order to prevent undue pressure from being applied to the pistons which could cause the shearing of shear pins holding the packer in unset position which would prematurely set the packer.

3,731,741

## SECONDARY OIL RECOVERY PROCESS USING OXYALKYLATED ADDITIVES

Harold A. Palmer, and Thomas E. Sample, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed July 6, 1971, Ser. No. 160,142

Int. Cl. E21b 43/22, 43/24

U.S. Cl. 166—272

10 Claims

A process for the recovery of hydrocarbon materials from a subterranean hydrocarbon-bearing formation by contacting the formation with an aqueous alkaline flooding medium containing a solubilizing agent.

## ERRATUM

For Class 166—304 see:  
Patent No. 3,732,166

3,731,742

## WELL FLOW CONTROLLING METHOD, APPARATUS AND SYSTEM

Phillip S. Sizer, and Albert W. Carroll, both of Dallas, Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed March 17, 1971, Ser. No. 125,173

Int. Cl. E21b 43/00

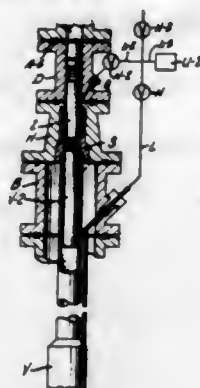
U.S. Cl. 166—315

24 Claims

A method, apparatus, and system for controlling flow of well fluids from a well in response to sensing of a leak in the connections between the components of the well head or fire



at the well head for closing off all flow from the well upon the occurrence of such condition. Encompassed is modification of existing installations to carry out the method with a minimum of added equipment or well work-over. Sensing mechanisms responsive to leakage between adjacent connected com-



ponents of the well head for actuating the closure and responsive to heat from fires at the well head are disclosed. The method, apparatus and system are adapted for multiple string installations and for new installations without modification. The system is also adapted for use with down-hole flow control devices in the well flow conductor.

3,731,743

#### FIRE CONTROL APPARATUS AIR POLLUTION PRODUCT ABATEMENT

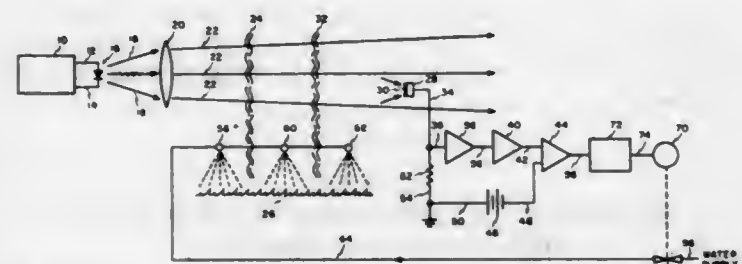
Albert H. Marshall, Maitland, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 20, 1971, Ser. No. 191,096

Int. Cl. B06b 3/00

U.S. Cl. 169-2 R

10 Claims



A light source such as a gallium arsenide laser is positioned in relation to light detector means to produce an electrical signal modulated by the pollution product of an oil fire and applied to a control valve responsive to said modulated electrical signal to control the operation of water spray equipment directed on said fire to thereby minimize air pollution product of said fire.

3,731,744

#### APPARATUS FOR REGULATING THE DEPTH OF PENETRATION OF A PLOUGH

Johann Lipinski, 1030 Vienna, Austria, assignor to Alex Friedmann, Vienna, Austria

Filed Dec. 21, 1971, Ser. No. 210,361

Claims priority, application Austria, Dec. 23, 1970, A 11624/70

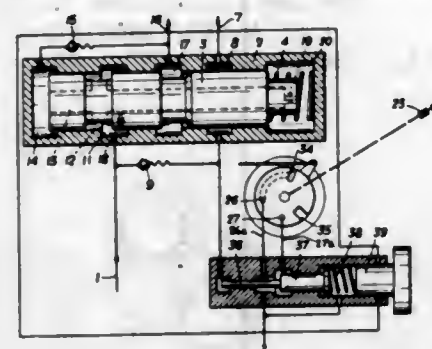
Int. Cl. A01b 63/112

U.S. Cl. 172-7

6 Claims

An apparatus for regulating the depth of penetration of a plow which is drawn by a tractor and lifted or lowered by a

hydraulic piston-cylinder arrangement. The depth of penetra-



tion of the plow is regulated by controlling the pressure in the working chamber of the lifting cylinder.

3,731,745

#### COMBINED DRAFT HOOK OPERATING AND DRAFT SENSING

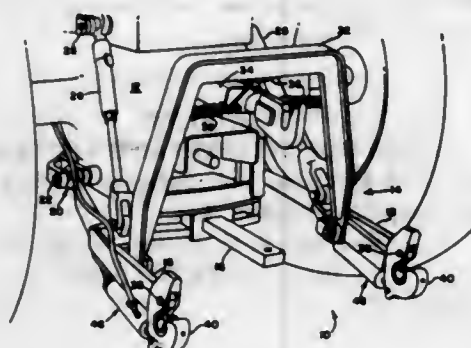
James Allen Koch, Hudson, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 1, 1972, Ser. No. 222,557

Int. Cl. A01b 63/112

U.S. Cl. 172-7

19 Claims



The lower draft links of a tractor three-point hitch include pivotal draft hooks which are power swung, by a pair of one-way hydraulic actuators, between open and closed positions for respectively receiving and retaining a hitch part of an implement. In the case of an earth-working implement, draft loads imposed on the hooks by the implement may vary during operation and cause variations in the pressure of the fluid in the actuators. A pressure responsive direction control valve is connected to the actuators and is shiftable in response to pressures above and below a preselected pressure for respectively directing fluid pressure to and exhausting fluid from a hydraulic lift cylinder for raising and lowering the draft links for adjusting the implement so as to maintain the preselected pressure in the actuators.

3,731,746

#### WEIGHT TRANSFER HITCH

Maynard E. Walberg, Independence, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 18, 1971, Ser. No. 199,943

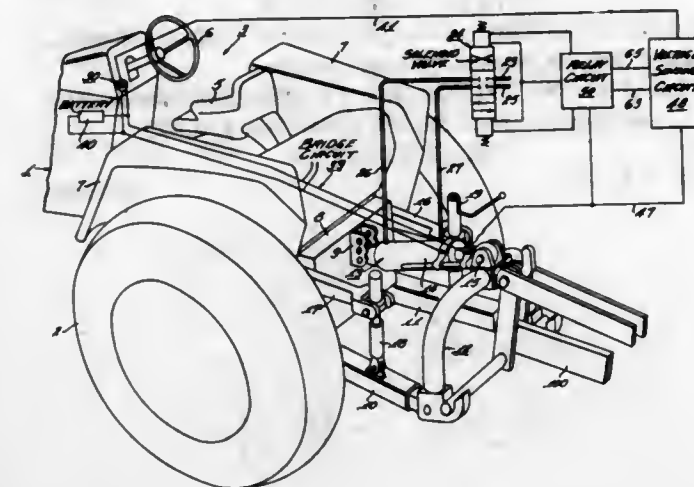
Int. Cl. A01b 63/12

U.S. Cl. 172-9

10 Claims

An electrically controlled hydraulic cylinder having a variable resistor and a bridge circuit for preselecting the desired

length of a remote hydraulic cylinder in the hydraulic system



of a tractor.

3,731,747

#### DISK HARROW

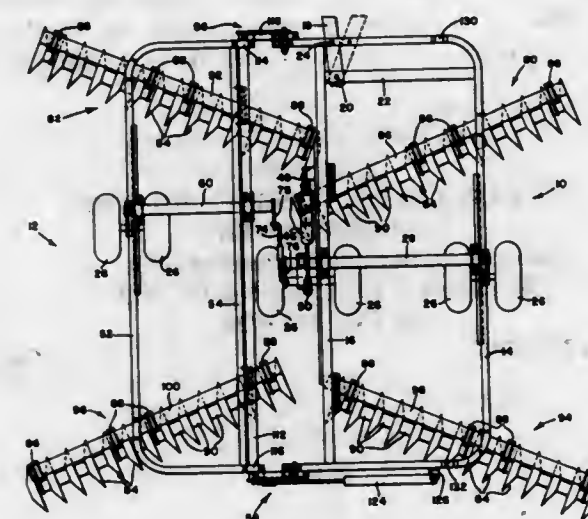
William Rudolph Frank, Moline, Ill., assignor to Deere & Company, Moline, Ill.

Filed Nov. 1, 1971, Ser. No. 194,640

Int. Cl. A01b 49/00

U.S. Cl. 172-311

11 Claims



An implement frame comprising a pair of subframes normally disposed in a side-by-side operating position and having a plurality of concave soil-working disks supported thereon operative as the implement is advanced forwardly to exert a lateral reaction force on the subframes. A pivot mechanism connects the subframes for pivotal movement about a longitudinally extending axis to permit the implement to conform to the contour of the ground during operation and to permit one of the subframes to be swung to a position above the other, thereby substantially reducing the width of the implement for transport. The mechanism connecting the subframes is constructed in such a manner that the pivot axis moves upwardly as the subframes are moved from their operating to their transport position, the axis being at a relatively low point during operation to resist the tendency of the soil reaction force acting on the disks to raise the center of the implement, and at a relatively high point during conversion of the implement from its operating to its transport position to permit the subframes to assume the latter position.

3,731,748

#### MULTIPLE PLOW HITCH

James Franklin Sullivan, East Moline, and Loren Glenn Arnold, Rock Island, both of Ill., assignors to Deere & Company, Moline, Ill.

Filed Feb. 23, 1971, Ser. No. 118,017

Int. Cl. A01b 49/00

U.S. Cl. 172-314

13 Claims



A pair of drawn plows are connected in echelon by an elongated hitch tube which has its front and rear ends connected to the forward ends of the drawbars of the front and rear plows respectively. The rear portion of the hitch tube is also connected to the rear portion of the forward plow by a laterally extending parallel linkage and is raised and lowered relative to the frame of the front plow by an extensible and retractable hydraulic cylinder which is connected in series with an extensible and retractable hydraulic cylinder for raising and lowering the frame of the front plow on its rear furrow wheel. This structure provides a constant hitch height for the rear plows.

3,731,749

#### TOWED PLOW

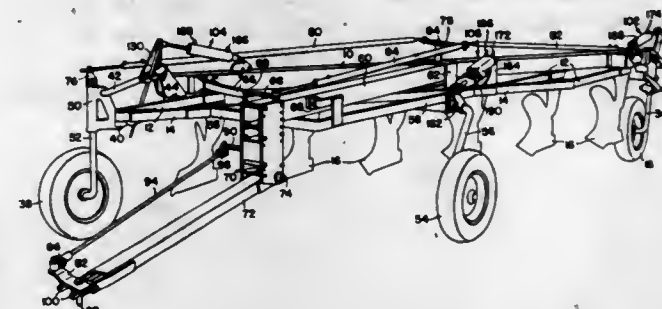
James Franklin Sullivan, East Moline, and Loren Glenn Arnold, Rock Island, both of Ill., assignors to Deere & Company, Moline, Ill.

Filed Feb. 23, 1971, Ser. No. 117,951

Int. Cl. A01b 63/16

U.S. Cl. 172-401

9 Claims



The frame of a gang plow is supported on front and rear furrow wheels and a land wheel, and is raised and lowered on the wheels by double-acting extensible and retractable hydraulic cylinders which are connected in series with the hydraulic cylinder for the land wheel being first in the series when raising. Stops are provided to determine the plowing position of the frame with respect to the furrow wheels and the hydraulic cylinders for the furrow wheels have lost-motion connections with the frame which permit limited additional retraction of the hydraulic cylinders after the frame has been lowered on the furrow wheels to the position determined by the stops. With this construction, the proper plowing position for the



frame with respect to the furrow wheels is determined by the stops and the plowing depth is determined by the amount of retraction of the cylinder for the land wheel. The hydraulic cylinder for the land wheel is also provided with an adjustable stop which prevents retraction of the hydraulic cylinder beyond a preselected position so that the plow will assume the same plowing depth each time it is lowered.

### 3,731,750 PLOW HITCH

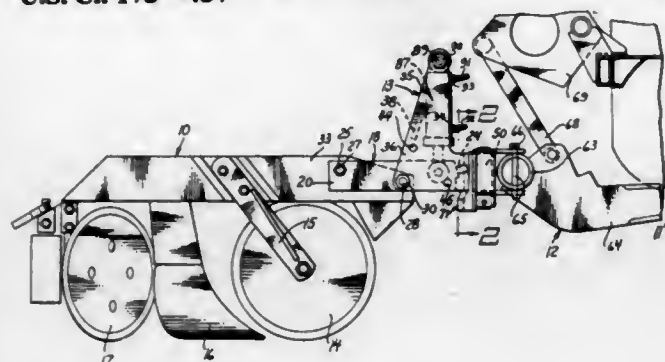
James W. Brazell, Atlanta, Ga., assignor to Heath International, Inc., Richmond, Mich.

Filed Feb. 16, 1971, Ser. No. 115,497

Int. Cl. A01b 63/00

U.S. Cl. 178—457

3 Claims



A plow hit for attaching a plow to a tractor or the like and which includes a means for centering the plow when it is raised to the transport position. The hitch includes a swivel attachment member for attaching the plow hitch to a hitch means on a powered vehicle, a swivel arm hingedly mounted at the front end on the swivel attachment vertical axis, a pivot assembly for attachment to a plow and which is pivotally mounted to the rear of the swivel arm about a horizontal pivot axis, power means carried by the swivel arm and connected to the pivot assembly for pivoting the plow about said horizontal pivot axis between lowered and raised positions, and means on the swivel attachment member and pivot assembly for limiting the horizontal swinging movement of the plow when it is in the lowered position, and for maintaining the plow in a centered position when the plow is in a raised position.

### 3,731,751 POWER DRIVEN AUGER ATTACHMENT FOR SNOWMOBILES

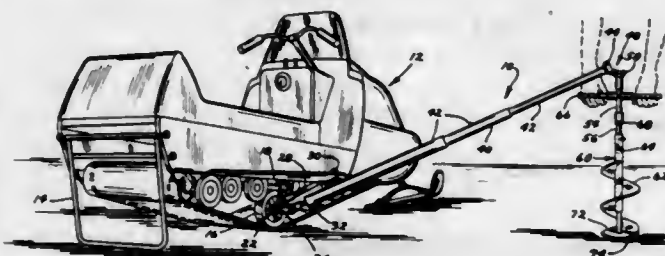
Harvey H. Rusco, P.O. Box 345, Schroeder, Minn.

Continuation-in-part of Ser. No. 138,993, April 30, 1971, abandoned. This application Sept. 28, 1971, Ser. No. 184,546

Int. Cl. E21c 1/02

U.S. Cl. 173—26

6 Claims



An ice auger is driven from the power train of a snowmobile through the instrumentality of an auger drive wheel which is rotatably mounted in a drive wheel mounting bracket and forced down against the inside of the bottom run of the snowmobile drive track. The drive between the drive wheel and the auger is accomplished using two universal joints with a telescoping drive shaft in between them. The mounting bracket pivots off of the underside of the snowmobile to force the drive wheel against the drive track and is held in place by an integral tensioning arm fastened to the snowmobile frame.

### 3,731,752 MAGNETIC DETECTION AND MAGNETOMETER SYSTEM THEREFOR

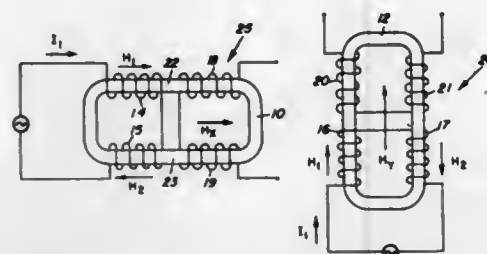
Charles A. Schad, Tulsa, Okla., assignor to Kalium Chemicals Limited, Regina, Saskatchewan, Canada

Division of Ser. No. 791,039, Jan. 14, 1969, abandoned. This application June 25, 1971, Ser. No. 156,821

Int. Cl. E21b 7/04

U.S. Cl. 175—45

8 Claims



A highly sensitive magnetometer, consisting of at least one pair of generally rectangular core elements having square hysteresis loops, for use in a guidance system for off-vertical drilling, is disclosed. The primary windings of each of the cores are driven by an oscillator, with the secondary windings of each core being differentially connected through a null circuit, which serves to balance the effects of background fields, and a detector to a suitable indicator. The primary windings of the cores are operated in resonance and the secondary windings are arranged to provide a high null output which eliminates the dead band caused by the threshold value of the diodes in the output detector circuit. This high null output may be accomplished by unbalancing the core windings or by feeding a portion of the primary winding drive current, or a signal synchronous therewith, to the corresponding secondary winding, thereby permitting measurement of the small magnetic fields which previously fell within the dead band of the device.

### 3,731,753 REVERSE CIRCULATING FOUNDATION UNDERREAMER

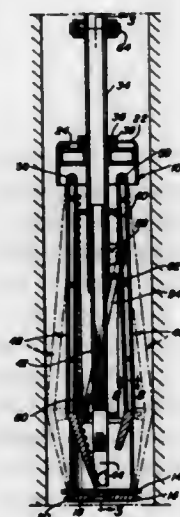
Alman A. Weber, P.O. Box 35564, Houston, Tex.

Filed July 1, 1971, Ser. No. 158,943

Int. Cl. E21b 9/26

U.S. Cl. 175—285

9 Claims



An underreamer mounted on a Kelly for adjustment and rotational driving thereby. A cylindrical housing surrounds the Kelly and mounts a pair of underreamer blades for an outward swinging thereof. A circulating flow is set up through the apparatus for continually removing the debris as it is cut by the reamer blades.

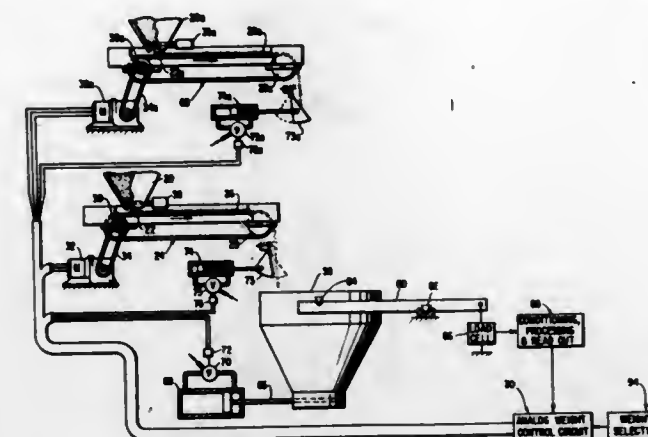
### 3,731,754 ELECTRICAL WEIGHING SYSTEMS Gilbert Allan Godwin, Oakland, N.J., and Chapin A. Pratt, Rutland, Vt., assignors to Howe Richardson Scale Company, Clifton, N.J.

This application Nov. 5, 1971, Ser. No. 196,235

Int. Cl. G01g 13/14

U.S. Cl. 177—165

2 Claims



A weighing apparatus and method wherein an electrical analog signal, having a level representative of the weight of a load, is converted into a digital pulse train by an analog-to-digital converter. A counter for counting the converter-produced pulses is connected to one or more devices that provide a read-out of the weight in visual and/or printed form. A program circuit is operatively connected to the converter and the counter, and selected circuit connections are made in the program for providing a selected one or more of the following conditions: (1) the division of the pulse train by a pre-selected divisor to count in only the quotient at the counter (2) the transfer of selected information from the counter to the read-out devices to cause the weight to be read out by counting in any of a plurality of different increments such as ones, twos or fives. Additional features pertain to tare circuits for taring the weight-representing signal.

### 3,731,755 TURN AND BANK STEERING SYSTEM FOR SNOWMOBILES

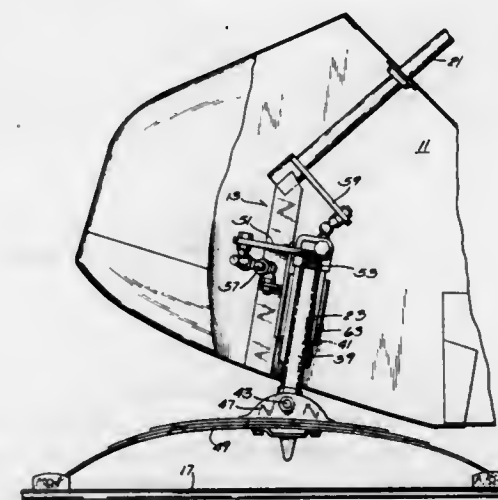
Robert Dretzka, South Milwaukee, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed April 8, 1971, Ser. No. 132,440

Int. Cl. B62m 27/02

U.S. Cl. 180—5 R

8 Claims



Disclosed herein is a snowmobile with a front cross bar having, at the opposite ends thereof, skis mounted for rotary movement relative to the cross bar about respective axes, and guide means mounting the cross bar on a frame for transverse

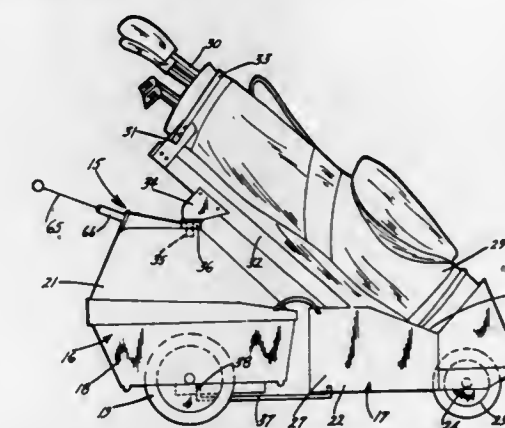
movement along a path such that one ski is lowered and the other ski is raised in response to transverse movement of the cross bar in one direction and such that the other ski is lowered and the one ski is raised in response to transverse movement of the cross bar in the opposite direction. The disclosed snowmobile also includes a connection between a steering column and the cross bar for transversely displacing the cross bar in response to steering movement of the steering column, and connections between the frame and each of the skis to provide common swinging of the skis about respective generally upright axes in response to transverse cross bar movement.

### 3,731,756 GOLF CART AND CONTROL THEREFOR Chester S. Hajec, 2195 West Hwy. 36, Roseville, Minn. Filed Oct. 29, 1970, Ser. No. 85,129

Int. Cl. B62d 11/04

U.S. Cl. 180—6.5

11 Claims



A motorized cart for use for carrying golf clubs and the like which has a power unit and a trailing load support member. The power unit includes drive motors which are electrically driven from storage batteries kept in the load support unit, and which will steer the vehicle in response to movements of a cord attached to the person using the cart so that it will follow him exactly by using differential steering for the two wheel power unit which leads the trailing load support unit.

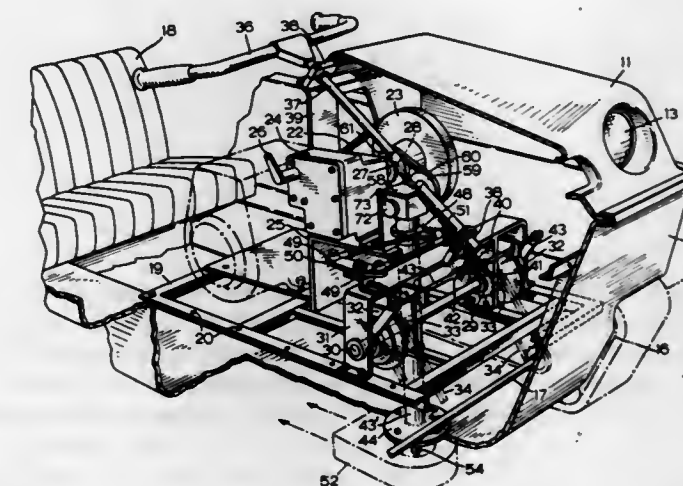
### 3,731,757 STEERING MECHANISMS Mihaly Bozsk, P. O. Box 47, R. R. No. 5, Hamilton, Ontario, Canada

Filed April 6, 1971, Ser. No. 131,752

Int. Cl. B62d 11/08

U.S. Cl. 180—6.26

1 Claim



A steering mechanism for an all-terrain vehicle has an auxiliary steerable member connected to the steering member for



control of another steerable terrain-engaging member such as a ski or water jet pump mounted thereon. The auxiliary steerable member includes a power-output shaft driven from the engine and driving the impeller of the jet pump unit. This auxiliary power output shaft can also be used to drive power devices mounted on the vehicle such as a snow-blower or grass-cutter.

3,731,758

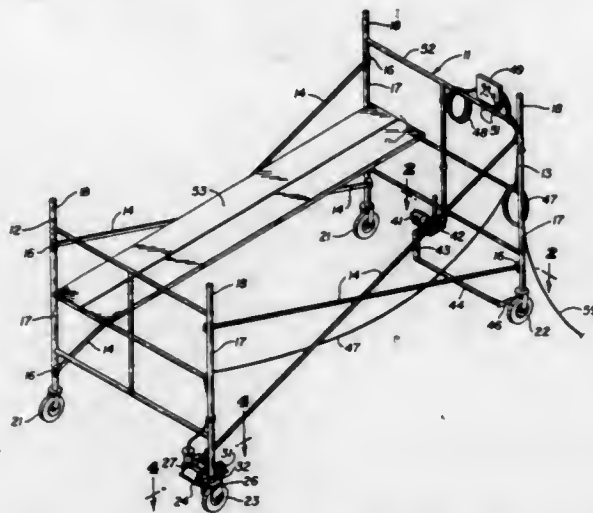
## SCAFFOLD DRIVE AND STEERING UNIT

James Hibma, Westminster, Colo., assignor to Anne Marie Hibma, County of Adams, Westminster, Colo., a part interest

Filed Jan. 4, 1971, Ser. No. 103,555  
Int. Cl. B60k 7/00

U.S. Cl. 180—11

9 Claims



A scaffold unit for construction and maintenance activities which provides a reversible drive motor at a fixed support wheel for propelling the scaffold and a motorized steering apparatus for the directional control of said scaffold by steering at least one castor mounted support wheel. The drive and steering motors are connected to a control panel that is movable to various elevated and/or remote locations. Electric drills may be used for said motors.

3,731,759

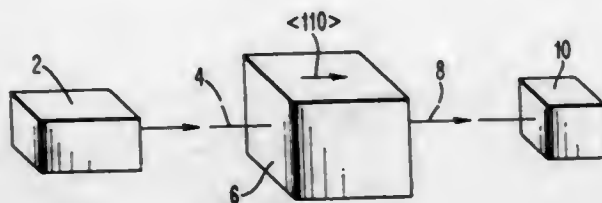
## ACOUSTIC FILTER

Duane G. Carlson, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed March 15, 1972, Ser. No. 234,943  
Int. Cl. H03h 9/00

U.S. Cl. 181—0.5 F

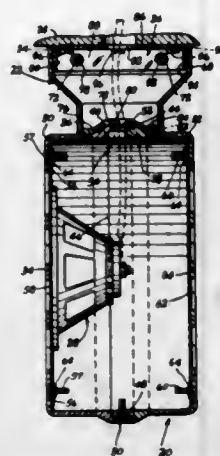
6 Claims



An acoustic analogue of an electronic high-pass filter. A doped semiconductor, whose conduction electrons satisfy degenerate statistics, is placed adjacent a generator of acoustic waves and such doped semiconductor highly attenuates phonons of a frequency of less than  $f_0$  but transmits those acoustic waves having a frequency of  $f_0$  and higher, where  $f_0 = \frac{1}{2\pi} \sqrt{\frac{V_s}{\rho A b}}$  and  $k_F$  = Fermi wave vector, etc. This  $f_0$  would vary between 500 MHz and 500 GHz, depending on doping. By employing such high-pass filter in series with a superconductor low-pass filter, one can obtain a highly monochromatic beam of phonons.

3,731,760  
HIGH SECURITY LOUD SPEAKER Baffle  
Josef J. Hammes, St. Louis, Mo., assignor to Lowe Manufacturing Company, St. Louis, Mo.  
Filed Dec. 16, 1971, Ser. No. 208,779  
Int. Cl. G10k 13/00; H04r 1/28  
U.S. Cl. 181—31 B

9 Claims



A high security loud speaker baffle for use in institutions such as prisons and the like to resist vandalism. The baffle is comprised of a pair of concave castings constituting a hollow baffle receiving a loud speaker. Each of the castings has a rim portion, one of which is exterior and the other interior, interfitting with one another and butting against shoulders. The two interfitted concave castings can be supported within a cradle receiving the rim portion and connected by tamper-proof screws to resist removal. The hollow loud speaker baffle comprised of the interfitted concave castings in addition to being used as a bidirectional baffle with the cradle can be simply employed by connecting one of the castings directly to a wall surface to provide a unidirectional baffle.

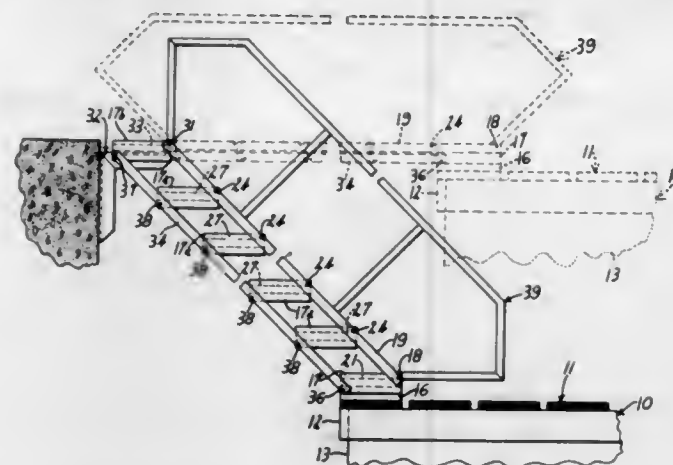
3,731,761  
FLOATING PIER WITH SELF ADJUSTING STAIRWAY ASSEMBLY

Raymond D. Glenn, P.O. Box 6, Cropwell, Ala.

Filed Aug. 19, 1971, Ser. No. 173,062  
Int. Cl. E06c 1/38

U.S. Cl. 182—1

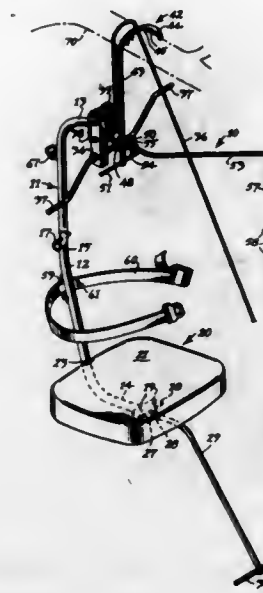
1 Claim



A buoyant pier is pivotally connected to the lower ends of laterally spaced, elongated, rigid support members with the other ends of the rigid support members pivotally connected to a supporting structure. Longitudinally spaced, parallel stair members extend horizontally between and are pivotally connected to the rigid support members. Other elongated support members extend between and are pivotally connected to the pier and the supporting structure to support and retain the stair members in parallel relationship as the pier moves to various elevations.

3,731,762  
HUNTING CHAIR  
Joe M. Sirik, Whitthorne Drive, Lavanla, Tenn.  
Filed Oct. 7, 1971, Ser. No. 187,446  
Int. Cl. A47c 1/00, 7/52; A63b 71/00  
U.S. Cl. 182—142

8 Claims



A hunting chair having a bow-shaped frame member including an intermediate back frame, a forwardly projecting upper head frame, and a forwardly projecting lower seat frame; a seat member detachably secured to the head frame, a detachable lifting mechanism secured to the seat frame, and a flexible linear member having one end fixed to the lifting mechanism and a free end adapted to be projected over an overhead support, such as a tree bough. The chair further includes a hanger rod having an arcuate upper portion for seating over the top of the bough and a lower portion attachable by swivel means to the head frame after the frame member has been elevated to a position adjacent the bough.

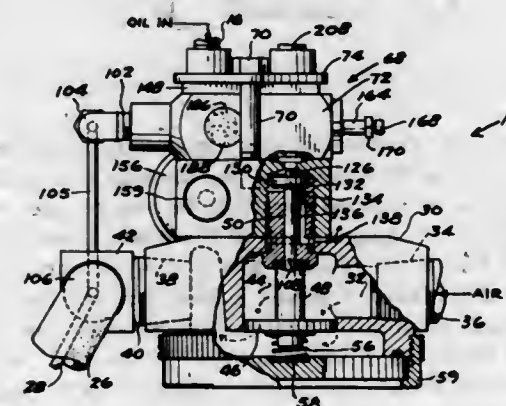
A foot rest, safety belt, and rifle support are also detachably secured to the frame member.

The seat member is provided with means for securing the detachable elements, normally secured to the frame member, to the seat member to provide a compact back-pack.

3,731,763  
LUBRICATING APPARATUS  
George E. Thrasher, Jr., Pontiac, and John T. Bertva, Utica, both of Mich., assignors to Master Pneumatic-Detroit, Inc., Sterling Heights, Mich.  
Filed March 25, 1970, Ser. No. 22,502  
Int. Cl. F16n 7/34

U.S. Cl. 184—7 D

20 Claims



A sensing disc is mounted for movement responsive to starting of a flow of air in a passageway through which air is

furnished to a pneumatic tool. Such movement operates valving to admit air under pressure through a branch passageway for actuating a lubricant pump. The sensing disc is spring returned upon discontinuation of the air flow, and return movement thereof closes the valving. The pump delivers a predetermined quantity of lubricant to the tool upon each starting of air flow in the passageway.

3,731,764  
PRESSURIZED FLUID APPLICATOR FOR SHEATHED CABLES AND THE LIKE  
Robert L. Workman, 7610 S. Boulder Road, Boulder, Colo.  
Filed Feb. 19, 1971, Ser. No. 116,834  
Int. Cl. F16n 13/08

U.S. Cl. 184—15 R

5 Claims

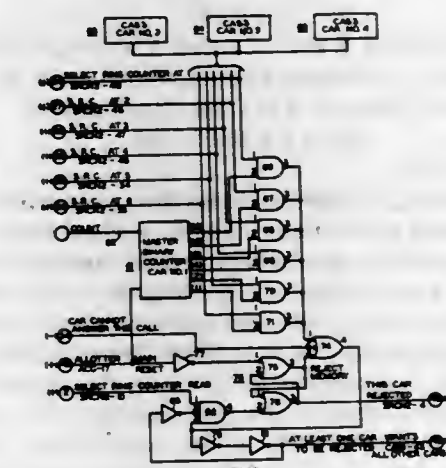


A portable pressurized fluid applicator which is specifically adapted for cleaning or lubricating sheathed cables and the like comprises a relatively rigid cylinder and a relatively flexible tubular extension on one end of the cylinder. A plunger member moves axially through the cylinder to force a fluid into the tubular extension. A sleeve adapter is placed around the end of the sheath for insertion into the open end of the tubular extension, and an adjustable clamp is positioned over the flexible tubular extension to contract the extension and adapter into fluid-tight, clamping engagement with the cable sheath whereby the fluid discharged into the extension will be forced through the space between the cable sheath and cable.

3,731,765  
MULTIPLE DIGITAL COMPARATOR  
Gerald D. Robaszkiewicz, Toledo, Ohio, assignor to Reliance Electric Company, Euclid, Ohio  
Filed June 9, 1971, Ser. No. 151,437  
Int. Cl. B66b 1/18

U.S. Cl. 187—29 R

18 Claims



A multiple digital comparator for ascertaining the largest or smallest count in a plurality of counters by progressively



scanning all of the counter's outputs from the most to least significant bits and rejecting those counters having bits set when other counters have those bits reset for the least count selection and by progressively scanning all the counter's outputs from the most significant bit to the least significant bit while rejecting those counters having bits reset when other counters have those bits set for the selection of the counter with the greatest count. Equal counts can be accommodated by an order of preference of selection so that only one counter is selected as having the least or greatest count. The comparator is illustrated for the selection of the least count as accumulated in counters individual to elevator cars whereby the car best situated to serve a call receives an assignment of that call.

3,731,766

**BRAKE RIGGING FOR RAILWAY CAR TRUCKS**

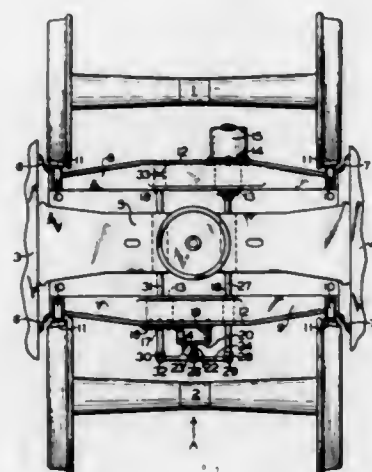
James A. Campbell, Berkeley, Calif., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Feb. 24, 1972, Ser. No. 229,042

Int. Cl. B61h 13/20; F16d 65/66

U.S. Cl. 188—52

15 Claims



A railway car truck mounted brake rigging in which a slack adjuster mounted on one of a pair of spaced apart brake beams is connected to an equalizer lever intermediate its ends which are in turn connected by push rods to the other brake beam on which is carried a single brake cylinder having its piston operatively connected to the one push rod to spread the brake beams into brake position responsive to the supply of fluid pressure to the brake cylinder. A plurality of embodiments are disclosed covering various methods of incorporating a handbrake with the brake rigging in order to provide slack adjusted handbrake operation as well as pneumatic operation without requiring that the rigging be altered significantly for use on a truck not having a handbrake connected thereto.

3,731,767

**BRAKING DEVICE INCLUDING ANTI-SKID MEANS**

Louis A. Lefort, 142 Bechman Street, Plattsburgh, N.Y.

Filed May 13, 1971, Ser. No. 142,888

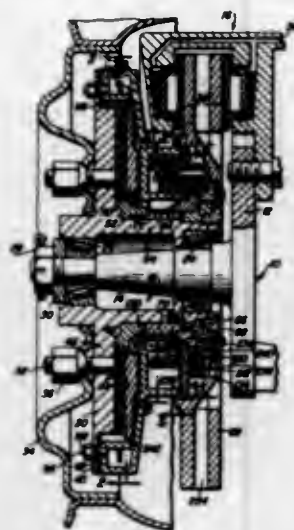
Int. Cl. F16d 55/46

U.S. Cl. 188—72.2

17 Claims

A wheel braking system including first and second sections rotatable relative to each other and to a wheel support structure about coinciding axes. A first vehicle operator controlled brake assembly is provided for braking the first section relative to the support structure and the second section includes structure for mounting a vehicle wheel thereon. Also, second brake structure is provided for braking the second section against rotation relative to the first section with a predetermined minimum braking action and includes automatic control structure to increase the braking action thereof to prevent rotation of the second section relative to the first section in response to the second section rotating relative to the first section. Also, the second brake structure controls are operative,

in response to termination of rotation of the second section relative to the first section due to an increased braking action thereon by the second brake structure as a result of rotation of the second section relative to the first section, to reduce the braking action of the second section relative to the first section to the aforementioned predetermined braking action or



force, whereby full application of the operator controlled brake assembly of a vehicle will result in the braked wheel or wheels of that vehicle being braked by rapidly alternating increasing and decreasing braking forces even though the operator of the vehicle may "freeze" on the brake control with the latter fully applied.

3,731,768

**EXTERNAL SHOE BRAKE PARTICULARLY FOR SPINNING AND TWISTING SPINDLES**

Gustav Fetzner, 7344 Gingen, Germany, assignor to Firma Zinser-Textilmaschinen Gesellschaft mit beschränkter Haftung, Postfach, Ebersbach, Germany

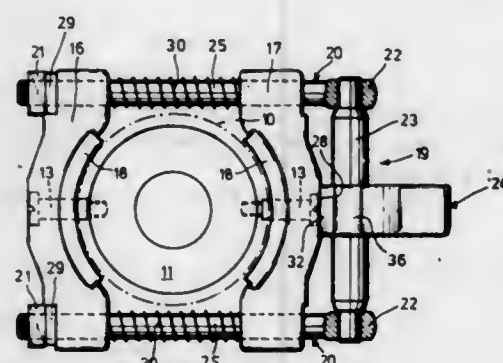
Filed April 13, 1971, Ser. No. 133,559

Claims priority, application Germany, Dec. 5, 1970, G 70 44 944.4

Int. Cl. F16d 49/16

U.S. Cl. 188—75

10 Claims



In a friction brake that includes a manually operable pivotable brake lever to draw towards one another two brake shoes for engaging an interposed spindle to be braked, the work face of the brake lever engaging one of the brake shoes has a contour which has a flat portion and a convex portion spaced therefrom. If the lever is moved in one direction from its normal (released) position, a cooperation between said flat portion and a brake shoe will maintain the lever in its braking position even without continuing application of manual force. If the lever is moved in another direction from its normal position, a cooperation between said convex portion and said brake shoe will continuously urge said lever from its braking position into its normal position.

3,731,769

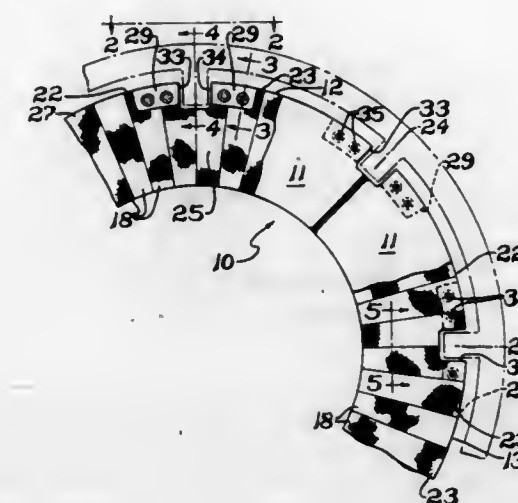
**FRICTION MEMBER ASSEMBLY**

William Edwin Ely, Troy, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Oct. 13, 1971, Ser. No. 188,894

Int. Cl. F16d 65/10

U.S. Cl. 188—218 XL



An annular friction member assembly for a disc type brake or clutch having segments of heat absorbing material sandwiched between and supported by facing members of carbon composite material. The facing members have driving lugs located at positions spaced from the heat-swept area for transmitting torque forces directly from the friction surfaces of the facing members to an associated brake or clutch part. Reinforcing members are located at the driving lugs and provide additional bearing area as well as added support to the facing members of carbon composite material to prevent failure under torque loads at the fasteners holding the facing members and the segments of heat absorbing material together.

3,731,770

**ADJUSTABLE SHOCK ABSORBER**

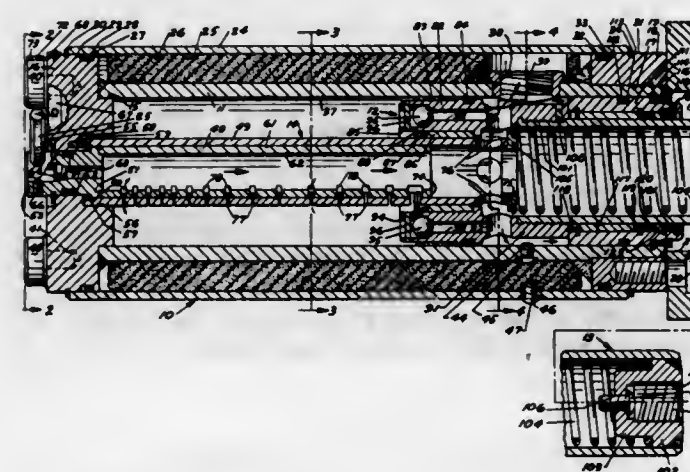
Glyn A. Bindon, Oxford, Mich., assignor to Ace Controls, Inc., Farmington, Mich.

Filed May 19, 1971, Ser. No. 144,894

Int. Cl. F16f 9/44

U.S. Cl. 188—285

23 Claims



An adjustable hydraulic shock absorber having a shock receiving piston means telescopically mounted over an axially disposed fluid metering tube means provided with a plurality of metering orifices, and means for adjusting the effective cross sectional areas of the metering orifices.

3,731,771

**PNEUMATIC-HYDRAULIC SHOCK ABSORBER**

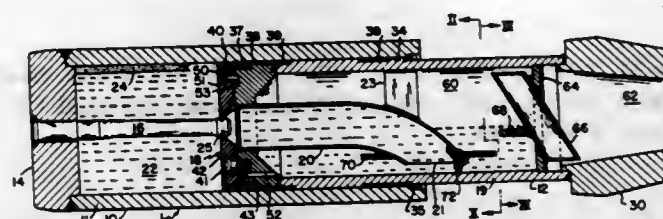
Norman J. Borgo, Coraopolis, Pa., assignor to Pittsburgh Forgings Company, Coraopolis, Pa.

Filed Feb. 17, 1972, Ser. No. 227,063

Int. Cl. F16f 9/06; B61g 9/08

9 Claims U.S. Cl. 188—289

4 Claims



My improvement is directed to a pneumatic-hydraulic shock absorber having a high pressure chamber formed by a cylinder and a low pressure chamber formed in the hollow portion of a piston slidably mounted in the cylinder. The shock is absorbed by a throttling action of a metering pin positioned in a deflector tube which connects the two chambers and the entrapped gas and foam which settle out in the high pressure chamber is returned to the low pressure chamber means by a passageway therebetween. The improvement is a bulkhead which partitions the low pressure chamber into two separate chambers connected through a sloped tube extending through the bulkhead. Baffles and deflector plates are employed in one of the partitioned chambers to control the movement of fluid so as to prevent the entrapment and transfer of gas into the high pressure chamber.

3,731,772

**DISC BRAKE FOR MOTOR VEHICLES**

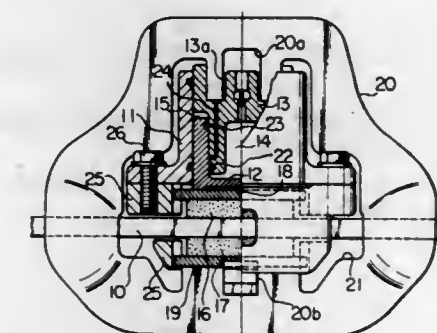
Shunichi Toshida, and Takashi Ozora, both of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed April 13, 1971, Ser. No. 133,543

Int. Cl. B60t 11/20

U.S. Cl. 188—345

8 Claims



A disc brake for an automotive hydraulic brake system having main and auxiliary brake lines, which disc brake includes a rotatable braking disc, a pair of friction pads positioned on either side of the braking disc, main and auxiliary fluid chambers into which fluid under pressure is introduced through the brake lines for moving the friction pads to positions to grip the braking disc and a yoke moved by means of the pressurized fluid to move one of the friction pads into its braking position, the main and auxiliary fluid chambers being isolated by two spaced sealing rings and a drain passage being provided which originates from between the two sealing rings whereby, in case one of the sealing rings fails during operation, the braking action is satisfactorily initiated and the leakage of the fluid



through the drain passage and the decrease in the level of the fluid in the cylinder reservoir provides a visual indication of the failure of the sealing ring to the driver of the motor vehicle from observation of a decrease in the fluid pressure in the master cylinder. Arrangements are further made to free the yoke from a braking torque which is otherwise imparted thereto from the friction pads during braking operation.

3,731,773

## SLIP CLUTCH ASSEMBLY

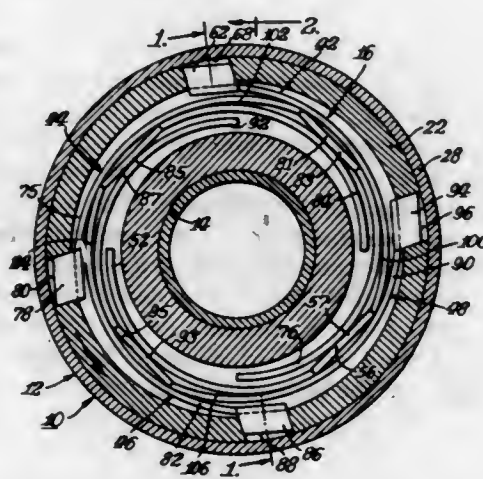
Max M. Austin, Mishawaka, and Norman B. Boulton, South Bend, both of Ind., assignors to National-Standard Company, Wiles, Mich.

Filed Sept. 24, 1971, Ser. No. 183,541

Int. Cl. F16d 41/20

U.S. Cl. 192-41 S

14 Claims



A band clutch assembly of the overrunning type designed to slip at a predetermined torque. A clutch band has a preformed spring section which cooperates with the underlying or overlying arcuate portion of an adjacent band section to provide a controlled compounding of the tip end of the band, which ceases at a predetermined applied torque to permit the band to slip.

3,731,774

## ONE WAY ROLLER CLUTCH WITH RESILIENT RETAINER

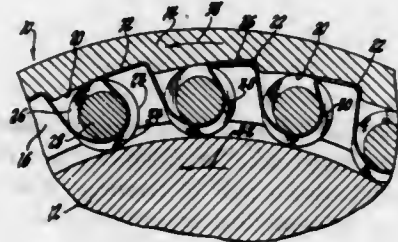
Oscar G. Kitchin, Clinton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed April 10, 1972, Ser. No. 242,424

Int. Cl. F16d 15/00, 41/06

U.S. Cl. 192-45

3 Claims



A one way roller clutch has a resilient retainer of generally annular form which holds the clutch rollers in unit handled relationship with the outer clutch race and which also biases the clutch rollers toward a position of wedging engagement between the clutch races.

3,731,775

## CLUTCH SPRING RETAINER ASSEMBLY

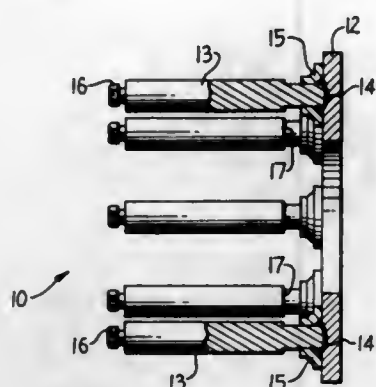
Larry A. Brown, and James W. McMichael, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 21, 1971, Ser. No. 191,436

Int. Cl. F16d 13/44

U.S. Cl. 192-89 R

2 Claims



A spring retainer assembly for a vehicle steering clutch has stud members bonded to a plate by friction welds. Spring seat members are disposed on the stud members adjacent the plate and are retained by shoulders provided on the stud members. The ends of the stud members projecting from the plate are tapped to receive capscrews.

3,731,776

## FRICTION MECHANISMS

Ronald Fisher, c/o Fort Dunlop, Erdington, Birmingham 24, Rugby, England

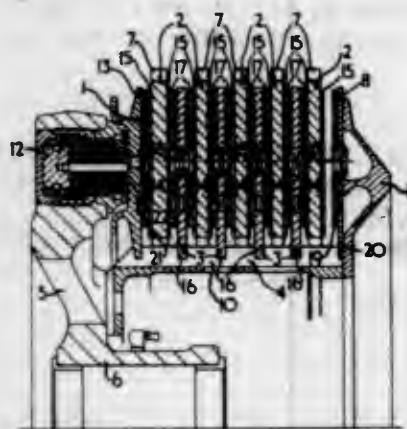
Filed March 15, 1971, Ser. No. 124,103

Claims priority, application Great Britain, March 19, 1970, 13,237/70

Int. Cl. F16d 13/60, 69/02

U.S. Cl. 192-107 M

9 Claims



A friction mechanism in which a pair of relatively rotatable friction members are arranged to be moved into and out of engagement with each other by an actuating mechanism. The surfaces of engagement of the friction members are each provided with a facing of sintered friction material comprising a matrix constituent and a particulate constituent dispersed within the matrix constituent. At least one of the facings of friction material incorporates a boride as a particulate constituent, of which the following is a specification.

3,731,777

## COIN OPERATED FLUID DISPENSER

William F. Burke, Westminster; Robert C. Greenwood, Los Angeles, and Thomas E. Jones, Costa Mesa, all of Calif., assignors to Pan-Nova, Inc., Santa Fe Springs, Calif.

Filed July 26, 1971, Ser. No. 165,449

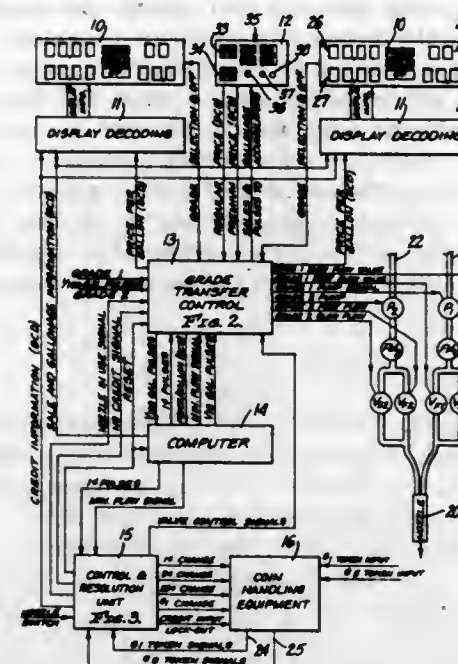
Int. Cl. G071 13/00

U.S. Cl. 194-13

15 Claims

A coin operated system for selectively dispensing premium and regular grades of gasoline utilizing a single coin handling

unit, computer and dispensing control. An electronic system for registering payment, controlling the amount of fluid



dispensed, and making exact change for unused payment. A dispenser adaptable to various monetary systems and to various coin input ranges and to various coin return ranges.

3,731,778

## PRINTER HAVING INDIVIDUAL CHARACTER CHIPS

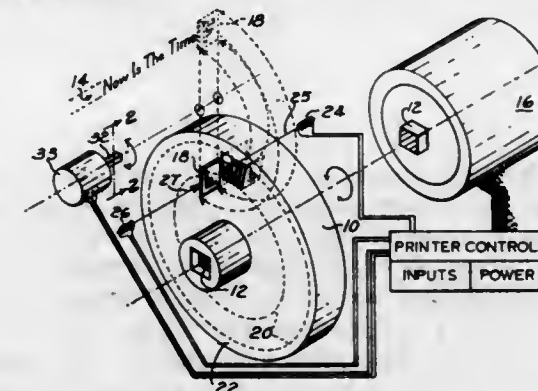
Frederick P. Wilcox, 565 Oenoke Ridge, New Canaan, Conn.

Filed July 15, 1970, Ser. No. 54,876

Int. Cl. B41j 23/02

U.S. Cl. 197-16

8 Claims



A serial character teleprinter, typewriter or the like in which the type face elements are individual small flat chips each having a single character on a main flat face thereof, the chips being of minimal thickness and having uniform profile dimensions only slightly larger than the outline or envelope dimensions of the largest character (or numeral or sign) included in the font. The chips forming a complete font-set are carried in a magazine, for example edgewise in individual radial guide slots formed in a turret wheel or drum which is rotated to bring any selected chip into transfer relation to a transfer mechanism, which, after receiving the chip, carries it to imprinting position and thereafter restores it to the magazine.

3,731,779

## TYPE DRUM ASSEMBLY FOR AN ON-THY-FLY PRINTER

Nicholas Koudar, Jr., Northville, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed June 30, 1970, Ser. No. 51,300

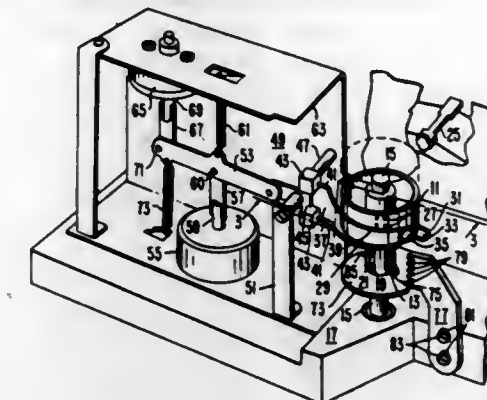
Int. Cl. B41j 23/04

U.S. Cl. 197-18

11 Claims

A type drum assembly for an on-the-fly printer including a rotatable, cylindrical type drum, axially positionable during rotation, the drum having rows of characters grouped on its

curved surface to form printing and non-printing phases of a rotation of the cylinder. A V-shaped guide, open at its small end and partially encompassing the drum, interacts with a cam follower stud on the curved surface of the drum for axially positioning the drum during the non-printing phase, the guide



being shifted by the interaction of two solenoids acting on a lever pivoted to the guide. A semicircular flange, fixed to the type drum, rides between the teeth of a comb during the print phase of a rotation of the drum for maintaining the drum at the selected axial position.

3,731,780

## PRINTING APPARATUS AND CONTROLLING CIRCUIT THEREFOR

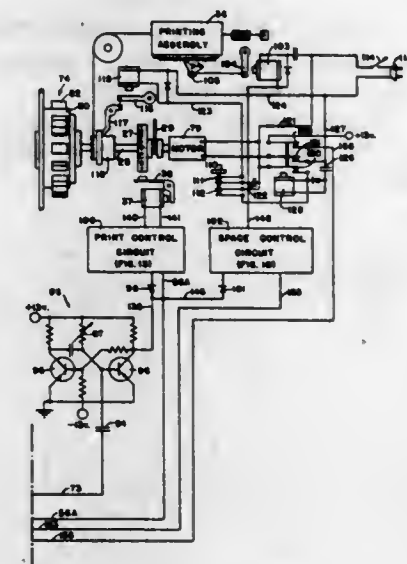
Arnold M. Wolf, Brooklyn, and John G. Richter, Yonkers, both of N.Y., assignors to ElectroSpace Corporation, Westbury, N.Y.

Continuation-in-part of Ser. No. 806,430, March 12, 1969, abandoned. This application May 10, 1971, Ser. No. 141,485

Int. Cl. B41j 1/32

U.S. Cl. 197-49

3 Claims



A printing apparatus which types characters on a type wheel under control of an electric circuit. The apparatus includes a type wheel, a printing hammer, and a series of timing AND circuits. A spacing mechanism moves the wheel along a record sheet to receive the printed symbols. The characters to be printed are selected by activating one of a series of storage multivibrators connected to the AND circuits and an optical timing device coupled to the type wheel supplies timed pulses to the AND circuits to control the printing operation.



3,731,781

## RIBBON SUPPLY CARTRIDGE

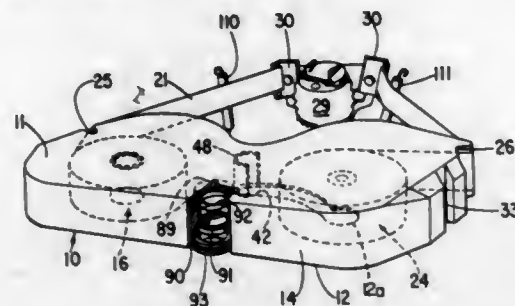
Allison H. Caudill, and Willie Goff, Jr., both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 752,096, July 16, 1968, Pat. No. 3,604,549, which is a continuation-in-part of Ser. No. 609,136, Jan. 13, 1967, abandoned. This application June 2, 1971, Ser. No. 149,267

Int. Cl. B41J 33/14

U.S. Cl. 197-151

5 Claims



A cartridge, which is removably mounted on a base plate, has a supply spool and a take-up spool rotatably mounted therein with the ends of the single pass ribbon attached thereto. The bottom wall of the cartridge has a curved slot to receive a resiliently biased drive roller, which is rotatably mounted on a pivotal arm on the base plate and has pointed projections thereon for penetrating the inked ribbon on the take-up spool to linearly advance the ribbon past its printing position. The cartridge has a cylindrical recess to receive a portion of the gear train. When the ribbon is a solvent coated plastic transfer matrix whereby overstriking is desired, then resiliently biased means is disposed within the recess in the cartridge to render the change means operative to reduce the amount of rotation of the drive roller. If a total release ribbon is used wherein no overstriking is desired, then the recess in the cartridge is empty and the larger amount of rotation of the drive roller occurs because the change means is not rendered operative.

3,731,782

## MAGNETIC FLOW DIRECTOR

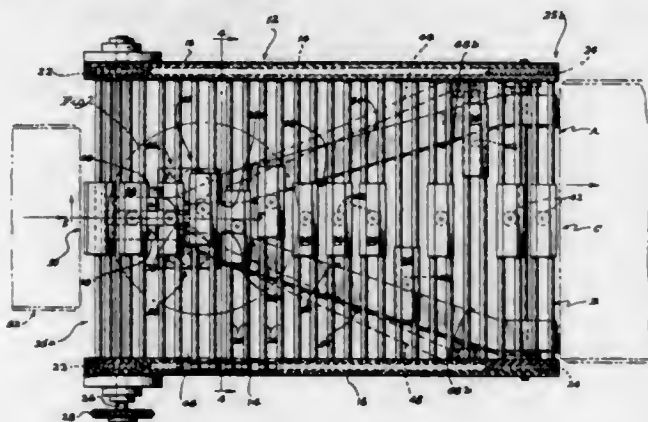
Victor Del Rosso, Ithaca, N.Y., assignor to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.

Filed June 9, 1971, Ser. No. 151,218

Int. Cl. B65g 47/26, 47/00

U.S. Cl. 198-31 R

28 Claims



A magnetic flow director for use in combination with an article conveyor movable along a pre-determined path and having at least one article carrier supported by the conveyor for independent movement thereon under the influence of magnetic attraction transversely of the path. In a preferred form, the director includes a permanent magnet and a selectively operable electromagnet for deflecting the carrier transversely

of the path for attractive engagement with a guide surface of the permanent magnet; such guide surface being characterized as including upstream and downstream surface portions relative to the direction of conveyor movement. The upstream portion is arranged for initial magnetic engagement by the deflected article carrier and extends substantially co-directionally with the path, and the downstream surface portion extends from the upstream surface portion in a diverging direction relative to the direction of conveyor movement. The electromagnet includes a guide surface terminating in a relatively downstream surface portion arranged in alignment with the upstream surface portion of the permanent magnet guide surface.

3,731,783

## METHODS AND APPARATUS FOR SORTING ARTICLES

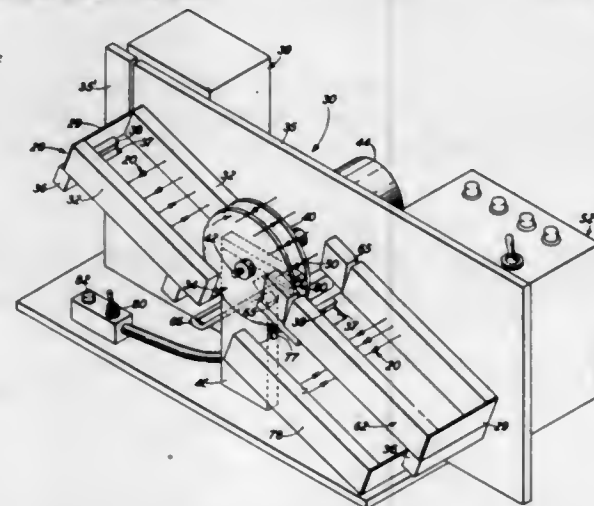
Donald H. Dreher, Reading; Robert E. Hess, Quakertown, and Donald M. Large, Temple, all of Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Nov. 8, 1971, Ser. No. 196,497

Int. Cl. B65g 47/24

U.S. Cl. 198-31 AA

19 Claims



A method and apparatus for sorting randomly oriented diodes into two groups such that all diodes in the same group conduct in the same direction; that is, are oriented alike. The randomly oriented diodes are suspended in a magnetic holding bin from which they are extracted by a sorting wheel and transported past a cam-jet-magnet sorting member. The sorting member ejects those diodes oriented in a first direction from the wheel into a first magnetic receiving bin. It assures retention, by the sorting wheel, of those diodes oriented in a second direction so that they are carried further for removal into a second magnetic receiving bin.

3,731,784  
CONVEYORS

Michael Bryon Osborne, Kirkella, Hull, England, assignor to Kingston Conveyors Limited, Hull, England

Filed Dec. 21, 1971, Ser. No. 210,495

Claims priority, application Great Britain, Dec. 30, 1970, 61,832/70

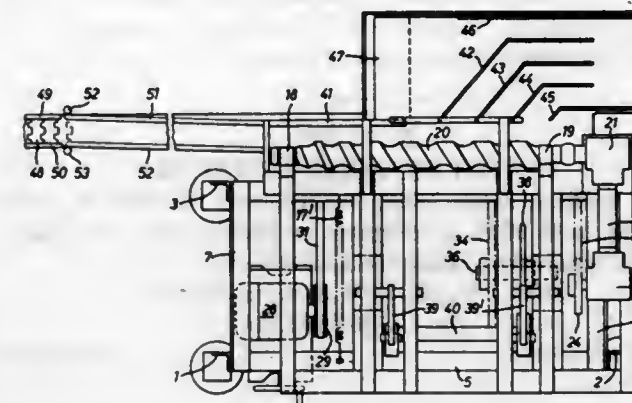
Int. Cl. B65g 47/24

U.S. Cl. 198-31 AB

3 Claims

A mechanism for dividing a continuously moving stream of single articles fed by a conveyor belt between fixed spaced guides into a plurality of streams or stream of two or more articles abreast comprising an article feeding rotary worm laterally displaceable relative to a set of fixed guides defining a plurality of paths, an article linear-movement guide, spaced from and parallel to the lead end of worm, is movable with the lateral displacement of such worm, and a pair of spaced linear guides are pivoted with respect to the fixed spaced guides and angularly rotatable with the lateral movement of the worm and its spaced guides such that the articles fed by the conveyor are brought from juxta position into spaced relation by the

rotation of the worm and then introduced thereby on lateral displacement thereof into the several paths of the set of fixed



guides along which they move due to another conveyor belt(s).

3,731,785

## METHOD AND APPARATUS FOR FORMING TYNE LAYERS IN AUTOMATIC BRICK STACKING SYSTEMS

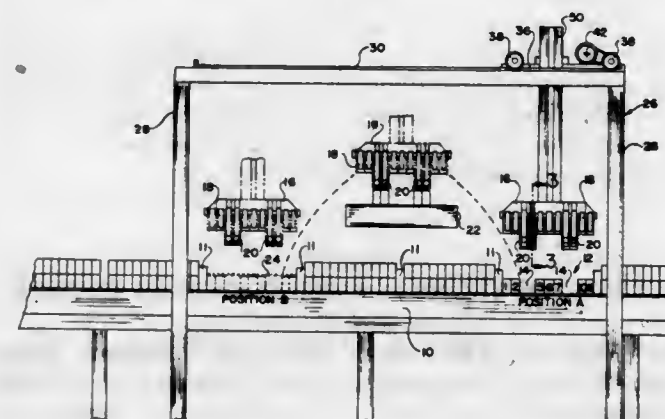
Gerald L. Stuart, Siler City, N.C., assignor to Forrest Paschal Machinery Company, Siler City, N.C.

Filed May 1, 1972, Ser. No. 249,031

Int. Cl. B65g 57/02, 59/02

U.S. Cl. 198-35

7 Claims



Double-layer courses of bricks, with the bricks in one layer atop the bricks in the other layer, are marshalled along an index conveyor between a kiln car unstacking apparatus and a brick stacking and strapping apparatus. A pickup head is lowered to a position overlying selected courses and a first set of gripper members is activated to grip the entire upper layer while a second set of grippers, independently operated from the first set, is activated to grip selected bricks in the lower layer, the selected brick being those necessary to form the tyne openings. The pickup head is then moved vertically and horizontally to a second position where selected brick from the lower layer are deposited on a tyne brick table. The pickup head is then moved to a third position where the upper level of brick is returned to its initial position atop the lower level in the same selected course. During the pickup and depositing of the upper layer and selected bricks from the lower layer, a separator sheet or board is placed atop the lower layer either automatically or manually.

3,731,786

## CONVEYOR BELT FOR BELT FISSURE DETECTION APPARATUS

Zenji Nagata; Masamitsu Ui, both of Komaki, and Tokio Fujimoto, Osaka, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka; Tokia Rubber Industries, Ltd., and Aza Utatsu Oaza Kitayama, Komaki, all of Japan

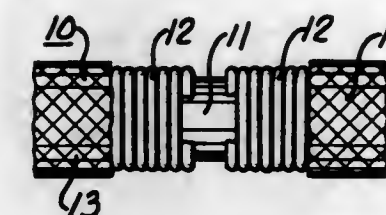
Filed Sept. 21, 1970, Ser. No. 74,089

Claims priority, application Japan, Sept. 19, 1969, 44/89949

Int. Cl. B65g 43/02

U.S. Cl. 198-40

5 Claims



A conveyor belt designed for employment in combination with a conveyor belt fissure detection apparatus wherein at consecutive intervals there is embedded in the interior of the conveyor belt a loop detection coil consisting of a plurality of conductors each having a flexible stranded core around which is spirally wound a metallic wire. The conductors are bound together by welt threads of synthetic material to insure independent flexibility of the separate conductors as bound together.

3,731,787

## MODULAR DISTRIBUTOR SYSTEM FOR BULK MATERIAL

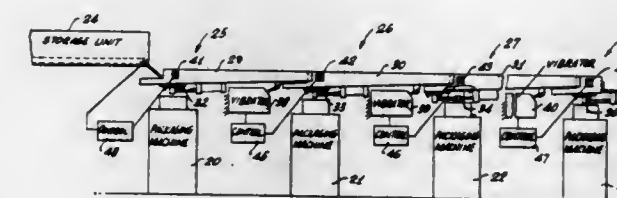
Vaughn Gregor, 1830 West Olympic Blvd., Los Angeles, Calif.

Filed Nov. 16, 1970, Ser. No. 89,941

Int. Cl. B65g 37/00

U.S. Cl. 198-82

19 Claims



A vibratory distributor system for supplying bulk material, such as potato chips, cereal or the like, to a number of use points on demand. The system comprises a plurality of successive modules arranged to nest with one another to provide a flow path from one module to the next. Each module includes a material-carrying tray and a gate, associated with each use point, each gate having a selectively operable closure member which controls gravity feed of the material to the use point. A sensor for each module monitors the material level at the location of each gate and, when the level drops to a threshold level, activates the vibrating means of the adjacent upstream module to cause material to flow. The upstream modules are thus progressively vibrated in accordance with the demand to convey material from a source of supply downstream to the various use points.



3,731,788

## ARTICLE SELECTING DEVICE

Patrick Delecroix, Hem, France, assignor to Societe Anonyme  
 Les Redoute, Roubaix, France

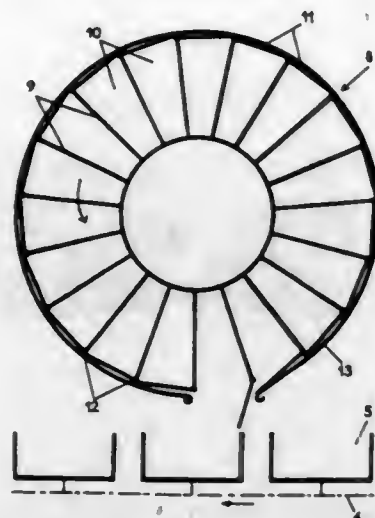
Continuation-in-part of Ser. No. 819,734, April 28, 1969. This  
 application Sept. 2, 1971, Ser. No. 177,274

Claims priority, application France, Aug. 14, 1968,  
 6819169

Int. Cl. B65g 37/00

U.S. Cl. 198-103

4 Claims



A device for picking-up articles selected among those arranged in a storage area is described as having the conveyor displacing containers each intended to receive article of a limited number of selections and passing under at least one wheel divided into sector-shaped compartments whose rotational movement is synchronized with that of the conveyor in such a way that each compartment always received the articles intended for the same container.

3,731,789

## CONVEYOR FOR DOCUMENTS

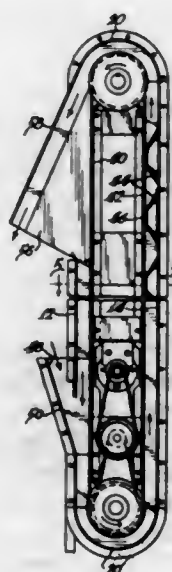
Eugene T. Fleischhauer, Charlottesville, Va., assignor to Acme  
 Visible Records, Inc., Crozet, Va.

Continuation-in-part of Ser. No. 873,472, Nov. 3, 1969,  
 abandoned. This application Dec. 9, 1971, Ser. No. 206,308

Int. Cl. B65g 15/00

U.S. Cl. 198-160

7 Claims



A conveyor for articles of various thicknesses includes a continuous conveyor belt driven around spaced rollers and a stationary housing that encloses the belt. Spaced groups of brushes or bristles are secured on the outwardly facing surface of the belt such that the ends of the bristles may slide across an

opposed surface of the housing. The bristles are inclined toward the direction of travel or conveyance of the belt in order to catch the edges of the conveyed article and impart a positive thrust to the articles within the conveyor. The flexibility of the bristles allows for the accommodation of articles of various sizes and thicknesses and minimizes damage to the conveyor or article in the event of jam up.

3,731,790

## PALLET RETRIEVING SYSTEM

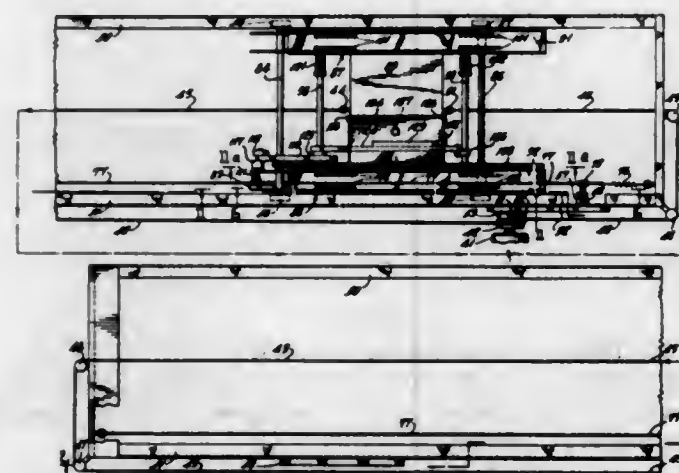
George William Esser, West Orange, and Webster W. Jury,  
 Wayne, both of N.J., assignors to North American Equip-  
 ment Corporation, South Hackensack, N.J.

Filed Nov. 18, 1970, Ser. No. 90,543

Int. Cl. B65g 25/04

U.S. Cl. 198-219

42 Claims



A system is disclosed in which a motor driven retriever device brings loaded pallets deposited at a receiving station along a path to an unloading station. If another pallet is already positioned at the unloading platform station, the retriever device deposits its pallet as close thereto as possible. When a pallet is removed from the unloading platform station, pallets positioned therebehind are moved up to fill the void. The details of the pallet retriever device are disclosed showing how mechanical members and electrical switches are combined to provide the system of this invention.

3,731,791

## SECURING OF FIXING ELEMENTS SUCH AS ANCHOR BOLTS

Robert Fourcade, Labouliere, and Andre Bourlond, Dijon,  
 both of France, assignors to Societe Explosifs et Produits  
 Chimiques, London, England and Societe Chimiques des  
 Charbonnages de France, Paris, France

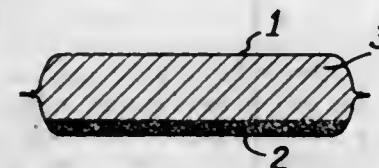
Continuation-in-part of Ser. No. 18,377, March 13, 1970,  
 abandoned, which is a continuation of Ser. No. 583,826, Oct. 3,  
 1966, abandoned. This application March 15, 1971, Ser. No.  
 124,114

Claims priority, application Great Britain, Oct. 5, 1965,  
 42,301/65; France, May 9, 1966, 6660832

Int. Cl. B65d 81/32

U.S. Cl. 206-47 A

3 Claims



Sealing cartridges are provided which comprise an outer frangible casing and distributed in the casing, a composition based on an unsaturated polyester resin together with a catalyst composition longitudinally disposed within the casing and in direct contact with the resin composition.

3,731,792

## NONSLUMPING GLASS FIBER PACKAGE

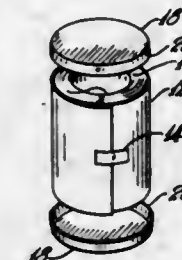
John A. Rolston, Newark, Ohio, assignor to Owens-Corning  
 Fiberglass Corporation, Toledo, Ohio

Filed Feb. 8, 1971, Ser. No. 113,218

Int. Cl. B65d 85/671

U.S. Cl. 206-52 W

3 Claims



Glass fibers coiled in layers into a generally tubularly shaped package, and in which the layer of fibers adjacent one of its generally cylindrical shaped surfaces, is adhered to the surface of a support by a tacky or adhesive material. The degree of tack is such as to hold the layer of coils in position on the support even though the remainder of the layers of coils have been removed, at least to a degree where they no longer support the remaining layer of coiled fibers. The degree of adhesion is such as to allow the adhered fibers to be pulled from the surface of the support without damage to the fibers. The support can be a sheet material, and in the preferred embodiment, is applied to the outside generally cylindrical surface of a tubular package of fibers to form one part of a protective container for the package. Caps may be telescoped over the opposite ends of the package to cooperate with the sheet material and completely incase the package of glass fibers.

3,731,793

## FILLED PACKAGE CONTAINING A COILED STRING OR THE LIKE

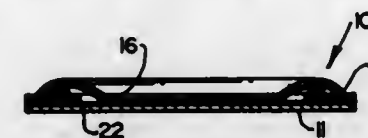
Herbert N. Hagel, Mountainside, N.J., assignor to National  
 Musical String Company, New Brunswick, N.J.

Division of Ser. No. 4,621, Jan. 21, 1970. This application May  
 19, 1971, Ser. No. 144,805

Int. Cl. B65d 85/04

U.S. Cl. 206-52 W

1 Claim



A package is comprised of two thin sheets, preferably rectangular and sealed to one another along their outer margins. One of the sheets has a relatively large centrally located filling opening. A strong or string like member is contained in the package between the two sheets and in surrounding relation to the central opening. The two sheets are additionally sealed to one another around the margin of the central opening, or the central opening is sealed by an overlying sheet, to totally isolate the package contents from the surrounding atmosphere.

3,731,794

## PACKAGING GRAMOPHONE RECORDS

Norman John Garrod, Great Common, Bletchingley, England  
 Filed Feb. 8, 1972, Ser. No. 224,488

Claims priority, application Great Britain, March 1, 1971,  
 5,727/71; March 30, 1971, 8,256/71

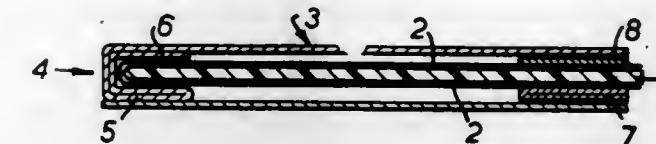
Int. Cl. B65d 85/30

U.S. Cl. 206-62 P

13 Claims

A package for a gramophone record includes an outer sleeve comprising a pair of side members connected on three

edges by flaps integral with one side member and each folded to provide a spine and a marginal flap adhered to the other side member, and an inner sleeve for receiving a record and provided with a spacer on one side member thereof which



faces the other outer sleeve side member, the spacer having a thickness equal to the thickness of that part of each marginal flap overlapped by a record when received in the package. The spacer may be adhered to or integral with the inner sleeve.

3,731,795

## NUT GAUGING MACHINE

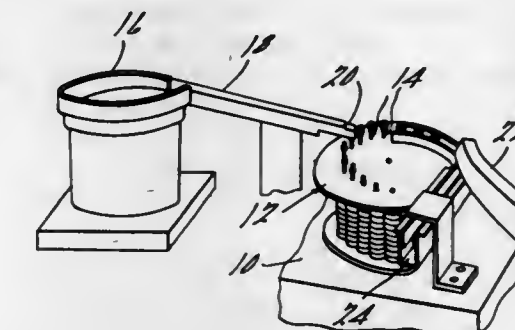
Arthur E. Velthoven, Warren, Mich., assignor to Federal  
 Screw Works, Detroit, Mich.

Filed March 16, 1972, Ser. No. 235,207

Int. Cl. B07c 5/06

U.S. Cl. 209-73

10 Claims



A machine for gauging lock nuts of the type in which the nut body is squeezed to distort a portion of the thread thereof. Adequately squeezed nuts are segregated from nuts which have either been squeezed insufficiently or not squeezed at all. A rotating carriage on the machine has probes on which the nuts are deposited. The nuts are discharged from the carriage through one of two unloading stations, depending upon whether or not the probes have been able to pass through the holes of the nuts.

3,731,796

## SORTING DEVICE FOR CORE HANDLER

Nathan R. Smith, Minneapolis, Minn., assignor to Ramsey En-  
 gineering Company, St. Paul, Minn.

Filed May 6, 1971, Ser. No. 140,726

Int. Cl. B07c 5/00

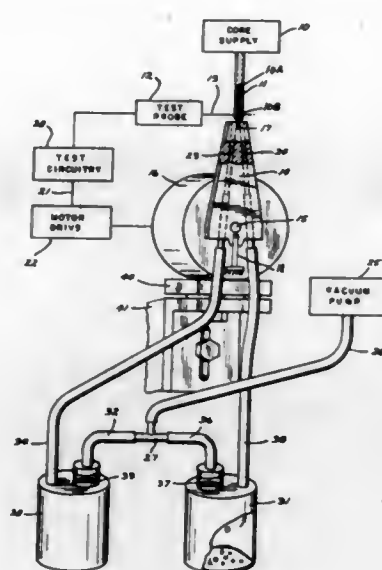
U.S. Cl. 209-74

20 Claims

A sorting mechanism for magnetic core handlers utilizing a sort gate or block that is provided with tubular openings, and is directly attached to the output shaft of a conventional stepper motor that has a shaft which can be rotated between a neutral position and at least one position from neutral. The gate is shifted directly by the movement of the motor shaft in



response to a test signal for a core being tested, and suitable vacuum means can be supplied to the sorting chambers to exert a vacuum force to pull tested cores through the properly aligned opening in the sort block.



exert a vacuum force to pull tested cores through the properly aligned opening in the sort block.

3,731,797

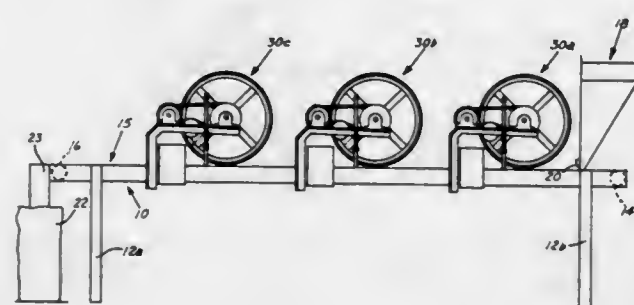
**SPLIT BEAN CLEANING METHOD AND APPARATUS**  
Harold D. Tanner, Cahone, Colo., assignor to Harold R. Tanner, Cahone, Colo.

Filed May 18, 1972, Ser. No. 254,453

Int. Cl. B07b 13/00

U.S. Cl. 209—78

12 Claims



A relatively thick layer of soft, resilient, foamed, elasto-plastic material pressed on split beans in a single layer removes goathead weed pods from the beans. In one form, a roller coated with the elasto-plastic, foamed material rolls over a single bean layer for cleaning the same.

3,731,798

**SIZER CONVEYOR**

Earl R. Anderson, Los Gatos, Calif., assignor to Brex Corp. Trustee, Los Gatos, Calif.

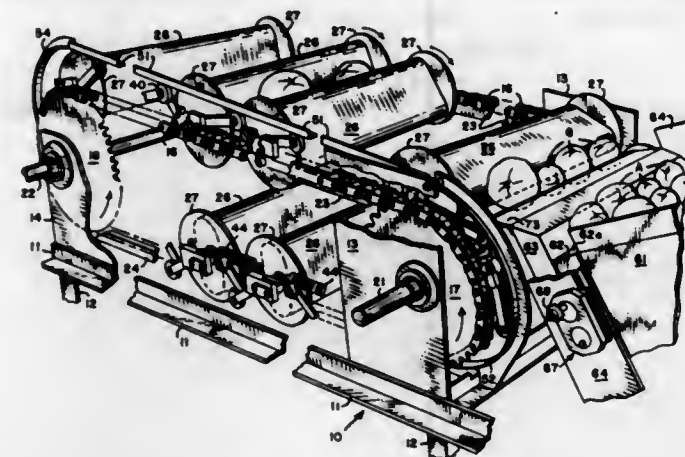
Continuation-in-part of Ser. No. 684,893, Nov. 6, 1967, abandoned. This application Dec. 28, 1970, Ser. No. 101,942

Int. Cl. B07b 13/04

U.S. Cl. 209—98

4 Claims

An endless series of grading elements are carried through a grading path and provide grading openings between each ad-



respecting elements to determine the size of the grading openings therebetween.

3,731,799

**AUTOMATIC CASHIER FOR BANK-NOTES**

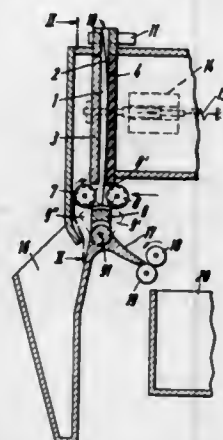
Mario Meloni, Muri, and Paul Keller, Rufenacht, both of Switzerland, assignors to Autelca AG, Gumligen, Switzerland  
Filed Nov. 11, 1971, Ser. No. 197,646

Claims priority, application Switzerland, Nov. 12, 1970, 18342/70

Int. Cl. B07c 5/342

U.S. Cl. 209—111.7

10 Claims



An automatic changer for paper bank-notes has a testing chamber into which a note is vertically inserted through a slot from which it slides along a pair of vertical guides into the testing chamber and is held therein in substantially stretched position against a closure mechanism. Three light sources are provided in conjunction with photo-electric receiving circuits to test the width and length of the note or bill for genuineness while the bill is held flat by a solenoid actuated movable wall within the testing chamber. The closure mechanism includes output feed roller means and a deflector mechanism in the path of the bill which are operable by the said circuits to feed the bill into a return box if the test result is negative or divert the bill into a cash container if the test result is positive.

3,731,800

**COUNTER-CURRENT CENTRIFUGAL DEVICE AND USE**

William J. Timson, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 27, 1970, Ser. No. 93,038. The portion of the term of this patent subsequent to March 3, 1987, has been disclaimed.

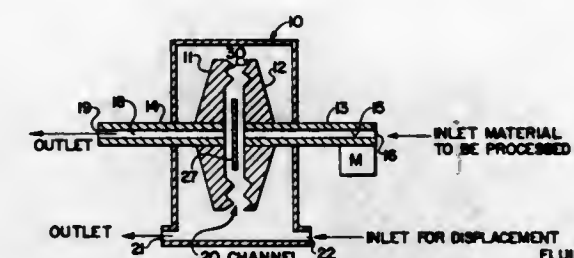
Int. Cl. B04b 5/12

U.S. Cl. 209—211

15 Claims

An apparatus which includes a housing defining a chamber therein, at least two rotatable plates in spaced, face-to-face

relationship defining a channel therebetween; at least one inlet for feeding fluid material into the channel; a plurality of spaced outlets for removing the processed material, at least one of which is spaced radially from the center of rotation of the plates, and means for interrupting the laminar flow in said channel, preferably by means of a zig-zag configuration in at least a portion of the surface of said plates, more preferably



adjacent the periphery. A counter-current flow pattern is provided by introducing a displacement fluid into the channel. Preferably, the plates are mounted on the same shaft and the inlet for material to be processed is through one plate adjacent to the shaft, and one outlet is through the other plate adjacent to the shaft. The apparatus can be used as a classifier, concentrator, or for washing materials of different density or the same density and different mass.

3,731,801

**WATER PURIFICATION**

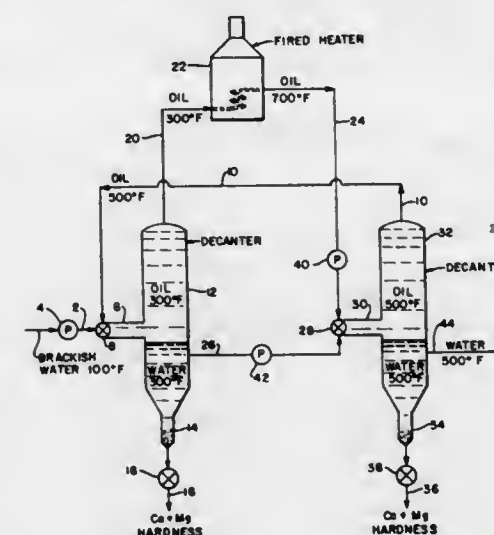
Howard V. Hess, Glenham, and Frank E. Guptill, Jr., Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed March 15, 1971, Ser. No. 124,389

Int. Cl. C02b 1/22, 5/00

U.S. Cl. 210—56

3 Claims



Method of separating from hard water dissolved mineral hardness constituents whose solubility varies inversely with temperature, in which the water temperature is raised by direct, preferably cocurrent contact with a preheated stream of liquid hydrocarbon oil, to a temperature sufficient to precipitate hardness constituents but below the temperature at which the hot oil will extract water, and at a pressure sufficient to maintain the oil and water in liquid phase.

3,731,802

**LIQUID SEPARATOR**

William S. James, 1483 Pine Knoll Lane, Mamaroneck, N.Y.

Filed March 23, 1971, Ser. No. 127,142

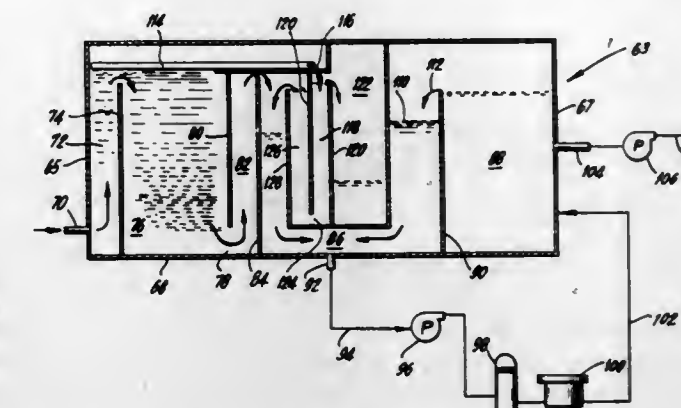
Int. Cl. B01d 17/00

U.S. Cl. 210—71

14 Claims

A device for separating two liquids of different density includes a closed tank having an entry section of relatively small

area with an overflow into a relatively large area settling tank. The large area settling tank has a withdrawal portion at its top which permits overflow of the lighter liquid into a trough and delivery downwardly into a relatively small area intermediate tank portion. The small area intermediate tank portion in turn has an overflow only for oil into a recovery tank at one end of the device. The lower end of the intermediate small area tank has a lower connecting passage to a second intermediate tank which overflows at the top into a small area collecting tank for



delivery out of the apparatus. The large area settling tank has a lower connecting passage for the flow of the heavier liquid into a heavy liquid collection passage which overflows to the outlet which is provided in the second small area outlet tank. The arrangement is such that the flow of the heavier liquid takes place from one end of the device to the outlet and there is a further counterflow of this heavier liquid from the lighter liquid collecting storage back to the second outlet tank for the heavier liquid.

3,731,803

**METHOD OF OPERATING A FILTER BED OF FINE GRANULAR MEDIA**

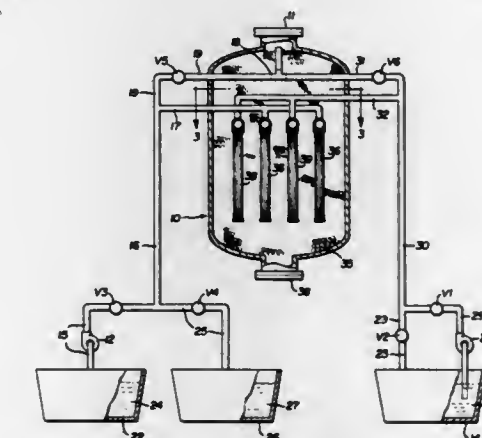
Gene Hirs, Detroit, Mich., assignor to Hydromation Filter Company, Livonia, Mich.

Filed Nov. 2, 1970, Ser. No. 85,857

Int. Cl. B01d 23/24

U.S. Cl. 210—80

5 Claims



This invention provides a method of and apparatus for the deep bed filtration of a liquid containing fine particles (generally on the order of less than 0.005 inches) to obtain an effluent of exceptional clarity. It has been discovered that filtration to this degree of clarity requires a compacted filter medium bed and that this bed compactness must be preserved during rejuvenation of the bed to avoid the dispersal of previously removed dirt particles throughout the filter medium. In this invention, the rejuvenation of the bed is carried out by the reverse flow of liquid through the bed at a flow rate at least twice the flow rate during filtration and without disturbing the configuration or compactness of the bed.



3,731,804

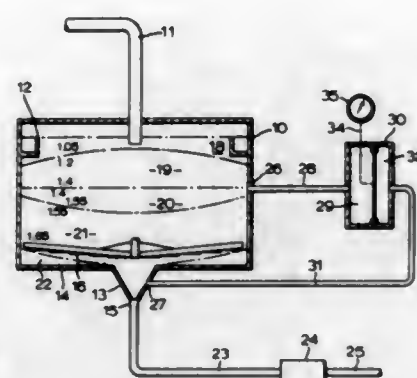
**CONTROL OF SENSITY OF THICKENER UNDERFLOW SLURRY**

Gerrit Richard Kampjes, and Ronald Ian Wilson, both of Alberta, Edmonton, Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Ontario, Canada

Filed Jan. 18, 1971, Ser. No. 107,116  
Int. Cl. B01d 21/24

U.S. Cl. 210—83

4 Claims



The low and high pressure sides of a differential pressure meter are communicated by means of water purged conduits to tap points in the side of a thickener. The tap points are at different elevations and by means of the meter, the differential pressure of the slurry within the thickener at the tap points is continuously monitored. The rate of removal of underflow slurry discharged from the thickener is regulated in response to monitored changes in the differential pressure such that a desired solids to liquid ratio is maintained within the thickener.

3,731,805

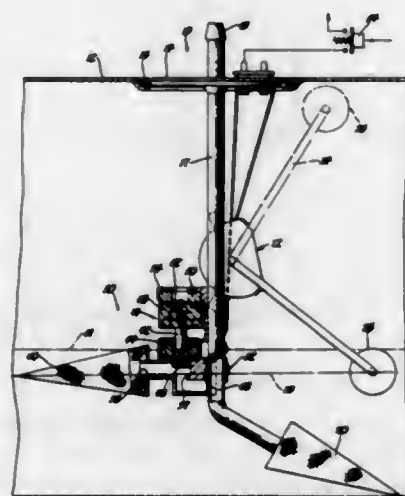
**ONE-TANK SAFETY FUEL RESERVE**

Robert C. Schalers, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 13, 1971, Ser. No. 171,618  
Int. Cl. B01d 29/42

U.S. Cl. 210—86

4 Claims



A tank discharge and indicating unit having means to indicate when a liquid in a tank, such as a gasoline tank on an automobile, reaches a reserve level and means to permit transfer of the reserve fuel from the tank. Such a unit will be very useful in automobile gas tanks whereby the driver will become aware immediately that he is on low fuel, and can through the means of my invention switch to a reserve supply.

3,731,806

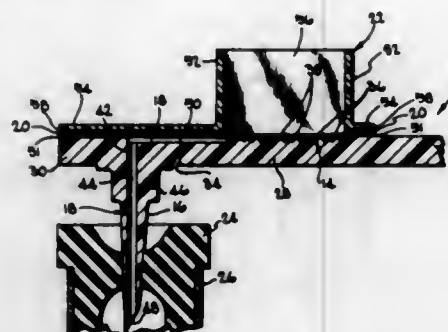
**SPECIMEN ANALYSIS DEVICE**

James B. McCormick, Hinsdale, Ill., assignor to Pelam Inc., Hinsdale, Ill.

Filed March 1, 1971, Ser. No. 119,729  
Int. Cl. B01d 35/00

U.S. Cl. 210—94

13 Claims



A device is provided for separating a biological fluid specimen into liquid and solid constituents for analysis. The illustrated device includes a receptacle for containing a quantity of the specimen in overlying relation to a filter in sheet form supported on a flat surface, and a vacuum source positioned beneath the filter to draw the liquid portion of the specimen through the filter while leaving the solid constituents on the upper surface of the filter for subsequent microscopic analysis.

3,731,807

**APPARATUS FOR AUTOMATICALLY DETERMINING THE OPTIMUM AMOUNTS OF REAGENTS TO BE ADDED TO A LIQUID FOR ITS CLARIFICATION**

Robert Louboutin, and Claude Daudenarde, both of La Celle, St. Cloud, France, assignors to Degremont Societe Generale Depuration et D', Saint Cloud, France

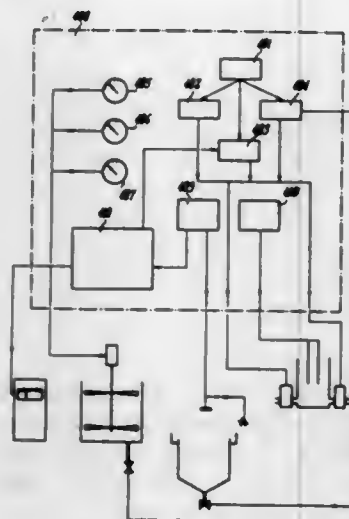
Filed July 7, 1970, Ser. No. 52,816

Claims priority, application France, Aug. 29, 1969, 6929571

Int. Cl. B01d 21/01

U.S. Cl. 210—96

10 Claims



Apparatus for automatically determining the optimum proportion of coagulant reagent to be added to a liquid in order to clarify same by coagulation of the substances in colloidal suspension therein, which comprises a plurality of mixing vessels into which predetermined quantities of liquid and reagent are introduced and in which these liquid and reagent are adapted to mix together, the resulting mixture being subsequently separated into a decanting fraction and a supernatant fraction, said means consisting advantageously of one

or a plurality of turbidimeters, and other means such as computer for analyzing and comparing the measurements made in said turbidimeter or turbidimeters, and determining the optimum proportion of reagent to be added to the liquid.

3,731,808

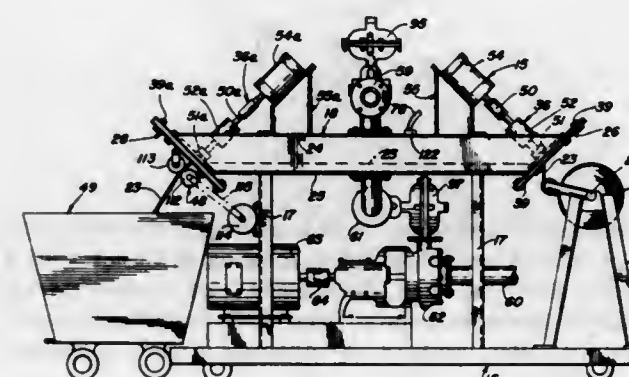
**FILTER APPARATUS**

Sherwood A. Rickert, 2559 North Monitor Avenue, Chicago, Ill.

Filed April 7, 1971, Ser. No. 131,932  
Int. Cl. B01d 33/00

U.S. Cl. 210—138

6 Claims



A filter apparatus for filtering solutions of various kinds and for various purposes including metal and like plating solutions including a filter housing having a web inlet opening and a web outlet opening through which a web of filter sheet material is drawn into the filter housing and the used sections thereof removed at intervals from the filter housing. Combination closure, sealing and web-clamping means or units are provided for cyclically opening and closing, sealing and clamping the web of filter sheet material in the web inlet and the web outlet openings of the filter housing. Means including an air pressure system embodying air-operated valves are provided for cyclically operating the combination closure, sealing and web-clamping means or units for the web inlet and web outlet openings of the filter housing.

The filter apparatus also includes means for cyclically pumping the filter solution into the filter housing and for removing the filtrate therefrom. The air pressure system includes air-operated valves for opening and closing the filter solution inlet in the filter housing and the filtrate outlet therefrom, and air pressure-responsive regulator switch means and an electronic timing switch means are provided for cyclically controlling the operation of the air valves for the web inlet and the web outlet openings in the filter housing and for cyclically controlling the operation of the air valves for the filter solution inlet and the filtrate outlet in the filter housing, and for other purposes.

A web of filter sheet material is provided having longitudinally spaced fluid-resistant areas or sections, which are resistant to filter solutions, for sealing the web inlet and web outlet openings in the filter housing during the filtering operation.

Means are provided for cyclically advancing the web of filter sheet material into and through the filter housing.

The apparatus also includes means for cyclically withdrawing unused filter solution from the filter housing at the end of each cycle of operations thereof and for withdrawing excess of filter solution from the web of filter sheet material at the end of each filtering operation and prior to the time when the used section of filter material is withdrawn from the filter housing and cut from the web of filter sheet material.

3,731,809

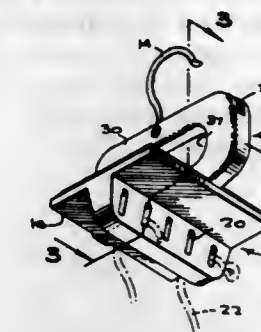
**HANGER ASSEMBLY FOR SUPPORTING A PLURALITY OF CLOTHES HANGERS**

Herman H. Saenger, Box 501, Fort Stockton, Tex.

Filed Aug. 25, 1971, Ser. No. 174,632  
Int. Cl. A47g 25/06

U.S. Cl. 211—118

6 Claims



A clothes hanger of unitary plastic construction is disclosed in which a hanger bar having a plurality of hook receiving apertures is connected to a generally rectangular open interior handle along its top surface with a hook being provided in a slot in the top of the handle for pivotal movement between an upwardly extending position in which the hook can be positioned over a supporting bar and a retracted position in which the hook is completely received in the slot in the handle so as to enable an easy manual grasping of the handle by a user.

3,731,810

**ION-EXCHANGER**

Hugo Wallmuller, Essen-Rüttenscheid, Germany, assignor to GHH-M.A. Technik Gesellschaft Fur Anlagenbau MbH, Essen, Germany

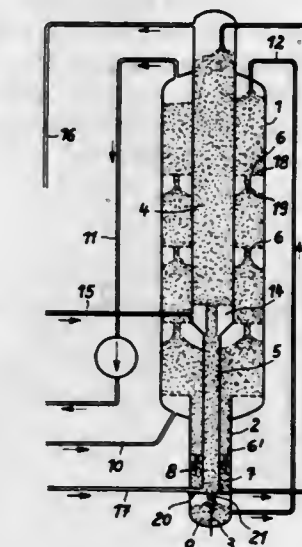
Filed May 6, 1971, Ser. No. 140,907

Claims priority, application Germany, May 15, 1970, P 25 035.5

Int. Cl. B01d 33/16

U.S. Cl. 210—189

2 Claims



An ion-exchanger comprising an exchanger column, a regenerating column connected in series with said exchanger column, and a washing column connected downstream of the said regenerating column, the regenerating column and the washing column being arranged concentrically within the exchanger column and forming the inner wall of the exchanger column, feedlines connecting the said exchanger column to the said regenerating column and the said washing column to the said exchanger column, untreated water inlet and clean water outlet lines communicating with said exchanger column, regenerating medium inlet and outlet lines



communicating with said regenerating column, and a washing water inlet line communicating with said washing column.

3,731,811

# APPARATUS FOR ADJUSTING THE CONCENTRATION OF A CIRCULATING LIQUID SUSPENSION TO A DETERMINED, CONSTANT VALUE

Karl Axel Goran Gustavsson, Enkoping, Sweden, assignor to Aktiebolaget Babco Ventilation, Enkoping, Sweden

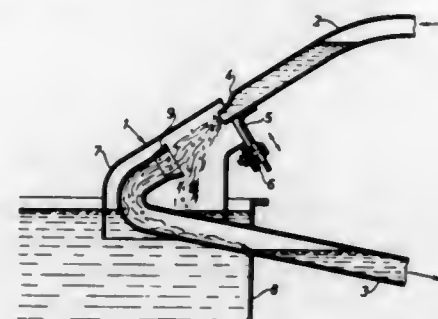
Filed June 19, 1970, Ser. No. 47,682

Claims priority, application Sweden, July 2, 1969, 9436/69

Int. Cl. B01d 17/00

U.S. Cl. 210—194

4 Claims



An apparatus for controlling the concentration of a circulating liquid suspension comprising a non-vertical nozzle and a funnel spaced therefrom in the direction of flow of liquid from the nozzle. Effluent having a concentration and viscosity above a predetermined value partially falls outside the funnel and effluent of the predetermined or lower concentration and viscosity is caught by the funnel to be recirculated. The critical value of the concentration and viscosity for the separation can be controlled by adjusting the angle of the nozzle or the spacing between it and the funnel.

3,731,812

# DOMESTIC SEWAGE TREATMENT PLANT

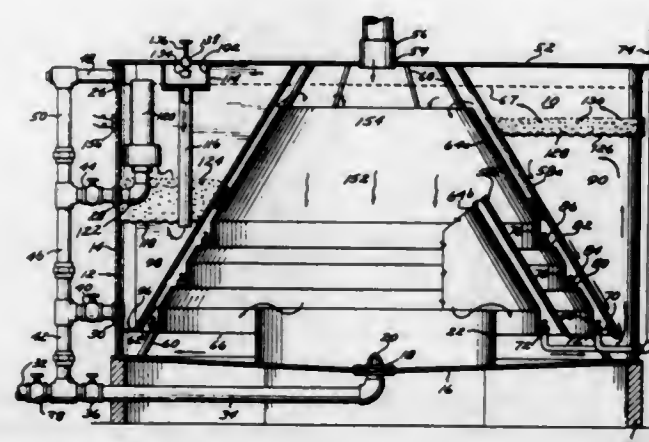
James S. Stone, Wheat Ridge, Colo., assignor to Sanitary Disposal Systems, Inc., Wheat Ridge, Colo.

Continuation-in-part of Ser. No. 771,672, Oct. 29, 1968, Pat. No. 3,503,876. This application Feb. 25, 1970, Ser. No. 1,052. The portion of the term of this patent subsequent to March 31, 1967, has been disclaimed.

Int. Cl. C02c 1/12

U.S. Cl. 210—199

26 Claims



A tertiary treatment domestic sewage treatment plant effecting particle size reduction by hydraulic action, utilizing extended aeration and adiabatic cooling of the surface of the treating bath to enhance oxygen absorption and being provided with a living filter.

# 3,731,813 FLOATING DEBRIS RECOVERY APPARATUS

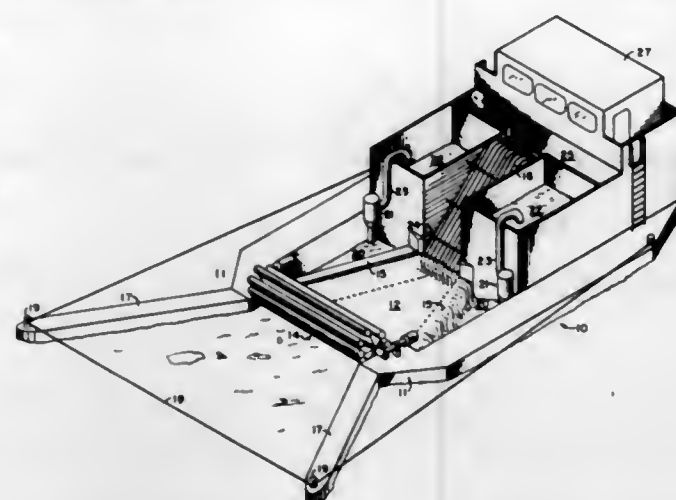
Robert R. Tipton, 249 El Caminito, Livermore, Calif.

Filed May 17, 1971, Ser. No. 143,910

Int. Cl. C02b 9/02

U.S. Cl. 210—242

9 Claims



A marine vessel is equipped with a holding basin into which floating pollutants are urged by a rotating skimmer with a floating wiper along the edge of the basin used to separate the floating liquid debris from the surface of the water and allow it to flow into a collection tank. A conveyor is used to remove the solid debris from the holding basin.

3,731,814

# LIQUID FILTER

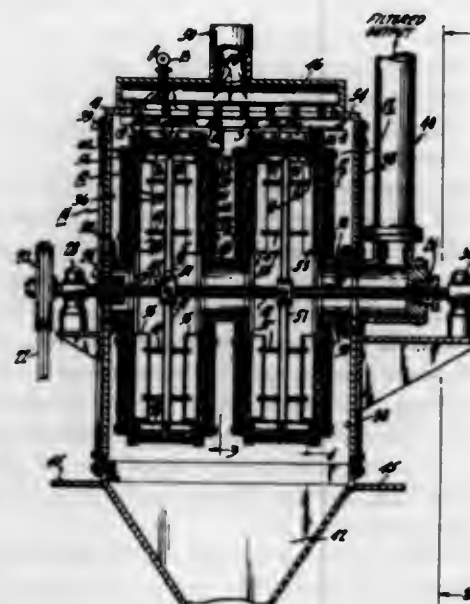
Theodore M. Walters, Milford, N.J., assignor to Charles H. Brown, New York, N.Y.

Continuation-in-part of Ser. No. 685,826, Nov. 27, 1967, Pat. No. 3,491,889. This application May 9, 1968, Ser. No. 727,842. The portion of the term of this patent subsequent to Jan. 27, 1967, has been disclaimed.

Int. Cl. B01d 29/38

U.S. Cl. 210—411

17 Claims



A clear liquid filter for removing solid particles from a liquid or slurry comprises a chamber having a filtration screen. A washer arm is positioned adjacent the interior surface of the chamber and is relatively movable in a direction parallel to the filter screen surface. The washer arm may comprise a rigid imperforate plate in the interior of the chamber and positioned rather close to but spaced from the screen. Various kinds of washer arms are disclosed. The construction of the washer arm in one or more forms is such that it scoops up the liquid within the chamber and pushes the scooped-up liquid against the filter screen surface.

the interior of the screen and outwards through the openings thereof as the relative motion of arm and screen continues. In another form, the washer arm is in the form of a tubular rotatable roller in direct contact with the interior surface of the chamber.

3,731,815

# FILTER AND METHOD OF MANUFACTURE

George H. Collingwood, Hopewell; Robert C. Winckhofer, and Gene C. Weedon, both of Richmond, all of Va., assignors to Allied Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 825,575, May 19, 1969, abandoned.

This application April 26, 1972, Ser. No. 247,901

Int. Cl. B01d 39/10

U.S. Cl. 210—496

14 Claims



Filters for petroleum based liquids and the like are manufactured from heat-treated fabric composed of filaments prepared from blended composite fibers. In general the filter is characterized by light weight, corrosion resistance, compatibility with petroleum based liquids, low cost, dimensional stability, and resistance to shock and other mechanical abuse.

3,731,816

# SUBSTITUTED CELLULOSE IN GRAIN FORM AND A METHOD OF PRODUCING THE SAME

Ove Harald Edlund, Uppsala, Sweden, and Bjorn Arild Andreassen, Hovik, Norway, assignors to Pharmacia Fine Chemicals AB, Uppsala, Sweden

Filed Aug. 6, 1971, Ser. No. 169,866

Claims priority, application Sweden, Aug. 6, 1970, 10834/70

Int. Cl. B01d 39/00

U.S. Cl. 210—500

10 Claims

A substituted cellulose to be used as a separation medium in gel filtering processes in the form of substantially spherical grains containing 2—25 g of substituted cellulose per deciliter and having a pore size of generally between 2 to 2,000  $\mu$ m, the cellulose containing as substituent ether bound uncharged groups, the substitution degree corresponding to a solubility of the substitution product in an 8 percent solution of sodium hydroxide in water (w/w) of at least about 1 percent (w/w) and to insolubility in water within the pH range of 11—1.

3,731,817

# FISHING ROD HOLDER

George V. Fowkes, and Richard Eugene Fowkes, both of Tulsa, Okla., assignors to Fo-Mac Enterprises, Inc., Tulsa, Okla.

Filed March 31, 1971, Ser. No. 129,855

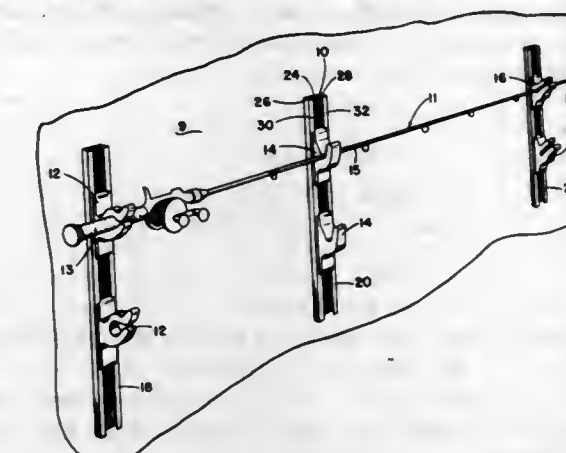
Int. Cl. A47I 7/00

U.S. Cl. 211—60 R

6 Claims

A fishing rod holder constructed primarily of weather resistant material, said material being flexible in either hot or

cold weather, and particularly designed and constructed for the storage and protection of fishing equipment such as fishing



3,731,818

# HOLDER FOR A PLURALITY OF WEAPONS

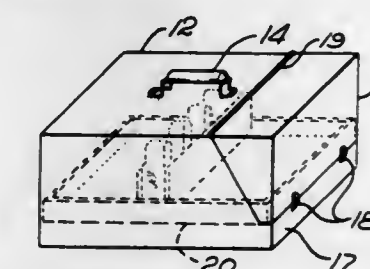
Jesse R. Young, 5302 West 138th Street, Hawthorne, Calif.

Filed Oct. 14, 1971, Ser. No. 189,275

Int. Cl. A47b 81/00; A47I 7/00

U.S. Cl. 206—16 R

10 Claims



A retaining support for a plurality of weapons is disclosed, which may be employed in a gun case. A centrally-mounted upright is affixed in a tray which is in turn received within the gun case. A pair of sets of rocker supports are disposed on opposed sides of the upright with resilient spacers therebetween and extending to receive and support guns at the barrel. A threaded shaft is affixed to the central upright and extends through both sets of rocker supports to provide studs which receive nuts for drawing the rocker supports together as to clamp guns therebetween.

3,731,819

# DIAGNOSTIC AGENTS STORAGE

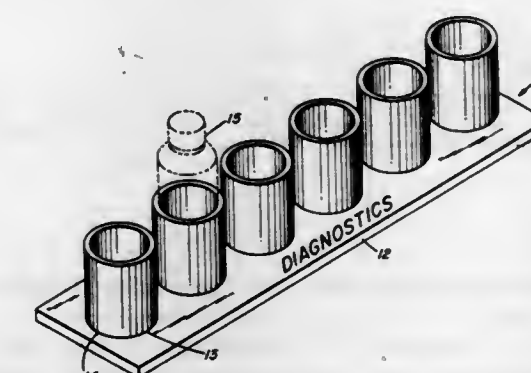
Ellsworth Roland Sandhage, 9 Sandhage Drive, Pearl River, N.Y.

Filed Sept. 22, 1971, Ser. No. 182,610

Int. Cl. A47b 73/00

U.S. Cl. 211—74

1 Claim



A storage rack adapted to hold a plurality of bottles of medical diagnostics, such as blood typing sera, consists of a



flat plastic base plate having in ordered configuration thereon and effectively integral therewith a plurality of cylindrical plastic sleeves each of such size as to conveniently hold a single bottle, and having a spring loaded pin to prevent held bottle from being accidentally displaced during use.

# ERRATUM

For Class 211-118 see:  
Patent No. 3,731,809

3,731,820

## RECTILINEAR MOTION DEVICE FOR A MECHANICAL HANDLING MACHINE

Akiri Niki, Kariya; Satoshi Hirose, Wakabaya, and Jiro Ohara, Nagoya, all of Japan, assignors to Nagoya Kiko Co., Ltd., Nagoya, Japan

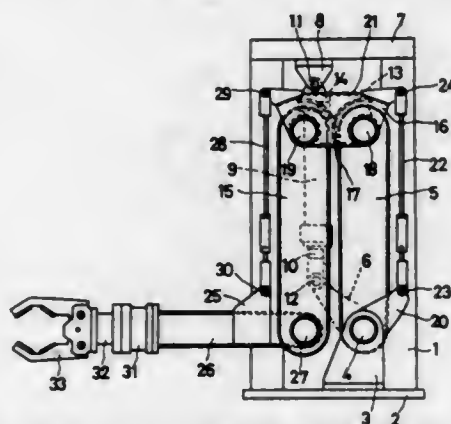
Filed July 6, 1970, Ser. No. 52,396

Claims priority, application Japan, July 8, 1969, 44/53947; June 10, 1970, 45/50142

Int. Cl. B66c 1/42

U.S. Cl. 214-1 BB

9 Claims



A rectilinear motion device which includes a mechanical arm having a pair of links or levers which extend and retract. The two levers are joined together at an elbow mechanism. The two levers extend at equal angles with respect to a reference line through the elbow mechanism. The ends of the two levers are respectively fixed with regard to the structure of the device and extensible to carry an arm which preferably maintains a planar position and which extends and retracts with the pair of levers.

3,731,821

## ARTICLE TRANSFER DEVICE

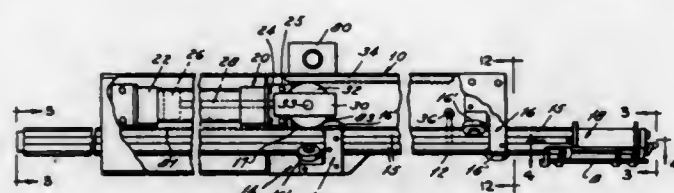
Bernard J. Wallis, 25200 Trowbridge Avenue, Dearborn, Mich.

Filed Sept. 15, 1970, Ser. No. 72,399

Int. Cl. B66c 1/42

U.S. Cl. 214-1 BB

1 Claim



An article transfer device having a generally tubular-shaped member shiftable on a frame and carrying article gripping means on one end thereof. Teeth are formed in the wall of the member to provide a gear rack by means of which the member is shifted to an extended position such that the article gripping means is supported remotely from the frame in cantilever fashion.

3,731,822

## FOUNDRY MOLD JACKET AND WEIGHT SHIFTER

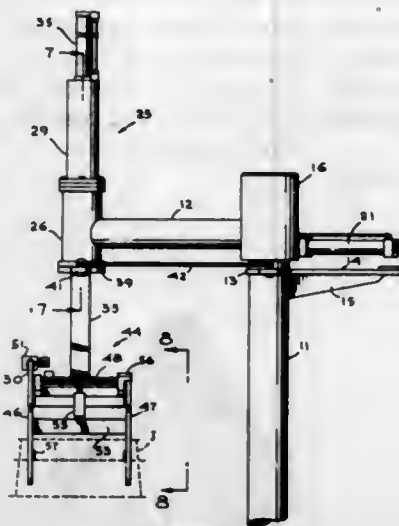
Wilmer J. Friesen, and Frank A. Hulet, both of Hutchinson, Kans., assignors to M. W. Hartman Manufacturing Co. Inc., Hutchinson, Kans.

Filed Dec. 24, 1970, Ser. No. 101,363

Int. Cl. B66c 1/62

U.S. Cl. 214-1 BC

3 Claims



The shifting of the jackets and weights from the molds on one conveyor system run to a contiguous conveyor system run is performed automatically by a swinging boom mechanism having a vertical lift mechanism on the outer end of the boom. An open clamp means attached to the lower end of the lift rod closes the clamp on the jacket and accompanying weight of a mold in which the molten metal has solidified. The closed clamp and its load is lifted clear of the mold, swung on the supporting post through an angle to an aligned position over a fresh mold approaching the metal pouring station, after which the jacket and weight, held in the clamp assembly, is lowered over the green mold, set or snugged down on the mold, and the clamp is then opened, raised, swung back over the first conveyor run, and the cycle repeated. The operation is synchronous with the step-by-step movement of the mold pallets on the conveyor.

3,731,823

## WAFER TRANSPORT SYSTEM

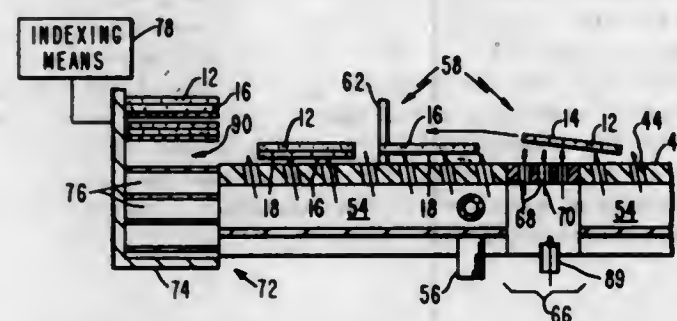
George R. Goth, Jericho, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 1, 1971, Ser. No. 148,371

Int. Cl. B65g 57/11

U.S. Cl. 214-6 F

8 Claims



A transport system for semiconductor wafers and similar articles includes a transporter for the wafers, apparatus which introduces wafers to the transporter at one of its ends, a receiver for the wafers at the other end of the transporter, and apparatus for stacking two wafers during their passage along the transporter between the introducing apparatus and the receiver. The transporter is desirably an air slide, and a first wafer is stopped within the air slide by detaining pins that may be moved into the wafer path. A second wafer is then deflected by vertical air jets to lift it over the first wafer, where

it is then stopped by the detaining pins and settles gently on top of the first wafer. If the air slide is bi-directional, the system may also include a wafer unstacker which receives the wafers from the receiver, then returns them to the introducing apparatus. This may be done with detaining pins of the same type used in the stacking apparatus and a Bernoulli pickup to restrain one of the wafers during unstacking. Such a system allows integrated circuit wafers to be stacked and unstacked without contacting a surface on each wafer in which the integrated circuits are being manufactured.

3,731,824

## FOOD STORAGE AND HANDLING SYSTEM APPARATUS

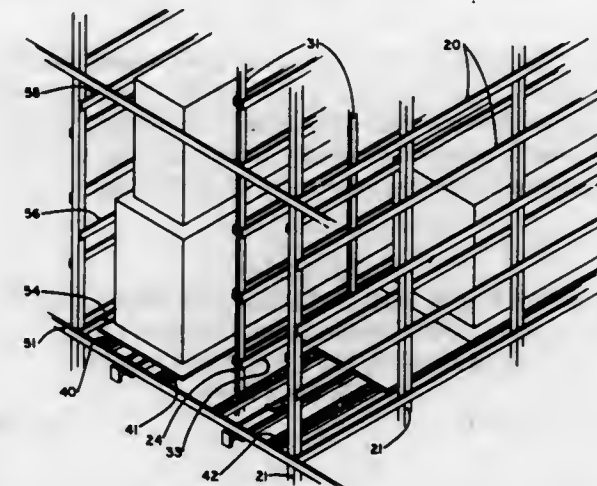
Newel Howlett, 1401 Hillside Place, Las Vegas, Nev.

Filed Oct. 22, 1971, Ser. No. 191,947

Int. Cl. B65g 1/04

U.S. Cl. 214-16 B

7 Claims



An improved apparatus and method for storing and handling articles and particularly refrigerated or frozen foods comprises a series of adjacent elongated storage compartments having rollers extending along the length of the bottom of each compartment on which rollers lie a row of flat plates which may be advanced along the rollers and on the upper surface of which plates materials are stacked. Plate advancing means are provided by a guided shaft extending substantially along the length of each compartment which shaft has attached thereto a series of catch members for contacting catch member receiving or stop means located on the underside of each of the plates; an operator advances the row of plates toward one end of the compartment by pulling the end of the shaft.

3,731,825

## SELF-UNLOADING PARTICULATE MATERIAL DELIVERY SYSTEM

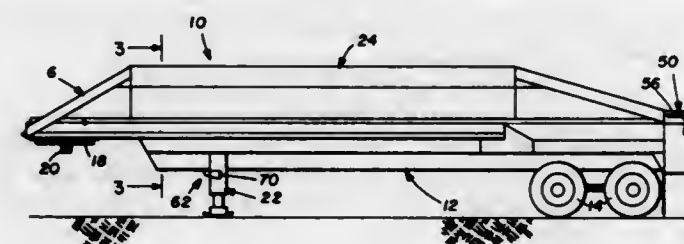
John H. Holland, and Gene O. Fox, both of Norman, Okla., assignors to Arkansas Rock and Gravel Co., Mufreesboro, Ark.

Filed Dec. 1, 1971, Ser. No. 203,740

Int. Cl. B60p 1/38

U.S. Cl. 214-83.36

12 Claims



A self-unloading particulate material delivery system includes a material receiving hopper comprised of a front wall

and side walls that slope inwardly and downwardly and a floor positioned beneath the lower ends of the walls. The rear of the hopper is open and the side walls and the floor extend beyond the rear of the hopper to form a discharge chute. A conveyor includes a pair of drive chains and a plurality of flights connected between the drive chains for movement thereby around a course extending through the hopper and the chute to unload material from the hopper. A flow indicator comprises a plate pivotally supported at the rear of the chute for actuation by material moving therethrough under the action of the conveyor to provide an output indicative of the rate of flow of material out of the delivery system. A flight locator includes a lever mounted in the path of the flights of the conveyor to provide an output indicative of the positioning of the conveyor flights relative to the course of the conveyor.

3,731,826

## BOAT CRADLE FOR MOBILE TRAILERS

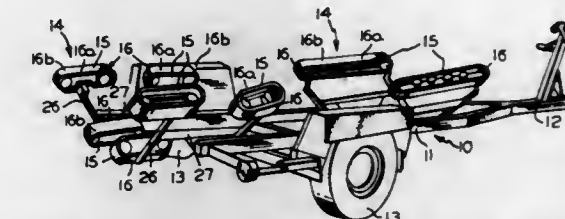
Lawrence N. Johnson, Route No. 1, Box 251A, Spokane, Wash.

Filed July 29, 1971, Ser. No. 167,186

Int. Cl. B60p 1/52, 3/10

U.S. Cl. 214-84

4 Claims



A trailer supported cradle for boats which minimizes the force required to mobilize a boat with respect to its trailer during loading and unloading activities and which substantially increases the area of contact between the boat hull and its supporting cradle to reduce the stress on the hull of the boat due to acceleration forces developed during transportation of the boat upon the tractor-drawn trailer, said support including elongated endless belts trained about articulately mounted sets of coplanar pulleys.

3,731,827

## LOGGING MACHINE

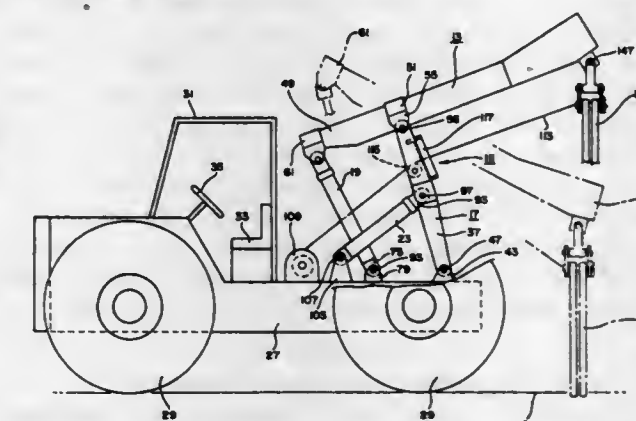
Ronald S. Eaves, Louisville, Miss., assignor to Taylor Machine Works, Louisville, Miss.

Filed May 7, 1971, Ser. No. 141,263

Int. Cl. E02f 3/70

U.S. Cl. 214-147 G

5 Claims



A self-propelled log grapple and skidding vehicle for grappling the one end of one or a group of felled trees to skiddingly drag the trees from a wooded area to a clearing for further processing. The vehicle includes a movable boom having a grappling device depending therefrom and winching apparatus for snaking felled trees out of areas that are inaccessible to the vehicle. The boom is operably moved by hydraulic



lift and tilt cylinder devices which are positioned in such a manner that they are provided maximum protection, i.e., not susceptible to being damaged when the heavy trees supported by the grapple device inadvertently collide with the vehicle. A mounting support of a fair lead for the winching apparatus is included which will assure that the winch line load is not imposed on the boom or the lift cylinders.

3,731,828

**BULK MATERIAL HANDLING SYSTEM**

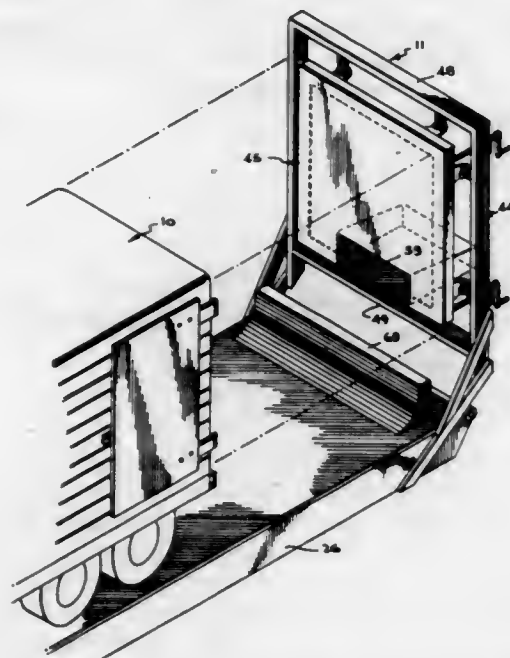
Edwin E. Clarke, Allentown, and Albert J. Florig, Norristown, both of Pa., assignors to said Clarke, by said Florig

Filed Jan. 7, 1970, Ser. No. 1,078

Int. Cl. B65g 67/40

U.S. Cl. 214—305

11 Claims



A bulk material handling system generally including a carrier for transporting bulk material, the carrier having an opening closed by a rupturable panel, means for supporting the carrier, means for tilting the support means to cause the bulk material within the carrier to flow toward the closed opening when the carrier is positioned on the support means, a rigid upright frame structure mounted on the support means, a rigid panel mounted on the upright frame structure, movable into engagement with the rupturable panel when the carrier is positioned on the support means, for supporting the weight of the bulk material within the carrier when the support means is tilted to cause the bulk material to flow toward the closed opening, and the rigid panel having discharge means through which bulk material within the carrier may be conveyed and discharged when the rigid panel engages the rupturable panel on the carrier, a portion of the rupturable panel is ruptured to intercommunicate the interior of the carrier and the interior of the discharge means and the support means is tilted to cause the bulk material within the carrier to gravity flow towards the closed opening and into the discharge means.

3,731,829

**CONTAINER-VEHICLE ASSEMBLY**

Ernst Wagenblast, Singen; Heinz Hohlwegler, Gottmadingen, and Siegfried Schauble, Singen, all of Germany, assignors to Maschinenfabrik Fahr Aktiengesellschaft, Gottmadingen, Germany

Filed Nov. 19, 1971, Ser. No. 200,329

Claims priority, application Germany, Nov. 23, 1970, P 20 57 567.1

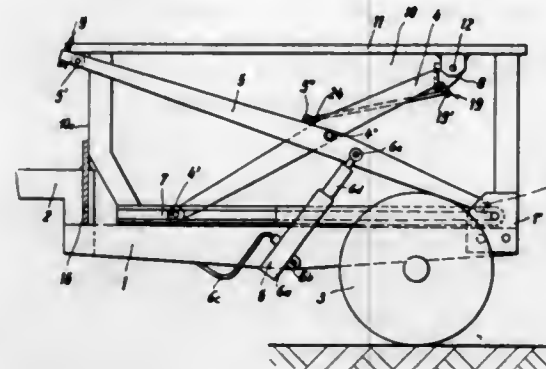
Int. Cl. B65g 7/00; B60p 1/64

U.S. Cl. 214—390

10 Claims

A container-vehicle assembly in which a bifurcated trailer adapted to be towed by an agricultural vehicle of the like has,

along the parallel shanks of the trailer body, a pair of vertically extendible and retractable scissor linkages adapted to support a container. A hydraulic drive raises and lowers the linkage and a simplified latch secures the container against undesired



release. The latch is provided with a swingable latch plate whose recess engages a bolt or pin of the container while a locking pawl retains the latch plate in its locked position or draws a latch plate downwardly to release the bolt when a cable is tightened during movement of the linkage.

3,731,830

**BIKE RACK FOR CAMPER AND THE LIKE**

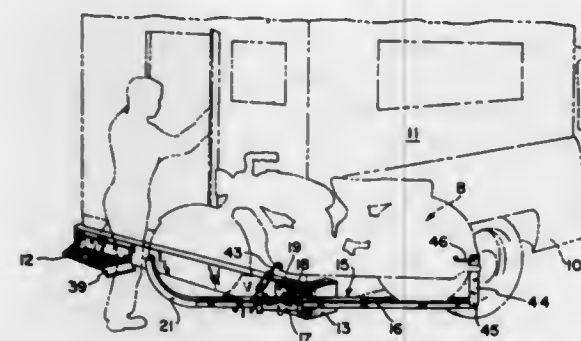
Robert J. Long, 14320 Clayton Road, San Jose, Calif.

Filed June 17, 1971, Ser. No. 154,045

Int. Cl. B60r 9/00

U.S. Cl. 214—450

10 Claims



A rack for receiving and supporting a motorbike and the like on the body of a road vehicle in a manner for shiftability and angular swing relative thereto for enabling ingress and/or egress to and from the body of the vehicle without complete removal of the motor bike from the rack entailing a carrier longitudinally movable and balanceable relative to a hinged roller support, spaced from bridging means on the vehicle and including suitable locking means convertible to a ramp for use during unloading and loading of the motor bike relative to the rack.

3,731,831

**TRAILER**

Arlen L. Huff, South Bend, Ind., assignor to Sellers Manufacturing Inc., Wakarusa, Ind.

Filed April 1, 1971, Ser. No. 130,263

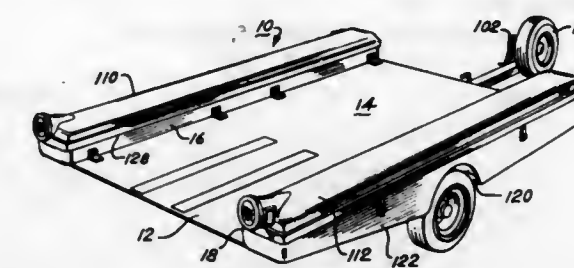
Int. Cl. B60p 1/28

U.S. Cl. 214—506

11 Claims

A trailer for use primarily for transporting vehicles such as snowmobiles, in which a bed is mounted on an undercarriage with the wheels of the undercarriage near the longitudinal center and in which an opening is provided at the front and rear ends of the bed for unloading and loading a snowmobile. A draw bar is pivotally connected to the underside of the bed and is adapted to swing laterally with respect to the bed to permit the bed to tilt both forwardly and rearwardly for unloading

and loading a vehicle. The wheels may be positioned laterally beyond the basic part of the bed, and a fender-compartment



combination having a longitudinal cover thereon is mounted over each of the two wheels.

3,731,832

**COVER LIFT TAB RELEASE**

John A. Foster, Rockford, Ill., assignor to J. L. Clark Manufacturing Co., Rockford, Ill.

Filed July 9, 1971, Ser. No. 161,236

Int. Cl. B65d 43/02

U.S. Cl. 215—46 A

1 Claim



To avoid bending of the free end portion of the sheet metal finger tab as it is swung upwardly to tear the skirt at upright score lines and release the cover as disclosed in U.S. Pat. No. 3,422,984, such end portion is formed with a center curl and separate curls inclined upwardly and outwardly from the ends of the center curl and along the side edges of the free end portion of the tab.

3,731,833

**PLUG FOR BORE HOLES**

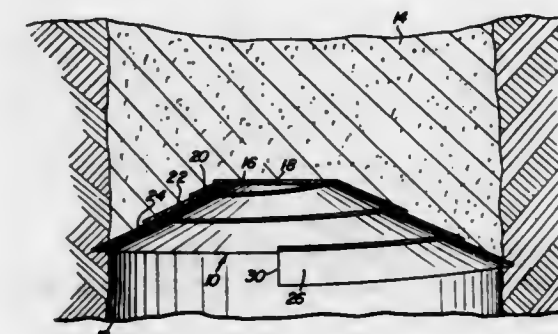
Arnold Thomas Hyrve, 818 Manlewood Crescent, Calgary, Alberta, Canada

Filed Oct. 15, 1971, Ser. No. 189,718

Int. Cl. B65d 39/12

U.S. Cl. 220—24.5

8 Claims



A plug for shot holes employed in seismic exploration in the form of a spiral sheet metal member with the convolutions slightly overlapping and shaped to define a frusto-conical member positioned in the shot hole with the largest convolution disposed below the central convolution.

3,731,834

**TEAR-OPEN CLOSURE**

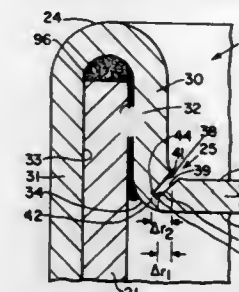
Charles D. Stuard, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed March 27, 1972, Ser. No. 238,217

Int. Cl. B65d 17/00

U.S. Cl. 220—27

9 Claims



A substantially full opening tear-open closure for a container, the closure being of the type having an endless thin wall portion intermediate a removable panel and a residual rim. The outside surface of the thin wall portion is recessed from the adjacent outside surface of the rim, and a smooth endless residual edge is disposed at the intersection of the outside surface of the rim and the adjacent surface intermediate the rim and the thin wall portion. The thin wall portion and its endless junctures with both the rim and the removable panel are configured to form a predetermined continuous line-of-weakening which is wholly disposed nearer the wall of the container body to which the closure is secured than the smooth endless residual edge. Thus, upon tearing along the predetermined line-of-weakening to effect the removal of the removable panel, the raw edge formed thereby is also wholly under the residual rim whereby the raw edge is substantially precluded from being a cut hazard.

3,731,835

**EASY OPENING CONTAINER**

Jerry D. Hawkins, Country Club Hills, and Henry J. Keinanen, Hickory Hills, both of Cook, Ill., assignors to Continental Can Company, Inc., New York, N.Y.

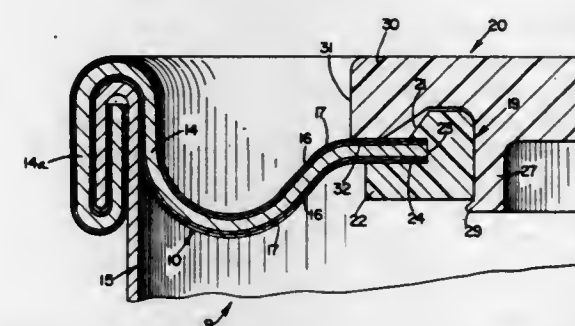
Continuation of Ser. No. 12,981, Feb. 20, 1970, abandoned.

This application Aug. 3, 1971, Ser. No. 168,726

Int. Cl. B65d 17/20

U.S. Cl. 220—53

7 Claims



A metal end unit for a container in which the metal end unit is formed with a pre-cut opening. A protective rim is bonded about the edge of the opening and a plastic sealing member overlies the opening and is separably bonded solely to the metal end unit by means of a thermo and pressure responsive bond promoting coating applied on the metal end unit.

The plastic closure is bonded by means of R-F energy applied to induce heat in the metal end unit at the interface of said bond promoting coating and the plastic closure. Pressure is applied to form the desired bond.

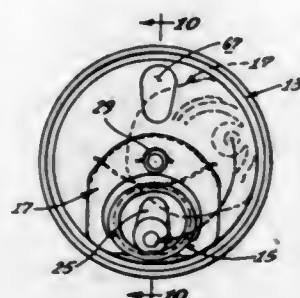


3,731,836

CONTAINER WALL WITH CONNECTOR FOR  
RETAINING THE TAB AND TEAR PORTION ON THE  
CONTAINER WALLFrancis M. Silver, Dayton, Ohio, assignor to Ercal C. Frazee,  
Dayton, OhioFiled March 17, 1972, Ser. No. 235,710  
Int. Cl. B65d 17/24

U.S. Cl. 220-54

17 Claims



An easy opening container wall comprising a container wall of sheet material having a tear portion therein and a tab affixed to the tear portion for removing the tear portion to form an opening in the container wall. A connector attaches the tab to the container wall. The connector allows manipulation of the tab so that following removal of the tear portion from the container wall by the tab, the connector retains the tab and the tear portion on the container wall.

3,731,837

## COVER PLATE

Douglas John Platts, Workshop, and Keith Ellis Hunter,  
Sheffield, both of England, assignors to General Descaling  
Company Limited, Nottinghamshire, England

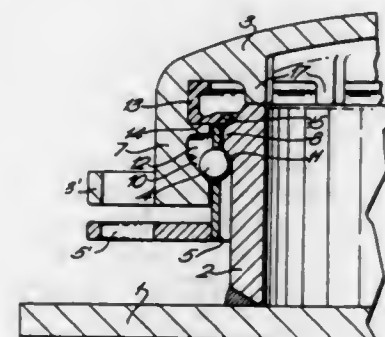
Filed June 28, 1971, Ser. No. 157,111

Claims priority, application Great Britain, Dec. 11, 1970,  
58,974/70

Int. Cl. B65d 45/00; E05c 19/00

U.S. Cl. 220-55 R

15 Claims



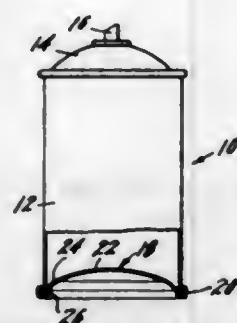
A container for transport or storage of liquid in bulk having a filling opening defined by an upstanding neck, the combination of a cover plate having a depending flange, by which the cover plate, when in position, is located on said neck, interlocking means for positively securing the cover plate to the neck including annular seating surfaces formed respectively on the neck and flange of the cover plate, a plurality of circumferentially arranged balls for operative engagement with said seating surfaces and by which the cover plate is positively held in position thereon, an annular cage encircling the neck and by means of which the balls are normally held in their operative position, the cage being capable of displacement by which the balls can be withdrawn from their operative position to a release position to permit removal of the cover plate.

3,731,838

CONTAINER END WALL CONSTRUCTION  
Erik Gedde, Part Ridge, Ill., assignor to American Can Com-  
pany, Greenwich, Conn.Filed April 8, 1971, Ser. No. 132,518  
Int. Cl. B65d 7/42

U.S. Cl. 220-67

3 Claims



Increased resistance against internal pressure in an end wall for a highly pressurized container is provided by an outwardly descending substantially planar portion at the periphery of a concavely domed central panel where the central panel meets a substantially vertical countersink wall.

3,731,839

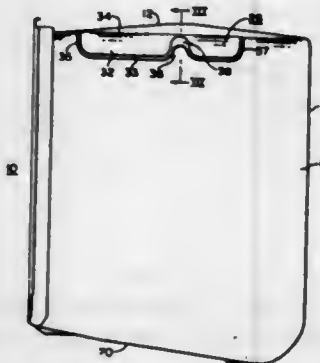
DISHWASHING TANK HAVING INTEGRAL HANDLING  
MEANSOlav L. Long, Columbus, Ohio, assignor to Westinghouse Elec-  
tric Corporation, Pittsburgh, Pa.

Filed April 20, 1971, Ser. No. 135,643

Int. Cl. B65d 7/42

U.S. Cl. 220-74

7 Claims



The invention provides a formed dishwasher tub or the like that includes integral, strengthening embossments situated and extending along the two top edges of the tub and with the same including integral, indented portions mediate their ends to accommodate processing hangers which suspend the dishwasher tub or the like as it proceeds through the manufacturing or process which may include the application of a coating material.

3,731,840

## PAINT TRAY AND HANDLE UNIT

Elzy Alonzo Beutler, and Daniel James Beutler, both of 299  
Drexel Avenue, Ventura, Calif.

Filed Aug. 25, 1971, Ser. No. 174,678

Int. Cl. B65d 25/28

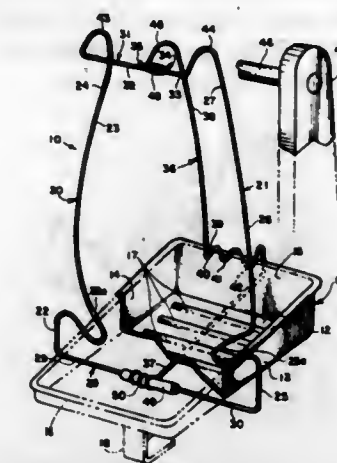
U.S. Cl. 220-95

12 Claims

A generally upstanding handle is coupled to a paint tray for use in carrying and supporting the paint tray.

The handle, constructed in accordance with one embodiment of the invention, is an open wire framework having its top portion bent to constitute hooks by which the paint tray

can be suspended for storage purposes or during periods of discharge area and a discharge manifold designed to receive the seeds and discharge them through exit tubes. Air flow into usage by a painter.



The framework has plural resilient tongues and plural adjustable resilient loops for engaging portions of the paint tray in order to assist in stabilizing a chosen position of the tray.

3,731,841

VENDING MACHINE WITH SCREW CONVEYOR TYPE  
CELLULAR MAGAZINE

Stanley O. Schlaf, Route 1, Winfield, Mo.

Continuation-in-part of Ser. No. 787,877, Dec. 30, 1968, Pat.

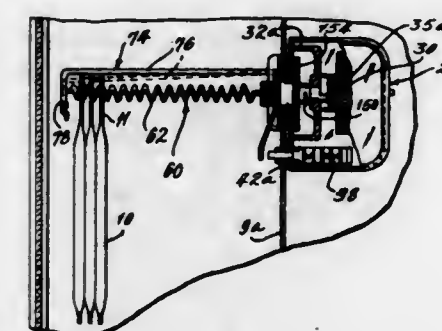
No. 3,572,546. This application March 30, 1971, Ser. No.

129,488

Int. Cl. G07f 11/00

U.S. Cl. 221-75

5 Claims



A dispensing machine having article carrying spindles provided with thin mounting shanks which fit into sockets in drive shafts forming part of drive units. Each spindle shank has a tang which is engaged by a transversely extending pin in the drive shaft to which the spindle connects. The pins extend through the sockets and are adapted to shift laterally therein under spring bias so that the spindles can be detached for loading. An adapter for converting existing dispensing machines for use with thin-shank spindles of the aforementioned variety. The adapter fits rigidly in the enlarged sockets of a drive shaft on such existing machines and has a socket adapted to receive the shank of the spindle as well as a laterally shiftable pin to hold the spindle therein.

3,731,842

## SEED SELECTOR FOR PLANTER

James E. Schlegel, Western Springs, Ill., assignor to Inter-  
national Harvester Company, Chicago, Ill.

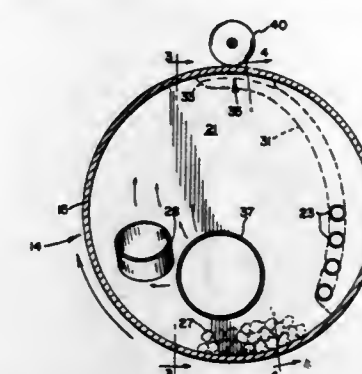
Filed April 29, 1971, Ser. No. 138,513

Int. Cl. B65g 29/00

U.S. Cl. 221-278

16 Claims

A seed selecting apparatus having rotatable seed selector drum with peripheral openings, an interior seed supply, air supplied under pressure to the interior selector of the drum to hold seed in the openings and carry the seeds upwardly to a



the discharge manifold assists in dislodging the seed and ejecting it through the exit tubes.

3,731,843

## GAS SOURCE

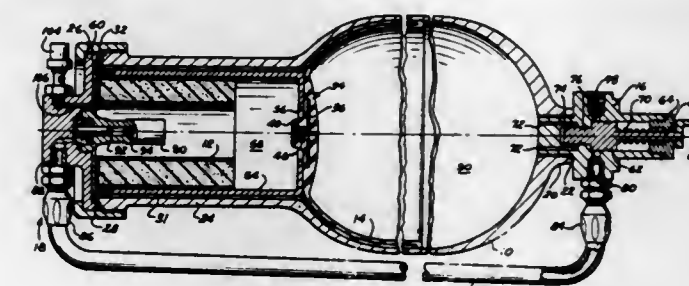
Carl W. Anderson, Jr., Springfield, Va., assignor to The  
Susquehanna Corporation, Alexandria, Va.

Filed June 10, 1971, Ser. No. 151,661

Int. Cl. B67d 7/24

U.S. Cl. 222-3

9 Claims



An embodiment of the gas source is disclosed which uses a compressed gas cylinder whose interior is divided into two chambers by a folded bladder. One chamber is a storage chamber for the compressed gas and the other is a combustion chamber for housing and burning a solid propellant. When the discharge valve is opened, a gas pressure pulse is applied from the storage chamber to a pressure-responsive spring in the propellant ignition system. The ignition system functions to ignite the propellant and cause the generation of gases. These gases act upon the bladder causing it to unfold as the compressed gas is discharged. The generation of gas is tailored to cause the compressed gas within the storage chamber and thereby the discharge pressure to remain essentially constant.

3,731,844

DEVICE FOR THE STORAGE, MIXING AND DISPENSING  
OF INGREDIENTSHugh William Barnes Baker, Beaconsfield, England, assignor  
to The Gillette Company, Boston, Mass.

Filed March 22, 1971, Ser. No. 126,582

Int. Cl. B67b 7/26

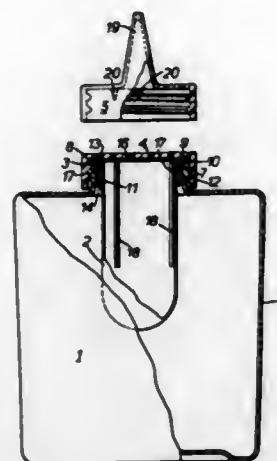
U.S. Cl. 222-83

6 Claims

A device for the storage, mixing and dispensing of two ingredients which comprises two containers nested in spaced relationship one within the other, each container having a mouth, a collar within the mouth of the outer container, means for releasably supporting the inner container within the collar with the mouths of the two containers substantially coplanar, a rupturable closure extending across and sealingly engaging the mouth of the inner container, and means engageable with the device for rupturing the closure to open the



mouth of the inner container and releasing the supporting means to permit the inner container to move within the outer



container so that the contents of the two containers can be mixed by shaking the device.

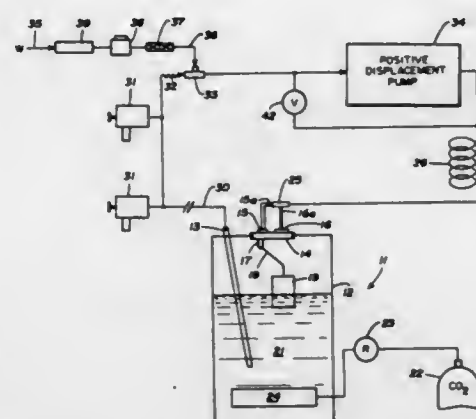
3,731,845

### SYSTEM FOR DISPENSING CHILLED CARBONATED WATER

Jack J. Booth, P.O. Box 507, Carrollton, Tex.  
Filed Nov. 23, 1970, Ser. No. 91,873  
Int. Cl. B67d 5/08

U.S. Cl. 222-67

5 Claims



A carbonation unit in a closed loop including a circulation pump, dispensing valves, a restrictor and a pressure regulated source of fresh makeup water with a float controlled inlet to the carbonation unit, which is normally restricted as carbonated water within the unit approaches a predetermined level. A bypass valve across the pump is open to recirculate water within the pump when the carbonation unit inlet becomes restricted. Water withdrawal from the carbonator through the dispenser valves opens the inlet for increased flow to the carbonator accompanied by a pressure drop to close the pump bypass valve. Pump suction drops the pressure across the restrictor to draw makeup water into the loop.

3,731,846

### FUEL SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINE POWERED PORTABLE TOOLS AND THE LIKE

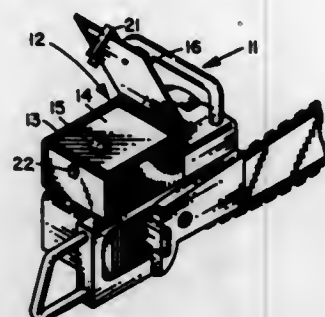
William A. Turner, 205 Sycamore Road, and John J. Ferrer, Jr., 200 Sycamore Road, both of Franklin, Va.  
Filed July 16, 1971, Ser. No. 163,252  
Int. Cl. B67b 7/24, 9/00

U.S. Cl. 222-86

8 Claims

A fuel system for a portable tool or the like powered by an internal combustion engine including a fuel compartment mounted thereon into which a fuel cell containing a supply of the proper fuel for such an engine may be downwardly moved.

A cover element for the fuel compartment may be swung upwardly about a hinge line to permit the fuel cell to be positioned therein and then swung downwardly to be secured in a closed position; seal means being provided to substantially assure the liquid tightness of the fuel compartment when closed.



The fuel compartment includes fuel cell rupturing or puncturing devices mounted therein in an upwardly extending position for penetrating the fuel cell as it is moved downwardly into the fuel compartment to permit fuel to flow therefrom into a fuel conduit extending from the lower portion of the fuel compartment towards the engine.

3,731,847

### PLURAL COMPARTMENT PRESSURIZED DISPENSING PACKAGE

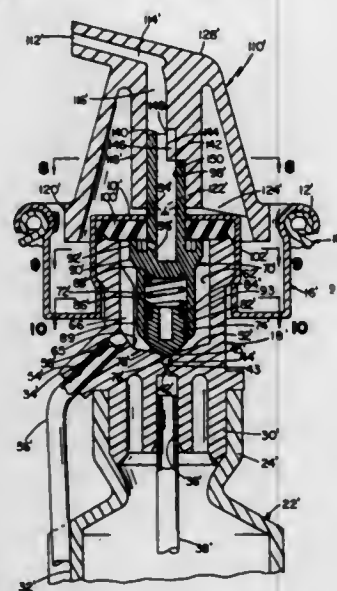
Milo E. Webster, Braintree, Mass., assignor to The Gillette Company, Boston, Mass.

Continuation-in-part of Ser. No. 778,689, Nov. 25, 1968, abandoned. This application June 1, 1971, Ser. No. 148,498

Int. Cl. B65d 35/22

U.S. Cl. 222-94

2 Claims



A pressurized dispensing package has a self-supporting flexible walled inner container disposed within and seated on the base of a rigid walled outer container. A valve assembly controls mixing of materials stored in the containers and flow of that mixture to the atmosphere. Dip tubes secured to the valve assembly extend to the bottom of each container. The outer container is charged with propellant through the valve stem of the valve assembly. An actuator cap on the stem is pivoted about a tilt axis to open two valves and discharge a mixture.

3,731,848

### COMPARTMENTALIZED CONTAINER

Shouichi Nakamichi, Amagasaki, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

Filed March 2, 1971, Ser. No. 120,203

Claims priority, application Japan, April 3, 1970, 45/32187

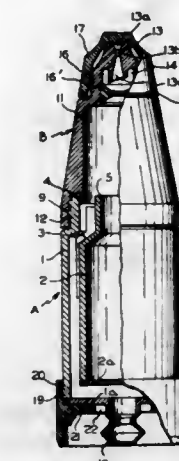
Int. Cl. B67d 5/56

U.S. Cl. 222-129

6 Claims

This invention relates to a compartmentalized container for preservation, mixing and distribution of a plurality of incom-

patible liquid chemicals or medicaments which must be segregated prior to use. The container has a composite container body consisting of a larger open-topped container having an elastic airchamber extending from the bottom thereof and a smaller open-topped container inserted into an firmly held in said larger container with the mouth thereof approxi-



mately in a common plane with the mouth of said larger container. A detachable cap closes the above mouth-plane. A pouring nozzle body having a nozzle head at its top, a reservoir and a hollow mixing space therewithin is detachably connectable to the composite container so as to cover its common mouth-plane in place of the above cap.

3,731,849

### CONTAINER AND CAP COMBINATION TO INDICATE TAMPERING

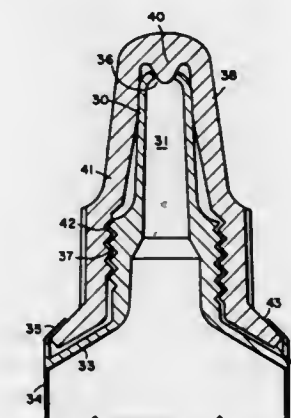
Frederick J. Burrows, Aston, Pa., assignor to Teledyne Mid-American Corporation, Chester, Pa.

Filed July 23, 1971, Ser. No. 165,566

Int. Cl. B67b 3/26

U.S. Cl. 222-153

6 Claims



A container and cap combination which indicates tampering if the cap is removed from the container, and then restored to its initial position on the container. The container has a tip which is adapted to be used to discharge its contents and which may be externally threaded. The tip connects with the shoulder on the forward end of the container and the shoulder connects with the side wall of the container, which, at least in the case of a collapsible tube, is initially open at the lower end but is subsequently filled with contents and closed. From the shoulder there extends a flange in the same direction as the tip and around the tip. The cap, which may be made of pliable plastic such as polyethylene, polypropylene or the like or of other materials such as metals, has an end wall adapted to close the opening of the tip, side walls connected to the end wall which may have internal threads to engage threads on the

tip, and an outwardly extending flange which is smaller in diameter than and within the flange on the container, the flange on the container being inwardly flared over the outer edge of the flange on the cap. In removing the cap, the cap may outwardly deform the flange on the container and thus when the cap is restored indicate that the tube has been subjected to tampering. Instead, the cap may be so pliable that it will spring from under the flange on the container and be impossible to restore beneath the flange on the container, thus indicating that the container has been subject to tampering. In another variation the cap or the container flange may be frangible and may separate into two parts if an effort is made to remove the cap, thus indicating tampering. The flange on the container is preferably continuous, but it may consist of a plurality of lugs, projections, scallops or the like. While in smaller containers the flange on the container will preferably be of the same diameter as the side wall, in larger containers the flange on the container will preferably be of a smaller diameter than the side wall of the container. In the preferred embodiment the flange on the cap is provided with a sloping diagonal edge at its outer corner adjacent the shoulder of the container, to aid it in deforming any bent portion of the flange on the container outwardly in inserting the cap.

3,731,850

### DROPLET GENERATOR AND METHOD

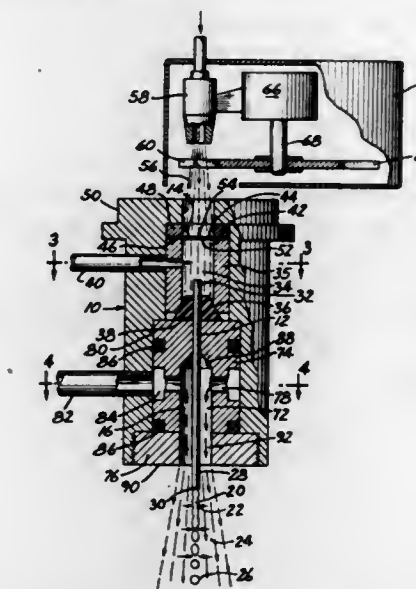
William H. Weitzel, San Diego, and Lee D. LaGrange, Del Mar, both of Calif., assignors to Gulf Oil Corporation, San Diego, Calif.

Filed Jan. 14, 1972, Ser. No. 217,853

Int. Cl. B01d 47/02

U.S. Cl. 222-193

7 Claims



A droplet generator and method for dispersing a liquid feed stock into uniform spherical droplets. The apparatus includes means for providing a jetstream of the liquid feed stock, means for generating uniformly periodic varicose instabilities in the jetstream, and means for providing a concurrent, coaxial flow of gas surrounding the jetstream in order to enhance the varicose instabilities in order to cause the uniform dispersion of the jetstream into uniform spherical droplets. It is desirable that the varicose instabilities have a wavelength of at least  $\pi$  times the unperturbed diameter of the jetstream.

3,731,851

### PARTICULATE MATERIAL DISPENSER

James Rauh, Union City, N.J., assignor to Milton R. Stanson, New York, N.Y., and James Rauh, Union City, N.J., part interest to each

Continuation of Ser. No. 796,760, Feb. 5, 1969, abandoned.

This application Feb. 26, 1971, Ser. No. 119,302

Int. Cl. B65d 83/06

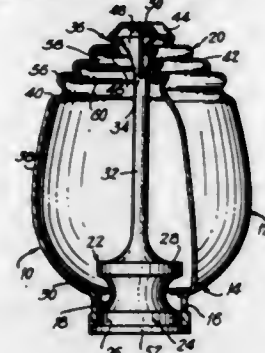
U.S. Cl. 222-213

7 Claims

A particulate material dispenser from which a metered amount of particulate material can be discharged. The



dispenser includes a flexible resilient container having a bottom end provided with a tubular neck portion forming a discharge opening for the container. A plug at the tubular neck portion has an outer closure end normally closing the container and an inner closure end also closing the container when the latter is compressed to discharge material, the plug being formed with an annular groove between its outer and inner closure ends so that this groove which normally communicates with the interior of the container will determine the amount of material discharged therefrom when the inner closure end of the plug is displaced into the tubular neck portion.



The plug is connected with a stem which extends axially along the interior of the container so that when the top end of the container is displaced toward the bottom end thereof the plug will be shifted to discharge material from the container. A base is connected either with the tubular neck portion or with the plug itself to provide a support for the container. The container wall is formed with grooves and ridges which are designed to facilitate compression and expansion of the container without capturing any particulate material in these grooves.

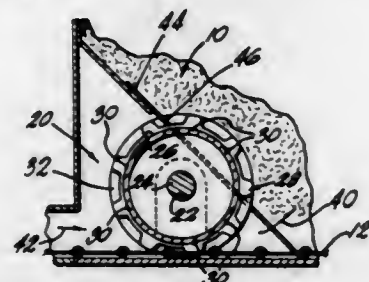
3,731,852

## FEED RETURN WHEEL FOR ANIMAL FEEDERS

Robert L. Van Huls, Zeeland, Mich., assignor to U. S. Industries, Inc., New York, N.Y.  
Division of Ser. No. 41,254, May 28, 1970, Pat. No. 3,656,158.  
This application Sept. 22, 1971, Ser. No. 182,903  
Int. Cl. G01f 11/06

U.S. Cl. 222-318

18 Claims



A feed return wheel having a feed compacting surface and a chain-engaging sprocket, the sprocket being formed integrally with the surface and the surface being provided with spaced raised protrusions for positively engaging returned feed to cause the latter to mix with fresh feed.

3,731,853

## MULTI-CHAMBER RECEPTACLE

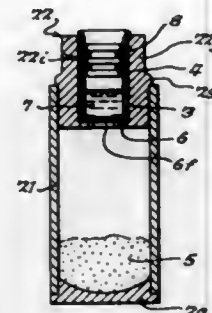
Erwin Beumann, Nendeln, and Gerhard Behn, Lettstrasse 789, Vaduz, both of Liechtenstein  
Filed July 27, 1970, Ser. No. 58,572.  
Claims priority, application Germany, Aug. 1, 1969, P 19 39 315.8  
Int. Cl. A61k 5/00

U.S. Cl. 222-386

7 Claims

A multi-chamber receptacle for storing and mixing the ingredients of products such as dental preparations, including a

chamber in a casing for storing liquid or pasty material and a piston for closing the chamber during initial storage and for then expelling the material from the chamber into a main



chamber in a container where the liquid or pasty material will be mixed with a pulverulent ingredient. The casing has a frangible bottom portion or the like adapted to be ruptured for transfer of the liquid or pasty material to the main chamber.

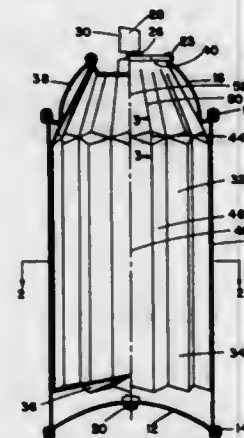
3,731,854

## COLLAPSIBLE CONTAINER LINER

Don E. Casey, 645 Neil Avenue, Columbus, Ohio  
Filed July 12, 1971, Ser. No. 161,840  
Int. Cl. G01f 11/00

U.S. Cl. 222-386.5

11 Claims



An aerosol container liner of flexible material having a plurality of longitudinally aligned pleats extending inwardly in the general direction of orderly liner collapse under the influence of a surrounding propellant. The liner comprises longitudinally arranged tiers of pleats joined by foldable, intermediate, hinge portions blending the adjoining pleats.

3,731,855

## PRESSURIZED CONTAINERS

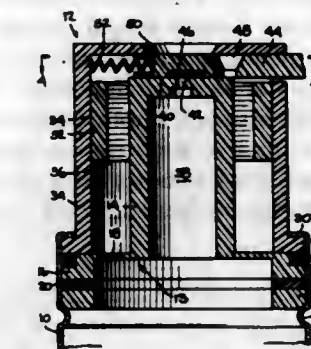
Kenneth D. Vos, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.  
Filed June 30, 1971, Ser. No. 158,194  
Int. Cl. B65d 83/14

U.S. Cl. 222-394

11 Claims

This invention relates to a pressurized package of the class which includes a container for receiving a product, propellant means in the container for discharging the product from the container, and a dispensing assembly mounted on the con-

tainer which is characterized by an actuating lever that shifts port extends laterally from the other end of the shank, and a laterally for unsealing a slide valve against which sealing is tip extends from the support for selective engagement with the



normally at least partially effected by the internal container pressure.

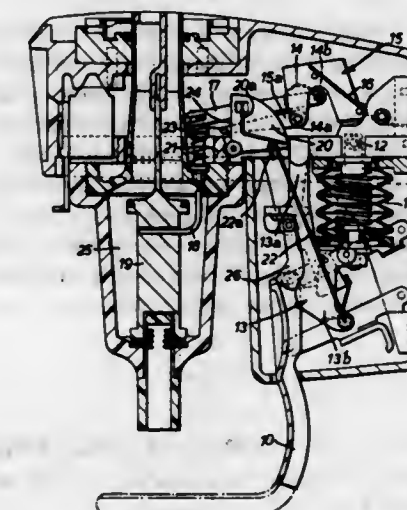
3,731,856

## LIQUID METERING DEVICE WITH TIME DELAYED CLOSURE

Robert William Young, Battledown, England, assignor to Autic Developments Limited, Cheltenham, England  
Filed Jan. 3, 1972, Ser. No. 214,966  
Claims priority, application Great Britain, Nov. 1, 1971, 50,645/71  
Int. Cl. B65d 47/28

U.S. Cl. 222-477

6 Claims



A liquid measure includes a change-over valve and an interlock mechanism including a bellows and an over-centre spring acting to provide a time delay between change-over operations of the valve. Cam means are provided whereby movement of a part of the interlock mechanism is not transmitted to the over-centre spring until a change-over condition is reached.

3,731,857

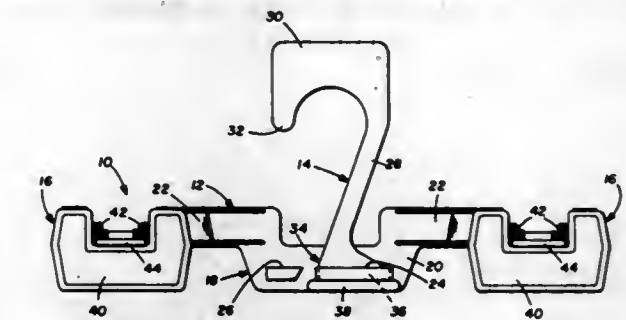
## GARMENT HANGER

Edmond R. Haggard, Dallas, Tex., assignor to Haggard Company, Dallas, Tex.  
Filed April 6, 1971, Ser. No. 131,597  
Int. Cl. A47J 51/098, 51/14

U.S. Cl. 223-96

11 Claims

In a garment hanger, a hanger hook is supported on a hanger body for movement between extended and retracted positions. The hanger body includes gripping members for receiving a garment and has shank and tip receiving slots formed in it. The hanger hook includes a shank that is slidably supported in the shank receiving slot and a member at one end of the shank for selective engagement with the shank receiving slot to secure the hanger hook in the extended position. A sup-



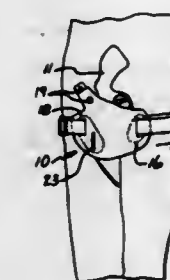
tip receiving aperture to secure the hanger hook in the retracted position.

3,731,858  
GUN HOLSTER

Roy L. Baker, 2729 Cannon Street, Rockford, Ill.  
Filed May 28, 1971, Ser. No. 147,862  
Int. Cl. F41b 13/04

U.S. Cl. 224-2 B.

16 Claims



The holster is made of two identical leather pieces joined in overlying relationship. One belt receiving slot is provided through both pieces at the bottom or trigger side of the gun; while two slots are provided at the top of the gun, one slot being at a level below the other. Stitching in the form of closed loops around the slots joins the pieces and forms the gun pocket. With this structure the holster is adaptable for regular or cross-draw for both right or left-hand use.

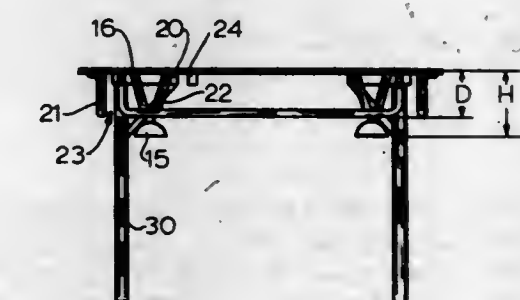
3,731,859

## COMBINATION CAR TOP RACK AND TABLE

Carl N. Bean, Jr., 133 Celeste Circle, Chapel Hill, N.C.  
Filed Nov. 15, 1971, Ser. No. 198,670  
Int. Cl. B60m 9/04

U.S. Cl. 224-42.01

1 Claim



A combination car top rack and table supports and secures luggage or other gear in transit and converts to a table when not in transit. A plurality of side rail members adjust to various positions useful both as part of a car rack and a table.



3,731,860

**CAMPER-BUMPER COMPARTMENT AND STEP**

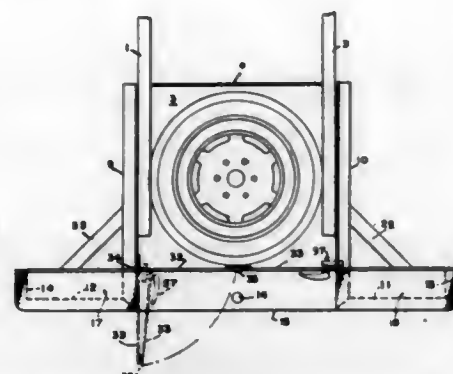
Arlyn W. Davis, Rt. No. 2, P.O. Box 228, Sheridan, Oreg.

Filed Dec. 31, 1970, Ser. No. 103,030

Int. Cl. B60r 9/06

U.S. Cl. 224-42.06

1 Claim



A spare tire mount for a vehicle having a chassis including a pair of longitudinal frame members of channel section. The tire mount is of box-like formation incorporated in the vehicle structure in a manner which adds to the utility of the vehicle, protects the same from damage liable to be sustained by accidental collision with a following vehicle, and which provides means for carrying extra tires, tools, baggage and the like, which are also protected by the box-like structure.

3,731,861

**METHOD FOR DICING MATERIALS HAVING A HEXAGONAL CRYSTAL STRUCTURE**

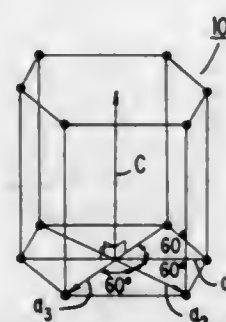
Robert Edward Busch, Elizabeth, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 28, 1971, Ser. No. 193,529

Int. Cl. B26f 3/00

U.S. Cl. 225-2

2 Claims



A method for dicing materials having a hexagonal crystal structure, in which the C axis of the crystal is oriented parallel to one surface. Two scribe lines are made on the one surface, each perpendicular to the other and one being perpendicular to the C axis. Two additional lines are scribed on the back surface, each being perpendicular to the C axis and lying in a plane which is inclined about 60° to the projection of the one surface scribe line which is likewise perpendicular to the C axis.

3,731,862

**ARTICLE HANDLING APPARATUS AND METHOD**

Daniel J. Bustran, Big Flats; Miho A. Gossie; Roy N. Sundstrom, both of Corning, and William R. Wisner, Big Flats, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 82,466, Oct. 20, 1970, Pat. No. 3,690,527

Filed May 15, 1972, Ser. No. 253,628

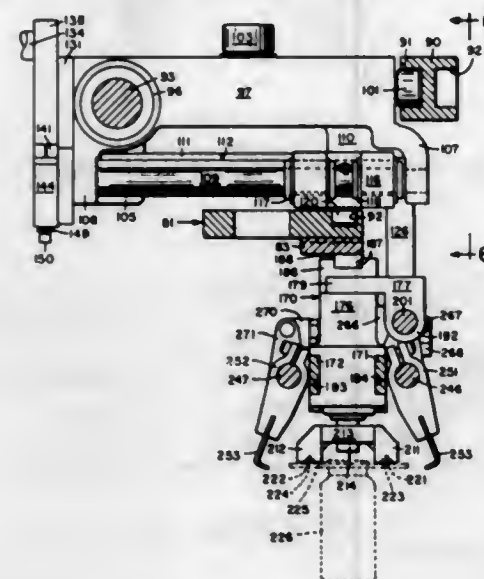
Int. Cl. B26f 3/00

U.S. Cl. 225-4

6 Claims

A substantially continuous ribbon of a thermoplastic material supporting a plurality of depending and equally

spaced-apart articles or bodies and moving in a generally linear direction through a first path of travel at a relatively high rate of speed is periodically fractured at equally spaced-apart points along the length thereof to successively provide a series or succession of ribbon lengths each supporting an equal number of the pendent articles, and successive ones of the ribbon lengths are handled and delivered to ribbon-length receiving and transfer means without contacting any of the pendent articles or bodies of such ribbon lengths. The thermoplastic ribbon may, for example, be a ribbon of a glassy material from which the pendent articles or bodies are in-



3,731,863

**DISPENSER CUTTER FOR TACKY MATERIALS**

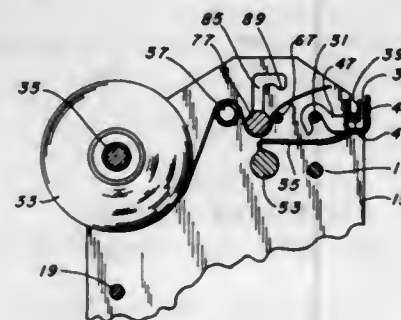
Joseph A. Nausedas, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 20, 1971, Ser. No. 209,900

Int. Cl. B26f 3/02

U.S. Cl. 225-20

7 Claims



A dispenser cutter for rolled fabric materials, particularly tacky materials such as wax impregnated paper, which includes a cutting blade, guard means to shield the cutting blade in its non-operative position and a combination of roller means to direct movement of the rolled fabric material into severing engagement with the cutting blade, to free a leader of the rolled fabric material from the cutting blade and to restrain the freed leader against retraction.

3,731,864

**WEB GUIDE ROLLER ASSEMBLY**

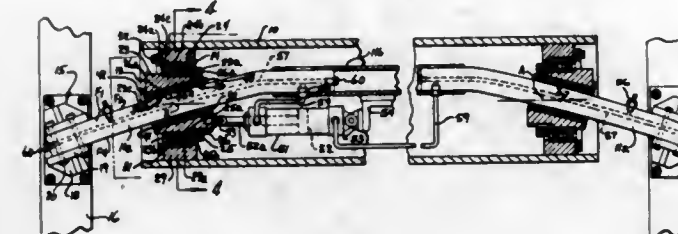
Robert W. Ott, Jr., Rockford, Ill., assignor to Rockford Servo Corporation, Rockford, Ill.

Filed Aug. 13, 1971, Ser. No. 171,573

Int. Cl. B65h 25/26

U.S. Cl. 226-19

11 Claims



A web guide roller assembly for guiding a traveling web in which the web guide roller is rotatably mounted on followers located internally of the roller, the followers defining a guide bearing slidably and nonrotatably engaging longitudinally arcuate portions of a guide bar that extends through the roller to thereby support the roller for longitudinal shifting and tilting movement relative to the path of web travel. An operator for longitudinally shifting the roller relative to the guide bar is advantageously located internally of the roller and operatively connected to the guide bar and one of the followers.

3,731,865

**FLUID TRANSFER MEANS**

Michael Burke Wood, Fossaway, England, assignor to International Research &amp; Development Company Limited, Fossaway, Newcastle upon Tyne, England

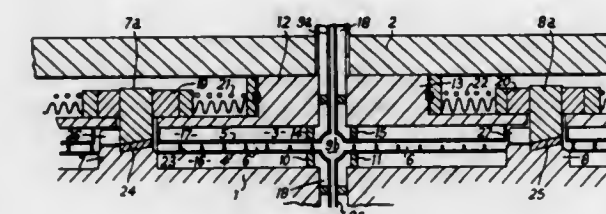
Filed March 1, 1971, Ser. No. 119,789

Claims priority, application Great Britain, Feb. 27, 1970, 9,717/70

Int. Cl. H02k 9/00

U.S. Cl. 277-15

5 Claims



A rotary seal assembly for transfer of cryogenic fluid to a rotor in which the fluid passes from a port in a stationary vacuum-insulated wall to a port in a rotating vacuum-insulated wall by way of an annular space between the walls which is closed by rotary seals at its ends remote from the ports and is shaped to minimize flow from the ports to the seals so that the seals can operate at ambient temperature.

3,731,866

**APPARATUS FOR REMOVING AND REPLACING MULTIPINNED COMPONENTS MOUNTED ON CIRCUIT BOARDS**

Roger S. Mason, Poughkeepsie, and George R. Pullis, Fishkill, both of N.Y., assignors to Cogar Corporation, Wappingers Falls, N.Y.

Filed Jan. 4, 1971, Ser. No. 103,645

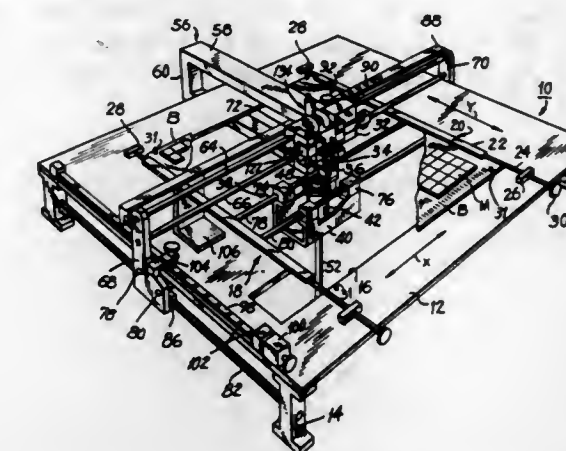
Int. Cl. B23k 1/00

U.S. Cl. 228-6

11 Claims

An apparatus for removing a selected electrical component soldered into a circuit board and replacing such component with another component is provided and includes a frame plate on which the circuit board is mounted. A head assembly

is positionable over the component to be removed and replaced, and this assembly carries a pair of heads, namely a component pickup head and a component insertion head. A soldering unit is positioned below the circuit board and shifts



with the head assembly. The soldering unit liquifies the solder holding the selected component in place, the pickup head removes the component from the board, the insertion head puts a new component in its place, and the soldering unit solders it into the circuit board.

3,731,867

**VACUUM DIE SENSOR APPARATUS AND METHOD FOR A SEMICONDUCTOR DIE BONDING MACHINE**

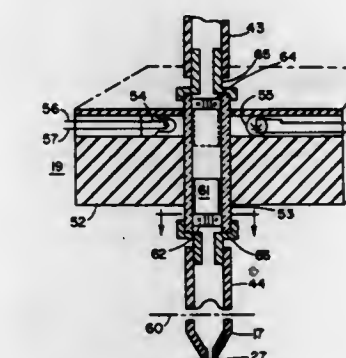
Milo W. Frisbie; Frank E. Polka, and Philip Vaught, all of Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed July 19, 1971, Ser. No. 163,920

Int. Cl. B23k 1/00

U.S. Cl. 228-6

9 Claims



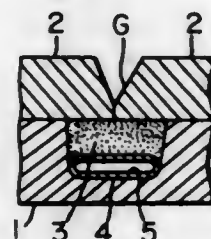
Sensing apparatus for determining whether or not a vacuum pickup mechanism for picking up a semiconductor die and transferring it to a lead to which it is to be bonded has picked up a die is disclosed wherein a photo cell is continuously illuminated by a beam of light except when the beam of light is blocked by a cylindrical plunger relatively easily movable in a glass tube. When no die has been picked up, and vacuum is applied at the sensing point the plunger moves up to block the light beam. Under this influence the indexing motor for moving the lead upon which the die is to be mounted is prevented from starting, and the lead frame remains stationary until a die is deposited. When a die has been picked up, the sensing vacuum is applied but is ineffective because the plunger remains down, after an upward transient, and through appropriate circuitry the indexing motor moves the lead frame along in the normal manner.



3,731,868

# ONE-SIDE BACK BEAD FORMING BUTT-WELDING PROCESS USING A THERMOSETTING BACKING COMPOSITE

Masayasu Arikawa, and Katsuro Ito, both of Fujisawa, Japan, assignors to Kobe Steel Ltd., Kobe, Japan  
Division of Ser. No. 657,197, July 31, 1967, Pat. No. 3,548,489. This application Aug. 13, 1970, Ser. No. 63,643  
Claims priority, application Japan, Aug. 4, 1966, 41/51391  
U.S. Cl. 228—50 2 Claims



A powdery backing composition for use in a one-side back-bead-forming butt-welding process wherein a powdery backing composition is applied against the underside of the groove between workpieces to be welded together and said workpieces are butt-welded on the upperside of said groove, said backing composition including thermosetting resin powder, iron powder, and slag forming agent and having been initially agglomerated by the melting of said resin powder prior to the welding operation.

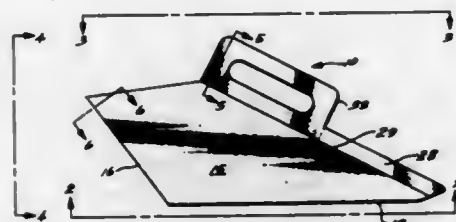
3,731,869

# DISPOSABLE CONTAINER

Nicholas E. Griffin, 881 South Grand Avenue, Pasadena, Calif.  
Filed July 2, 1971, Ser. No. 159,433  
Int. Cl. B65d 5/00

U.S. Cl. 229—22

2 Claims



A collapsible urinal which folds flat for storage, and erects into a container of generally pyramidal shape. The container is made from a flat blank which is folded and sealed such that no interior fluid traps are formed and so all raw unsealed edges of the blank are outwardly facing to prevent fluid absorption along these edges. The container is easily emptied and rinsed, and can be reused several times before disposal.

3,731,870

# COMPARTMENTED ICE CREAM CARTON WITH INTERIOR VERTICAL SUPPORT AND DIVIDER, DUAL OPENING MEANS AND RECLOSURE MEANS

Kenneth T. Buttery, Kalamazoo, Mich., assignor to Brown Company, Kalamazoo, Mich.

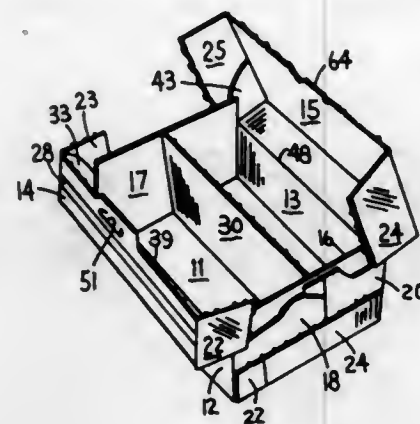
Filed May 3, 1971, Ser. No. 139,720  
Int. Cl. B65d 5/48

U.S. Cl. 229—27

16 Claims

A top-opening, rectangular paperboard carton including top, bottom, front wall, rear wall, and end wall panels which together define an enclosure and the top panel of which comprises two members hinged, respectively, to the front wall

panel and the rear wall panel. A detachable vertical divider panel separates the enclosure into a plurality of compartments



and the top panel members provide separate access means to such compartments.

3,731,871

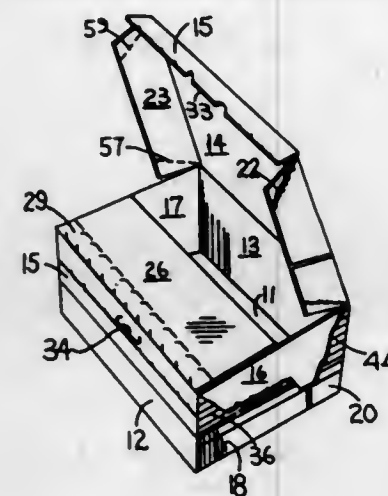
# COMPARTMENT FRONT OPENING CARTON WITH INTERIOR VERTICAL DIVIDER AND SUPPORT

Kenneth T. Buttery, Kalamazoo, and Richard G. Haas, Parchment, both of Mich., assignors to Brown Company, Kalamazoo, Mich.

Filed May 3, 1971, Ser. No. 139,658  
Int. Cl. B65d 5/48

U.S. Cl. 229—27

10 Claims



A front-opening, rectangular paperboard carton including top, bottom, front wall, rear wall and end walls, which together define an enclosure and an upstanding divider separating the enclosure into a plurality of compartments. At least one compartment is provided with a removable cover panel.

3,731,872

# FOUR-SIDED TAPER BOX

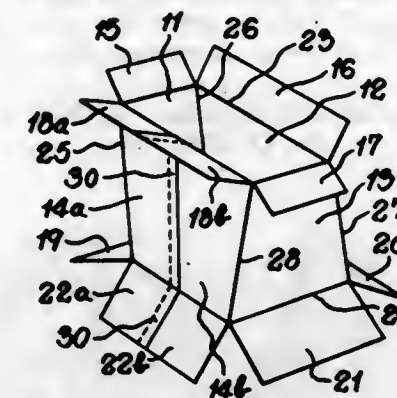
Robert W. McCormick, W. Palm Beach, Fla., assignor to Union Camp Corporation, Township of Wayne, N.J.  
Filed May 14, 1971, Ser. No. 143,396  
Int. Cl. B65d 5/02

U.S. Cl. 229—37 R

3 Claims

A four-sided box having two opposite side panels tapered in

one direction, and the other two opposite side panels tapered



in the opposite direction, which box is formed from a substantially rectangular blank.

3,731,873

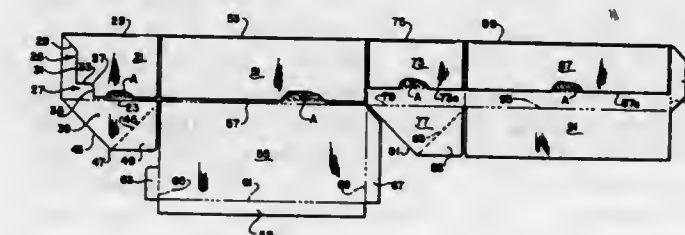
# QUICK-ERECT CARTON

Edward J. Brangle, Jr., 7054 Amherst Avenue, University City, Mo.

Filed Jan. 19, 1972, Ser. No. 219,080  
Int. Cl. B65d 5/36, 5/02

U.S. Cl. 229—41

4 Claims U.S. Cl. 238—346



A quick-erect carton supplied in a collapsed condition in flattened two-sided form with one end and one side panel constituting one side and another end and another side panel constituting the other side, adapted to be erected by opening it up to rectangular form with the end panels at the ends and the side panels at the sides thereof, and with a bottom panel hinged on one side at the bottom of one side panel which initially extends up between the two sides of the collapsed carton, which automatically folds down into the bottom of the carton when the carton is opened, and which is automatically locked at its side opposite its hinge and at both ends.

3,731,874

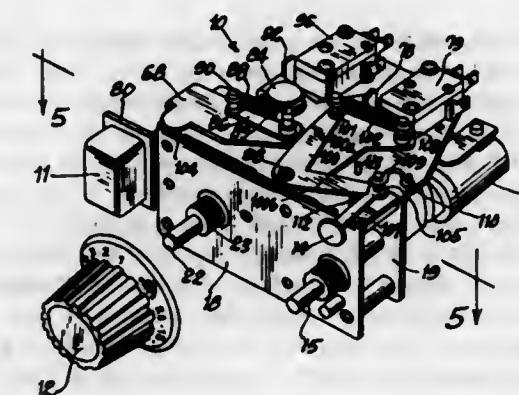
# COMBINATION COUNT-DOWN COUNTER AND RESET COUNTER FOR A DUPLICATING MACHINE OR THE LIKE

Wallace R. Fowle, North Riverside, Ill., assignor to A. B. Dick Company, Niles, Ill.

Filed June 29, 1971, Ser. No. 158,026  
Int. Cl. G06m 3/02

U.S. Cl. 235—91 R

14 Claims



Manual operation of a quantity selector knob rotates a selector wheel carrying a stop thereon. An indexing wheel is

mounted in adjacent coaxial relationship with the selector wheel and is indexed in one rotary direction in response to cyclical operation of a component of a duplicating machine. The indexing wheel carries a formation for abutting engagement with said stop. Biasing means engage the indexing wheel for urging the latter in a direction opposite said one direction thereby to bring said formation into engagement with said stop. The indexing wheel operates means for deactuating the cyclical operation of the aforesaid machine component when the indexing wheel occupies a predetermined rotary position. In the reset mode of operation, restraining means prevent rotation of the selector wheel during rotation of the indexing wheel in said one direction; in the count-down mode of operation, the force of the restraining means is overcome by frictional engagement between the indexing wheel and the selector wheel thereby causing the latter and the selector knob to rotate with the indexing wheel in said one direction.

3,731,875

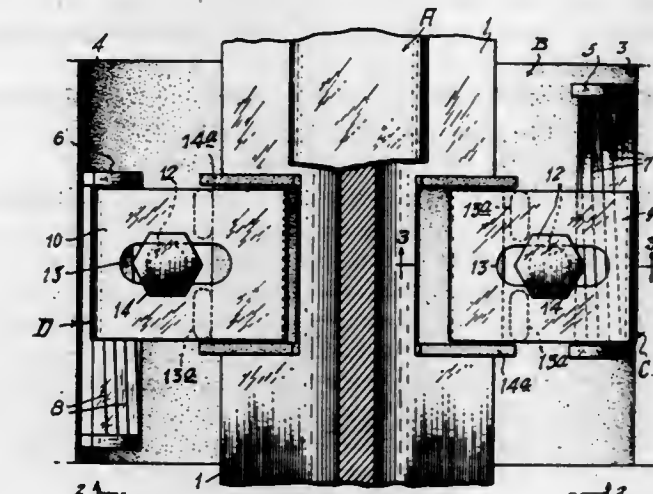
# ADJUSTABLE FASTENER ASSEMBLY FOR CONCRETE TIES

Gar Wood N. Burwell, Madison, N.J., assignor to The Rails Company, Maplewood, N.J.

Filed April 28, 1971, Ser. No. 138,115  
Int. Cl. E01b 9/66

U.S. Cl. 238—346

3 Claims



A rail fastener comprises a hold-down bolt anchored in a tie and passing through a slot in a clamp plate which abuts the rail base flange and is adjustably associated with a bottom piece slidable longitudinally in an abutment seat in spaced parallel relation to the edge of the rail base flange on the tie, whereby the track gage can be adjusted and at the same time the bolt can be protected against thrusts from lateral movement of the rail; and preferably the clamp plate and bottom piece are formed for wedge-like coaction upon longitudinal movement of the bottom piece in the abutment seat relatively to the clamp plate to produce small movements of the clamp plate toward or away from the rail.

3,731,876

# INJECTION SPRAY SYSTEMS

Merle Robert Showalter, 5947 B Western Run Drive, Baltimore, Md.

Filed March 19, 1971, Ser. No. 126,179  
Int. Cl. B05b 1/24, 17/04

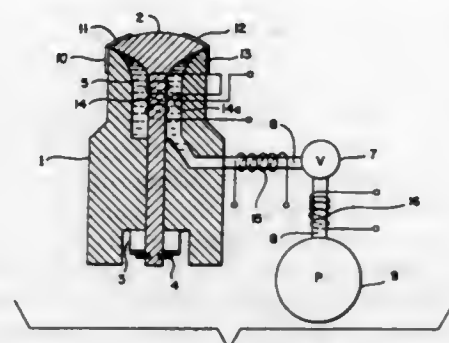
U.S. Cl. 239—13

5 Claims

Injection spray systems and methods are disclosed for spraying heated and pressurized liquid through a nozzle orifice to produce very fine spray droplets. The pressurized liquid is



heated to a temperature above ambient temperature whereby the vapor pressure of the liquid exceeds the pressure outside



of the nozzle orifice so that discharge of the heated and pressurized liquid through the orifice produces very fine droplets.

3,731,877

# **APPARATUS FOR GENERATING SONIC AND ULTRA-SONIC VIBRATIONS IN FLUIDS**

Nikolai Nikolaevich Nekrasov, ulitsa Gagarina, 5-a, kv. 45; Vasily Leonidovich Kazanaky, per. Chekhova, 2, kv. 1; Sergei Pavlovich Kirichenko, ulitsa Kutuzova, 22, kv. 52, all of Novokulbyshevsk; Nikolai Nikifovich Tsyganov, pos. Zavodskoi, ulitsa Klevskaya, 4, kv. 4, and Alexei Alexandrovich Sergeichev, ulitsa Tsyolkovskogo, 10, kv. 28, both of Syzran, all of U.S.S.R.

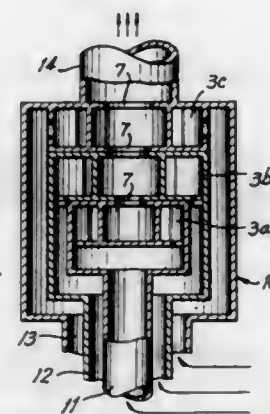
Division of Ser. No. 752,272, Aug. 13, 1968, Pat. No. 3,614,961.

Filed Oct. 23, 1970, Ser. No. 83,678

Int. Cl. B05b 3/14, 7/04, 1/34

U.S. Cl. 239-102

5 Claims



An apparatus is provided for producing oscillations in a fluid and the apparatus comprises a plurality of vibration generators arranged in sequence one after the next. Each generator has an annular casing with inlet ports for the introduction of fluid and an outlet port for discharge of fluid. At least two nozzles are mounted in each casing and are constituted by identical spiral shape screens uniformly arranged around the outlet port, adjacent portions of the screens overlapping each other by less than a central angle of 90°. The portions of the screens between the nozzles serve as deflecting blades which define an acute angle with each of the nozzles at the point of intersection of the streams fed from the nozzles. A common housing is provided for the generator casings and the inlet ports are separately fed with fluid, the outlet ports of the individual casings being coaxially arranged to combine the flow from the outlet of the generators in succession and cause the fluid to flow coaxially through the housing to a discharge outlet thereof.

3,731,878  
AGRICULTURAL SPRAYER

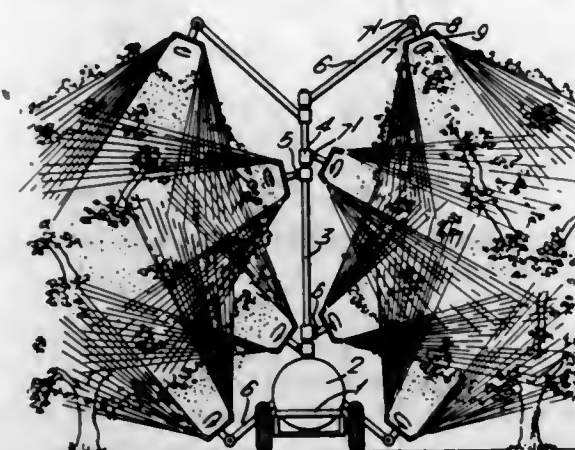
Jacob Lubetzky, Tel Aviv, and Zeev Svavolski, Ramat Hasharon, both of Israel, assignors to Reses Limited, Tel Aviv, Israel

Filed Oct. 27, 1971, Ser. No. 192,878

Int. Cl. B05b 3/06

U.S. Cl. 239-166

8 Claims



An agricultural sprayer for spraying liquid chemicals, insecticides, and the like, onto trees, shrubs, vines, or fieldcrops, in a continuously turbulent spray so that all the leaves are continuously agitated and therefore are sprayed on all their surfaces. The sprayer apparatus includes a support carrying at least two nozzles which are in communication with a pump supplying a spraying liquid. The support is adapted to rotate about an arm owing to the reaction of the spray and it is angularly adjustable relative to the arm. The arm is angularly adjustable relative to a bar which is adapted to be removably mounted to a pipe or for longitudinal travel between rows of the agricultural crop to be sprayed.

3,731,879

# **SPRAYING BEAM FOR PEST CONTROL MEANS SUSPENDED FROM A VEHICLE**

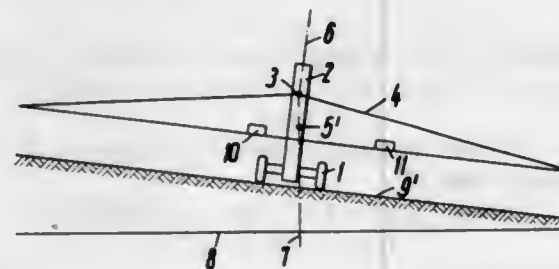
Hendrik Johannes Hoegen Dijkhof, Doetinchem, Netherlands, assignor to H. J. Hoegen Dijkhof G.m.b.H., Emmerich, Germany

Filed July 7, 1971, Ser. No. 160,440

Int. Cl. B05b 1/20

U.S. Cl. 239-167

18 Claims



In a spraying beam for pest control means suspended from a vehicle, it is known to mount the spraying beam to the vehicle by a rigid coupling. It is also known to freely suspend the beam from the vehicle to swing about an axis into the horizontal position, relative to the ground surface, so that its center of gravity always settles vertically below said axis. In the present invention, the beam is suspended from a vehicle to swing about an axis lying in the direction of travel of the vehicle, the beam including a device by which the position of its center of gravity can be displaced through the suspension axis. The device may comprise one or more trimming weights or an apparatus to displace the geometric suspension axis of the beam. Alternatively, the device may take the form of control signal emitters which act in response to the pivoting angle of one of the signal emitters relative to the spraying beam.

3,731,880

# **BALL VALVE ELECTROMAGNETIC FUEL INJECTOR**

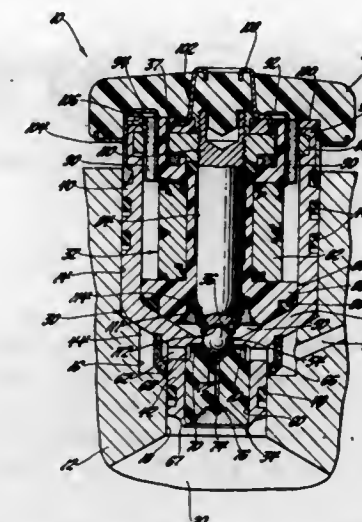
Donald L. Williams, Port Clinton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 8, 1971, Ser. No. 187,623

Int. Cl. F16k 31/06

U.S. Cl. 239-585

2 Claims



A ball valve electromagnetic fuel injector includes a spring biased low-mass magnetic ball which oscillates with respect to a conical valve seat in the injector case to open and close the fuel supply. A solenoid having a stationary pole piece with a spherical tip recess provides a uniform attractive force in pulling the ball away from the valve seat to the open position in accordance with a fuel metering schedule.

3,731,881

# **SOLENOID VALVE WITH NOZZLE**

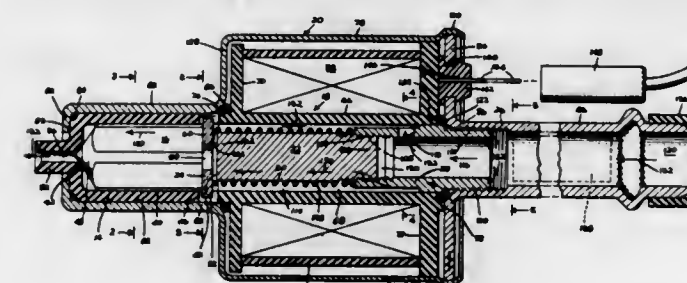
Thomas E. Dixon; Robert W. Herr, and Edward D. Sigi, all of Fort Wayne, Ind., assignors to Bowmar Instrument Corporation, Fort Wayne, Ind.

Filed Feb. 24, 1972, Ser. No. 229,118

Int. Cl. B05b 1/32; F16k 31/02

U.S. Cl. 239-585

17 Claims



A fuel injection valve having a hollow plastic nozzle with a discharge orifice at its front end, and a plastic bobbin with a hollow barrel and spaced flanges, the nozzle and barrel being in spaced alignment, and a coil surrounding the barrel between the flanges. A valve plunger in the nozzle is movable between closed and opened positions and has a front end which closes the orifice in the closed position, the plunger forming a first fluid passage communicating with the orifice. A magnetic casing surrounds a part of the nozzle and the bobbin and coil, and holds the nozzle and bobbin in assembled relation, the casing having a portion bridging the space between the nozzle and barrel. An armature is attached to the rear end of the plunger and has a portion extending into the space between the nozzle and bobbin and defining a first, fixed airgap with the bridging portion of the casing, the armature also forming a second fluid passage communicating with the first passage. A magnetic core is positioned in the barrel and forms a second airgap with the armature in its closed position, the

core, casing and armature forming a magnetic circuit for the coil. The core forms a third fluid passage communicating with the second passage, and a spring normally biases the armature and plunger to the closed position. The core is secured to the casing, and the casing includes an inlet conduit communicating with the third passage.

3,731,882

# **APPARATUS FOR THE MANUFACTURE OF MOST FINELY PULVERIZED RED PHOSPHORUS**

Fritz Muller, Knapsack near Cologne; Karl-Heinz Stendenbach, Bruchl-Pingdorf; Franz-Josef Dany, Lechenich; Dieter Steidl, Sulzbach/Taunus; Horst Heinrich Weizenkorn, Effern near Cologne, and Willi Forst, Tlegen, all of Germany, assignors to Knapsack Aktiengesellschaft, Knapsack near Cologne, Germany

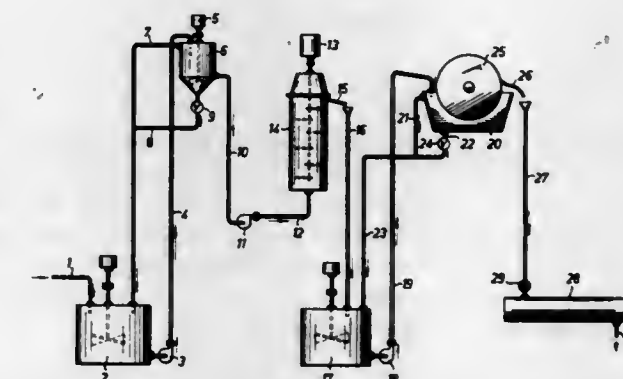
Division of Ser. No. 860,275, Sept. 23, 1969, Pat. No.

3,628,739. This application Nov. 2, 1971, Ser. No. 194,883

Int. Cl. B02c 15/08

U.S. Cl. 241-46.15

7 Claims



Production of most finely pulverized red phosphorus, by subjecting an aqueous suspension of red phosphorus with a particle size of between about 50 and 100 microns, produced inside a ball mill from yellow phosphorus and water, to pulverization with agitation to obtain particles with a size between 1 and 20 microns, for example 10 microns, prior to filtering the suspension. The red phosphorus is produced using an apparatus wherein preliminary reservoir tank, a preliminary tank and a device provided with an agitator and filled with glass balls of between 1 and 2 mm in diameter, are disposed ahead of the filter tank.

3,731,883

# **COMMINUTION MILL**

Peter Voelckow, 6550 Bad Kreuznach; Karl Schafer, 6551 Neu-Bamberg uber Bad Kreuznach, in der Loh 22, both of Germany, and Jacques Pestre, F-81 Labruguiere, Tarn, France, assignors to Inter-Wood-Maschinen GmbH & Co. KG, Bad Kreuznach, Germany

Filed May 12, 1971, Ser. No. 142,670

Claims priority, application Switzerland, May 15, 1970, 7335/70

Int. Cl. B02c 13/13

U.S. Cl. 241-52

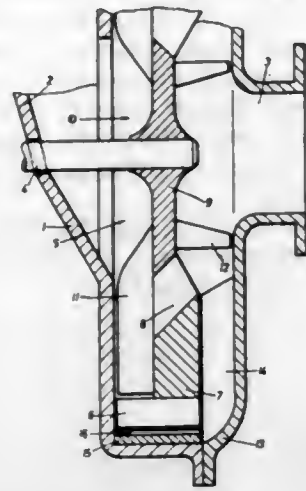
6 Claims

The specification discloses a comminution mill, or disintegrator, in which material to be comminuted is introduced into a housing at one side, while the comminuted material is withdrawn from the housing at the other side. Within the housing, a rotor is rotatably mounted and the periphery of the rotor is provided with grinding blades which run inside a grinding ring mounted in the housing and forming therewith a grinding region. On the inlet side of the rotor, the rotor is provided with radially extending vanes which form fan blades and precrushing blades and direct the material entering the inlet toward the aforementioned grinding region and impel it therethrough toward the outlet side of the housing. Inside the housing on the outlet side of the rotor there are arranged



guide vanes which direct the material from the grinding region toward the outlet of the housing.

The rotor is, furthermore, provided with sifting blades extending axially from the rotor on the outlet side thereof in the region of the housing surrounding the aforementioned outlet so that material passing from the aforementioned guide vanes



to the outlet comes within the range of the sifting blades. The rotor is, furthermore, provided with apertures extending therethrough in the region radially outwardly from the aforementioned sifting blades so that large particles will be engaged by the sifting blades and be driven thereby back through the apertures to the inlet side of the rotor and will again pass through the aforementioned grinding region.

3,731,884

#### APPARATUS FOR PREPARING FRAGMENTS FROM TIRE CASINGS

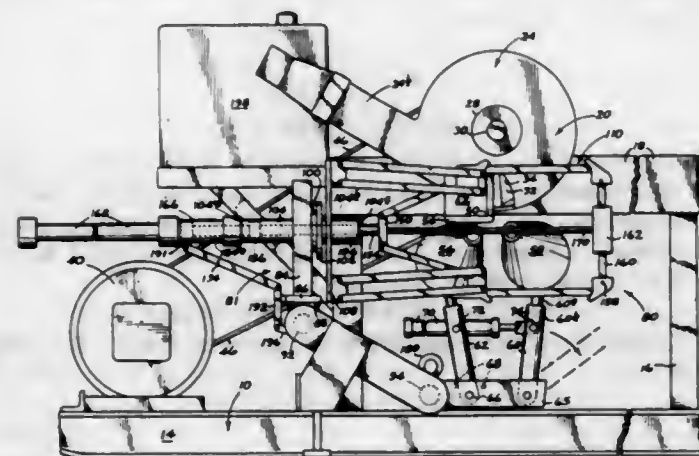
Roy B. Tupper; Myron D. Tupper, both of Sandy, and Norman C. Locati, Lake Oswego, all of Oreg., assignors to Lester M. Thorpe, Portland, Oreg.

Filed Nov. 29, 1971, Ser. No. 202,967

Int. Cl. B26d 1/28

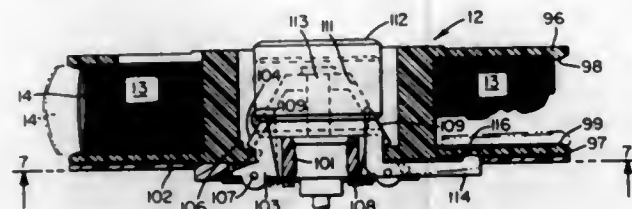
U.S. Cl. 241-222

10 Claims



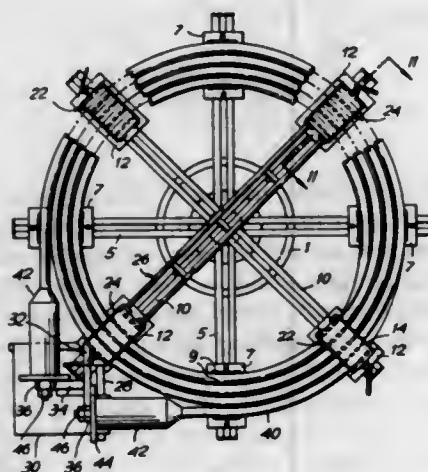
Apparatus for preparing fragments from tire casings and the like. The specific apparatus disclosed means revolvably supporting the tire casing for rotation about its axis. Such supporting means also includes opposed squeeze rollers that bear against opposite sidewalls of the tire casing, thus to flatten the tire casing. Cutting means in the apparatus includes a cutter which moves during operation in successive cutting passes across the periphery of the tire casing adjacent where such is confined by said opposed squeeze rollers.

3,731,885  
TAPE REEL AND HUB ASSEMBLY  
Raymond C. Siebert, Saratoga, Calif., assignor to Ampex Corporation, Redwood City, Calif.  
Filed Aug. 24, 1970, Ser. No. 66,497  
Int. Cl. B65h 17/02  
U.S. Cl. 242-68.3 4 Claims



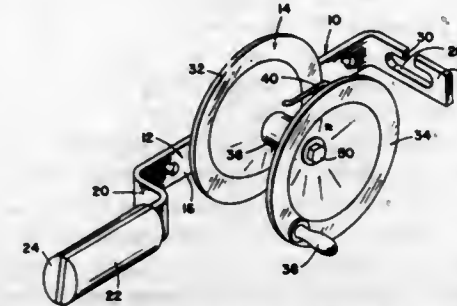
To facilitate automatic self-threading operation, a helical scan magnetic tape apparatus is arranged so that the tape centerline follows a path substantially parallel to the top plate of the machine, the scanning drum and guides therefor being tilted at an angle to the top plate. Exit and entrance guides for the tape at the drum are parallel to the drum axis and therefore also tilted, but all other tape guides are normal to the top plate. The tape is taken off the entrance and exit guides at a predetermined angle that ensures parallelism of the tape centerline to the top plate. A supply reel with the tape and a stiff leader mounted thereon is provided, together with means for driving the leader to the takeup reel, which is provided with means for securing and wrapping the leader and tape. The drum is also arranged for precise change of tilt to facilitate stop and slow motion effects. The tape supply reel is arranged for quick and easy mounting on, and removal from the apparatus. A scanner assembly transformer signal coupling and tachometer is also provided.

3,731,886  
APPARATUS FOR SPIRALLY WINDING A SHEATHED CABLE AND DEVICES FOR RETAINING SUCH A CABLE IN A SPIRALLY WOUND CONFIGURATION  
Romualdo Macchi, Via S. Paolo 31, Pisa, Italy  
Filed April 5, 1971, Ser. No. 130,964  
Claims priority, application Italy, April 11, 1970, 9449 A/70  
Int. Cl. B65h 75/34 7 Claims  
U.S. Cl. 242-77.1



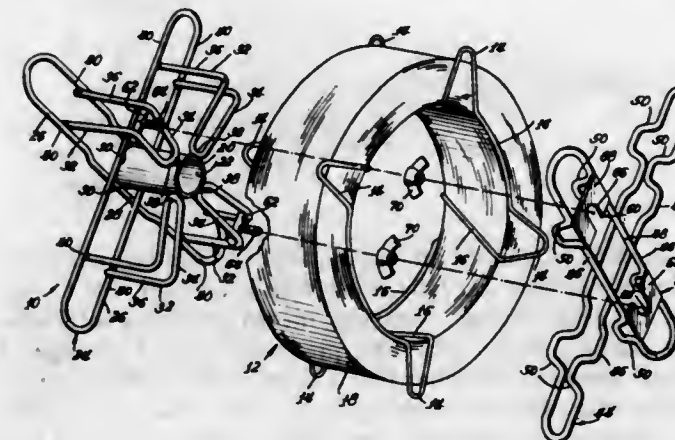
A spirally wound sheathed cable is retained in its spirally wound configuration by means of clamping devices mounted at end portions of a frame extending diametrically across the cable. Further, independent, clamping devices angularly spaced from the frame are supported by the wound cable. The frame is adjustable in length to vary the diametral spacing between the clamping devices carried thereby.

3,731,887  
PORTABLE STORAGE REEL FOR LINES  
Clayton E. Wheeler, 9125 East Latimer Court, Tulsa, Okla.  
Filed March 8, 1971, Ser. No. 121,996  
Int. Cl. B65h 75/40  
U.S. Cl. 242-96 4 Claims



A manually operable portable reel for storing lines, such as water ski tow lines, in a boat when the lines are not in use. A reel is rotatably secured on a support frame or handle unit which may be easily held in one hand while winding or unwinding of the line or cable, and having means for facilitating guiding of the line during the spooling or unspooling operation.

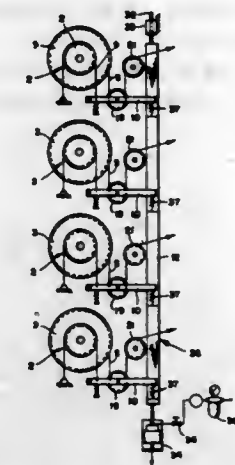
3,731,888  
WIRE REEL APPARATUS  
Carlis E. Cassel, Niles, and Robert F. Currier, Jackson, both of Mich., assignors to National-Standard Company, Niles, Mich.  
Filed June 2, 1972, Ser. No. 258,985  
Int. Cl. B65h 75/20, 49/00  
U.S. Cl. 242-129 3 Claims



A wire reel apparatus has a cylinder core member whose axial bore conforms to standard diameter spool sizes of commercial letoff machines. A first side member is secured at one end of the core member and is formed from a plurality of spaced radial wire frames. A plurality of support members are secured between the other end of the core member and the first side member, and include an axial portion lying in a concentric plane to the axis of the core member to provide a supporting surface for the coils of wire. A detachable second side member is formed of a plurality of spaced radial frame members and is secured in abutting relation with the radial portion of the tie members by means of a pair of clamping devices.

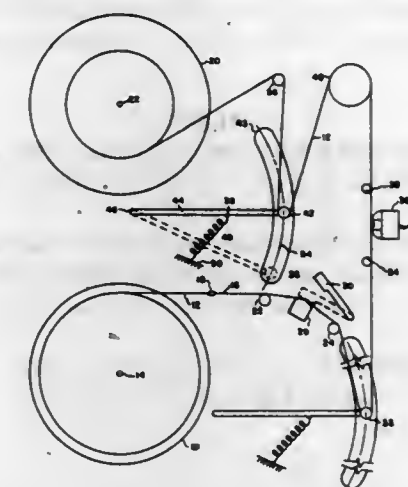
3,731,889  
TENSIONING APPARATUS  
Alexander V. Alexeff, Cleveland, Ohio, assignor to Alexeff-Snyder Enterprises, Inc., Cleveland, Ohio  
Filed Feb. 1, 1971, Ser. No. 111,260  
Int. Cl. B65h 59/04  
U.S. Cl. 242-156.2 11 Claims  
Tensioning apparatus for maintaining one or more strands under substantially constant tension during pay out includes a

let-off stand for each spool of strand material and a pivotally mounted dancer bar having a dancer roll thereon engaging the strand material. A tension load is applied to the dancer bar which controls the amount of braking force applied to each spool. Should the pulling force on the strand material increase, the dancer bar automatically moves to a position causing a reduction in the braking force, whereas should there be a



reduction in the pulling force, the dancer bar automatically moves to a position causing an increase in the braking force thus to maintain a substantially constant tension on the strand material. Where plural strands are being payed out at the same time, the tension in all of the strands may be controlled as a group by providing a single load tensioning device for all of the dancer bars in the group.

3,731,890  
DIGITAL MAGNETIC TAPE TRANSPORTS  
Laurence J. Ruoff, Newport Beach, and Lani W. Brewer, Anaheim, both of Calif., assignors to Data Handling Corporation, Santa Ana, Calif.  
Filed Jan. 19, 1972, Ser. No. 218,987  
Int. Cl. B65h 59/38; G03b 1/04; G11b 1/52  
U.S. Cl. 242-188 12 Claims



This invention relates to a device for sensing tape position on a reel to reel tape handling mechanism. The device is essentially a tape tension arm angular position transducer having two parts, the first part being a photo sensing and emitting mechanism composed of a light emitting diode and two phototransistors arranged on a bias in a sensor assembly beneath the front panel of the tape deck, the second part being a light reflective pattern affixed to and cooperating with the sensor assembly and mounted to the tension arm of the tape handling mechanism. The light reflective pattern consists of two concentric ring segments positioned on a portion of the tension arm, each ring segment having linearly varying light reflectivity to non reflectivity characteristics from end to end in opposite senses. The two photo transistors are each respon-



sive to reflection of light off respective reflective rings and their respective outputs are arranged to produce oppositely biased signals, thereby giving an indication of the arm position. The signals are coupled to the supply or take up reel drive mechanisms to counter balance the tension as desired.

3,731,891

## WEB MATERIAL FEEDING APPARATUS

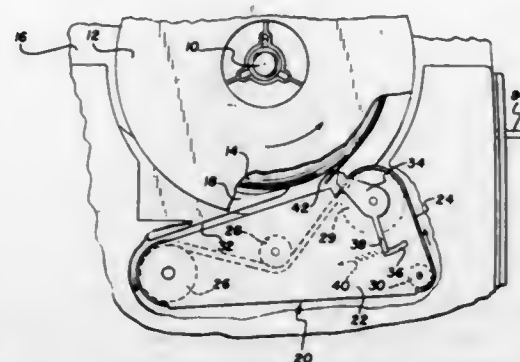
Daniel J. Stark, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 9, 1971, Ser. No. 178,954

Int. Cl. G03b 1/04; G11b 15/32

U.S. Cl. 242-195

9 Claims



Motion picture projector apparatus includes a spindle for receiving a roll of film or the like and for rotating the roll of film take-up direction through a clutch which is disengaged when the torque between the clutch parts exceeds a predetermined value. A hook-like member is adapted to be moved into close proximity to the rotating roll for engaging the film through an opening in a leading end portion of the film. Engagement of the film by the hook prevents further rotation of the roll in a take-up direction to increase the torque between the clutch parts to a value in excess of the predetermined value. A drive member is engageable with the roll to rotate the roll in an unwinding direction after the clutch has been disengaged. A stripping member is engageable with the roll for separating the leading end portion of the web material from the roll and for directing the leading end portion away from the roll during rotation of the roll in an unwinding direction.

3,731,892

## SPATIAL DISCRIMINATION SYSTEM FOR USE WITH PULSED OPTICAL ENERGY AND TELEVISION PICK-UP TUBES

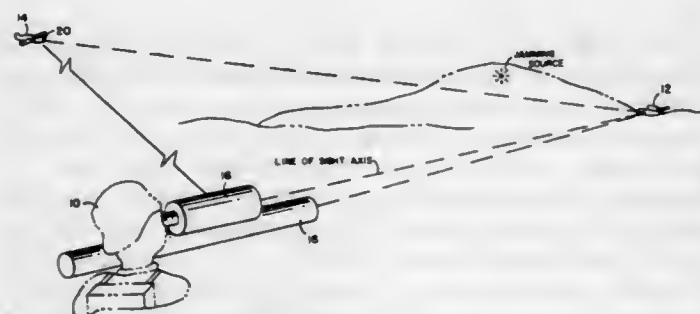
Michael J. Cantella, Winchester, and Max W. Stewich, Chelmsford, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 21, 1970, Ser. No. 56,032

Int. Cl. F41g 7/14, 9/00, 11/00

U.S. Cl. 244-3.16

7 Claims



A spatial discrimination system for use with pulsed optical energy which allows a television viewer or aircraft terminal guidance system to distinguish between steady and pulsed

sources of light. Video electronic spatial discrimination takes advantage of the spatial characteristics of a point source to distinguish it from extended spatial objects. Basic spatial discrimination performance is extended to permit rejection of all signals except the desired point source pulse. Laser energy is reflected from a target and detected by the television camera or terminal guidance system in an approaching aircraft. The detected signal is coupled through an image tube, providing a video frequency output for indicating the position of the target. The image section of the tube is surrounded by a modulating coil for displacing the image along the direction of the raster scan lines, producing an elongated charge pattern on the storage surface of the tube. An elongated charge pattern does not fulfill the spatial discriminator requirements for acceptance and thereby allows original point source signals such as continuous waves to be eliminated from the video. For a point source, as the reflected pulse of laser energy having a time duration less than the displacement dwell time on each resolution element, the spatial properties are preserved, thus providing a signal for directing aircraft flight toward the target.

3,731,893

## COOLING SYSTEM, EMPLOYING BAFFLING MEANS, FOR AN AERODYNAMICALLY HEATED VEHICLE

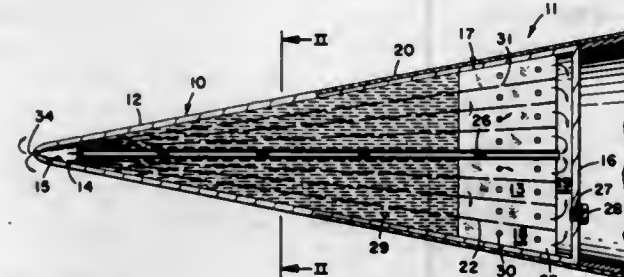
Charles J. Stalmach, Jr., Grand Prairie, Tex., assignor to LTV Aerospace Corporation, Dallas, Tex.

Filed May 25, 1971, Ser. No. 146,702

Int. Cl. B64g 1/00; B64c 3/36

U.S. Cl. 244-1 SS

15 Claims



A cooling system for an aerodynamically heated vehicle includes a chamber partially filled with a coolant and having front and rear portions. A baffling means, mounted within the front portion of the chamber, prevents forward passage of coolant from the chamber but is open to the rear to permit passage of coolant to the rear portion of the chamber. A conduit means is provided for conducting coolant from the rear portion of the chamber to the external surface of a portion of the outer skin of the vehicle which portion is subject to aerodynamic heating. During high-speed, decelerative, atmospheric flight of the vehicle, e.g., during reentry into the atmosphere of the earth, decelerative forces urge the coolant toward the forward portion of the chamber while aerodynamic heating of the vehicle causes vaporization of the coolant within the chamber. Vaporized coolant flows from the rear portion of the chamber, through the conduit means, to the external surface of the aerodynamically heated outer skin.

3,731,894

## SPIRAL BELT JOINT

John D. Curran, Chardon; Zygmunt S. Fredericks, Chesterland, and James D. Marshall, Mentor, all of Ohio, assignors to W. S. Tyler Incorporated, Mentor, Ohio

Continuation of Ser. No. 817,962, April 21, 1969, abandoned.

This application April 30, 1971, Ser. No. 139,247

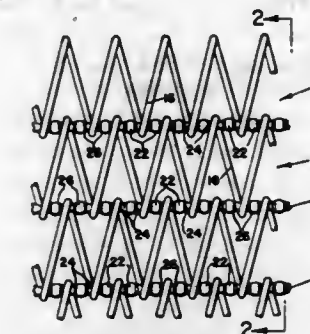
Int. Cl. B65g 15/30

U.S. Cl. 245-6

15 Claims

A joint connecting adjacent spirally wound coils of woven wire where two spirally wound wire coils are disposed in substantially parallel position and have intermeshing convolu-

tions. A rod having alternate flat and round sections longitudinally along its length extends through the intermeshing con-



volutions with the convolutions engaging the round sections of the rod.

3,731,895

## COLLAPSIBLE TREE STAND

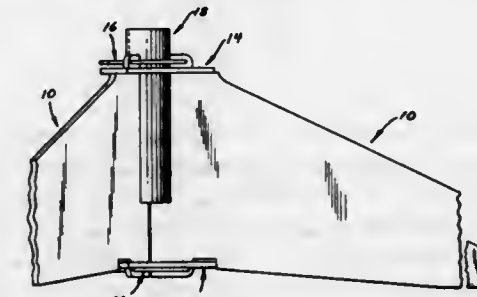
William E. Petric, 5003 West 159th St., Oak Forest, Ill.

Filed April 14, 1972, Ser. No. 244,108

Int. Cl. A47g 33/12

U.S. Cl. 248-48

7 Claims



A collapsible stand for supporting a pole or the like vertically off the ground including three, generally triangular shaped legs each of which has a substantially vertical side with tongues projecting from both ends thereof. A pair of connectors including three equally spaced, radially extending slots are provided, one for receiving the uppermost tongues of the legs and one for the lowermost tongues of the legs. Retaining means are provided for the connectors and the uppermost connector includes an aperture to provide access to an upwardly opening notch in each of the legs for receipt of a pole therein.

3,731,896

## ENGINE MOUNT ASSEMBLY

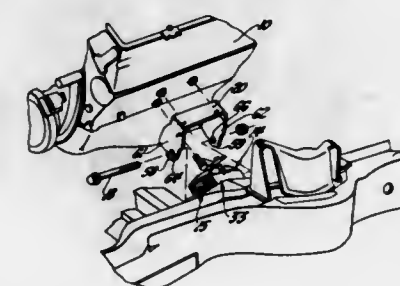
Chester J. Fehlberg, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 7, 1972, Ser. No. 216,203

Int. Cl. F16f 15/00

U.S. Cl. 248-9

3 Claims



An engine mount assembly for resiliently supporting an engine on a frame of a motor vehicle includes a frame attaching bracket in which is mounted an engine attaching bushing. The bushing and bracket have a plurality of cooperating opposed

walls providing separate spaces in which rubber is molded and assembled in compression to provide resilient engine mounting for jounce, for and aft, and roll movement with respect to the frame. The separate spaces provide for the use of different rubbers and different preloads for particular engine-vehicle combinations. In addition, the bushing and bracket cooperate to limit relative movement of the engine with respect to the frame in all directions.

3,731,897

## CAMERA BRACKET

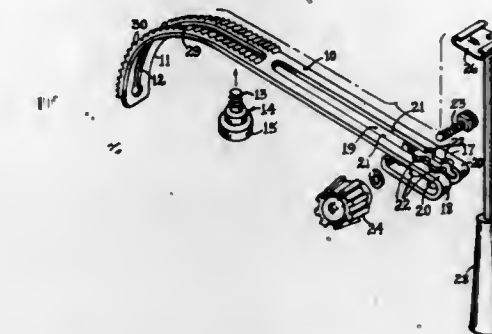
Allan S. Price, 1954 N. Fremont Street, Chicago, Ill.

Filed June 30, 1971, Ser. No. 158,215

Int. Cl. G03b 17/56

U.S. Cl. 248-230

4 Claims



A portable support for supporting a camera during use thereof from the shaft of an umbrella, automobile antenna, or the like, wherein means is provided for removably and firmly connecting the camera to the bracket and the bracket to such shaft, the bracket having means for optionally connecting the same to a combination handle and flash unit mount or the like, in lieu of connection to the umbrella shaft or the like.

3,731,898

## MISSILE SUSPENSION SYSTEM

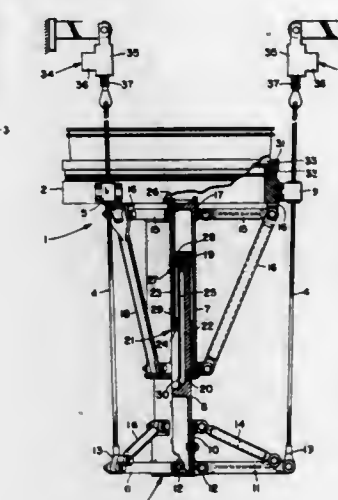
Ira D. Smith, Bedford, Ohio, assignor to Pneumo Dynamics Corporation, Cleveland, Ohio

Filed July 27, 1971, Ser. No. 166,461

Int. Cl. F16f 7/00, 9/346

U.S. Cl. 248-328

6 Claims



A suspension system for precisely positioning missiles and other structures below ground level comprising a support stand including a pair of telescoping members having a liquid spring therebetween for maintaining the members in resiliently spaced-apart relation. The members are suspended from above by a plurality of cables connected to the lower member, and a support ring for the missile or other structure is carried by the upper member. Angular and vertical adjustment of the suspension system may be achieved after installation by raising or lowering one or more of the suspension cables which adjusts the position of the missile or other structure supported thereby.



3,731,899

**APPARATUS FOR PRODUCING CONCRETE BLOCKS WITH UNDERCUT PORTIONS**

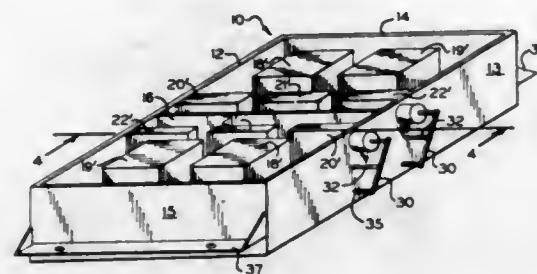
Gary J. Nuzzo, 100 Roberts Drive, Syracuse, N.Y.

Filed March 1, 1971, Ser. No. 119,739

Int. Cl. B28b 7/20

U.S. Cl. 249-142

1 Claim



Apparatus for forming a concrete block having the usual block with two cavities connected to a small facing block or slab by web portions spaced from the top and bottom of the block and slab, comprises the usual mold box with cores for the block cavities and spaces between the block and slab. Core portions are provided on the stripper head for filling the spaces between the top of the webs and the top of the block. Core portions are provided for filling the spaces between the bottoms of the webs and the bottom of the block, the core portions being slideable from withdrawn position in cavity core recesses to extended position underlying the web spaces. Motor means are provided on the outer side of the mold box sides for extending and retracting the slideable core portions.

3,731,900

**UNITARY CORE FOR MOLDING A NASAL CANNULA**

Harold R. Havstad, Lakewood, Calif., assignor to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Filed March 22, 1971, Ser. No. 126,452

Int. Cl. B28b 7/28

U.S. Cl. 249-177

8 Claims



A flexible nasal cannula having improved characteristics is produced in a mold cavity incorporating a forming means comprising a transverse core having straight upper portion and a lower portion extending at an angle from the upper portion and a nipple core portion comprising a pair of rod-like extensions located toward the upper end of the upper portion and which extend substantially perpendicular to its axis. In a molding process, the forming means is maintained in special relation within a mold cavity, a thermoplastic material is flowed within the cavity around the forming means, cooled sufficiently to set the material and thereafter the cannula is removed from the forming means.

3,731,901

**EXPANDABLE CORE ASSEMBLY**

Ernest C. Holdredge, Jr., c/o Allastics, Inc., 1275 Enterprise Drive, Norcross-Tucker Industrial Park, Norcross, Ga.

Continuation-in-part of Ser. No. 12,812, Feb. 19, 1970, Pat.

No. 3,613,605. This application March 29, 1971, Ser. No.

128,955

Int. Cl. B28b 7/30

U.S. Cl. 249-180

12 Claims



An expandable core assembly for use in an injection molding operation designed to produce hollow plastic articles of manufacture. The core assembly is positioned between injection mold halves and expanded to define a cavity within an article which is molded between the injection mold halves. After molding, the core assembly is collapsed for convenient removal from within the mold halves and molded article.

3,731,902

**ADJUSTABLE BULKHEAD FOR A CONCRETE WALL FORM**

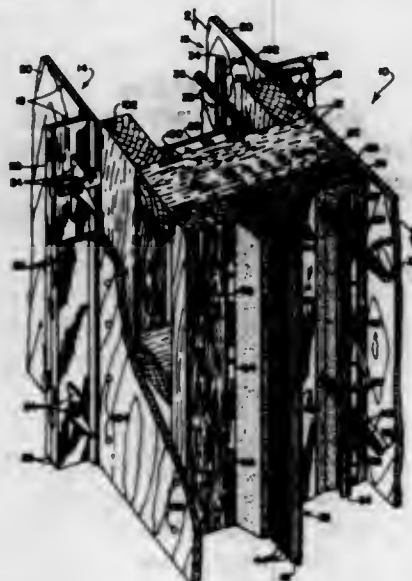
James C. Shoemaker, Hampshire, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Division of Ser. No. 86,729, Nov. 4, 1970. This application Dec. 16, 1971, Ser. No. 208,855

Int. Cl. E04g 11/00

U.S. Cl. 249-210

5 Claims



An adjustable bulkhead for interim end sealing in a concrete wall or slab form during an interval between concrete pouring operations. A variety of bulkhead components cooperate with one another in sealing relationship to exclude the passage of concrete past any reinforcing rods,

water seals, conduits or other residual concrete-embedded members which traverse or bridge the interfacial surfaces between adjacent concrete pourings.

of the parallel surfaces and permit fluid bypass, and the sealing assemblies being identical whereby either side of the flow passage may be the inlet or outlet.

3,731,903

**BALL CANISTER AND SYSTEM FOR CONTROLLING CAVITATION IN LIQUIDS**

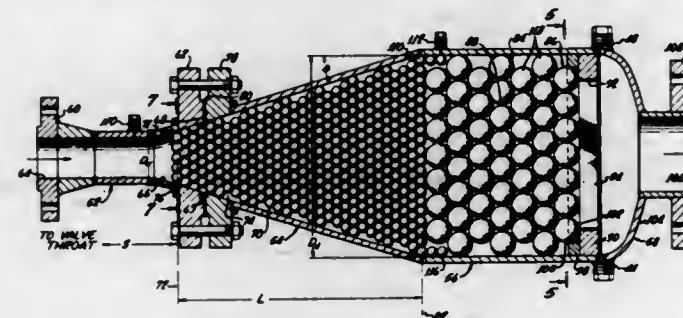
Albert A. Webb, Riverside, Calif., and James Paul Tullis, Fort Collins, Colo., assignors to Fowler, Knobbe &amp; Martens, Orange, Calif.; Paul J. Tullis, Fort Collins, Colo.; Fred H. Hanson, Riverside; Robert M. Massey, Crestline and Albert A. Webb, Riverside, Calif., part interest to each

Filed Dec. 4, 1970, Ser. No. 95,044

Int. Cl. F16k 47/00; F16l 55/02

U.S. Cl. 251-118

5 Claims



Disclosed is a ball canister having a hollow case with an inlet and an outlet, the case having a portion which is frustoconical and is filled with tightly packed balls, with the diameter and length of the ball filled case portion being sized to significantly repress cavitation in a liquid flow system into which the canister is to be inserted, either alone or in conjunction with a control valve. A sizing method is disclosed and a particular construction example is explained for a high pressure water system.

3,731,904

**BALL VALVE**

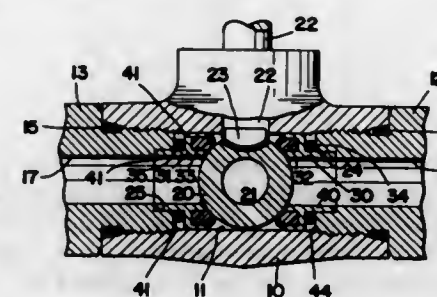
Louis J. Vallance, Euclid, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Feb. 3, 1972, Ser. No. 223,216

Int. Cl. F16k 5/06

U.S. Cl. 251-315

9 Claims



An on-off valve having a body with a passage therethrough, a valve element within the passage to control fluid flow therethrough, a sealing assembly on each side of the valve element and each assembly comprising a retainer ring between the body and the valve element, a seat ring in each retainer ring to seal against leakage between the valve element and retainer rings, a sealing ring disposed between the retainer ring and body, the sealing ring serving to permit fluid bypass of the retainer ring on the upstream side and enter the passage where the valve element is located but to seal and prohibit fluid bypass on the downstream side, the sealing ring on the downstream side engaging parallel faces in the retainer and body to seal against fluid bypass, the sealing ring on the upstream side being expanded in outside diameter by fluid pressure to reduce its cross section to thereby disengage from one

3,731,905

**POPPET VALVE STRUCTURE HAVING O-RING SEAT SEAL**

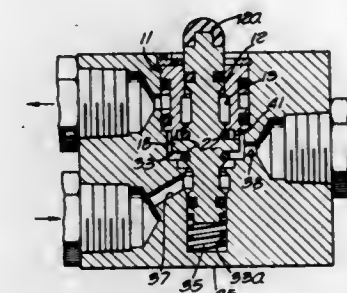
Meyer Piet, Arcadia, Calif., assignor to Futurecraft Corporation, Industry, Calif.

Filed Nov. 3, 1971, Ser. No. 195,247

Int. Cl. F16k 43/00

U.S. Cl. 251-333

6 Claims



A poppet valve structure preferably for controlling flow of low pressure fluids, which is adapted for use in a multiplicity of valve arrangements, and embodies valve seat and valve members concentrically associated and alternately axially movable to valve closed and valve opened positions, one of the members having a circumferential groove of substantially semicircular cross-section for receiving a circumferential peripheral portion of an O-ring of circular cross-section without distortion, and so that substantially half the cross-sectional area circumferentially projects, the other member having a circular seating surface engageable and disengageable with respect to the projecting portion of the ring adjacent one wall of the groove, the other wall of the groove being extended to provide a back-up surface on the opposite side of the ring from the seating surface, and the seating surface and back-up surface providing a radial flow space for the ring material exteriorly of the groove. In some cases, a stop is provided for limiting the extent of movement of the members towards valve closed position.

3,731,906

**WHEEL ALIGNMENT TOOL**

Bill Beach, 1629 St. Clair Street, Jacksonville, Fla.

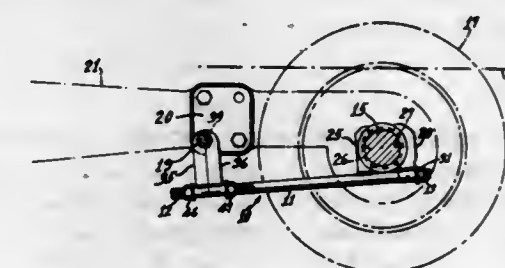
Continuation of Ser. No. 856,991, Sept. 11, 1969, abandoned.

This application June 14, 1971, Ser. No. 153,046

Int. Cl. B66f 3/08, 3/36

U.S. Cl. 254-100

16 Claims



The tool includes an elongated rod with an adjustable clamping device on one rod end portion and another clamping device on the other rod end portion.



### 3,731,907 VIBRATOR SYSTEM

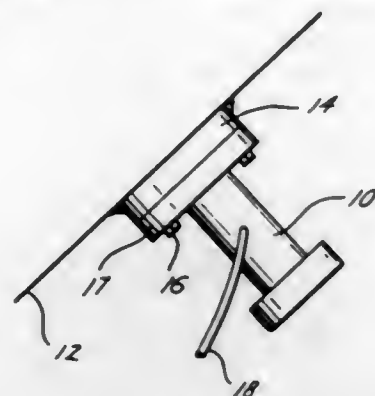
Don B. Lash, Houston, Tex., assignor to National Air Vibrator Company, Houston, Tex.

Filed July 8, 1971, Ser. No. 160,878

Int. Cl. B011 1/100

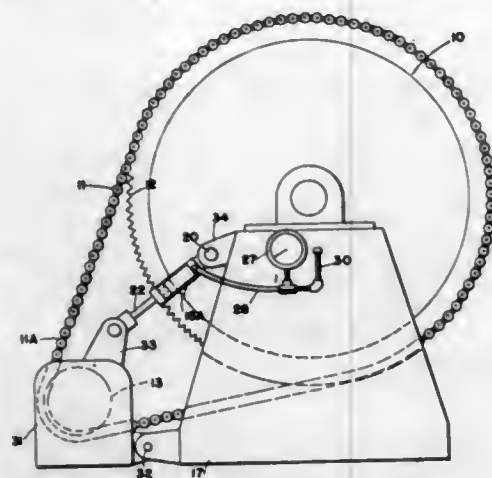
U.S. Cl. 259-1 R

14 Claims



A unidirectional impact vibrator is provided which includes a sleeve member having a tapered bore therein for positioning upon a correspondingly tapered pin member. An adaptor unit is provided which may be affixed to a surface to be vibrated, and which includes a pin member having a taper corresponding to the taper of the bore in the sleeve of the vibrator provided.

in inches of slump. The device may either have a sprocket engaging the drive chain or may substitute for the conventional



chain tightener and react directly between the drive casing and the base.

### 3,731,910 CUPOLA STRUCTURE

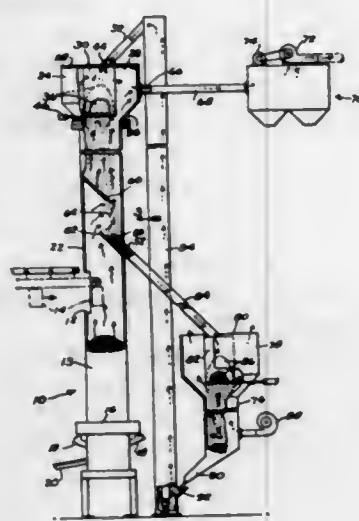
Thomas J. Butler, 7625 E. Morrow Circle, Dearborn, Mich.

Filed May 17, 1971, Ser. No. 144,024

Int. Cl. F27b 1/18

U.S. Cl. 263-29

17 Claims



Mounted adjacent the closed top of a cupola stack is a hopper which rains a torrent of discrete heat-exchange particles such as sand downwardly through the upward flowing hot gases in the stack. Deflectors within the stack deflect the torrent toward a discharge opening in the side of the stack above the melt zone. Accumulated particles adjacent the discharge opening seal the gases against escape therethrough. An outlet from an expansion chamber adjacent the top of the stack passes the cooled gases to a conventional filter which removes the smoke burden from the gases.

### 3,731,908 APPARATUS FOR CLEANSING SOFT OR HARD GOODS

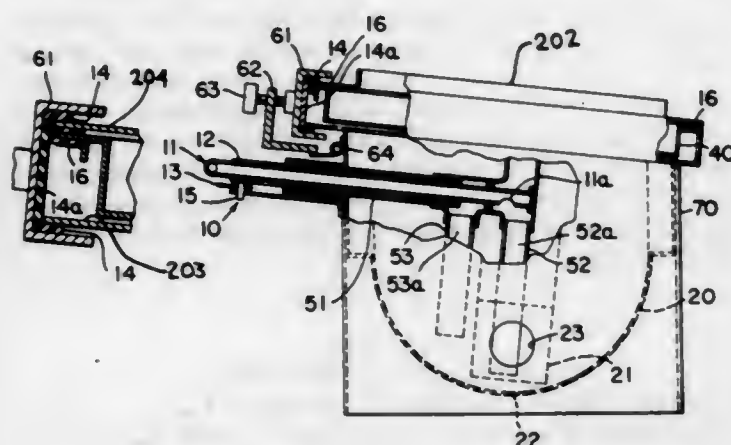
Ell Raitport, 1807 Mower St., Philadelphia, Pa.

Filed Oct. 29, 1969, Ser. No. 873,775

Int. Cl. D06f 1/08, 1/10

U.S. Cl. 259-4

13 Claims



A container for cleaning and polishing, having a hermetically sealed loading opening and telescopically arranged fluid inlets. Fluid motion is created in the container by a pump and temperature variations.

### 3,731,909 SLUMP METERS FOR MOBILE CONCRETE MIXERS

Frederick Stanley Johnson, Calgary, Alberta, Canada, assignor to Consolidated Concrete Limited and Herbert T. Welch, Calgary, Alberta, Canada, part interest to each

Filed March 27, 1972, Ser. No. 238,090

Int. Cl. B28c 5/18

U.S. Cl. 259-177

8 Claims

A closed hydraulic piston and cylinder assembly is connected to a pressure gauge and is acted upon by the drive chain so that a variation of the load in the drum, which is a function of the slump condition of the concrete, is read out directly on a pressure gauge which may be calibrated directly

### 3,731,911 DEVICE FOR RAISING AND LOWERING THE TORCHES OF A FLAME CUTTING MACHINE

Georg Roder, Frankfurt/Main, Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed Nov. 2, 1970, Ser. No. 86,073

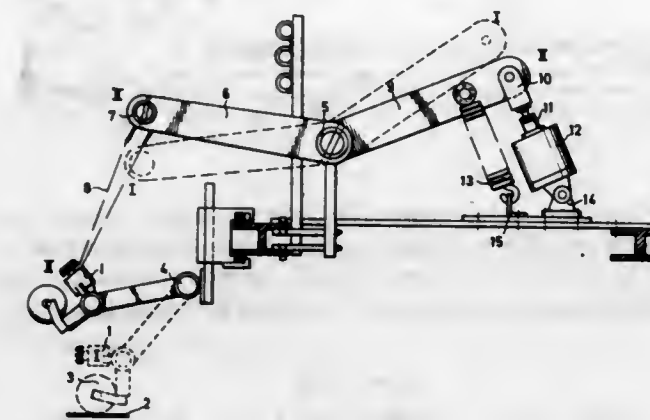
Int. Cl. B23k 7/02, 7/10

U.S. Cl. 266-23 M

10 Claims

A device for raising and lowering torches of flame cutting machines includes parallel swivel levers mounted about a common horizontal axis with a rod extending between the free

ends of the levers and the torches mounted to the rod. A resilient restoring force is utilized to hold the torches in the



driving position, while an activation arrangement is utilized for overcoming the restoring force.

### 3,731,912 CONTAINERS WITH SLIDING VALVE FOR LIQUID SMELT

Hans-Joachim Kutzer, Wiesbaden-Rambach, Germany, assignor to Ddler-Werke A.G., Wiesbaden, Germany

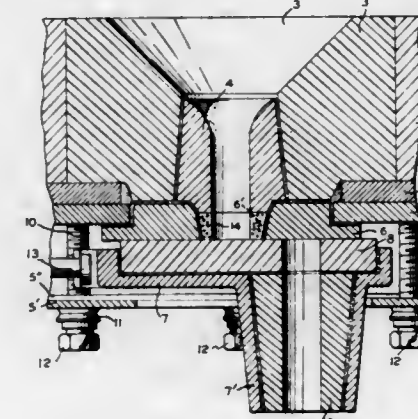
Filed July 24, 1970, Ser. No. 57,979

Claims priority, application Germany, July 26, 1969, P 19 38 117.0

Int. Cl. C21b 7/14

U.S. Cl. 266-38

6 Claims



A container has a sliding valve for a liquid smelt. A refractory block with an insert is set in the bottom of the container. An orifice plate of refractory material is connected to the block and has a flow-passage, and a valve plate having a flow passage for the smelt is located therebelow. A support on the bottom of the container on which the valve plate slides provides a sealing action upon being linearly and rotatively displaceable in relation to the orifice plate. An outflow and a driving device is combined with the valve plate. A refractory body is set in a bore in the orifice plate and has means to feed an inert gas into the smelt.

### 3,731,913 SPRINGS

Archie J. Hirst, deceased, late of Leicester, England (by Renate Hirst, Legatee), assignor to Dunlop Holdings Limited, London, England

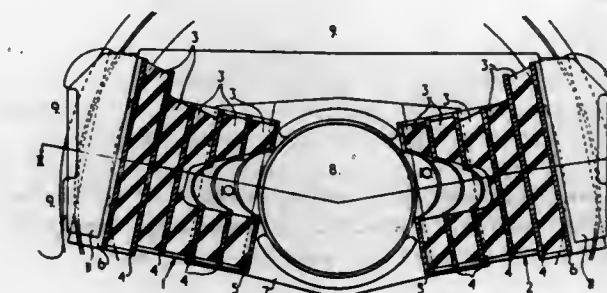
Filed April 5, 1971, Ser. No. 131,148

Claims priority, application Great Britain, April 7, 1970, 16,284/70

Int. Cl. F16f 1/36

U.S. Cl. 267-63 R

11 Claims



A spring and a suspension system primarily for railway vehicles, comprising a chevron-type rubber sandwich spring in which the spring width increases towards the apex end of the spring wherein the central region of the apex-end of the spring is cored-out to provide a cavity extending into the spring. Of which the following is a specification.

### 3,731,914

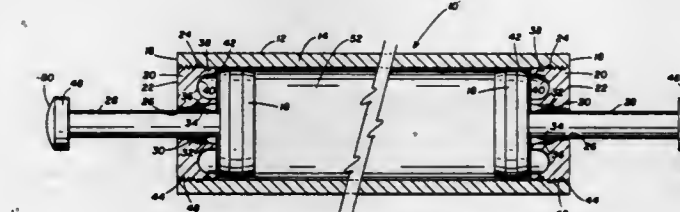
DOUBLE ENDED SPRING SHOCK ABSORBER  
Geoffrey Wilton Cope, Williamsville, and Loren William Smith, Eggertsville, both of N.Y., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed March 18, 1971, Ser. No. 125,669

Int. Cl. F16f 5/00

U.S. Cl. 267-65 R

9 Claims



Double ended spring shock absorber consisting of a cylinder having pistons reciprocable therethrough at each end and a compressible material disposed between the end plugs within the cylinder.

### 3,731,915 FEED ROLL ABRASION ROLLER

Joachim Guenther, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 8, 1971, Ser. No. 196,691

Int. Cl. B65h 3/06

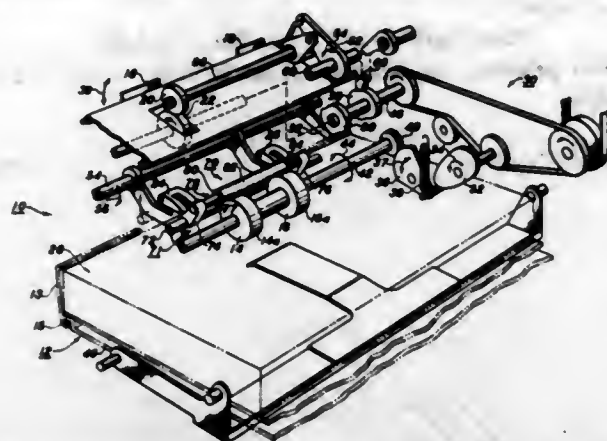
U.S. Cl. 271-36

9 Claims

An apparatus in which an abrasive member is positioned in rubbing engagement with a moving separating and advancing means of a sheet forwarding mechanism to retain a preselected frictional force between the separating and ad-



vancing means and successive single sheets for permitting the efficient separation and advancement thereof.



The foregoing abstract is neither intended to define the invention disclosed in the specification, nor is it intended to be limiting as to the scope of the invention in any way.

3,731,916

# DISCRIMINATING APPARATUS FOR MOVING TRANSLUCENT SHEETS

Ronald Sidney Pettet, Horndean, England, assignor to De La Rue Instruments Limited, London, England

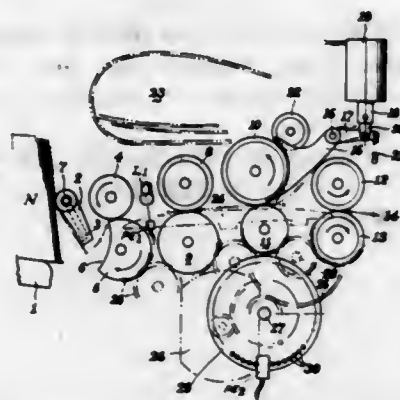
Filed June 1, 1971, Ser. No. 148,744

Claims priority, application Great Britain, June 1, 1971, 26,940/70

Int. Cl. B65h 7/00

U.S. Cl. 271-57

17 Claims



Apparatus for discriminating between moving translucent sheets comprising a sheet transportation means adapted to convey the sheets in spaced relationship along a flow-line, a photoelectric detection device sited on one side of the flow-line, a first differential amplifier having an input in circuit with the said detection device and adapted to produce a first output signal every time the photoelectric device detects attenuation of the light source in excess of a first predetermined value, and a second differential amplifier having an input also in circuit with the said detection device and adapted to produce a second output signal every time the photoelectric device detects attenuation of the light source in excess of a second different predetermined value.

3,731,917

# TREADMILL EXERCISING DEVICE

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed Feb. 25, 1971, Ser. No. 118,861

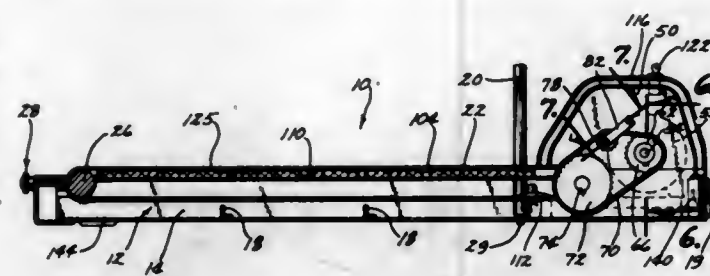
Int. Cl. A63b 23/06

U.S. Cl. 272-69

4 Claims

A treadmill exercising device comprising first and second spaced apart rollers mounted on a frame so that they are each rotatable with respect to a horizontal axis. An endless belt extends around and between the rollers and includes an upper

walking belt portion which slides upon a smooth, highly polished, heat resistance support surface as a person walks on the upper walking belt portion. Additional features are provided for varying the speed of the belt and for maintaining the



proper tension in the same. To vary the speed, removable sprockets of different size are provided. The treadmill is operated by an electric motor which is directly connected to a knurled or serrated drive roller to prevent belt slippage.

3,731,918

# SHEET RELEASE FROM VACUUM CONVEYOR

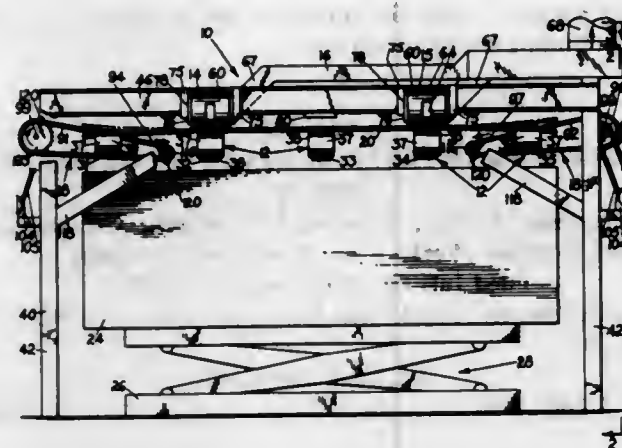
Charles L. Larson, Crants Pass, Oreg., assignor to Jeddell Bros. Swood Mills, Inc., Gold Hill, Oreg.

Filed May 20, 1971, Ser. No. 145,170

Int. Cl. B65h 29/68, 29/24

U.S. Cl. 271-74

7 Claims



Apparatus for releasing a sheet from the underside of a vacuum conveyor. The apparatus includes spaced-apart movable bars positioned on opposite sides of the conveyor, which bars, when signaled into action as a result of a sheet being sensed as being properly positioned in the apparatus, move downwardly and toward one another at oblique angles against the top of opposite sides of the sheet. With such action, the bars, through engaging and pushing down on the sheet, release it from the conveyor, and then follow its fall a sufficient distance to prevent undesirable sailing as the sheet approaches an underlying stack, or other support.

## ERRATUM

For Class 272-69 see:  
Patent No. 3,731,917

3,731,919

# TRAINING APPARATUS FOR SKIERS

Ernst Schurch, Obergrundstr. 3, Lucerne, Switzerland  
Continuation-in-part of Ser. No. 827,665, May 26, 1969, abandoned. This application July 1, 1971, Ser. No. 158,865  
Claims priority, application Switzerland, May 30, 1968, 8195/68

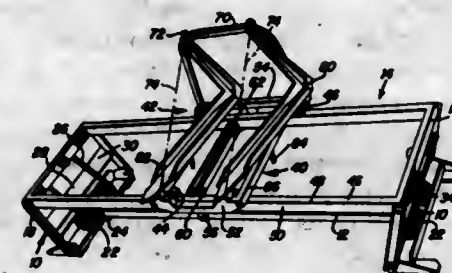
Int. Cl. A63b 69/18

U.S. Cl. 272-57 B

7 Claims

A sliding carriage equipped with separate removable pedals disposed on a rocking-frame engaged against the force of a

spring slanting toward its smaller ends while the carriage is



moving out of the middle of the rocking-frame against the elasticity of a rubber strip.

3,731,920

# BOTTOM TIP FOR THE LEG OR POLE OF A POGO STICK

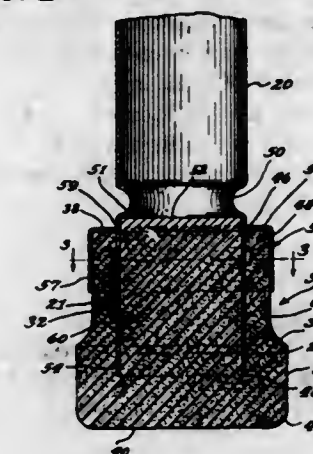
Hari Matsuda, Evanston, Ill., assignor to Martin Yale Industries, Inc., Chicago, Ill.

Filed Jan. 10, 1972, Ser. No. 216,606

Int. Cl. A63b 25/08

U.S. Cl. 272-57 E

7 Claims



A bottom tip for the leg or pole of a Pogo stick, which tip comprises a member formed of a resilient material, such as rubber or the like, provided with an intermediate annular groove or recess in which the lower end of the tubular leg or pole is received so that a portion of the resilient material of the tip is within the tubular leg adjacent the bottom thereof and a portion of the tip surrounds the leg, and in which the bottom edge of the leg is spaced from the bottom of the annular groove or recess, with a rigid retaining ring surrounding the outer portion of the resilient member.

3,731,921

# BENCH FOR SIMULATING AND DEVELOPING SWIMMING MOVEMENTS

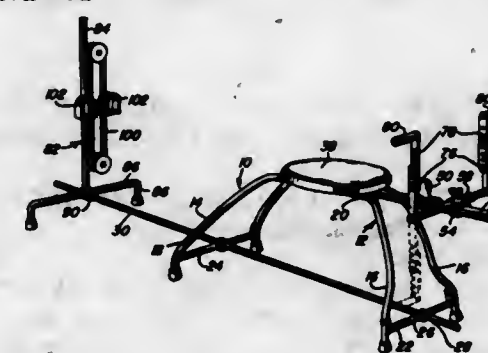
Clarence W. Andrews, Jr., P. O. Box 409, Russellville, Ky.

Filed March 29, 1971, Ser. No. 128,736

Int. Cl. A63b 69/10

U.S. Cl. 272-71

6 Claims



A horizontally disposed elongated but short bench including an extension support projecting outwardly from a first forward

end thereof and having a pair of opposite side crank arms supported therefrom for swinging about a horizontal transverse axis. The bench is to be laid upon by a person in horizontal chest downward position with the chest resting upon the bench and the crank arms engaged by the hands. A rearwardly displaced portion of the bench includes opposite side vertically reciprocal foot receiving portions and the person laying upon the bench may exercise in a manner simulating various swimming strokes, the crank arms being adjustable in effective length and adjustable angularly relative to each other about their axis of rotation. Further, the foot-receiving portions may be supported either for equal inverse reciprocation or simultaneous reciprocation.

3,731,922

# METHOD OF ISOTONIC EXERCISE

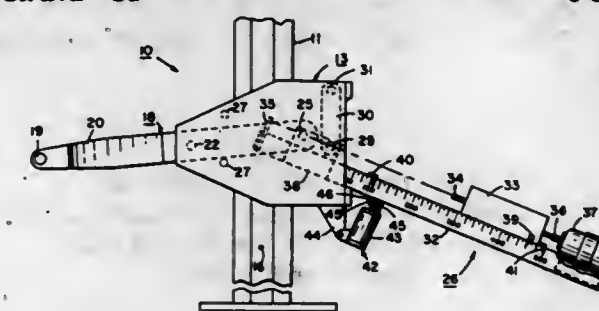
Sidney W. Jungreis, 21 Roosevelt Road, Mapplewood, N.J.  
Division of Ser. No. 760,409, Sept. 18, 1968, Pat. No.

3,588,101. This application Jan. 21, 1971, Ser. No. 108,314

Int. Cl. A63b 21/24, 21/00

U.S. Cl. 272-81

6 Claims



Method of isotonic exercise involving the lifting of a load responsive arm to approximately the waist position and holding it there while varying loads are applied to the load responsive arm.

3,731,923

# ARTIFICIAL SKI SLOPE

Woodrow P. Greene, Atlanta, Ga., assignor to Snow Products, Inc., Atlantic, Ga.

Filed April 26, 1971, Ser. No. 137,321

Int. Cl. E01c 13/00

U.S. Cl. 94-3

10 Claims



An artificial ski slope made of plastic artificial grass in which is retained granular plastic material.

3,731,924

# ACTION GAME

Michael I. Rackman, 1710 Glenwood Road, Brooklyn, N.Y., and Morton P. Matthew, RFD 2, Kreiner Lane, Norwalk, Conn.

Filed March 15, 1971, Ser. No. 124,060

Int. Cl. A63i 9/00

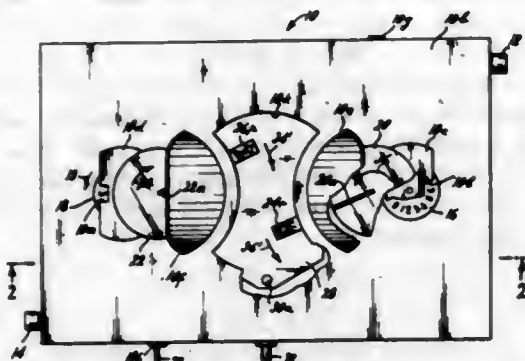
U.S. Cl. 273-1 E

7 Claims

An action game where each of two players controls movement of a respective piece along one of two predetermined paths which are adjacent to each other in a "play area." Each player can see the other player's piece only when it is in the play area; he is given an indication of the position of his own



piece at all times. A player scores a point if his piece catches the other player's piece in the play area. By skillful control of the speed of his piece while correctly estimating the position of the other player's piece when it is not in the play area and



therefore not visible to him, a player can score the number of points necessary for a win. The pieces automatically change shape depending on whether a player is the first or the second to enter the play area. Automatic scoring counters are also provided.

3,731,925

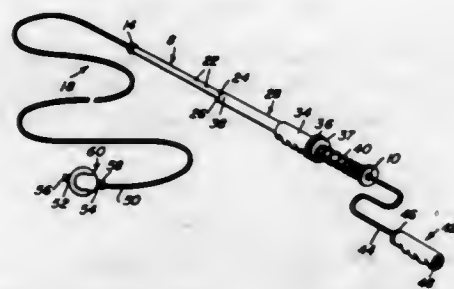
**BATTING PRACTICE DEVICE**

Jack N. Caldwell, 1500 Holly Avenue, Merritt Island, Fla.  
Filed May 26, 1971, Ser. No. 147,130

Int. Cl. A63b 69/40

U.S. Cl. 273-26 E

7 Claims



A batting practice device for use by a person skilled in the art of coaching and training a youngster how to stand at home plate, how to keep his eyes on a real baseball which is caused to sweep in varying paths (high, low, and otherwise) across the plate, how to time his batting swing and, also how to acquire the feel of batting the ball. It comprises a suitably elongated hollow barrel through which a flexible nylon or similar tethering line is slidably threaded. This barrel provides a line stabilizing and whirling holder designated as a control stick. A regular baseball is captively mounted on the outward end of the line. A first handgrip is provided on the inward end. A second spring biased handgrip is slidably mounted on the flanged inner end of the barrel. These handgrips, when properly grasped and used, will enable the user to swing the tethered ball in a circular path and to deliver the ball to the wary but eager batter.

3,731,926

**TRAINING DEVICE INCLUDING CAPTIVE BALL TO BE STRUCK BY GAME CLUB**

Douglas Lincoln Vincent, 26 Chelsea Avenue, Broadbeach, Queensland, Australia

Filed Oct. 28, 1970, Ser. No. 84,859

Claims priority, application Australia, Oct. 31, 1969, 63183/69

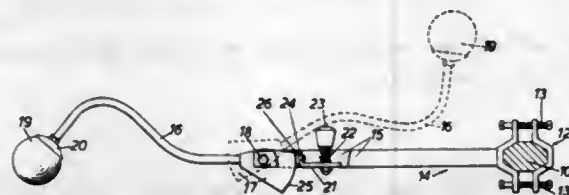
Int. Cl. A63b 69/40, 61/00, 67/02

U.S. Cl. 273-26 E

3 Claims

A game ball is tethered to a vertical support. The tethering structure includes first and second horizontally extending parts. The inner end of the first part is clamped to the vertical

support and capable of being vertically adjusted thereon. The inner end of the second part is pivotally connected to the outer end of the first part for swinging movement in a horizontal plane. A game ball is secured to the outer end of the second part. In its initial position, the second part is in substantial alignment with the first part. When the ball is struck by a game club, the second part swings almost 180° degrees around the pivotal connection to a position substantially parallel to the first part. At the end of its swinging movement, the second arm engages the end of a coil spring mounted on a side of the



first part, which causes the second part to rebound to its initial position. As the second part approaches its initial position, a complementary cam and nylon button on the second and first parts, respectively, coact to brake the second part to a halt ready for the next stroke. The game ball may be a tennis ball, baseball, or golf ball. The movement of the second part can be employed to spin a reversible disc including gone indicia on its opposite sides. The disc may be located in a housing including a window through which the indicia may be seen and the disc may be spun by an arrangement including a spindle, gear, rod, spring and pawl.

3,731,927

**GLOVE AND BALL TETHERED THERETO**

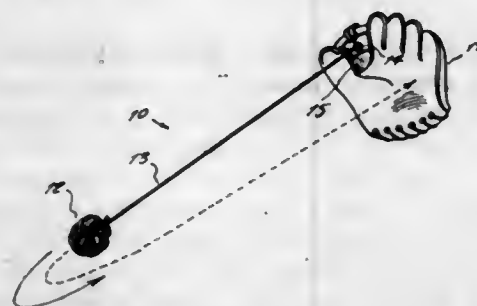
Thomas J. Rocco, Jr., 26 Aster Court, Brooklyn, N.Y.

Filed Oct. 13, 1971, Ser. No. 188,727

Int. Cl. A63b 69/40

U.S. Cl. 273-26 E

6 Claims



A novelty sports toy for diversion and enjoyment to youngsters and others, the device consisting of a base ball glove to which there is tethered one end of a stretchable elastic rubber, the opposite end of the rubber being attached to a knotted ball of rubber bands, the ball accordingly being adaptable to the thrown a short distance during which the rubber becomes gradually more taut so that it finally pulls the ball back toward the glove where the player tries to catch it in the glove.

3,731,928

**ATHLETIC TRAINING DEVICE**

Warren Earl Wolfe, 6290 Wing Lake Road, Birmingham, Mich.

Filed April 13, 1972, Ser. No. 243,767

Int. Cl. A63b 69/40, 69/36

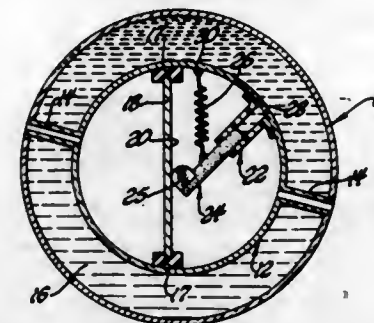
U.S. Cl. 273-26 R

13 Claims

A device for the purpose of assisting and training an individual in a sport wherein a ball is struck by an instrument, and wherein it is desired to train the athlete to watch the ball at the instant of impact of the implement therewith. The device includes an outer spherical member having a translucent portion, and disposed within the outer sphere is an abrasive surface adapted to be engaged by a spark producing

device at the instant of impact. The abrasive surface may be located either on a wall located inside the outer spherical member, on the outer surface of a second spherical member located centrally of the outer spherical member or on a wall

compressive force caused by the force of the impinging projectile is great enough to bounce the projectile forwardly in its original line of trajectory and away from the surface of the pad.



3,731,931

**HORIZONTAL TARGET BAR AND HOOKED PROJECTILE**

Frank P. Monaco, 19 Longmeadow Road, Shelton, Conn.

Filed Sept. 21, 1971, Ser. No. 182,375

Int. Cl. A63b 71/04

U.S. Cl. 273-95 R

9 Claims

extending across the second spherical member. In the latter instance, the space between the two spherical members may be filled with a fluid which drives the spark producing device, e.g., a flint, across the abrasive surface.

3,731,929

**OSCILLATORY RESILIENT BODY AND TETHER**

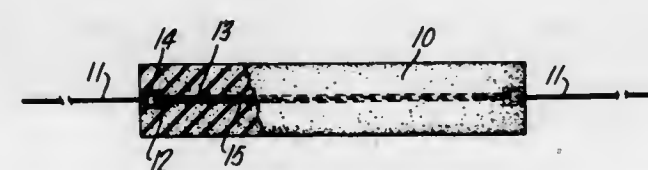
Raoul R. Landry, Montreal, Quebec, Canada, assignor to Des-Land Products Reg'd, Longueuil, Quebec, Canada

Filed April 19, 1971, Ser. No. 96,641

Int. Cl. A63f 71/02

U.S. Cl. 273-95 A

6 Claims



A toy having a body resilient material and a substantially inextensible extending through the body and adapted to attach an elastic cord at opposed ends of the body to permit said body to be oscillated between two players.

A game of skill generally similar to quoits or horseshoes having a projectile to be tossed toward a scoring stake having a horizontal section, said projectile having a handle provided with hooks projecting longitudinally from one end and which are capable of interlocking with said scoring stake. If desired the hooks on the projectile may be distinctively marked with scoring indicia.

3,731,932

**TARGET RECEPTACLES HAVING MECHANISM TO DISLODGE PROJECTILES TOSSED THEREIN**

Jeffrey D. Breslow, Chicago, and Eugene Jaworski, Park Ridge, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 14, 1972, Ser. No. 217,861

Int. Cl. A63b 71/02

U.S. Cl. 273-102.1 C

5 Claims

**PROJECTILE AND TARGET HAVING A RESILIENT FRICTIONAL RESISTANT SURFACE CAUSING AN IMPINGING PROJECTILE TO BOUNCE BACK TOWARD THE PROJECTOR**

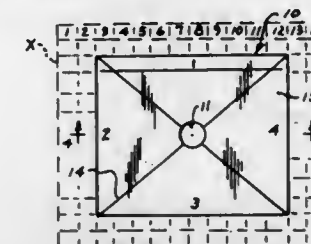
Howard T. Jeandron, 42 First St., Keyport, N.J.

Filed Jan. 26, 1971, Ser. No. 109,762

Int. Cl. A63b 71/02

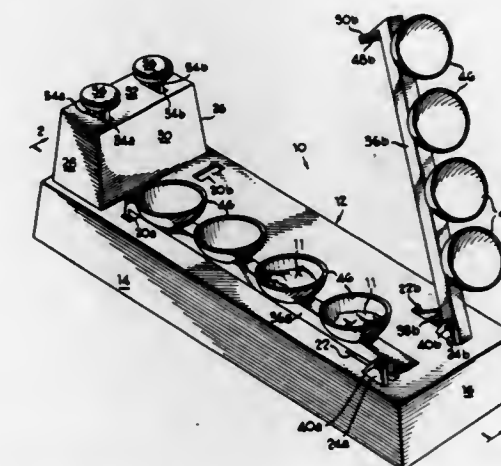
U.S. Cl. 273-95 R

7 Claims



A game pad and a plurality of discs in which the pad is comprised of a sheet of resilient material such as polyurethane and the pad is provided with a central aperture or pocket. In use the pad is positioned in a horizontal solidly backed position upon the floor or ground and a plurality of discs similar in size and weight to a penny are utilized to be tossed from a distant point into the pocket on the pad. Because the pad is formed of a resilient polyurethane material having the property of instant recoil, a surface friction to resist slippage of the projectile upon the pad is inherently developed and the resultant

A target game of the type wherein throwable missiles are aimed at competitive receiving stations with each receiving station mounted on a support for movement between a retracted position and an extended position and characterized by the provision of a latch means for normally holding each receiving station in a retracted position with the latch means being releasable responsive to reception of a playing piece thereon to permit movement of the receiving station to an extended position which dislodges the playing pieces therefrom.





3,731,933

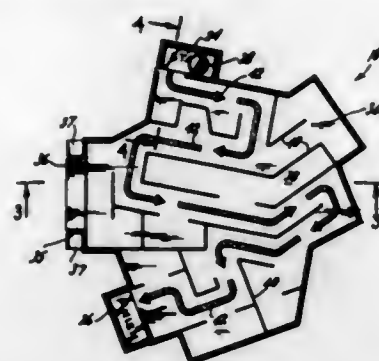
## GAME BOX HAVING A MAZE

Perry J. Grant, Pacific Palisades, Calif., assignor to Reuben B. Klammer D/B/A Reugen Klammer & Associates, Beverly Hills, Calif.

Filed May 20, 1971, Ser. No. 145,123  
Int. Cl. A63F 7/04

U.S. Cl. 273-113

7 Claims



A game box includes a game box having a maze as part of its structure. A game ball is adapted to traverse the maze from a start position to a finish position in response to manipulation of the game box by a player. A transparent top wall encloses the game ball within the game box and enables the maze and game ball to be viewed by the player. An opaque cover is selectively movable from a first position, wherein the maze and game ball may be viewed by the player, to a second position wherein the maze and game ball are hidden from the view of the player. A schematic representation of the maze is inscribed on the opaque cover and may be viewed by the player when the cover is in the second position to aid the player in manipulating the game ball from the start position to the finish position when the maze and game ball are hidden from view.

3,731,934

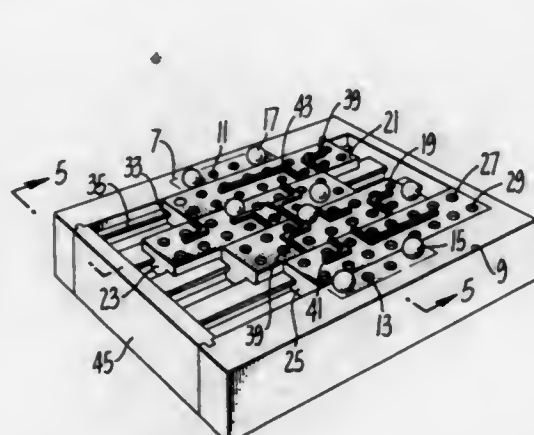
## BOARD GAME APPARATUS

Philip L. Shoptaugh, 5860 Buena Vista Avenue, Oakland, Calif.

Filed Aug. 5, 1971, Ser. No. 169,368  
Int. Cl. A63F 3/00

U.S. Cl. 273-131 AB

6 Claims



A game board having a series of sliders with spaces thereon for the playing pieces and also containing barrier elements. The sliders are mounted for lateral movement between home positions disposed at opposite sides of the board. Each slider has two rows of spaces and the barrier elements are arranged to separate adjacent spaces in one row and to separate a space in one row from the aligned space in the other row. The object of the game is for one player to move his playing pieces from one side of the board to the other before his opponent.

3,731,935

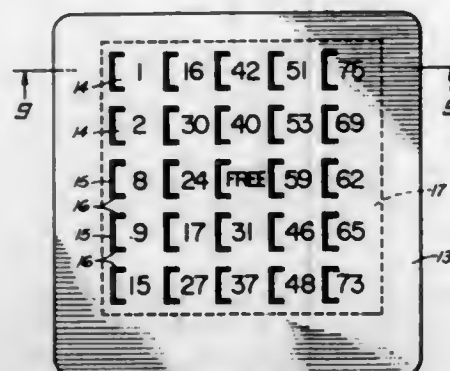
## GAME BOARDS

James F. Moore, Jr., 1515 W. Thomas Avenue, Englewood, Colo.

Filed Nov. 17, 1971, Ser. No. 199,532  
Int. Cl. A63M 3/06

U.S. Cl. 273-136 F

7 Claims



A laminated bingo board consisting of the following superimposed laminations: a back board; a first spacing board; a game number board; a transparent plastic slide guide sheet; a second spacing board; a window board; and a plurality of substantially flat and flexible number-covering slides. The number board has a vertical knife cut positioned at the side of each number thereon and short horizontal cuts communicating with the ends of the vertical cut, so that the slide of that number may be moved through a space provided by deflecting a portion of the number board adjacent said cuts to a concealed position directly beneath an adjacent number. If the slide of a "called" number is withdrawn from its concealed position below the adjacent number it will slide over and cover the "called" number.

3,731,936

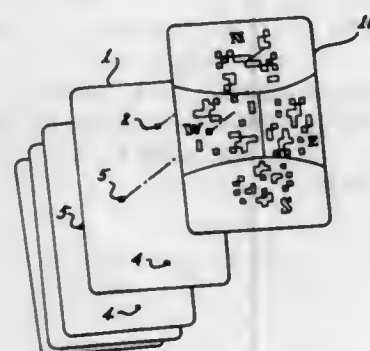
## COMPETITION BRIDGE CARDS

Ben H. Copeland, 2066 East Balboa, Tempe, Ariz.

Filed Oct. 12, 1971, Ser. No. 188,191  
Int. Cl. A63F 1/14

U.S. Cl. 273-149 P

10 Claims



A deck of playing cards having the back side of each card coded by means of a plurality of dots. The pattern of dots is identical on each card but is longitudinally and/or laterally displaced by a different amount on each card. An overlay card is divided into distinct areas with a selected positioning of a plurality of apertures, or transparent portions, in each area. On registration of the overlay card with each playing card, one of the dots in the card will be visible through one of the apertures in the overlay card. The area within which that dot appears directs the dealer as to which of the players is to receive that card. This process continues until all cards in the playing deck have been dealt. In this manner, the players will receive a predetermined arrangement of cards.

3,731,937

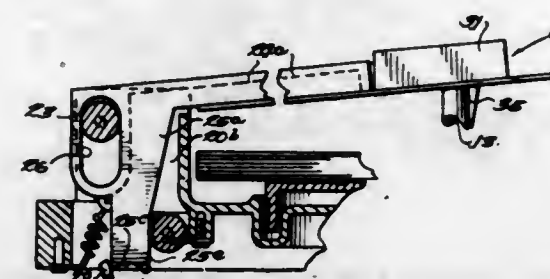
## PHONOGRAPH RECORD PLAYING APPARATUS

Robert L. Van Antwerp, St. Joseph, and Larry M. Hughes, Colesburg, both of Mich., assignors to The Magnavox Company, Fort Wayne, Ind.

Filed July 13, 1970, Ser. No. 54,337  
Int. Cl. G11b 17/04

U.S. Cl. 274-10 R

23 Claims



The disclosure relates to phonograph record playing apparatus, supporting and positioning records in a manner which provides an unusually low profile for the equipment. The disclosure emphasizes the relationship between a shaped spindle and a record stabilizing assembly. The assembly includes a support disposed outwardly of the periphery of a turntable and an elongate record engaging member having an outer end mounted for linear and pivotal movement with respect to the support. The elongate member is disposed radially of a spindle for the turntable and is both pivotally movable and slideable in a vertical plane between a loading position, a plurality of operating positions and a rest position. When the elongate member is in the raised loading position, one or more records may be loaded on or removed from the spindle. When in the rest position, the elongate member deactivates the equipment.

3,731,938

## RECORD PLAYERS

John Pelham Wren, Chisleholme, England, assignor to Plessey Handel Und Investments A. G., Zug, Switzerland

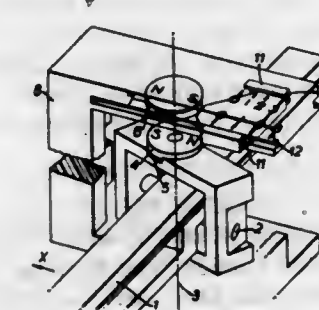
Filed May 26, 1971, Ser. No. 147,006

Claims priority, application Great Britain, June 2, 1970, 26,590/70

Int. Cl. G11b 3/10

U.S. Cl. 274-23 R

3 Claims



A pick-up arm arrangement in which for the reduction of side thrust due to "tracking error" a disc magnet (ferrite) is mounted on the pick-up arm with the axis of the magnet lying along the vertical pivotal axis of the arm while another disc magnet is mounted on a fixed part of the pick-up mounting arrangement and spaced from the magnet along the axis so that in response to pivotal movement of the pick-up about its vertical pivot during the playing of a record the magnetic interaction between the poles of the magnets produced a magnetic force on the arm which opposes the side thrust on the arm. A magnetic shield may be interposed between the magnets in order to afford control of the magnetic force acting on the arm.

## ERRATUM

For Class 277-15 see:  
Patent No. 3,731,865

3,731,939

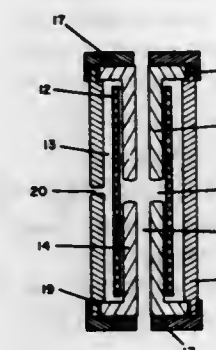
## WELLBORE INSTRUMENT SEALING APPARATUS

Leslie J. Wright, Collinsville, and Reginald G. Ford, Tulsa, both of Okla., assignors to Cities Service Oil Company, Tulsa, Okla.

Filed May 28, 1971, Ser. No. 148,064  
Int. Cl. F16J 15/10

U.S. Cl. 277-34

3 Claims



Disclosed herein is apparatus to be utilized in conjunction with a wellhead assembly consisting of a steel body accommodating a Hassler type sealing sleeve. The apparatus is utilized for sealing wellbore test instruments which are extended within a wellbore containing fluids under low pressures and is particularly applicable to the sealing of thermocouple lines which conventionally are most difficult to adequately seal, generally requiring large apparatus to form the seal.

3,731,940

## ELASTOMER SEAL WITH A PLURALITY OF ANNULAR RIBS FOR A ROTATING SHAFT OF A CENTRIFUGAL PUMP OR THE LIKE

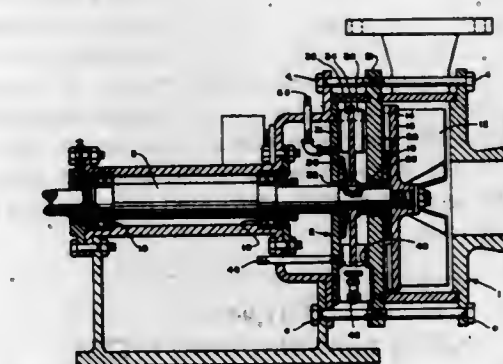
Walter L. Spruiell, 210 W. Texas, Iowa Park, Tex.

Filed Aug. 6, 1971, Ser. No. 169,616

Int. Cl. F04d 29/08, 29/22

U.S. Cl. 277-12

2 Claims



An elastomer seal for a rotating shaft of a centrifugal pump which has annular ribs and is so cupped as to form a seal when the centrifugal pump is in static condition, which also seals at various slow speeds until the pump attains sufficient centrifugal pumping speed to divert the fluid being pumped away from the shaft, and with the annular ribs forming seals with the wall of the pump housing in sequential relation as the speed of rotation of the shaft decreases and becomes static.



3,731,941

## FACING MATERIALS FOR AN INTERNAL COMBUSTION ENGINE CYLINDER AND A COOPERATING PISTON RING

Yoshio Mori, Tokyo; Yoshihito Sato, Kawaguchi, and Kentaro Takahashi, Omiya, all of Japan, assignors to Nippon Piston Ring Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1971, Ser. No. 203,877

Claims priority, application Japan, Dec. 12, 1970, 45/110109

Int. Cl. F16J 9/12, 15/08

U.S. Cl. 277-235 R

7 Claims

Abrasion wear of piston rings and of the inner cylinder wall of an internal combustion engine is very low when the piston ring consists of cast iron of specified composition and a Rockwell hardness of at least C 40, and the cylinder wall consists of electrodeposited nickel having fine particles of silicon carbide or other very hard material dispersed therein so that the cylinder wall has a hardness of Rockwell A 70-A 100.

3,731,942

## HYDRAULICALLY ACTUATED TOOL COLLET

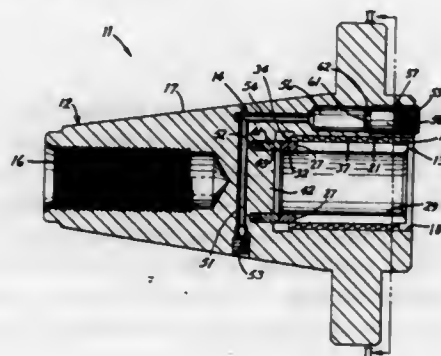
James R. Buck, Richland, Mich., assignor to Buck Tool Company, Kalamazoo, Mich.

Filed Sept. 30, 1970, Ser. No. 76,884

Int. Cl. B23b 31/36

U.S. Cl. 279-4

2 Claims



An improved chuck construction, particularly for holding a work tool, comprising a housing and a gripping sleeve mounted on the housing for relative axial movement therebetween. The housing and the gripping sleeve are each provided with a plurality of circumferentially spaced cam rows, with each row including a plurality of axially spaced ramp-like cams. The cam rows on the gripping sleeve and on the housing coact with one another in response to relative axial movement therebetween for causing the sleeve to deform radially so as to grip a tool. A captive or closed fluid system cooperates with the sleeve for moving same axially relative to the housing, which system includes a manually actuated member, such as a set screw, for causing the pressure of the fluid within the system to vary so as to cause relative axial movement of the sleeve relative to the housing and so as to cause the sleeve to be radially deformed into gripping engagement with the tool.

3,731,943

## SAFETY SKI BINDING SYSTEM

John D. Wilkes, 1024 Wisconsin Avenue, Washington, D.C.

Continuation-in-part of Ser. No. 838,873, July 3, 1969, Pat. No. 3,614,119. This application Oct. 18, 1971, Ser. No. 189,910

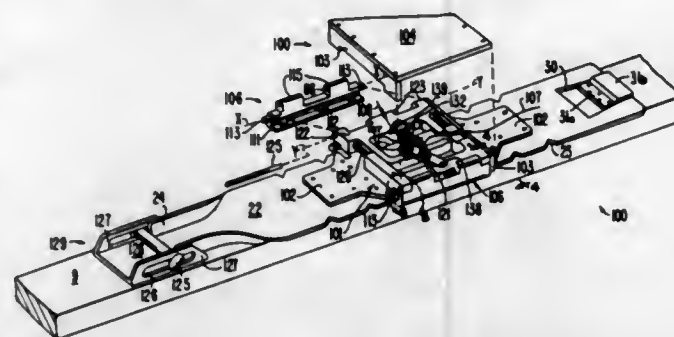
Int. Cl. A63c 9/08

U.S. Cl. 280-11.35 D

41 Claims

A safety ski binding system wherein a binding assembly is provided for rigid attachment to a ski boot and includes a pair of jaws rotatable on axes parallel to the length of the ski between a released position where the jaws are above the top surface of the ski and a locked position where the jaws engage

a ski attachment means connected to the ski. The attachment means are in the form of a rigid or hinged plate or longitudinal strips. The hinge is provided at the forward end of the plate, and the hinged plate includes latch means for releasably



latching the rear end of the plate. The binding assembly includes means for moving the jaws from released to locking position and provision for stored energy release for movement of the jaws from locked to unlocked position when forces on the jaws exceed an adjustable force threshold.

3,731,944

## FIXING SKI BOOTS TO SKIS

Georges Pierre Joseph Salomon, Annecy, France, assignor to S. A. Francois Solomon et Fils, Annecy, France

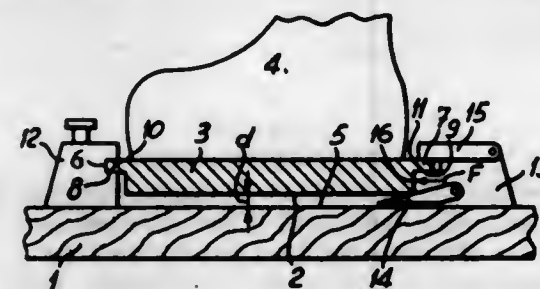
Filed March 30, 1971, Ser. No. 129,461

Claims priority, application Switzerland, April 8, 1970, 5163/70

Int. Cl. A63c 9/00

U.S. Cl. 280-11.35 C

8 Claims



A ski boot comprises a rigid substantially flat sole having a lower surface for walking and support surfaces, distinct from and above the lower surface, located at toe and heel ends of the sole. Bearing surfaces on toe and heel bindings cooperate with said support surfaces to hold the boot on a ski with said lower surface spaced apart from the upper surface of the ski.

3,731,945

## SAFETY SKI BINDING APPARATUS

Ralph S. Johnson, 907 Frontier Park Avenue, Cheyenne, Wyo.

Filed May 22, 1970, Ser. No. 39,927

Int. Cl. A63c 9/00

U.S. Cl. 280-11.35 T

8 Claims



Safety ski binding apparatus has lateral movement restraining structure operatively associated with the ski and ski boot for establishing a pivot intermediately of the heel and toe bindings about which the ski boot will turn to reduce the strain

3,731,946

## TORSIONALLY FLEXIBLE HITCH

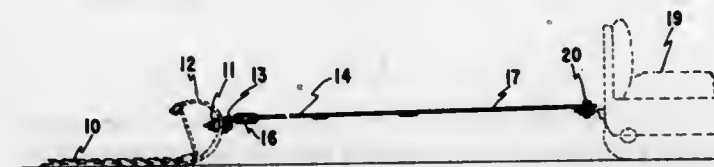
Orville H. Westcott, 1115 West 10th Street, Sioux Falls, S. Dak.

Filed May 10, 1971, Ser. No. 141,543

Int. Cl. B62b 13/00

U.S. Cl. 280-24

2 Claims



A tow bar for a toboggan or the like for use in connection with a snowmobile. The bar is flat and resilient whereby flexure is permitted, but the toboggan is restrained from tipping over.

3,731,947

## LADDER TROLLEY

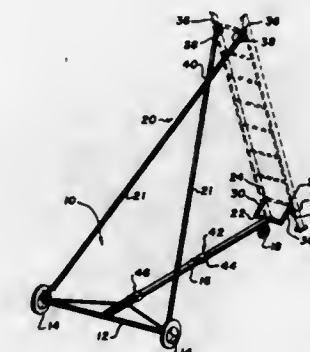
Lawrence A. Fontaine, 3035 Charles Street, Vancouver, British Columbia, Canada

Filed June 3, 1971, Ser. No. 149,652

Int. Cl. B62b 11/00

U.S. Cl. 280-36 R

3 Claims



A foldable trolley which can be attached to an extension ladder or to any other heavy ladder and provides a way of easily moving the ladder about on the job. The trolley consists of a wheeled and foldable frame which includes hooks for engaging certain rungs of the ladder so that the ladder can be wheeled about while in a substantially upright position. The trolley folds up when the ladder is in use.

3,731,948

## OCCUPANT RESTRAINT SYSTEM

Richard C. Risko, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 2, 1971, Ser. No. 204,159

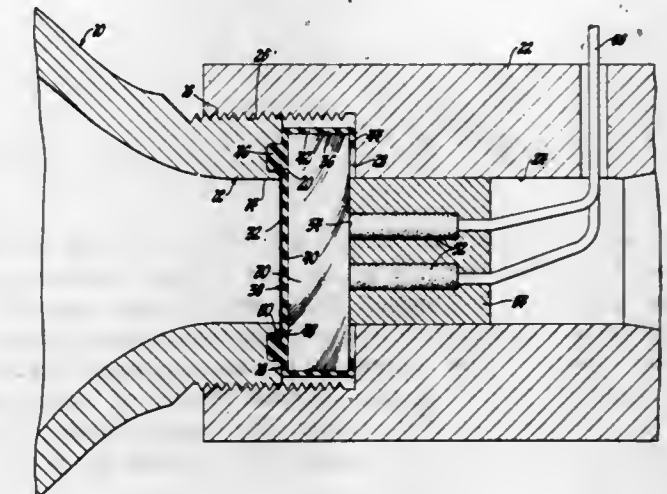
Int. Cl. B60r 21/02

U.S. Cl. 280-150 AB

3 Claims

An occupant restraint system includes a pressure vessel providing a source of pressure fluid and having a cylindrical outlet neck including cylindrical inner and outer walls joined by a radial end wall provided with an axially outwardly opening continuous groove of generally rectangular cross section.

A manifold communicates the pressure vessel with a diffuser and an inflatable occupant restraint cushion. The manifold includes a threaded inlet wall which is threaded on the threaded outer wall of the neck and which merges into the passage wall of the manifold across a radial wall. A cylindrical glass diaphragm has one face juxtaposed to the outlet opening of the neck and the groove in the end wall and an opposite face juxtaposed to the radial wall of the manifold. A seal of resilient material covers the one face of the diaphragm and the side wall thereof, and partially covers the other face. An integral



rib extends axially of the one face and is received within the groove in the end wall of the pressure vessel. The seal is compressed between the radial wall of the manifold and the end wall of the pressure vessel and the seal rib is compressed against the base wall of the groove. The seal rib is of lesser cross section than the groove and the leakage of pressure fluid between the seal and the end wall into the groove forces the radial outer wall of the rib into engagement with the radial outer wall of the groove. Detonators encased in stemming material seat against the other face of the glass diaphragm and are electrically fired to rupture the diaphragm.

3,731,949

## FLAT BAG MADE OF TUBULAR SECTIONS

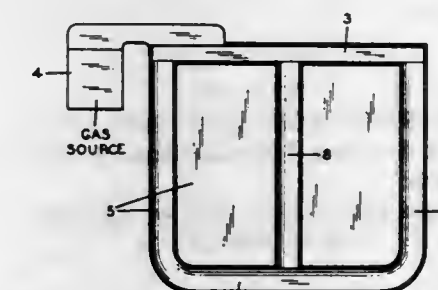
Donald G. Radke, Rochester, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Filed May 12, 1971, Ser. No. 142,658

Int. Cl. B60r 21/08

U.S. Cl. 280-150 AB

1 Claim



This invention relates to a bag inflated for automotive passenger restraint, said bag having a minimum area which is inflatable to extend the bag over the area it must extend across to protect the passenger.



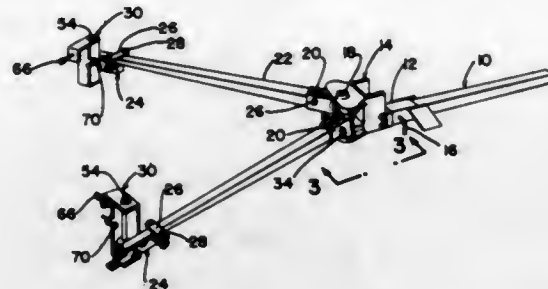
3,731,950

**ADJUSTABLE LOAD STABILIZING TRAILER HITCH**  
Harry Logan Burcham, Lodi, Calif., assignor to Valley Tow-Rite, Inc., Lodi, Calif.

Filed Aug. 4, 1971, Ser. No. 168,874  
Int. Cl. B60d 1/06

U.S. Cl. 280-406 A

3 Claims



An adjustable load stabilizing trailer hitch of the type having a pair of tapered elongate spring bars pivotally mounted on either side of the ball mount. The spring bars have camming members mounted at their free ends for engagement with vertically adjustable cam supports. The camming members and cam supports acting together increase flexure of the spring bars to resist swaying of the trailer. The mounted ends of the spring bars are inherently designed for locking the bars in position into the ball mount.

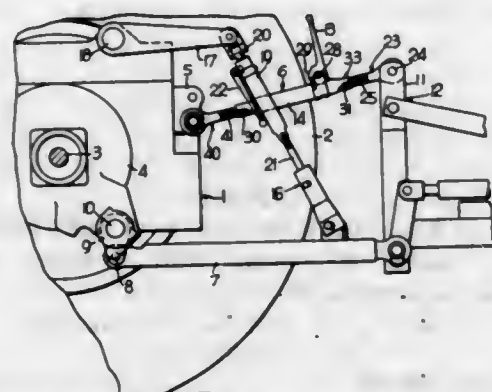
3,731,951

**ADJUSTABLE LINK THREAD CLEANER**  
Lawrence M. Gruenberger, West Allis, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Dec. 16, 1970, Ser. No. 98,560  
Int. Cl. B60d 1/14

U.S. Cl. 280-461 A

10 Claims



An adjustable link having an internally threaded sleeve receiving an externally threaded extension member with automatic thread cleaning means to provide a freely running thread.

3,731,952

**FLASHING FOR ROOF VENT PIPES**  
Bruce J. Elwart, Ferndale, Mich., assignor to Royal Seven Inc., Ferndale, Mich.

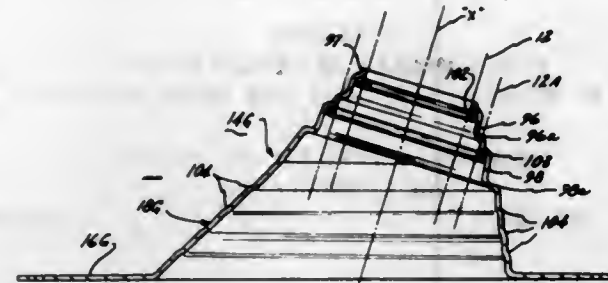
Filed Feb. 2, 1972, Ser. No. 222,893  
Int. Cl. E04d 13/14

U.S. Cl. 285-3

7 Claims

A flashing for roof vent pipes and the like in which a frusto-conical shield member surrounding the vent pipe has an enlarged flat base flange engaging the rooftop surface and an upper portion provided with a plurality of concentric cylindrical stepped portions selectively dimensioned to fit varying pipe sizes, the smaller stepped portion being readily severed from

the remainder so that the next larger stepped portion will fit a larger pipe, with O-ring seals having slightly smaller inner diameters than the inner diameters of the vent pipe engaging stepped portions being fitted adjacent thereto for sealing en-



agement with the vent pipe. At least a portion of the shield member has circular corrugations extending therearound so that the shield will flex to conform with slight differences in roof pitches, as well as to provide flexing required by expansion and contraction of the building structure.

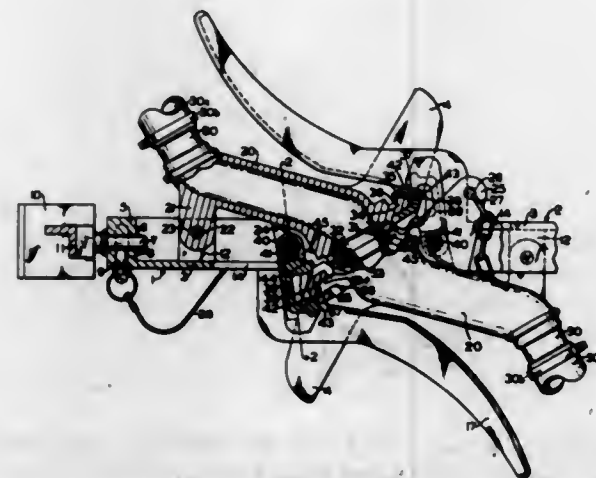
3,731,953

**AUTOMATIC AIR HOSE CONNECTOR**  
Fred Temple, Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Sept. 9, 1971, Ser. No. 178,904  
Int. Cl. F16l 55/00

U.S. Cl. 285-12

9 Claims



This invention relates to an automatic air hose connector for use on railway cars. This hose connector has a mating head which is provided with a removable hose nipple that has a hose secured to one end and a hose coupling formed on the other. When two adjacent cars, each having an automatic air hose connector, are coupled, while the nipples remain secured to the mating heads, the gaskets carried in the end of each hose coupling are moved into abutting relationship one with the other to form a seal therebetween so that a continuous conduit extends from one car to the other. Prior to coupling a car having an automatic air hose connector to a car without such a connector, the hose nipple is removed from the mating head so that, subsequent to the coupling of the cars, the hose coupling formed on the end of the nipple can be manually coupled to the hose coupling on the end of the hose at the adjacent end of the car without an automatic air hose connector to thereby form a continuous conduit from one car to the other.

3,731,954

**FLUID COUPLING**

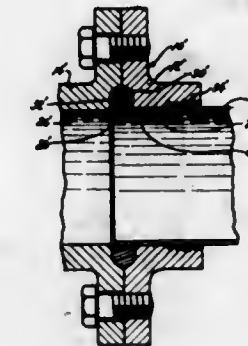
Robert J. Haglund, 5990 Orchard Bend, Birmingham, Mich.

Filed Sept. 23, 1971, Ser. No. 182,952

Int. Cl. F16l 23/00, 13/08, 13/10

U.S. Cl. 285-12

1 Claim



A fluid coupling comprising a pair of connected coupling members having registering passages extending therethrough with the passage in one of the coupling members having a threaded portion for connection to a threaded pipe and also having a smooth bore portion for bonding in the alternative to a non-threaded pipe of the same size as the threaded pipe. There is also provided an annular seal that seals the juncture of the coupling members and also provides a seal in addition to the bonded joint.

3,731,955

**PUSH-PULL CONNECTOR HAVING A SHEAR-RESISTANT LOCKING RING**

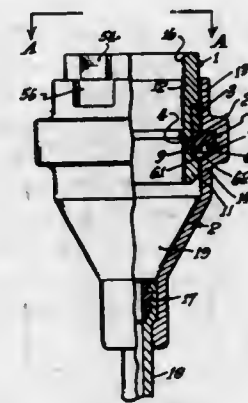
Adolph W. Borsum, and William K. Borsum, both of 521 Pacific Avenue, Solana Beach, Calif.

Filed Sept. 24, 1971, Ser. No. 183,582

Int. Cl. F16l 17/00

U.S. Cl. 285-111

12 Claims



A push-pull connector including conventional telescopically slidable male and female connector members each provided with an annular peripheral recess, the members being interlocked by a resilient U-shaped packing secured in one of the recesses and extending into an engaged position in the other recess. A disconnect ring, preferably mounted in this other recess, is slidably movable axially of the connector members to forcefully cam the packing out of its interlocking engagement to permit the connector members to be separated. Shear strength of the locking member is increased by specially forming the recess-engaging portion of the U-shaped packing. In particular, this portion is formed as a parallelogram and the arrangement is such that approximately one-half of the parallelogram projects into engagement with the other recess, the other half of the parallelogram remaining in the recess in which the packing is secured. Compressive forces produced by the normal tendency of the connector members to separate are applied in shear substantially along the diagonal of the parallelogram which, since it contains the maximum bulk of the packing, is capable of resisting the shear.

3,731,956

**PANEL STRUCTURE AND THE LIKE WITH CONNECTING MEANS**

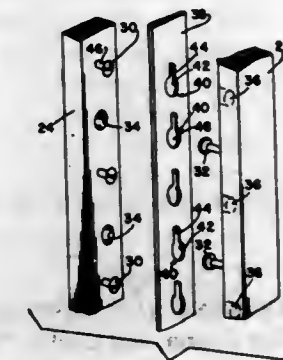
William J. Hanley, P. O. Box 5758 N.S., Nassau, Bahamas

Filed Dec. 8, 1970, Ser. No. 96,139

Int. Cl. F16b 5/07

U.S. Cl. 287-20.926

10 Claims



A panel structure comprising a plurality of individual panel members having flat connector means disposed therebetween having slot means for receiving locking bolt means therethrough with the connector means having an unlocked position and a locked position so that separate panel members may be quickly joined together in a rigid fashion for assembling a wall partition, room, or the like, and in which the connector members may be disposed in an unlocked position so that the panel members may be quickly disassembled, when desired.

3,731,957

**BALL JOINTS**

Yasuo Uchida, Hamamatsu, Japan, assignor to Ishikawa Tekko Kabushiki Kaisha, Tokyo, Japan

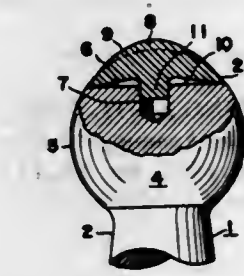
Filed Oct. 1, 1971, Ser. No. 185,769

Claims priority, application Japan, Oct. 13, 1970, 45/89793

Int. Cl. F16c 11/06

U.S. Cl. 287-87

4 Claims



A ball joint comprising a ball stud having a spherical head, and a socket for receiving said spherical head of said ball stud. Said spherical head of said ball stud has a portion which is made of a resilient material.

3,731,958

**FASTENING DEVICES**

Adrian Gottfried Offenbreich, Sodra Forstadsgatan 49, 211 43 Malmo, Sweden

Filed April 14, 1970, Ser. No. 133,790

Claims priority, application Sweden, April 15, 1970, 5104/70

Int. Cl. F16b 7/00

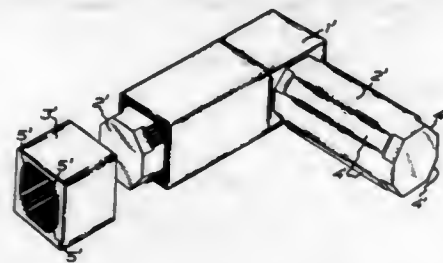
U.S. Cl. 287-189.36 H

4 Claims

A device for the non-releasable fastening of a tube and a fastening body having a joining member which is adapted to



nest in the tube and has at least one longitudinal, recessed or bevelled portion which is permanently deformed upon en-



gagement with a conforming longitudinal projection of the tube.

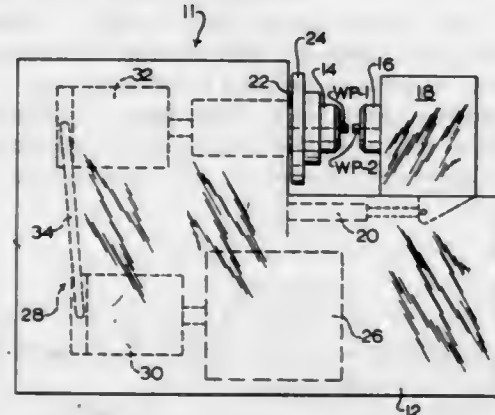
3,731,959

#### FRICTION WELDING SINTERED MATERIALS

Marion A. Calton, East Peoria, and Carl D. Weiss, Peoria, both of Ill., assignors to Production Technology Inc., Peoria, Ill. Division of Ser. No. 747,779, July 19, 1968, Pat. No. 3,571,905. This application Aug. 12, 1970, Ser. No. 63,319 Int. Cl. F16b 11/00

U.S. Cl. 287-189.36 B

3 Claims



A friction welded assembly comprised of two workpieces bonded across a common weld zone interface and wherein at least one of the workpieces comprises a porous sintered metallic material.

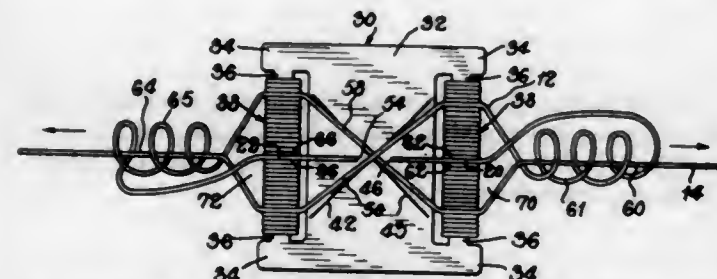
3,731,960

#### SELF-THREADING KNOT-TYING DEVICE

Samuel J. Pagano, 45 Ocho Avenue, Milltown, N.J. Filed Feb. 9, 1971, Ser. No. 113,885 Int. Cl. D03J 3/00

U.S. Cl. 289-17

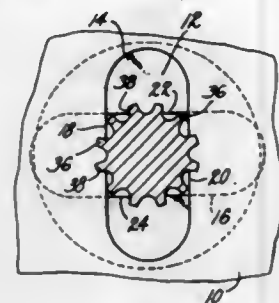
15 Claims



A knot-tying device for use in tying a true barrel knot between first and second lines, the device including two pairs of diagonally opposite resiliently releasable line retaining means for holding crossed segments of the lines, and two further retaining means, each located between adjacent line retaining means of each of the two pairs. Preferably, the adjacent line retaining means of each of the two pairs are confronting coils located at opposite ends of a helical spring and each further retaining means is a pair of confronting coils located intermediate the opposite ends of the same helical spring.

3,731,961  
AUTOMOBILE BUMPER ASSEMBLY  
Philip D. Becker, Southbury, Conn., assignor to Buell Industries, Waterbury, Conn.  
Filed Dec. 16, 1971, Ser. No. 208,792  
Int. Cl. F16b 7/00  
U.S. Cl. 287-189.36 F

4 Claims



An automobile bumper assembly in which the bumper and support bracket are provided with elongated crossed recesses and a bolt having a ribbed shoulder is assembled into the central opening formed by the crossed recesses so that corresponding indentations are formed in the side edges of each recess to enable the assembly to resist movement of the bumper on the support in impact with an object.

3,731,962

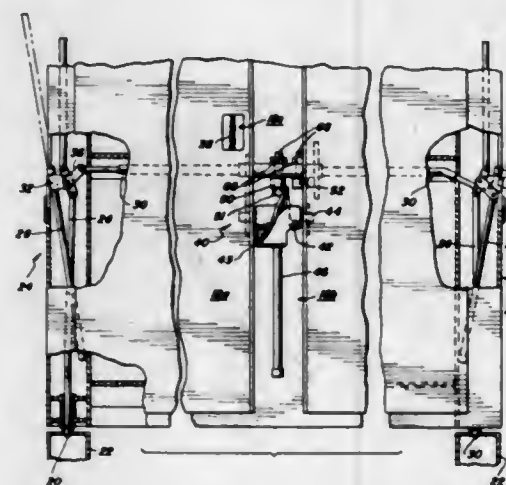
#### LATCH OPERATING MECHANISM FOR BULKHEADS

Samuel H. Enochian, Thornton, Ill., assignor to Unarco Industries, Inc., Chicago, Ill.  
Continuation-in-part of Ser. No. 81,294, Oct. 16, 1970, Pat. No. 3,695,656. This application Nov. 4, 1971, Ser. No. 195,675

Int. Cl. E05c 1/06, 9/16

U.S. Cl. 292-34

9 Claims



An actuator of multiple latches of a bulkhead is provided with improvement features that insures making the operator of the device cognizant of the condition of the latches, that prevents inadvertent swinging of a handle that could result in damage, that brings about improved movement of linkages that operate the latches, and which permits of reduced servicing costs in the event repair is required.

3,731,963

#### ELECTRICALLY ACTUATED LOCK MECHANISM

Raymond B. Pond, 195 Springfield Avenue, Greenfield Park, Quebec, Canada  
Continuation-in-part of Ser. No. 837,643, June 30, 1969. This application April 20, 1971, Ser. No. 135,571

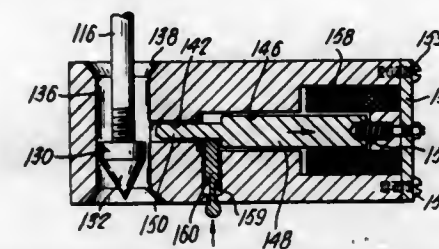
Int. Cl. E05b 47/04, 65/19

U.S. Cl. 292-144

4 Claims

A locking mechanism includes a tubular sleeve adapted to receive a shouldered projection extending from the closure

member, a spring biased plunger normally projecting into the projection seat to engage the projection. A solenoid is as-



sociated with the plunger for retracting the plunger from the tubular sleeve to release the projection when it is required to unlock the closure member.

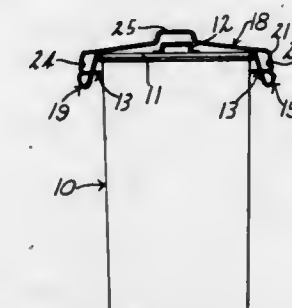
3,731,964

#### LOCK FOR GARBAGE CAN COVERS

Noel Hyde, 305 Park Road, Pleasant Grove, Ala.  
Filed Nov. 26, 1971, Ser. No. 202,107  
Int. Cl. B65d 45/30, 45/32

U.S. Cl. 292-258

4 Claims



A lock for garbage can covers, which in one form is a strap which extends across the top of the can, engaging the cover, with loop formations on the ends of the strap which are adapted to fit within the confines of the handles carried by the garbage can or container, there being means on the outer leg of the loop releasably to engage the bases of the handles, thus to lock the cover in place. Specifically, the outer leg of the loop carries indentations into which the bases of the handles fit, and the loop is narrow enough to permit the same to be moved toward the garbage can, thus to release the handles from the indentations. An alternate form is provided in which the loop retaining means are on the ends of separately formed straps, which straps are secured to the top of the cover.

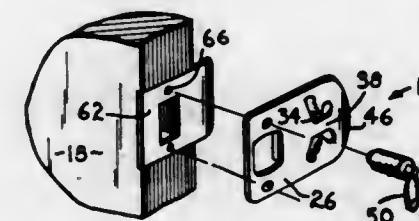
3,731,965

#### DOOR LOCK

Archie D. Adkison, Jr., R. R. 22, Parkville, Mo.  
Filed Dec. 13, 1971, Ser. No. 207,478  
Int. Cl. E05c 19/18

U.S. Cl. 292-292

5 Claims



A lock for use with a door having a latch which is adapted to be received in a notch located in the door frame can be utilized either as a permanently-installed lock or as a portable

lock that can easily be moved to various locations. A planar member is adapted to be disposed between the door frame and the door when the latter is in closed position. A laterally extending tab is disposed at a right angle to the planar member and is adapted to be received in the notch. A pair of slots in the member are mirror images of each other and diverge away from a divider element that lies in a horizontal plane passing through the tab. Each slot is configured to present a plurality of seats for receiving a keeper pin adjacent the door, when the latter is closed, to present a dead bolt lock. By simply turning the member 180° the lock can accommodate either a left or right-hand opening door with the opposite slot being utilized for each position of the member. A housing is normally disposed in the notch of a door frame and is permanently secured to the frame by a pair of fasteners. The planar member has a pair of arms which are adapted to be disposed on either side of the notch and by removing the housing and inserting the fasteners through appropriate openings in the aforementioned arms, the lock apparatus may be permanently mounted on the door frame.

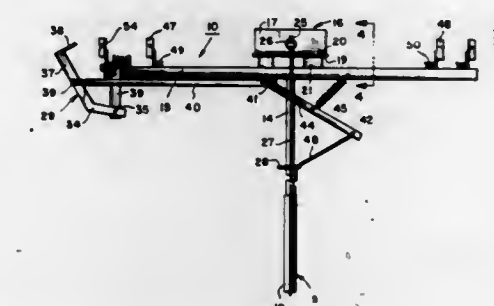
3,731,966

#### APPARATUS FOR CHANGING FLUORESCENT LIGHTING TUBES AND THE LIKE

Steve Nagy, 248 15th Street, Richmond, Calif.  
Filed May 10, 1971, Ser. No. 141,888  
Int. Cl. H10k 3/32

U.S. Cl. 294-20

8 Claims



Apparatus for changing from the ground level fluorescent lighting tubes of suspended ceiling fixtures which are otherwise inaccessible for such change except from a ladder or scaffold. The apparatus includes an elongated pole having sufficient length to reach a ceiling fixture, and an elongated longitudinally extending carrier is mounted upon the pole so as to be manipulated thereby. A tube holder having a pair of jaws selectively movable between open and closed positions is mounted upon the carrier and extends upwardly therefrom. The holder is adapted to releasably receive a fluorescent tube for removal and replacement thereof, and when gripping such tube, supports the same in a generally horizontal longitudinally disposed orientation. A fixture stop is supported by the carrier adjacent one end thereof and it is movable with respect thereto and with respect to the holder in generally longitudinal directions between positions in which it is remote from a fixture and in engagement therewith to enforce longitudinal displacements thereof relative to the holder and any tube supported thereby so as to urge one end of the tube against a compression socket so as to force the same into a retracted position, thereby permitting the opposite end of the tube to be inserted into the socket therefor.

3,731,967

#### ROOF WALKWAY FOR TRUCK CABS

Donald L. Hughes, Berea, Ohio, assignor to Sealed-Unit Services, Inc., Cleveland, Ohio  
Filed Aug. 25, 1971, Ser. No. 174,902  
Int. Cl. B60r 9/04

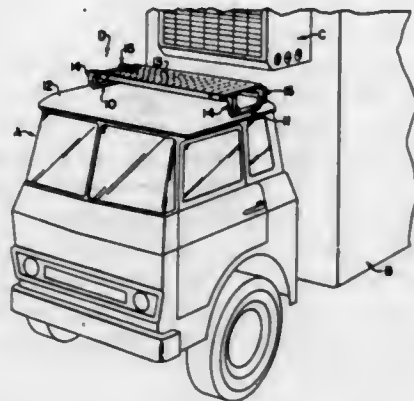
U.S. Cl. 296-1 R

3 Claims

A walkway with universal mounting means for mounting on the top of truck cabs and the like of different sizes and shapes.



The walkway has a platform with receptacles at each end that receive a slidable bar on the top of each of four legs. The legs may be adjusted in the sockets to various spacings depending on the width of the cab. Mounting brackets are secured to opposite sides of the cab top usually at the curved edge portions



thereof so as to transfer the load of the walkway as directly as possible to the cab frame. The legs are connected to the brackets by bolts at connection points located along an axis at each end of the walkway so that any number of tilted positions of the mounting brackets can be accommodated depending on the curvature at the edge of the cab.

3,731,968

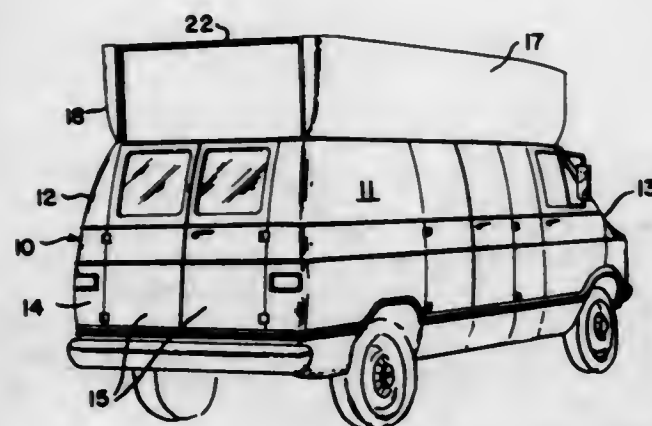
**CARGO VEHICLE CONSTRUCTION**

Robert Duffield, R. D. No. 2, Box 178, New Alexandria, Pa.  
Filed June 4, 1971, Ser. No. 150,145

Int. Cl. B60p 3/42

U.S. Cl. 296-10

4 Claims



A convertible van construction is provided having a body with a pair of opposed side walls and a pair of end walls, one of said walls having access means into the van interior, said side and end walls defining an open top of said body, a pair of roof members hinged to the top edges of the two opposed side walls for selectively opening and closing said open top of said body, said pair of roof members being of generally equal size and shape and seal means at the edges of said roof members which join on closing.

3,731,969

**AERODYNAMIC DEFLECTOR**

Johann T. Biddell, London, Ontario, Canada, assignor to Trail-Air Scoop Limited

Filed May 12, 1971, Ser. No. 142,467

Claims priority, application Canada, Nov. 16, 1970, 098171

Int. Cl. B62d 35/00

U.S. Cl. 296-1 S

10 Claims

An aerodynamic body for disposition on the roof of an automobile is disclosed. The body is essentially wedge shaped

with side skirts and having a curved rising surface for causing the wind to flow over and around a trailer being pulled by the



automobile to thereby reduce the wind drag on the trailer and improve trailer tracking during travel.

3,731,970

**MOTOR HOME CONSTRUCTION**

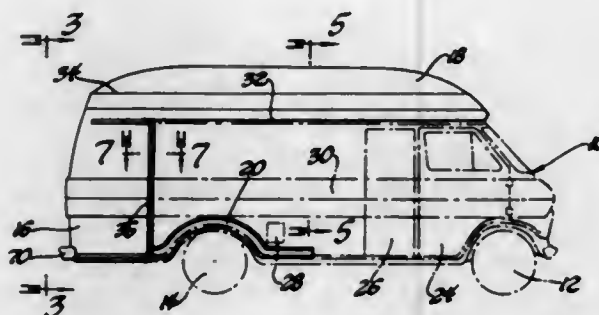
Ronald R. Frank, 24 Van Dyke, Marlette, Mich., and Raymond C. Frank, 4083 Second Street, Brown City, Mich.

Filed March 4, 1971, Ser. No. 121,062

Int. Cl. B60p 3/32

U.S. Cl. 296-23 R

12 Claims



The means and method of constructing a motor home from a vehicle having a delivery van body style and which includes cutting away the old roof and the back end of the van body, providing an integral replacement roof and back end extension for attachment to the cut-away body with the new roof carried on the edges of the old one, over the drip molding, and the side edges of the extension having a fastening flange bonded to it that is attached to the intumed edge at the back end of the cut-off van body. Internal wall finishing is by use of full wall panels, formed and fitted for cupboard space, and frame extensions afford additional storage space.

3,731,971

**FOLDING TABLE WITH BENCHES**

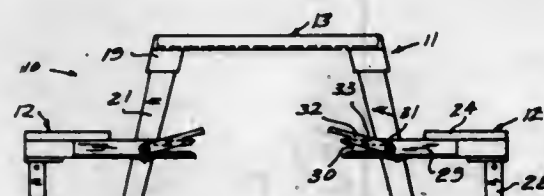
Carl Sjogren, 169 Pearl St., Frewsburg, N.Y.

Filed Dec. 2, 1971, Ser. No. 204,213

Int. Cl. A47b 39/00

U.S. Cl. 297-159

1 Claim



A table combined with a pair of benches is joined and articulated for collapse simplifying transport and storage.

3,731,972

**SAFETY SEAT**

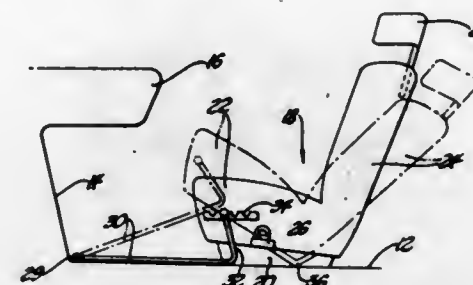
Howard B. McConnell, Pontiac, Mich., assignor to Sam Allen & Son, Pontiac, Mich.

Filed Oct. 4, 1971, Ser. No. 186,329

Int. Cl. B60r 21/10

U.S. Cl. 297-216

3 Claims



A safety seat construction for automotive and other vehicle use which includes mechanical means for causing the vehicle seat bottom to be raised at the front and the seat back to be tilted backwardly, and which includes in combination therewith a shoulder restraining device that is mounted on the seat back to hold a person against the seat back as it is tipped rearwardly.

3,731,973

**VALVE ASSEMBLY FOR EXHAUST SYSTEM**

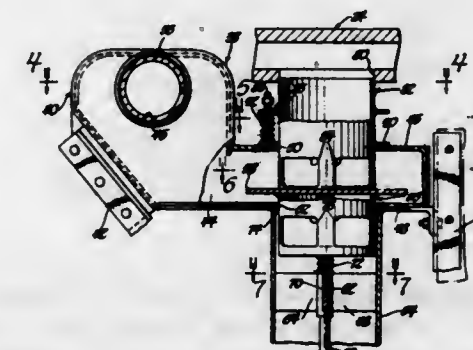
Harold L. Kermode, Richfield, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 30, 1971, Ser. No. 185,128

Int. Cl. B60p 1/00

U.S. Cl. 298-1 H

2 Claims



A valve assembly for an exhaust system of a dump vehicle having a chassis supporting an operator's cab and a pivoted material-handling body. The valve assembly is carried by the chassis and adapted to direct exhaust gases upwardly into the hollow interior of the body when the latter is in a lowered load-retaining position and is adapted to direct exhaust gases toward the ground when the body is in a raised dumping position.

3,731,974

**SHOCK ABSORBER FOR TILT-TYPE TRAILER**

George T. Stafford, Jr., P.O. Box 2805, Birmingham, Ala.

Filed April 30, 1971, Ser. No. 138,974

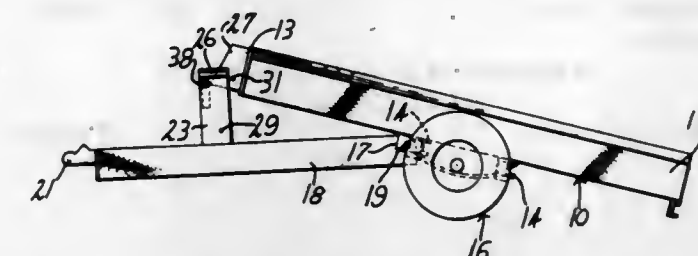
Int. Cl. B60p 1/24

U.S. Cl. 298-17 R

4 Claims

Uprstanding plates mounted between tilt type trailer bed and draw bar frame with adjacent surfaces of plates slidably engaging each other. At least one plate is carried by the draw bar

frame and at least another one of plates is carried by the trailer bed. Adjustable means retains adjacent plates in frictional



contact with each other and restrains relative movement between adjacent plates as trailer bed moves toward tilted position.

3,731,975

**APPARATUS AND PROCESS FOR UNDERSEA MINING OF MINERAL BEARING SAND AND GRAVEL**

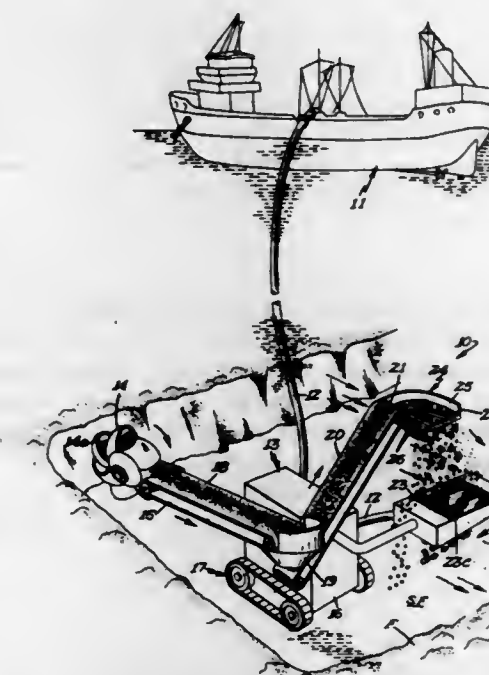
Leonard A. Lindelof, Minneapolis, Minn., assignor to QVA Corporation, Minneapolis, Minn.

Filed Nov. 18, 1971, Ser. No. 199,986

Int. Cl. E02t 7/00

U.S. Cl. 299-8

5 Claims



A process and mobile apparatus for the undersea mining of sand and gravel deposits containing gold particles and associated heavy minerals such as platinum, magnetite, etc., includes an excavating device which continuously excavates the sand and gravel material. Conveyor means receive the excavated sand and gravel and conveys the material to a discharge point which is located a predetermined distance above and a predetermined distance upstream from a screen type collection device. The predetermined difference in elevation and the downstream spacing between the collection device and the discharge point is so related to the ambient ocean current adjacent the ocean floor that separation of the sand and gravel discharged from the discharge point takes place as a result of the action of gravity and the subsurface ambient current acting on the material. The gold and associated metal particles (platinum, magnetite, etc.) and sand and gravel particles which are slightly coarser than the gold particles will be moved downstream by the ambient ocean current as the material falls and will be received by the collection device, while the sand particles will be carried downstream beyond the collection device, and the more coarse materials will fall upstream with respect to the collection device.



3,731,976

## MINING METHODS USING EQUIPMENT SUSPENDED FROM ROOF-MOUNTED RAILS

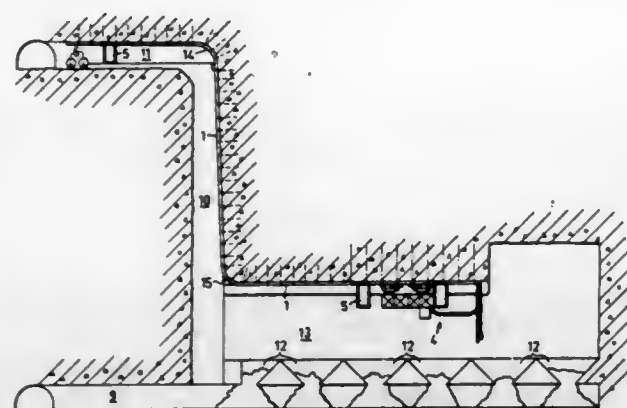
Roland Granskog, and Rolf Degerman, both of Skelleftea, Sweden, assignors to Linden-Alimak AB, Skelleftea, Sweden

Filed Sept. 14, 1970, Ser. No. 71,939

Int. Cl. E21c 35/20

U.S. Cl. 299-18

15 Claims



A method for mining in barren rocks or orebodies in order to bring about substantially horizontal drifts or upwardly inclined drifts having an inclination less than the angle of repose of the loosened material, and vertical mining of underground cavities, respectively and that said mining is carried out with a mining unit, which is movably suspended on rail means in the roof of said drifts or underground cavity, and that said loosened material is removed by a loading unit and a haulage carriage, which also are suspended on said rail means for moving thereon either individually or joined together.

3,731,977

## EQUIPMENT FOR PREPARING UNDERGROUND DRIFTS, E.G. TUNNELS, CHANNELS, SHAFTS, ETC.

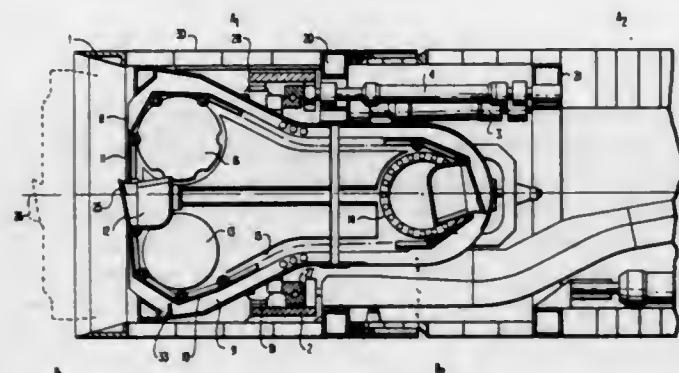
Miklos Benedek; Tamas Irsai; Sandor Fekete; Sandor Ambrus; Istvan Savolyi, and Zoltan Both, all of Budapest, Hungary, assignors to Banyaszati Tervezo Intezet, Budapest, Hungary

Filed Feb. 26, 1971, Ser. No. 119,227

Int. Cl. E21d 9/00

U.S. Cl. 299-31

7 Claims



The invention relates to equipment for producing underground drifts, by means of which a much bigger drift driving progress can be realized than up till now, under practically optional soil conditions and groundwater conditions and in addition without any previous drainage. The propulsion of the lining units requires less demand on force and at the same time a perfect waterproofing can be achieved between the individual lining units and between the cutting shield and the adjacent lining unit.

3,731,978

## HUBCAP FOR A VEHICLE WHEEL ASSEMBLY

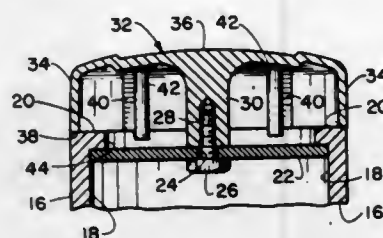
Dalton M. Davis, Palos Verdes, Calif., assignor to Pyramid Enterprises, Inc., Torrance, Calif.

Filed Dec. 21, 1970, Ser. No. 100,097

Int. Cl. B60b 7/06

U.S. Cl. 301-108 SC

3 Claims



A hubcap for the central hub opening of a spider in a vehicle wheel assembly which employs a plurality of aligning pins to insure the exact positioning of the hubcap upon the spider.

3,731,979

## BRAKE ANTI-SKID SYSTEM

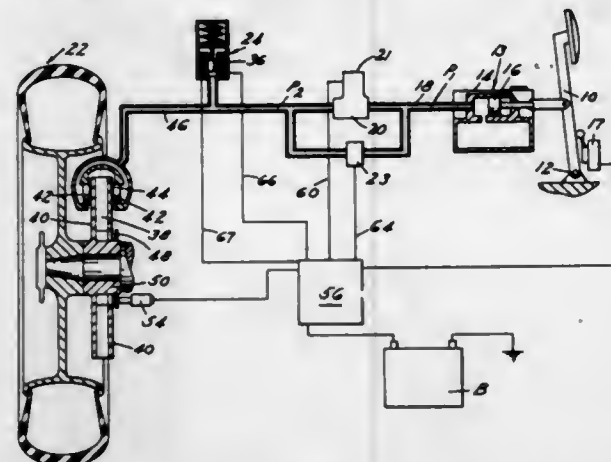
Joseph J. Mikalla, Southfield, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 873,428, Nov. 3, 1969, abandoned. This application March 19, 1971, Ser. No. 125,985

Int. Cl. B60t 8/12

U.S. Cl. 303-21 F

14 Claims



An electromagnetic sensing device on the wheels of a vehicle produces a voltage that is used to keep a relay switch in a central power circuit open. Upon loss of this voltage due to stoppage of a wheel during skidding, the power circuit closes a solenoid valve in the hydraulic brake line, preventing the brake fluid pressure from dropping, and thus keeping the brake disc from rotating. Simultaneously, a square wave generator in the power circuit produces a square wave voltage to activate a solenoid coil operating a piston for automatically cycling the pressure in the brake line, maintaining the brake torque at or near the point of critical slip.

3,731,980

## ANTISKID CONTROL SYSTEM

Werner Fink; Dieter Kircher, and Jutta Mittelbach, all of Frankfurt, Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed May 10, 1972, Ser. No. 251,898

Claims priority, application Germany, May 27, 1971, P 21 26 391.2

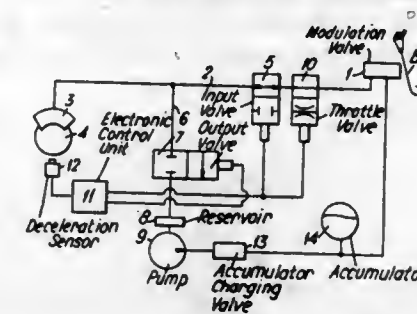
Int. Cl. B60t 8/06

U.S. Cl. 303-21 F

7 Claims

There is disclosed a control valve arrangement for an antiskid control system which substantially eliminates the abrupt

pressure buildup on the brake circuit at the end of each antiskid control cycle when the vehicle wheel has reached a certain reacceleration value. A throttle valve is added to a conventional control valve arrangement so that upon achieving



the desired reacceleration value the braking pressure gradually builds up on the brake circuit and thereby eliminates interfering signals in the control signals produced by the antiskid electronic control unit and vibrations of the vehicle itself.

3,731,981

## CONTROL VALVE AND SYSTEM

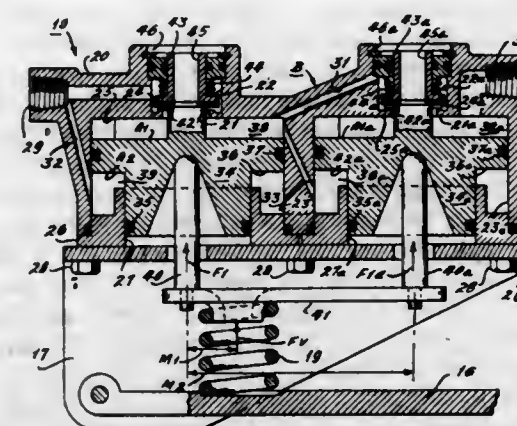
Richard C. Bueler, Des Perre, Mo., assignor to Wagner Electric Corporation, Newark, N.J.

Filed May 21, 1971, Ser. No. 145,795

Int. Cl. B60t 8/18

U.S. Cl. 303-22 R

46 Claims



A control valve for use in a vehicle load condition responsive brake system is provided having a pair of proportioning members connected in series flow relation between a fluid pressure source and a pressure responsive brake and also subjected to variable forces directly related to vehicle load conditions. The proportioning members are generally operable to perform proportioning operations on the fluid pressure selectively applied from the fluid pressure source to the brake and responsive to the variable forces for varying the magnitudes of the applied fluid pressure at which the proportioning operations occur.

3,731,982

## FLUID PRESSURE OPERABLE BRAKE CONTROL VALVES

Philip Norman Paginton, London, England, assignor to Westinghouse Brake and Signal Company, Limited, London, England

Filed May 28, 1971, Ser. No. 147,749

Claims priority, application Great Britain, June 9, 1970, 27,924/70

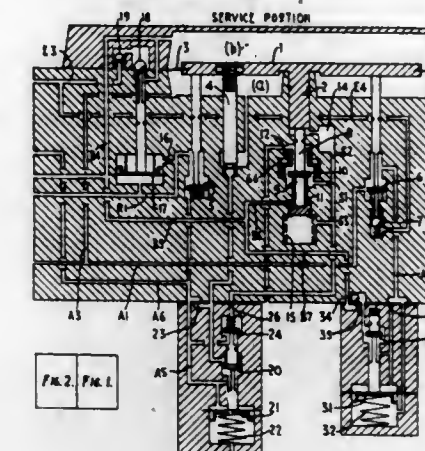
Int. Cl. B60t 15/22

U.S. Cl. 303-33

5 Claims

A triple valve for fluid operable braking is provided with an additional emergency braking valve portion which has its own

pressure responsive member which is responsive to at least a predetermined reduction of brake pipe pressure relative to quick action chamber pressure in a given period of time to open a brake cylinder valve to apply pressure to the brake cylinder from a reservoir and open a vent valve to vent the



brake pipe, the vent valve and the brake cylinder valve being arranged in line and having between them an accelerated release valve which on return movement of the pressure responsive member past its initial position, is allowed to open to connect brake cylinder to brake pipe until the latter are within a predetermined pressure of each other.

3,731,983

## BRAKE CONTROL VALVE APPARATUS

Jack Washbourn, London, N1 9AJ, England, assignor to Westinghouse Brake and Signal Company Limited, London, England

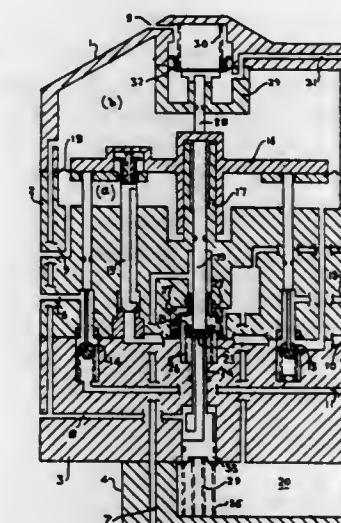
Filed Sept. 24, 1971, Ser. No. 183,408

Claims priority, application Great Britain, Oct. 16, 1970, 49,178/70

Int. Cl. B60t 15/18

U.S. Cl. 303-33

7 Claims



A fluid operable triple valve for brake control means in which stability in the brake-applied equilibrium or lap position on the one hand and stability in the released position on the other hand are each provided by a spring acting to opposed movement of the pressure responsive diaphragm of the valve and fluid operable means being provided to remove the action of the spring in each case as soon as its thrust has been overcome by the pressure differential across the diaphragm.



3,731,984

# MAGNETIC BEARING BLOCK DEVICE FOR SUPPORTING A VERTICAL SHAFT ADAPTED FOR ROTATING AT HIGH SPEED

Helmut Habermann, 2 Allée Principale, Forêt de Vernon par 27, France

Filed Oct. 21, 1971, Ser. No. 191,258

Claims priority, application France, Oct. 22, 1970, 7038162

Int. Cl. F16c 39/06

U.S. Cl. 308—10

11 Claims



A shaft is suspended by upper and lower bearing blocks of the magnetic type. The upper and/or lower blocks are provided with a detector to sense when the shaft tends to leave a coaxial position in the associated block and a correction signal is generated and applied.

3,731,985

# BALL BEARINGS

Albert Martin De Gaeta, 133 84th Street, Brooklyn, N.Y.

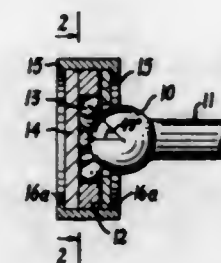
Continuation-in-part of Ser. No. 759,560, Sept. 13, 1968,

abandoned. This application Feb. 24, 1971, Ser. No. 118,257

Int. Cl. F16c 9/06

U.S. Cl. 308—194

12 Claims



A ball bearing capable of taking both radial and axial loads comprises an integral ball on the end of a shaft engaging a full circular complement of balls running in a cylindrical outer race ring and confined axially by end plates at opposite ends of the outer race ring. The outer race ring and end plates are held in an outer case formed of metal having a lower modulus of elasticity than the outer race ring and end plates. A second bearing system comprises a shaft fixed axially on at least one end of a hollow cylinder in which two balls are confined. A finger extends through an opening in the side wall of the cylinder and between the two balls to take axial thrust on the shaft in either direction. The shaft is rotatably supported by radial bearings.

3,731,986

# DISPLAY DEVICES UTILIZING LIQUID CRYSTAL LIGHT MODULATION

James L. Ferguson, Kent, Ohio, assignor to International Liquid Xtal Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 113,948, Feb. 9, 1971,

abandoned. This application April 22, 1971, Ser. No. 136,441

Int. Cl. G02t 1/18

U.S. Cl. 350—150

11 Claims



Optical display devices for converting electrical intelligence into optical images with the use of a shutter device comprising a layer of liquid crystal material sandwiched between opposing parallel plates coated with transparent conducting films. These plates, with the liquid crystal material therebetween, are disposed between and parallel to a pair of polarizers such that when an electrical potential is established across the conducting films and the liquid crystal layer, the device will change from a light transmitting to opaque medium, or vice versa, depending upon the orientation of the two polarizers. By forming the two conducting films in the shape of a desired optical image, that image can be made to appear or disappear, depending upon whether a potential is established between the conducting films. Furthermore, by creating separate conducting areas, as by etching the conducting films, any given number of conductive regions can be switched ON while other regions are not affected to produce any one of a number of different images with the same liquid crystal sandwich assembly. Finally, by etching a pattern of strips of transparent conducting material on the two opposing plates, by orienting the strips on the respective plates at right angles to each other, and by selectively applying pulsed voltages to the strips on the respective plates, the area of liquid crystal layer can be scanned point by point to produce with the same display any one of a number of optical images such as numerals, letters or the like. The invention has particular utility in computer and calculator read-outs, for example, since the display can be energized at a voltage level compatible with that used to drive the integrated circuitry used in such devices without the necessity for relatively high voltage driving circuitry.

3,731,987

# ZOOM LENS MOUNT ASSEMBLY WITH MEANS FOR CLOSE-UP FOCUSING

Yozo Iida, 786 Izumi Komae-machi, Kitatama-gun, Tokyo, and Hideyo Nemura, 2-256 Yohgo-machi Tamagawa, Setagaya-ku, Tokyo, both of Japan

Filed Aug. 13, 1971, Ser. No. 171,530

Claims priority, application Japan, Aug. 18, 1970, 45/71709

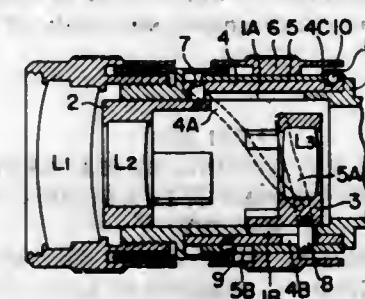
Int. Cl. G02b 7/10

U.S. Cl. 350—187

6 Claims

A zoom lens assembly includes a focusing lens system, a magnification varying lens system consisting of two movable lens groups, and an image forming lens system. Movement of an operating ring in the assembly simultaneously moves the

two movable lens groups according to a predetermined relationship. The operating ring also adjusts the distance between



the two movable lens groups so that the simultaneous movement according to the predetermined relationship effects a zooming action or achieves focusing for ultra-short distances.

3,731,988

# MAGNIFYING LENS DEVICES

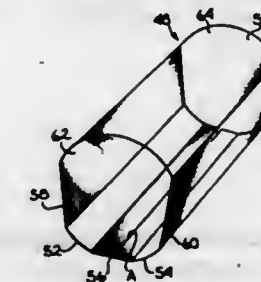
Robert D. Lynch, 3520 Fifth Avenue, Los Angeles, Calif.

Filed Aug. 27, 1971, Ser. No. 175,499

Int. Cl. G02b 3/06, 25/00

U.S. Cl. 350—188

5 Claims



Magnifying devices for magnifying newsprint and the like having a generally cylindrical shape with one or more flattened areas parallel to the axis of the cylinder. The magnifying devices are of a transparent material with smooth and clear cylindrical surfaces and with at least one flattened surface having a frosted like appearance. The magnifying devices are used by placing the frosted surface against the newsprint or similar matter to be magnified and the magnified matter is viewed through one of the clear cylindrical surfaces. The frosted surface does not affect the visual appearance of the matter being magnified and creates a magnifying device of interesting physical appearance which is not readily observably scratched on the frosted surface. An alternate shape utilizing such a frosted surface is also disclosed.

3,731,989

# WIDE ANGLE PHOTOGRAPHIC LENS SYSTEM

Yoshiyuki Shimizu, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

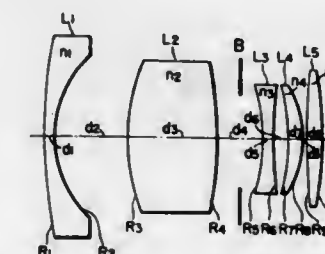
Filed Dec. 9, 1971, Ser. No. 206,358

Claims priority, application Japan, Dec. 15, 1970, 45/111286

Int. Cl. G02b 9/60

U.S. Cl. 350—216

3 Claims



A wide angle photographic lens system comprises five single lenses and provides for a relative aperture of F/2.8, an angle of

field of 62° and a back focus about 1.1 times as long as the focal length. As viewed in the direction of travel of light, the first of the five lenses is a negative meniscus lens convex to the object side of the system, the second lens a positive biconvex lens, the third lens a negative biconcave lens, the fourth lens a positive meniscus lens concave to the object side, and the fifth lens a positive biconvex lens. An aperture stop is interposed between the second and third lenses. When the total focal length of the lens system is represented by  $f$ , the system satisfies the conditions that the air gap between the first and second lenses be in the range from  $0.2f$  to  $0.6f$ , that the air gap between the second and third lenses be in the range from  $0.15f$  to  $0.25f$ , that the radius of curvature of the image-facing surface of the second lens have an absolute value in the range from  $0.9f$  to  $1.5f$ , and that the back focus of the system be in the range from  $0.9f$  to  $1.2f$ .

3,731,990

# SYMMETRICAL COPY LENSES

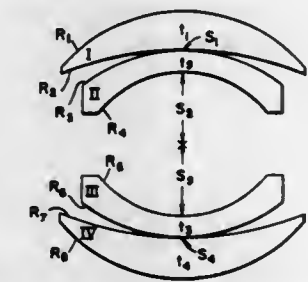
Lynn L. Van Orden, Holley, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Oct. 28, 1971, Ser. No. 193,289

Int. Cl. G02b 9/36, 17/08

U.S. Cl. 350—221

16 Claims



A series of four element photographic lenses for use at or near unity magnification, the lenses being in the form either of four elements in a symmetrical pattern or two elements and a mirror.

3,731,991

# REFLECTING MEANS FOR BEAM CONTROL UTILIZING MOVABLE MEMBERS FOR ADJUSTMENT

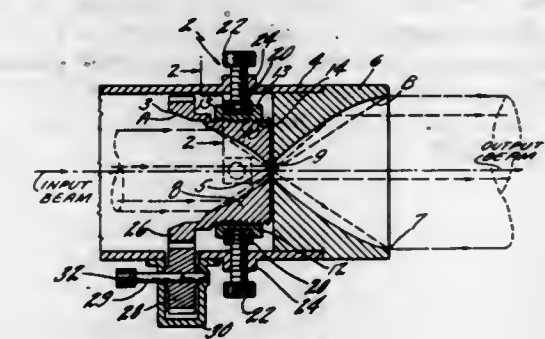
Joe F. Arnold, North Palm Beach, Fla., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed March 3, 1969, Ser. No. 804,385

Int. Cl. G02b 5/10

U.S. Cl. 350—294

4 Claims



A reflecting device having a housing with a fixed body and a second movable body mounted thereon, each body having a reflecting passage means extending therethrough with each passage having an axis. Said second movable body being mounted so that the axes of each passage means can be aligned and the distance between the fixed body and movable



body can be controlled. Each reflecting passage has a small diameter opening and a large diameter intersecting the sides of its respective body. In their mounted position the small diameter openings face each other. The surface of the reflecting passage means of said second movable body being formed so that an input beam entering the large diameter opening will have the rays of the beam focused so as to pass through the small diameter opening and have the focal point lie outside the first passage. The surface of said reflecting passage means of said first body being formed as a reflecting surface so that the beam leaving the focal point will have the rays deflected to form a collimated beam of a different diameter than that of the input beam. When this device is used as an aerodynamic window in a gas dynamic laser, the output beam can be of the same diameter as the input beam.

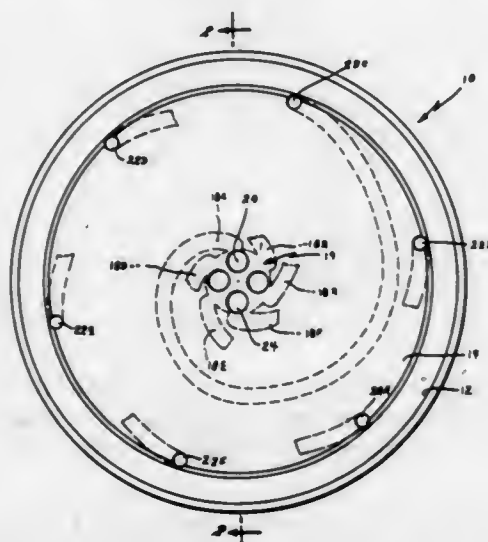
3,731,992

**SPIRAL GROOVED LIQUID COOLED LASER MIRROR**  
Dennis N. Mansell, Palos Verdes, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed April 6, 1972, Ser. No. 241,560  
Int. Cl. G02b 5/08

U.S. Cl. 350—310

4 Claims



A liquid cooled laser mirror having a mirror structure and a cover. A plurality of spiral grooves are located within the mirror structure while entrance and exit ports are located within the cover. Liquid enters through the cover entrance ports, circulates through the spiral grooves, and exits through the cover exit ports thereby cooling the mirror.

3,731,993

**LENS MATERIAL FOR REDUCING EFFECTIVE COLOR VISION**

Fritz Artur Piringer, Vienna, Austria, assignor to National Patent Development Corporation, New York, N.Y.

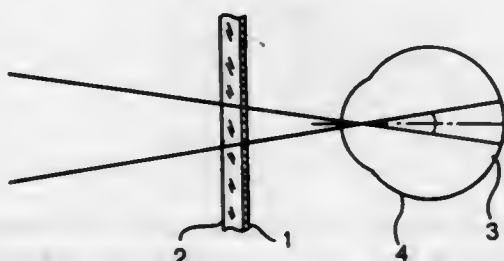
Continuation of Ser. No. 866,293, Oct. 14, 1969, abandoned.

This application Nov. 9, 1971, Ser. No. 197,092

Int. Cl. G02c 7/10; B43d 5/06; C03c 17/00

U.S. Cl. 351—165

6 Claims



A spectacle lens is provided for a person with deficient color vision, the lens having a support with a transparent

mosaic on the support constituted by a plurality of juxtaposed small color filter regions of different colors and respective spectral transmission factors which differ in magnitude in inverse proportion to the diagnosed sensitivity of the intended user.

3,731,994

**METHOD OF RECORDING, DUPLICATING AND REPRODUCING IMAGES IN THE FORM OF RELIEF PATTERNS**

Richard Wick, Munich, and Friedrich Bestenreiner, Grunwald, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

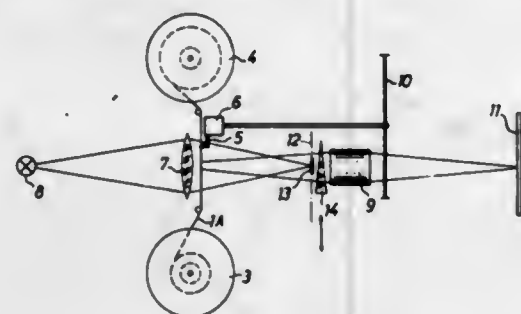
Filed July 22, 1971, Ser. No. 165,150

Claims priority, application Germany, July 25, 1970, P 20 37 038.1

Int. Cl. G03b 19/18, 21/32

U.S. Cl. 352—38

13 Claims



The exposed emulsion layer on a transparent carrier of motion picture film is converted into a relief pattern which is thereupon transferred onto a master record. The master is used for the making of duplicate films and the images represented by relief patterns on the duplicate films are reproduced by a Schlieren process or a phase contrast process.

3,731,995

**METHOD AND APPARATUS FOR PRODUCING ANIMATED MOTION PICTURES**

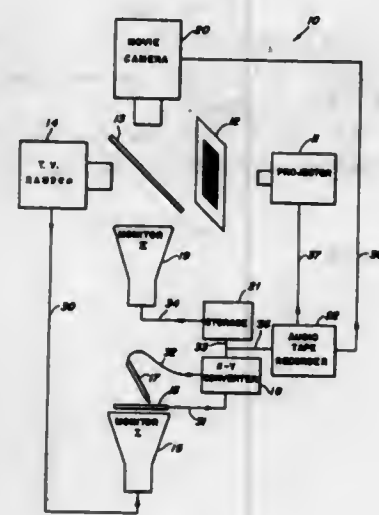
Leonard Reiffel, Chicago, Ill., assignor to Instructional Dynamics, Inc., Chicago, Ill.

Filed Oct. 29, 1970, Ser. No. 84,964

Int. Cl. G03b 15/00

U.S. Cl. 352—87

9 Claims



An electrical-optical system for displaying background images, superimposing manually generated animated drawings electronically on such background images, and recording the

composite double images on a movie film. The background images initially are reproduced optically or electronically in order to superimpose the animated drawings thereon in exact registration. The background images recorded on the movie film are made by direct optical projection to avoid distortion produced within the electronic system.

3,731,996

**ANIMATED DISPLAY SYSTEM**

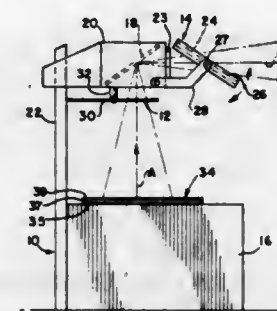
Anthony Siksa, 2705 Lahser Rd., Bloomfield Hills, Mich.

Filed Dec. 27, 1971, Ser. No. 211,861

Int. Cl. G03b 21/32

U.S. Cl. 352—87

14 Claims



A system for animating a picture illuminated by a light source. The system includes a rotary sheet of material having linearly oriented molecules and a lens element of optically inactive material angularly positioned in the path of light from said light source for producing the animation.

3,731,997

**FILM COUNTER DEVICE FOR MOTION PICTURE CAMERAS**

Yozo Iida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

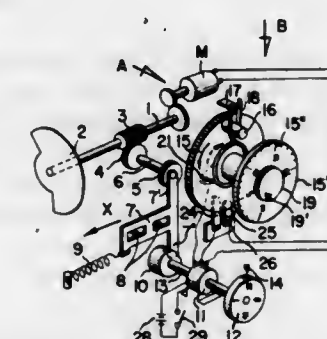
Filed Sept. 29, 1971, Ser. No. 184,783

Claims priority, application Japan, Sept. 30, 1970, 45/96786

Int. Cl. G03b 21/36

U.S. Cl. 352—91

6 Claims



A motion picture camera film counter device which enables film once exposed to be rewound and supplied for a second exposure by exactly the same amount as that subject to the first exposure. The film counter device is characterized by a normal-reverse rotation change-over switch for changing over a motor circuit between a normal rotation mode and a reverse rotation mode with the aid of brushes connected in the motor circuit and cooperable with an electrically conductive member and its insulators provided on a counter member mounted for rotation on a shaft member, the counter member being engaged with and disengaged from a clutch member in response to the mode of the change-over switch.

3,731,998

**REMOTE FOCUSING ASSEMBLY**

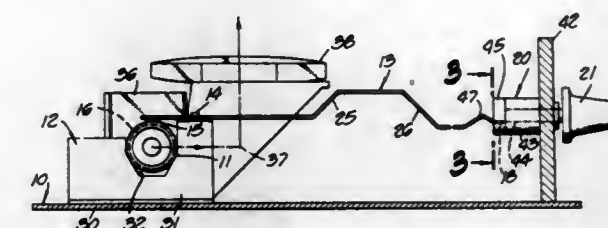
Hans Graafmans, Huntington Beach, Calif., assignor to Technicolor, Inc., Hollywood, Calif.

Filed May 14, 1971, Ser. No. 143,447

Int. Cl. G03b 3/00

U.S. Cl. 352—140

6 Claims



There is disclosed herein a remotely operable focusing assembly for motion picture projectors and the like. In certain types of motion picture projectors and motion picture viewers, the placement of the optical system and projector lens is such that it is difficult to provide a suitable linkage or arrangement for moving the lens for focusing purposes. The present assembly includes a relatively simple pivotally mounted arm with an eccentric drive at one end for moving a relatively short-throw lens at the other. The arrangement is such that the arm may be bent or otherwise disfigured so as to pass over, under, or around obstructions within the projector. The arrangement allows a substantial amount of eccentric rotation in obtaining full travel of the lens to thereby allow fine adjustment of focus.

3,731,999

**FILMSTRIP VIEWER ATTACHMENT FOR TAPE RECORDER**

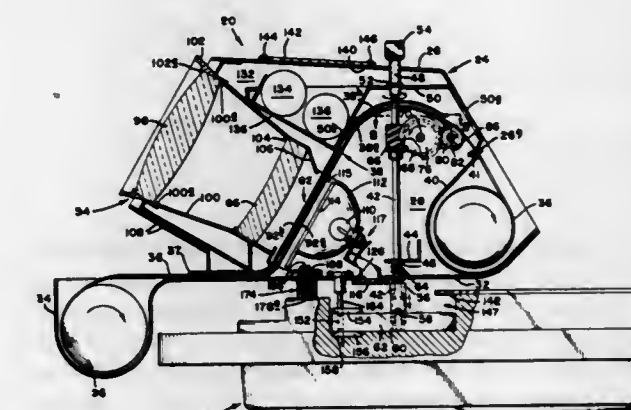
Daniel B. Ventre, 24 Anderson Street, Stamford, Conn.

Filed March 4, 1971, Ser. No. 121,030

Int. Cl. F03b 31/06

U.S. Cl. 353—18

13 Claims



A filmstrip viewer which is removably mounted to and driven by a tape recorder, particularly of the cassette type, to provide a system for presenting synchronized pictures and sound. A drive shaft in the viewer is removably connectable to and driven in synchronism with the spool of a tape cassette, cartridge or reel loaded on the tape recorder. The drive shaft is geared to sprocket wheels which advance the filmstrip through the viewer, and the gearing provides for frame-by-frame advancement with an appropriate time delay for the incorporation of the sound presentation. The viewer may also be provided with an improved lamp socket, an automatic illumination switch, and with manual means for advancing and adjusting the filmstrip position.



3,732,000

## SOUND-SLIDE PROJECTOR

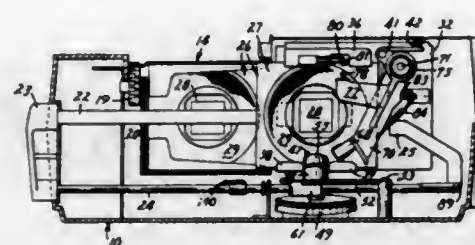
Leland W. Annett, Crystal, and George J. Wallin, St. Paul, both of Minn., assignors to Minnesota Mining & Manufacturing Company, Saint Paul, Minn.

Filed March 30, 1972, Ser. No. 239,460

Int. Cl. G03b 31/06, 21/00

U.S. Cl. 353-19

7 Claims



A sound-slide projector for use with a sound-slide, wherein the sound media is a thin, flexible disk having a magnetizable coating on one face which disk is supported at a central opening therethrough on the sound-slide frame for rotation about the photographic slide and wherein a tapered capstan and a pressure roller are provided to drive the disk between their peripheries while a magnetic transducer is moved radially with respect to the disk.

3,732,001

## AUTOMATIC LENS FOCUSING METHOD AND APPARATUS

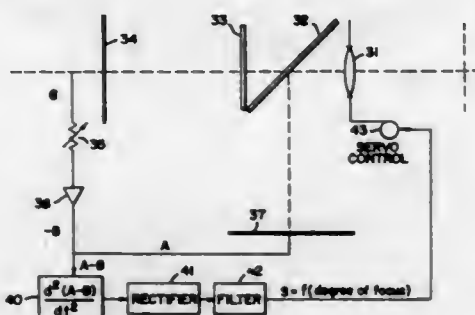
William J. Harrison, 116 Longfellow Road, Mill Valley, Calif. Continuation of Ser. No. 691,405, Dec. 18, 1967, abandoned.

This application Feb. 22, 1971, Ser. No. 117,815

Int. Cl. G03b 3/10

U.S. Cl. 353-101

9 Claims



An automatic lens focusing method and apparatus is disclosed wherein advantage is taken of the geometrical optics of out-of-focus images by varying the effective aperture of an image forming lens to produce relative motion of the out-of-focus portions of the formed image. A motion detector at the imaging plane generates a signal in response to motion of the out-of-focus portions of the formed image which may then be used for control of the image-forming lens to provide optimum focusing or to provide range finding information.

3,732,002

## PHOTOGRAPHIC RECORDER FOR DIE SORTING SYSTEM

Mordechai Wiesler, 6 Carmel Circle, Lexington; Virgil Martinovich, Eastern Point Boulevard, Gloucester, and John S. MacIntyre, 18 William Road, Lynnfield, all of Mass.

Division of Ser. No. 785,209, Dec. 19, 1968, Pat. No. 3,583,561. This application Nov. 27, 1970, Ser. No. 93,111

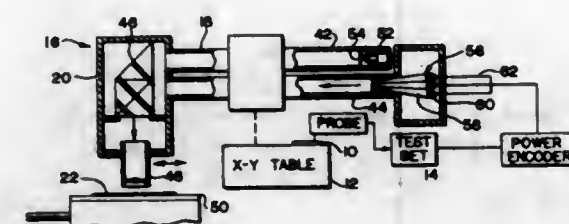
Int. Cl. G03b 27/00

U.S. Cl. 355-1

3 Claims

An electro-optical encoding device for photographically recording a coded signal representing test data of the opera-

tional characteristics of a semiconductor die. Individual light sources are optically coupled and focused towards a beam splitter through a bundle of light pipes which taper towards the beam splitter. Each light source is selectively energized by



command signals generated from a power source in response to data signal representing the operating characteristics of the semiconductor die under test. Illumination of certain one or more of the light sources results in various code combinations which are optically coupled to and recorded on a film.

3,732,003

## ELECTROSTATOGRAPHIC COMPENSATION APPARATUS

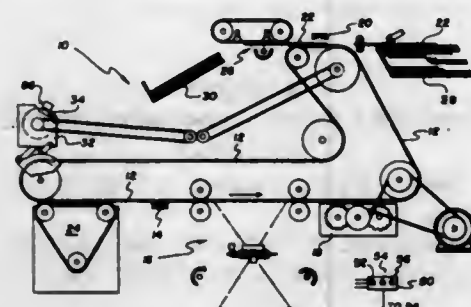
Conrad Altmann, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1971, Ser. No. 213,013

Int. Cl. G03g 15/00

U.S. Cl. 355-3

9 Claims



In an electrostatographic copying device of the type which utilizes a replaceable web having a particular sensitivity response which falls into one of a number of sensitivity response ranges, the particular sensitivity response range of each web being encoded thereon or on a cartridge in which the web is disposed, compensation apparatus adapted to alter any one of a number of operations performed with respect to a utilized web, in a manner which insures comparable copies when webs of differing sensitivity are employed from time to time.

3,732,004

## VERTICAL ELECTROSTATIC COPYING MACHINE WITH GHOST FREE IMAGE PROJECTING SYSTEM

Yorio Yamanol, and Masahiro Maeda, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sept. 10, 1970, Ser. No. 70,976

Claims priority, application Japan, Sept. 11, 1969, 44/86371

Int. Cl. G03g 15/22

U.S. Cl. 355-3

6 Claims

A vertical electrostatic copying machine includes a vertical illuminating chamber provided at its top with a horizontal original supporting window and at its bottom with a lens which focuses an image on a vertical plane by way of a mirror. The original is illuminated by a pair of curved reflector backed op-

3,732,006

## CONTINUOUS MICROFILMER TIMING CIRCUIT

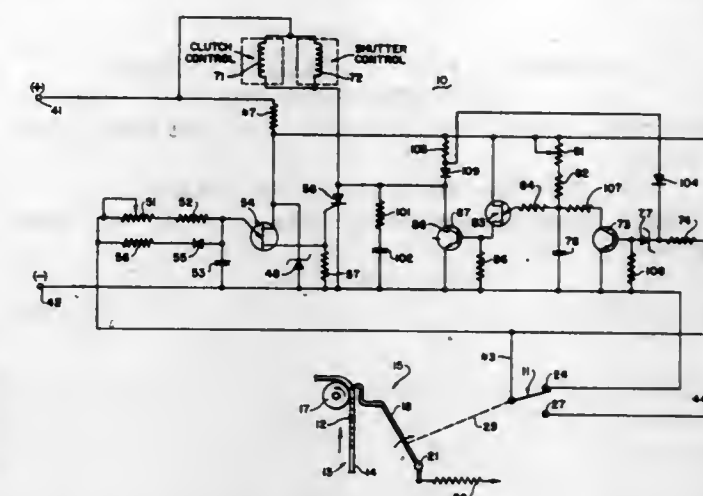
Dwight T. Howard, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 24, 1971, Ser. No. 146,232

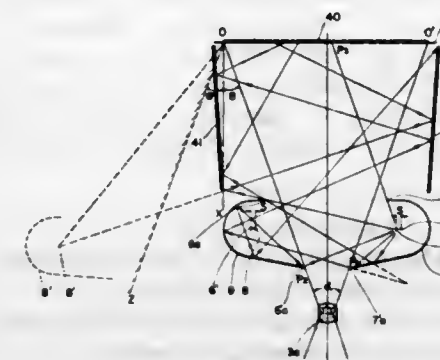
Int. Cl. G03b 21/00

U.S. Cl. 355-14

5 Claims



posite lamps at the lower part of the chamber and planar specular reflectors depending from opposite edges of the window and so inclined as to reflect the light from the lamps in a manner to prevent ghost images. The copy paper is drawn from a source thereof forward of the upper part of the illu-



minating chamber and is advanced along a loop path downwardly, rearwardly and then upwardly to discharge, and along the path it is sequentially cut, charged, exposed, developed and dried. The copy paper source may be a roll or a stack of precut sheets.

3,732,005

## INTEGRATED CIRCUIT SEQUENCER

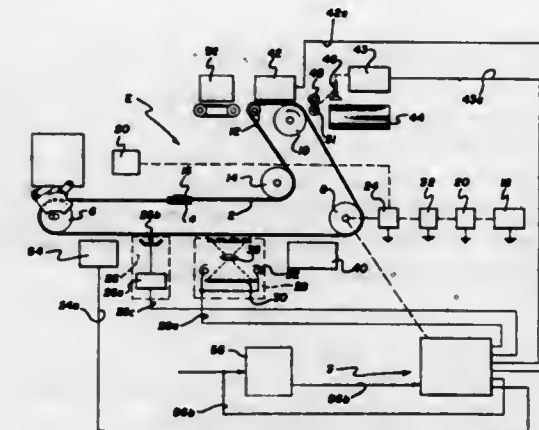
Gareth Aeron Lloyd, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 12, 1972, Ser. No. 217,093

Int. Cl. G03g 15/00

U.S. Cl. 355-14

3 Claims



Electrophotographic copying apparatus is disclosed having an elongated electrosensitive web defining a plurality of selectable image areas and movable along an endless path relative to a plurality of actuable work stations disposed along the path. Each work station is operative when actuated to perform a work operation on a selected image area of the web. The apparatus includes an electronic sequencer for sequentially actuating particular ones of the work stations to cause them to perform work operations on the web in timed relation to movement of selected image areas along the path respectively. The sequencer includes a shift register having a plurality of states, the state at any particular time being a function of the position of the web along the path and the number of copies to be made. The sequencer further includes means for producing a first signal having a frequency proportional to the rate of movement of the web along the path, a counter responsive to the first signal and having a plurality of states, the state at any particular time manifesting the total cumulative number of first signals, and decoding networks responsive to particular states of the shift register and particular states of the counter for sequentially actuating and de-actuating the actuable work stations in timed relation to movement of the web past predetermined positions along the endless path to effect sequential operation of such work stations with respect to selected image areas.

3,732,007

## METHOD AND DEVICE FOR INSTANT RECORDING OF LIGHT IMAGES WHILE OBSERVING SAID LIGHT IMAGES

Teizo Kushima, Osaka; Susumu Tanaka, Otsu-shi, and Kuniki Seino, Amagasaki-shi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

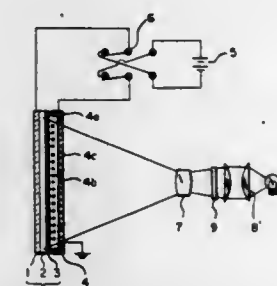
Filed Feb. 25, 1969, Ser. No. 802,056

Claims priority, application Japan, March 1, 1968, 43/12903

Int. Cl. G03g 13/04

U.S. Cl. 355-17

19 Claims



The present invention relates to a method and a device for instant recording of light images while observing said light images which makes use of a three layer photosensitive plate having photopermeability and serving as a rear screen so as to enable projected light images to be visible, and composed of a high insulating layer, a photosensitive layer having the P.I.P. character, and a conductive layer; the exposure for uniformly irradiating the overall surface of the photosensitive plate is given from one face thereof and simultaneously the voltage of an optional polarity is impressed on the photosensitive plate to



give an overall uniform charge thereto, and light images are irradiated onto the photosensitive plate and thus, while observing the light images effected on the rear screen, the voltage of opposite polarity to said polarity is impressed at any time desired to give the exposure of light images and thereby recording of light images is effected onto said photosensitive plate.

3,732,008

# **APPARATUS FOR THE PRODUCTION OF ORTHOPHOTOPLANS**

Paul Lasalle, Sevres, France, assignor to Eugène Matra, Paris, France

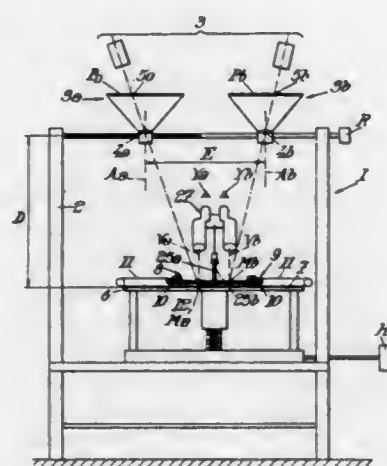
Filed Sept. 10, 1971, Ser. No. 179,419

Claims priority, application France, Sept. 16, 1970, 7033616

Int. Cl. G03b 27/32

U.S. Cl. 355—22

10 Claims



The apparatus comprises an optical projection device for a pair of stereoscopic photographs and a support for a sensitive surface, a receiving device and a device for the successive exposure of adjacent zones of the sensitive surface. The receiving device comprises two distinct visible marks Ma, Mb. Optical means with two sighting axes enable a stereoscopic reconstitution of a space mark and of a portion of the subject. The mark Ma is constituted by an aperture. The apparatus is useful for producing orthophotoplans in colors.

3,732,009

# **PHOTO-COMPOSING MACHINES**

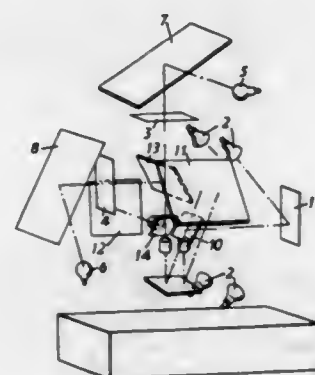
George William Callum, Cannington Town London, England, assignor to Lamson Paragon Limited, London, England

Filed Oct. 15, 1971, Ser. No. 189,624

Int. Cl. G03b 27/52, 27/70

U.S. Cl. 355—43

4 Claims



This invention is concerned with a photocomposing machine and is more particularly concerned with a photocomposing machine for use in preparing printing plates for use in a

machine for printing business forms. In such a machine text matter is prepared on a master sheet which is mounted on a carrier which moves through the machine in such a way that the matter to be projected is correctly positioned in the photocomposing machine. Mask mechanism are also provided in the photocomposing machine and these mask mechanism have to be moved at the same time as the carrier. The present invention provides means for moving the text material and means for moving the masks and means for controlling the movement of the drive mechanism to drive the text material and the masks in synchronism whereby the desired text material can be more quickly located in the required position.

3,732,010

# **PAPER ADVANCE AND MARKING MECHANISMS FOR PHOTOGRAPHIC PRINTING APPARATUS**

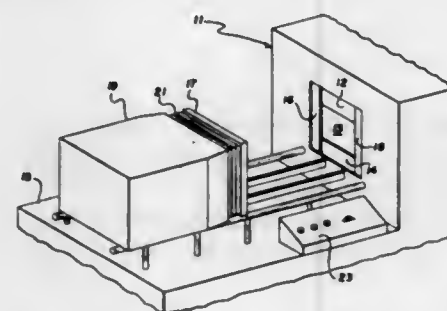
James E. Harter, and John E. Morse, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 20, 1971, Ser. No. 181,685

Int. Cl. G03b 27/32, 27/52

U.S. Cl. 355—64

10 Claims



Photographic printing apparatus capable of making varying sizes of prints corresponding to varying magnifications utilizes a two stage printing paper advance mechanism continually referenced to horizontal and vertical optical center lines whereby the sequential exposures of varying size are contiguous thereby effecting economic utilization of print paper. The two stage paper advance also permits simplified marking of the print paper for subsequent cutting operations.

3,732,011

# **APPARATUS FOR CONTROLLING THE EXPOSURE OF LIGHT SENSITIVE MATERIAL**

Cyril Hansard, 84 Harlow Terrace, Harrogate, England

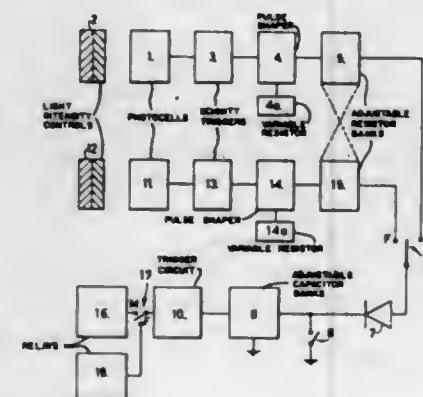
Filed Sept. 17, 1971, Ser. No. 181,472

Claims priority, application Great Britain, Sept. 24, 1970, 45,483/70

Int. Cl. G03b 27/76

U.S. Cl. 355—68

29 Claims



Apparatus for controlling the exposure of a photosensitive material to light. The apparatus includes an electrical pulsing circuit capable of producing voltage pulses, a photocell

responsive to the intensity of the light to control the pulsing circuit so that the frequency of the pulses is dependent on the intensity of the light, a capacitor which is manually adjustable to a predetermined value in accordance with the quantity of light needed for desired exposure of the material, a control resistor, through which the pulses may be applied to charge the capacitor, which is manually adjustable in accordance with a given parameter, a manually operable switch for initiating exposure of the material to light and simultaneously for commencing charging of the capacitor through the control resistor by the pulses, and a trigger which is operative to stop the exposure when the charge in said capacitor reaches the predetermined value.

The control resistor may be manually adjustable in accordance with highlight or shadow density of graphic matter to be copied. Also, apparatus with interlinked adjustment for both these parameters is described, such apparatus being capable of controlling exposure for half tone and line negatives. Apparatus with highlight density control only for controlling exposure in contact printing boxes is also described.

3,732,012

# **HIGH CONTRAST IMAGE DEVELOPMENT APPARATUS**

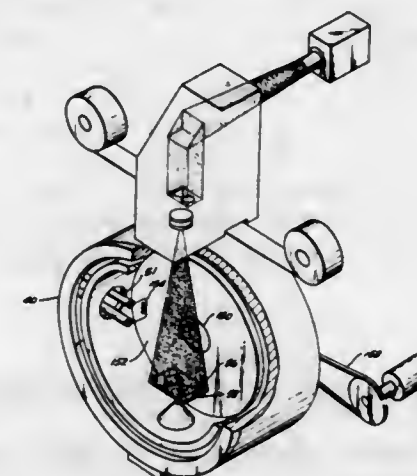
Alfred F. Kaspaul, and Erika E. Kaspaul, both of Malibu, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 71,043, Sept. 10, 1970, Pat. No. 3,671,238, which is a continuation-in-part of Ser. No. 839,271, July 7, 1969, Pat. No. 3,660,067. This application Oct. 12, 1971, Ser. No. 188,050

Int. Cl. G03b 27/00

U.S. Cl. 355—133

11 Claims



Apparatus for improving the contrast of images formed by depositing metal vapor atoms on actinic ray imagewise-exposed nucleated surfaces of nucleation recording medium. Optical densities of over 2.0 are obtained by suitable moderation of the thermal energy of the vapor atoms such that the atoms form an amorphous image film which exhibits low specular reflectance. Moderation is achieved by use of low temperature and/or large area vapor sources, chemical interactions with the source or energy exchange between the vapor atoms and secondary gases or wall surfaces within the developing chamber.

3,732,013

# **MULTIPATH LASER MOVING TARGET INDICATOR**

Hans Hieslmair, Elberon; John N. Fulton, West Long Branch, and Charles J. Bickart, Ocean, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed April 2, 1971, Ser. No. 130,740

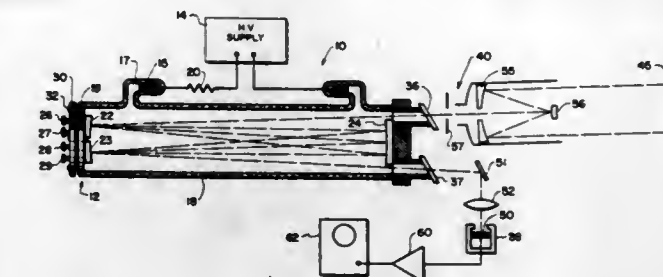
Int. Cl. G01p 3/36; H01s 3/00

U.S. Cl. 356—28

5 Claims

A moving target velocity indicator including a multipath laser which operates simultaneously as an oscillator for

producing a laser beam which is directed onto both a moving target and a detector and as an amplifier of the Doppler-shifted laser beam reflected from the target. The optical return signal from the target is amplified while passing through the multipath laser system and is directed, after the final pass



through the laser medium, onto the detector. This amplified signal can be combined at the detector with the transmitted signal to provide a beat signal at the frequency of the Doppler shift which can be applied to an oscilloscope display calibrated in frequency. Knowing the frequency of operation of the laser, the velocity of the target can then be calculated.

3,732,014

# **ELECTROMAGNETIC RADIATION APPARATUS FOR ANALYZING SMALL PARTICLES**

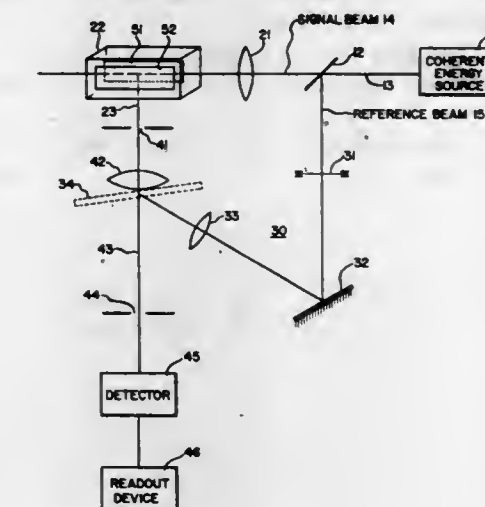
Egidijus Edward Uzgiris, Schenectady, N.Y., assignor to General Electric Company

Filed Jan. 31, 1972, Ser. No. 222,150

Int. Cl. G01n 15/02, 21/00, 21/26

U.S. Cl. 356—102

15 Claims



Method and apparatus for measuring static and dynamic properties of small particles are disclosed. A beam of energy is split into signal and reference beams. The signal beam is focused into a sample cell containing a solution or suspension of the particles to be analyzed, where it is scattered by interaction with the particles. Energy scattered at some angle is passed through restrictive apertures and a collecting lens to a detector. The reference beam is directed through an attenuator and a focusing lens to a fixed scattering matrix, which is located along the path of propagation of the scattered signal light. A portion of the scattered reference light is passed through a restrictive aperture to the detector where it is heterodyned with the scattered signal light.



3,732,015

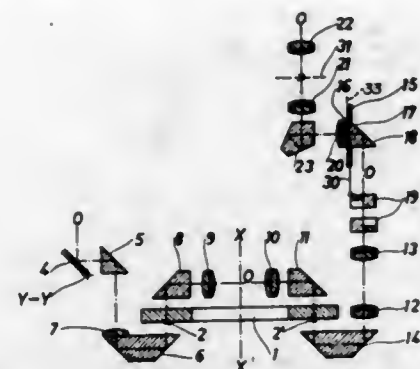
## ANGLE-MEASURING DEVICE

Wieland Feist, and Buno Von Chamler, both of Jena, Germany, assignors to Jenoptik Jena G.m.b.H., Jena, District of Gera, Germany

Filed Nov. 19, 1970, Ser. No. 97,424  
Int. Cl. G01c 1/06

U.S. Cl. 356-139

2 Claims



In an angle-measuring instrument having a reading microscope, the digital readings on the dial are displayed by apertures in a diaphragm which is located in the field of vision of the reading microscope. These apertures are: one for the division lines; one for the degree numbers; two for the even and odd numbers, respectively; and one for both the 1-minute numbers and the second numbers. The two 10-minute apertures are staggered relative to one another in such a manner that either an even number or an odd number is displayed at one time.

3,732,016

## METHOD AND APPARATUS FOR MEASURING MATERIAL THICKNESS

Philippe-Marie Deshayes, Neuville des Dieppe, and Guy Paul Weber, Arques La Bataille, both of France, assignors to La Cellophane, Paris, France

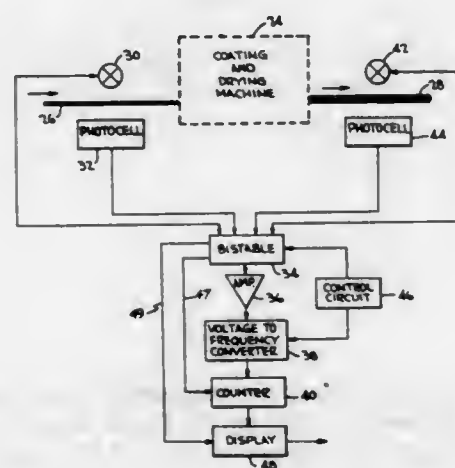
Filed Feb. 10, 1971, Ser. No. 114,184

Claims priority, application France, March 25, 1970, 7010636

Int. Cl. G01b 11/00; G01r 21/46

U.S. Cl. 356-161

8 Claims



Apparatus for measuring material thickness including a source of light directed toward the material, a light detector receiving light from the source passing by the material and providing an output voltage dependent upon the light received, a voltage to frequency converter providing an oscillating output dependent upon the output voltage from the

light detector, and a counter receiving the oscillating output from the converter to represent the thickness of the material by the count stored therein. A method for measuring material thickness including detecting light passed through the material and providing a voltage corresponding thereto, converting the voltage into a frequency signal dependent thereon, and counting oscillations of the frequency signals.

3,732,017

## GAS ANALYZER UTILIZING A TUNABLE LASER WITH A REFERENCE SUBSTANCE IN THE LASER CAVITY

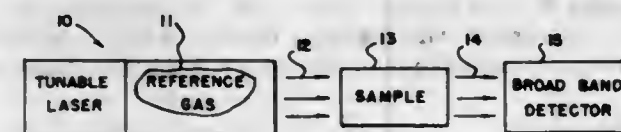
William G. Wolber, Southfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 23, 1970, Ser. No. 83,391

Int. Cl. G01a 21/06, 21/34

U.S. Cl. 356-201

11 Claims



A gas analyzer which employs a tunable laser is described. The laser is tunable over a well defined bandwidth so that coherent energy of all frequencies within the bandwidth is available. A known gas is introduced into the laser cavity so that the laser will lase only at the frequencies which correspond to the absorption frequencies of the gas. The output of the swept laser is therefore a reference spectrum containing a series of lines which correspond to the absorption frequencies of the known gas. The reference spectrum is therefore uniquely characteristic of the known gas. By illuminating a sample of an unknown gas with the reference spectrum some of, or all of, the peaks will be absorbed when the unknown gas partially, or completely, is composed of gases identical to those of the reference gas. The illumination from the unknown gas is detected with a broad band detector and the composition of the unknown gas identified by noting which of the reference spectrum peaks are absorbed and by the amount they are absorbed.

3,732,018

## LETTERING PEN SUPPORT BRACKET FOR BOW PEN SHANK

George W. Streander, Alamogordo, N. Mex., assignor to Design Systems, Inc.

Filed Sept. 10, 1971, Ser. No. 179,482

Int. Cl. B43k 23/00

U.S. Cl. 401-48

4 Claims



An elongated extension member for use in conjunction with and as an axial extension of a lettering pen handle, the base end of a compass arm and other drafting implements. The extension member includes an elongated body portion having similarly laterally offset opposite ends provided with aligned bores. One of the aligned bores is adapted to receive one end

3,732,021

## MODULAR EXPANSION JOINT

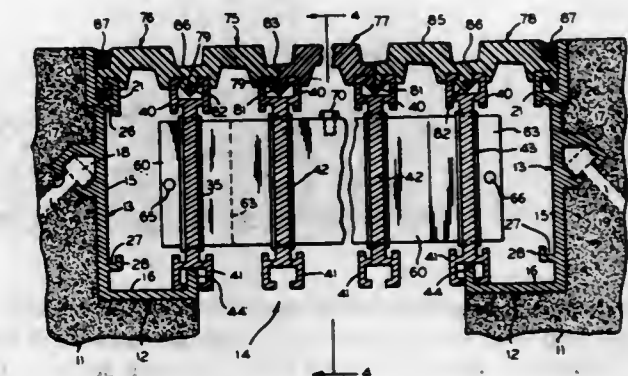
Michael C. Rizza, Walnut Creek, Calif., and Delmont D. Brown, North Baltimore, Ohio, assignors to The D.S. Brown Company, North Baltimore, Ohio

Filed March 8, 1971, Ser. No. 121,957

Int. Cl. E01c 11/10

U.S. Cl. 404-57

9 Claims



Modular expansion joint made from aluminum extrusions providing the longitudinal frames, longitudinal rails, and load-bearing support beams. The rails have an I-beam structure with downwardly and upwardly opening channels respectively receiving a lip of the frames and receiving and interlocking therein deformable longitudinal beads on the lower surface of an elastomer tread which completely covers and spans the joint. The load-bearing, length-variable beams extend through the rails, and coil springs are interposed between contiguous rails. The rails are composed of aligned rail segments with contiguous ends slidably spliced together.

3,732,022

## VIBRATORY COMPACTOR

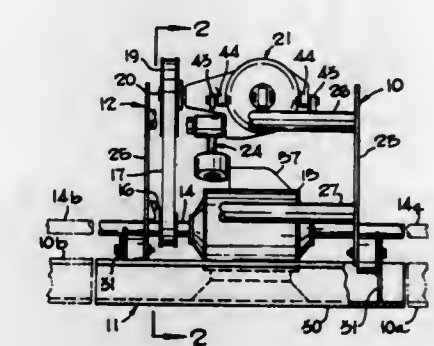
John Henry Danuser, c/o Danuser Machine Company, 500 East 3rd Street, Fulton, Mo.

Filed Nov. 8, 1971, Ser. No. 196,637

Int. Cl. E01c 19/30

U.S. Cl. 404-113

10 Claims



This compactor includes a compacting shoe carrying a fixed housing mounting a vibration inducing shaft. The shoe is resiliently mounted to a carrier frame and a gearbox pivotally mounted to the carrier frame transmits power to the vibration shaft by means of a flexible belt assembly. The flexible belt is tensioned by means of an adjustable arm, which extends between the gearbox housing and the vibration shaft housing and is disposed on the center line between driver and driven elements of the flexible drive assembly. The arm is pivotally connected at one end to the gearbox housing and resiliently connected at the other end to the vibration shaft housing.

3,732,019

## CARD TRAY CONSTRUCTION AND METHOD OF FORMING SAME

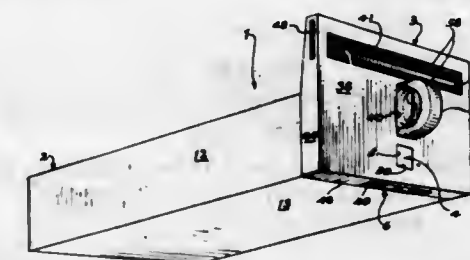
Carl H. Little, Jamestown, N.Y., assignor to Weber-Knapp Company, Jamestown, N.Y.

Filed March 18, 1971, Ser. No. 125,493

Int. Cl. B42f 13/00, 17/16

U.S. Cl. 402-61

2 Claims



A card tray construction including a tray body section; a tray front section affixed to a front wall of the body section; a card holder rod running through the front section and into the tray body section for the purpose of stringing cards to be retained in the tray section; and a holder rod latching device accessible through an opening in the bottom wall of the front section. The latching device is in the form of a prefabricated unit, which is adapted to be inserted through its access opening and be automatically retained in a proper mounted position upon assembly of the front and tray body section.

3,732,020

## PREFORMED SURFACING FOR PAVEMENTS

Raymond Frank Aspinale Judge, London; Frederick Royal Martin, Bournemouth, and Russell George Mozley, Carlsholton, all of England, assignors to The Secretary of State for the Environment in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland

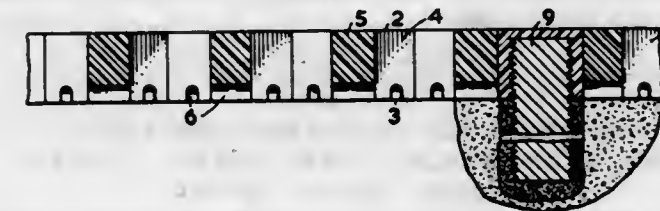
Filed Feb. 4, 1971, Ser. No. 112,668

Claims priority, application Great Britain, Feb. 4, 1970, 5,358/70

Int. Cl. E01c 11/24

U.S. Cl. 404-19

13 Claims



A preformed surfacing for a pavement is in the form of a sheet of flexible material containing cavities open to its upper surface and interconnected by ducts beneath the surface so that when laid down on a prepared subsurface having a drainage slope, water falling on the surfacing can drain away through the cavities and ducts. The sheet can be fixed to the subsurface by anchors bonded into cavities in the sheet.



3,732,023

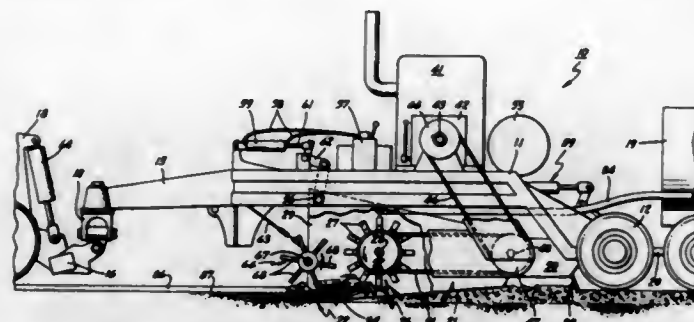
## SOIL STABILIZATION APPARATUS

Carleton L. Rank, Walnut Creek, and Ray T. Ryan, San Rafael, both of Calif., assignors to Metradox Associates, Lafayette, Calif.

Filed March 11, 1969, Ser. No. 806,121  
Int. Cl. E01c 19/02

U.S. Cl. 404-90

4 Claims



Apparatus is described which makes it possible to utilize old asphalt and asphalt/concrete traffic bearing surfaces in forming a stabilized base for a new traffic bearing surface. Basically, the apparatus of the invention comprises a vehicle having a transversely extending cutting blade mounted in a location to sever an upper layer of the material over which it is traveling from the remainder of the material and feed such layer rearwardly relative to the traveling vehicle to a pulverizing and mixing rotor also extending transversely of the apparatus.

Besides pulverizing an old traffic bearing surface, the rotor mixes same with soil and a soil stabilizing medium such as lime or cement. The degree of pulverization and mixing, as well as the thickness of the surface layer removed, is controllable.

3,732,024

## LEVELER FOR PAVING MACHINE

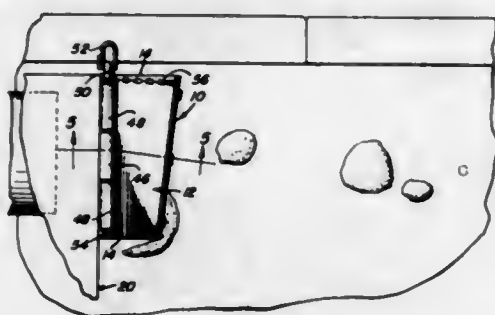
James A. Gedrich, R.R. No. 2, Box 245, Burlington, Wis.

Filed March 1, 1971, Ser. No. 119,690

Int. Cl. E01c 19/22

U.S. Cl. 404-118

8 Claims



A leveling attachment for pavers and the like mounted forward of the tracks or wheels and engageable with the ground so as to define a leveled path. The attachment includes a depending pivotally mounted front wall spring-loaded so as to resist rearward movement and provide a flexing action to loosen and move encountered materials. The front wall is laterally inclined so as to inwardly direct the material and is vertically adjustable.

3,732,025

## METHOD FOR MACHINING VALVE BODY CASTINGS

Harry E. Miles, Jr., and Dale W. Wright, both of Saginaw, Mich., assignors to Miles Machinery Company, Saginaw, Mich.

Filed June 15, 1971, Ser. No. 153,205

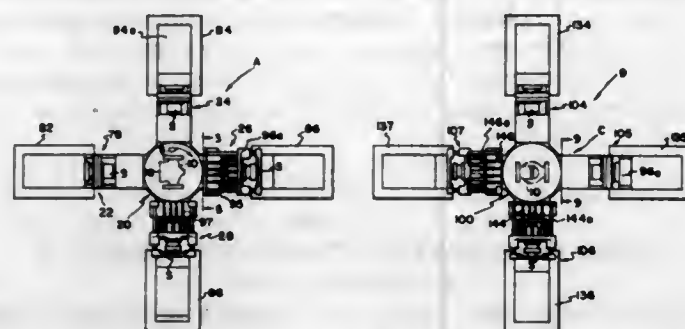
Int. Cl. B23b 35/00, 41/00

U.S. Cl. 408-1

13 Claims

The method of, and system for, machining valve body castings, and the like, having inlet and outlet cored openings

in opposite ends thereof, a valve seat, and a cored bonnet opening in the side thereof comprising the steps of: positively locating the casting via the opposed cored openings by inserting locating plugs in the inlet and outlet openings; machining



the bonnet opening and/or seat of the positively located valve body; repositioning the valve body and positively locating on the machined bonnet opening and/or seat; and then machining the cored inlet and outlet openings or flange openings in opposite ends thereof.

3,732,026

## HAND OPERATED POWER TOOL AND CHUCK THEREFOR

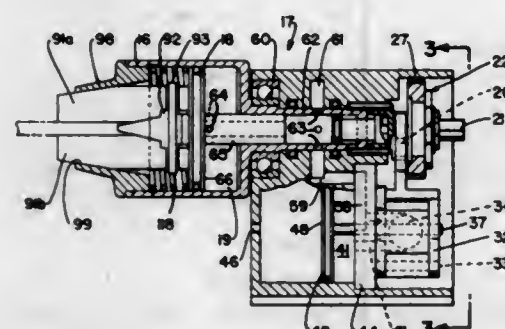
Rudolph W. Peters, 5786 Balmoral Drive, Oakland, Calif.

Filed Jan. 11, 1971, Ser. No. 105,251

Int. Cl. B23b 45/02, 31/30

U.S. Cl. 408-124

13 Claims



A hand power tool is described having a drive arrangement providing on initial energization of the unit automatic gripping of a tool. The drive arrangement includes a fluid pump which is driven by the motor of the tool when it is first started. The pump delivers fluid pressure to a chamber within the tool chuck and drives a piston therein which, in turn, drives the jaws of the chuck into clamping engagement with the tool piece shank. The jaws of the chuck are meshed with one another in a manner assuring that they uniformly move radially inward to grip the shank and align the tool with the rotational axis of the chuck.

3,732,027

## METHOD AND APPARATUS FOR CONVERTING DIGITAL INPUT SIGNALS INTO DISTINCT OUTPUT POSITIONS OR VELOCITIES

Kurt Lupke, Dresden Strasse 113, 3300 Braunachweig; Urban Ragg, Leibnizstr. 7, Walblingen near Stuttgart, and Gunter Diesel, Gottelmannstrasse 42b, Mainz, all of Germany

Filed June 18, 1970, Ser. No. 47,342

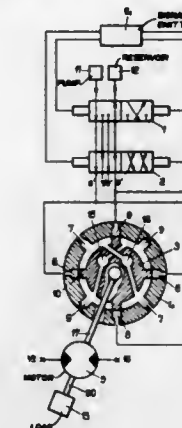
Int. Cl. F15b 11/12, 13/044

U.S. Cl. 415-51

5 Claims

Method and apparatus for converting digital input signals into output positions or velocities employing a flowing medium. A directional control valve receives an input signal and

transmits the signal in the form of a flowing medium to a servo valve having a plurality of control ports and a slide with a plurality of closure members to shut off certain of the control ports. Flowing medium proceeds through the valve to actuate a motor means having an operating member. The operating member is directly connected to the slide member of the valve



and, therefore, actuation of the operating member operates the slide to close off the control ports, thereby terminating the flowing medium and thusly stopping the operation. The directional control valve can also be hooked in parallel with the servo valve to communicate directly with the motor means.

3,732,028

## CENTRIFUGAL PUMP, IN PARTICULAR A SAND OR GRAVEL PUMP, AND A METHOD FOR OPERATING SUCH A PUMP

Peter A. Heynemanna, Arnhem, and Franciscus Noordhoff, Bergen, both of Netherlands, assignors to N.V. Rubberfabriek Vredestein, The Hague, Netherlands

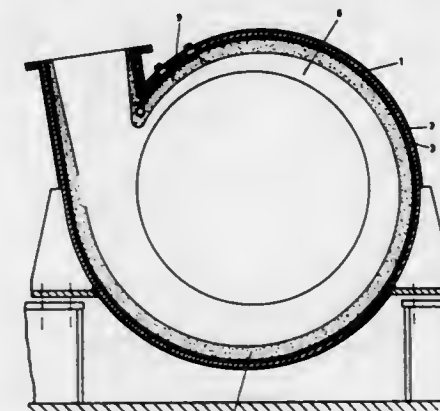
Filed June 16, 1971, Ser. No. 153,551

Claims priority, application Netherlands, July 1, 1970, 7009709

Int. Cl. F04b 7/00

U.S. Cl. 415-197

5 Claims



A centrifugal pump of the type such as a sand pump, a gravel pump and the like, having an outer pump casing in which a sheet metal inner casing exchangeably is arranged, said sheet metal casing being provided with a liner of wear-resistant material, such as rubber.

3,732,029

## COMPACT HEAT EXCHANGER

James R. Raymond, Leechburg, and Clarence I. Thomson, III, Murrysburg, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 14, 1971, Ser. No. 207,924

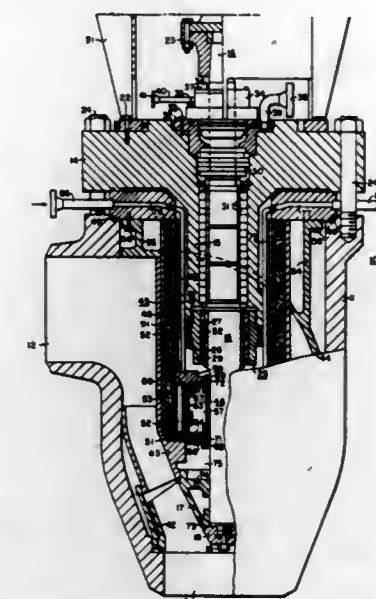
Int. Cl. F01d 11/00, 5/08

U.S. Cl. 415-111

10 Claims

The heat transfer efficiency of a heat exchanger is increased by making the entire flow pattern of the exchanger a straight-

through flow pattern, thereby providing a compact heat exchanger which is substantially 100 percent effective and



compact in size. Thus, the required cooling effect is accomplished with an exchanger which is smaller in size than a prior exchanger and has a reduced cost.

3,732,030

## BLOWER WHEEL ASSEMBLY

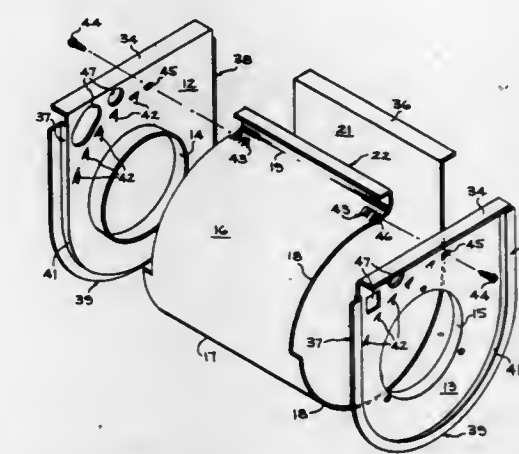
Donald M. Mullings, Yardley, Pa., assignor to General Electric Company, Louisville, Ky.

Filed March 2, 1972, Ser. No. 231,223

Int. Cl. F04d 29/42, 29/40

U.S. Cl. 415-219

4 Claims



By the present invention there is provided a blower wheel housing having generally parallel side walls including an air inlet and a wrapper connecting the side walls to form a hollow chamber. A blower wheel is located in the housing and is axially aligned with the inlet opening. Access to the blower wheel for its removal or servicing is provided by peeling back the wrapper radially away from the blower wheel.

3,732,031

## COOLED AIRFOIL

Charles E. Bowling, Speedway; George B. Meginnis, and Ronald P. Schwedland, both of Indianapolis, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed June 17, 1970, Ser. No. 47,046

Int. Cl. F01d 5/18

U.S. Cl. 416-97

3 Claims

A cooled turbine blade or vane for high-temperature machines. To obtain maximum strength and oxidation re-



sistance and the best cooling characteristics, the airfoil has a core of cast super alloy covered by a porous facing of wrought super alloy sheet, the core providing passages to transmit the



cooling fluid to the facing. The effective cooling and resistance to corrosion are due primarily to the facing and the strength and resistance to centrifugal, buffeting, or ballooning loads are contributed primarily by the cast core.

### 3,732,032 CENTRIFUGAL PUMPS

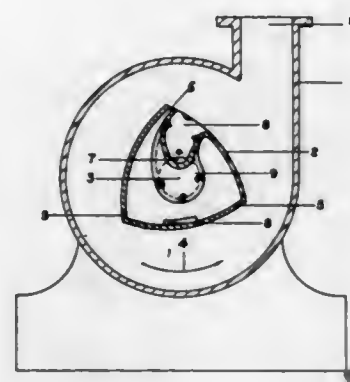
Charl M. Dancel, Wellington, Republic of South Africa, assignor to Baggers (Proprietary) Limited, Bellville, Cape Province, Republic of South Africa

Filed Feb. 16, 1971, Ser. No. 115,333

Int. Cl. F01d 5/00

U.S. Cl. 416-144

6 Claims



The invention relates to an impeller for a centrifugal pump permitting the passage of solids through the pump and which maintains a high delivery pressure and capacity in which the impeller has a body having, in cross section, a regular polygonal configuration, an axis of rotation located substantially equidistant the corners of the body, an inlet to the body located at the axis of rotation, an outlet from the body provided in a sidewall of the body and a conduit communicating between the inlet and the outlet.

### 3,732,033 BOAT PROPELLER LOCK

Joseph E. Macchi, 6 Richard Avenue, Bellingham, Mass.

Filed Jan. 3, 1972, Ser. No. 215,008

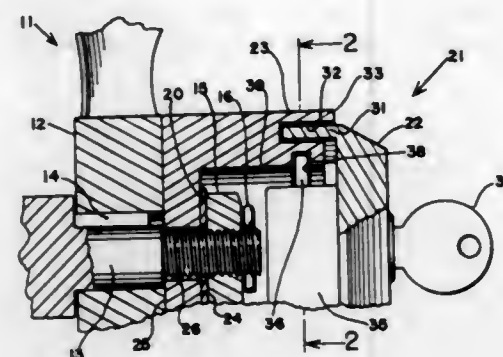
Int. Cl. B63h 1/20

U.S. Cl. 416-244

11 Claims

Disclosed is an enclosure which can be locked in position to conceal a nut used to secure a boat propeller to a drive shaft. The enclosure includes a cover portion that can be locked into

engagement with a base portion that is retained by and specially accommodates the nut. Both the enclosure and the lock



mechanism therefore are formed of an oxidation resistant material so as to prevent deterioration during use in a water environment.

### 3,732,034 CONTROL SYSTEM FOR COMPRESSORS OPERATING IN PARALLEL

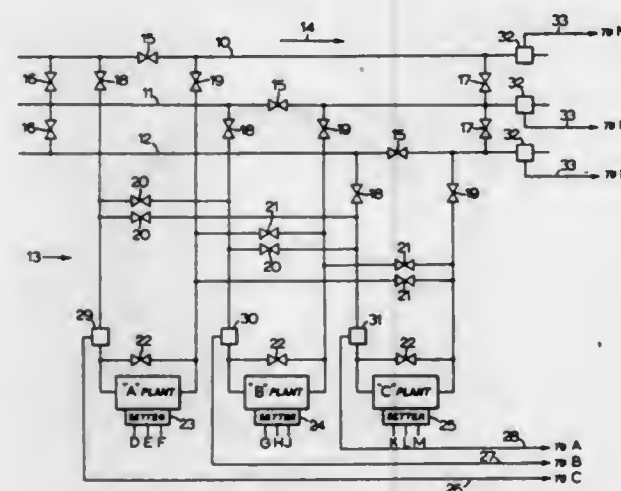
Robert J. C. Reid, Oakville, and Graham F. Crate, Ottawa, Ontario, both of Canada, assignors to Trans-Canada Pipe Lines Limited, Toronto, Ontario, Canada

Filed July 21, 1971, Ser. No. 164,572

Int. Cl. F04b 41/06

U.S. Cl. 417-6

9 Claims



Control apparatus for controlling the operation of a compressor station comprising at least two compressor plants connected to operate in parallel, includes means providing "raise" and "lower" signals responsive to the discharge pressure of the station being lower or higher respectively than a desired discharge pressure, control means providing for each compressor plant a control signal that is responsive to the differences between the actual and desired flows of the compressor plant, control means for each compressor plant that control the plant to raise or lower the discharge pressure of the station, means that supply the "raise" or "lower" signals to the control means, and means responsive to the control signals for gating the supplying means on and off to permit or block delivery of "raise" and "lower" signals to the control means.

### 3,732,035 DEVICE FOR INTERMITTENT GAS-LIFT EXPLOITATION OF OIL WELLS

A. Pal Szilas; Janos Bogner; Bela Matting, and Laszlo Bajoczkay, all of Miskolc, Hungary, assignors to Nagyalfoldi Koolaj-es Foldgaztermelo Vallalat, Szolnok, Hungary

Filed April 29, 1971, Ser. No. 138,543

Int. Cl. F04f 1/06, 3/00; F16k 15/00

U.S. Cl. 417-143

4 Claims



A device for the intermittent exploitation of gas-lift oil wells lines with a casing seals the lower portion of the casing from the upper portion except through a valved passageway. The valve is a flexible diaphragm communicating with an oleopneumatic chamber through capillary orifices so that when gas under pressure is supplied from the surface, the flow of liquid through the capillary orifices delays the opening of the valve.

### 3,732,036 SUMMING VALVE ARRANGEMENT

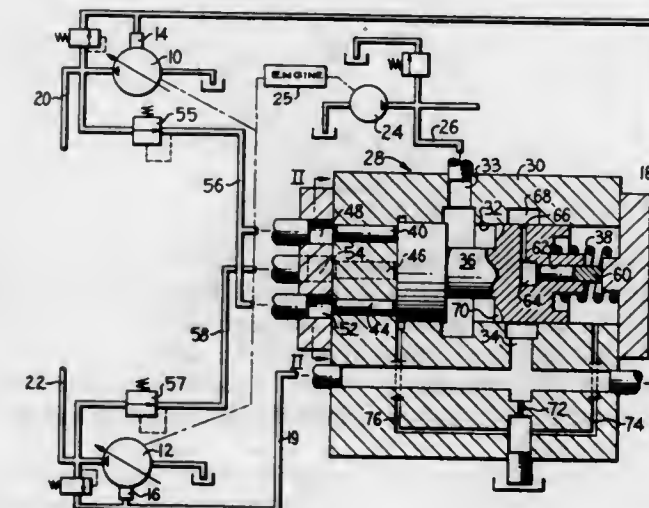
William F. Busbey, Pekin, and Donald L. Hopkins, Joliet, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed March 24, 1971, Ser. No. 127,738

Int. Cl. F04b 49/00

U.S. Cl. 417-216

7 Claims



There is disclosed control means that is operative to vary the horsepower output of a plurality of variable displacement pumps in response to the sum of the outputs of the pumps.

### 3,732,037 PUMP DISPLACEMENT CONTROL

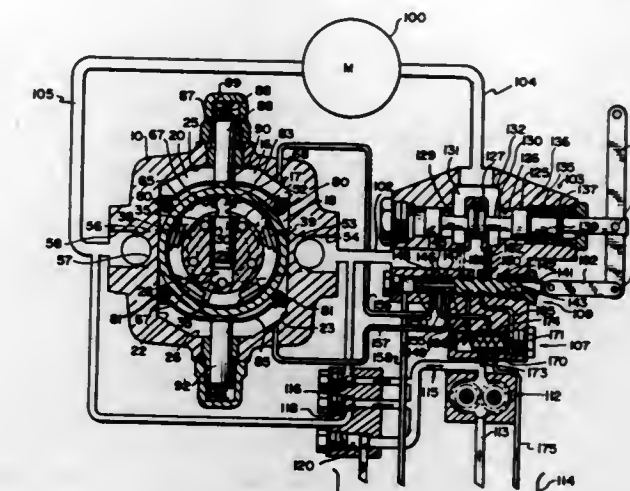
Floyd E. Carlson, 4504 Lanewood Circle, Rockford, Ill.

Filed May 27, 1971, Ser. No. 147,442

Int. Cl. F04b 49/00; F15b 15/18

U.S. Cl. 417-217

15 Claims



A control for a variable displacement pump adapted to supply a reversible load device including fluid operable means for varying the displacement of the pump in opposite directions from neutral to supply fluid in opposite directions to the load, means providing a source of control fluid under pressure, a directional valve for directing control fluid to opposite sides of the displacement varying means to determine the direction of pump delivery, a variable orifice for creating a measurable pressure drop in the pump inlet or the pump outlet, means for sensing the pressure drop across the orifice to control the amount of displacement to provide constant flow, and a single control for first operating the directional valve to establish the direction of pump delivery and then varying the orifice to establish the amount of flow.

### 3,732,038 CONTROL FOR GAS COMPRESSION APPARATUS

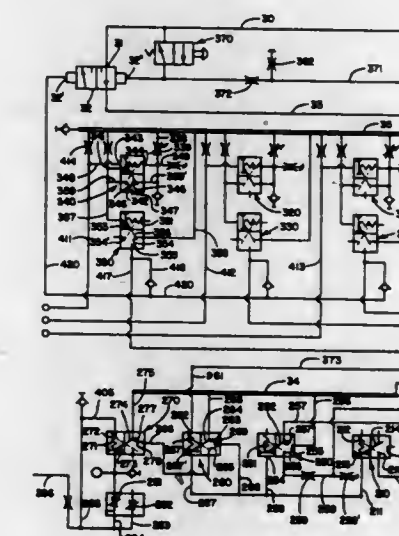
Karol Pilarczyk, Loudonville, and Hans Pennink, Scotia, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 23, 1971, Ser. No. 118,005

Int. Cl. F04b 49/02

U.S. Cl. 417-282

2 Claims



A control for discontinuing normal operation of gas compression apparatus in which a plurality of interconnected devices operate to place the apparatus in an idle state upon the occurrence of an undesirable condition in the apparatus.



3,732,039

## FUEL CONTROL VALVE

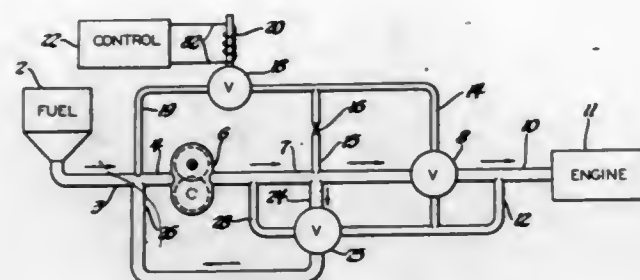
Frank S. Carothers, Jr., Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 24, 1971, Ser. No. 201,741

Int. Cl. F04b 49/00; G05d 11/00

U.S. Cl. 417-300

4 Claims U.S. Cl. 417-222



A valve arrangement for controlling flow of fuel from a positive-displacement pump to an engine such as a gas turbine, the control being exerted by an electric current which biases a pilot valve to regulate a control pressure. The control pressure and pressure of metered fuel act in opposition on a metering valve so that the pressure of fuel delivered to the engine is determined by the control pressure and thus by the electric current. Metered fuel pressure and pump outlet pressure control a by-pass valve which returns excess fuel to the pump inlet. The entire control arrangement preferably is integrated into a compact assembly.

3,732,040

## PUMP FOR DELIVERING HEATED FLUIDS

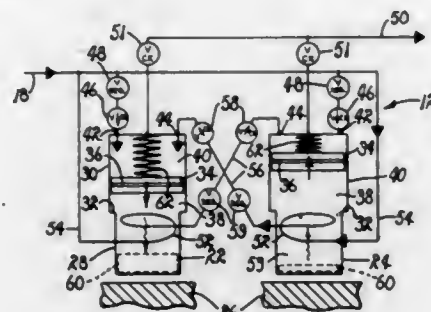
George M. Low, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Eric E. Sabelman, Sierra Madre, Calif.

Filed March 2, 1971, Ser. No. 120,241

Int. Cl. F04b 17/00; F03g 7/06

U.S. Cl. 417-391

5 Claims



A thermomechanical pump particularly suited for use in pumping a warming fluid obtained from an RTG (Radioisotope Thermal Generator) through science and flight instrumentation aboard operative spacecraft. The invention is characterized by a pair of operatively related cylinders, each including a reciprocating piston head dividing the cylinder into a pressure chamber confining therein a vaporizable fluid, and a pumping chamber for propelling the warming fluid, and a fluid delivery circuit for alternately delivering the warming fluid from the RTG through the pressure chamber of one cylinder to the pumping chamber of the other cylinder, whereby the vaporizable fluid within the pair of pressure chambers alternately is vaporized and condensed for driving the associated pistons in pumping and intake strokes.

3,732,041

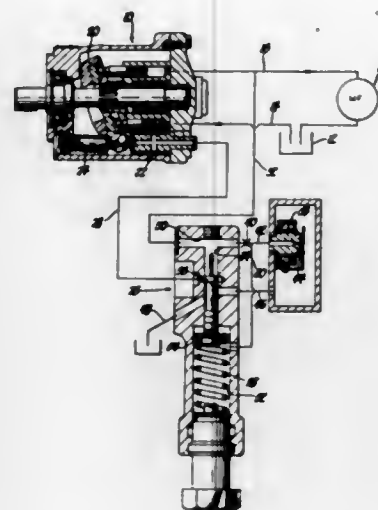
## POWER TRANSMISSION

Thomas E. Beal, Rochester, and John W. Curnow, Utica, both of Mich., assignors to Sperry Rand Corporation, Troy, Mich.

Filed June 10, 1971, Ser. No. 151,680

Int. Cl. F04b 11/26

2 Claims



A pump for use in a hydraulic power transmission system has a servomotor for varying its displacement which is controlled by a valve responsive to delivery line pressure of the pump. The valve, in turn, is controlled both by a spring which determines a minimum level of delivery pressure and by a piston responsive to the pressure level in a bleed circuit. The bleed circuit includes a fixed restriction and an electrically modulated flapper valve so that the pressure level in the pump delivery line may be modulated by adjustment of the current flowing through the coil of the electrically modulated flapper valve.

3,732,042

## POWER MODULE

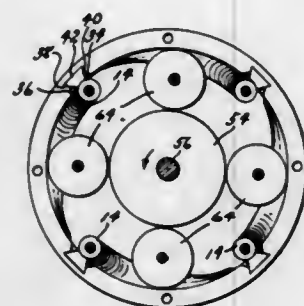
William Buchholz, Roscoe, N.Y.

Filed June 3, 1971, Ser. No. 149,626

Int. Cl. F04b 43/08

U.S. Cl. 417-477

8 Claims



A power module for providing continuous rotational torque without direct contact between the propellant and module rollers. A plurality of flexible tubes are positioned within helical grooves in the inner surface of a cylinder casing. A rotor assembly having a plurality of rollers is positioned within the casing mounted for rotation against the inner surface and driving a power shaft.

The rollers and tubes are in angularly disposed contact with each other, preferably at substantially right angles. Pressure is applied to the tubes causing them to uniformly expand along the grooves and inwardly of the inner surface of the cylinder, driving the rollers. The chordal distance between the rollers and the location of the tubes along the inner surface of the cylinder is crucial and designed so that as the roller is forced off the edge of one tube, at the exit end, the succeeding roller

is just about ready to make contact with the entrance end of the particular tube. As the first roller leaves the tube, the force causing a pressure build-up behind the roller is removed and fluid can be expelled therefrom. There is sufficient inertia in the succeeding roller to cause it to move onto the entrance end of the tube and the continuing fluid entering the tube immediately causes a pressure build-up behind the roller and the process begins again.

When the tubes have been completely expanded, the inertia within the rollers carries them until they are positioned just ahead of the next collapsed tube, and the procedure is repeated.

3,732,043

## HIGH-PRESSURE AND HIGH-TEMPERATURE DEVICE

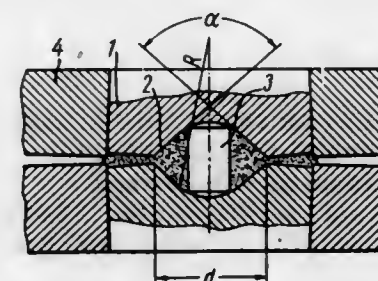
Valentin Nikolaevich Bakul, ulitsa Kirova, 34a, kv. 12; Alexei Iosifovich Prikhna, ulitsa Vyshegorodskaya, 33, kv. 20, and Alexandr Alexandrovich Shulzhenko, ulitsa Novo-Konstantinovskaya, 17, kv. 27, all of Kiev, U.S.S.R.

Filed April 22, 1971, Ser. No. 136,527

Int. Cl. B30b 11/32

U.S. Cl. 425-77

6 Claims



A high pressure/temperature device for carrying out the synthesis of superhard materials, such as diamond and cubic boron nitride, the device consisting of two dies having recesses in closing faces, said recesses forming, in combination, a high-pressure chamber which accommodates a container charged with a reaction mixture. In each die, the recess is made in the form of a truncated cone conjugated with a sphere or in the form of a hyperboloid of revolution.

3,732,044

## PRODUCTION LINE FOR PRODUCTS OF PRESTRESSED CONCRETE OR OF REINFORCED CONCRETE

Mircea Borcoman, 53,55 Bd de la Villette, Paris, France

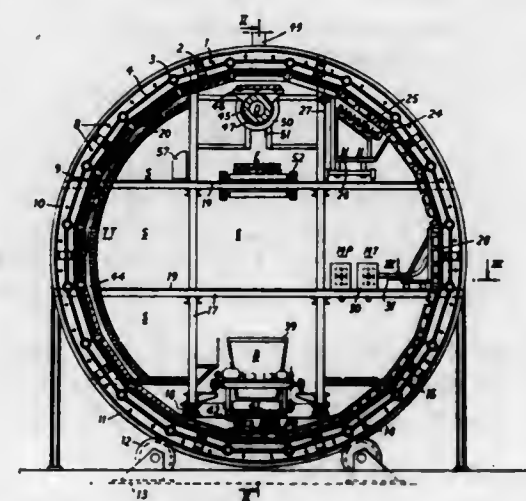
Filed Oct. 7, 1970, Ser. No. 79,187

Claims priority, application France, Oct. 10, 1969, 6934660

Int. Cl. B28b 5/12, 23/06

U.S. Cl. 425-111

7 Claims



The production line includes a rotary hall, which itself transports the moulds, in front of installations for cleaning and

3,732,045

## APPARATUS FOR MAKING BRAKE SHOES

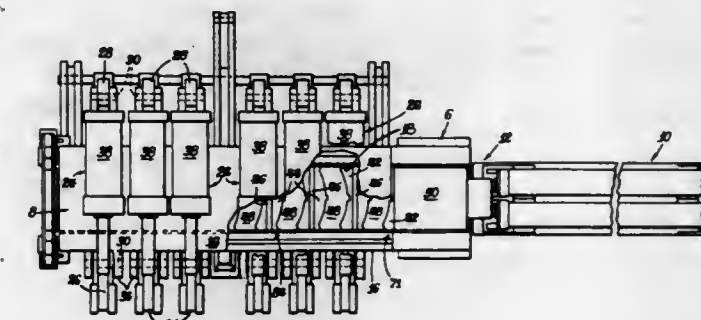
Howard Edward George, Chicago, Ill., and Jean Marie Gustin, St. Hyacinthe, Quebec, Canada, assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Oct. 14, 1971, Ser. No. 189,362

Int. Cl. B30b 11/06

U.S. Cl. 425-117

4 Claims



A heated brake shoe press has a longitudinal open end cavity defined by a base and cover. One end of the cavity may be closed by a movable platen. A movable plunger projects into the other end of the cavity and is slideably engaged with the cavity throughout its length. Inserts and liners are slideably engaged in the cavity in a given order and define a plurality of molding cavities that are fillable with moldable material. The heat, and the pressure exerted by the plunger configures the material in the molding cavities to a shape defined by the inserts and liners. After forming, the platen may be moved to an open position and the inserts and configured material may be pushed out of the cavity by the plunger. To accommodate such action and to reduce galling and scoring of the cavity walls, Teflon buttons are attached to the insert faces which engage the cavity wall.

3,732,046

## DIMENSIONAL CONTROL APPARATUS

Ronald C. Martin, Newark, Del., and Marty E. Sixt, Napoleon, Ohio, assignors to Advanced Drainage Systems, Inc., Columbus, Ohio

Continuation of Ser. No. 804,963, March 6, 1969, abandoned.

This application March 22, 1971, Ser. No. 127,052

Int. Cl. B29c 3/06, 17/02, 17/16

U.S. Cl. 425-140

6 Claims



Apparatus and method control dimensions of corrugated tubing by stretching tubing predetermined amount as it travels between molding unit and downstream pulling assembly running at about same rate tubing is discharged from molding unit. First counter mechanism adjacent discharge end of molding unit counts predetermined number of corrugations in tubing and immediately thereafter generates signal indicating that predetermined number has been counted. Generation of signal from first counter triggers signal from second counter mechanism indicative of number of corrugations passing



pulling assembly. Signal from second counter indicates more than predetermined number of corrugations has been counted, less than predetermined number has been counted, or count substantially equal to predetermined number. When more than predetermined number of corrugations is counted speed of pulling assembly is incrementally decreased to lessen stretch of tubing, and conversely, when less than predetermined number is counted speed of pulling assembly is incrementally increased to increase stretch of tubing. Second counter mechanism is initially adjusted so that no signal is generated by second counter when tubing between molding unit and pulling assembly is stretched predetermined amount.

3,732,047

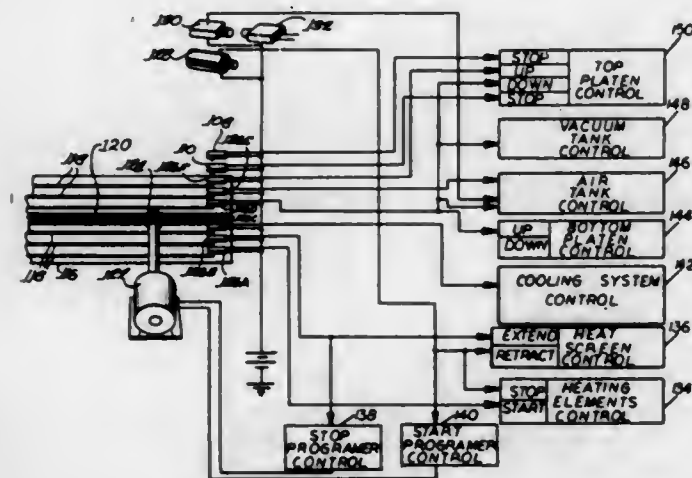
**THERMOFORMING APPARATUS**

Robert E. Kostur, Oak Brook, Ill., assignor to Comet Industries Inc., Bensenville, Ill.

Continuation of Ser. No. 808,075, March 18, 1969, abandoned. This application Aug. 12, 1971, Ser. No. 171,385  
Int. Cl. B29c 3/06

U.S. Cl. 425-144

9 Claims



A plastic program card includes a plurality of projecting rows of plastic each having notches at selected locations. It is driven through a program unit having a different push-button switch aligned with each row of the card to be actuated by the notches therein to control different functions of the thermofforming machine. The temperature of the sheet of plastic, the positions of the moving parts of the thermofforming machine, and the position of the plastic being formed are sensed by other devices within the thermofforming machine and these devices control further operations of the machine and control the driving of the plastic program card through the program unit.

3,732,048

**APPARATUS FOR CASTING OF CERAMICS**

Michel Henri Guerga, Bois, and Bernard Lucien Desire Hallier, La Varenne, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

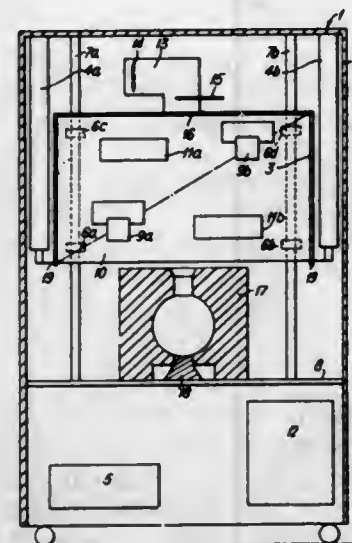
Filed Feb. 8, 1971, Ser. No. 113,483  
Claims priority, application France, Dec. 18, 1970, 7005727  
Int. Cl. H05b 9/00; B28b 1/26

U.S. Cl. 425-174.4

4 Claims

Ceramic articles are cast in plaster molds using a combination of microwave heating and air ventilation. A mold is filled with a slurry and positioned in a cavity having sources of microwave energy to heat the material to a desired temperature. A ventilation device then supplies cool pulsed air to the external surface of the mold to set the slurry. Excess slurry is

emptied, further microwave heating applied and cooler air directed into the interior of the mold to harden the paste. The



3,732,049

**APPARATUS FOR THE MANUFACTURE OF GRANULATED MATERIAL**

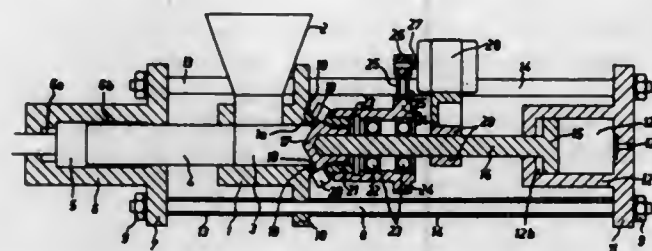
Hans Studli, Winterthur-Hard, Switzerland

Filed April 12, 1971, Ser. No. 132,988  
Claims priority, application Switzerland, April 22, 1970, 6036/70

Int. Cl. B29f 3/14

U.S. Cl. 425-192

6 Claims



An apparatus for manufacturing granulated material wherein a press or compression cylinder for a plastic molding material possesses a discharge end which can be closed by a counter piston. Between the peripheral edge of the compression cylinder and the peripheral edge of the counter piston there is provided a substantially ring-shaped throughpassage. Groove means are formed at least at one of the peripheral edges and through which groove means the molding material or mass can be pressed in the form of rods or strands. A rotating cutting element is mounted at the counter piston for the purpose of cutting these strands or rods.

3,732,050

**APPARATUS FOR FORMING PREFERABLY CUP-SHAPED HOLLOW BODIES BY DRAWING A MATERIAL, CAPABLE OF BEING FORMED BY HEAT**

Sven Nils Hakan Holmstrom, Loberod, and Jan-Erik Olsen, Lund, both of Sweden, assignors to AB Tetra Pak, Lund, Sweden

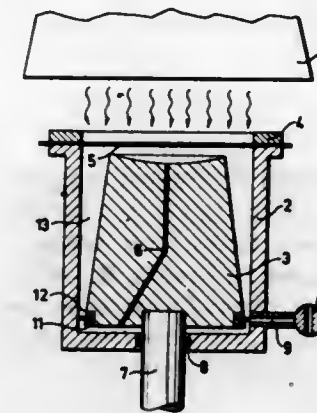
Division of Ser. No. 794,257, Jan. 27, 1969, Pat. No. 3,608,016. This application April 28, 1971, Ser. No. 138,303  
Claims priority, application Sweden, Feb. 7, 1968, 1611/68  
Int. Cl. B29c 17/02

U.S. Cl. 425-289

2 Claims

Apparatus for making cup-shaped hollow bodies having means for clamping a sheet of thermoplastic material over a closed space having a mandrel therein, means for heating said

sheet and then moving the mandrel out from the closed space and against the heated sheet to deform same and form a hol-



low body. Means are provided for making the walls of the body substantially uniform and for severing the hollow body from the unused sheet of material.

3,732,051

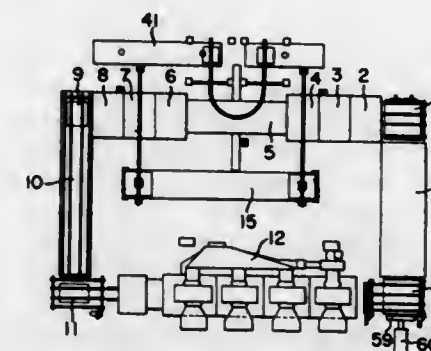
**MOLDING APPARATUS FOR PRODUCING RESINOUS THERMOPLASTIC ARTICLES**

Masaya Sakabe; Elchi Kobinata, and Masaru Takaoka, all of Inashiki-gun, Japan, assignors to Mitsubishi Petrochemical Company, Limited, Tokyo-to, Japan

Filed Aug. 27, 1970, Ser. No. 67,510  
Int. Cl. B29c 24/00

U.S. Cl. 425-407

6 Claims



Apparatus for producing large-sized synthetic resin foamed articles, such as pallets for carrying, transporting and storing freight goods, which are relatively bulky and heavy in weight and which can not be produced with an ordinarily available injection machine having limited capacity, is provided, which comprises metallic including an upper and lower section, means for transporting said molds in an endless path including means for changing the direction of travel of said molds, means for removing the upper section from the lower section and for transporting said upper section to a point downstream where it may be replaced upon a lower section filled with plastic material, means for remaining a formed article from the lower section, means for filling the lower section with raw plastic material after which the upper section is replaced thereon, means for heating the mold in at least three consecutive stages having different temperature levels, and means for cooling the molds from which they are returned to the upper section removal means. The aforementioned means are consecutively arranged along the endless mold transporting path in the order hereinbefore set forth.

3,732,052

**APPARATUS FOR THE CONTINUOUS MANUFACTURE OF PRECAST REINFORCED CONCRETE PRODUCTS, PARTICULARLY SLABS AND BEAMS**

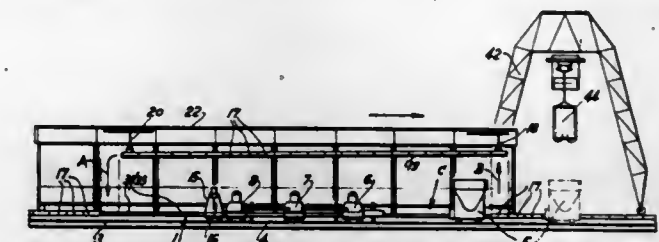
Klaus Gunia, Neuwied, Germany, assignor to Friedr. Remy Nachfolger GmbH, Neuwied/Rhein, Germany

Filed Feb. 22, 1971, Ser. No. 117,545  
Claims priority, application Germany, Feb. 24, 1970, P 20 08 457.5

Int. Cl. B28b 7/14

U.S. Cl. 425-219

15 Claims



Apparatus for the continuous manufacture of precast reinforced concrete products. There is provided an elongated mold track with the rails arranged on both sides thereof. Means for distributing concrete are supported on said rails for movement therealong. Said molds are supported on said mold track by suitable carriage means which are themselves supported on said rails. Vibratory compacting and smoothing means may also be supported, interchangeably if desired, on said carriages. Stepwise movable separating means, which may include a vertically vibratory knife, are supported on said rails and arranged for suitably cutting the poured concrete into selected lengths. Heat insulative covering hoods are arranged over said molds and means are provided for lifting said hoods off from mold carrying carriages wherein the concrete material is partially dried and replacing same over freshly poured concrete products.

3,732,053

**APPARATUS FOR REMOVING CURED CONCRETE ARTICLES FROM PALLETS**

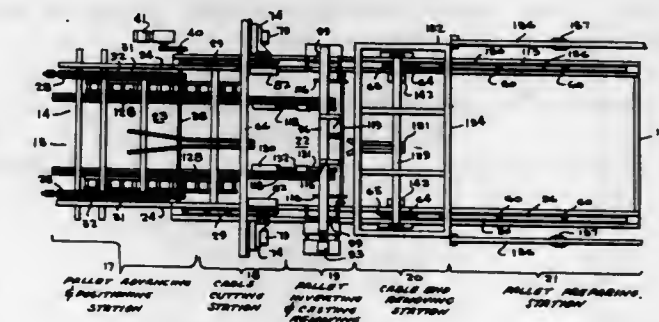
Ercell L. Glass, Tampa, Fla., assignor to J. L. Cone, Jr.; C. W. Cone and Douglas P. Cone

Division of Ser. No. 872,662, Oct. 30, 1969, Pat. No. 3,611,518, which is a division of Ser. No. 660,133, Aug. 11, 1967, abandoned. This application July 28, 1970, Ser. No. 58,759

Int. Cl. B28b 13/04, 23/06

U.S. Cl. 425-289

13 Claims



Apparatus and method for removing cured concrete articles, particularly prestressed concrete articles, from pallets in which they are cast and cured which includes feeding and guiding pallets containing cured articles into predetermined position, cutting by saws the stressing cables to free castings from the pallets, inverting the pallets beneath plungers which enter openings in the pallet bases and press castings from the pallets onto receiving means which lower them to an accumulating area, reverting the pallets to their previous orientation, driving the cut cable ends from the pallet retaining means by



swinging hammers, and cleaning, oiling and restraining the empty pallets, the pallets being moved step-by-step from one operating procedure station to the next from entering into the apparatus to exit therefrom.

3,732,054

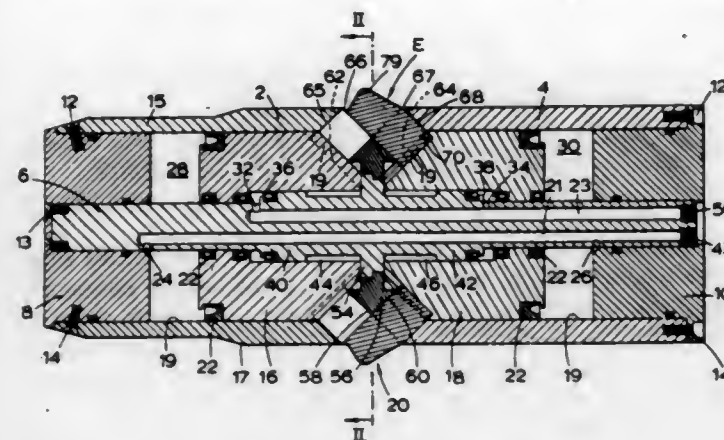
## ANNULAR EXPANDING RING STRUCTURE

Bjorn Lyng, Vanvikan, Norway, assignor to Lyng Industrier A/s Leksvikarmatur, Leksvik, Norway  
Filed Oct. 18, 1971, Ser. No. 189,958

Claims priority, application Norway, Oct. 22, 1970, 3996/70  
Int. Cl. B29c 17/00

U.S. Cl. 425—393

9 Claims



An annular expanding ring structure comprising a number of circumferentially arranged segments adapted to undergo partly radial movements relative to the central axis there-through. The segments are arranged in two complementary sets such that each of the segments in the ring structure is interposed with surface contact between the two adjacent segments of the other set in alternating fashion. Each of the segments is suspended in a cylindrical body constituting the support for the segments to be moveable in synchronized fashion along a straight axis lying in the respective one of two identical cones, one for each set. The cones have common axis and geometrically coinciding base circles, which circle constitutes the center plane of the ring structure. Each of the segments has two opposed plane sliding faces, and the average angle between the opposed side faces of each segment viewed in a plane normal to the central axis is  $360^\circ : E$ , wherein E is the total number of segments.

3,732,055

## APPARATUS FOR AUTOMATICALLY PRODUCING A MOLDED SOLE

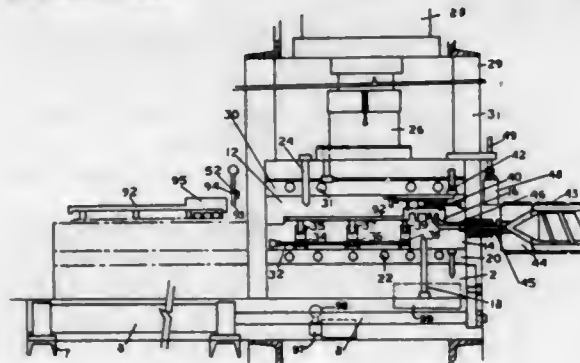
Ladislav Hujik, Batawa, Ontario, Canada, assignor to Bata Shoe Company, Inc., Belcamp, Md.

Filed Oct. 30, 1970, Ser. No. 85,481

Claims priority, application Canada, Oct. 31, 1969, 66,367  
Int. Cl. B29f 1/14

U.S. Cl. 425—308

2 Claims



The automatic manufacture of a molded sole in which means are provided for automatically removing the sprues of

material normally remaining attached to a sole after the molding thereof with the sprues being removed during movement of the molds between a molding position and a discharge position. Subsequently and during the return movement of the molds from the discharge position to the molding position, the molded soles are wiped from the molds, whereby upon return of the molds to the molding position, the apparatus is ready for a further molding cycle.

3,732,056

## APPARATUS FOR HOT PRESSING OXIDE CERAMICS IN A CONTROLLED OXYGEN ATMOSPHERE

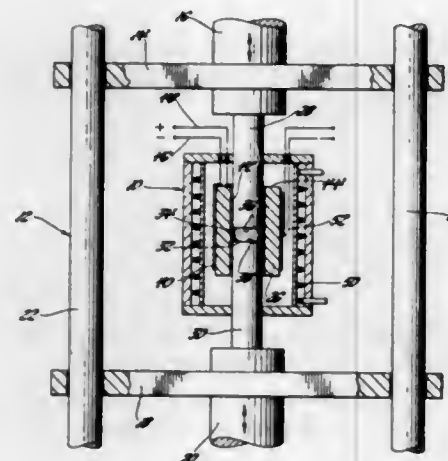
Davis D. Eddy; Glenn E. Sutherland; Adolph L. Michell, all of Roseville, and Merton H. Brooks, Royal Oak, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 1, 1971, Ser. No. 176,842

Int. Cl. B30b 11/04

U.S. Cl. 425—352

6 Claims



An improved hot press apparatus for compacting oxide ceramic powders including an electrolyte die member of a solid material conductive of oxygen ions with negligible electronic conductivity, a pair of porous electrodes applied to the inner and outer surfaces of the electrolyte die member, and a resistance heater for bringing the die member to hot press temperature is disclosed. Application of a potential to the electrodes develops a voltage across the electrolyte die member whereby oxygen molecules at the outer surface are adsorbed into the electrolyte die member, pass therethrough as oxygen ions, and are desorbed at the inner surface thereof to provide an oxygen atmosphere in the area where pressure is being applied to the oxide ceramic powder. By varying the potential applied to the electrodes the oxygen partial pressure in the die can be controlled to produce sintered oxide ceramics having improved electrical, magnetic and mechanical properties.

3,732,057

## OIL BURNER SYSTEM

Kurt Lipper, and Uri Chaim Lipper, both of 1 Reuben Street, Jerusalem, Israel

Filed Dec. 20, 1971, Ser. No. 209,907

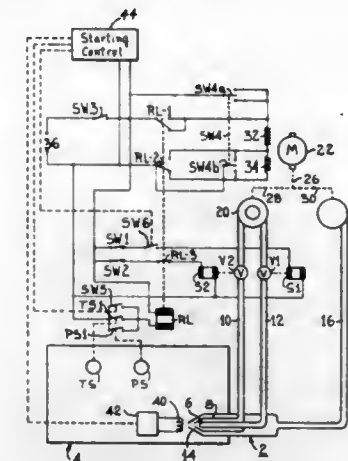
Claims priority, application Israel, Jan. 7, 1971, 35961  
Int. Cl. F23n

U.S. Cl. 431—19

7 Claims

An oil burner system for a furnace comprises a plural-speed electrical motor, a fuel pump, an air blower driven by the motor, an air conduit leading from the air blower to the oil burner, a plurality of oil conduits leading from the fuel pump to fuel nozzles in the oil burner, a solenoid-actuated valve in each of the oil conduits, a temperature and/or pressure sensor

for sensing the temperature in the furnace, and a relay controlled by the temperature sensor for reducing or increasing



the speed of the motor and for closing or opening one of the valves, thereby to reduce or increase the quantity of air fuel supplied to the burner.

3,732,058

## APPARATUS FOR IGNITING PERCUSSIVELY OR ELECTRICALLY FIREABLE FLASH UNITS

Wolfgang Ort, 7 Stuttgart 1, and Gerhard Brauning, 7050 Walblingen, both of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

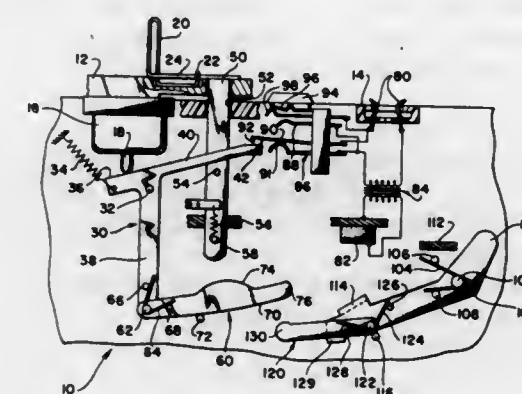
Filed June 1, 1970, Ser. No. 148,357

Claims priority, application Germany, June 13, 1970, P 20 29 231.3; July 31, 1970, P 20 38 113.9; Aug. 29, 1970, G 70 32 349.8

Int. Cl. F21k 5/02

U.S. Cl. 431—93

17 Claims



Photographic apparatus which can receive and actuate both percutively and electrically fireable flash units has percutively firing means and piezoelectric firing means selectively actuable in response to application of the same actuating force. Disclosed structure includes a blocking lever for disabling either the percutively firing means or the piezoelectric firing means in response to receipt of the other type of flash unit.

In another embodiment, means are included for simultaneously firing both types of flash units.

In another embodiment, the piezoelectric firing means is operable when there is either no percutively fireable flash unit present or a previously fired percutively fireable unit is present.

In other embodiments, the percutively and piezoelectric firing means, blocking lever and flash actuating means are incorporated within adapters for use with cameras which have no flash capability or which are able to fire only one type of flash unit.

3,732,059

## BURNER FOR GASEOUS FUELS IN REDUCED OXYGEN

## AND/OR SIGNIFICANT VELOCITY ATMOSPHERE

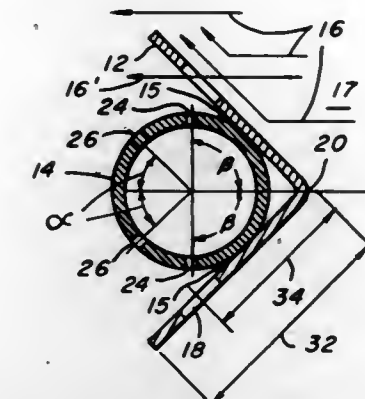
Hershel Goodnight; John S. Zink, and Robert D. Reed, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed May 28, 1971, Ser. No. 148,054

Int. Cl. F231 19/04

U.S. Cl. 431—286

14 Claims



This invention describes a burner system for burning gaseous fuels in an atmosphere containing oxygen less than that of air and/or in an atmosphere of significant flow velocity. It comprises one or more burner-baffle arrays which may be mounted singly, or in spaced parallel arrangement across the flow of said oxidizing atmosphere. Each array includes longitudinally spaced V-shaped angular baffles placed with the convex surface toward the gas flow. A gaseous fuel conduit connects with the concave downstream side of the baffle within the V angle formed by the side walls. Fuel gas inlet ports are spaced along the length of the conduit. Openings are provided in the walls of the baffles, spaced in direct relation to the positions of said ports.

3,732,060

## WELDING AND CUTTING UNIT

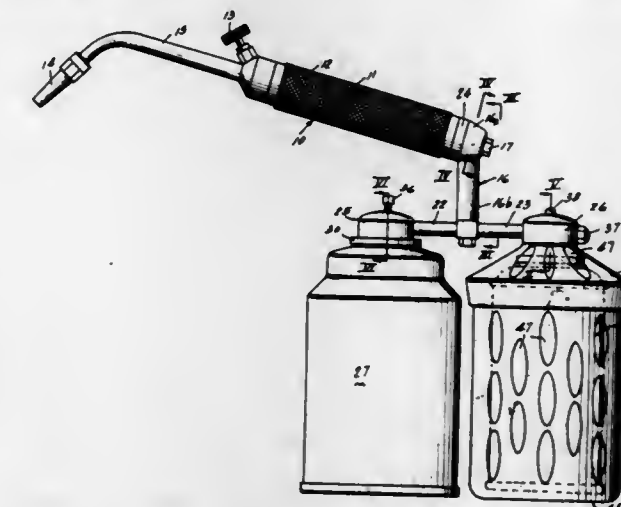
John P. Churchill, Indiatlant, and Tommy Lewis Thompson, Melbourne, both of Fla., assignors to Life Support, Inc., Melbourne, Fla.

Filed May 17, 1971, Ser. No. 143,854

Int. Cl. F23d 13/04

U.S. Cl. 431—344

8 Claims



A lightweight, portable apparatus for welding or cutting supplied with fuel and oxygen from canisters, one of which houses a chemical oxygen generator. The canisters may be suspended directly from the welding or cutting torch or may be connected thereto through flexible hoses. When suspended from the torch, the canisters may be rotated to desired out-of-the-way positions. The oxygen generator canister is encased in a heat shield and a relief valve is provided to prevent undesired pressure build-up in the generator.



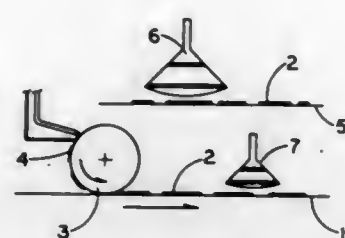
3,732,061

**REINFORCED PAGE AND METHOD OF PRINTING ON SAME**

Kenneth Lewis Hackley, Oxford, Ohio, assignor to Champion International Corporation, Knightsbridge, Ohio  
Filed June 3, 1971, Ser. No. 149,431  
Int. Cl. F27b 9/14

U.S. Cl. 432-10

5 Claims



A reinforced page suitable for insertion in a notebook or the like has along one edge a plastic with a metal or metallized surface for reinforcement. Holes extend through the metal and plastic. The method of printing with such a page involves passing the page through a printing or copying device where it is exposed to heat, such as a xerographic dry copier, with the metal surface facing toward the heat source.

3,732,062

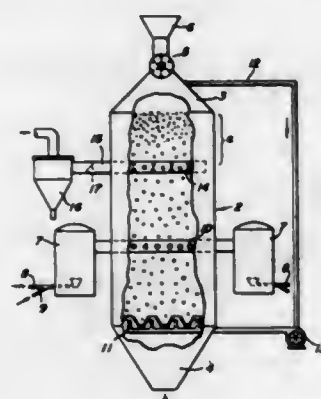
**METHOD OF AND APPARATUS FOR REDUCING AIR POLLUTION IN THE THERMAL PROCESSING OF ORES AND OTHER MATERIALS**

John H. Porteus, 1300 S. 27th Place, Apt. A-4, Birmingham, Ala.

Filed Jan. 20, 1972, Ser. No. 219,484  
Int. Cl. F27b 1/00

U.S. Cl. 432-16

13 Claims



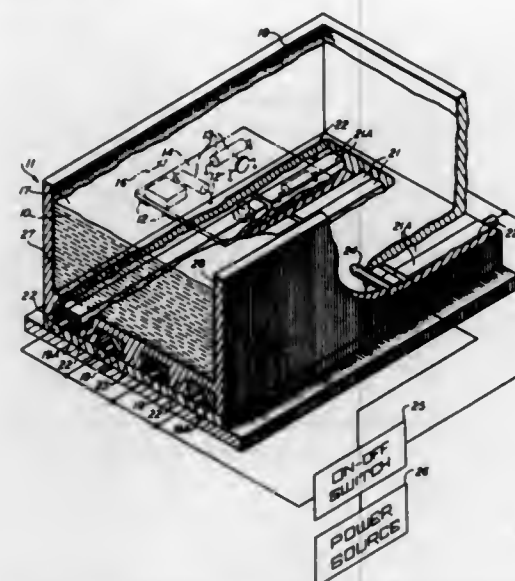
Off-gases from the high temperature firing of predominantly inorganic material, as in the manufacture of sinter and cement clinker, calcining and heat-hardening of pellets and other preforms, which have become fouled with various fumes, organic and/or metallic vapors, etc. by being used to dry and preheat the raw material with such fuel and other ingredients as may be mixed with the raw material, are recycled to a zone where they again pass through the highly-heated hot product to incinerate any burnable fumes or other contaminants in the recycled gases. All or part of such gases are then exhausted to the atmosphere while any part of said gases that are not exhausted mix with and are recycled along with the off-gases, being currently generated in the process. Shaft furnaces, traveling grate pelletizing and sintering bands, and combination systems are constructed for such recycle of the contaminated off-gases.

**3,732,063  
METHODS FOR SOLDERING BY UTILIZING A SOLDER BATH HAVING A THERMAL GRADIENT**

Vincent A. Corsaro, Haverhill, and Norman F. Smith, Methuen, both of Mass., assignors to Western Electric Company, Incorporated, New York, N.Y.  
Filed May 20, 1971, Ser. No. 145,244  
Int. Cl. F27b

U.S. Cl. 432-29

3 Claims



When mass soldering connections on a printed circuit board or other article by advancing the board across the surface of a solder bath, heat transfer to the board, icicle-like formations on the connections and uneven coating on the board are each minimized by utilizing an increasing temperature gradient along the path over which the board or article travels. The temperature gradient may be established and maintained because solder is a relatively poor conductor of heat. The temperature gradient is initially achieved and controlled by selectively controlling the heat applied to the bath so that more heat is applied to the exit portion of the bath than to the entrance portion. The temperature gradient is also influenced by heat losses both to the ambient atmosphere and to the boards passing through the bath.

3,732,064

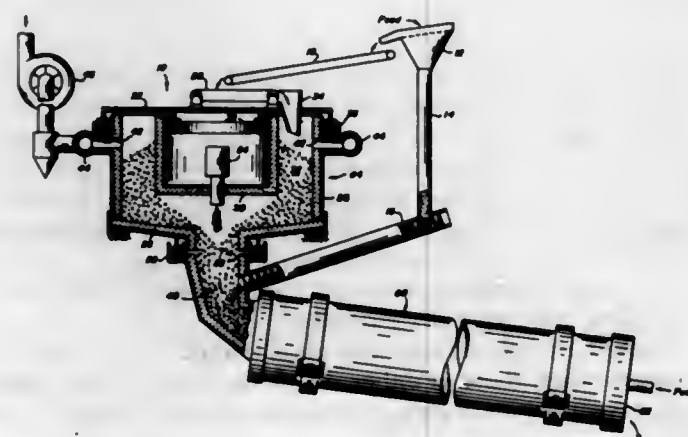
**METHOD AND APPARATUS FOR HEAT TREATING AGGLOMERATES**

Louis H. Jaquay, Carnegie, Pa., assignor to Dravco Corporation, Pittsburgh, Pa.

Filed Aug. 10, 1971, Ser. No. 170,590  
Int. Cl. F27b 7/02

U.S. Cl. 432-13

12 Claims



A method and apparatus for heat treating agglomerates is disclosed. The larger particles are separated from the fines, and the larger particles are then discharged to a preheater where they are heated to a temperature above the desired heat

treating temperature. The thus heated larger particles are then combined with the separated fines in such a manner to effect heating of the fines by the larger particles such that the temperature of the mixture is reduced to below the desired heat treating temperature. The heated mixture of the larger particles and fines is then heated at the desired heat treating temperature.

3,732,065

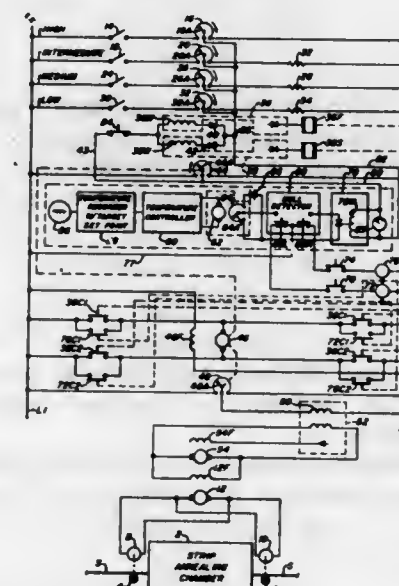
**STRIP ANNEALING LINE TEMPERATURE CONTROL SYSTEM**

John A. Crawford, Concord, Calif., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 21, 1971, Ser. No. 182,332  
Int. Cl. F27b 9/28

U.S. Cl. 432-45

6 Claims



A continuous strip annealing line has potentiometers which determine the speed of the line, a pilot motor operating a first rheostat whose setting causes changes in line speed, a second rheostat operated by the pilot motor, and control means between the potentiometers and second rheostat operable when their voltages are unequal to cause rotation of the pilot motor in such direction to bring the voltages into balance. A temperature regulation control system includes a strip temperature sensor, a null detector connected to the output of the temperature sensor, and a magnetic amplifier having its output connected to the null detector and its input connected across the potentiometer and second rheostat. The null detector has two normally open contacts one closing when the strip temperature is too high so as to speed up the line by operating the pilot motor and the other closing when the strip temperature is too low to slow down the line. The contacts open when the two inputs to the null detector are in balance. Switches operable by the operator permit conventional operation or operation of the temperature regulation control and in conjunction with the potentiometers permit change from temperature regulation to conventional operation without changing line speed.

3,732,066

**OVEN FOR CONTROLLING HEATING AND CURING OF RESINOUS INSULATING MATERIAL**

Harry P. Kipple, Pittsburgh, Pa.; Virgil J. Cozzarin, Clarence, N.Y., and Francis C. Kapperman, deceased, late of Eggertsville, N.Y. (by Dorothy M. Kapperman, administratrix), assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

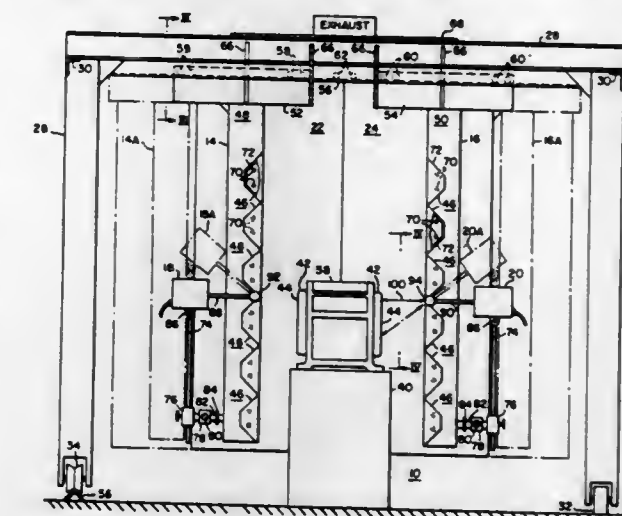
Filed Nov. 16, 1970, Ser. No. 89,797  
Int. Cl. F27b 3/02

U.S. Cl. 263-2 R

6 Claims

An oven for heating and curing a powder of heat hardenable resinous material that has been applied to the portions of coil

windings in a slot of a magnetic core as well as to the coil end turns including at least two heating panels disposed at spaced distances from the coated coil windings, the panels having a plurality of infrared radiant energy sources directed towards the coil windings, the panels being movable toward and away



3,732,067

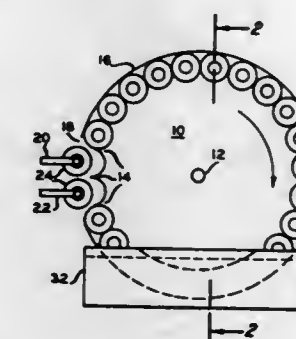
**APPARATUS FOR SURFACE TREATMENT OF INTERIOR OR PARISON PREFORM**

Richard K. Young, and Calvin D. Dockery, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 850,783, Aug. 18, 1969, Pat. No. 3,655,848. This application Nov. 4, 1971, Ser. No. 195,574  
Int. Cl. F27b 9/16

U.S. Cl. 432-85

4 Claims



In the production of biaxially oriented hollow articles from preformed parisons of olefin polymers, marked improvement in the clarity of the finished product is obtained when the inner surface of the parison preform is melted and thereafter quenched.

3,732,068

**CYLINDRICAL ELONGATED FURNACE FOR TREATING MATERIAL AT HIGH TEMPERATURE AND UNDER HIGH PRESSURE**

Hans Larker, Robertsfors, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed July 1, 1971, Ser. No. 158,742

Claims priority, application Sweden, July 10, 1970, 9594/70  
Int. Cl. F27b 3/02

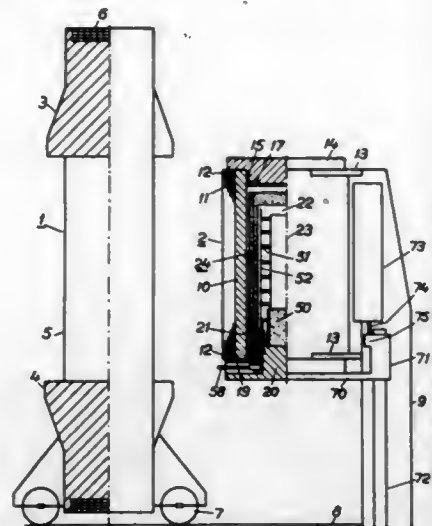
U.S. Cl. 432-120

9 Claims

A vertical furnace for treating material at high temperature and under high pressure has a stand into which a cylindrical pressure chamber is introduced. This stand is formed of a high pressure cylinder with top and bottom end closures which pro-



ject into the cylinder. A furnace chamber is formed within the pressure cylinder by two hat-shaped parts with insulating



material between them. These parts rest on an annular portion of the bottom closure. The inner part of the bottom closure is removable for charging the furnace.

3,732,069

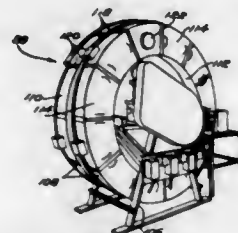
#### APPARATUS FOR HANDLING AND DRYING PENCIL LEADS

Verion E. Wiser, Shelbyville, and Charles W. McCallie, Bell Buckle, both of Tenn., assignors to James Talcott Inc., Boston, Mass.

Division of Ser. No. 879,381, Nov. 24, 1969, Pat. No. 3,586,298. This application March 15, 1971, Ser. No. 124,231 Int. Cl. F27b 9/16

U.S. Cl. 263—7

3 Claims



Apparatus for handling and drying pencil leads comprising means for receiving the leads after extrusion and cutting thereof but while the leads are still moisture laden and hence limp and easily deformable, said means maintaining the leads in straightened condition while loading the leads into cylindrical cans, the loaded cans being rotatable about their own axes to maintain the leads therein in straightened condition, the apparatus further comprising a rotary furnace for receiving the loaded cylindrical cans to effect drying of the leads, said rotary furnace comprising a rotor that slowly moves the loaded cans through an annular heating chamber, the loaded cans being mounted on discs which are rotatably mounted on the rotor, and drive means for simultaneously imparting rotation to the rotor and to the discs, the rotation of the latter being at a substantially greater rate than the rotation of the former, whereby as the rotor slowly carries the loaded cans through the heating chamber, the discs are simultaneously rotating about their own axes.

3,732,070

#### BURNER

Joseph A. Vietorisz, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed March 31, 1971, Ser. No. 129,868

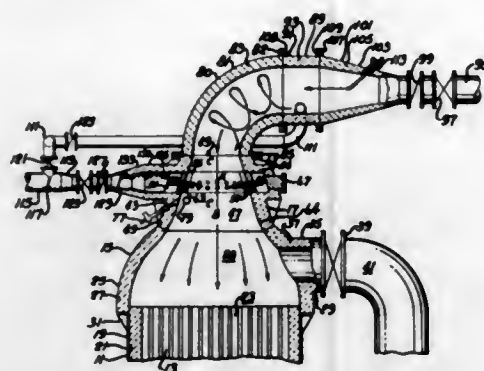
Int. Cl. F231 9/00

U.S. Cl. 263—19 R

17 Claims

A burner used in conjunction with heat exchangers or furnaces has a chamber that is divided into a gas-mixing zone and

a combustion zone, a means for axially introducing selected amounts of a relatively slow-flowing combustion supporting first gas into the mixing zone, a means for radially introducing selected amounts of a relatively rapid-flowing combustion supporting second gas as a plurality of gas streams into the gas



mixing zone whereupon the first and second gases become intimately admixed, and a means in the combustion zone for igniting the admixed gases to generate hot exhaust gases for supplying heat to be stored in the heat exchanger or, utilized otherwise.

3,732,071

#### TOWER FURNACE

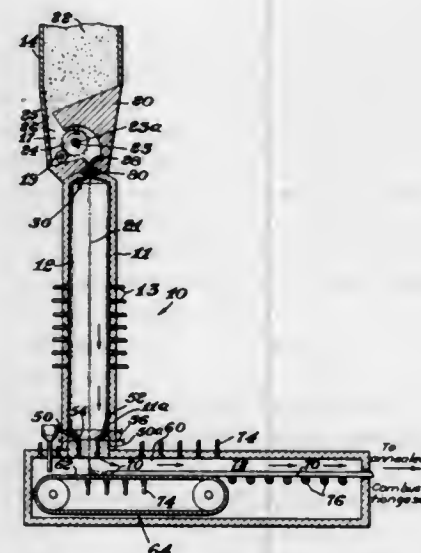
Nathan Waldman, Midland, and Julian H. Meserve, Saginaw, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 60,062, July 31, 1970, abandoned. This application Dec. 17, 1971, Ser. No. 209,320

Int. Cl. F27b 3/00, 15/00

U.S. Cl. 432—235

6 Claims



Disclosed herein is an improved apparatus and process for the manufacture of foamed ceramic material. The process comprises passing particles of a bloatable composition downwardly in a continuous planar curtain through an elongated heating zone, thereby to heat the particles above their melting temperature, and either cooling the particles to form expanded aggregate or alternatively collecting the particles while they are still molten to form a slab of foamed ceramic material. The improved apparatus comprises a tower furnace having an elongated serrated drum feeder positioned to discharge particles into the furnace in the form of a uniform curtain. The improved process and apparatus are especially advantageous to ceramic foam manufacture in that, as collected, the particles form a foamed ceramic slab of relatively uniform density and cell structure and of a generally rectangular cross-section.

## CHEMICAL

3,732,072

#### METHOD FOR RINSING FABRIC ARTICLES

Erwin B. Bahusen, Hinsdale, Ill., assignor to Steiner American Corporation, Salt Lake City, Utah

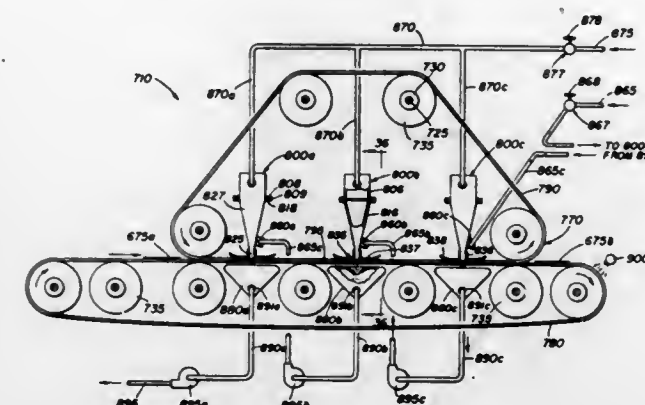
Original application Nov. 25, 1969, Ser. No. 879,764.

Divided and this application Sept. 28, 1971, Ser. No. 184,575

Int. Cl. B05b 7/00; B05c 5/02

U.S. Cl. 8—149.1

3 Claims



A method for rinsing cloth articles wherein the cloth articles are rinsed by directing a mist of gas and rinse liquid along a path normal to the articles therethrough to prevent puddles of the rinse liquid and the wash solution from forming thereon.

3,732,073

#### N,N-DIETHYLAZIRIDINIUM CHLORIDE AS A COREACTANT CATALYST FOR REACTIONS OF N-METHYLOL REAGENTS WITH CELLULOSE

Stanley P. Rowland, Earl J. Roberts, and Clinton P. Wade, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

Filed Mar. 28, 1972, Ser. No. 238,869

Int. Cl. D06m 15/58, 15/56, 13/48

U.S. Cl. 8—183

9 Claims

N,N-diethylaziridinium chloride (DAC) is a coreactant catalyst for the reaction of cellulose with a broad variety of N-methylol compounds. This catalyst is effective in promoting reaction between cotton and individual N-methylol reagents or combinations of those reagents. The DAC was found especially effective as delayed-cure cross-linking processes. Little reaction occurred during delay periods up to 33 days and no increases in recovery angles were found in the delayed and uncured samples. The delayed-but-cured samples showed crease-recovery angles equal to those achieved in immediate cures.

3,732,074

#### SCALE METER

Herbert Feitler, Jr., 10346 Mississippi Ave., Los Angeles, Calif. 90025

Filed Jan. 6, 1971, Ser. No. 104,311

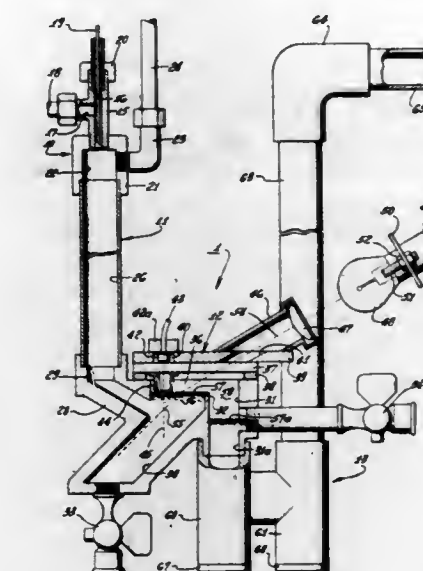
Int. Cl. G01n 21/28, 33/18

U.S. Cl. 23—230 R

21 Claims

A scale meter comprising a mixing head for mixing a reagent and a water sample to cause the precipitation

of particles in the water, a holding tube to allow the precipitate particles to grow to a detectable size, and a detector cell having a light source and a photo cell to detect light scattered from the precipitate particles in the water. This scale meter can be employed to determine the critical or true scaling pH of a given water. This scale meter can also be employed in a scale preventative



system for a water system. In a scale preventative system the signal from the photo cell is amplified and compared in a comparator to a second signal which is equivalent to a signal from a water having scale conditions. When the amplified signal is larger than the second signal the comparator actuates means for preventing scaling in the water system.

3,732,075

#### AIR POLLUTION CONTROL DEVICE

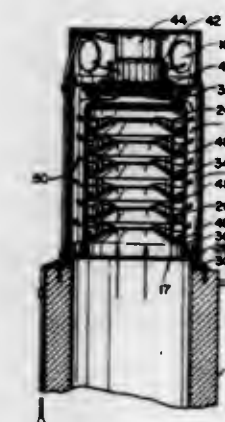
Peter Acaba, 605 East 6th Street, Apt. 1E, New York, N.Y.

Filed Dec. 16, 1970, Ser. No. 98,783

Int. Cl. B01d 50/00

U.S. Cl. 23—284

5 Claims



An air pollution control apparatus for removing pollutants from exhaust gases prior to discharge into the atmosphere



which includes both mechanical and chemical filtering of the gases. The gases are drawn through a housing containing a plurality of spaced baffle members surrounded by a porous filter material for precipitating and trapping particulates; a chemical filter further reacts with the gases to neutralize noxious substances therein. A suction impeller in the housing is utilized for maintaining and controlling the gas flow through the filters and for discharging the purified gas through exhaust ports in the housing. The filters are furthermore advantageously removably mounted to permit for the easy disposal of pollutants collected and for replacement of the filters when necessary.

3,732,076

**RARE EARTH HYDROGEN DETECTOR**

Stephen M. Toy, Orange, and Austin Phillips, Santa Monica, Calif., assignors to McDonnell Douglas Corporation

Filed June 21, 1971, Ser. No. 155,019

Int. Cl. G01n 21/12, 21/60

U.S. Cl. 23—232 R

10 Claims



Hydrogen emanation and distribution at microstructural features to one micron size and below and bulk hydrogen to .001 part per million is detected with a rare earth metal detector system. The system operates on the basis of a chemical reaction of a rare earth metal with hydrogen. The rare earth metal is applied to the surface of the specimen to be examined and allowed to react with the hydrogen therein to form a metal hydride. In most rare earth metals, a color change occurs at the hydride reaction sites so that hydrogen emanation areas can be located on the specimen. By measuring the volume of the hydride sites, the amount of hydrogen reacted with the rare earth, and hence the amount of hydrogen in the specimen can be calculated.

3,732,077

**METHOD AND COMPOSITION FOR DETERMINING BUN**

Lowell B. Foster, and Jane M. Hochholzer, both of Birmingham, Ala., assignors to Damon Corporation, Needham Heights, Mass.

Filed Oct. 29, 1971, Ser. No. 193,973

Int. Cl. G01n 33/16, 21/24

U.S. Cl. 23—230 B

3 Claims

Blood serum is tested for the presence of urea nitrogen by reacting urea present in the serum with an aqueous reagent having a pH of between 0.4 and 1.5 and containing diacetylmonoxime, phenazone, arsenic pentoxide and sulfuric acid. Reaction is effected by heating the serum-reagent mixture to 85° to 100° C., cooling and measuring the optical absorbance of the cooled mixture at a wavelength between 450 and 485 nm.

**3,732,078  
FLOW REDISTRIBUTOR FOR A FIXED BED DOWN  
FLOW REACTOR**

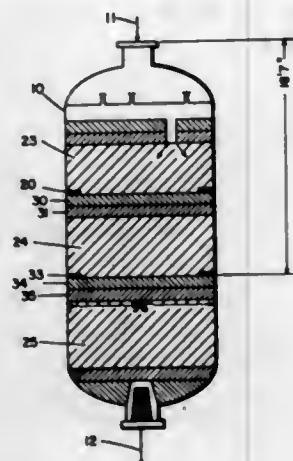
John R. Kassarian, Detroit, Mich., assignor to Marathon Oil Company, Findlay, Ohio

Filed April 16, 1971, Ser. No. 134,776

Int. Cl. B01J 9/04

U.S. Cl. 23—288 R

7 Claims



In a fixed bed down flow reactor, e.g., a gas-oil hydrotreater, there is installed a deflector, e.g., a 6-inch wide rim around the inside perimeter of the reactor and a load of low flow resistance particles, e.g., balls, is loaded immediately below the rim so that channeling is redistributed.

3,732,079

**DISPOSABLE PLASTIC SYRINGE FOR USE IN  
COLORIMETRY**

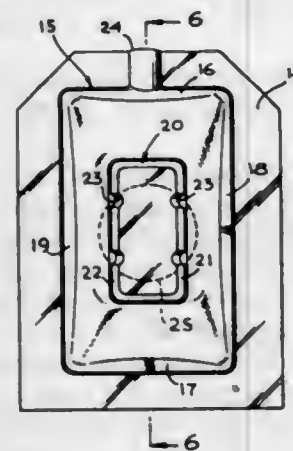
Ward B. Davis, Glendale, Calif., assignor to Sterilizer Control Royalties, North Hollywood, Calif.

Continuation-in-part of Ser. No. 800,887, Feb. 20, 1969, Pat. No. 3,620,676. This application Feb. 3, 1971, Ser. No. 112,234

Int. Cl. G01n 1/14, 31/22

U.S. Cl. 23—253 TP

6 Claims



A disposable plastic syringe particularly for use in colorimetry is formed by embossing a sheet of transparent synthetic plastic, or otherwise forming in it, a bulbar cavity, and subsequently closing the cavity by adhering a plane synthetic plastic sheet over the cavity, the two sheets being either heated sealed or adhesively joined together at the margins around the cavity. The cavity is connected to the outside edge of the device by an embossed groove which when attached to the plane sheet forms a tubular inlet or outlet. The cavity is shaped as a truncated pyramid with a turret closing the top, this turret forming a finger-pressable "button" by which the syringe will draw in or expel liquid through the tubular connection to the margin of the device. The volume of

liquid drawn into each specimen syringe is relatively accurately measured. A partial coating, such as a stripe or spot, inside the bulbar cavity using a color-change-indicator composition provides means for making a colorimetric determination of the acidity or the content of some individual constituent of the liquid drawn into the syringe device.

3,732,080

**PANEL-SHAPED CATALYTIC ELEMENT WITH  
FASTENING MEANS**

Joachim Klepitzko, Am Der Burgmuehle 1, 646 Gelnhausen, Germany

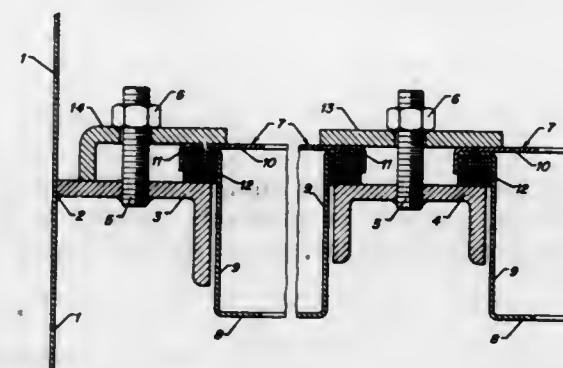
Filed March 1, 1971, Ser. No. 120,030

Claims priority, application Germany, March 12, 1970, G 70 09 055.0

Int. Cl. B01J 9/04; F01n 3/14

U.S. Cl. 23—288 F

4 Claims



Panel type catalyst elements with peripheral flanges that provide a U-shape profile to hold a gasket member provide for easier and improved clamped attachment to spaced supporting frame members.

3,732,081

**APPARATUS FOR FLUID-SOLID CONTACTING  
OPERATIONS**

Don B. Carson, Mount Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 27,784, April 13, 1970, Pat. No. 3,607,129. This application May 20, 1971, Ser. No.

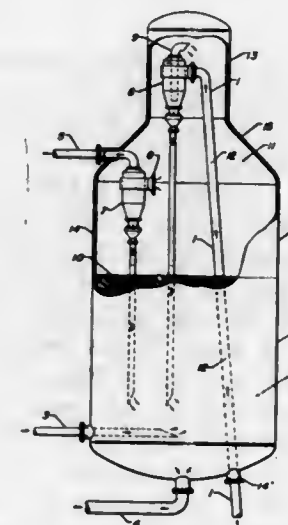
145,352. The portion of the term of this patent subsequent

to Sept. 21, 1988, has been disclaimed.

Int. Cl. B01J 9/20

U.S. Cl. 23—288 S

8 Claims



An apparatus comprising a riser reaction zone and a reaction zone vessel, said vessel having disposed therein a first and

second particle separation means, the second particle separation means is connected to said riser reaction zone which passes into said vessel through its lowermost portion. The first particle separation means is connected to an outlet stream passing out of the reaction zone vessel. The apparatus is applicable for use in catalytic cracking operations, fluidized dehydrogenation operations, or any fluid-solid catalytic operation in which fluidized catalysts are utilized to effectuate a reaction. In a particular instances the apparatus may be used to perform a riser reaction and a dense fluidized bed contacting simultaneously.

3,732,082

**METHOD OF PRODUCING SUBSTANTIALLY DUST  
FREE CALCIUM CHLORIDE PARTICULATE**

Robert S. Kolat, Bay, and Raymond K. Hudson, Caro, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Aug. 11, 1970, Ser. No. 63,004

Int. Cl. B01J 6/00; C01f 11/18

U.S. Cl. 23—304

12 Claims

A process for producing substantially dust and fines free particulate calcium chloride wherein at least the particulate surface is glazed by exposure to heat above the temperature at which a glaze occurs, while simultaneously preventing agglomeration of the particulate by agitation until the calcium chloride surface cools to below this temperature. Exposure time to temperatures in excess of the glaze temperature determines the depth of the glazed zone.

3,732,083

**COMPOSITE ARTICLE**

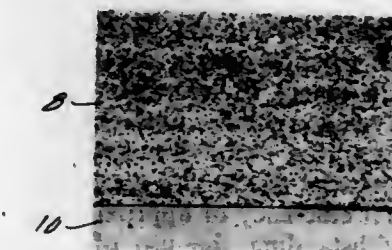
Gordon J. Le Brasse and Victor Gallatin, Ann Arbor, Mich., assignors to Federal-Mogul Corporation

Filed Aug. 13, 1970, Ser. No. 63,419

Int. Cl. B32b 15/20

U.S. Cl. 29—197

5 Claims



An aluminum based bearing alloy and bearing components fabricated therefrom which comprises from about 3.5% to about 4.5% tin, from about 3.5% to about 4.5% silicon, from about 0.7% to about 1.3% copper and the balance substantially all aluminum, along with conventional impurities.

3,732,084

**EMULSIFIED CARBON FUEL**

James Nixon and Alan Beerbower, Westfield, N.J., assignors to Esso Research and Engineering Company

No Drawing. Filed June 16, 1969, Ser. No. 833,661

Int. Cl. C10I 1/32

U.S. Cl. 44—51

11 Claims

A stable, semi-solid or pseudoplastic emulsion containing unusually high amounts, e.g. 60 wt. percent of elemental carbon is prepared by coating finely-divided carbon with an emulsifier and thereafter admixing the emulsifier-coated carbon particles with a liquid hydrocarbon, an emulsifier, and a polar organic liquid to form an emulsified carbon fuel having as the dispersed phase a major



proportion of the hydrocarbon, e.g. jet fuel, and as the continuous phase a minor proportion of the polar organic liquid, e.g. formamide-urea mixtures. Such fuels typically have yield stresses in the range of 1,000-10,000 dynes/cm<sup>2</sup>, are readily pumpable and are useful as fuels in air-breathing rockets.

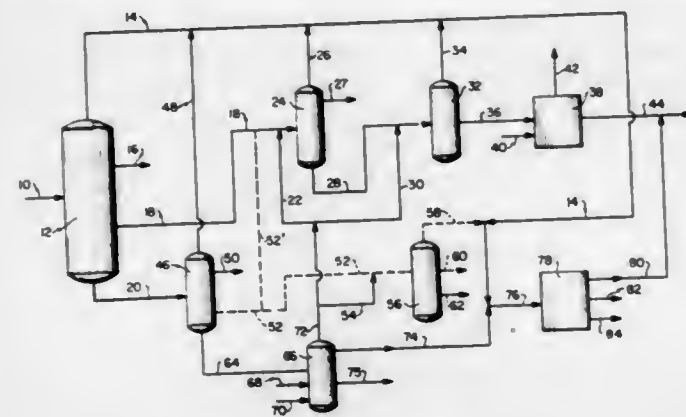
### 3,732,085 THERMALLY EFFICIENT NONPOLLUTING SYSTEM FOR PRODUCTION OF SUBSTITUTE NATURAL GAS

Norman L. Carr, Allison Park, Warren A. Roe, Jr., Upper St. Clair, and Harry C. Stauffer, Cheswick, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed June 4, 1971, Ser. No. 150,146  
Int. Cl. C07c 9/04

U.S. Cl. 48-214

12 Claims



Sulfur-free, methane-rich substitute natural gas is produced from a high sulfur crude oil by a nonpolluting process capable of achieving an unexpectedly high thermal efficiency. The process comprises separating whole crude oil into a plurality of fractions comprising a bottoms fraction and a lighter oil fraction, desulfurizing and hydrocracking the oil fraction into a substantially sulfur-free naphtha in the presence of hydrogen, which is provided by converting a residue portion obtained from the bottoms fraction. The resulting sulfur-free naphtha is converted into substitute natural gas in the presence of steam. Not only is a thermal efficiency of approximately 100 percent obtained, notwithstanding the use of a portion of the crude oil for refinery fuel, but naphtha is produced at a volumetric efficiency of about 100 percent based upon the crude oil feedstock. The system is autogenic with respect to hydrogen requirements for desulfurization, nitrogen removal, and hydrocracking.

### 3,732,086 METHOD AND APPARATUS FOR RECOVERING DISCRETE GOBS OF MOLTEN GLASS

Clarence A. Heyne, Toledo, Ohio, assignor to Owens-Illinois, Inc.

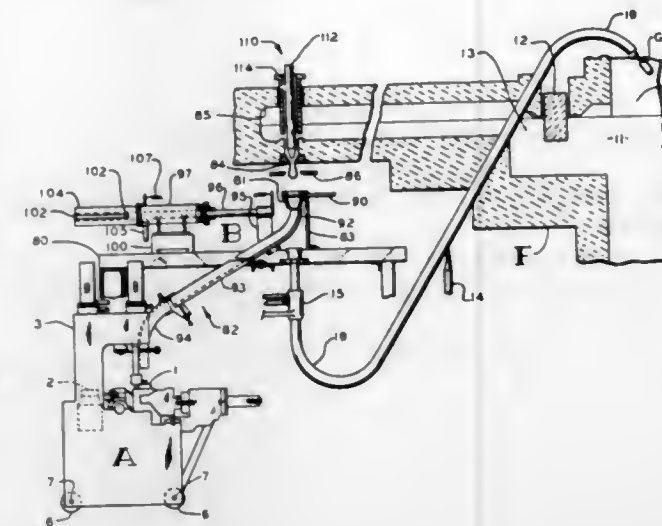
Filed Dec. 28, 1970, Ser. No. 101,845  
Int. Cl. C03b 5/26

U.S. Cl. 65-28

14 Claims

Embodiments are disclosed of means for recovering discrete gobs of molten glass for reuse. A conduit has an entrance end located to receive the discrete gobs of molten glass from a gob feeding means and an exit end positioned to deliver recovered gobs received by the conduit to a molten glass supplying means. The discrete gobs are conveyed through the conduit means by supplying fluid under pressure or creating a vacuum in the conduit to urge the discrete gobs to the melting tank of a furnace. The gob recovery system may be utilized with IS mold-

ing machines, Owens pot process machines, and the like. Whenever the discrete gob forming apparatus is utilized



with the Owens pot process equipment, the flow of glass through the pot may be positively metered to provide better homogeneity in the molten glass in the pot.

### 3,732,087 TETRASILICIC MICA GLASS-CERAMIC METHOD

David G. Grossman, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 24, 1971, Ser. No. 117,933

Int. Cl. C03b 29/00; C03c 3/22

U.S. Cl. 65-33

3 Claims



This invention relates to the production of tetrasilicic fluorine mica glass-ceramic articles from the controlled heat treatment of crystallizable glasses containing, in weight percent on the oxide basis, 45-70% SiO<sub>2</sub>, 8-20% MgO, 8-15% MgF<sub>2</sub>, a total of 5-35% [R<sub>2</sub>O+RO], wherein R<sub>2</sub>O ranges from about 5-25% and consists of one or more oxides selected in the indicated proportions from the group consisting of 0-20% K<sub>2</sub>O, 0-23% Rb<sub>2</sub>O and 0-25% Cs<sub>2</sub>O, and wherein RO ranges from 0-20% and consists of one or more oxides selected from the group consisting of SrO, BaO and CdO, a total of 0-10% of oxides selected from the group consisting of As<sub>2</sub>O<sub>5</sub> and Sb<sub>2</sub>O<sub>5</sub>, and up to about 5% of glass colorants. These tetrasilicic mica products exhibit good machinability with steel tools, good mechanical strength, moderate thermal expansion and good chemical durability. The use of the optional constituents As<sub>2</sub>O<sub>5</sub>, Sb<sub>2</sub>O<sub>5</sub> and the glass colorants permits the production of translucent glass-ceramics and glass-ceramics having the appearance of marble.

### 3,732,088 BLOW HEAD ASSEMBLY

Anthony T. Zappia, 7576 Ivywood Drive, Apt. A,

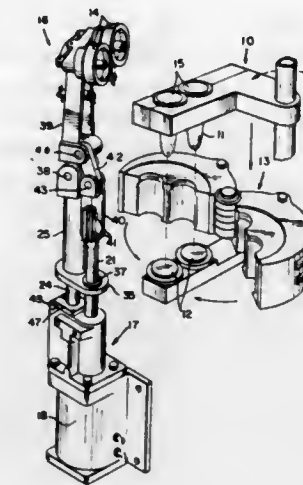
Indianapolis, Ind. 46250

Filed Aug. 30, 1971, Ser. No. 176,054

Int. Cl. C03b 9/14

U.S. Cl. 65-261

6 Claims



A blow head assembly for forming hollow glassware, the assembly being adapted for arrangement near a blow mold into which parisons are successively dropped, and comprising an arm carrying a blow head and mounted to swing about a horizontal axis between a horizontal position in which the arm overlies the mold with the blow head in spaced registry with the mold, and an elevated position in which the arm is laterally withdrawn from the mold, the pivotal mounting for the arm being carried by a post arranged for limited rectilinear reciprocation, and a reciprocator parallel with the line of reciprocation of the post, operative to swing the arm between its stated positions and effective to cause the post to move synchronously with the reciprocator when the arm is in horizontal position to shift the blow head rectilinearly into and out of mating engagement with the mold.

### 3,732,089 PROCESS FOR PRODUCING MICRO-ORGANISMS

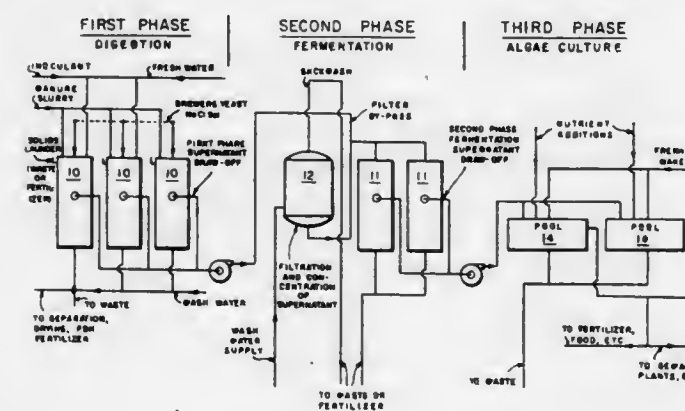
Charles K. Megronigle, 1801 Baltimore Pike, Springfield, Pa. 19064

Filed Aug. 16, 1971, Ser. No. 171,919

Int. Cl. C05f 11/08

U.S. Cl. 71-8

13 Claims



The processing of the excrement of lactating cows is disclosed having a digestion phase, a fermentation phase and an algae culture phase. In the digestion stage a slurry of excrement of lactating cows is reacted with brewer's

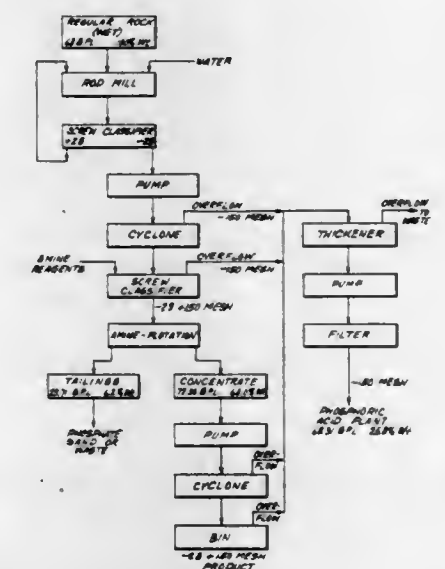
yeast, sodium chloride, an inoculant and water to provide a first phase supernatant for use, separated from wastes, in the second phase. In the second or fermentation phase the first supernatant is filtered, concentrated and fermented, wastes separated, and a second supernatant drawn off for use in the third or algae culture stage. In the latter stage nutrients and fresh water are added to the second supernatant which is held in pools with withdrawal of the wastes and separation of a culture useful in the treatment of animal wastes, sewage and waste waters and products useful for a variety of purposes including reduction of odors, increased oxidation in sewage effluent, degreasing of sewer conduits and plant equipment, accelerated settlement of sewage solids, foaming reduction and control, nitrogen and phosphorous level reductions in sewage plant effluent, accelerated cellulose fiber degradation, organic soil additives, and animal feed supplement and/or additives.

### 3,732,090 PROCESSING OF PHOSPHATE ROCK

Harvie W. Breathitt, Jr., Lakeland, Robert D. Evans, Pierce, and Wesley M. Houston, Lakeland, Fla., assignors to Agrico Chemical Company, Tulsa, Okla. Continuation of application Ser. No. 633,319, Mar. 3, 1967, which is a continuation-in-part of application Ser. No. 365,269, May 6, 1964, both now abandoned. This application Feb. 17, 1971, Ser. No. 116,244

U.S. Cl. 71-37

6 Claims



Phosphatic pebble is up-graded by subjecting a slurry of phosphate matrix to the steps of washing and size classification, with the phosphatic pebble resulting from the classification being subjected to wet grinding; the fines from wet grinding are suitable for acidulation to produce a fertilizer material, and the coarser fraction from wet grinding is further beneficiated by flotation.

### 3,732,091 METHOD FOR PREPARING MUTUAL DISPERSIONS OF CARBIDES AND METALS OR ALLOYS AND NOVEL PRODUCTS THEREOF

René A. Paris and Dominique Thibaudon, Lyon, Marc P. Roubin, Villeurbanne, and Jacques M. Paris, Lyon, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Puteaux, France

Filed July 1, 1970, Ser. No. 51,470

Claims priority, application France, July 4, 1970,

6922753

U.S. Cl. 75-5 AC

9 Claims

A mixed oxide, a co-precipitate of hydroxides or a mixed complex of a first metal providing the carbide of



proportion of the hydrocarbon, e.g. jet fuel, and as the continuous phase a minor proportion of the polar organic liquid, e.g. formamide-urea mixtures. Such fuels typically have yield stresses in the range of 1,000–10,000 dynes/cm<sup>2</sup>, are readily pumpable and are useful as fuels in air-breathing rockets.

3,732,085

# THERMALLY EFFICIENT NONPOLLUTING SYSTEM FOR PRODUCTION OF SUBSTITUTE NATURAL GAS

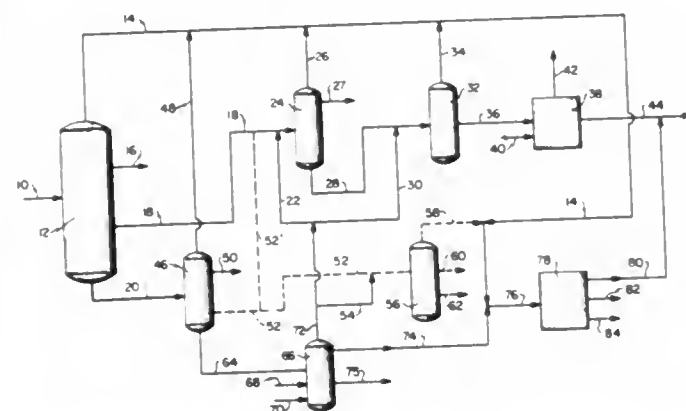
Norman L. Carr, Allison Park, Warren A. Roe, Jr., Upper St. Clair, and Harry C. Stauffer, Cheswick, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed June 4, 1971, Ser. No. 150,146

Int. Cl. C07c 9/04

U.S. Cl. 48—214

12 Claims



Sulfur-free, methane-rich substitute natural gas is produced from a high sulfur crude oil by a nonpolluting process capable of achieving an unexpectedly high thermal efficiency. The process comprises separating whole crude oil into a plurality of fractions comprising a bottoms fraction and a lighter oil fraction, desulfurizing and hydrocracking the oil fraction into a substantially sulfur-free naphtha in the presence of hydrogen, which is provided by converting a residue portion obtained from the bottoms fraction. The resulting sulfur-free naphtha is converted into substitute natural gas in the presence of steam. Not only is a thermal efficiency of approximately 100 percent obtained, notwithstanding the use of a portion of the crude oil for refinery fuel, but naphtha is produced at a volumetric efficiency of about 100 percent based upon the crude oil feedstock. The system is autogenic with respect to hydrogen requirements for desulfurization, nitrogen removal, and hydrocracking.

3,732,086

# METHOD AND APPARATUS FOR RECOVERING DISCRETE GOBS OF MOLTEN GLASS

Clarence A. Heyne, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed Dec. 28, 1970, Ser. No. 101,845

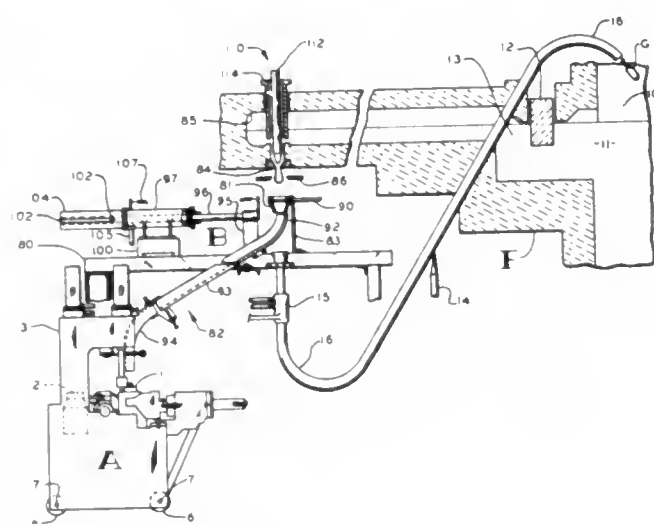
Int. Cl. C03b 5/26

U.S. Cl. 65—28

14 Claims

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3,732,087

# TETRASILICIC MICA GLASS-CERAMIC METHOD

David G. Grossman, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 24, 1971, Ser. No. 117,933

Int. Cl. C03b 29/00; C03c 3/22

U.S. Cl. 65—33

3 Claims



This invention relates to the production of tetrasilicic fluorine mica glass-ceramic articles from the controlled heat treatment of crystallizable glasses containing, in weight percent on the oxide basis, 45–70% SiO<sub>2</sub>, 8–20% MgO, 8–15% MgF<sub>2</sub>, a total of 5–35% [R<sub>2</sub>O+RO], wherein R<sub>2</sub>O ranges from about 5–25% and consists of one or more oxides selected in the indicated proportions from the group consisting of 0–20% K<sub>2</sub>O, 0–23% Rb<sub>2</sub>O and 0–25% Cs<sub>2</sub>O, and wherein RO ranges from 0–20% and consists of one or more oxides selected from the group consisting of SrO, BaO and CdO, a total of 0–10% of oxides selected from the group consisting of As<sub>2</sub>O<sub>3</sub> and Sb<sub>2</sub>O<sub>3</sub>, and up to about 5% of glass colorants. These tetrasilicic mica products exhibit good machinability with steel tools, good mechanical strength, moderate thermal expansion and good chemical durability. The use of the optional constituents As<sub>2</sub>O<sub>3</sub>, Sb<sub>2</sub>O<sub>3</sub> and the glass colorants permits the production of translucent glass-ceramics and glass-ceramics having the appearance of marble.

3,732,088

# BLOW HEAD ASSEMBLY

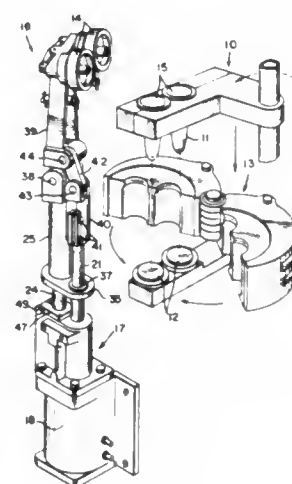
Anthony T. Zappia, 7576 Ivywood Drive, Apt. A, Indianapolis, Ind. 46250

Filed Aug. 30, 1971, Ser. No. 176,054

Int. Cl. C03b 9/14

U.S. Cl. 65—261

6 Claims



A blow head assembly for forming hollow glassware, the assembly being adapted for arrangement near a blow mold into which parisons are successively dropped, and comprising an arm carrying a blow head and mounted to swing about a horizontal axis between a horizontal position in which the arm overlies the mold with the blow head in spaced registry with the mold, and an elevated position in which the arm is laterally withdrawn from the mold, the pivotal mounting for the arm being carried by a post arranged for limited rectilinear reciprocation, and a reciprocator parallel with the line of reciprocation of the post, operative to swing the arm between its stated positions and effective to cause the post to move synchronously with the reciprocator when the arm is in horizontal position to shift the blow head rectilinearly into and out of mating engagement with the mold.

3,732,089

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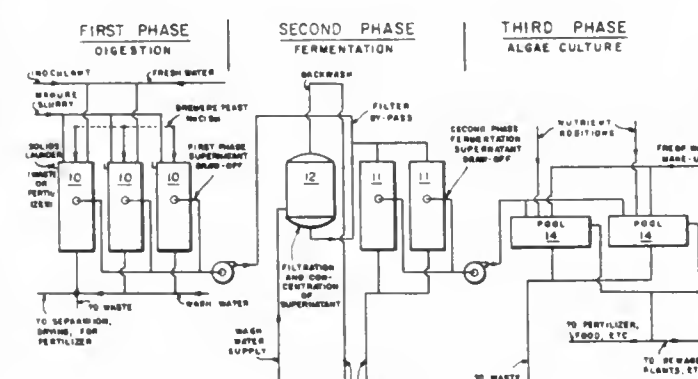
Charles K. Megronigle, 1801 Baltimore Pike, Springfield, Pa. 19064

Filed Aug. 16, 1971, Ser. No. 171,919

Int. Cl. C05f 11/08

U.S. Cl. 71—8

13 Claims



The processing of the excrement of lactating cows is disclosed having a digestion phase, a fermentation phase and an algae culture phase. In the digestion stage a slurry of excrement of lactating cows is reacted with brewer's

yeast, sodium chloride, an inoculant and water to provide a first phase supernatant for use, separated from wastes, in the second phase. In the second or fermentation phase the first supernatant is filtered, concentrated and fermented, wastes separated, and a second supernatant drawn off for use in the third or algae culture stage. In the latter stage nutrients and fresh water are added to the second supernatant which is held in pools with withdrawal of the wastes and separation of a culture useful in the treatment of animal wastes, sewage and waste waters and products useful for a variety of purposes including reduction of odors, increased oxidation in sewage effluent, degreasing of sewer conduits and plant equipment, accelerated settlement of sewage solids, foaming reduction and control, nitrogen and phosphorous level reductions in sewage plant effluent, accelerated cellulose fiber degradation, organic soil additives, and animal feed supplement and/or additives.

3,732,090

# PROCESSING OF PHOSPHATE ROCK

Harvie W. Breathitt, Jr., Lakeland, Robert D. Evans, Pierce, and Wesley M. Houston, Lakeland, Fla., assignors to Agrico Chemical Company, Tulsa, Okla.

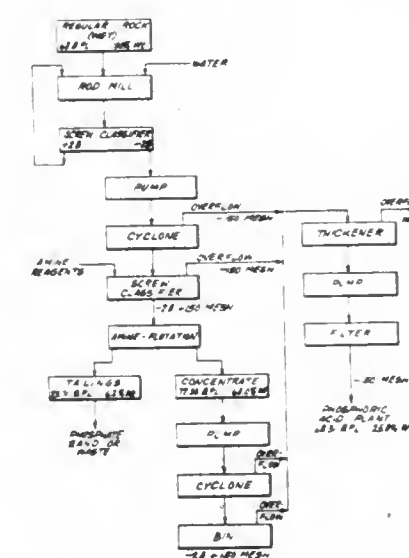
Continuation of application Ser. No. 633,319, Mar. 3, 1967, which is a continuation-in-part of application Ser. No. 365,269, May 6, 1964, both now abandoned.

This application Feb. 17, 1971, Ser. No. 116,244

Int. Cl. C05b 11/04

U.S. Cl. 71—37

6 Claims



Phosphatic pebble is up-graded by subjecting a slurry of phosphate matrix to the steps of washing and size classification, with the phosphatic pebble resulting from the classification being subjected to wet grinding; the fines from wet grinding are suitable for acidulation to produce a fertilizer material, and the coarser fraction from wet grinding is further benefited by flotation.

3,732,091

# METHOD FOR PREPARING MUTUAL DISPERSIONS OF CARBIDES AND METALS OR ALLOYS AND NOVEL PRODUCTS THEREOF

René A. Paris and Dominique Thibaudon, Lyon, Marc P. Roublin, Villeurbanne, and Jacques M. Paris, Lyon, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Puteaux, France

Filed July 1, 1970, Ser. No. 51,470

Claims priority, application France, July 4, 1970, 6922753

Int. Cl. B22f 9/00

U.S. Cl. 75—5 AC

9 Claims

A mixed oxide, a co-precipitate of hydroxides or a mixed complex of a first metal providing the carbide of



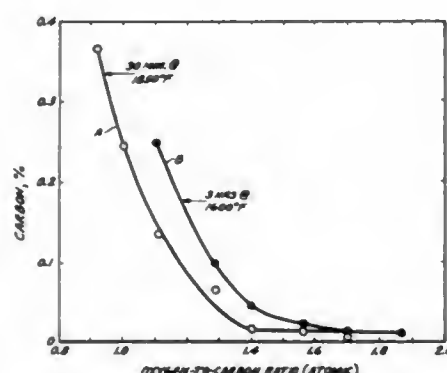
the dispersion and of a second metal providing the metal of the dispersion are subjected to a heat treatment in an enclosure. The compound thus obtained is subjected, in a reducing and carburizing atmosphere containing hydrogen and methane, to thermal treatment below 1100° C. to reduce all the oxides and carburize the first metal. Heating is effected at a speed of 100 to 400° C./hour. The dispersions comprise particles of single or mixed carbides uniformly distributed in the midst of elementary grains of metal. The dispersions are used in powder metallurgy.

3,732,092

**HEAT TREATMENT OF IRON POWDER**  
George E. Wieland, Jr., and Eugene M. Rudzki, Bethlehem, Pa., assignors to Bethlehem Steel Corporation  
Filed Mar. 31, 1972, Ser. No. 239,970  
Int. Cl. B22f 9/00

U.S. Cl. 75—5 BA

8 Claims



Raw iron powders are blended so that the atomic ratio of the reducible oxygen to the carbon content of the blend is within the range of 1.2 to 1.6. The raw powder blend is heat treated in a furnace, without an auxiliary atmosphere, to reduce the carbon and reducible oxygen contents of the powder.

3,732,093

# PROCESS FOR THE PREPARATION OF CAESIUM METAL

Christian Vaniscotte, Vermelles, France, assignor to Houilleres du Bassin du Nord & du Pas-de-Calais, Douai, France  
No Drawing. Filed Nov. 30, 1967, Ser. No. 686,847  
Claims priority, application France, Dec. 2, 1966, 86,039

Int. Cl. C22b 27/00

U.S. Cl. 75—66

6 Claims

This invention is concerned with a process for the preparation of caesium metal wherein an ore containing caesium is directly reacted with silicon in the presence of a sufficient quantity of lime at 1300° C. to yield the pure metal.

3,732,094

# PROCESS FOR PREPARING ELEMENTAL MERCURY

Duane Brown, 104 E. Huntington Drive, Tempe, Ariz. 85281, and Alton R. Carlson, 720 E. Dobbins Road, Phoenix, Ariz. 85040

Filed June 29, 1970, Ser. No. 50,838

Int. Cl. C22b 3/00, 11/00, 43/00

U.S. Cl. 75—101 R

11 Claims

This application discloses a process for recovering mercury from various mercury-containing materials such as ores, ore concentrates, alloys, amalgams and compounds. According to one feature of the process, the mercury is ex-

tracted in the form of a soluble mercury complex by leaching the mercury source with a novel leach liquid. The novel leach liquid contains components which react during the leaching step to generate a hypohalite leach reagent in situ. The hypohalite, in turn, oxidizes the mercury or mercury compound which is then solubilized in the leach liquid to form a strong pregnant liquor.

According to another feature of the process, arsenic, selenium and tellurium impurities are separated from the pregnant liquor by means of a novel technique involving the formation of an insoluble metal hydroxide suspension in the pregnant liquor, which suspension selectively adsorbs the soluble impurity metal compounds which are in turn separated from the pregnant liquor. If gold compounds are present in the purified pregnant liquor, they are selectively removed prior to the reduction step by contacting the pregnant liquor with a combined reductant and adsorbent for the gold.

According to another feature of the invention, pregnant leach liquors containing soluble mercury complexes, either prepared as described above or by any other suitable process, are treated to reduce the mercury complex to form elemental mercury in a single homogeneous liquid phase. The liquid phase reduction is preferably carried out in two stages, i.e., a first stage in which the mercury content of the leach liquor is only partially reduced to form an insoluble mercury compound which is separated from the mother liquor. After separation of the partially reduced insoluble mercury compound, it is treated with an additional quantity of the reducing agent to complete the reduction of the insoluble mercury compound to elemental mercury.

3,732,095

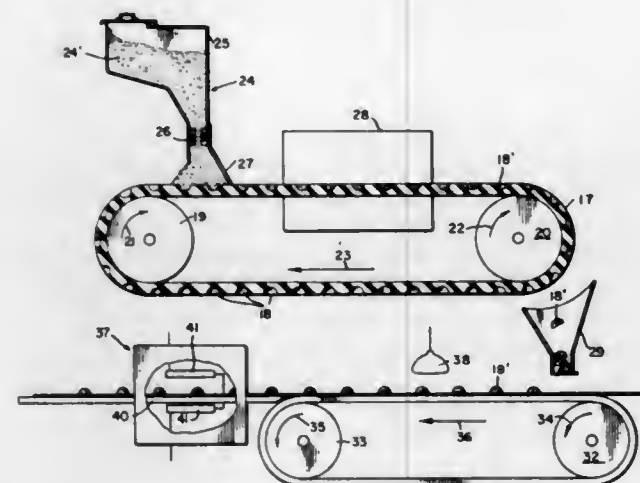
# METHOD OF MAKING POROUS ELECTRODES COMPRISING FREEZING WET POWDER AND SINTERING

Gerhart P. Klein, Manchester, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.  
Division of application Ser. No. 17,519, Mar. 19, 1970, now abandoned, and continuation-in-part of application Ser. No. 810,405, Sept. 13, 1968, which is a division of application Ser. No. 552,312, May 23, 1966. This application Aug. 23, 1971, Ser. No. 174,210

Int. Cl. B22f 1/00

U.S. Cl. 75—211

6 Claims



A method for making porous anodes suitable for use in capacitors which involves forming moistened metal powder into a mass, freezing the moistened mass thereby bonding the metal powder together and sintering the mass to convert it to a porous pellet suitable for use as an anode for a capacitor.

3,732,096

# ELECTROPHOTOGRAPHIC PHOTOSENSITIVE LAYER

Satoru Houjo and Masaaki Takimoto, Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
Filed Jan. 8, 1971, Ser. No. 105,051

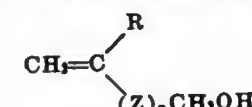
Claims priority, application Japan, Jan. 8, 1970, 45/2,589

Int. Cl. G03g 5/00, 5/08

U.S. Cl. 96—1.5

15 Claims

An inorganic photoconductor is added to a binder which comprises a copolymer of a vinyl monomer and a component expressed by the following general formula



where R represents H or CH<sub>3</sub>, Z represents COO(CH<sub>2</sub>)<sub>m</sub>, CONHCH<sub>2</sub> or OCH<sub>2</sub>, m represents an integer of from 1 to 5, and n represents 0 or 1, an alkyl resin compatible with said copolymer and a polyisocyanate compound capable of crosslinking at least a part of said copolymer.

3,732,097

# METHOD FOR DIRECTLY DEVELOPING A RELIEF IMAGE IN A POLYMERIZABLE COMPOSITION

John P. Dickie, Monroeville, Philip H. Harju, Spring Church, and David Kostishack, Verona, Pa., assignors to Koppers Company, Inc.

No Drawing. Filed Feb. 2, 1971, Ser. No. 112,082

Int. Cl. G03c 1/70, 5/00

U.S. Cl. 96—35.1

4 Claims

A process for directly developing a relief image in a polymerizable composition is disclosed. The process involves an image-wise exposure of a polymerizable layer to a beam of actinic light, and differentially polymerizing the layer under the influence of this image-wise exposure to form directly a polymerized casting in the form of a relief image. Also, mirror-relief images can be developed directly on opposite surfaces of the resultant polymerized casting. The castings can be used for printing plates, circuit boards, and can be used to make fluidic amplifiers.

3,732,098

# RED LIGHT DEVELOPMENT OF FREE RADICAL SYSTEM WITHIN 50 NANOMETERS

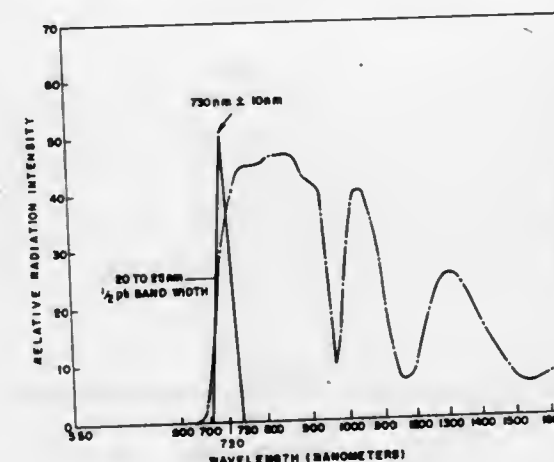
Frederick W. Schmidt, Bedford Heights, Ohio, assignor to Horizons Incorporated, a Division of Horizons Research Incorporated

Filed Sept. 22, 1971, Ser. No. 182,703

Int. Cl. G03c 5/24, 5/04

U.S. Cl. 96—48 R

3 Claims



The process described in United States Pat. 3,510,300 is greatly improved by restricting the radiation used for developing visible images in non-silver free radical film to a very narrow band of wavelengths not broader than 50 nanometers.

3,832,099

# TEMPERATURE SENSITIVE PRESSURE-APPLYING MEMBERS FOR A PHOTOGRAPHIC PROCESSING LIQUID

Richard Chen, Winchester, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

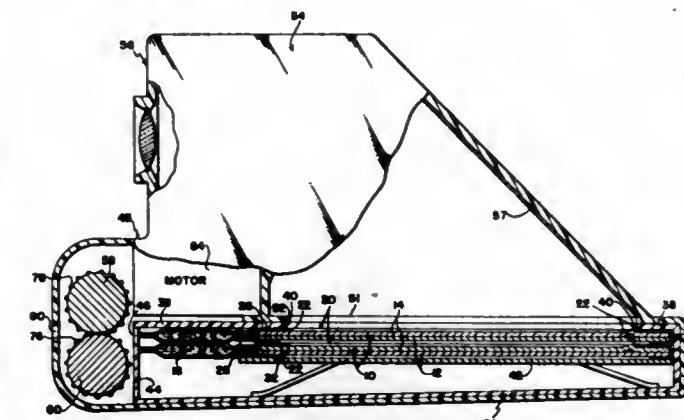
Original application June 21, 1968, Ser. No. 738,954.

Divided and this application Dec. 30, 1970, Ser. No. 102,934

Int. Cl. G03c 5/54

U.S. Cl. 96—29 R

4 Claims



A photographic process, in which a viscous photographic, processing liquid is distributed in a thin layer between an exposed photosensitive element and another element by moving the elements in super-position through a convergent passage between a pair of juxtaposed pressure-applying members. The viscosity of the liquid varies inversely with temperature, the speed of movement of the elements is constant and the pressure-applying members are biased toward one another with a force that is varied in inverse relation to the ambient temperature to insure uniform liquid distribution despite temperature changes.

3,732,100

# METHOD OF MAKING ELECTRICAL CAPACITORS

James E. Genthe, Chelmsford, Mass., assignor to Itel Corporation, Lexington, Mass.

Continuation-in-part of application Ser. No. 9,389, Feb. 6, 1970, which is a continuation-in-part of application Ser. No. 717,502, Apr. 1, 1968, both now abandoned.

This application Oct. 18, 1971, Ser. No. 190,296

Claims priority, application Great Britain, Mar. 28, 1969, 16,264/69

Int. Cl. G03c 5/00, 11/00

U.S. Cl. 96—38.4

6 Claims

An electrical component production method wherein an electrically conductive image electrode is exposed and photographically developed on the surface of a substrate supported photoconductive layer.

3,732,101

# PHOTOGRAPHIC FILM UNIT

Edwin H. Land, Cambridge, and Albert J. Bachelder, Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of application Ser. No. 5,799, Jan. 26, 1970, now Patent No. 3,619,192, which is a continuation-in-part of abandoned application Ser. No. 622,286, Mar. 10, 1967. This application June 21, 1971, Ser. No. 155,119

The portion of the term of the patent subsequent to Nov. 9, 1988, has been disclaimed

Int. Cl. G03c 1/48

U.S. Cl. 96—76 C

22 Claims

A photographic film unit comprising all of the materials required to produce a photographic print including a first element which is a photosensitive element, a second



element which may be a transparent image-receiving element, a binding element secured to the exterior margins of the first and second elements adjacent three sides of the area to be exposed and processed, and a container of processing liquid secured to the elements adjacent the remaining side of the exposure area. The binding element secures the first and second elements to one another along three sides of the exposure area and preferably also serves as the means for securing the container to the elements adjacent the remaining side of the exposure area. The film unit is designed to be maintained intact throughout and subsequent to exposure and processing in which a processing liquid is discharged from the container and distributed in a layer between the first and second elements over the exposed area to form a transfer image between the elements. The external binding sheet functions to control the thickness of the layer of liquid, to insure sufficient liquid at the edges of the exposed area to provide for complete image formation and to provide a white border for the finished print.

3,732,102

### PRODUCTION OF PHOTOGRAPHIC SILVER HALIDE EMULSIONS

Hendrik Alfons Borginon, Mortsel, and Frans Henri Claes, Edegem, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Continuation-in-part of abandoned application Ser. No. 774,190, Nov. 7, 1968. This application Mar. 12, 1971, Ser. No. 123,887

Claims priority, application Great Britain, Nov. 7, 1967, 50,631/67

Int. Cl. G03c 1/02

U.S. Cl. 96—94

3 Claims

The formation of fine grains in a photographic silver halide emulsion formed in an ammonia-free gelatin medium is promoted by carrying out any or all of the significant steps in manufacturing and coating such emulsions under sub-atmospheric pressure, preferably below 100 mm. Hg.

3,732,103

### SILVER HALIDE EMULSIONS CONTAINING ALKYL SELENOLS AND THIOLS AS ANTI-FOGGANTS

Arthur Herman Herz and Edwin Russell Wescott, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed May 3, 1971, Ser. No. 139,941

Int. Cl. G03c 1/34

U.S. Cl. 96—109 R

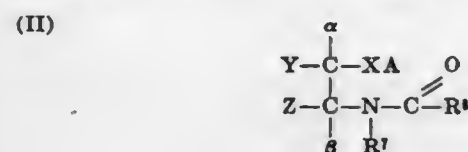
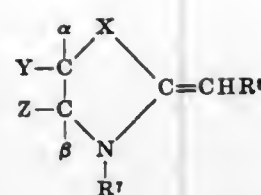
9 Claims

Photographic silver halide emulsions and elements comprising said emulsions are stabilized against fog by organic selenium derivatives and their sulfur-containing analogs. New alkyl selenols useful in fog stabilizing concentrations are likewise disclosed.

These fog stabilizing organic compounds have the structural formula:



in which A is a cation, X is sulfur or selenium,  $R^1$  to  $R^5$  are each hydrogen or organic residues provided that at least one of said  $R^1$  to  $R^5$  is a sulfonic acid group or salt thereof and  $m$  and  $n$  are each about 0 to about 4 so that the sum of  $m$  and  $n$  equals a positive integer up to about 8;

or  
(III)

in which A is a cation, X is sulfur or selenium,  $R^7$  is an organic residue;  $R^6$  is hydrogen or an organic residue;  $\alpha$  and  $\beta$  are each hydrogen, organic residue or the electrons required to form double bonds between the carbon atoms; Y and Z are each hydrogen or an organic residue or together comprise atoms needed to complete a cyclic nucleus.

3,732,104

### SILVER HALIDE EMULSIONS CONTAINING AZAINDENE AND AMIDE STABILIZING AGENTS

Hubert Vandenabeele, Wilrijk, Joseph Louis De Munck, Heide-Kalmthout, Robrecht Julius Thiers, Brasschaat, Robert Joseph Pollet, Vremde, Raymond Leopold Florens, Edegem, and Jozef Frans Willems, Wilrijk, Belgium, assignors to Gevaert-Agfa, N.V., Mortsel, Belgium

No Drawing. Filed Oct. 27, 1970, Ser. No. 84,489

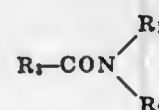
Claims priority, application Great Britain, Nov. 3, 1969, 53,825/69

Int. Cl. G03c 1/34

U.S. Cl. 96—109

12 Claims

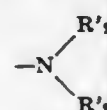
Photographic materials comprising a light-sensitive silver halide emulsion element containing an azaindene emulsion stabilizing agent in contact with as an additional stabilizing agent an amide having the formula:



wherein

each of  $R_1$  and  $R_2$  stands for hydrogen, lower alkyl, lower alkyl carrying a hydroxyl group, lower alkyl carrying the group  $R_3CONH-$ , or a phenyl group,

$R_1$  together with  $R_2$  stands for the atoms necessary to close a pyrrolidone, piperidine or morpholine nucleus,  $R_3$  stands for lower alkyl or the group



wherein each of  $R'_1$  and  $R'_2$  have the same significance as  $R_1$  and  $R_2$ ,  $R'_1$  and  $R'_2$  both being different from hydrogen, or  $R_3$  may represent hydrogen when  $R_1$  or  $R_2$  is substituted alkyl, or

$R_3$  together with  $R_2$  stands for alkylene.

A synergistic effect is obtained with regard to fog inhibition particularly upon storage of the element.

3,732,105

### LIGHT-SENSITIVE COPYING COMPOSITIONS

Kurt-Walter Klupfel, Wiesbaden-Sonnenberg, Hartmut Steppan, Wiesbaden-Dotzheim, and Herbert Maar, Wiesbaden, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

No Drawing. Filed Oct. 27, 1971, Ser. No. 193,139

Claims priority, application Germany, Oct. 30, 1970, P 20 53 363.5

Int. Cl. G03c 1/54, 1/70

U.S. Cl. 96—115 P

10 Claims

This invention relates to a light-sensitive copying composition which comprises at least one light-sensitive sub-

stance of which the solubility decreases on exposure and at least one high molecular weight binder which is soluble or swellable in aqueous-alkaline solutions, the binder being a reaction product of at least one sulfonyl-isocyanate of the general formula



wherein R is selected from the group consisting of an alkyl or alkoxy group with 1 to 6 carbon atoms, an aryl or aryloxy group with 6 to 10 carbon atoms or a tertiary amino group, and as a second component a member selected from the group consisting of a vinyl alcohol polymer, epoxy resin, cellulose ester, cellulose ether or polyester with free OH groups, or a polyamine, polyamide or polyurethane.

3,732,106

### LIGHT-SENSITIVE COPYING COMPOSITIONS

Hartmut Steppan, Wiesbaden-Dotzheim, Herbert Maar, Wiesbaden, and Kurt-Walter Klupfel, Wiesbaden-Sonnenberg, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

No Drawing. Filed Oct. 27, 1971, Ser. No. 193,140

Claims priority, application Germany, Oct. 30, 1970, P 20 53 364.6

Int. Cl. G03c 1/70

U.S. Cl. 96—115 R

9 Claims

This invention relates to a light-sensitive copying composition which comprises at least one light-sensitive unsaturated polymeric substance which is soluble, or at least swellable, in aqueous alkali, and at least one photoinitiator, the polymeric substance being a reaction product of a polymeric substance containing units with active hydrogen atoms, with at least one sulfonyl-isocyanate of the general formula



wherein R is selected from the group consisting of an aliphatic or cycloaliphatic group with at least one olefinic double bond.

3,732,107

### PHOTOPOLYMERIZABLE COPYING COMPOSITION

Raimund Josef Faust, Wiesbaden-Biebrich, Germany, assignor to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

No Drawing. Filed Oct. 29, 1971, Ser. No. 193,985

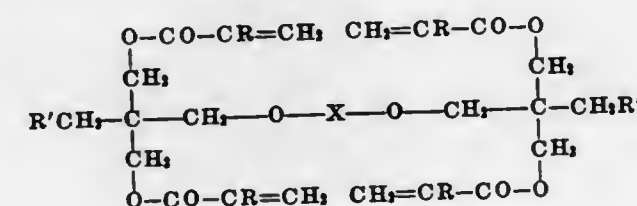
Claims priority, application Germany, Nov. 2, 1970, P 20 53 683.8

Int. Cl. G03c 1/68, 1/70

U.S. Cl. 96—115 P

13 Claims

This invention relates to a photopolymerizable copying composition comprising at least one binder, at least one photoinitiator, and at least one polymerizable unsaturated ester having the formula



in which

R is selected from the group consisting of hydrogen or a methyl group,  $R'$  is selected from the group consisting of hydrogen, a methyl group, or  $-O-CO-CR=CH_2$ , and X is a diacyl group derived from a dicarboxylic acid having 2 to 12 carbon atoms.

3,732,108

### RECOVERY OF AND SEED MEAT FROM THIOGLUCOSIDE-CONTAINING OILSEED

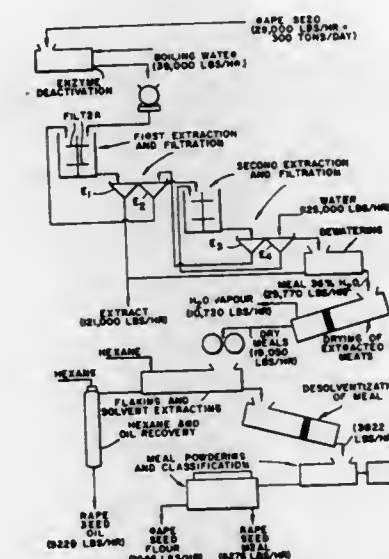
Kuttikandathil Eapen Eapen, Staten Island, N.Y.; Norman Wilson Tape, and Richard Paul Andrew Sims, both of Ottawa, Ontario, Canada, assignors to Canadian Patent and Development Limited, Ottawa, Ontario, Canada

Continuation-in-part of Ser. No. 805,619, March 10, 1969, abandoned. This application Dec. 17, 1971, Ser. No. 209,240

Int. Cl. A23l 1/20

U.S. Cl. 99—2 E

10 Claims



There is described a process for obtaining protein-rich, substantially non-toxic, oilseed flour by subjecting certain oilseed to myrosinase inactivating temperatures in the presence of water, myrosinase being the enzyme responsible for liberation of toxic compounds upon enzymatic hydrolysis. The water-treated seeds are subjected to decortication so as to expose the seed meat, thioglucoside is substantially removed by extracting at least the exposed seed meat with cold or warm water, the water-extracted material is dried and oil is recovered. The process is particularly applicable to rapeseed and other related seeds and provides a protein-rich flour, suitable for human consumption or animal feeding, which may have a protein content of up to about 56–62 percent, rapeseed oil and, as a by-product, a seed coat rich meal which is useful for animal feeds.

3,732,109

### READY-TO-EAT OAT CEREAL BISCUIT

Jeffrey G. Post, Schaumburg, and Neal F. Smith, Libertyville, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Jan. 27, 1971, Ser. No. 110,248

Int. Cl. A23l 1/10

U.S. Cl. 99—83

1 Claim

A ready-to-eat oat cereal biscuit is produced by admixing oat flour and water, subjecting the mixture to a water boiling temperature and a superatmospheric pressure, releasing the pressure, forming flakes from the released pressure mixture, drying the flakes to a critical moisture content, subdividing the flakes to a specified size, mixing the subdivided pieces with syrup, then compacting the mixture to form a biscuit and drying the formed biscuits.

A ready-to-eat oat cereal biscuit is disclosed comprising finely subdivided oat flakes and syrup compressed together and dried to a moisture content from about 4 percent to 5 percent by weight.



3,732,110

**PROCESS FOR PRODUCING RICOTTA CHEESE**  
Nicholas E. Pontecorvo, Tarzana, Calif., assignor to Pontecorvo R & D Company, Los Angeles, Calif.  
Continuation-in-part of application Ser. No. 39,721, May 22, 1970. This application Mar. 8, 1971, Ser. No. 121,709

Int. Cl. A23c 19/02

U.S. Cl. 99—116

13 Claims

A heated mixture of whey and milk is processed simultaneously in a plurality of small adjacent cells by successive acidifying steps, to develop separate floating bodies of curd which are then collected in respective skimming baskets as residual whey is drained off below them, and are finally removed by simultaneously lifting the skimming baskets from the cells.

3,732,111

**SPICE ANTIOXIDANT PRINCIPLE AND PROCESS FOR THE EXTRACTION THEREOF**

David L. Berner and Glen A. Jacobson, Cherry Hill, and Charles D. Trombold, Cinnaminson, N.J., assignors to Campbell Soup Company, Camden, N.J.  
Filed June 7, 1971, Ser. No. 150,638

Int. Cl. A23i 1/22; C07g 17/00

U.S. Cl. 99—140 R

10 Claims

Ground spice is extracted with heated animal or vegetable oil. The oil soluble extract containing volatile and non-volatile components is separated from the spice solids. The extract is heated under vacuum conditions and simultaneously sparged with steam to obtain a deodorized oil extract containing the oil soluble non-volatile spice antioxidant principle.

3,732,112

**INTERMEDIATE MOISTURE FOOD COMPOSITIONS CONTAINING ALIPHATIC 1,3-DIOLS**

John W. Frankenfeld, Atlantic Highlands, N.J., and Marcus Karel, Newtonville, and Theodore P. Labuza, North Tewksbury, Mass., assignors to Esso Research and Engineering Company

No Drawing. Filed Nov. 16, 1970, Ser. No. 90,135

Int. Cl. A23i 3/34

U.S. Cl. 99—150 R

19 Claims

Intermediate moisture food compositions are prepared utilizing as an ingredient linear aliphatic 1,3-diols having 4 to 15 carbon atoms in the chain and their esters for the inhibition of bacterial, yeast and mold growth.

3,732,113

**METHOD AND APPARATUS FOR PREPARING A POULTRY PRODUCT**

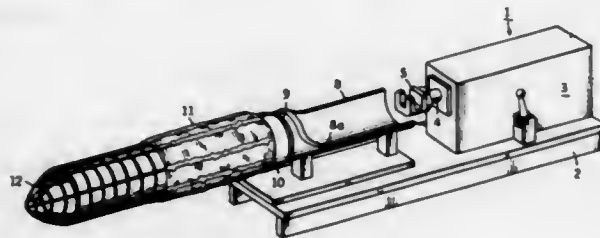
Roger E. Walters, Glendale, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Filed Feb. 12, 1971, Ser. No. 115,028

Int. Cl. B65b 25/06

U.S. Cl. 99—174

7 Claims



A poultry roll which is fabricated by surrounding poultry meat with an artificial skin may be assembled and tied together in a single operation. A scoop unit having a shape conforming to a portion of the desired configuration of the poultry roll is utilized. An artificial or fabricated skin is placed within the scoop unit, pieces

of poultry meat are layered on the artificial skin, and the artificial skin is folded over the layered poultry meat to substantially surround the poultry meat. The scoop unit containing the poultry meat roll is then connected to a ram which is effective to insert the scoop unit and poultry meat roll through an arbor having a prestretched net material thereon. The net material grippingly engages the poultry roll while releasably engaging the scoop unit, and thereafter the ram retracts the scoop unit from the arbor allowing the meat roll to be retained within the net material.

3,732,114

**LAMINATED FROZEN FOOD PRODUCT**

Crosby Field, deceased, late of Brooklyn, N.Y., by Dorothy H. Hole, Charles H. Berg and Margaret R. Norbeck, executors of the Estate of said Crosby Field

Division of Ser. No. 734,126, June 3, 1968, Pat. No. 3,528,257.

This application June 29, 1970, Ser. No. 60,175

Int. Cl. A23b 7/04; F25c 5/06, 7/12

U.S. Cl. 99—192

3 Claims



A method and apparatus for extremely rapid freezing and the product it produces. Thin layers of product are frozen and subcooled on a flexible strip in consecutive layers. The product is then removed from the strip and processed.

3,732,115

**SILICIOUS COMPOSITION FOR MARKING HOT METAL AND METHOD OF MAKING AND USING SAME**

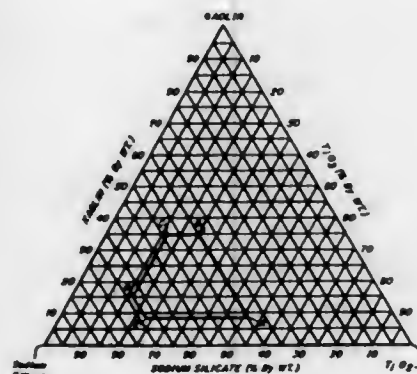
David R. Lankard, Granview Heights, and Herbert D. Sheets, Jr., Columbus, Ohio, assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 840,225, July 9, 1969, which is a continuation-in-part of abandoned application Ser. No. 612,783, Jan. 31, 1967. This application Aug. 30, 1971, Ser. No. 176,051

Int. Cl. C09d 1/02, 11/00, 13/00

U.S. Cl. 106—19

2 Claims



A liquid composition for marking metal products while at high temperature, by jet-spray application, comprises a pigment of metal oxide, such as titanium dioxide, in a vehicle of sodium-silicate solution containing kaolin as a suspending agent. A method of making such composition is also disclosed.

3,732,116

**GLASS-CERAMIC ARTICLES CONTAINING STRONTIA-, YTTRIA-, LANTHANA-, AND/OR TANTALA-BEARING CRYSTAL SPECIES**

Richard F. Reade, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

No Drawing. Filed Oct. 21, 1970, Ser. No. 82,844

Int. Cl. C03c 3/22

U.S. Cl. 106—39.7

1 Claim

This invention relates to the production of glass-ceramic articles exhibiting very low coefficients of thermal expansion and excellent resistance to creep at temperatures up to 1000° C. More specifically, this invention is concerned with glass-ceramic articles containing beta-spodumene solid solution as the principal crystal phase which are crystallized in situ from glass compositions in the  $\text{Li}_2\text{O}-\text{Al}_2\text{O}_3-\text{SiO}_2$  field but which also contain minor, but necessary, amounts of  $\text{SrO}$ ,  $\text{Y}_2\text{O}_3$ ,  $\text{La}_2\text{O}_3$ , and/or  $\text{Ta}_2\text{O}_5$ .

3,732,117

**DIELECTRIC CERAMIC COMPOSITION COMPRISING LEAD-LANTHANUM TITANATE SOLID SOLUTION**

Tsuneharu Nitta; Hiromitsu Taki, both of Osaka, and Kaneoml Nagase, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed March 24, 1971, Ser. No. 127,836

Claims priority, application Japan, April 2, 1970, 45/28414; May 19, 1970, 45/43182; June 9, 1970, 45/50068

Int. Cl. C04b 33/00

U.S. Cl. 106—73.2

7 Claims

Dielectric ceramic having a high dielectric constant and a low dielectric loss over a wide frequency range of 1 kHz to 30 MHz, a small temperature coefficient of dielectric constant, high stability with time, a high breakdown voltage and high mechanical strength is a sintered mixture composed essentially of 65 to 96 percent by weight of  $\text{BaTiO}_3$ , 3 to 20 percent by weight of  $[\text{Pb}_{1-x}\text{La}_{2x(1-y)}\text{Ti}_{1-x-y}\text{O}_{3-y}]$  (where x is a 0.15 to 0.8 mole and y is 0.5 to 0.9 mole), 1 to 15 percent by weight of  $\text{BaZrO}_3$ , and/or, as additives, up to 10 percent by weight of at least one additive selected from the group consisting of  $\text{Bi}_2\text{O}_3$ ,  $\text{Bi}_2(\text{TiO}_3)_3$ ,  $\text{Bi}_2(\text{SnO}_3)_3$ ,  $\text{Bi}_2(\text{ZrO}_3)_3$  and  $\text{SiO}_2$ .

3,732,118

**CHEMICAL PROCESS**

Robert Langley, Newton Mearns, and Robert Bruce McKay, Kilmarnock, Scotland, assignors to Ciba-Gelby AG, Basel, Switzerland

No Drawing. Filed Dec. 24, 1970, Ser. No. 101,435

Int. Cl. C08h 17/14

U.S. Cl. 106—309

14 Claims

Flocculation resistant pigments are prepared by milling together a phthalocyanine pigment and a minor portion of a chloromethylated phthalocyanine pigment and a reactive polyamide.

3,732,119

**TEMPERATURE SENSITIVE VISUAL DISPLAY DEVICE**

Donald Churchill, James V. Cartmell, and Robert E. Miller, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Application Feb. 27, 1967, Ser. No. 618,751, now abandoned, which is a continuation-in-part of application Ser. No. 558,354, June 17, 1966. Divided and this application Nov. 5, 1968, Ser. No. 798,237

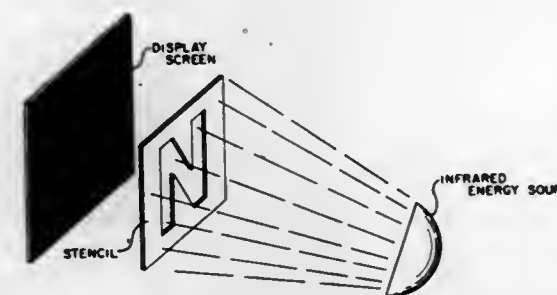
Int. Cl. B41m 5/18

U.S. Cl. 117—1.7

4 Claims

A temperature-responsive display device or composition, comprising mesomorphic ("liquid crystal") material(s) contained in minute capsules as the temperature-responsive component, is provided. The minute capsules, when placed in heat-conductive relation with a heat source together with an associated thermal gradient pattern to be displayed, exhibit an iridescence indicative of a certain characteristic temperature range, which temperature

range varies according to the types and mixtures of mesomorphic materials employed. Encapsulation of the mesomorphic materials affords physical and chemical protection from various kinds of degradation and allows their use in practical and efficient thermal-gradient display systems.



3,732,120

**PRESSURE-SENSITIVE RECORDING SHEET**

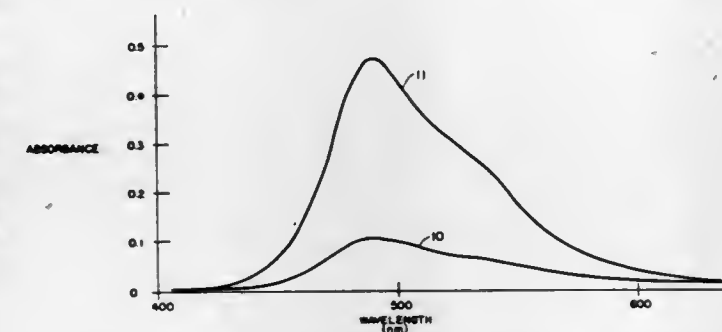
Bruce W. Brockett and Robert E. Miller, Dayton, and Mary L. Hinkle, Middletown, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed June 14, 1971, Ser. No. 152,830

Int. Cl. B41m 5/16

U.S. Cl. 117—16

14 Claims



Sensitized record sheet material, suitable for developing useful color in oily, colorless, chromogenic dye-precursor inks applied thereto. Said record sheet material has a coating comprising an oil-soluble metal salt of a phenol-formaldehyde novolak resin.

## ERRATUM

For Class 117—36 see:  
Patent No. 3,732,141

3,732,121

**GLOSS FORMING PROCESS**

Ronald W. Long, Florissant, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

No Drawing. Continuation-in-part of abandoned applications Ser. No. 822,018 and Ser. No. 822,026, both May 5, 1969. This application Feb. 13, 1970, Ser. No. 11,339

Int. Cl. B44d 1/44; C09d 3/02; D21h 1/34

U.S. Cl. 117—65.2

10 Claims

A process for increasing the gloss of paper coating compositions containing protein binders is disclosed. The process involves adding a high gloss inducing material to a bound coating composition, coating a paperboard stock with the coating composition, and calendering the coated paperboard to a gloss which is substantially higher than coated paperboard which is not treated with the high gloss inducing material. Additionally, a gloss inducing solution may be sprayed on the coating before calendering or the gloss inducing solution may be used separately.



3,732,122

**PRESSURE-SENSITIVE ADHESIVE TAPE**

Vagn Christian Albert Fehr-Christensen, Fridbach 2, Zug, Switzerland

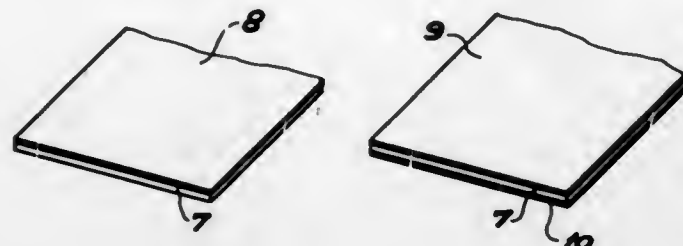
Filed Jan. 25, 1971, Ser. No. 109,542

Claims priority, application Great Britain, Feb. 3, 1970, 5,219/70

Int. Cl. C09J 7/02

U.S. Cl. 117—122 PF

3 Claims



In the manufacture of pressure-sensitive adhesive tape a carrier tape consisting of a plastic material is normally used, such carrier tape being covered at least one side with a suitable adhesive layer. The carrier tape is normally made of a sheet with a thickness of 0.04 mm. with a tensile breaking strength of from 12 to 15 kp. at a width of 25 mm. measured at a draw rate of 300 mm. per minute. The purpose of the present invention is to provide a pressure-sensitive adhesive tape having a tensile breaking strength in the longitudinal direction of at least 40 kp./25 mm. width at 0.05 mm. thickness and a transverse elongation of at least 20% are obtained, both measurements made at a draw rate of 300 mm./min. In accordance with the invention this is obtained by using a carrier tape which is produced from a strip of polyolefinic sheet by subjecting the strip to a longitudinal stretching under such conditions that the transverse dimension of the strip is substantially unaffected by the stretching.

3,732,123

**HEATER DESCALING**

Frank Stofa, Park Ridge; Laurence O. Stine, Western Springs; James R. Deering, Prospect Heights, and Douglas G. Linden, Hoffman Estates, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 21, 1970, Ser. No. 100,507

Int. Cl. B08b 7/04, 9/06; C10g 9/16

U.S. Cl. 134—19

10 Claims

The descaling of heater tubes is effected by alternately subjecting the deposited scale to oxidation and reduction techniques. Oxidation is preferably effected in a vapor atmosphere of 1.0 to 15.9 percent oxygen, and reduction in an atmosphere of 5.0 to 50.0 percent hydrogen. The heater is flushed, after either the reduction step, or after both oxidation and reduction, with steam and/or nitrogen to remove loosened particles of scale.

3,732,124

**ELECTROCHEMICAL CELLS COMPRISING CURRENT COLLECTOR MEMBER EMBEDDED INTO THE PROTRUDING EDGES OF THE ELECTRODES**

Jean-Pierre Calley, Ambares, France, assignor to Societe des Accumulateurs Fixes et de Traction (Societe Anonyme) Romainville, France

Filed June 28, 1971, Ser. No. 157,163

Claims priority, application France, July 1, 1970, 24,413

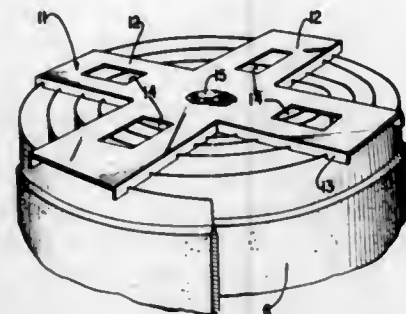
Int. Cl. H01m 35/32

U.S. Cl. 136—13

8 Claims

Electrochemical cells involving an assembly of opposite polarity electrodes having bared carrier portions projecting respectively at opposite ends of the assembly with current collectors welded respectively at opposite ends

of the assembly to the bared projecting carrier portions of the electrodes with accompanying embedment effected



3,732,125

**FILLING DEVICE FOR USE WITH LIQUIDS**

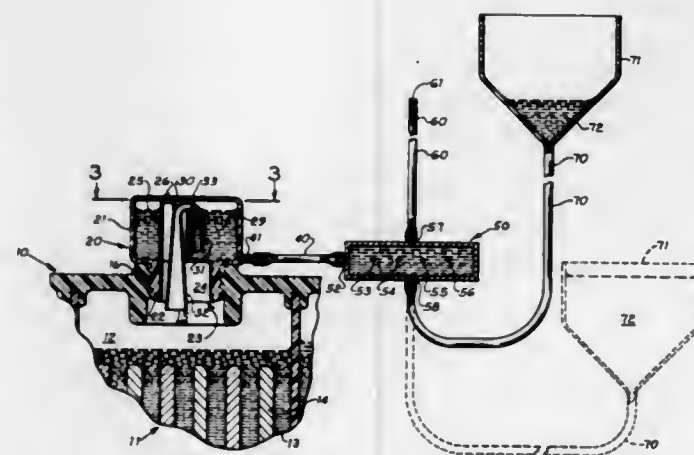
Emerson L. Stroh, 3356 N. Gladstone Ave., Indianapolis, Ind. 46218

Filed Oct. 12, 1971, Ser. No. 188,021

Int. Cl. H01m 7/00; G01f 23/00

U.S. Cl. 136—162

12 Claims



A device is disclosed which is suitable for use in adding distilled water to storage batteries. The device incorporates a siphon to add water to the battery and is designed such that water is added only if the electrolyte level is below a predetermined level.

3,732,126

**TREATMENT OF METALS**

Harold Ralph William Cobb, Didcot, and Eric Brown, Wantage, England, assignors to United Kingdom Atomic Energy Authority, London, England

No Drawing. Continuation of application Ser. No. 649,454, June 28, 1967. This application July 20, 1970, Ser. No. 64,021

Claims priority, application Great Britain, June 30, 1966, 29,538/66

Int. Cl. C21d 7/02, 9/08; C22f 1/00

U.S. Cl. 148—11.5 R

9 Claims

A method of treating metals which comprises working a metal to produce a varying amount of strain hardening throughout the cross section of metal and heat treating the metal to give a fine grain size at a surface of the metal and a coarser grain size in the interior of the metal.

3,732,127

**METHOD OF HEAT PROCESSING ALLOY STEEL TO OBTAIN MAXIMUM SOFTNESS AND UNIFORMITY**

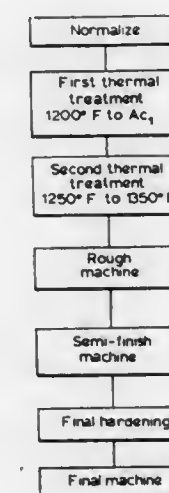
Roland W. Furgason, South Milwaukee, Wis., assignor to Ladish Co., Cudahy, Wis.

Filed Jan. 2, 1970, Ser. No. 156

Int. Cl. C21d 1/18

U.S. Cl. 148—12.4

16 Claims



A method of thermally processing ultra high strength steel to obtain maximum softness and uniformity to increase its response to machining or other processing without adversely affecting its ability to respond to the final thermal treatment required to meet the final mechanical properties. The steel is subjected to a double thermal process in which the steel is initially given a thermal treatment at a temperature above 1200° F. and below the recognized lower critical on heating, cooled to below the martensitic finish temperature, and then reheated to a temperature in the range of 1250° F. to 1350° F. During the initial treatment the steel is maintained at temperature for a period of time sufficient to allow small areas of the steel to transform to austenite and cause the remaining carbides to spheroidize and upon cooling produces a microstructure which exhibits a partially spheroidized structure with small areas of fresh martensite uniformly dispersed throughout. The second thermal treatment causes the fresh martensite to spheroidize into carbides to provide a microstructure and low hardness level which is more responsive to further processing, as well as improved uniformity in hardness throughout the part and from part-to-part.

3,732,128

**HEAT TREATMENTS OF DIE CASTINGS UNDER PRESSURE**

Charles D. Statham, Trenton, N.J., assignor to N L Industries, Inc., New York, N.Y.

No Drawing. Filed July 16, 1971, Ser. No. 163,480

Int. Cl. C22f 1/04, 1/06

U.S. Cl. 148—159

3 Claims

Metallic die castings of magnesium, aluminum and alloys thereof are subjected to a heat treatment of from 300° to 600° C. under a pressure of from 100 to 10,000 p.s.i. followed by a low temperature aging treatment to improve the properties of the metals without forming blisters on the die cast product.

3,732,129

**EXPLOSIVE CHARGES INITIATED BY EXPLODING WIRES**

Gerhard Martin, Troisdorf, Germany, assignor to Dynamit Nobel Aktiengesellschaft

No Drawing. Filed Nov. 29, 1968, Ser. No. 780,202  
Claims priority, application Germany, Dec. 22, 1967, P 16 46 348.2

Int. Cl. C06b 19/00

U.S. Cl. 149—2

11 Claims

Explosive materials of the group brisant explosives and priming powders, which normally have densities such that they are not well suited for use with exploding wires used for initiation. Such materials are treated to provide them in a form of reduced density, whereby use therein of exploding wires is accommodated. The explosive material in the form of small particles is molded to form a body thereof, with the aid of a binder, to provide the material with a density of about 30–65% of the average crystal density of the explosive material. The exploding wire is embedded in the molded body, and, the ignition energy of the exploding wire is about 0.1–120 joules.

3,732,130

**GUN PROPELLANT CONTAINING NONENERGETIC PLASTICIZER, NITROCELLULOSE AND TRIAMINOGUANIDINE NITRATE**

Joseph E. Flanagan, Woodland Hills, and Vernon E. Haury, Santa Susana, Calif., assignors to North American Rockwell Corporation

No Drawing. Filed Oct. 14, 1971, Ser. No. 192,717

Int. Cl. C06d 5/06

U.S. Cl. 149—18

10 Claims

Non-metallized gun propellant systems are provided containing triaminoguanidine nitrate oxidizer alone or in combination with other oxidizers such as cyclotrimethylene trinitramine or cyclotetramethylene tetranitramine. The binder system is based on nitrocellulose and a non-energetic plasticizer such as polyethylene glycol.

3,732,131

**GUN PROPELLANT CONTAINING NITROPLASTICIZED NITROCELLULOSE AND TRIAMINOGUANIDINE NITRATE**

Vernon E. Haury, Santa Susana, and Milton B. Frankel, Tarzana, Calif., assignors to North American Rockwell Corporation

No Drawing. Filed Oct. 14, 1971, Ser. No. 192,718

Int. Cl. C06d 5/06

U.S. Cl. 149—18

9 Claims

Non-metallized gun propellant systems are provided containing triaminoguanidine nitrate oxidizer alone or in combination with other oxidizers such as cyclotrimethylene trinitramine or cyclotetramethylene tetranitramine. The binder system is based on nitrocellulose and is typically a highly nitroplasticized nitrocellulose binder system.

3,732,132

**EXTRUDABLE FLUOROCARBON PROPELLANTS**

Raymond T. Merrow, Ridgecrest, Calif., Elmo C. Julian, Cincinnati, Ohio, Judson B. Eldridge, China Lake, Calif., George B. Rice, Trout Creek, Utah, and Robert L. Dow, China Lake, Charley R. Rodgers, Ridgecrest, and Bertram O. Stull, China Lake, Calif., assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Nov. 23, 1964, Ser. No. 413,680

Int. Cl. C06d 5/06

U.S. Cl. 149—19

7 Claims

Propellant compositions are prepared containing metals, oxidizing agents and a copolymer of vinylidene fluoride and perfluoropropylene with polytetrafluoroethylene.

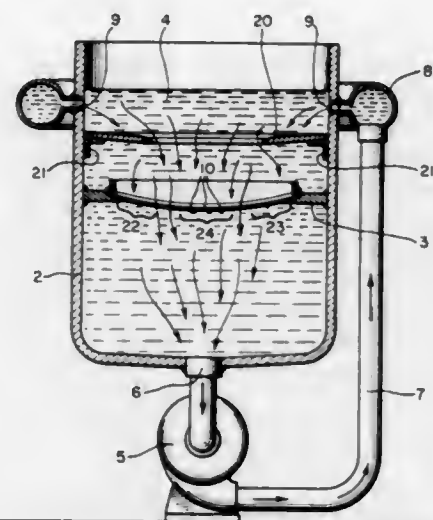


### 3,732,133 RE-ETCH METHOD

James W. Schwartz, Glenview, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.  
Filed Aug. 2, 1971, Ser. No. 168,223  
Int. Cl. C23f 17/00

U.S. Cl. 156—6

2 Claims



A process for re-etching the apertures of a color cathode-ray tube shadow mask to increase the diameter of each aperture by an amount dependent upon its spacing from the center of the mask by flowing a fluid etchant through the mask apertures and controlling the velocity of etchant flow through the apertures to differ from aperture to aperture as a function of the spacing.

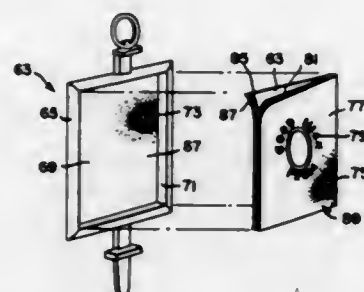
### 3,732,134

#### JEWELRY PIECE AND METHOD

John Graham Michael, c/o Brown Wholesale Company, 2095 North 63rd Street, Philadelphia, Pa.  
Division of Ser. No. 764,548, Oct. 2, 1968, Pat. No. 3,599,359.  
This application April 27, 1971, Ser. No. 137,868  
Int. Cl. B44c 1/24

U.S. Cl. 156—58

10 Claims



A jewelry piece comprising a jewelry body member, a bezel channel formed in the body member, and a sign plate mounted in the bezel channel, said sign plate including a developed photographic film with intelligence thereon, and a reflecting backing on the film, said sign plate being beveled.

A method for making a series of sign plates of the same design for jewelry pieces, comprising photographing art work on a series of frames of film having sprocket holes so that the art work on each frame is registered with respect to the sprocket holes, developing the film to obtain a roll of film frames, affixing a reflecting backing to the developed film, positioning each film frame precisely beneath a stamping die by using the sprocket holes, stamping out the sign plates, affixing the sign plates to a jewelry piece body, and beveling the sign plate.

A sign plate comprising a developed photographic film with intelligence thereon, and a reflecting backing on the developed film.

A method of making a sign plate comprising photographing art work on film, developing the film to obtain a developed film with intelligence thereon, and affixing a reflecting backing to the film.

### 3,732,135

#### TEXTILE PROCESS

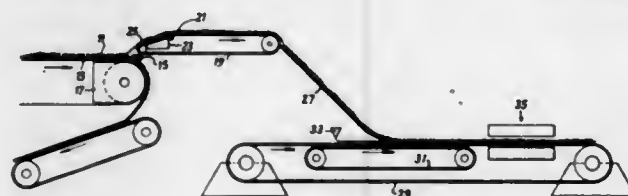
Ian Thomas Ernst, Killara, New South Wales, Australia, and Louis Richard Mizell, Andover, Mass., assignors to I.W.S. Nominee Company Limited, London, England

Filed Apr. 10, 1970, Ser. No. 27,386  
Claims priority, application Great Britain, Apr. 18, 1969, 20,036/69

Int. Cl. B32b 31/18, 33/00

U.S. Cl. 156—72

10 Claims



The invention disclosed relates to the production of pile fabrics from sliver knit fabrics. The process consists essentially of cutting a layer of pile fibres from the sliver knit fabric, transferring the layer of fibres to a layer of adhesive and pressing the fibre ends into contact with the adhesive at an elevated temperature. The heat and pressure are preferably applied simultaneously to the assembly of pile fibres and adhesive, for example by a heated flat press or heated rolls. The adhesive layer may be carried on a release surface, from which it may be stripped as a coherent film after the pile fibres have been bonded to it, or it may be formed on a permanent backing sheet, or indeed it may be formed in situ on the fibre ends themselves. A backing sheet may be bonded to the adhesive layer after the fibres have been bonded to it. The process yields pile fabrics which can be used in many applications, for example in the clothing or shoe industries or in paint rollers.

### 3,732,136

#### PROCESS AND APPARATUS FOR BACKING TUFTED CARPET

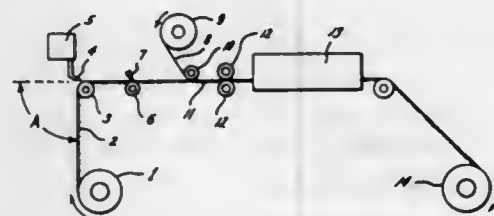
Donald S. Lord, Columbus, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Mar. 17, 1971, Ser. No. 125,317

Int. Cl. B32b 31/16; D05c 15/00

U.S. Cl. 156—72

12 Claims



In applying backing and adhesive to tufted carpets, improved bundle wrap and bundle penetration of the tufts by the adhesive is obtained by applying the action of one or more vibrating or reciprocating blades to the back of the tufted carpet at a point between where the adhesive is applied and where the backing material is applied.

### 3,732,137

#### PREPARATION OF HIGH PRESSURE DECORATIVE LAMINATES HAVING REGISTERED COLOR AND EMBOSING USING ENCAPSULATED INK

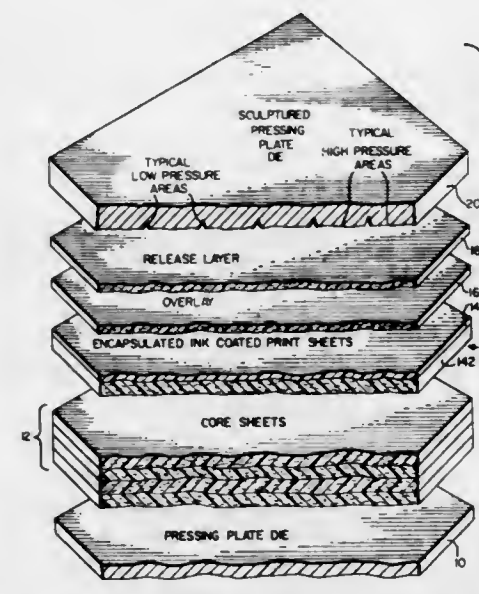
Herbert I. Scher and Israel S. Ungar, Randallstown, and John E. McQuade, Jr., Baltimore, Md., assignors to Esso Research and Engineering Company

Filed Oct. 26, 1970, Ser. No. 84,080

Int. Cl. B32b 3/00; B44c 1/24

U.S. Cl. 161—2

5 Claims



In the manufacture of high pressure decorative laminates having embossed surfaces with registration of color and texture, a melamine impregnated paper, coated with encapsulated ink, is used in place of the conventional decorative sheet below the overlay sheet. A sculptured plate is used having high pressure areas and low pressure areas, the encapsulated ink surface being separated from the sculptured plate by the overlay and a release layer. The resulting laminate after pressing has color developed by the rupture of the microcapsules and release of the ink contained therein at areas corresponding to high pressures due to the presence of and shape of the sculptured plate, whereas in the areas of lower pressure the microcapsules remain unruptured.

### 3,732,138

#### PANEL CONSTRUCTIONS

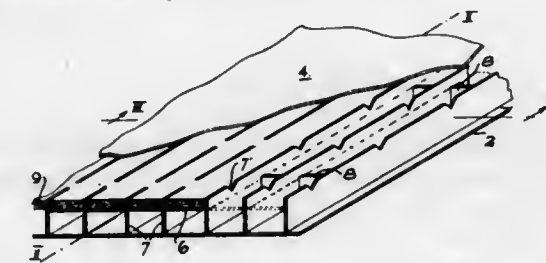
Ehud Almog, 13 Yegia Kapalm Street, Ramat Hasharon, Israel

Filed March 31, 1971, Ser. No. 129,683

Int. Cl. B32b 3/12, 1/06

U.S. Cl. 161—43

12 Claims



A panel characterized in that at least one of its external faces, i.e., the one under compression stresses when the panel is loaded, is made of a lamination including an outer layer bonded to an inner layer by an intermediate layer of rigid plastic foam. The thickness of the rigid plastic foam layer is many times the thickness of each of the said outer and inner layers, and the thickness of the complete panel is many times the thickness of the lamination. The panel further includes strengthening ribs extending longitudinally between the lamination and the other external face of the panel.

### 3,732,139

#### ABSORBENT FIBROUS NONWOVEN FABRIC AND METHOD OF FORMING THE SAME

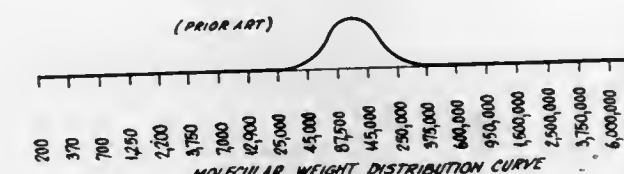
Michael R. Fehllas, New Brunswick, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 3, 1971, Ser. No. 195,373

Int. Cl. B32b 5/00

U.S. Cl. 161—170

8 Claims



Synthetic resin binder compositions for bonding nonwoven fabrics, methods of using the same, and the resulting bonded nonwoven fabrics, wherein the synthetic resin binder compositions comprise from about 10 percent to about 50 percent by weight of a polymodal molecular weight distribution synthetic acrylic ester resin in which (1) one mode or peak is present in the molecular weight range of from about 300 to about 2,000 and another mode or peak is present in the molecular weight range of from about 4,000 to about 600,000 and (2) from about 10 percent to about 40 percent by weight has a molecular weight in the range of from about 300 to about 2,000 and from about 90 percent to about 60 percent by weight has a molecular weight in the range of from about 4,000 to about 600,000 said polymodal molecular weight distribution synthetic acrylic ester resin having a swell index in tetrahydrofuran of from about 50 to about 200, from about 50 percent to about 90 percent by weight of insolubles in tetrahydrofuran, and a second order glass transition temperature of from about -40° C to about +5° C.

### 3,732,140

#### METHOD FOR PRODUCING A FIBROUS BUNDLE WITH A TRACER AND PRODUCT THEREOF

Gerhard N. Bolen, Granville, Robert J. Gelin, Newark, and William N. Haggerty, Reynoldsburg, Ohio, assignors to Owens-Corning Fiberglas Corporation

No Drawing. Filed Oct. 15, 1970, Ser. No. 81,108

Int. Cl. D02g 3/18, 3/36

U.S. Cl. 161—175

13 Claims

A method of producing a fibrous bundle having a tracer therein comprising advancing glass fiber strands through a bath comprising a colorant, drying the treated strands and combining the same with a plurality of sized glass strands.

### 3,732,141

#### PRESSURE-SENSITIVE RECORD MATERIAL

Bruce W. Brockett and Robert E. Miller, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

No Drawing. Continuation-in-part of application Ser. No. 94,170, Dec. 1, 1970, which is a continuation-in-part of application Ser. No. 49,557, June 24, 1970, both now abandoned. This application Apr. 2, 1971, Ser. No. 130,831

Int. Cl. B41m 5/14, 5/16

U.S. Cl. 117—36.8

24 Claims

Pressure-sensitive record material which involves the making of a vanadium-chelate print by pressure-release of droplets of a solution of an organic chelating agent in a hydrophobic liquid for color development by oil-insoluble vanadium salts. The print intensity, rate of print development, and resistance of the print to fading are optimized by addition to the print-developing coat of different combinations of calcium carbonate, silica gel and oil-soluble phenol-aldehyde resins.



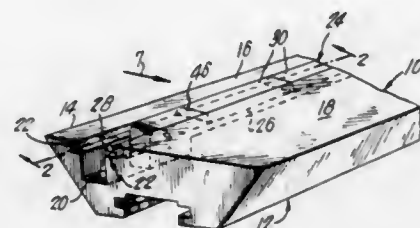
3,732,142

## INSERT FOR PAPER MACHINE DRAINAGE ELEMENTS

Oliver J. Beacom, Montreal, Quebec, and Donald G. MacBean, Pierrefonds, Quebec, Canada, assignors to JWI Ltd., Montreal, Quebec, Canada  
 Filed Feb. 25, 1971, Ser. No. 118,767  
 Int. Cl. D21g 9/00

U.S. Cl. 162—374

4 Claims



A replaceable drainage element having a wear resistant insert composed of a plurality of discrete elements arranged in end-to-end relationship and clamped in this relationship by a clamping member applying clamping pressure to the elements.

3,732,143

## METHOD AND APPARATUS FOR DRILLING OFFSHORE WELLS

Cornelis G. Joosse, The Hague, Netherlands, assignor to Shell Oil Company, New York, N.Y.

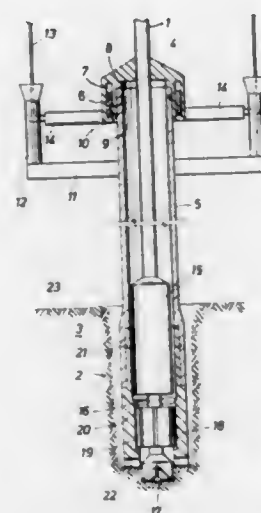
Filed May 20, 1971, Ser. No. 145,142

Claims priority, application Great Britain, June 17, 1970, 29,423/70

Int. Cl. E21b 43/01, 7/12

U.S. Cl. 175—6

15 Claims



A method and apparatus for drilling offshore wells wherein a base unit and conductor string are lowered in the water by a drill string that is coupled to the conductor string, a rotatable shoe including cutting means being mounted on the lower end of the conductor string. A self-contained drilling unit is disposed in the conductor string below the coupling between the conductor string and drillstring, the drilling unit being used to drive the rotatable shoe to install the conductor string. After the conductor string is installed the drill string and self-contained drilling unit are withdrawn and the conductor string and base unit cemented in place.

3,732,144

## PROCESS FOR PRODUCING L-THREONINE AND L-LYSINE

Kiyoshi Nakayama, Sagami-hara, and Hiroshi Kase, Tokyo, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan  
 No Drawing. Filed Jan. 18, 1971, Ser. No. 107,554  
 Claims priority, application Japan, Jan. 22, 1970, 45/5,390

Int. Cl. C12d 13/06

U.S. Cl. 195—29

9 Claims

A process for producing L-threonine and L-lysine simultaneously by fermentation which comprises culturing an L-threonine plus L-lysine-producing certain type mutant strains of coryneform glutamic acid-producing bacteria represented by *Corynebacterium glutamicum* under aerobic conditions in an aqueous nutrient medium.

3,732,145

## PROCESS FOR PRODUCING CITRIC ACID

Isoshi Oomori and Kiyoyuki Suzue, Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

No Drawing. Filed Oct. 28, 1970, Ser. No. 84,942

Int. Cl. C12d 1/04

U.S. Cl. 195—30

18 Claims

Citric acid is produced by culturing a microorganism belonging to the genus *Aerobacter*, *Pseudomonas*, *Micrococcus* or *Bacillus* in a medium containing L-isocitric acid and/or isocitric acid lactone as a main carbon source or culturing said microorganism in a medium containing L-isocitric acid or carbohydrate or both these materials, separating cells from the medium, adding them to an aqueous solution containing L-isocitric acid and/or isocitric acid lactone, converting said acid or lactone to citric acid by incubation, and recovering the resulting citric acid.

3,732,146

## PROCESS FOR THE ISOLATION OF NATIVE, HIGHLY PURIFIED PLASMINOGEN

Norbert Heimburger, Marbach near Marburg/Lahn, Germany, assignor to Behringwerke Aktiengesellschaft, Marburg/Lahn, Germany

Filed Dec. 22, 1970, Ser. No. 100,821

Int. Cl. C07g 7/02

U.S. Cl. 195—66 B

11 Claims

Method for isolating native plasminogen in highly purified form from plasma or serum by contacting the plasminogen-containing material with a water-insoluble carrier containing an  $\epsilon$ -amino carboxylic acid and then eluting the carrier to recover plasminogen bound thereto.

3,732,147

## COLORIMETRIC DETERMINATION OF DEHYDROGENASES

Alan Phillip Fosker, High Wycombe, and Patrick James Mill, Beaconsfield, both of England, assignors to Miles Laboratories Inc., Elkhart, Ind.

Filed Sept. 16, 1971, Ser. No. 181,192

Claims priority, application Great Britain, Sept. 17, 1970, 44,498/70

Int. Cl. G01n 31/14

U.S. Cl. 195—103.5 R

8 Claims

Test composition and method for assaying dehydrogenase enzymes in test fluids which comprises contacting the fluid with a test reagent comprising a coenzyme, a substrate for the dehydrogenase enzyme, a terminal acceptor dye and Mel-dola's Blue as an intermediary hydrogen carrier. A preferable embodiment of the present invention comprises incorporating the test composition with a solid carrier therefor and using the same as a dip and read test device.

3,732,148

## INDUSTRIAL PROCESS AND APPARATUS FOR CULTIVATING MICROORGANISMS

Sigismund Franckowiak, Montesson, Pierre Trambouze, Versailles, and Hugo Van Landeghem, Vienne, France, assignors to Institut Français du Pétrole des Carburants et Lubrifiants, Rueil-Malmaison, Hauts de Seine, France

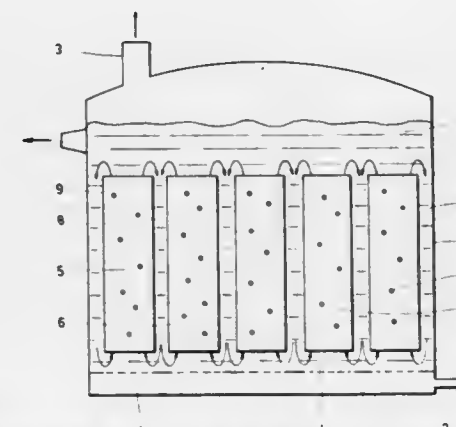
Filed Dec. 10, 1969, Ser. No. 883,881

Claims priority, application France, Dec. 11, 1968, 177,774; July 7, 1969, 6923039

Int. Cl. C12b 1/14

U.S. Cl. 195—109

6 Claims



For aerating and cultivating microorganisms, there is provided an enclosure having a plurality of vertical partitions sub-dividing the enclosure into vertical elongated zones communicating with one another at their top and at their base. One group of the zones is fed with air at the base so as to carry the liquid phase of culture upwardly into a zone common to said group at the top where the air is at least partially separated from the liquid phase. Another group of the zones is not fed with air, but instead is used for the downward flow of the liquid phase, thereby obtaining continual circulation of the culture. At least some of the vertical partitions are hollow and provided with means for passing cooling liquid there-through, the ratio between the total surface of the hollow partitions and the total volume of the vertical elongated zones delimited thereby being between 0.1 and 10 sq. meters per cubic meter, preferably between 0.5 and 2 sq. meters per cubic meter.

3,732,149

## APPARATUS FOR THE LARGE SCALE GROWTH OF LIVING CELLS

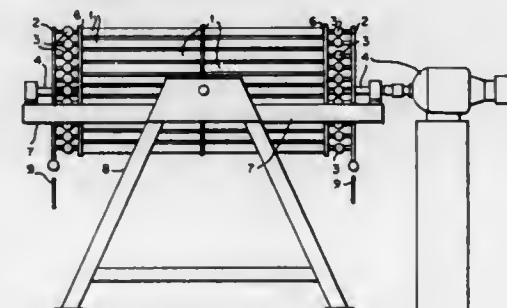
Giovanni Santero, Milan, Italy, assignor to Societa Farmaceutici Italia (Farmitalia), Milan, Italy

Filed Sept. 16, 1970, Ser. No. 40,354

Int. Cl. C12b 1/00

U.S. Cl. 195—139

5 Claims



Apparatus for growing cell cultures wherein a plurality of uniform columns in which cell cultures can grow are clamped together at the ends with manifolds which are fixed onto a shaft parallel to the columns so that the columns may be rotated about the shaft; the clamped col-

umns also fixed to a support frame and there are means provided for rotating the shaft about a horizontal axis and for rotating the support frame about a vertical plane.

3,732,150

## PROCESS FOR SEPARATING HALOGENATED HYDROCARBONS BY AZEOTROPIC DISTILLATION WITH AMMONIA

Grant C. Bailey, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 22, 1971, Ser. No. 191,904

Int. Cl. C07c 19/08; B01d 3/36

U.S. Cl. 203—44

4 Claims

A process for separating pentafluoroethane from a first mixture of pentafluoroethane and 1,1,1-trifluoroethane and for separating tetrafluoroethane from a first mixture of tetrafluoroethane and 1,1-difluoroethane by adding ammonia to said first mixtures to form second mixtures having azeotropes and distilling the second mixtures in azeotropic distillation zones.

3,732,151

## COPPER PLATING

Charles N. Abbott, Dayton, Ohio, assignor to Dayton Bright Copper Company, Dayton, Ohio  
 No Drawing. Continuation-in-part of application Ser. No. 679,971, Nov. 2, 1967. This application Apr. 27, 1970, Ser. No. 32,409

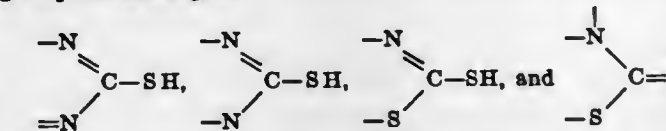
The portion of the term of the patent subsequent to Mar. 12, 1985, has been disclaimed

Int. Cl. C23b 5/20, 5/46

U.S. Cl. 204—52 R

6 Claims

The present invention relates to improved extender compositions used in copper electroplating comprising a mixture of a sulfurized sulfonated aromatic or hydroaromatic hydrocarbon, or substitution product thereof; an amino derivative of a triarylmethane; and as a leveling agent a compound containing a radical selected from the group consisting of



The combination of the three types of ingredients gives an additive composition of a synergistic character when used in copper plating in the form of improved brightness and leveling over a wider range of current density than previous additive compositions, and are particularly improved with respect to leveling.

3,732,152

## ANODIZED MAGNESIUM AND MAGNESIUM ALLOYS

David L. Hawke, Metuchen, N.J., assignor to N L Industries, Inc., New York, N.Y.

No Drawing. Filed July 13, 1971, Ser. No. 162,316

Int. Cl. C23b 9/06

U.S. Cl. 204—56 M

2 Claims

Magnesium metal or magnesium alloys are anodized by immersing in an aqueous bath containing sodium hydroxide and sodium hexafluorotitanate and passing an alternating current through the bath.

3,732,153

## ELECTROCHEMICAL APPARATUS AND PROCESS FOR THE MANUFACTURE OF HALATES

Cyril J. Harke, Burnaby, and John C. Parkinson, North Vancouver, British Columbia, Canada, and John E. Currey, Lewiston, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed Oct. 5, 1971, Ser. No. 186,749

Int. Cl. C01b 11/26; B01k 3/00, 3/04

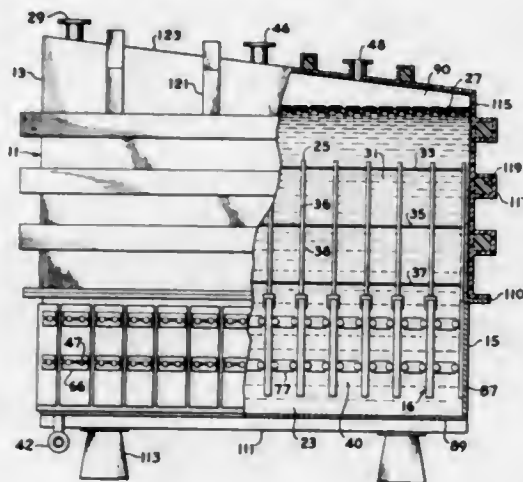
U.S. Cl. 204—95

20 Claims

An electrochemical apparatus for the manufacture of halates, e.g., sodium chlorate, includes an electrolytic cell



having monopolar dimensionally stable anodes held to and removable from the cell at a side thereof, and cathodes, ducts for conducting hypohalite and gaseous electrolysis products upwardly through the cell and baffled means for conducting the hypohalite downwardly to a bottom portion of the cell, from which it may be drawn off as chlorate, or recycled, the baffled means for returning the hypohalite and other electrolyte constituents downwardly being such that the hypohalite will be held for a long enough time so as to become substantially converted to chlorate. In preferred aspects of the invention, the dimensionally stable monopolar anodes are of plati-



num, platinum-iridium alloy or ruthenium oxide over a valve metal such as titanium, tantalum or niobium, internal cooling of the electrodes is provided, conductors are copper rods clad with titanium, which also serve to rigidify the anodes, the cell top is of a fiberglass-reinforced plastic, replenished electrolyte is continually added to the cell, the anodes and cathodes are held apart by spacing lines of electrolyte-resistant plastic, which may be fastened together around a pair of cathode surfaces, and at least two such electrochemical apparatuses are electrically joined by copper connectors of a construction which minimizes thermal expansion-contraction strains on the electrodes.

### 3,732,154 CATALYTIC HYDROFINISHING OF LUBE OIL PRODUCT OF SOLVENT EXTRACTION OF PETROLEUM DISTILLATE

Ivor W. Mills, Media; Merritt C. Kirk, Jr., Thornton, and Albert T. Olenzak, Media, all of Pa., assignors to Sun Oil Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 812,516, Feb. 19, 1969, Pat. No. 3,619,414. This application Sept. 8, 1970, Ser. No. 70,590  
Int. Cl. C10g 23/02, 41/00

U.S. Cl. 208—87

12 Claims

Hydrofinished petroleum products, useful as lube oils, rubber oils, refrigerator oils, transformer oils, cable oils, ATF and friction drive transmission fluids, etc., can be produced by a process comprising (1) solvent extracting petroleum distillate stock to obtain a raffinate product and an extract product, and (2) contacting at least one of these products with hydrogen, in the presence of a catalyst comprising a hydrogenating component selected from the group consisting of sulfides and oxides of a combination of nickel and at least one Group VIB metal (Cr, Mo, W). Especially preferred metal combinations are (a) nickel and molybdenum, (b) nickel, molybdenum and at least one other iron group metal (e.g.,

Co) and (c) nickel and tungsten. The preferred petroleum distillate is naphthenic by viscosity-gravity constant classification.

### 3,732,155 TWO-STAGE HYDRODESULFURIZATION PROCESS WITH HYDROGEN ADDITION IN THE FIRST STAGE

Richard R. Cecil, and Thomas E. Fink, both of Baton Rouge, La., assignors to Esso Research and Engineering Company, Linden, N.J.

Filed March 31, 1971, Ser. No. 129,946

Int. Cl. C10g 23/00

U.S. Cl. 208—210

18 Claims

A process wherein sulfur-containing light or heavy hydrocarbon feeds are contacted with sulfur-resistant catalysts and desulfurized. The process involves a combination of steps, viz., an initial step wherein the feed is contacted with the catalyst in the presence of hydrogen and desulfurized, hydrogen, light ends and by-product hydrogen sulfide are separated from the partially desulfurized product and a subsequent step wherein said product is contacted with catalyst without the addition of any hydrogen to said step. Better hydrogen utilization and efficiency are obtained in the total desulfurization of the feed.

### 3,732,156 PRODUCTION OF LUBRICATING OILS

Robert Neil Bennett, Ashford, England, and Francis John Morum, West Cross, Wales, assignors to The British Petroleum Company Limited, London, England

No Drawing. Filed May 20, 1971, Ser. No. 145,492  
Claims priority, application Great Britain, June 1, 1970, 26,307/70

Int. Cl. C10g 13/02, 37/10; C01b 33/28

U.S. Cl. 208—111

7 Claims

Lubricating oil of improved V.I. and also gasoline are produced by partial hydrocracking of a petroleum feedstock boiling above 350° C. at 300–400° C. and 6900–26,700 kN./m.<sup>2</sup>g. using a catalyst of a hydrogenating metal and a decationised faujasite-type zeolite. Less middle distillate is produced than when using non-zeolite catalysts. The use of a decationised faujasite is necessary, a magnesium faujasite catalyst giving no V.I. improvement.

The hydrogenating metal is preferably a platinum group metal and the preferred conversion is 40–95% wt. of product boiling below 350° C. Products, after dewaxing, of 85–125 V.I. can be produced from feedstocks of 60–80 V.I.

### 3,732,157 ELECTROLYTIC CELL INCLUDING TITANIUM HYDRIDE CATHODES AND NOBLE-METAL COATED TITANIUM HYDRIDE ANODES

Bernard J. Dewitt, Akron, Ohio, assignor to Nora International Company, Panama City, Panama

Continuation-in-part of Ser. No. 726,865, May 6, 1968, Pat. No. 3,617,462. This application Feb. 17, 1971, Ser. No. 115,992

The portion of the term of this patent subsequent to Oct. 26, 1988, has been disclaimed.

Int. Cl. B01k 3/06

U.S. Cl. 204—268

12 Claims

Electrolytic cells for the electrolysis of aqueous alkali metal chlorides are disclosed. Further disclosed are electrodes for use in combination with said cells, the said electrodes having titanium hydride cathodic members and noble metal coated titanium hydride anodic members. The noble metal coatings on the anodic members are gold, silver, platinum, palladium, iridium, ruthenium, osmium, and rhodium. In one exemplification, the electrolytic cell is of bipolar configuration and has a bipolar electrode of titanium hydride with a titanium hydride cathodic surface, and a noble metal anodic surface.

### 3,732,158 METHOD AND APPARATUS FOR SPUTTERING UTILIZING AN APERTURED ELECTRODE AND A PULSED SUBSTRATE BIAS

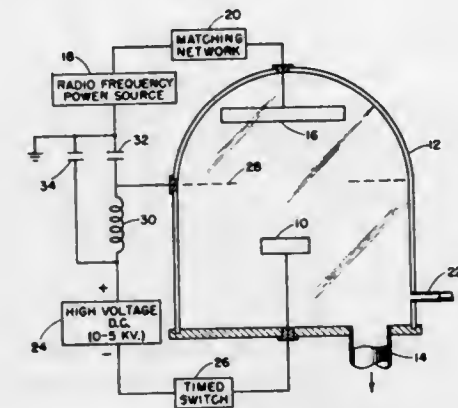
John S. Przybyszewski, North Olmsted, and Richard K. Shaltens, Lakewood, Ohio, assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Jan. 14, 1971, Ser. No. 106,424

Int. Cl. C23c 15/00

U.S. Cl. 204—192

7 Claims



Combining the advantages of ion plating with the versatility of a radio frequency sputtered source. A pulsed high voltage direct current is passed to the article being plated during radio frequency sputtering.

### 3,732,159 FLOW-THROUGH CHAMBER FOR ANALYSIS OF CONTINUOUSLY FLOWING SAMPLE SOLUTION

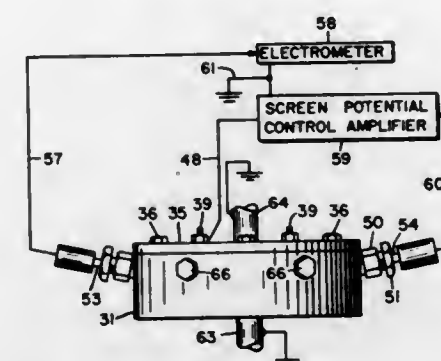
David M. H. Platt, Hopkinton, Mass., assignor to Corning Glass Works, Corning, N.Y.

Filed Apr. 17, 1970, Ser. No. 29,467

Int. Cl. G01n 27/26, 27/28

U.S. Cl. 204—195 R

12 Claims



Disclosed is a flow-through sample analyzing chamber in which the electrodes are symmetrically disposed with respect to the fluid inlet and outlet passages, and the chamber construction in such that the flow of fluid therein is symmetrical. A conductive screen may be disposed in the fluid flow path to provide a uniform electrical field in the vicinity of the electrodes and to trap bubbles, thereby preventing the passage thereof over the electrodes.

### 3,732,160 SUBMERGED FILTER-HORIZONTAL FLOW MODE

John W. Klock, Tempe, Ariz., assignor to Research Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 754,341, Aug. 21, 1968, now Patent No. 3,563,888. This application Dec. 31, 1970, Ser. No. 103,271

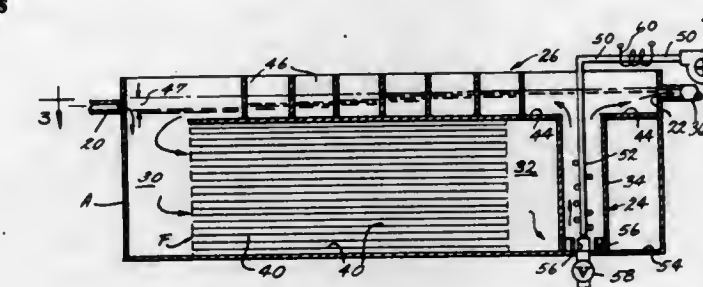
Int. Cl. C02c 1/04

U.S. Cl. 210—14

21 Claims

Waste-containing liquor is biochemically treated in a tank or cell by continuously recirculating it through a

filter media which is submerged in the liquor while continuously withdrawing a small portion of said liquor. A pressurized column of oxygen-containing gas entrains and lifts the liquid waste through an unobstructed tube and recirculates it horizontally through the filter media. During the lifting process oxygen from the fluid permeates the waste in order to ensure active aerobic metabolism.



The tank may be arranged in series with other similar tanks utilizing horizontal flow through the filter media, or one or more of such tanks may be arranged in combination with one or more tanks having vertical flow through the filter media, as disclosed in my copending application, Ser. No. 754,341, filed Aug. 21, 1968. The influent may be either raw sewage or partially treated wastes.

### 3,732,161 METHOD FOR REMOVING OIL AND DEBRIS FROM WATER

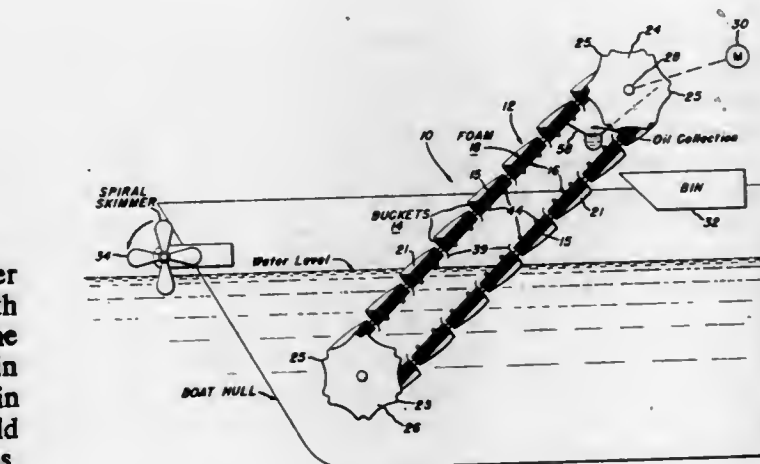
James F. Grutsch, Hammond, and Russell C. Mallatt, Crown Point, Ind., assignors to Standard Oil Company, Chicago, Ill.

Original application Mar. 18, 1970, Ser. No. 20,508. Divided and this application Jan. 22, 1971, Ser. No. 108,939

Int. Cl. E02b 15/04

U.S. Cl. 210—30

4 Claims



Oil, solid particles such as biological slime and floating debris, etc., are removed from water by an apparatus including endless chain means made up of a series of interconnected foraminous chambers holding a regenerable porous filter material such as polyurethane. Preferably, the filter material has an outer large pore section and an inner small pore section. A plurality of buckets are attached to the chain means and, as the chain means moves through a closed loop path, these buckets catch debris and dump it into a holding bin. Simultaneously, the filter material absorbs surface and subsurface oil and the like from



water traveling through the filter material. The filter material is regenerated by squeezing the filter material to release the oil.

### 3,732,162 METHOD OF REMOVING OIL SPILLS FROM WATER

Frederic C. McCoy, Beacon, Howard V. Hess, Glenham, and Rodney L. Sung, Fishkill, N.Y., assignors to Texaco Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 25,588, Apr. 3, 1970. This application July 6, 1971, Ser. No. 160,193

Int. Cl. C02b 9/02

U.S. Cl. 210—40

7 Claims

Oil spills are removed from the surface of a body of water by contacting the oil with a coagulating amount of a coagulant such as asphalt and mixtures of wax or asphalt with anti-caking agents. Enough coagulant is used to form a floating, semi-solid mass with the oil. The coagulant may be used in finely divided form or in a molten state.

### 3,732,163 PROCESS AND APPARATUS FOR THE OZONE TREATMENT OF A LIQUID MATERIAL

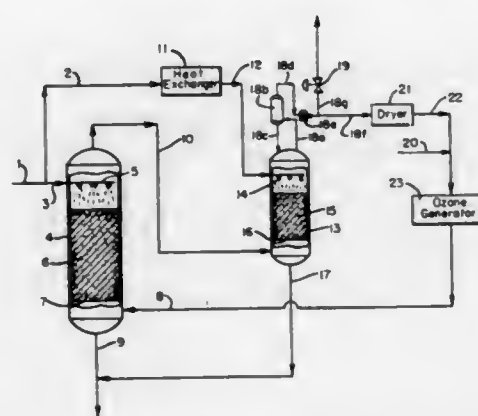
Heine Lapidot, Latham, N.Y., assignor to General Electric Company

Filed Nov. 3, 1971, Ser. No. 195,390

Int. Cl. C02c 5/04

U.S. Cl. 210—47

17 Claims



A process for the ozone treatment of a liquid material which includes introducing a major portion of the liquid into a first ozonation zone; introducing the remainder of the liquid into a second ozonation zone; introducing an ozone-containing gas into the first ozonation zone; removing a gaseous stream from the first ozonation zone and conducting it to the second ozonation zone; removing a gaseous stream from the second ozonation zone and conducting it to an ozone-generating zone wherein the ozone-containing gas is produced; the second ozonation zone is smaller in size than the first ozonation zone but provides more efficient liquid-gas contact than does the first ozonation zone; and the apparatus useful for carrying out the process.

### 3,732,164 NITROGEN REMOVAL FROM WASTE WATER BY BREAKPOINT CHLORINATION

Thomas A. Pressley, Springfield, Va., and Dolloff F. Bishop, Jr., Camp Springs, Md., assignors to The United States of America as represented by the Administrator of the Environmental Protection Agency, Washington, D.C.

Filed Aug. 30, 1971, Ser. No. 175,902

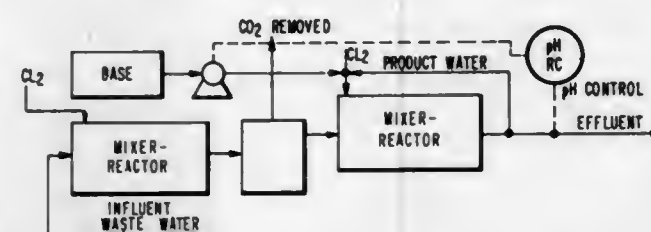
Int. Cl. C02b 1/36

U.S. Cl. 210—60

8 Claims

Sodium hypochlorite or chlorine is used to oxidize the ammonia in raw, secondary and lime clarified municipal waste-

waters. In systems with only ammonia as the chlorine demand, the breakpoint exhibits a minimum chlorine dose at approximately an 8:1 weight ratio of  $\text{Cl:NH}_3\text{—N}$  in the pH range of 6–7. End products at the breakpoint are  $\text{N}_2$ ,  $\text{NCl}_3$ , and  $\text{NO}_2^-$ . Qualitatively, the formation of the  $\text{N}_2$  is completed in less than



one minute in the pH range of 6–8. In wastewater, the breakpoint requires a minimum chlorine dose of approximately an 8:1 weight ratio of  $\text{Cl:NH}_3\text{—N}$  in lime clarified secondary effluent. The chlorine dosage, to achieve the breakpoint increases as the degree of wastewater treatment decreases.

### 3,732,165 SALT PLATFORM SEAL ARRANGEMENT

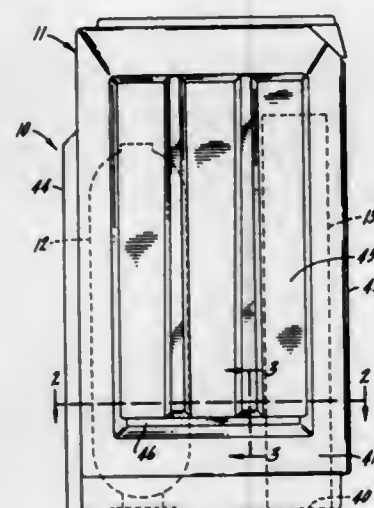
Donald S. Campbell, North St. Paul, Minn., assignor to Ecodyne Corporation, Chicago, Ill.

Filed March 24, 1971, Ser. No. 127,479

Int. Cl. C01d 3/04

U.S. Cl. 210—190

2 Claims



An improved salt platform support and seal arrangement mounted inside the brine well of a water conditioner, comprising: a substantially rectangular brine drum having a pair of opposing side walls, the side walls having substantially horizontal rib portions undercut therefrom extending a short distance into the drum; and a salt platform supported on the rib portions so as to overlap the rib portions a sufficient distance to permit sliding movement of the salt platform on the rib portions while preventing salt pellets from falling to the bottom of the brine drum.

### 3,732,166 PROCESS OF CLEANING WELLS WITH CARBON DISULFIDE EMULSIONS

Kenneth J. Lissant, St. Louis, Mo., assignor to Petrolite Corporation, Wilmington, Del.

No Drawing. Original application Dec. 17, 1969, Ser. No. 886,016, now Patent No. 3,700,594, dated Oct. 24, 1972. Divided and this application Sept. 15, 1971, Ser. No. 180,877

Int. Cl. E21b 43/00

U.S. Cl. 166—304

6 Claims

Non-Newtonian formulations containing carbon disulfide ( $\text{CS}_2$ ) of reduced toxicity and flammability. These formulations are illustrated by high internal phase ratio

(HIPR) emulsions containing carbon disulfide in the internal phase, said internal phase containing more than about 60% of the formulation by volume and preferably more than about 80% of the formulation by volume. These formulations are particularly useful in cleaning oil and gas wells by the removal of wax and/or sulfur.

### 3,732,167 MOTOR OIL COMPOSITION

Walter D. Foucher, Jr., Wappingers Falls, William R. Siegart, Poughkeepsie, and Herbert C. Morris, Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed Dec. 24, 1970, Ser. No. 101,394

Int. Cl. C10m 1/48

U.S. Cl. 252—32.7 E

8 Claims

Motor oil composition comprising a mineral lubricating oil containing in combination an alkylated diphenylamine, a zinc dihydrocarbyl dithiophosphate, a hydroxyalkyl hydrocarbyl thiophosphonate, a nitrogen-containing methacrylate polymer and an overbased calcium sulfonate and method for operating an internal combustion reciprocating engine.

### 3,732,168 PROCESS AND COMPOSITION FOR THE PRODUCTION OF INSULATING SOLDERABLE COATINGS

Gerhard F. Ottmann; Hans-Ulrich Poth, both of Wuppertal-Elberfeld, Germany, and Horst Holfort, Mexico 20 DF, Mexico, assignors to Dr. Kurt Herberts & Co. vorm Otto Louis Herberts, Wuppertal-Barmen, Germany

Filed Nov. 9, 1970, Ser. No. 88,183

Claims priority, application Germany, Nov. 13, 1969, P 19 57 157.4

Int. Cl. B44d 1/42; H01b 3/18

U.S. Cl. 252—63.7

19 Claims

A process and composition for producing insulating solderable coatings on electrical conductors are disclosed wherein a solution containing a polyhydroxyl compound having a heterocyclic ring system and from 5 to 12 percent by weight hydroxyl groups, and a polyfunctional isocyanate is coated on the conductor and cured at a temperature above 250° C. The coated conductors are characterized by high resistance to heat and chemicals, as well as short soldering times in a solder bath.

### 3,732,169 POLY(ALKOXY)SILOXANE FLUID COMPOSITION CONTAINING A PHENOLIC CRYSTALLIZATION INHIBITOR

Merwyn L. Burrous, El Cerrito, and Neal W. Furby, Berkeley, Calif., assignors to Chevron Research Company, San Francisco, Calif.

No Drawing. Continuation-in-part of abandoned application Ser. No. 860,051, Sept. 22, 1969. This application Jan. 31, 1972, Ser. No. 222,344

Int. Cl. C09k 3/00

U.S. Cl. 252—78

9 Claims

A functional fluid inhibited against crystallization which comprises a poly(alkoxy)siloxane base fluid, a bulk oxidation inhibitor, and a phenolic crystallization inhibitor. A rubber swelling agent may also be present.

### 3,732,170 BIO-SOAKING PERFORMANCES

Yvon Demangeon, Ermont, France, assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Continuation of application Ser. No. 75,716, Sept. 25, 1970. This application June 26, 1972, Ser. No. 266,261

Int. Cl. C11d 7/54

U.S. Cl. 252—95

4 Claims

Biological cleaning composition containing an enzyme and, as an oxidizing agent, an alkali-metal monopersulfate

triple salt. Preferred enzymes are proteolytic subtilisin enzymes. A preferred monosulfate triple salt is



### 3,732,171 COMPOSITION AND METHOD FOR IRON REMOVAL

Eugene J. Kuhajek, Woodstock, and Gordon H. Tibbitts, Hebron, Ill., assignors to Morton International, Inc., Chicago, Ill.

Filed Sept. 14, 1970, Ser. No. 71,854

Int. Cl. C11d 7/54

U.S. Cl. 252—105

13 Claims

A composition and method of removing iron ions from iron-coated or iron-fouled substances, more particularly for removing iron ions from iron-fouled ion exchange resins used in water-treating operations. The composition comprises an alkali metal hydrosulfite and an alkali metal sulfite contributor.

### 3,732,172 PROCESS FOR MAKING MINUTE CAPSULES AND PREFABRICATED SYSTEM USEFUL THEREIN

James A. Herbig and John F. Hanny, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

No Drawing. Filed Feb. 28, 1968, Ser. No. 708,792

Int. Cl. B01j 13/02; B44d 1/02

U.S. Cl. 252—316

10 Claims

A process is provided for producing minute capsules, en masse, wherein volatile solvent is evaporated from droplets of dissolved polymeric material dispersed in a liquid manufacturing vehicle immiscible with the volatile solvent which droplets have enwrapped dispersed capsule core entities. The process includes only evaporation of the solvent from the solution of polymeric material and requires no liquid-liquid phase separation. Practice of the novel process requires that important system components, namely, (a) manufacturing vehicle, (b) solution of polymeric capsule-wall forming material, and (c) intended capsule core entities be mutually immiscible, inert, and mobile. For example, the core material may be  $\text{NH}_4\text{NO}_3$ , the wall material may be nitrocellulose, the solvent may be methyl ethyl ketone, and the vehicle may be heptacosafuorotri-butylamine.

### 3,732,173 MANUFACTURE OF WATER-SOLUBLE CATIONIC NON-THERMOSETTING METHYLAMINE- EPICHLOROHYDRIN POLYMER AT CON- STANT TEMPERATURE

Daniel Elmer Nagy, Fairfield, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 778,934, Nov. 26, 1968, now Patent No. 3,567,659.

This application Jan. 4, 1971, Ser. No. 103,836

The portion of the term of the patent subsequent to

Mar. 2, 1988, has been disclaimed

Int. Cl. C08g 23/12, 43/00

U.S. Cl. 260—2 BP

5 Claims

A hydrophilic water-dispersible cationic storage stable methylamine-epichlorohydrin polymer is prepared by reacting 1 mol of methylamine with 0.8–1.2 mol of epichlorohydrin to produce a cationic and water-dispersible polymer and substantially completely reacting said polymer at a pH above 8 and temperature above 80° C. said polymer with successively small increments of epichlorohydrin until the polymer is close to being a gel. Preferably, the last increment is large enough to cause the solution to gel if completely reacted, and a monofunctional amine is added when the viscosity of the solution is just short of the gel point to arrest further progress of the reaction.



3,732,174

**VULCANIZATION OF HALOGEN CONTAINING ELASTOMERS WITH THIOALKANOIC ACIDS AND THEIR SALTS AND UNCURED AND CURED PRODUCTS THEREOF**

Paul P. Nicholas, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.  
No Drawing. Filed Feb. 7, 1972, Ser. No. 224,318  
Int. Cl. C08g 23/06

U.S. Cl. 260—2 A

13 Claims

A new method for vulcanizing epihalohydrin elastomers employs, as essential vulcanization ingredients, (1) a thioalkanoic acid or its metal salts such as thiodipropionic acids, methylene-bis-thiopropionic acid, thiodiacetic acid and mercaptoacetic acid or the corresponding sodium or lead salts, and (2) a tertiary amine, particularly the compound 1,4-diaza(2.2.2)bicyclooctane. When the acid form of ingredient (1) is employed it is necessary to add a third component which is a metal base compound such as an alkali metal carboxylate, lead oxide, etc. When a metal salt of a thioalkanoic acid ingredient (1) such as disodium thiodipropionate is employed the third component is unnecessary. This vulcanizing system provides very fast and adjustable cure cycles producing vulcanizates of low odor and of excellent physical properties.

3,732,175

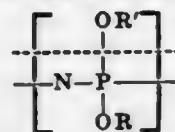
**CROSSLINKING OF PHOSPHAZENE POLYMERS**

Harry Rex Allcock, State College, Pa., assignor to The Firestone Tire & Rubber Company, Akron, Ohio  
No Drawing. Filed Sept. 27, 1971, Ser. No. 184,180  
Int. Cl. C08g 33/16

U.S. Cl. 260—2 P

5 Claims

The crosslinking of poly(alkoxy- and aryloxy)-phosphazenes the skeletal chains of which consist of recurring units represented by the general formula



in which R and R' each represents alkyl, fluoralkyl or aryl or other monovalent units, is accomplished by a ligand exchange process involving an alkali metal salt of a fluorinated polyol.

3,732,176

**LOW RESILIENCY MICROCELLULAR POLYURETHANE ELASTOMER WITH INTEGRAL SKIN AND METHOD FOR PREPARATION THEREOF**

Fritz Hostettler, Freehold, N.J., and George W. Hoffman, Crystal Lake, Ill., assignors to The Quaker Oats Company, Chicago, Ill.  
No Drawing. Filed Jan. 12, 1972, Ser. No. 217,280  
Int. Cl. C08g 22/44

U.S. Cl. 260—2.5 AP

5 Claims

This invention relates to a method for preparing certain microcellular elastomers having low resiliency and an integral skin which is substantially non-porous comprising contacting certain polyether glycols and ethylene oxide capped 4,4'-isopropylidenediphenol with methylene bis(4-phenylisocyanate) in the presence of a blowing agent and a catalyst system consisting of a tertiary amine and an organotin compound.

3,732,177

**EXOTHERMIC INSULATING COMPOSITIONS COMPRISING GLASS POLISHING RESIDUE**

Norman F. Tisdale, Jr., Valencia, and James F. McCarthy, Mars, Pa., assignors to The Union Commerce Bank, Cleveland, Ohio  
No Drawing. Continuation-in-part of application Ser. No. 845,046, July 25, 1969. This application Mar. 27, 1970, Ser. No. 23,509  
Int. Cl. B22c 1/22; C04b 35/14; C08g 51/04, 51/18

U.S. Cl. 260—17.2

10 Claims

Exothermic insulating compound for use in the casting of metals comprising 50–82% finely divided refractory

material comprising at least about 10% glass polishing residue, 0 to 72% sand, 0 to 20% silica flour, and 0 to 20% diatomaceous earth, 4–12% asbestos fiber, up to 12% cellulosic material, up to 12% reactive metal, up to 14% metal oxide, and 3–12% binder resin.

3,732,178

**VINYL CHLORIDE EMULSION POLYMER AND COPOLYMER COMPOSITIONS**

Ludwig Kuhnert, Marl, Germany, assignor to Chemische Werke Huls Aktiengesellschaft, Marl, Germany  
No Drawing. Continuation-in-part of application Ser. No. 790,152, Jan. 9, 1969, now Patent No. 3,627,717, and abandoned applications Ser. No. 887,395, Dec. 22, 1969, and Ser. No. 20,015, Mar. 22, 1970. This application Sept. 27, 1971, Ser. No. 184,209

Claims priority, application Germany, Jan. 20, 1968, P 17 20 430.7; Apr. 18, 1968, P 17 70 223.7; Jan. 14, 1969, P 19 10 149.3; Apr. 11, 1969, P 19 18 414.6  
The portion of the term of the patent subsequent to Dec. 14, 1983, has been disclaimed  
Int. Cl. C08f 3/30, 29/18, 45/54

U.S. Cl. 260—23 EM

11 Claims

Vinyl chloride polymer and copolymer compositions are prepared by emulsion polymerization of vinyl chloride in the presence of sodium salt of  $\alpha$ -sulfo-fatty acids. The compositions and methods are improved by emulsifying the vinyl chloride in the presence of sodium salts of  $\alpha$ -sulfo-fatty acids having 12 to 24, and preferably 12 to 18 carbon atoms, wherein the sodium salts of the  $\alpha$ -sulfo-fatty acid have a concentration of 0.6 to 4.0, and preferably 0.8 to 3.0 percent by weight based on the monomers and the polymerization is performed at a pH value of 2 to 11.

3,732,179

**PROCESS FOR PREPARING POLYURETHANES FROM HYDROXY-METHYLATED DERIVATIVES OF RESIN ACIDS**

John B. Lewis and Glen W. Hedrick, Lake City, Fla., assignors to the United States of America as represented by the Secretary of Agriculture  
No Drawing. Original application May 12, 1970, Ser. No. 36,672, now Patent No. 3,702,338. Divided and this application Mar. 15, 1972, Ser. No. 235,077  
Int. Cl. C08g 9/32

U.S. Cl. 260—24

3 Claims

The preparation of a new series of polyols derived from naval stores is described and their use in polyurethanes is demonstrated. Small amounts of these resin acid derivatives give added strength to polyurethane films prepared from propylene glycol polyethers and could very well be useful intermediates for industry. Increasing amounts of these new glycols blended with trimethylolpropane, 1,4-butanediol, and a polypropylene glycol and reacted with TDI gave clear strong films with tensile strengths around 5000 p.s.i. Further addition resulted in harder, more brittle films. Because of the brittle character of most of the films, use of the polymers probably would be limited to coating applications. On the other hand, change in the formulation in one instance resulted in films having fair low temperature and elastomeric properties. The diisocyanate requirements are reduced when the polyols are used as a component of the glycol system.

3,732,180

**PHOTOCONDUCTIVE COMPOSITION AND METHOD**

Eugene P. Gramza and David D. Schreiber, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
No Drawing. Original application Nov. 18, 1970, Ser. No. 90,778, now Patent No. 3,684,502, dated Aug. 15, 1972. Divided and this application Dec. 27, 1971, Ser. No. 212,782  
Int. Cl. C08g 51/30, 51/28

U.S. Cl. 260—33.6 R

12 Claims

A method is provided for forming a co-crystalline complex of pyrylium dye and polymer which involves dis-

solving the components in a solvent system in which the solubilities of the components are substantially equal. A nonpolar precipitating liquid in which the components are insoluble is combined with the solution above to produce precipitation of the complex which is then removed from the various liquids. The resultant complex is photoconductive and can be used to sensitize other photoconductors. Electrophotographic elements are prepared by dispersing the so-formed complex in a polymeric vehicle and coating the dispersion on a support.

3,732,181

**POLYMER COMPOSITES REINFORCED WITH LOW-MELT GLASS**

Nell Hunter Ray, Hartford, and Francis Raymond Sherliker, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England  
No Drawing. Filed Apr. 7, 1971, Ser. No. 132,180  
Claims priority, application Great Britain, Apr. 17, 1970, 18,481/70  
Int. Cl. C08g 51/04

U.S. Cl. 260—41 B

20 Claims

Composite materials of low melting inorganic oxide glass and organic polymers in which glass and polymer are co-deformable at suitable temperatures. The glasses have a transformation temperature in the range 100–400° C. Lead and zinc phosphate glasses are preferred. Methods of shaping composites and forming fibres in situ are described.

3,732,182

**PROCESS FOR PREPARING LINEAR POLYESTERS**

Kazuya Chimura, Kazuo Ito, Shunichi Takashima, Yoshihiro Shimoshinbara, and Mizuo Shindo, Otake, Japan, assignors to Mitsubishi Rayon Company Limited  
No Drawing. Filed Apr. 20, 1971, Ser. No. 135,751  
Claims priority, application Japan, May 1, 1970, 45/36,833; May 9, 1970, 45/39,045; May 19, 1970, 45/42,773; June 5, 1970, 45/48,506; Oct. 22, 1970, 45/93,095  
Int. Cl. C08g 17/015

U.S. Cl. 260—75 R

13 Claims

A process for preparing linear polyesters wherein polycondensation of glycol terephthalates is performed in the presence of a novel catalytic antimony compound prepared from an antimony compound having the formula  $\text{Sb}(\text{OR}_1)(\text{OR}_2)(\text{OR}_3)$ , such as Sb alkoxide, and  $\alpha$ -hydroxycarboxylic acid and/or  $\alpha, \beta$ -dicarboxylic acid. Resultant polyesters exhibit excellent whiteness and transparency and therefore, are particularly useful for textile fibers and films.

3,732,183

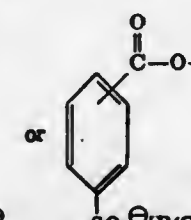
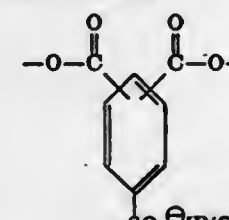
**FILAMENT-FORMING SYNTHETIC LINEAR POLYESTERS MODIFIED BY SULFONATE GROUPS**

Jurgen Popp, Kelkheim, Taunus, and Lieselotte Wappes, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany  
No Drawing. Filed Sept. 9, 1971, Ser. No. 179,211  
Claims priority, application Germany, Sept. 11, 1970, P 20 44 931.4  
Int. Cl. C08g 17/08

U.S. Cl. 260—75 P

4 Claims

Filament-forming synthetic polyesters having a high molecular weight and comprising links in the chain of the polymer molecule which contain sulfonate groups. These chain links containing sulfonate groups have the general formulae



910 O.G.—23

in which R stands for an alkyl radical, for example,  $\text{CH}_3$ ,  $\text{C}_2\text{H}_5$ ,  $n\text{---C}_3\text{H}_7$ ,  $n\text{---C}_4\text{H}_9$ , or the 3-sodium (sulfo-propyl) radical, or the 4-sodium (sulfo-butyl) radical and are contained in the polymer in an amount of from 0.5 to 5 mol percent, calculated on the polymer unit consisting of dicarboxylic acid radical and diol radical.

3,732,184

**EMULSION POLYMERIZATION METHOD**

Martin K. Lindemann and Donald M. Wacome, Greenville, S.C., assignors to Chas. S. Tanner Co., Greenville, S.C.  
No Drawing. Filed Apr. 22, 1971, Ser. No. 136,532  
Int. Cl. C08g 22/04

U.S. Cl. 260—77.5 BB

23 Claims

Polymer latices containing thermosetting polymers and which have the capacity to cure to greater insolubility are provided by a two stage emulsion polymerization method. The polymerization is an aqueous emulsion polymerization using a redox catalyst system in which from 35–70% of the total monomers are polymerized in the first stage, with the product being cooled prior to the introduction of the balance of the monomers.

3,732,185

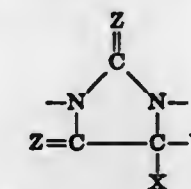
**POLYPARABANIC ACID DERIVATIVES**

Jurgen Hocker, Cologne, and Rudolf Merten, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft  
No Drawing. Filed June 28, 1971, Ser. No. 157,742  
Claims priority, application Germany, June 29, 1970, P 20 32 077.8  
Int. Cl. C08g 22/02

U.S. Cl. 260—77.5 CH

9 Claims

Polyparabanic acid derivatives which contain the structural unit:



(I)

repeatedly in one molecule; in this structural unit

$\text{Z}=\text{O}$  or  $\text{S}$ ;

X and Y, which may be the same or different, represent radicals of the formula  $\text{---NR}_1\text{R}_2$ ;  $\text{---OR}_1$  or  $\text{---SR}_1$ , where

$\text{R}_1$  represents an optionally substituted alkyl, optionally substituted alkyl, optionally substituted cycloalkyl or optionally substituted aryl radical, and  $\text{R}_2$  represents hydrogen or has the same meaning as  $\text{R}_1$ , or

$\text{R}_1$  and  $\text{R}_2$  together can also represent an alkylene or arylene radical which joins X and Y together to form a ring, and process for their production.

3,732,186

**POLYISOCYANATES CONTAINING CYCLIC IMIDE GROUPS**

Willi Dunwald, Leverkusen-Alkenrath, Karl-Heinz Mielke, Cologne-Stammheim, Gerhard Muller, Leverkusen, and Rudolf Merten, Cologne-Flittard, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany  
No Drawing. Continuation of application Ser. No. 688,619, Dec. 6, 1967, which is a continuation of application Ser. No. 326,606, Nov. 26, 1963, both now abandoned. This application Aug. 5, 1971, Ser. No. 169,461  
Claims priority, application Germany, Jan. 8, 1963, F 38,722  
Int. Cl. C08g 22/00

U.S. Cl. 260—77.5 AM

13 Claims

A polyisocyanate composition containing at least two free  $\text{---NCO}$  groups and at least one cyclic imide group



3,732,174

**VULCANIZATION OF HALOGEN CONTAINING ELASTOMERS WITH THIOALKANOIC ACIDS AND THEIR SALTS AND UNCURED AND CURED PRODUCTS THEREOF**

Paul P. Nicholas, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.  
No Drawing. Filed Feb. 7, 1972, Ser. No. 224,318  
Int. Cl. C08g 23/06

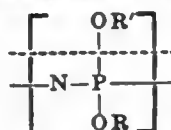
**U.S. Cl. 260—2 A** 13 Claims  
A new method for vulcanizing epihalohydrin elastomers employs, as essential vulcanization ingredients, (1) a thioalkanoic acid or its metal salts such as thiodipropionic acids, methylene-bis-thiodipropionic acid, thiodiacetic acid and mercaptoacetic acid or the corresponding sodium or lead salts, and (2) a tertiary amine, particularly the compound 1,4-diaza(2.2.2)bicyclooctane. When the acid form of ingredient (1) is employed it is necessary to add a third component which is a metal base compound such as an alkali metal carboxylate, lead oxide, etc. When a metal salt of a thioalkanoic acid ingredient (1) such as disodium thiodipropionate is employed the third component is unnecessary. This vulcanizing system provides very fast and adjustable cure cycles producing vulcanizates of low odor and of excellent physical properties.

3,732,175

**CROSSLINKING OF PHOSPHAZENE POLYMERS**

Harry Rex Allcock, State College, Pa., assignor to The Firestone Tire & Rubber Company, Akron, Ohio  
No Drawing. Filed Sept. 27, 1971, Ser. No. 184,180  
Int. Cl. C08g 33/16

**U.S. Cl. 260—2 P** 5 Claims  
The crosslinking of poly(alkoxy- and aryloxy-)phosphazenes the skeletal chains of which consist of recurring units represented by the general formula



in which R and R' each represents alkyl, fluoralkyl or aryl or other monovalent units, is accomplished by a ligand exchange process involving an alkali metal salt of a fluorinated polyol.

3,732,176

**LOW RESILIENCY MICROCELLULAR POLYURETHANE ELASTOMER WITH INTEGRAL SKIN AND METHOD FOR PREPARATION THEREOF**

Fritz Hostettler, Freehold, N.J., and George W. Huffman, Crystal Lake, Ill., assignors to The Quaker Oats Company, Chicago, Ill.  
No Drawing. Filed Jan. 12, 1972, Ser. No. 217,280  
Int. Cl. C08g 22/44

**U.S. Cl. 260—2.5 AP** 5 Claims  
This invention relates to a method for preparing certain microcellular elastomers having low resiliency and an integral skin which is substantially non-porous comprising contacting certain polyether glycols and ethylene oxide capped 4,4'-isopropylidenediphenol with methylene bis(4-phenylisocyanate) in the presence of a blowing agent and a catalyst system consisting of a tertiary amine and an organotin compound.

3,732,177

**EXOTHERMIC INSULATING COMPOSITIONS COMPRISING GLASS POLISHING RESIDUE**

Norman F. Tisdale, Jr., Valencia, and James F. McCarthy, Mars, Pa., assignors to The Union Commerce Bank, Cleveland, Ohio  
No Drawing. Continuation-in-part of application Ser. No. 845,046, July 25, 1969. This application Mar. 27, 1970, Ser. No. 23,509  
Int. Cl. B22c 1/22; C04b 35/14; C08g 51/04, 51/18

**U.S. Cl. 260—17.2** 10 Claims  
Exothermic insulating compound for use in the casting of metals comprising 50–82% finely divided refractory

material comprising at least about 10% glass polishing residue, 0 to 72% sand, 0 to 20% silica flour, and 0 to 20% diatomaceous earth, 4–12% asbestos fiber, up to 12% cellulosic material, up to 12% reactive metal, up to 14% metal oxide, and 3–12% binder resin.

3,732,178

**VINYL CHLORIDE EMULSION POLYMER AND COPOLYMER COMPOSITIONS**

Ludwig Kuhn, Marl, Germany, assignor to Chemische Werke Huls Aktiengesellschaft, Marl, Germany  
No Drawing. Continuation-in-part of application Ser. No. 790,152, Jan. 9, 1969, now Patent No. 3,627,717, and abandoned applications Ser. No. 887,395, Dec. 22, 1969, and Ser. No. 20,015, Mar. 22, 1970. This application Sept. 27, 1971, Ser. No. 184,209  
Claims priority, application Germany, Jan. 20, 1968, P 17 20 430.7; Apr. 18, 1968, P 17 70 223.7; Jan. 14, 1969, P 19 10 149.3; Apr. 11, 1969, P 19 18 414.6  
The portion of the term of the patent subsequent to Dec. 14, 1988, has been disclaimed  
Int. Cl. C08f 3/30, 29/18, 45/54

**U.S. Cl. 260—23 EM** 11 Claims  
Vinyl chloride polymer and copolymer compositions are prepared by emulsion polymerization of vinyl chloride in the presence of sodium salt of  $\alpha$ -sulfo-fatty acids. The compositions and methods are improved by emulsifying the vinyl chloride in the presence of sodium salts of  $\alpha$ -sulfo-fatty acids having 12 to 24, and preferably 12 to 18 carbon atoms, wherein the sodium salts of the  $\alpha$ -sulfo-fatty acid have a concentration of 0.6 to 4.0, and preferably 0.8 to 3.0 percent by weight based on the monomers and the polymerization is performed at a pH value of 2 to 11.

3,732,179

**PROCESS FOR PREPARING POLYURETHANES FROM HYDROXY-METHYLATED DERIVATIVES OF RESIN ACIDS**

John B. Lewis and Glen W. Hedrick, Lake City, Fla., assignors to the United States of America as represented by the Secretary of Agriculture  
No Drawing. Original application May 12, 1970, Ser. No. 36,672, now Patent No. 3,702,338. Divided and this application Mar. 15, 1972, Ser. No. 235,077  
Int. Cl. C08g 9/32

**U.S. Cl. 260—24** 3 Claims  
The preparation of a new series of polyols derived from naval stores is described and their use in polyurethanes is demonstrated. Small amounts of these resin acid derivatives give added strength to polyurethane films prepared from propylene glycol polyethers and could very well be useful intermediates for industry. Increasing amounts of these new glycols blended with trimethylolpropane, 1,4-butanediol, and a polypropylene glycol and reacted with TDI gave clear strong films with tensile strengths around 5000 p.s.i. Further addition resulted in harder, more brittle films. Because of the brittle character of most of the films, use of the polymers probably would be limited to coating applications. On the other hand, change in the formulation in one instance resulted in films having fair low temperature and elastomeric properties. The diisocyanate requirements are reduced when the polyols are used as a component of the glycol system.

3,732,180

**PHOTOCONDUCTIVE COMPOSITION AND METHOD**

Eugene P. Gramza and David D. Schreiber, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
No Drawing. Original application Nov. 18, 1970, Ser. No. 90,778, now Patent No. 3,684,502, dated Aug. 15, 1972. Divided and this application Dec. 27, 1971, Ser. No. 212,782  
Int. Cl. C08g 51/30, 51/28

**U.S. Cl. 260—33.6 R** 12 Claims  
A method is provided for forming a co-crystalline complex of pyrylium dye and polymer which involves dis-

solving the components in a solvent system in which the solubilities of the components are substantially equal. A nonpolar precipitating liquid in which the components are insoluble is combined with the solution above to produce precipitation of the complex which is then removed from the various liquids. The resultant complex is photoconductive and can be used to sensitize other photoconductors. Electrophotographic elements are prepared by dispersing the so-formed complex in a polymeric vehicle and coating the dispersion on a support.

3,732,181

**POLYMER COMPOSITES REINFORCED WITH LOW-MELT GLASS**

Neil Hunter Ray, Hartford, and Francis Raymond Sherliker, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England  
No Drawing. Filed Apr. 7, 1971, Ser. No. 132,180  
Claims priority, application Great Britain, Apr. 17, 1970, 18,481/70  
Int. Cl. C08g 51/04

**U.S. Cl. 260—41 B** 20 Claims  
Composite materials of low melting inorganic oxide glass and organic polymers in which glass and polymer are co-deformable at suitable temperatures. The glasses have a transformation temperature in the range 100–400° C. Lead and zinc phosphate glasses are preferred. Methods of shaping composites and forming fibres in situ are described.

3,732,182

**PROCESS FOR PREPARING LINEAR POLYESTERS**

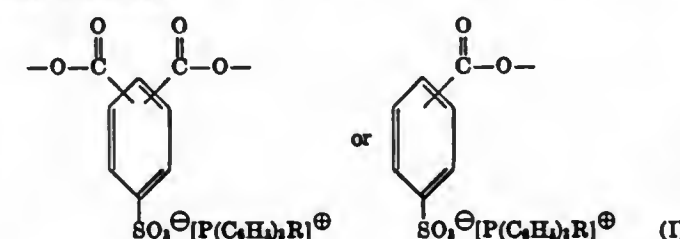
Kazuya Chimura, Kazuo Ito, Shunichi Takashima, Yoshihiro Shimoshinbara, and Mizuo Shindo, Otake, Japan, assignors to Mitsubishi Rayon Company Limited  
No Drawing. Filed Apr. 20, 1971, Ser. No. 135,751  
Claims priority, application Japan, May 1, 1970, 45/36,833; May 9, 1970, 45/39,045; May 19, 1970, 45/42,773; June 5, 1970, 45/48,506; Oct. 22, 1970, 45/93,095  
Int. Cl. C08g 17/015

**U.S. Cl. 260—75 R** 13 Claims  
A process for preparing linear polyesters wherein polycondensation of glycol terephthalates is performed in the presence of a novel catalytic antimony compound prepared from an antimony compound having the formula  $\text{Sb}(\text{OR}_1)(\text{OR}_2)(\text{OR}_3)$ , such as Sb alkoxide, and  $\alpha$ -hydroxycarboxylic acid and/or  $\alpha,\beta$ -dicarboxylic acid. Resultant polyesters exhibit excellent whiteness and transparency and therefore, are particularly useful for textile fibers and films.

3,732,183

**FILAMENT-FORMING SYNTHETIC LINEAR POLYESTERS MODIFIED BY SULFONATE GROUPS**  
Jurgen Popp, Kelkheim, Taunus, and Lieselotte Wappes, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany  
No Drawing. Filed Sept. 9, 1971, Ser. No. 179,211  
Claims priority, application Germany, Sept. 11, 1970, P 20 44 931.4  
Int. Cl. C08g 17/08

**U.S. Cl. 260—75 P** 4 Claims  
Filament-forming synthetic polyesters having a high molecular weight and comprising links in the chain of the polymer molecule which contain sulfonate groups. These chain links containing sulfonate groups have the general formulae



910 O.G.—28

3,732,184

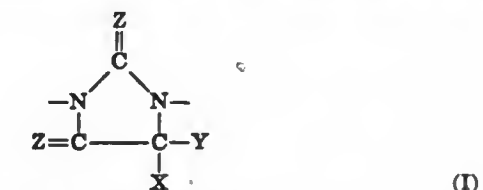
**EMULSION POLYMERIZATION METHOD**  
Martin K. Lindemann and Donald M. Wacome, Greenville, S.C., assignors to Chas. S. Tanner Co., Greenville, S.C.  
No Drawing. Filed Apr. 22, 1971, Ser. No. 136,532  
Int. Cl. C08g 22/04

**U.S. Cl. 260—77.5 BB** 23 Claims  
Polymer latices containing thermosetting polymers and which have the capacity to cure to greater insolubility are provided by a two stage emulsion polymerization method. The polymerization is an aqueous emulsion polymerization using a redox catalyst system in which from 35–70% of the total monomers are polymerized in the first stage, with the product being cooled prior to the introduction of the balance of the monomers.

3,732,185

**POLYPARABANIC ACID DERIVATIVES**  
Jurgen Hocker, Cologne, and Rudolf Merten, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft  
No Drawing. Filed June 28, 1971, Ser. No. 157,742  
Claims priority, application Germany, June 29, 1970, P 20 32 077.8  
Int. Cl. C08g 22/02

**U.S. Cl. 260—77.5 CH** 9 Claims  
Polyparabanic acid derivatives which contain the structural unit:



repeatedly in one molecule; in this structural unit

Z=O or S;

X and Y, which may be the same or different, represent radicals of the formula  $\text{---NR}_1\text{R}_2$ ;  $\text{---OR}_1$  or  $\text{---SR}_1$ , where

R<sub>1</sub> represents an optionally substituted alkyl, optionally substituted alkyl, optionally substituted cycloalkyl or optionally substituted aryl radical, and R<sub>2</sub> represents hydrogen or has the same meaning as R<sub>1</sub>, or

R<sub>1</sub> and R<sub>2</sub> together can also represent an alkylene or arylene radical which joins X and Y together to form a ring, and process for their production.

3,732,186

**POLYISOCYANATES CONTAINING CYCLIC IMIDE GROUPS**

Willi Dunwald, Leverkusen-Alkenrath, Karl-Heinz Mielke, Cologne-Stammheim, Gerhard Muller, Leverkusen, and Rudolf Merten, Cologne-Flittard, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany  
No Drawing. Continuation of application Ser. No. 688,619, Dec. 6, 1967, which is a continuation of application Ser. No. 326,606, Nov. 26, 1963, both now abandoned. This application Aug. 5, 1971, Ser. No. 169,461  
Claims priority, application Germany, Jan. 8, 1963, F 38,722  
Int. Cl. C08g 22/00

**U.S. Cl. 260—77.5 AM** 13 Claims  
A polyisocyanate composition containing at least two free  $\text{---NCO}$  groups and at least one cyclic imide group



in the molecule and having a molecular weight of from about 200 to about 10,000 are prepared by reacting, in an inert organic solvent, aliphatic and aromatic anhydrides with organic polyisocyanates. The polyisocyanates of the invention are particularly useful as precursors in the preparation of lacquers and coatings.

3,732,187

# CARBODIIMIDE FOAMS OF REDUCED BRITTLENESS PREPARED FROM RESOLE-DERIVED QUASI-PREPOLYMERS

Moses Cenker, Trenton, and Peter T. Kan, Plymouth, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Filed Dec. 6, 1971, Ser. No. 205,393

Int. Cl. C08g 22/48

U.S. Cl. 260—77.5 BF 5 Claims

Rigid foams characterized by carbodiimide linkages of reduced brittleness and improved strength and heat resistance are prepared by the catalytic condensation of an NCO-terminated resole-derived quasi-prepolymer, optionally, in admixture with other organic polyisocyanates.

3,732,188

# PROCESS FOR MAKING POLYIMIDE PREPOLYMER AND PRODUCT PRODUCED THEREBY

Fred F. Holub and John T. Hoback, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Continuation-in-part of application Ser. No. 26,079, Apr. 6, 1970, now Patent No. 3,678,015. This application Mar. 18, 1971, Ser. No. 125,875

The portion of the term of the patent subsequent to July 18, 1989, has been disclaimed

Int. Cl. C08g 20/00

U.S. Cl. 260—78 UA 23 Claims

A method is provided for making a curable prepolymeric reaction product of an organic diamine and an aliphatically unsaturated dicarbonyl compound, such as an organic anhydride or organic dicarboxylic acid. The curable prepolymeric reaction product can be heat softened to allow incorporation of filler and is convertible to the infusible state by heat or by the employment of a free radical initiator. Reaction of the organic diamine and the aliphatically unsaturated dicarbonyl compound is effected in a phenolic solvent medium. A hydrocarbon solvent optionally can serve to facilitate removal of water of reaction prior to the recovery of the reaction product of the organic diamine and the aliphatically unsaturated dicarbonyl compound. The prepolymeric reaction product can be molded to produce high temperature resistant polyimide films and structures.

3,732,189

# METHOD FOR MAKING POLYIMIDES AND PRODUCTS PRODUCED THEREBY

James V. Crivello, Mechanicville, and Ann L. Seiden-splanner, Burnt Hills, N.Y., assignors to General Electric Company

No Drawing. Filed Mar. 27, 1970, Ser. No. 23,492

Int. Cl. C08g 20/00

U.S. Cl. 260—78 UA 3 Claims

A method for making polyimide polymers is provided by effecting reaction between an aliphatically unsaturated anhydride, such as maleic anhydride, and an aryl diamine, for example 4,4'-diaminodiphenylmethane in the presence of certain acidic catalysts, such as an organic carboxylic acid. The polyimides produced by the subject method exhibit superior heat resistance, and are useful as molding compounds, laminating resins, etc.

3,732,190

# SELF-CROSSLINKABLE COPOLYMERS

Gerhard Balle, Cologne-Flittard, and Gunter Kolb, Cologne-Stammheim, Germany, assignors to Bayer Aktiengesellschaft

No Drawing. Continuation-in-part of application Ser. No. 42,891, June 2, 1970. This application Sept. 22, 1971, Ser. No. 182,906

Claims priority, application Germany, July 26, 1969, P 19 38 038.2

Int. Cl. C08f 15/40

U.S. Cl. 260—78.5 R 2 Claims

Self-crosslinkable copolymers consisting of copolymerized units of

- (A) an  $\alpha$ -halogenoalkyl ester,
- (B) one or more copolymerizable monomers which may be an ester of acrylic acid or methacrylic acid or a conjugated diene,
- (C) one or more olefinically unsaturated compounds which are free of carboxyl, hydroxyl, amino and carboxylic acid amide groups and which are different from the monomers of (B) and
- (D) one or more olefinically unsaturated compounds containing at least one carboxylic, hydroxyl, amino or carboxylic acid amide group

and process of crosslinking the same which comprises elimination of hydrogen halide at a pH of at least 7 and a temperature of 0 to 250° C.

3,732,191

# POLYTHIOL VULCANIZATION OF EPIHALO-HYDRIN ELASTOMERS

Paul P. Nicholas, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Filed Feb. 7, 1972, Ser. No. 224,317

Int. Cl. C08g 23/00

U.S. Cl. 260—79 16 Claims

Epithalohydrin elastomers are vulcanized by means of a 3-component vulcanization system comprising a polythiol, a tertiary amine, and a metal base compound. Polythiols such as 3,6-dithiaoctane-1,8-dithiol in combination with a tertiary amine such as 1,4-diaza(2.2.2)bicyclooctane, and sodium acrylate or litharge as a metal base compound vulcanize epithalohydrin elastomers such as the homopolymers of epichlorohydrin and elastomeric copolymers of epichlorohydrin and ethylene oxide forming vulcanizates of excellent physical and chemical properties. The curing system is quite flexible providing a wide variation in cure times at ordinary vulcanization temperatures.

3,732,192

# RUBBER FORMULATIONS CONTAINING THIOSULFONATE ESTERS

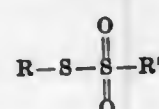
Robert J. Arnold, Chicago, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed May 24, 1971, Ser. No. 146,482

Int. Cl. C08f 27/06

U.S. Cl. 260—79.5 B 10 Claims

Controlling prevulcanization of a vulcanizable diene rubber formulation containing antiozonant and vulcanization accelerator by incorporating therein a thiosulfonate of a particular composition having the formula



where R and R' are aryl, alkyl, cycloalkyl or substituted derivatives thereof.

3,732,193

# THIN FILM PROCESS FOR POLYMERIZATION OF WATER SOLUBLE MONOMERS

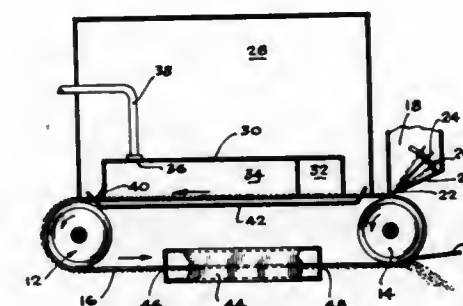
Jerry J. Svarz, La Grange, Ill., assignor to Nalco Chemical Company

Filed Apr. 28, 1971, Ser. No. 138,027

Int. Cl. C08f 3/90, 15/02, 1/00

U.S. Cl. 260—79.3 MU

5 Claims



A continuous polymerization process, in which an aqueous solution of a water soluble unsaturated monomer is polymerized on a heated continuously moving belt, gives polymeric products in a dry thin film form.

3,732,194

# CONTINUOUS PROCESS FOR THE PRODUCTION OF ALFIN POLYMERS

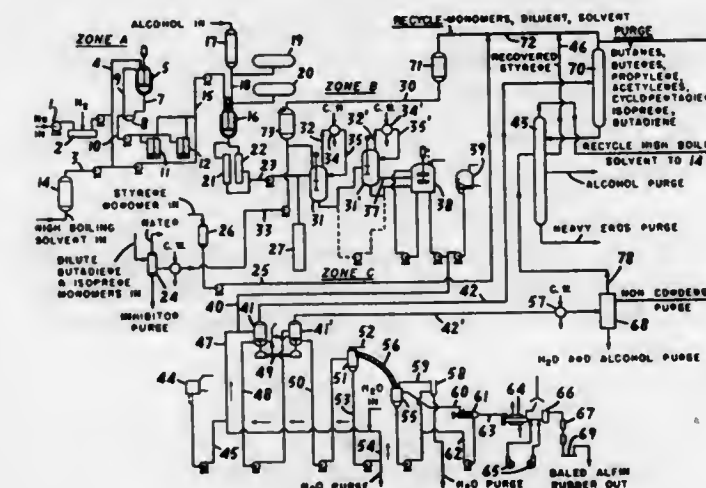
Theodore B. Baba, Hillsdale, N.J., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of applications Ser. No. 672,882, Oct. 4, 1967, and Ser. No. 809,228, Mar. 31, 1969. This application Feb. 20, 1970, Ser. No. 13,242

Int. Cl. C08d 1/00, 3/06, 7/04

U.S. Cl. 260—82.1

1 Claim



A continuous process for the preparation of alfin polymers is provided, wherein monomers are polymerized in the presence of an alfin catalyst, a low boiling diluent, and a molecular weight moderator. The low boiling diluent is preferably under reflux, for cooling of the reaction mixture during the exothermic polymerization, and it also makes possible the preparation of a flowable high solids content alfin polymer reaction mixture. Unreacted monomer, volatile low polymer, low boiling diluent and any additional solvents that may be present are separated by subjecting the alfin polymer reaction mixture to steam-stripping, and the condensate may be purified, and recycled for reuse.

3,732,195

# PROCESS FOR THE POLYMERIZATION OF CONJUGATED DIOLEFINS

Morford C. Throckmorton, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Original application Sept. 11, 1969, Ser. No. 857,230. Divided and this application June 21, 1971, Ser. No. 155,300

Int. Cl. C08d 1/4

U.S. Cl. 260—94.3

6 Claims

There is disclosed a process for the polymerization of butadiene and butadiene in mixture with other conjugated diolefins to form polymers containing at least 90 percent of the butadiene units in the cis-1,4 configuration comprising contacting at least one diolefin under polymerization conditions with a catalyst comprising (A) at least one organometallic compound, (B) at least one organonickel compound, and (C) at least one compound selected from a group consisting of metal fluoroborates, metal fluorophosphates, metal fluoroantimonates and organic derivatives of fluorophosphates and fluoroantimonates wherein the metal is selected from a group consisting of lithium, beryllium, calcium, magnesium, nickel and cobalt.

3,732,196

# ANTI-ELECTROSTATIC LIGHT-STABLE POLY-OLEFIN MOULDING COMPOSITIONS

Dieter Dieterich, Leverkusen, and Horst Niermann, Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Jan. 28, 1971, Ser. No. 110,777

Claims priority, application Germany, Mar. 4, 1970, P 20 10 118.2

Int. Cl. C08f 29/04

U.S. Cl. 260—93.7

5 Claims

Moulding compositions comprising an olefin polymer and as antistatic agent a salt of an aliphatic carboxylic acid with at least 6 carbon atoms and of a 2-dialkylamino-methyl-2-alkyl-1,3-propane diol.

3,732,197

# PRODUCTION OF $\alpha$ -OLEFIN POLYMERS

Sadao Kitagawa, Aml-machi, Japan, assignor to Mitsubishi Petrochemical Company Limited, Tokyo-to, Japan

No Drawing. Filed Dec. 7, 1970, Ser. No. 95,925

Claims priority, application Japan, Dec. 8, 1969, 44/98,524

Int. Cl. C08f 1/56, 3/10

U.S. Cl. 260—93.7

4 Claims

At least one kind of tropylium salt (cycloheptatrienium salt) in combined with a Ziegler-Natta type catalyst (comprising basically, a compound of a transition metal of Group IV, V, or VI and an organometallic compound of a metal of Group I, II, or III) to form a highly effective catalyst whereby at least one kind of  $\alpha$ -olefin can be polymerized to produce  $\alpha$ -olefin polymers of high crystallinity.

3,732,198

# POLYMERISATION OF ETHYLENE

Kenneth Stephenson Whiteley and Richard Roy Cooper, Welwyn Garden City, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Jan. 19, 1970, Ser. No. 4,091

Claims priority, application Great Britain, Jan. 20, 1969, 3,136/69; Oct. 30, 1969, 5,324/69

Int. Cl. C08f 1/56, 1/58

U.S. Cl. 260—94.9 C

5 Claims

Ethylene is polymerised at pressures above 1,000 kg./cm.<sup>2</sup> using a catalyst comprising a compound of a transition metal and in the presence of from 0.5 to 20% (by weight on the ethylene monomer) of a compound containing a specified allylic group.



3,732,199

## PEPTIDE SYNTHESIS

John S. Paul Schwarz, State College, Pa., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.  
No Drawing. Continuation-in-part of application Ser. No. 741,215, June 28, 1968. This application Mar. 15, 1971, Ser. No. 124,554

Int. Cl. C07c 103/52

U.S. Cl. 260—112.5 8 Claims  
Improvement in the synthesis of peptides involving the formation of novel active intermediates. These active intermediates are formed by reaction at lowered temperatures of an imidyl halide with the tertiary ammonium salt of the acid moiety of an amino acid or peptide. The intermediate thus formed is then reacted with the amino moiety of the amino acid or peptide to be coupled, thus forming the desired peptide or polypeptide.

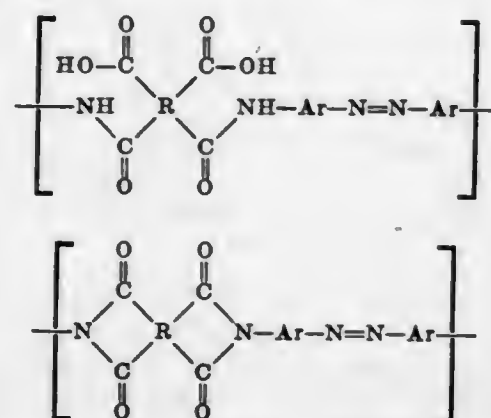
3,732,200

## POLYAMIDE ACIDS OF CERTAIN TETRACARBOXYLIC ACIDS AND CERTAIN AZO CONTAINING DIAMINES

Hartwig C. Bach, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.  
No Drawing. Continuation-in-part of application Ser. No. 792,823, Jan. 21, 1969. This application June 15, 1970, Ser. No. 46,454

Int. Cl. C08g 20/22, 20/32

U.S. Cl. 260—144 1 Claim  
Ordered fiber-forming polyamide acids and polyimides of the following respective formulas



R is tetravalent aromatic radical, Ar is an asymmetrical-divalent aromatic radical with the proviso that one Ar radical is the mirror image of the other. These polymers are useful as coatings, films, fibers, foams and resins.

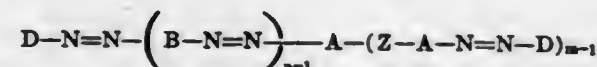
3,732,201

## 3-CHLORO - 1,2,4 - THIADIAZOLYL-5 AND 3-CHLORO - 1,2,4 - THIADIAZOLIUM-5 AZO DYESTUFFS

Visvanathan Ramanathan, Basel, Switzerland, assignor to Ciba-Geigy AG  
No Drawing. Filed Feb. 16, 1970, Ser. No. 11,888  
Claims priority, application Switzerland, Feb. 19, 1969, 2,509/69

Int. Cl. C29b 29/10, 29/36, 29/38

U.S. Cl. 260—153 11 Claims  
A dyestuff of the formula



in which D is quaternated or unquaternated 3-halogeno-1,2,4-thiadiazolyl-5-, n is 1 or 2, m is 1 or 2, n and m together are 2 or 3, Z is a single bond, an oxygen or sulfur atom, an imido or sulfonyl group, or a divalent organic residue, B is a 1,4-phenylene residue that may be substituted, and A is the residue of a coupling component, D, B, A and Z being free from sulfonic acid groups.

3,732,202

## PROCESS FOR EXTRACTING OLEANOLIC ACID-3-DIGLUCOSIDE AND PRODUCTS OBTAINED THEREFROM

Kenneth Jewers, Bromley, Kent, and Terence Albert King, London, England, assignors to The Solicitor for the Affairs of Her Majesty's Treasury, London, England  
No Drawing. Filed June 19, 1969, Ser. No. 834,881  
Claims priority, application Great Britain, June 21, 1968, 29,760/68

Int. Cl. C07c 47/18

U.S. Cl. 260—210 R 11 Claims  
A molluscicidally active agent is obtained by alcoholic extraction of *Phytolacca dodecandra*, particularly berries thereof, and alkaline hydrolysis of the extract. The active material is identified as the diglucoside of oleanolic acid. Analogues thereof are also disclosed. The active material is stable and effective in natural waters at concentrations of about 5–10 p.p.m.

3,732,203

## PROCESS FOR THE PREPARATION OF CARDENOLIDE- AND BUFADIENOLIDE-3-[GLYCOSIDE-DI-ALKYL-ORTHOCARBONATES]

Ulrich Stache, Hofheim, Taunus, Kurt Radschelt, Kelheim, Taunus, Werner Haede, Hofheim, Taunus, Werner Fritsch, Neuenhain, Taunus, and Ernst Lindner, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany  
No Drawing. Filed Dec. 4, 1970, Ser. No. 95,399  
Claims priority, application Germany, Dec. 6, 1969, P 19 61 389.9

Int. Cl. C07c 173/00

U.S. Cl. 260—210.5 10 Claims  
Cardenolide- and bufadienolide-3-[glycoside-di-alkyl-orthocarbonates] and process for their preparation by reaction of cardenolide- or bufadienolide-3-glycosides with a tetra-alkyl-orthocarbonate in the presence of acidic catalysts.

3,732,204

## SYNTHESIS OF ACRONYCINE AND RELATED COMPOUNDS

James R. Beck, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.  
No Drawing. Original application July 17, 1967, Ser. No. 653,667, now Patent No. 3,624,087. Divided and this application July 6, 1971, Ser. No. 128,528  
Int. Cl. C07d 37/12

U.S. Cl. 260—279 R 2 Claims  
The total synthesis of acronycine and related compounds from readily available starting materials is described, as are various classes of intermediates useful in the synthesis.

3,732,205

## PROCESS OF MAKING POWDERED CELLULOSE LAURATE

James Teng, St. Louis County, Chokyun Rha, St. Louis, Barry L. Scallet, Clayton, and Marcella C. Stubbs, St. Louis, Mo., assignors to Anheuser-Busch, Inc., St. Louis, Mo.  
No Drawing. Original application July 25, 1969, Ser. No. 845,067, now abandoned. Divided and this application Jan. 15, 1971, Ser. No. 106,882  
Int. Cl. C08b 3/10

U.S. Cl. 260—224 4 Claims  
Powdered cellulose laurate is prepared by reacting cellulose with a reagent containing the lauroyl grouping to produce cellulose laurate, dissolving the cellulose laurate in chloroform, adding methanol slowly until the solution becomes cloudy, then adding a substantially greater amount of methanol rapidly, and recovering a powdered cellulose laurate.

3,732,206

## PREPARATION OF ETHER-ESTER STARCH DERIVATIVE

Leslie P. Kovats, Granite City, Ill., assignor to Anheuser-Busch, Incorporated, St. Louis, Mo.  
No Drawing. Filed Mar. 1, 1971, Ser. No. 119,871  
Int. Cl. C08b 19/04

U.S. Cl. 260—233.5 7 Claims  
The disclosure describes a mixed dextrin ether-ester derivative and specifically hydroxyethyl or hydroxypropyl starch dextrin ether-esters of dibasic organic acid anhydrides, preferably succinic or maleic anhydrides. The product is made by an essentially dry process involving the heating of intimately contacted hydroxyethyl or hydroxypropyl starch or starch dextrin with dibasic organic acid anhydride at a temperature of 100–160° C. in the presence of 0.5% to 10% moisture for selected times to produce a product of about 0.0016 to about 0.16 degree of substitution.

These products are in unswollen granule form and are useful as thickeners and as adhesives, which can include borax, alkali metal hydroxide and water.

3,732,207

## PREPARATION OF DEXTRINS AND STARCH ESTERS

Leslie P. Kovats, Granite City, Ill., assignor to Anheuser-Busch, Incorporated, St. Louis, Mo.  
No Drawing. Filed Jan. 29, 1971, Ser. No. 111,097  
Int. Cl. C08b 19/04

U.S. Cl. 260—233.5 7 Claims  
The disclosure describes a starch reaction product of dibasic organic acid anhydrides and specifically starch dextrin esters and thin boiling starch esters of dibasic organic acid anhydrides, preferably succinic or maleic anhydrides. The product is made by an essentially dry process involving the heating of intimately contacted starch or starch dextrin with dibasic organic acid anhydride at a temperature of 100–155° C. in the presence of only 0.5 to 15% moisture for selected times to produce a product of 0.02 to 0.04 degree of substitution.

These products are in unswollen granule form and are useful as adhesives and as thickening agents.

3,732,208

## STARCH ETHERS AND METHOD OF PREPARING SAME

Edwin L. Speakman, Clinton, Iowa, assignor to Standard Brands Incorporated, New York, N.Y.  
No Drawing. Filed Mar. 13, 1972, Ser. No. 234,417  
Int. Cl. C08b 19/06

U.S. Cl. 260—233.3 R 14 Claims  
The disclosure is directed to carboxyphenyl ethers of starch and to a method of preparing the same. The carboxyphenyl ethers of starch will gelatinize or disperse readily by heating in water to form pastes having relatively stable viscosity. Also, the carboxyphenyl ethers of starch have good film forming characteristics.

3,732,209

NOVEL 17 $\beta$ -OXYGENATED CYCLOPROPA(16 $\alpha$ ,17 $\alpha$ ) STEROIDS

Kenneth Earl Fahrenholtz, Bloomfield, and Richard Wightman Kierstead, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.  
No Drawing. Filed Mar. 15, 1971, Ser. No. 124,589  
Int. Cl. C07c 173/00

U.S. Cl. 260—239.5 17 Claims  
Novel 17 $\beta$ -oxygenated steroids having a fused cyclopropyl or halogenated cyclopropyl ring at the 16 $\alpha$ ,17 $\alpha$ -

positions are useful as hormonal agents, particularly as androgenic and anabolic agents.

3,732,210

PROCESS FOR THE MANUFACTURE OF PREGNANE-20-ONE-3 $\beta$ ,5 $\beta$ ,14 $\beta$ ,21-TETROL

Ulrich Stache, Hofheim, Taunus, Werner Fritsch, Neuenhain, Taunus, Werner Haede, Hofheim, Taunus, and Kurt Radschelt, Kelheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany  
No Drawing. Filed Jan. 26, 1971, Ser. No. 109,932  
Claims priority, application Germany, Jan. 28, 1970, P 20 03 653.7  
Int. Cl. C07c 173/00

U.S. Cl. 260—239.55 R 3 Claims

A process for the manufacture of pregnane-20-one-3 $\beta$ ,5 $\beta$ ,14 $\beta$ ,21-tetrol, useful as a starting material for pharmacologically valuable compounds of the pregnane series, by converting  $\Delta^{4,14}$ -pregnadiene-3,20-dione-21-ol to the corresponding 3,20-bis-alkylene-dioxy- $\Delta^{4,14}$ -pregnadiene-21-ol with ethylene glycol or neopentyl glycol; acylating to form the 21-acylate and then partially de-ketalizing the acylate to produce 20-alkylene-dioxy- $\Delta^{4,14}$ -pregnadiene-3-one-21-acylate; reducing the 3-keto group with an organometallic reducing agent, whereby the 21-acylate group may also be converted by the reducing agent to the 21-ol; acylating the 20-alkylene-dioxy- $\Delta^{4,14}$ -pregnadiene-3,21-diol or -3-ol-21-acylate to form 20-alkylene-dioxy- $\Delta^{4,14}$ -pregnadiene-3,21-diacylate; treating this with hypobromous acid to form 5 $\alpha$ ,15 $\alpha$ -dibromo-20-alkylene-dioxy-pregnane-3 $\beta$ ,5 $\beta$ ,14 $\beta$ ,21-tetrol-3,21-diacylate and debrominating with a base to form 20-alkylene-dioxy-4 $\beta$ (5 $\beta$ ), 14 $\beta$ (15 $\beta$ -dioxido-pregnane-3 $\beta$ ,21-diol or the corresponding -3,21-diacylate; and reducing to 20-alkylene-dioxy-pregnane-3 $\beta$ ,5 $\beta$ ,14 $\beta$ ,21-tetrol with an organometallic reducing agent. The 20-alkylene-dioxy group is hydrolyzed to form the desired pregnane-20-one-3 $\beta$ ,5 $\beta$ ,14 $\beta$ ,21-tetrol, which may be further reacted with dihydropyran to form the corresponding -3 $\beta$ ,21-ditetrahydropyranyl ether.

3,732,211

## 1-ACYLOXYETHER-1,4-BENZODIAZEPIN-2-ONES AND METHODS FOR THEIR PREPARATION

Joseph Hellerbach, Basel, Switzerland, and Armin Walser, West Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.  
No Drawing. Filed July 9, 1971, Ser. No. 162,026  
Claims priority, application Switzerland, July 29, 1970, 11,438/70

U.S. Cl. 260—239.3 D 16 Claims  
1-substituted - 1,4 - benzodiazepin-2-ones, derivatives thereof, and processes for the preparation of same are described. These compounds are useful as anti-convulsant, muscle relaxant and sedative agents.

3,732,212

## 1,2,3,10,11,11a-HEXAHYDRO-5H-PYRROLO[2,1-c][1,4]BENZODIAZEPINE-5,11-DIONES

Philip M. Carabateas, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.  
No Drawing. Filed Apr. 20, 1970, Ser. No. 30,315  
Int. Cl. C07d 57/02, 99/10

U.S. Cl. 260—239.3 T 14 Claims  
Heterocyclo[1,4]benzodiazepine derivatives having analgesic antagonist, anti-inflammatory, and psychomotor depressant activity.



3,732,213

## NOVEL TRIAZOLE COMPOUNDS

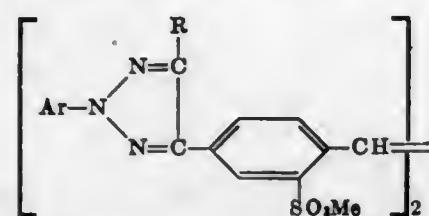
Hans Balzer, Munchenstein, Basel-Land, and Fritz Fleck, Bottmingen, Basel-Land, Switzerland, and Alec Victor Mercer, Leeds, and Roger Paver, Bradford, England, assignors to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland

No Drawing. Filed Dec. 14, 1970, Ser. No. 98,148  
Claims priority, application Switzerland, Dec. 19, 1969, 18,918/69; Oct. 27, 1970, 15,924/70

Int. Cl. C09b 23/00

U.S. Cl. 260—240 CA

Triazole derivatives of the formula



wherein Ar represents an optionally substituted aryl radical; R represents hydrogen, a low molecular alkyl radical or an optionally substituted phenyl radical; and Me represents a hydrogen, ammonium or alkali metal ion, an equivalent of an alkaline earth metal or an amine cation.

3,732,214

METHOD FOR THE SYNTHESIS OF ZEAXANTHINS, XANTHOPHYLLS, AND  $\beta$ -CAROTENE

Joseph Donald Surmatis and Armin Walser, West Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Original application July 16, 1970, Ser. No. 55,565, now Patent No. 3,661,997, which is a division of application Ser. No. 617,787, Feb. 23, 1967, now Patent No. 3,558,712. Divided and this application July 16, 1971, Ser. No. 163,436

Int. Cl. C07d 13/04

U.S. Cl. 260—240 H

Method by which zeaxanthins, xanthophylls and 3-oxo- $\beta$ -carotene can be synthesized from the condensation product of mesityl oxide and aceto-acetic ester as well as new and novel intermediates produced in the synthesis. Zeaxanthin and xanthophyll are known coloring agents for foodstuffs, including beverages, pharmaceutical and cosmetic preparations. Furthermore, through the use of the condensation product of mesityl oxide and aceto-acetic acid, new compounds for coloring foodstuffs, including beverages, pharmaceutical and cosmetic preparations are produced.

3,732,215

## IMIDAZOLE DERIVATIVES

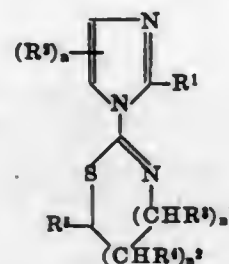
Rudiger D. Haugwitz, Highland Park, and Venkatachala L. Narayanan, Hightstown, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed Feb. 8, 1971, Ser. No. 113,693

Int. Cl. C07d 93/06, 91/32

U.S. Cl. 260—243 R

Imidazole derivatives are provided having the structure



and which are useful as anthelmintic agents and anti-inflammatory agents.

3,732,216

## 3-HETEROARYL-2-THIO-1,3-THIAZANE-2,4-DIONES

Joseph Weinstock, Phoenixville, Pa., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Filed Nov. 17, 1971, Ser. No. 199,768

Int. Cl. C07d 93/06

U.S. Cl. 260—243 R

3 - heteroaryl - 2-thio-1,3-thiazane-2,4-diones in which the heteroaryl moiety is pyridyl, thiazolyl, thienyl, furyl, pyridazinyl, thiadiazolyl, pyrimidyl or triazinyl and having anti-arthritis activity are generally prepared via ring closure of a  $\beta$ -(thiocarbamoylthio) substituted carboxylic acid with acetic anhydride/concentrated sulfuric acid.

3,732,217

## 2-ETHYL-1-PYRROLINE-3-CARBOXAMIDES

William B. Dickinson, Loudonville, and Philip C. Lang, Schodack, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

No Drawing. Original application Feb. 15, 1967, Ser. No. 616,191, now Patent No. 3,624,081, dated Nov. 30, 1971. Divided and this application Oct. 19, 1970, Ser. No. 82,133

Int. Cl. C07d 27/14

U.S. Cl. 260—247.5 R

Antibacterial 2 - ethyl-1-pyrroline-3-carboxamides and derivatives thereof are prepared from either 1-(2-propynyl)-2-pyrrolidinone or 1-(1,2-propadienyl)-2-pyrrolidinone and amines in the presence of base. The carboxamides react with phenyl isocyanates to produce 1-phenyl-carbamyl-2-ethyl-2-pyrroline-3-carboxamides, with either an acid halide or acid anhydride to give the corresponding 1-acyl - 2 - ethylenepyrrolidine-3-carboxamides and with hydrogen to give the corresponding 2-ethyl-pyrrolidine-3-carboxamides.

3,732,218

## QUATERNARY SUBSTITUTED TRIAZINES

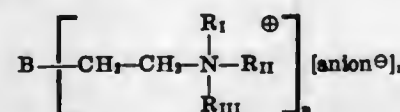
Hoelzle Gerd, Liestal, and Paul Ulrich, Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Application Nov. 12, 1968, Ser. No. 775,208, now Patent No. 3,632,294, which is a continuation-in-part of application Ser. No. 317,138, Oct. 18, 1963. Divided and this application Feb. 4, 1971, Ser. No. 112,808

Int. Cl. C07d 55/14

U.S. Cl. 260—248 NS

New quaternary nitrogen compounds and dyeing processes using these quaternary nitrogen compounds are provided. The quaternary nitrogen compounds may be represented by the formula



wherein B represents an acidifying substituent, R<sub>I</sub>, R<sub>II</sub> and R<sub>III</sub> each represents an alkyl radical, or one of them represents an NH<sub>2</sub>-group while the remaining radicals are linked together forming 5 and 6-membered cycloalkyl residues; n is a small whole number and anion<sup>⊖</sup> represents the negative radical of a monobasic or polybasic acid.

The dyeing processes provided are for the coloring of fibrous materials with reactive compounds in which the quaternary nitrogen compound is employed as dyeing assistant to promote the reaction between the reactive compound and the fibrous material.

3,732,219

## TETRAHYDRO-as-TRIAZINE-3(2H)THIONES

Paul E. Krieger, Indianapolis, Ind., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Aug. 30, 1968, Ser. No. 756,412

Int. Cl. C07d 55/10

U.S. Cl. 260—248 AS

Substituted tetrahydro-as-triazine-3(2H)thiones are prepared by the reaction of carbon disulfide with a sub-

stituted 2-aminoalkylhydrazine such as 1-(2-aminoethyl)-1-propylhydrazine or 1-(2-aminobutyl)-1-methylhydrazine. The novel compounds are useful as intermediates in the preparation of substituted thiazolo[3,2-b] and [2,3-c]-as-triazines. The thiazolotriazine compounds have pharmacological activity as antidepressants as indicated by their antagonism of reserpine and their potentiation of amphetamine, and are also useful in potentiation of barbiturates.

3,732,220

## CHLORO-N,N-DISUBSTITUTED AMINO METHYLENE AMINO-s-TRIAZINES

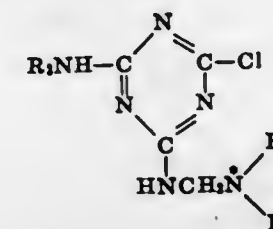
John B. O'Brien, Morris Plains, Herman Stone, Morristown, and Harry E. Ulmer, Convent Station, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Oct. 16, 1970, Ser. No. 81,620

Int. Cl. C07d 55/20

U.S. Cl. 260—249.8

Triazines of the structure



wherein R<sub>1</sub> is a C<sub>1</sub> to C<sub>4</sub> alkane, phenyl or benzyl, R<sub>2</sub> is independently hydrogen, a C<sub>1</sub> to C<sub>4</sub> alkane, phenyl or benzyl, or R<sub>1</sub> and R<sub>2</sub> together with the

N

form a C<sub>4</sub> or C<sub>5</sub> heterocyclic ring and wherein R<sub>3</sub> is a C<sub>1</sub> to C<sub>4</sub> aliphatic hydrocarbon, are highly selective and effective herbicides.

3,732,221

## HETEROCYCLIC COMPOUNDS CONTAINING ETHYLENE DOUBLE BONDS AND PROCESS FOR THEIR MANUFACTURE

Adolf Emil Siegrist, Basel, Peter Liechti, Binningen, Erwin Maeder, Aesch, Basel-Land, Leonardo Guglielmetti, Birsfelden, and Hans Rudolf Meyer and Kurt Weber, Basel, Switzerland, assignors to Ciba-Geigy A.G., Basel, Switzerland

No Drawing. Continuation of abandoned application Ser. No. 588,318, Oct. 21, 1966. This application May 11, 1971, Ser. No. 142,388

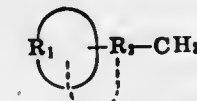
Claims priority, application Switzerland, Oct. 28, 1965, 14,902/65; July 4, 1966, 9,649/66

Int. Cl. C09b 23/00

U.S. Cl. 260—240 B

The present invention comprises a process for the manufacture of heterocyclic compounds containing ethylene double bonds. This process is characterized by reacting a compound of formula

(1)



in which R<sub>1</sub> represents a heterocyclic ring system of aromatic character which (a) contains at least one 5-membered or 6-membered heterocyclic ring with at least one ring nitrogen atom, (b) is free of hydrogen atoms which (1) are bonded to ring nitrogen atoms and (2) which are replaceable by alkali metal, and (c) is bonded to a ring member of R<sub>2</sub> by means of a ring member or has

two adjacent ring members in common with two adjacent ring members of R<sub>2</sub>, in which R<sub>2</sub> denotes a carbocyclic or heterocyclic ring system of aromatic character which contains 6 ring members, and which optionally is condensed with further aromatic or hydroaromatic ring systems, and in which (b) the methyl group shown in the formula is in a p-position to the bond to R<sub>1</sub>, is reacted with a Schiff base in the presence of a strongly basic alkali compound, with the reaction medium to be used being a strongly polar, neutral to basic, organic solvent which (I) is free of atoms, especially hydrogen atoms, which are replaceable by alkali metal and (II) is practically anhydrous, except in the case of the use of an alkali hydroxide as the strongly basic alkali compound in which case the alkali hydroxide may have a water content of up to 25%.

3,732,222

## CYCLOALKYL AMINOTHIOCARBONYL DISULFIDES

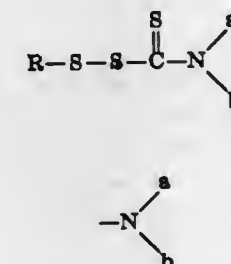
Eitichi Morita, Copley, Ohio, assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Sept. 28, 1970, Ser. No. 76,277

Int. Cl. C07d 87/46

U.S. Cl. 260—247.1

Cycloalkyl aminothiocarbonyl disulfides of the formula



wherein R<sub>1</sub> is a C<sub>1</sub> to C<sub>4</sub> alkane, phenyl or benzyl, R<sub>2</sub> is independently hydrogen, a C<sub>1</sub> to C<sub>4</sub> alkane, phenyl or benzyl, or R<sub>1</sub> and R<sub>2</sub> together with the

is an amino radical in which a and b independently are alkyl, cycloalkyl, or aralkyl or together with the nitrogen atom form a heterocycle, and R is cycloalkyl are prepared by reacting carbon disulfide with the appropriate sulfenamide. The new disulfides are excellent vulcanization accelerators.

3,732,223

## s-TRIAZINYL-ISOCYANATES

Ulrich von Gizeycki and Günter Oertel, Cologne-Filtard, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Aug. 18, 1970, Ser. No. 64,814

Claims priority, application Germany, Aug. 28, 1969, P 19 43 635.2

Int. Cl. C07d 55/50

U.S. Cl. 260—249.8

s-Triazinyl mono- and di-isocyanates are prepared, the latter compounds being new compositions, by a process which comprises reacting s-triazinyl mono- and di-amines with oxalyl chloride. The s-triazinyl isocyanates are particularly useful as precursors in the manufacture of polyurethane resins.

3,732,224

## METHOD OF CONTROLLING PLANT GROWTH AND 3-SUBSTITUTED LUMAZINES USED IN SUCH METHOD

Richard L. Jacobs, Perrysburg, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio

No Drawing. Continuation-in-part of applications Ser. No. 740,045, and Ser. No. 740,099, both June 26, 1968, both now abandoned. This application Oct. 20, 1969, Ser. No. 867,873

Int. Cl. C07d 51/46

U.S. Cl. 260—251.5

A method for controlling plant growth and new compounds used in such method. The method includes the



step of applying the new compounds to the locus to be protected. The compounds are 3-substituted-lumazines, where the 3-substituent is a member of the group consisting of alkyl groups having from 2 to 8 carbon atoms and cycloalkyl groups having from 3 to 12 carbon atoms.

3,732,225

## PYRAZOLO[3,4-d]PYRIMIDINE DERIVATIVES

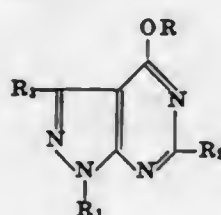
Hermann Breuer, Burgweinting, and Uwe D. Treuner and Ernst Schulze, Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed July 23, 1970, Ser. No. 57,828

Int. Cl. C07d 5/46

U.S. Cl. 260—256.4 F 4 Claims

New pyrazolo[3,4-d]pyrimidine derivatives which have the formula



wherein R is hydrogen or lower alkyl, R<sub>1</sub> is lower alkyl, cycloalkyl, phenyl or substituted phenyl, R<sub>2</sub> is cycloalkyl, phenyl or substituted phenyl and R<sub>3</sub> is hydrogen, lower alkyl, cycloalkyl, phenyl or substituted phenyl, and salts thereof, are useful as hypoglycemic agents and anti-inflammatory agents.

3,732,226

## 4-[(2 - CYANOETHYL)AMINO] - 2 - PHENYL-5-PYRIMIDINECARBOXYLIC ACID ESTERS

Arthur A. Santilli, Havertown, and Dong H. Kim, Wayne, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Original application Aug. 14, 1968, Ser. No. 752,485, now Patent No. 3,641,027, dated Feb. 8, 1972. Divided and this application Apr. 23, 1971, Ser. No. 136,670

Int. Cl. C07d 51/42

U.S. Cl. 260—256.4 N 6 Claims

The disclosure is directed to 5,6,7,8-tetrahydro-5-oxo-pyrido[2,3-d]pyrimidine-6-carbonitriles and to carboxylic acid esters which are intermediates in their preparation. Both the final products and the intermediates have central nervous system activity as depressants.

3,732,227

## 4-[(CYANOMETHYL)ALKYLAMINO] - 2 - PHENYL-5 - PYRIMIDINOCARBOXYLIC ACIDS, ALKYL ESTERS

Dong H. Kim, Wayne, and Arthur A. Santilli, Havertown, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Original application Aug. 14, 1968, Ser. No. 752,486, now Patent No. 3,575,977, dated Apr. 20, 1971. Divided and this application Dec. 30, 1970, Ser. No. 103,006

Int. Cl. C07d 51/42

U.S. Cl. 260—256.4 N 3 Claims

The disclosure is directed to 7-alkyl-2,5,6-trisubstituted-7H-pyrrolo[2,3-d]pyrimidines and to the 4-[(cyanomethyl)alkylamino]-2-substituted-5-pyrimidine carboxylic acid

esters which are intermediates in their production. The compounds have central nervous system activity as depressants.

3,732,228

## TETRAHYDROPYRIMIDINES

Daniel Bertin, Jacques Perronnet, and Andre Teche, Paris, France, assignors to Roussel-UCLAF, Paris, France

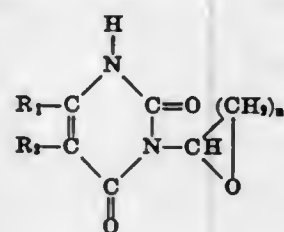
No Drawing. Filed Mar. 22, 1971, Ser. No. 126,865

Claims priority, application France, Mar. 26, 1970, 7010906; Jan. 28, 1971, 7102829

Int. Cl. C07d 51/30

U.S. Cl. 260—260 11 Claims

1,2,3,4-tetrahydropyrimidine-2,4-diones of the formula



(I)

wherein R<sub>1</sub> is selected from the group consisting of lower alkyl of 1 to 7 carbon atoms and phenyl, R<sub>2</sub> is selected from the group consisting of hydrogen, chlorine, bromine and lower alkyl of 1 to 7 carbon atoms and n is 3 or 4 which have herbicidal activity and their preparation and intermediates therefor.

3,732,229

## 3-CYCLOHEXYL PHENYL-2-HYDROXYPROPYL-4-PHENYL PIPERAZINES

Peter Thomas Bysouth and Robert William Clarke, London, England, assignors to The British Drug Houses Limited, Middlesex, England

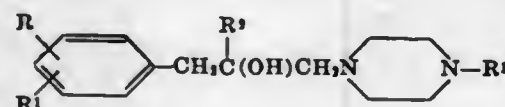
No Drawing. Continuation of abandoned application Ser. No. 740,881, June 28, 1968. This application June 23, 1971, Ser. No. 156,092

Claims priority, application Great Britain, July 5, 1967, 30,873/67

Int. Cl. C07d 51/70

U.S. Cl. 260—268 PH 13 Claims

Novel substituted piperazine compounds of the formulae



wherein

R is hydrogen or alkoxy having from 1 to 8 carbon atoms;

R<sup>1</sup> is alkyl having up to 10 carbon atoms, alkoxy having up to 10 carbon atoms, cycloalkyl having from 5 to 7 carbon atoms, cycloalkyloxy having from 5 to 7 carbon atoms, cycloalk-1-enyl having from 5 to 7 carbon atoms, phenyl, phenoxy or halogen;

R<sup>2</sup> is hydrogen or methyl;

R<sup>3</sup> is 2-hydroxycyclohexyl, 2-pyridyl, phenyl, dimethoxyphenyl, chloronitrophenyl, chloromethoxyphenyl, and methylsulphamoylphenyl, phenyl substituted with a group selected from those consisting of alkyl having up to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms, fluorine, chlorine, bromine, nitro, amino, sulphamoyl, hydroxy, trifluoromethyl and acetamido; and

Their pharmaceutically acceptable acid addition salts.

3,732,230

## LIQUID PHASE POLYCHLORINATION OF PYRIDINE HYDROCHLORIDES

Thomas K. Brewer, El Sobrante, and Charles D. Crawford, Fullerton, Calif., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Dec. 7, 1970, Ser. No. 95,879

Int. Cl. C07d 31/26, 33/36

U.S. Cl. 260—283 R 11 Claims

Polychlorinated derivatives of aromatic N-heterocyclic compounds are prepared by carrying out the chlorination step in a liquid phase operation while employing hydrogen chloride partial pressures of at least about 30 pounds per square inch gauge.

3,732,231

## D-6-METHYL-8-CYANO METHYLERGOLINE (I) AND METHOD OF MAKING THE SAME

Miroslav Semonsky and Norbert Kucharczyk, Prague, Czechoslovakia, assignors to Spofa, United Pharmaceutical Works, Prague, Czechoslovakia

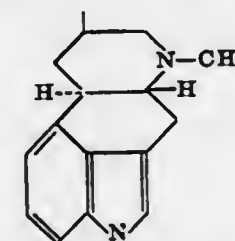
No Drawing. Continuation of abandoned application Ser. No. 713,297, Mar. 15, 1968. This application June 18, 1971, Ser. No. 154,672

Claims priority, application Czechoslovakia, Mar. 16, 1967, 1,920/67, 1,921/67, 1,922/67

Int. Cl. C07d 43/20

U.S. Cl. 260—285.5 1 Claim

D-6-methyl-8-cyano methylergoline having the formula



prepared by reacting D-6-methyl-8-hydroxymethylergoline (I) with phosphoryl chloride and thereafter reacting the D-6-methyl-8-chloromethylergoline formed with an alkali metal cyanide. The compounds of the invention constitute antifertility and lactation inhibiting agents.

3,732,232

## PROCESS FOR THE PREPARATION OF IMIDAZOISOQUINOLINEDIONE COMPOUNDS

Erik Regel, Wuppertal-Cronenberg, Ludwig Eue, Cologne, and Karl Heinz Buchel, Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

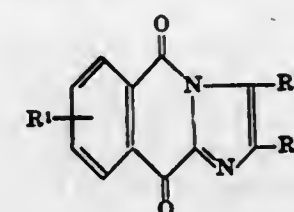
No Drawing. Filed Aug. 30, 1971, Ser. No. 176,251

Claims priority, application Germany, Sept. 3, 1970, P 20 43 649.1

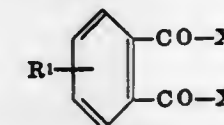
Int. Cl. C07d 57/04

U.S. Cl. 260—288 R 24 Claims

Imidazoisoquinolinediones of the formula

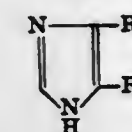


are prepared smoothly and without substantial by-product formation by reacting a phthalic acid halide of the formula



(2)

with an imidazole of the formula



(3)

R<sup>1</sup> is hydrogen, alkyl, halogen, nitro or alkoxy, or aryl which may be substituted by alkyl, halogen, haloalkyl or nitro,

R<sup>2</sup> and R<sup>3</sup> individually are hydrogen, alkyl, aryl or halogen or, together with the intermediate two carbon atoms of the imidazole ring, represent a benzene ring, which may be substituted by halogen, nitro or trifluoromethyl; and

X is halogen, preferably chlorine. The products are herbicides.

3,732,233

## TETRAHYDROMETHANO BENZOXAZOCINS AND SALTS THEREOF

Harry G. Pars, Lexington, and Raj K. Razdan, Belmont, Mass., assignors to Beecham Group Limited, Brentford, Middlesex, England

No Drawing. Continuation-in-part of application Ser. No. 821,125, May 1, 1969, which is a continuation-in-part of application Ser. No. 707,448, Feb. 23, 1968. This application July 23, 1970, Ser. No. 57,783

Int. Cl. C07d 99/04

U.S. Cl. 260—293.55 13 Claims

Novel compounds are provided which are 3,4,5,6-tetrahydro-2,6-methano-2H-1,5-benzoxazocin compounds, salts thereof, intermediates thereof and their production. Typical compounds are 2,5 - dimethyl-3,4,5,6-tetrahydro-2,6-methano-2H-1,5-benzoxazin-7-ol and 2,8-dimethyl-3,4,5,6-tetrahydro-2,6-methano-2H-1,5-benzoxazocin. The compounds including their stereo and geometric isomers may be in the form of their acid-addition salts, alkali metal salts and N-oxides and are formulated with the usual excipients or carriers into unit dosage form for use as analgesics and having beneficial central nervous system activity.

3,732,234

## (THIO-, SULFINYL- AND SULFONYL) CONTAINING PYRIDINE COMPOUNDS

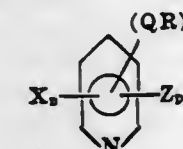
Penelope B. Domenico, Danville, Calif., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application Sept. 26, 1969, Ser. No. 861,506, now Patent No. 3,639,413, dated Feb. 1, 1972. Divided and this application May 17, 1971, Ser. No. 144,331

Int. Cl. C07d 21/48, 31/50

U.S. Cl. 260—294.8 F 7 Claims

The present disclosure is directed to (thio-, sulfinyl- and sulfonyl) containing pyridine compounds corresponding to the formula





wherein R represents hydrogen, alkyl monohaloalkyl, alkenyl, monohaloalkenyl, cycloalkyl, monohalocycloalkyl, phenyl, aralkyl, alkaryl or monohalophenyl; Q represents sulfide ( $-S-$ ), sulfinyl



each X independently represents chlorine, bromine or fluorine; Z represents one of cyano ( $-CN$ ), carbamoyl ( $-CONH_2$ ) of carboxy ( $-COOH$ ) or the salts thereof; n represents an integer of 0 to 3, inclusive; m represents an integer of 1 to 3, inclusive; p represents an integer of 1 or 2 and the sum of  $n+m+p$  equals an integer of 2 to 5, inclusive, with the proviso that when Q is other than sulfide ( $-S-$ ), R is other than hydrogen and when R is H, m is not greater than 2. The preparation of these compounds and their utility as pesticides is also taught.

3,732,235

#### SALT OF PYRIDOXINE ALPHA-KETOGLUTARATE WITH 5-HYDROXYTRYPTOPHANE

Cristobal Martinez, Miguel Fernandez, and Rodrigo Carmona, Madrid, Spain, assignors to Laboratorios Made, S.A., Madrid, Spain

No Drawing. Filed Feb. 23, 1971, Ser. No. 118,151

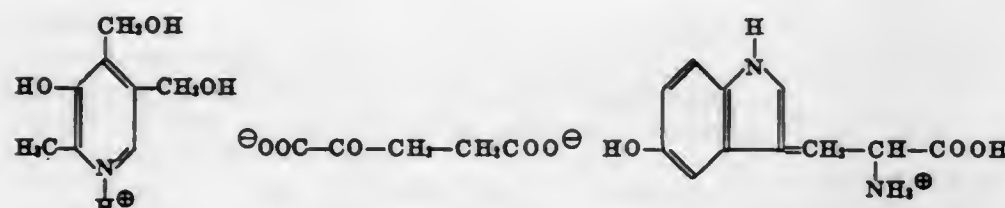
Claims priority, application Spain, Feb. 25, 1970, 376,906

Int. Cl. C07d 31/34, 31/28

U.S. Cl. 260—295 R

1 Claim

A compound of the formula:



The compound is prepared by reacting pyridoxine alpha-ketoglutarate with 5-hydroxytryptophane. The compound is useful for treating deficiencies in neuronal metabolism, tremors, infant's convulsions, nervous troubles caused by administration of isoniazid, difficulties in neuromuscular activity, alcoholism, atherosclerosis, anaemias, cirrhosis, skin diseases, etc.

3,732,236

#### 2-PHENYL-INDOLINE AMIDINES

Yao Hua Wu and Walter G. Lobeck, Jr., Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

No Drawing. Filed Apr. 12, 1971, Ser. No. 133,365

Int. Cl. C07d 27/38

U.S. Cl. 260—296 B

14 Claims

Indoline amidines which have a 2-phenyl substituent are effective diuretic and analeptic agents. They are prepared by reacting a 2-phenylindoline with a carboxamide selected from the group consisting of formamides and lactams in the presence of phosphorus oxychloride. Typical examples of the 2-phenylindoline amidines are 2-

phenyl-1-[7-(3,4,5,6-tetrahydro 2H-azepinyl)]indoline and 1-(tert-butyliminomethyl)-2-phenylindoline.

3,732,237

#### 5-NITRO-2-THIAZOLECARBOXAMIDOXIME AND DERIVATIVES THEREOF

Uwe Treuner, Regensburg, and Hermann Breuer, Burgweinting, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

No Drawing. Filed May 25, 1971, Ser. No. 146,813

Int. Cl. C07d 91/32

U.S. Cl. 260—302 R

9 Claims

5-nitro-2-thiazolecarboxamidoxime may be used to produce a series of derivatives which are useful as antimicrobial agents.

3,732,238

#### CARBAMOYL-BENZOTRIAZOLE ANTHELMINTICS

Maurice William Baker, Clifton, Jennifer Crowley, Newark, Thomas Iswel Watkins, West Bridgford, and Nigel George Clark, St. Albans, England, assignors to Boots Pure Drug Company, Nottingham, England

No Drawing. Filed July 14, 1971, Ser. No. 162,622

Claims priority, application Great Britain, Aug. 5, 1970, 37,878/70

Int. Cl. C07d 55/04

U.S. Cl. 260—308 B

5 Claims

N-dialkylcarbamoylbenzotriazoles are prepared by reacting the appropriate carbamoyl chloride with benzotriazole in the presence of a tertiary amine. The compounds have activity as anthelmintic agents. An example of the

3,732,239

#### 4- AND 5-METHYL-1H-BENZOTRIAZOLES PREPARED FROM VICINAL TOLUENEDIAMINE MIXTURES

Sydney M. Spatz, Williamsville, Maurice E. Bailey, Orchard Park, and Francis E. Evans, Hamburg, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Original application June 20, 1969, Ser. No. 835,257, now Patent No. 3,637,514, dated Jan. 23, 1972. Divided and this application Nov. 5, 1971, Ser. No. 196,239

Int. Cl. C07d 55/04; C23f 11/14

U.S. Cl. 260—308 B

3 Claims

Toluenediamine mixtures comprising at least about 96% by weight of vicinal toluenediamine isomers and not more than about 4% by weight of non-vicinal isomers, said mixtures being adapted for conversion to 4- and 5-methyl-1H-benzotriazoles in high yields.

#### 3,732,240 THIAZOLO[3,4-a]BENZIMIDAZOLE DERIVATIVES AND PROCESS

Rudiger D. Haugwitz, Highland Park, and Venkateshala L. Narayanan, Hightstown, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed Jan. 21, 1971, Ser. No. 108,600

Int. Cl. C07d 99/06

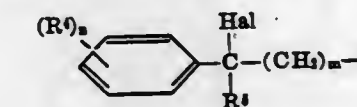
U.S. Cl. 260—306.7

6 Claims

Thiazolo[3,4-a]benzimidazoles are provided which are useful as antiparasitic and antiinflammatory agents.

X is a carboxyl moiety or a grouping of a functional carboxylic acid derivative; m is 0, 1, 2, 3, 4, 5 or 6; and n is 0, 1 or 2,

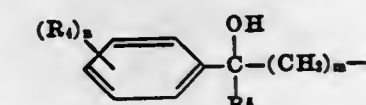
and pharmaceutically acceptable non-toxic salts thereof are produced by reacting a halogen derivative of the formula:



wherein

R<sup>4</sup>, R<sup>5</sup>, X, m and n are as above defined, and Hal is halogen,

with an optionally alkyl substituted imidazole in the presence of acid-binding base or an excess of imidazole, preferably in an inert polar solvent at a temperature of from about 20° C. to about 180° C., or reacting the above halogen derivative with an alkali metal or silver salt of an optionally alkyl substituted imidazole in an inert solvent at a temperature of from about 20° C. to about 200° C., or reacting a hydroxy compound of the formula:



wherein R<sup>4</sup>, R<sup>5</sup>, X, m and n are as above defined,

with an optionally alkyl-substituted imidazole.

These phenyl-imidazolyl-fatty acid derivatives exhibit antimycotic activity.

3,732,243

#### 2-(p-BROMOPHENYL)-9-DIMETHYL-AMINO-PROPYL-9H-IMIDAZO[1,2-a]BENZIMIDAZOLE

Haruo Ogura, Tsuneo Itoh, Hiroaki Takayanagi, Yukio Yamazaki, and Hiromu Takagi, Tokyo, Japan, assignors to Sankyo Company Limited and Kodama Limited, both of Tokyo, Japan

No Drawing. Filed June 17, 1971, Ser. No. 154,214

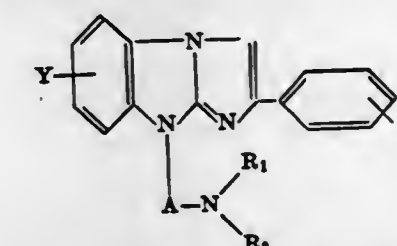
Claims priority, application Japan, June 23, 1970, 45/54,600; June 26, 1970, 45/55,791

Int. Cl. C07d 57/02

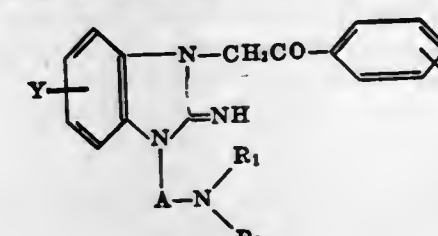
U.S. Cl. 260—309.2

Imidazo[1,2-a] benzimidazole derivatives having the formula

1 Claim



wherein X represents a halogen atom or nitro group, Y represents hydrogen atom, a halogen atom or a lower alkyl group, R<sub>1</sub> and R<sub>2</sub> may be the same or different and each represents hydrogen atom or a lower alkyl group and A represents a lower alkylene group and a pharmaceutically acceptable acid addition salt thereof. The products have pharmacological properties and are useful as analgesic agents and prepared by heating a compound having the formula



#### 3,732,242 PHENYL-IMIDAZOLYL ACETIC OR PROPIONIC ACID DERIVATIVES

Karl Heinz Buchel, Werner Meiser, Manfred Plempel, and Carl Metzger, Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 18, 1970, Ser. No. 38,531

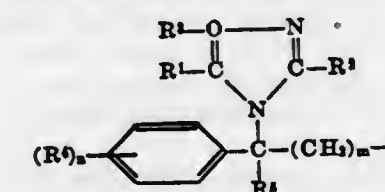
Claims priority, application Germany, May 21, 1969, P 19 25 994.0

Int. Cl. C07d 49/00

U.S. Cl. 260—309

41 Claims

Phenyl-imidazolyl-fatty acid derivatives of the formula:



wherein

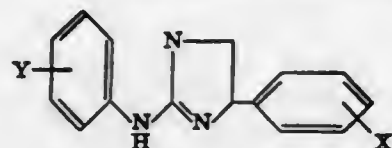
R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup> are the same or different, and are hydrogen or lower alkyl;

R<sup>4</sup> is hydrogen, alkyl, lower alkoxy, alkylmercapto, or an electro negative moiety;

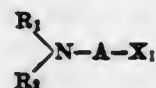
R<sup>5</sup> is benzene, benzene substituted by alkyl, lower alkoxy, alkylmercapto or an electro negative moiety, or R<sup>5</sup> is an aliphatic moiety;



wherein X, Y, R<sub>1</sub>, R<sub>2</sub> and A are the same as above or a pharmaceutically acceptable acid addition salt thereof in the presence or absence of a condensing catalyst and an inert organic solvent or reacting a compound having the formula



wherein X and Y are the same as above with a compound having the formula



wherein R<sub>1</sub>, R<sub>2</sub> and A are the same as above and X<sub>1</sub> represents an acid radical of a reactive ester in the presence of a base.

3,732,244

### 1,3-DIOXY-2-SUBSTITUTED-4,4,5,5-TETRAHYDRO-CARBON SUBSTITUTED - Δ<sup>2</sup> - DIHYDRO- AND IMIDAZOLINES

David G. B. Boocock, Scarborough, Ontario, Canada, and Edwin F. Ullman, Atherton, Calif., assignors to Syva Corporation, Palo Alto, Calif.

No Drawing. Continuation-in-part of application Ser. No. 724,591, Apr. 26, 1968. This application Mar. 22, 1971, Ser. No. 126,985

Int. Cl. C07d 49/34

U.S. Cl. 260—309.6

13 Claims

Δ<sup>2</sup>-dihydro- and imidazoline having disubstitution in both the 4 and 5 positions of the ring, wherein both the nitrogen atoms in the ring are bonded to oxygen. Substituted at the two position are halogen, oxy and oxo groups. Preferred compounds have a nitroxide functionality in conjugation with a nitronyl functionality.

3,732,245

### PROCESS AND INTERMEDIATES FOR THE PREPARATION OF INDOLES FROM ORTHO-NITROTOLUENES

Andrew David Batcho, Belleville, and Willy Leimgruber, Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 876,619, Nov. 24, 1969, abandoned. This application Nov. 4, 1970, Ser. No. 86,953

Int. Cl. C07d 27/56

U.S. Cl. 260—319.1

16 Claims

Ortho-nitrotoluenes are condensed with formamide acetals to yield the corresponding ortho-nitro-β-aminostyrenes which undergo cyclization upon reduction to yield indoles.

3,732,246

### N-SUBSTITUTED NAPHTHALENE-DICARBOXIMIDES

Eugene R. Wagner, Zionsville, Ind., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application May 24, 1968, Ser. No. 731,744, now Patent No. 3,546,238. Divided and this application Sept. 25, 1970, Ser. No. 75,763

Int. Cl. C07d 27/52

U.S. Cl. 260—326 C

5 Claims

N-substituted-1,4,5,8-tetrahydro-4a,8a-naphthalene-dicarboximides wherein the N-substituent is phenyl, mono-halophenyl, pyridyl, tolyl or xylyl are prepared by the reaction of an amine such as an aminopyridine or a halo-aniline with 1,4,5,8-tetrahydro-4a,8a-naphthalene dicarboxylic acid anhydride. The novel compounds are useful as central nervous system depressants and sedatives.

3,732,247

### 3-DI-SUBSTITUTED METHYLENE PYRROLIDINES WHEREIN THE 1- OR N-LOWER-ALKYL SUBSTITUENT CONTAINS AT LEAST TWO CARBON ATOMS

Grover C. Halsey and Carl D. Lunsford, Richmond, Va., and John A. Richman, Jr., Rockville, Md., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

No Drawing. Continuation-in-part of application Ser. No. 812,975, Apr. 1, 1969. This application Aug. 14, 1970, Ser. No. 63,916

Int. Cl. C07d 27/04

U.S. Cl. 260—326.8

5 Claims

Certain 3-di-substituted methylene pyrrolidines having a 1- or N-lower-alkyl substituent having at least two carbon atoms are especially effective anti-depressants. The compounds have the formula given immediately below.

3,732,248

### 3-SUBSTITUTED-1-PHENYL INDOLINONES

Antonio Canas-Rodriguez and Peter Rodway Leeming, Canterbury, England, assignors to Pfizer Inc., New York, N.Y.

No Drawing. Original application Dec. 15, 1969, Ser. No. 885,321, now Patent No. 3,644,403. Divided and this application Apr. 2, 1971, Ser. No. 130,782

Int. Cl. C07d 27/40

U.S. Cl. 260—325

4 Claims

Novel 3-mono-aminoalkyl-1-phenyl indolines and 2-indolinones are disclosed.

3,732,249

### ACIDIC CITRATE OF BUFOTENIDINE AND ITS PREPARATION

Otoharu Ishizaka, Tokyo, Japan, assignor to Kyushin Selyaku Kabushiki Kaisha, Tokyo, Japan

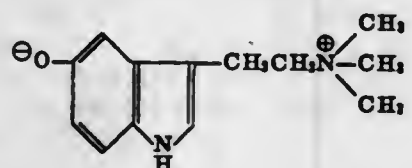
No Drawing. Filed Jan. 14, 1971, Ser. No. 106,528

Int. Cl. C07d 27/56

U.S. Cl. 260—326.15

8 Claims

An acidic citrate of the compound bufotenidine of the formula



is provided having improved stability and in flavorless and readily dissolvable form. The process comprises

- immersing fine particles of the crude drug *Bufonis venenum* with ethyl acetate for at least six hours at room temperature;
- immersing the residue separated from said ethyl acetate with from about 15 to about 25 parts of an alcohol at a temperature below 40° C.;
- immersing the residue of the resultant alcoholic solution in water at room temperature in an atmosphere devoid of light for 1-3 hours;
- removing the residue from the resultant aqueous solution and adding to said aqueous solution an alcoholic solution of picric acid at a temperature of 15° to 40° C., the resultant mixture thereafter standing in a cool atmosphere devoid of light for at least 24 hours;
- collecting the resulting precipitate of (d) and adding thereto a solution of dilute hydrochloric acid, thereafter adding an ether solution thereto and allowing the resultant mixture to stand quietly;
- separating the ether phase from the mixture of (e) to yield an aqueous solution, to which are successively added citric acid and sodium hydrogen carbonate; and
- removing the water from the resultant solution to yield said acidic citrate.

3,732,250

### PREPARATION OF THIOLACTONES

Peter E. Fritze, West Millington, and George L. Brode, Somerville, N.J., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed May 20, 1971, Ser. No. 145,464

Int. Cl. C07d 63/06, 61/00; 67/00

U.S. Cl. 260—327 R

11 Claims

Thiolactones have been prepared by contacting lactones in the vapor phase with a sulfur containing donor over a Lewis base in an inert atmosphere at a temperature of about 150 to 350° C.

3,732,251

### BASICALLY SUBSTITUTED COUMARIN COMPOUNDS

Rudi Beyerle, Bruchkobel, and Adolf Stachel, deceased, by Ingeburg Lydia Katharina Stachel, Rolf-Eberhard Nitz, Klaus Resag, and Eckhard Schraven, Frankfurt am Main, Germany, assignors to Cossella Farbwerke Manikur Aktiengesellschaft, Frankfurt am Main-Fechenheim, Germany

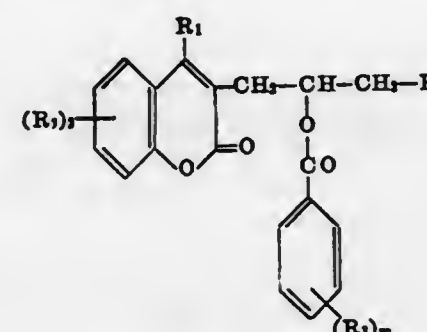
No Drawing. Continuation-in-part of application Ser. No. 789,919, Jan. 8, 1969, now Patent No. 3,652,557. This application May 12, 1971, Ser. No. 142,757

Int. Cl. C07d 7/26

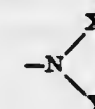
U.S. Cl. 260—343.2 R

7 Claims

The present invention relates to new coumarin compounds useful as coronary dilators and having the structural formula



or the hydrochloric acid addition salts thereof wherein R stands for the radical of an alkyl, alkenyl, cycloalkyl, aralkyl or aryl amine which is bound via a nitrogen atom, or for the group



X representing a lower cyanoalkyl, alkylcarbonylalkyl, alkoxyalkonylalkyl or amidocarbonylalkyl group, the alkyl and alkoxy groups containing 1-4 carbon atoms, Y representing a lower alkyl or alkoxy group containing 1-4 carbon atoms, or having the same meaning as X;

R<sub>1</sub> is selected from the group consisting of alkyl radicals having 1-4 carbon atoms and phenyl radicals;

R<sub>2</sub> is selected from the group consisting of 5,7-, 6,7-, and 7,8-positioned alkoxy groups having 1-4 carbon atoms;

R<sub>3</sub> is selected from alkoxy groups having 1-4 carbon atoms and

m is selected from the group consisting of 1, 2 and 3.

3,732,252

### METHOD FOR THE SYNTHESIS OF TRIOXAN

Hiroyasu Komazawa and Osamu Matsuno, Fuji, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

No Drawing. Filed Dec. 29, 1971, Ser. No. 213,728

Int. Cl. C07d 21/00

U.S. Cl. 260—340

1 Claim

A process for synthesizing trioxan by heating an aqueous solution of 25-80% by weight of formaldehyde in the presence of 1-20% by weight of an acidic substance as catalyst, characterized by adding one or more of soluble organic compounds such as alcohols, ethers or esters having a dielectric constant of less than 40 in such an amount as defined below:

- $\geq 0.0233$  (wt. percent)  $\times$  (wt. percent of water in the reaction mixture) for the compound having a dielectric constant of less than 10.
- $\geq 0.00233 \times$  (dielectric constant)  $\times$  (wt. percent of water in the reaction mixture) for the compound having a dielectric constant of 10.1-20.
- $\geq \{0.0325$  (dielectric constant-20)  $+ 0.0465\} \times$  (wt. percent of water in the reaction mixture) for the compound with a dielectric constant of 20.1-40.

3,732,253

### α-HALO-PHENYLACETAMIDES

Bruno Cavalleri and Anna Sardi, Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

No Drawing. Filed Dec. 30, 1970, Ser. No. 102,932

Int. Cl. C07d 13/10

U.S. Cl. 260—340.5

13 Claims

α-Halo-phenylacetamide compounds, such as N-phenethyl-α-fluorophenylacetamide, N-(4-ethoxyphenethyl)-α-fluorophenylacetamide and N-(3,4-dimethoxyphenethyl)-α-bromophenylacetamide, are prepared by the reaction of an α-halo substituted phenylacetyl halide with a substituted phenethylamine in the presence of an anion acceptor such as a tertiary amine. The α-halo-phenylacetamide compounds have pharmacological activity on the cardiovascular system, and are particularly active as coronary dilators.

3,732,254

### SESAMOLYL AND PIPERONYL ETHERS AND THIOETHERS

John B. Siddall, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Filed Feb. 25, 1971, Ser. No. 119,041

Int. Cl. C07d 13/10

U.S. Cl. 260—340.5

11 Claims

Novel phenyl derivatives of Formula I formed by mercuric salt addition of water or alcohol useful for control of insects.

3,732,255

### PROCESS FOR OPTICAL RESOLUTION OF O-ACETYPANTOLACTONE

Saburo Nabeta, Iejl Kuniyoshi, and Masahiro Inagaki, Chiba, Japan, assignors to Daiichi Selyaku Company, Limited, Tokyo, Japan

Filed Sept. 30, 1969, Ser. No. 862,436

Claims priority, application Japan, Sept. 30, 1968, 43/70,105

Int. Cl. C07d 5/06

U.S. Cl. 260—343.6

6 Claims

Optically resolving a mixture of D(-)-O-acetyl-pantolactone and L(+)-O-acetyl-pantolactone by seed-



ing a homogeneous liquid mixture of these two materials with optically active seed crystals of either of the two enantiomers in a binary system. The same isomer as the seed crystals is crystallized and the precipitate can be recovered.

3,732,256

# REDUCED MALEOPIMARIC ACID AND PROCESS FOR ITS PREPARATION

Walter H. Schuller and Ray V. Lawrence, Lake City, Fla., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Original application Apr. 15, 1970, Ser. No. 28,944, now Patent No. 3,637,600. Divided and this application Mar. 26, 1971, Ser. No. 128,579

Int. Cl. C07c 61/14

U.S. Cl. 260—346.3

2 Claims

This invention relates to the preparation of reduced maleopimaric acid from reduced fumaropimaric acid, the preparation of the acid chloride of reduced maleopimaric acid, and the reaction of the acid chloride with diamines to give polyimide-amides, useful for the preparation of films.

3,732,257

# TRIMELLITIC ACID ANHYDRIDE PRODUCT RECOVERY BY STEAM STRIPPING CRUDE ANHYDRIDE OF TOTAL SOLIDS FROM PSEUDOCUMENE OXIDATION EFFLUENT AND CONTINUOUS FRACTIONATION OF STRIPPED PRODUCT

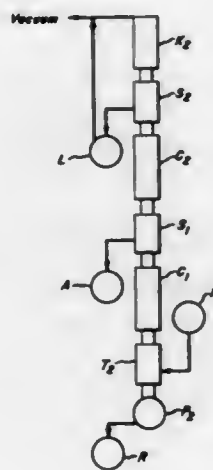
James O. Knobloch, Naperville, and J. Michael Woollen, Chicago, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed July 1, 1971, Ser. No. 158,907

Int. Cl. B01d 3/38; C07c 63/02, 63/32

U.S. Cl. 260—346.4

5 Claims



Fluid effluent from pseudocumene oxidation with molecular oxygen in the presence of acetic acid as reaction medium under liquid phase conditions or concentrate thereof is subject to simultaneous stripping of reaction medium, thermal conversion of its trimellitic acid content to crude trimellitic anhydride and steam stripping at atmospheric pressure followed by continuous fractionation of the crude anhydride to recover product anhydride of improved color and color stability. Such anhydride recovery avoids inefficiency of trimellitic acid recovery from fluid oxidation effluent by crystallization, long residence of crude anhydride at high temperature in batchwise distillation with its attendant double anhydride formation and loss of desired anhydride product.

3,732,258

# LINEAR COPOLYMERS OF VINYL-CYCLOHEXENE DIEPOXIDE AND 1,2-ALKYLENE OXIDES BY CATALYSIS WITH A TERTIARY-AMINE WATER SYSTEM

Gary L. Statton, Wallingford, Pa., assignor to Atlantic Richfield Company, Philadelphia, Pa.

No Drawing. Filed Dec. 10, 1970, Ser. No. 97,045

Int. Cl. C08g 23/14

U.S. Cl. 260—348 C

12 Claims

Liquid linear soluble copolymers of vinylcyclohexene diepoxide and 1,2-monoepoxides can be produced in good yield using a catalyst system comprising a tertiary amine and an active hydrogen-containing compound.

3,732,259

# BENZOQUINONE ETHERS AND PROCESS FOR THEIR MANUFACTURE

Stefan Hari, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed July 15, 1969, Ser. No. 842,021

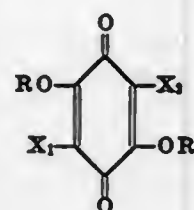
Claims priority, application Switzerland, July 29, 1968, 11,303/68

Int. Cl. C07c 49/64, 79/36, 147/06

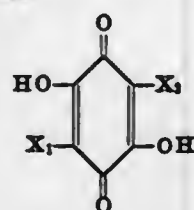
U.S. Cl. 260—396 R

11 Claims

A process for the manufacture of benzoquinones of the formula



in which R represents an alkyl or cycloalkyl residue, X<sub>1</sub> represents a hydrogen or halogen atom or an electronegative substituent and X<sub>2</sub> represents a halogen atom or an electronegative substituent, wherein a dihydroxybenzoquinone of the formula



is reacted with an orthoformic acid ester.

3,732,260

# CORTICOID STEROID COMPOUNDS

Hans Jacob Fex and Knut Bertil Hogberg, Halsingborg, and Imre Konyves, Hittarp, Sweden, assignors to Aktiebolaget Leo, Halsingborg, Sweden

No Drawing. Filed Jan. 19, 1970, Ser. No. 4,067

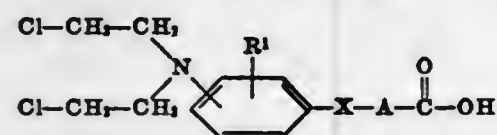
Claims priority, application Great Britain, Jan. 23, 1969, 3,952/69

Int. Cl. C07c 169/34

U.S. Cl. 260—397.45

30 Claims

New 21-esters of corticoid steroid hormones the esters having an antitumor activity, are prepared by reacting a reactive derivative of the general formula



wherein R<sup>1</sup> can be hydrogen, lower alkyl, halogen, or lower alkoxy, X can be oxygen, sulphur, or a monovalent carbon-to-carbon bond, A can be alkylene, aminoalkylene, or lower-alkanoyl aminoalkylene, and A together with X also can be a monovalent carbon-to-carbon bond, with a corticoid steroid.

3,732,261

# STEROID COMPOUNDS

John R. Smythies, Birmingham, Ala., and Kenneth E. Eakins, London, England, assignors to Nelson Research & Development Company, Irvine, Calif.

No Drawing. Filed Dec. 3, 1971, Ser. No. 204,683

Int. Cl. C07c 169/34

U.S. Cl. 260—397.4

5 Claims

The disclosure describes steroid compounds substituted in the 6 and 15 positions, and in the α-configuration, with —OH, —O and —OA where A is an alkyl group having from one to about seven carbon atoms. The disclosure also describes steroid compounds which contain a highly charged group at the 11 position. These compounds are useful as blockers of prostaglandins or adenosine 3', 5'-monophosphate (cyclic AMP) in humans or animals.

3,732,262

# 10-HYDRAZONO-3,7-DIALKYL-2,6-DECADIENOATES

Clive A. Henrick and John B. Siddall, Palo Alto, Calif., assignors to Zeecon Corporation, Palo Alto, Calif.

No Drawing. Filed May 12, 1971, Ser. No. 142,818

Int. Cl. C07c 109/14, 69/66; A01n 9/20

U.S. Cl. 260—404.5

11 Claims

Novel hydrazono compounds prepared by the reaction of a hydrazine with an aliphatic unsaturated aldehyde which are useful for the control of insects.

3,732,263

# METHOD FOR POLYMERIZING FATTY ACIDS

Lawrence U. Berman, Skokie, Ill., assignor to Kraftco Corporation, New York, N.Y.

No Drawing. Filed Sept. 16, 1970, Ser. No. 72,845

Int. Cl. C09f 7/06; C11c 3/00

U.S. Cl. 260—407

4 Claims

A method for polymerization of unsaturated fatty acids is provided. In the method, polymerization of unsaturated fatty acids in the presence of a particular neutral clay catalyst. The usual temperature range embraced is from about 225° C. to about 270° C. for a period of about one hour to about five hours at a pressure of from about 90 p.s.i.g. to about 160 p.s.i.g. Moisture is usually present in the reaction mixture in an amount of from about 2 to about 5 percent by weight of the reaction mixture.

3,732,264

# 3-ALKOXY-α,β-UNSATURATED ACIDS AND ESTERS

John W. Baum, Palo Alto, and Donald W. Erickson, Cupertino, Calif., assignors to Zeecon Corporation, Palo Alto, Calif.

No Drawing. Filed Nov. 12, 1971, Ser. No. 198,418

Int. Cl. C07c 59/22, 69/66; A01n 9/24

U.S. Cl. 260—408

16 Claims

Novel aliphatic α,β-unsaturated esters and acids having a lower alkoxy group at C-3 and synthesis thereof, which are useful for the control of insects.

3,732,265

# FLAME RETARDANTS FOR FLEXIBLE FOAMED PLASTIC

Gerald A. Roth, Palos Hills, Ill., assignor to Swift & Company, Chicago, Ill.

No Drawing. Filed July 30, 1969, Ser. No. 846,267

Int. Cl. C11c 3/00

U.S. Cl. 260—408

6 Claims

Hydroxyl and halogen containing adducts obtained by reacting a hydroxy higher fatty acid ester and an aliphatic

haloepoxide in the presence of an acid catalyst are produced and used to prepare flame resistant non-rigid polyurethane foams.

3,732,266

# HYDROGENATION OF OILS

Frank A. Dudrow, Louisville, Ky., assignor to Chemetron Corporation, Chicago, Ill.

Filed Apr. 8, 1970, Ser. No. 26,509

Int. Cl. C11c 3/12

U.S. Cl. 260—409

2 Claims

A method and apparatus are provided for control of the temperature of a fluid reaction mass. Heat exchanger means in the reaction vessel contains a body of coolant which is vaporized to absorb heat. A closed coolant condensation system communicates with the heat exchanger means to remove heat as it is generated.

3,732,267

# 14-PHENYL-9,12-DIOXO-11-HYDROXYTETRADEC-13-ENOIC ACID AND SALT THEREOF

Masateru Miyano, Morton Grove, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 799,965, Feb. 17, 1969. This application Oct. 7, 1971, Ser. No. 187,568

Int. Cl. C07c 65/20; C08h 17/36

U.S. Cl. 260—413

3 Claims

The condensation of dimethyl 3-oxoundecane-1,11-dioate with styrylglyoxal affords 14-phenyl-9,12-dioxo-11-hydroxytetradec-13-enoic acid. The instant compounds are useful as intermediates to prostanoic acid derivatives which exhibit anti-microbial, pepsin-inhibitory, hypotensive and smooth muscle-contracting properties.

3,732,268

# MICROBIOLOGICAL PREPARATION OF OPTICALLY ACTIVE 9-OXO-5(S)-HYDROXY-DECANOIC ACID AND THE LACTONE THEREOF

Julius Berger, Passaic, and Michael Rosenberger, Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Original application July 22, 1970, Ser. No. 57,371. Divided and this application Jan. 12, 1972, Ser. No. 217,294

Int. Cl. C08h 17/36

U.S. Cl. 260—413

1 Claim

Optically active 9-oxo-5(S)-hydroxy-decanoic acid is prepared by selective microbiological reduction of 5,9-dioxo-decanoic acid. The product acid is converted to levorotatory 9-oxo-5(S)-hydroxy-decanoic acid lactone by treatment of the reaction medium with a strong mineral acid. The aforesaid lactone is useful as an intermediate in the total synthesis of medicinally valuable, optically active steroids.

3,732,269

# METHOD OF MAKING HEXA-ALKYL DISTANNOXANES TOGETHER WITH TETRA-ALKYL TIN COMPOUNDS

Karl Rudolf Wehn and Eckhard Guderian, Kamen, Germany, assignors to Schering AG, Berlin and Bergkamen, Germany

No Drawing. Filed Nov. 2, 1971, Ser. No. 195,047. Claims priority, application Germany, Nov. 7, 1970, P 20 54 902.4

Int. Cl. C07f 7/22

U.S. Cl. 260—429.7

10 Claims

A method for making a mixture of a hexa-alkyl distannoxane and a tetra-alkyl tin compound, from which mixture the products—which are useful as biocides—can be separately recovered, by reacting tin tetrachloride with an aluminum trialkyl in a mol ratio of 0.98:1 to 0.78:1 in ether, and then hydrolyzing the reaction product under alkaline conditions.



3,732,270

**WERNER CHROMIUM COMPLEXES AND METHODS FOR THEIR PREPARATION**

John Edwin Bride, Mentor, Ohio, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Feb. 19, 1971, Ser. No. 117,112

Int. Cl. C07f 11/00

U.S. Cl. 260—438.5 C

9 Claims

A Werner complex composition has trivalent chromium atoms coordinated with acido groups and chlorine atoms. The acido groups are from saturated aliphatic dicarboxylic acids having less than six carbon atoms and that may contain hydroxyl groups, but not more than three hydroxyl groups. The complexes are characterized by a specific range for the ratio of both the chromium atoms to acido groups as well as chromium atoms to chlorine atoms. The complex composition is useful in preparing chromium plating baths that have a bright plating range that is desirably extended over a broad range for decorative chromium plate.

3,732,271

**N-(THIO)DIAMIDES**

Kamel Boustany and John P. Vander Kooi, Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

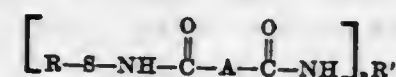
No Drawing. Filed July 30, 1970, Ser. No. 59,719

Int. Cl. C07c 119/00

U.S. Cl. 260—453 R

19 Claims

Diamides of the formula



are prepared by reacting a primary amine or diamine with N-thioimide. The diamides are inhibitors of premature vulcanization.

3,732,272

**HERBICIDAL N,N-ALKYL ALKYLIMINOALKYL THIOCARBAMATES**

Harry Tilles, El Cerrito, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Dec. 14, 1970, Ser. No. 98,022

Int. Cl. C07c 155/08

U.S. Cl. 260—455 A

12 Claims

Novel N,N-alkyl alkyliminoalkyl thiocarbamates are disclosed. The compounds are useful as herbicides.

3,732,273

 **$\alpha$ -METHYLOL-BENZON-SULPHONIC ACID ESTERS**

Hans-Georg Heine, Krefeld, and Hans Rudolph and Hans-Joachim Krender, Krefeld-Bockum, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Apr. 1, 1970, Ser. No. 24,862

Claims priority, application Germany, Apr. 18, 1969, P 19 19 678.2

Int. Cl. C07c 143/68

U.S. Cl. 260—456 R

8 Claims

The invention provides novel  $\alpha$ -methylol-benzon-sulphonic acid esters which may be manufactured by reacting equivalent amounts of an  $\alpha$ -hydroxy-methylbenzoin and a sulphonic acid ester chloride in the presence of a hydrogen chloride binding agent. The novel compounds decompose on irradiation with UV light under liberation of the corresponding sulphonic acid. There-

fore, they are suitable for use as curing catalysts which can be activated by UV-rays for acid-curable resins or resin compositions.

3,732,274

**NOVEL FLUOROALKYL CHLOROFORMATES AND A METHOD FOR THEIR PREPARATION**

David Edward Young, Denville, Lowell Ray Anderson, Parsippany, Douglas Eugene Gould, Dover, and William Burke Fox, Morristown, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Aug. 25, 1969, Ser. No. 852,896

The portion of the term of the patent subsequent to Dec. 14, 1988, has been disclaimed

Int. Cl. C07c 69/64; A01n 9/12

U.S. Cl. 260—463

10 Claims

Hydrogen containing fluoroalkyl chloroformates of formula:



wherein R is selected from the group consisting of hydrogen, alkyl, fluoroalkyl and aryl with the proviso that at least one R substituent is fluoroalkyl, and at least one carbon-hydrogen bond is present in the molecule. The alkyl and fluoroalkyl moieties may be made up of the same or a different number of carbon atoms and each may contain up to six carbons (lower alkyl), in a straight or branched chain structure and when R contains six carbon atoms, it may represent cyclic alkyl. These novel hydrogen containing fluorinated chloroformate products belong to a class of halogenated alkyl chloroformates, being useful as intermediates for the preparation of corresponding carbonate esters; peroxides; as polymerization catalysts and as insecticides and fumigants.

These novel hydrogen containing fluorinated chloroformates may be prepared by reacting the corresponding hypochlorite having the formula:



wherein R is defined as above, with carbon monoxide at a temperature of up to 75° C., or higher. This method may also be used to prepare tertiary perfluorinated alkyl chloroformates having no hydrogen-to-carbon bonds in the molecule.

3,732,275

**SEPARATING PHTHALONITRILES FROM REACTION GASES CONTAINING THE SAME**

Rolf Platz, Mannheim, and Martin Decker, Gert Buerger, and Hanns-Helge Stechl, Ludwigshafen, Germany, assignors to Badische Anilin- &amp; Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Continuation-in-part of abandoned application Ser. No. 726,563, May 3, 1968. This application Dec. 30, 1970, Ser. No. 102,925

Int. Cl. C07c 121/58

U.S. Cl. 260—465 B

4 Claims

An improved process for the recovery of phthalonitriles from hot reaction gases containing the same by contacting the hot reaction gases with a coolant which is at a temperature of from 40° to 200° C. and cooling them down at a rate of more than 350° C. per second, the coolant being water, benzonitrile or o-tolunitrile which from recycling contains 2 to 40% phthalonitriles. o-Phthalonitrile is suitable for the production of phthalocyanines which are valuable pigments; terephthalonitrile and isophthalonitriles can be reduced to the corresponding diamines which are starting materials for the manufacture of polyamides which can be used for the production of fibers.

3,732,276

**HYDRODIMERIZATION PROCESS OF ACRYLIC COMPOUNDS**

Cyrille Van Eygen, Boltsfort, and Antonin Hendrickx, Brussels, Belgium, assignors to UCB, Societe Anonyme, Saint-Gilles-lez-Brussels, Belgium

No Drawing. Filed July 5, 1966, Ser. No. 562,475

Claims priority, application Great Britain, July 7, 1965, 28,801/65

Int. Cl. C07c 121/26, 121/20, 121/16

U.S. Cl. 260—465.8 A

6 Claims

The hydrodimerization of acrylic compounds is materially improved by effecting same in the presence of an alkali or alkaline earth metal amalgam in a medium of liquid consistency containing the acrylic compound(s), from 0.1 to 100 milliequivalents of acid per liter and at least one non-reactive amide.

3,732,277

**1-(2'-CYANO-PHENOXY)-2-HYDROXY-3-ETHYL-AMINO-PROPANE AND SALTS THEREOF**

Herbert Köppe and Karl Zelle, Ingelheim am Rhein, and Werner Traunacker, Munster-Sarmsheim, Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhein, Germany

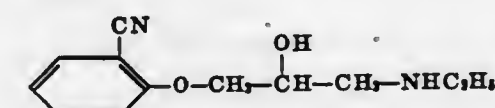
No Drawing. Filed Aug. 3, 1970, Ser. No. 60,749

Int. Cl. C07c 121/78

U.S. Cl. 260—465 E

2 Claims

1-(2'-cyano-phenoxy) - 2 - hydroxy-3-ethylamino-propane of the formula



and non-toxic, pharmacologically acceptable acid addition salts thereof; the compounds are useful as  $\beta$ -adrenergic receptor blocking agents in warm-blooded animals.

3,732,278

**ETHYL (4-TRIFLUOROMETHYL-2,3,5,6-TETRA-FLUOROPHENYL) CYANOACETATE**

William P. Norris, China Lake, Calif., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Original application Apr. 24, 1968, Ser. No. 723,908. Divided and this application Dec. 2, 1970, Ser. No. 94,540

Int. Cl. C07c 121/66

U.S. Cl. 260—465 D

1 Claim

A method for the preparation of new highly fluorinated p-xylylene monomers and polymers which have excellent chemical and thermal properties.

3,732,279

**PREPARATION OF m-( $\beta$ -CYANOETHOXY) BENZOIC ACID AND ESTERS THEREOF**

Norio Kotera, Amagasaki, and Yoshitsugu Suzuki, Takarazuka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

No Drawing. Filed Mar. 1, 1971, Ser. No. 119,924

Claims priority, application Japan, Mar. 10, 1970, 45/20,734

Int. Cl. C07c 121/02

U.S. Cl. 260—465 D

7 Claims

m-( $\beta$ -Cyanoethoxy)benzoic acid and the lower alkyl esters thereof are obtained in a high yield by cyanoethylating m-hydroxybenzoic acid and the lower alkyl esters thereof with acrylonitrile in the presence of a tertiary amine. Said products are highly useful as starting materials or intermediates for polyamides and polyesters.

3,732,280

**PROCESS FOR SEPARATION OF TEREPHTHALONITRILE**

Richard V. Norton, Wilmington, Del. (% Sun Oil Company, P.O. Box 426, Marcus Hook, Pa. 19061) Continuation-in-part of abandoned application Ser. No. 89,776, Nov. 16, 1970. This application Jan. 7, 1972, Ser. No. 224,264

Int. Cl. C07c 121/54, 121/58

U.S. Cl. 260—465 C

2 Claims

Process for separation of terephthalonitrile from its admixture with tolunitrile and xylene by the combined steps of (1) adding said mixture to hot xylene, withdrawing a portion of said hot xylene mixture, cooling said withdrawn portion to crystallize terephthalonitrile, filtering off said terephthalonitrile, and returning the filtrate to said hot xylene mixture; (2) removing and condensing vapors from said hot xylene mixture, chilling said condensate, filtering off terephthalonitrile, and combining it with terephthalonitrile obtained in step (1).

3,732,281

**ACRYLONITRILE DIMERS**

Julian Feldman and Bernard A. Saffer, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 271,463, Apr. 8, 1963, now abandoned. This application Nov. 26, 1971, Ser. No. 202,636

Int. Cl. C07c 121/36

U.S. Cl. 260—465.8 D

1 Claim

2-methyleneglutaronitrile is prepared by the dimerization of acrylonitrile in the presence of a tertiary phosphine catalyst, in a solvent which is preferably acetonitrile.

3,732,282

**TRI-OLEFINIC ALIPHATIC NITRILES**

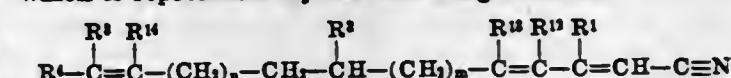
Clive A. Henrick and John B. Siddall, Palo Alto, Calif., assignors to Zeecon Corporation, Palo Alto, Calif. No Drawing. Continuation-in-part of application Ser. No. 187,897, Oct. 8, 1971, which is a continuation-in-part of applications Ser. Nos. 111,650, 111,702, 111,765, 111,766, and 111,770, all Feb. 1, 1971, and all now abandoned, and Ser. No. 115,725, Feb. 16, 1971, now Patent No. 3,706,733. This application Nov. 8, 1971, Ser. No. 196,800

Int. Cl. C07c 121/30

U.S. Cl. 260—465.9

11 Claims

Aliphatic hydrocarbon tri-olefinic and aliphatic substituted di-olefinic acids, esters, aldehydes, ketones, thiol esters, alcohols, thiols, halides, nitriles, amines, amides and derivatives thereof, intermediates thereof, syntheses thereof, and the control of insects, one embodiment of which is represented by the following formula:



3,732,283

**SUBSTITUTED NITROALKYL NITRATE AND PEROXYNITRATE**

William M. Cummings, Fishkill, N.Y., assignor to Texaco Inc., New York, N.Y.

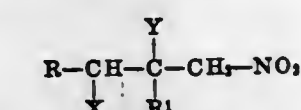
No Drawing. Filed May 17, 1971, Ser. No. 144,212

Int. Cl. C07c 77/02

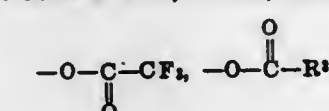
U.S. Cl. 260—466

17 Claims

Nitroalkyl nitrate and peroxy nitrates characterized by the formula:

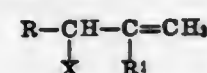


where R and R<sup>1</sup> are hydrogen or alkyl or from 1 to 10 carbons, where X is R<sup>2</sup>O—, —CN, Cl, phenyl, —ONO<sub>2</sub>,

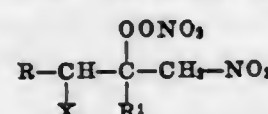




where  $R^2$  is alkyl of from 1 to 10 carbons or phenyl and  $R^3$  is hydrogen, phenyl or alkyl of from 1 to 10 carbons, and where Y is  $-\text{ONO}_2$  or  $-\text{ONO}$ , said nitroalkyl nitrates being prepared by first contacting a substituted alkene of the formula:



where R,  $R^1$  and X are as heretofore defined with a mixture of dinitrogen tetroxide and oxygen to form substituted nitroalkyl peroxyhydrate of the formula:



where R,  $R^1$  and X are as heretofore defined and second contacting said peroxyhydrate with a reducing agent to form said substituted nitroalkyl nitrate, the first and second contacting being conducted in the presence of inert liquid. The nitroalkyl nitrate final products of the invention are useful as fuel additives to increase power output of petroleum distillates such as gasoline and kerosene. Further, they are useful as intermediates in the preparation of surfactants, fuel and lubricant additives, insecticides, fungicides (e.g. controlling early blight in bean plants), pharmaceuticals and polymers.

### 3,732,284 PROCESS FOR THE PREPARATION OF $\beta$ -CYCLO- ALKYLPROPIONIC ESTERS OF DIMETHYL- AMINOETHANOL

Raymond Valette, Sautier par Sautier-les-Chartreux, France, assignor to Les Laboratoires Albert Rolland, Paris, France

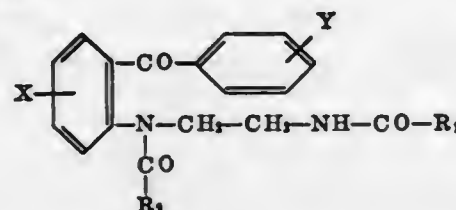
No Drawing. Filed Aug. 12, 1969, Ser. No. 849,509  
Claims priority application Great Britain, Aug. 20, 1968, 39,875/68

Int. Cl. C07c 93/22, 67/02  
U.S. Cl. 260-468 R 7 Claims  
Therapeutically useful dimethylaminopropanol  $\beta$ -cycloalkylpropionate esters are prepared by reacting a methyl, ethyl, propyl or butyl cycloalkylpropionate ester with dimethylaminoethanol in a non-aqueous solvent.

### 3,732,285 NOVEL AMINOBENZOPHENONE DERIVATIVES

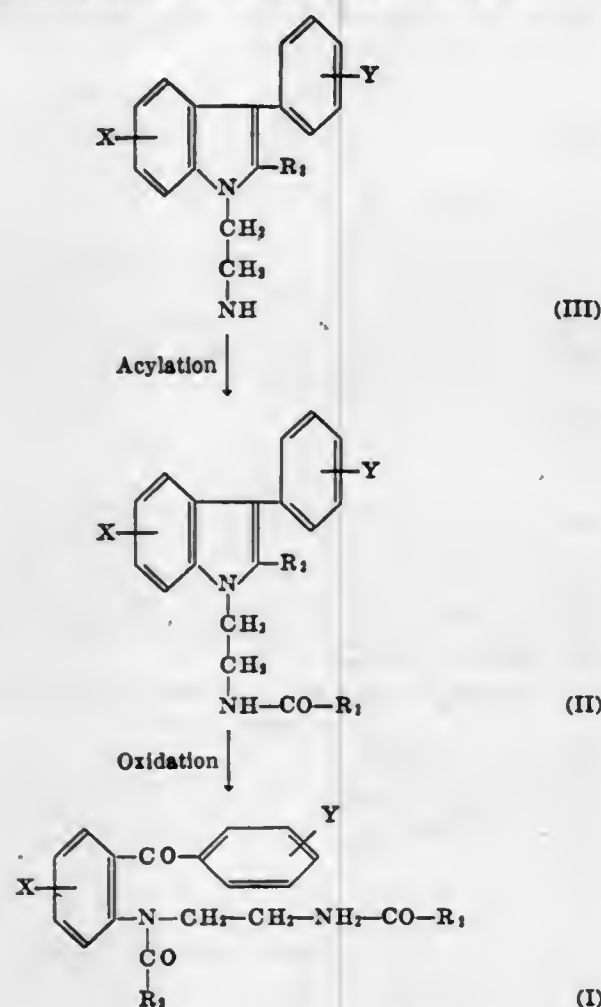
Hisao Yamamoto, Nishinomiya, Shigeo Inaba, Takarazuka, Tadashi Okamoto, Toshiyuki Hirohashi, Ashiya, Kikuo Ishizumi, Ikeda, Michihiro Yamamoto, Toyonaka, Isamu Maruyama, Minoo, Kazuo Mori, Kobe, and Tsuyoshi Kobayashi, Minoo, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan  
No Drawing. Filed Mar. 22, 1971, Ser. No. 127,053  
Claims priority, application Japan, Mar. 25, 1970, 45/25,546; Mar. 26, 1970, 45/25,674

Int. Cl. C07c 125/06  
U.S. Cl. 260-471 C 1 Claim  
Novel aminobenzophenone derivative represented by the Formula I,



wherein  $R_1$  signifies a hydrogen atom or an alkoxy group;  $R_2$  signifies a hydrogen atom or  $\text{C}_1-\text{C}_3$  alkyl group; X and Y each signify a hydrogen atom, a halogen atom,  $\text{C}_1-\text{C}_3$  alkyl group, a trifluoromethyl group or a nitro group, is prepared by acylating an 1-(2-aminoethyl)-indole derivative represented by the Formula III with a formic acid

derivative, then oxidizing the resulting 1-(N-acylaminoethyl)-indole derivative represented by the Formula II with an oxidizing agent by the following reaction schema:



The aminobenzophenone derivatives of the Formula II have central nervous controlling effects and are useful intermediates for preparing benzodiazepine derivatives, which are known as remarkably effective tranquilizers, muscle relaxants, anticonvulsants and hypnotics.

### 3,732,286 COMPOSITIONS COMPRISING AN EPOXY RESIN, DICYANIAMIDE AND AN ACYLGUANIDINE

Pyong-Nae Son, Akron, and Carl D. Weber, Copley, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Nov. 1, 1971, Ser. No. 194,524  
Int. Cl. C08g 30/14

U.S. Cl. 260-47 EN 5 Claims  
Mixtures storable at room temperature for periods up to 30 days, yet which cure quickly at moderately elevated temperatures and are suitable for the manufacture of shaped structures, coatings and adhesive bonds, have been prepared comprising an epoxy resin, dicyaniamide as a curing agent, and an acylguanidine as an accelerator for the cure.

### 3,732,287 BISMONOCARBOXYLIC ESTERS OF 3-FORMYLBUTANEDIOL-1,2

Walter Himmele, Walldorf, and Werner Aquila, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Sept. 1, 1970, Ser. No. 68,785  
Claims priority, application Germany, Sept. 9, 1969, P 19 45 479.6

Int. Cl. C07c 69/78, 45/08, 175/00  
U.S. Cl. 260-476 R 3 Claims

Bismonocarboxylic esters of 3-formylbutanediol-1,2 and their production by reaction of bismonocarboxylic

esters of butene-1-diol-3,4 with carbon monoxide and hydrogen in the presence of carbonyl complexes of rhodium at elevated temperature and superatmospheric pressure. Bismonocarboxylic esters of 3-formylbutanediol-1,2 are used for the production of  $\beta$ -formylcrotyl esters which are valuable starting materials for the production of vitamin A esters.

### 3,732,288 DIFLUOROAMINO COMPOUNDS

Clifford L. Coon, Fremont, Marion E. Hill, Palo Alto, and Donald L. Ross, Menlo Park, Calif., assignors to the United States of America as represented by the Secretary of the Navy

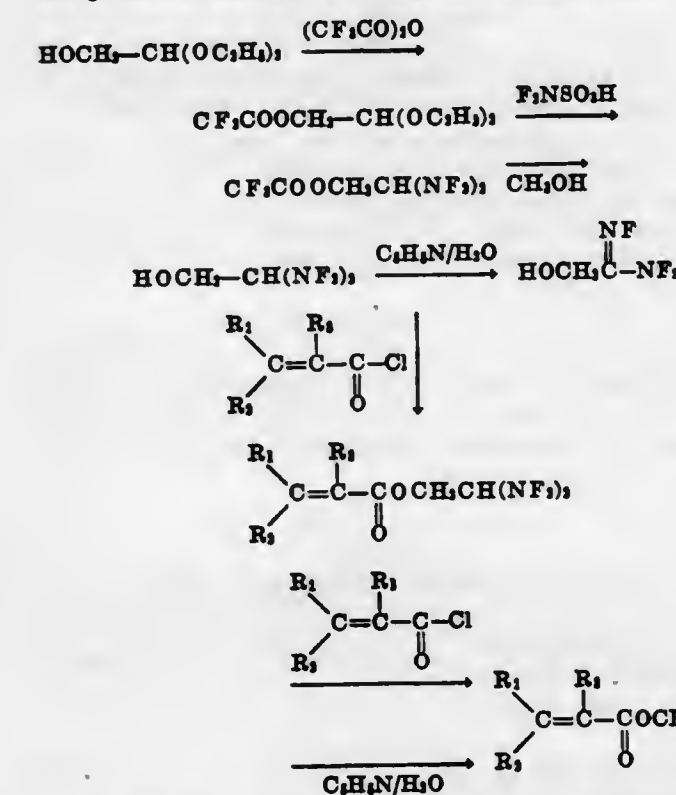
No Drawing. Filed Mar. 10, 1970, Ser. No. 23,106  
Int. Cl. C07c 69/54, 69/62

U.S. Cl. 260-486 H 8 Claims

Compounds of the formula

$$\begin{array}{c} \text{R}_1 \quad \text{R}_2 \quad \text{NF} \\ | \quad | \quad // \\ \text{C}=\text{C}-\text{C}-\text{OCH}_2-\text{C}-\text{NF}_2 \\ | \quad | \\ \text{R}_3 \quad \text{O} \end{array}$$

are produced by the following reaction sequence:



where  $R_1$ ,  $R_2$  and  $R_3$  vary independently and represent H and lower alkyl. These compounds are used to produce polymers which are used in propellant binders.

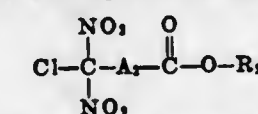
### 3,732,289 HALO DINITRO-ALKANOIC ACID ESTERS OF ALKANEDIOLS

Marvin H. Gold, Sacramento, and Henry J. Marcus, West Covina, Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

No Drawing. Application Jan. 3, 1967, Ser. No. 616,147, which is a division of application Ser. No. 326,286, Nov. 26, 1963. Divided and this application Apr. 23, 1970, Ser. No. 31,382

Int. Cl. C07c 79/40  
U.S. Cl. 260-487 2 Claims

A process for controlling the growth of bacteria and fungus comprising treating the bacteria or fungus with an effective amount of a compound of the formula:



wherein  $A_2$  is lower alkylene and  $R_2$  is lower alkyl.

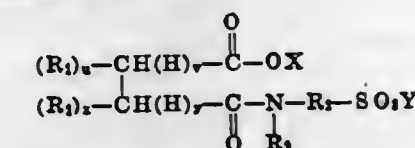
### 3,732,290 MONOAMIDE HYDROCARBYL SULFONIC ACID SALTS OF HYDROCARBYL SUCCINIC ACID AS DETERGENT ACTIVES

Mitchell Danzik, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Dec. 17, 1969, Ser. No. 885,977  
Int. Cl. C07c 143/52, 143/12

U.S. Cl. 260-507 R 9 Claims

Detergent active materials comprising monoamide hydrocarbyl sulfonic acid salts of hydrocarbyl succinic acid of the formula



in which  $u$ ,  $v$ ,  $x$  and  $y$  are 0 or 1, the sum of  $u$  and  $v$  is 1, the sum of  $x$  and  $y$  is 1, the sum of  $u$  and  $x$  is 1, the sum of  $v$  and  $y$  is 1,  $R_1$  is a hydrocarbyl group of 8 to 30 carbon atoms;  $R_2$  is a hydrocarbylene group of 1 to 8 carbon atoms;  $R_3$  is H, a hydrocarbyl group of 1 to 8 carbon atoms, or  $-\text{R}_3-\text{SO}_3\text{Y}$ ; X is H or Y; and Y is a water soluble salt forming cation.

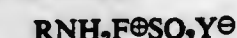
### 3,732,291 PREPARATION OF FLUOROAMMONIUM SALTS AND THEIR APPLICATIONS

Vytautas Grakauskas, Arcadia, and Allen H. Remanick, Pasadena, Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

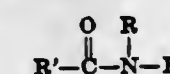
No Drawing. Filed Apr. 1, 1969, Ser. No. 812,438  
Int. Cl. C07c 143/02

U.S. Cl. 260-513 R 7 Claims

This patent describes novel N-fluoroammonium salts having the general formula



wherein R is selected from the group consisting of hydrogen, alkyl, substituted alkyl, cyclic and heterocyclic radicals, and Y is a lower alkyl radical. This patent further describes the method of preparing the above compounds by reacting a compound of the formula



with an alkanesulfonic acid wherein in the above formula R is defined above, and R' is selected from the group consisting of alkyl, alkoxy and amino.

### 3,732,292 INDENYL COMPOUNDS

David F. Hinkley, Plainfield, and John B. Conn, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed May 1, 1970, Ser. No. 33,890  
Int. Cl. C07c 147/00

U.S. Cl. 260-515 A 3 Claims

5-fluoro-2-methyl-1-(4'-methylsulfinylbenzylidene)-3-indenyl acetic acid is prepared by processes that form the 3-acetic acid side chain as the final step.

### 3,732,293 IODINATED BIS(AMINOBENZOIC ACIDS) AND ESTERS THEREOF

James H. Ackerman, Bethlehem, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 713,302, Mar. 15, 1968, now Patent No. 3,542,861, which is a continuation-in-part of application Ser. No. 550,605, May 17, 1966. This application Nov. 13, 1969, Ser. No. 876,615

Int. Cl. C07c 147/12, 147/14, 149/34

U.S. Cl. 260-516 8 Claims

Bis(3-carboxylamino-2,4,6-triiodo-5-substituted-benzoic acids) bridged at the 3-position by an oxygen



or sulfur interrupted alkylene chain, useful as intravenous cholecystographic agents, are prepared by reaction of a 3-amino-5-substituted-2,4,6-triodobenzoic acid with the appropriate dibasic acid dihalide.

3,732,294

# AMINOACETYL ANTHRANILIC ACIDS AND PROCESS FOR PRODUCTION THEREOF

Minoru Shindo and Kanji Moro, Tokyo, and Tetsuo Shinokaki, Chiba-ken, Japan, assignors to Chugai Sanyaku Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Nov. 7, 1969, Ser. No. 874,985

Claims priority, application Japan, Nov. 15, 1968, 43/83,238; Apr. 24, 1969, 44/31,250

Int. Cl. C07c 103/18

U.S. Cl. 260—518 A

7 Claims

The known 7-chloro-1,3-dihydro-1-methyl-5-phenyl-2H-1,4-benzodiazepin-2-one which was found to be pharmacologically effective in neuro-psyche disorders is prepared easily and in high yield by an improved process comprising the reaction of a novel intermediate, N-aminoacetyl-5-chloro-N-methylantranilic acid, with phosphorus pentachloride followed by reacting with benzene in the presence of aluminum chloride, the intermediate which is also found to have valuable pharmacological activities being, in turn, prepared by the reaction of 5-chloro-N-methyl-N-phthalimidoacetyl-antranilic acid with hydrazine.

3,732,295

# TRIMETHOXYBENZOYL-AMINOALKANOIC ACIDS

Franco Dompe', Milan, Italy, assignor to Dompe' Farmaceutici S.p.A., Milan, Italy

No Drawing. Filed Jan. 28, 1970, Ser. No. 6,585

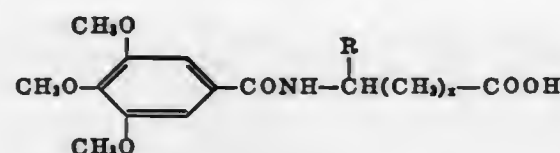
Claims priority, application Italy, Nov. 25, 1969, 24,863/69

Int. Cl. C07c 103/12

U.S. Cl. 260—519

3 Claims

Trimethoxybenzoyl-aminoalkanoic acids of general formula



wherein x is an integer from 1 to 5 and R is an alkyl group having 1 to 3 carbon atoms and their derivatives are prepared by reacting 3,4,5-trimethoxybenzoic acid chloride with an aminoalkanoic acid at a temperature between -5 and +5° C. The compounds are useful in the treatment of heart infarct.

3,732,296

# PREPARATION OF AROMATIC ACIDS

Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed May 5, 1971, Ser. No. 140,626

Int. Cl. C07c 63/02

U.S. Cl. 260—524 R

9 Claims

Aromatic acids such as benzoic acid may be prepared by treating an alkylaromatic compound such as toluene in an oxygen-containing gas in the presence of a catalyst comprising a mixture of an iron halide and a thallium-containing compound at oxidation conditions, the use of such a catalyst resulting in the recovery of improved yields of the desired product.

3,732,297

# BIS(ACID HALIDE) DIHYDROANTHRACENES

Desmond Sheehan, Fairfield, Conn., assignor to American Cyanamid Company, Stamford, Conn.

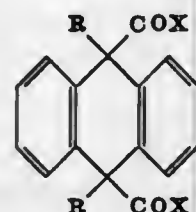
No Drawing. Application Oct. 11, 1968, Ser. No. 766,989, which is a division of application Ser. No. 489,748, Sept. 23, 1965, now Patent No. 3,470,103. Divided and this application Dec. 16, 1970, Ser. No. 98,943

Int. Cl. C07c 63/46

U.S. Cl. 260—544 M

2 Claims

New 9,10-substituted anthracenes which are useful in a chemiluminescent reaction, having the structure



wherein X is a halo group and R is a phenyl group.

3,732,298

# 2-(HYDROXYAMINO)- $\alpha,\alpha,\alpha$ -TRIFLUORO-p-TOLUENESULFONAMIDE AND PROCESS

Harry L. Yale, New Brunswick, N.J., assignor to E. R. Squibb & Sons Inc., New York, N.Y.

No Drawing. Original application Oct. 20, 1967, Ser. No. 676,696, now Patent No. 3,520,883, dated July 21, 1970. Divided and this application May 14, 1970, Ser. No. 48,725

Int. Cl. C07c 143/80

U.S. Cl. 260—556 B

4 Claims

This invention relates to 2-(hydroxyamino)- $\alpha,\alpha,\alpha$ -trifluoro-p-toluenesulfonamide and a method for preparing the same by catalytically hydrogenating 2-nitro- $\alpha,\alpha,\alpha$ -trifluoro-p-toluenesulfonamide.

3,732,299

# ACENAPHTHENE CARBOXAMIDES

Seymour D. Levine, North Brunswick, and Ingeborg T. Harper, Kendall Park, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

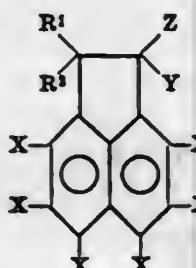
No Drawing. Filed Nov. 3, 1969, Ser. No. 873,700

Int. Cl. C07c 103/76

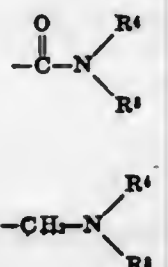
U.S. Cl. 260—558 A

2 Claims

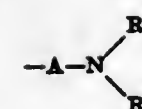
Acenaphthene derivatives are provided having the general structure



wherein at least one of R<sup>1</sup> and R<sup>2</sup> are alkyl and the other can be hydrogen; Z is —CN, —COOR<sup>3</sup> (wherein R<sup>3</sup> is hydrogen or a hydrocarbon radical or halophenyl), —CH<sub>2</sub>OH,



and Y is hydrogen or



wherein R<sup>4</sup> to R<sup>7</sup> are hydrogen or a hydrocarbon radical, A is alkylene, and X is hydrogen, halogen, alkyl, alkoxy, haloalkyl or haloalkoxy. These compounds possess anti-inflammatory activity.

3,732,300

# PHENYLAMINOETHANOL DERIVATIVES

Lawrence H. C. Lunt and Paul Toon, Bethnal Green, England, assignors to Allen and Hanburys Limited, London, England

No Drawing. Original application Sept. 20, 1967, Ser. No. 669,263, now Patent No. 3,644,353. Divided and this application May 11, 1971, Ser. No. 142,367

Claims priority, application Great Britain, Sept. 23, 1966, 42,590/66

Int. Cl. C07c 103/26

U.S. Cl. 260—559 S

8 Claims

Novel 1-phenyl-2-amino ethanol derivatives of the formula:



are disclosed. Some have stimulant action and some have blocking action on  $\beta$ -adrenergic receptors. 5-(2-tert-butylamino-hydroxyethyl)-salicylamide in particular exerts a marked blocking effect while being remarkably non-toxic and free from central nervous depressant activity.

3,732,301

# $\alpha$ -(ALKANOYLHYDRAZINO)- $\beta$ -(3,4-DI-OXYSUBSTITUTEDPHENYL) PROPIONAMIDES

Meyer Slettinger, North Plainfield, Sandor Karady, Elizabeth, Manuel G. Ly, New Brunswick, and Seemon H. Pines, Murray Hill, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Original application Feb. 24, 1970, Ser. No. 13,770, now Patent No. 3,676,480. Divided and this application June 24, 1971, Ser. No. 156,490

Int. Cl. C07c 103/19

U.S. Cl. 260—559 H

1 Claim

Novel L- $\alpha$ -acylhydrazino- $\beta$ -phenyl-propionitrile compounds useful as intermediates in the production of L- $\alpha$ -hydrazino- $\beta$ -phenyl-propionic acids. Also included are processes for preparing the novel compounds of this invention by aminating L- $\alpha$ -acylamido- $\beta$ -phenyl-propionitrile and processes for hydrolyzing the novel compounds of this invention to form L- $\alpha$ -hydrazino- $\beta$ -phenyl-propionic acid compounds.

3,732,302

PROCESS FOR PRODUCING METHACRYLAMIDE  
Kazumi Takagi and Teruo Matsuda, Niihama, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka-shi, Osaka-fu, Japan

Filed Apr. 30, 1970, Ser. No. 33,332

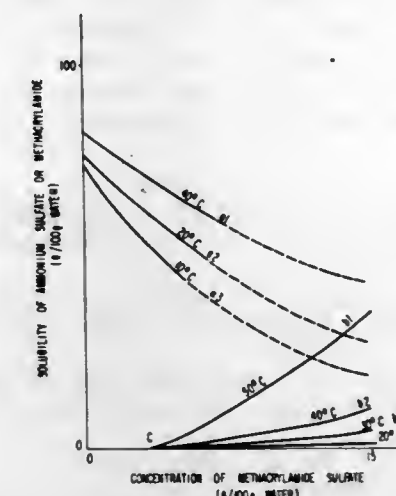
Int. Cl. C07c 103/00

U.S. Cl. 260—561 N

7 Claims

A process for producing methacrylamide of high purity which comprises neutralizing an aqueous solution of methacrylamide sulfate, obtained by the reaction between acetone cyanohydrin and sulfuric acid in a conventional manner, with ammonia to a neutralization degree of be-

low 95%, collecting the crude methacrylamide precipitated upon cooling, and purifying the collected crude



methacrylamide with water or with an aqueous solution of ammonia.

3,732,303

# PROCESS FOR THE PREPARATION OF 2-OXIMINO-6-NITRO HEXANAMIDE

Robert Fuhrmann, Morris Plains; Fred W. Koff, Clifton, and John Pisanichyn, Morristown, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 14, 1971, Ser. No. 189,365

Int. Cl. C07c 103/00

U.S. Cl. 260—561 A

2 Claims

2-oximino-6-nitro hexanamide is suitably purified by recrystallization from a solvent selected from the group consisting of (a) C<sub>1</sub> to C<sub>3</sub> dialkyl ethers of ethylene glycol, and (b) C<sub>2</sub> to C<sub>3</sub> halogenated alkanes having a Cl/C atom ratio ranging from about 1:1 to 1:3.

3,732,304

# NOVEL COMPOSITION

John D. Diekmann, Menlo Park, and John B. Siddall, Palo Alto, Calif., assignors to Zeecon Corporation, Palo Alto, Calif.

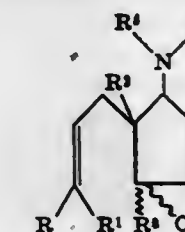
No Drawing. Filed May 10, 1971, Ser. No. 142,076

Int. Cl. C07c 87/02

U.S. Cl. 260—563 R

11 Claims

Novel amino cyclopentane compounds of Formula A, prepared from a cyclopentane-1,3-dione, useful for the control of insects



wherein each of R, R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, and R<sup>4</sup> is hydrogen or lower alkyl, R and R<sup>1</sup> together form a cycloalkyl ring, and R<sup>2</sup> is methyl or ethyl.

3,732,305

# S-SUBSTITUTED THIOSULFURIC ACID DERIVATIVES AND PREPARATION THEREOF

Ludwig Bauer, Wilmette, Ill., assignor to the United States of America as represented by the Secretary of the Army

No Drawing. Filed Mar. 3, 1970, Ser. No. 16,240

Int. Cl. C07c 129/00

U.S. Cl. 260—564 R

1 Claim

This invention relates to antiradiation compounds comprising a molecule which includes a component with antiradiation properties linked to a component with substantial lipid solubility. There are also described seven new



compounds, illustrative of this new type of antiradiation compound. The seven compounds are S-[(N-substituted carboxamidinium)methyl] thiosulfuric acids (Bunte salts) having the general formula  $-O_3SSCH_2C(=NH_2^+)NHR$  and hydrolysis products thereof, wherein R represents bi- and tricyclic aliphatic ring systems. The compounds have demonstrated utility as antiradiation agents.

3,732,306

# CERTAIN OXIME ESTERS AND THEIR USE AS ACARICIDES AND IN CONTROLLING FUNGI AND BACTERIA

Arnold D. Gutman, San Rafael, and Don R. Baker, Pinole, Calif., assignors to Stauffer Chemical Company, New York, N.Y.

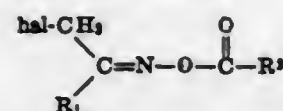
No Drawing. Original application July 22, 1968, Ser. No. 746,309. Divided and this application July 2, 1970, Ser. No. 60,961

Int. Cl. C07c 123/00

U.S. Cl. 260—566 AE

12 Claims

Compounds having the formula



in which hal is chlorine, bromine or iodine,  $R^1$  is (1) hydrogen, (2) lower alkyl, (3) aryl, (4) nuclear substituted derivatives thereof in which the substituents are halogen, nitro, lower alkoxy, lower alkyl, or cyano and (5) haloalkyl, and  $R^2$  is (1) aryl, (2) nuclear substituted derivatives thereof in which the substituents are halogen, cyano, nitro, lower alkoxy, or lower alkyl, (3) styryl, (4) nuclear substituted styryl, in which the substituents are halogen, cyano, nitro, lower alkoxy or lower alkyl, (5) benzyl, (6) nuclear substituted benzyl in which said substituents are halogen, cyano, nitro, lower alkoxy or lower alkyl, (7) phenethyl, (8) nuclear substituted phenethyl in which the substituents are halogen, cyano, nitro, lower alkoxy, or lower alkyl, (9) cycloalkyl having 3 to 6 carbon atoms, and (10) furyl.

3,732,307

# BENZOPHENONE HYDRAZONES CONTAINING PERFLUOROALKYL, PERFLUOROALKOXY, AND PERFLUOROALKYLTHIO SUBSTITUENTS

William J. Middleton, Chadds Ford, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Sept. 24, 1970, Ser. No. 75,236

Int. Cl. C07c 109/16

U.S. Cl. 260—566 B

9 Claims

Fluorinated benzophenone hydrazones are biologically active against insects and show activity in influencing the metabolism of plants.

3,732,308

# 1-ALKYLAMINO - 3 - (1,4-ETHANO-1,2,3,4-TETRAHYDRO - 5 - NAPHTHOXY)-AND - 3-(5-BENZONORBORNANOXY) - 2-PROPANOLS AND THE SALTS THEREOF

Francesco Lauria, Milan, Vittorio Vecchietti, Pavia, Mario Bergamaschi, Monza, Milan, and Raffaele Tommasini, Milan, Italy, assignors to Carlo Erba S.p.A., Milan, Italy

No Drawing. Filed July 24, 1970, Ser. No. 58,165

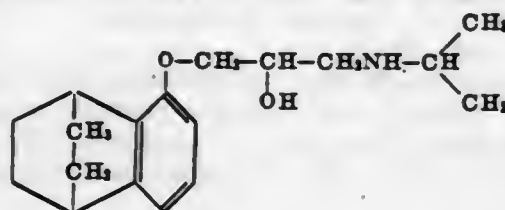
Claims priority, application Italy, July 30, 1969,

Int. Cl. C07c 93/06

U.S. Cl. 260—570.7

8 Claims

Basic compounds are disclosed, as for instance of the formula:



and methods of preparation of these compounds, such as the reaction of isopropylamine with 1-(1,4-ethano-1,2,3,4-tetrahydro-5-naphthoxy) - propyl-2,3-epoxide. The compounds possess adrenergic beta-receptor blocking activity.

3,732,309

# POLYEPOXIDE-POLYMERCAPTAN-AMINE ADDUCTS

Edward William Garnish, Saffron Walden, and Clifford George Haskins, Haslingfield, England, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Dec. 30, 1969, Ser. No. 889,311

Claims priority, application Great Britain, Jan. 2, 1969, 402/69

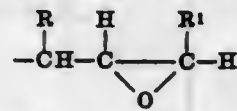
Int. Cl. C07c 87/00, 87/14, 87/20

U.S. Cl. 260—583 P

16 Claims

As curing agents for epoxy resins adducts obtained by reaction of

(a) a polyepoxide having, per average molecule, more than one 1,2-epoxide group of the formula



(I)

directly attached to oxygen, to nitrogen, or to sulphur, where R and  $R^1$  each represent hydrogen or together represent  $-\text{CH}_2\text{CH}_2-$ ,

(b) a polymercaptan containing at least one pair of  $-\text{SH}$  groups in which one  $-\text{SH}$  group is separated from the other by a chain of at least six carbon, or carbon and oxygen, atoms, and

(c) an amine.

3,732,310

# MERCAPTOPROPYLAMMONIUM DERIVATIVES

Ludwig Konrad Huber, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

No Drawing. Filed July 19, 1971, Ser. No. 168,787

Int. Cl. C07c 149/24

U.S. Cl. 260—583 B

3 Claims

3-mercaptopropylammonium derivatives of the formula  $(\text{HSCH}_2\text{CH}_2\text{CH}_2\text{NR}^1\text{R}^2\text{R}^3)\text{X}$  where  $R^1$  is  $\text{NH}_2$ ,  $R^2$  is lower alkyl,  $R^3$  is alkyl having one to 16 carbon atoms, and X is an anion. The compounds are useful as bactericides and fungicides.

3,732,311

# PRODUCTION OF N-ALKYLATED AMINES

Seymour Baron, Wayne, N.J., assignor to Fine Organics, Inc., Lodi, N.J.

No Drawing. Filed Feb. 24, 1970, Ser. No. 13,793

Int. Cl. C07c 85/06

U.S. Cl. 260—583 R

6 Claims

The invention enables production of N-alkylated amines without the use of high pressures, and with high recovery, by continuous single-step reaction of an alcohol with either ammonia or a primary or secondary amine, in vapor phase, through the discovery that thorium sulfate, used as a catalyst for the first time in said reaction, enables discard of high pressures, reaction at atmospheric pressure or thereabout, and the use of simple equipment and low labor cost.

3,732,312

# PROCESS FOR PREPARING ALIPHATIC AMINES

Zdzislaw J. Dudzinski, Clifton, N.J., assignor to Millmaster Onyx Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 411, Jan. 2, 1970, which is a division of application Ser. No. 636,664, May 8, 1967. This application Nov. 10, 1970, Ser. No. 88,520

The portion of the term of the patent subsequent to Apr. 1, 1986, has been disclaimed

Int. Cl. C07c 85/04

U.S. Cl. 260—584 R

5 Claims

Tertiary aliphatic amines are prepared by the reaction of 1-chloroalkanes or 1-bromoalkanes with secondary

alkylamines in a solventless environment at a temperature at least as high as room temperature, but preferably ranging from about 100° to 170° C., and at ambient or slightly above ambient pressure.

3,732,313

# HIGH MOLECULAR WEIGHT POLYOLS

Samuel H. Sharman, Kensington, and Mitchell Danzik, Pinole, Calif., assignors to Chevron Research Company, San Francisco, Calif.

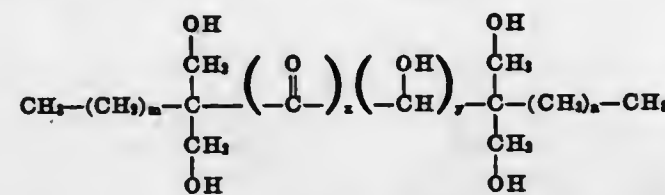
No Drawing. Original application Aug. 28, 1970, Ser. No. 68,030, now Patent No. 3,646,100. Divided and this application Sept. 27, 1971, Ser. No. 184,246

Int. Cl. C07c 49/18

U.S. Cl. 260—594

4 Claims

High molecular weight polyols of the formula:



in which m and n are integers from 0 to 40 and the sum of m and n is from 15 to 40, x and y are integers from 0 to 1 and the sum of x and y is 1. These are useful as intermediates in the preparation of detergents.

3,732,314

# PREPARATION OF AROMATIC ALDEHYDES

Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Dec. 7, 1970, Ser. No. 95,947

Int. Cl. C07c 45/02

U.S. Cl. 260—599

7 Claims

Aromatic aldehydes are prepared by treating an alkyl substituted aromatic hydrocarbon with an oxygen containing gas in the presence of an alkanol and a catalyst system comprising one or more metal salts.

3,732,315

# PRODUCTION OF AROMATIC HYDROXY-ALDEHYDES

Herwig Hoffmann, Frankenthal, and Joachim Datow and Gotthilf Wenner, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Rheinland-Pfalz, Germany

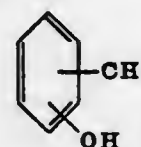
No Drawing. Filed May 13, 1970, Ser. No. 37,038

Int. Cl. C07c 45/00

U.S. Cl. 260—600

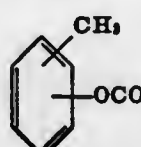
2 Claims

A process for the production of an aromatic hydroxy-aldehyde which may contain inert substituents and which has the general formula:

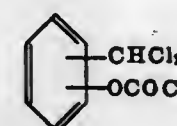


(I)

and which may have another benzene ring condensed onto the benzene ring, wherein an aromatic methylchloroformic acid ester which may contain inert substituents and which has the general formula:



(II)



(III)

and which may have another benzene ring condensed onto the benzene ring, and the resultant dichloromethylchloroformic ester (III) is then hydrolyzed to the aromatic hydroxyaldehyde (I).

3,732,316

# PROCESS FOR PRODUCING METHYL PHOSPHINE OXIDES

Kingsong Chingtsung Lin, Newark, Ohio, assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Filed Nov. 12, 1970, Ser. No. 89,103

Int. Cl. C07f 9/50

U.S. Cl. 260—606.5 P

5 Claims

Methyl phosphine oxides are prepared by thermal isomerization of the corresponding hydroxymethyl phosphines. The products find utility as fire retardant additives for organic polymers such as polyurethane foams and polyesters, and as intermediates for the production of surfactants, plasticizers, fire retardant polymers, and generally as oxidation stabilizers for use in lubricating oils, hydraulic fluids and organic polymers.

3,732,317

# HYDROXYARYL THIOETHERS

Kurt H. Pilgram, Modesto, Calif., Dirk Medema, Amsterdam, Netherlands, and Samuel B. Soloway and George W. Gaertner, Jr., Modesto, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Sept. 14, 1970, Ser. No. 72,163

Int. Cl. C07c 149/46

U.S. Cl. 260—607 B

8 Claims

Hydroxyaryl thioethers are prepared by first preparing a phenyl sulfonium bisulfate—either directly by reacting a phenol with dimethyl sulfoxide in sulfuric acid or stepwise by reacting an organic sulfide with chlorine in sulfuric acid to form a chloro-sulfonium bisulfate and reacting this crude reaction mixture with a phenol—then reacting the crude reaction mixture containing the phenyl sulfonium bisulfate with water containing halide ions to effect formation of the thioether. Nitration of the intermediate phenyl sulfonium bisulfate thus prepared can be effected using nitric acid and optionally additional sulfuric acid without the isolating of any intermediate products. Novel intermediates are also prepared via this method.

3,732,318

# $\alpha$ -CHLOROSULFOXIDES AND PROCESS FOR PREPARATION THEREOF

Shinobu Iriuchijima and Genichi Tsuchihashi, Tokyo, Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

No Drawing. Filed Feb. 24, 1971, Ser. No. 118,554

Claims priority, application Japan, Mar. 7, 1970,

Int. Cl. C07c 147/00

U.S. Cl. 260—607 R

4 Claims

A new process for the production of  $\alpha$ -chlorosulfoxides is described. Sulfoxides are chlorinated with chlorine gas in the presence of pyridine or its derivatives. The process



yield  $\alpha$ -chlorosulfoxides economically and in a high yield. These compounds are useful as medicines and agricultural chemicals.

3,732,319

# FORMATION OF T-BUTYL ETHER FROM METHYLAL

John O. Turner, West Chester, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

No Drawing. Filed Sept. 4, 1970, Ser. No. 69,966

Int. Cl. C07c 43/04

U.S. Cl. 260—614 R

1 Claim

Compounds such as dimethoxymethane, diethoxymethane or diisopropoxymethane may be converted to the corresponding t-butyl ether by reacting the same with t-butyl alcohol in the presence of an acidic catalyst such as sulfuric acid or certain acidic ion exchange resins or mole sieves.

3,732,320

# PROCESS FOR PURIFYING ETHYLENE GLYCOL

Fred Austin Ford, Lake Charles, La., assignor to Cities Service Company, New York, N.Y.

No Drawing. Continuation of application Ser. No. 625,902, Mar. 6, 1967, which is a continuation-in-part of application Ser. No. 483,854, Aug. 30, 1965. This application Nov. 18, 1969, Ser. No. 871,687

Int. Cl. C07c 29/24; C08g 17/06

U.S. Cl. 260—637 R

8 Claims

A process for reducing the iron content of ethylene glycol by treatment with a cation exchange resin operating in the acid cycle. Products can be obtained which meet fiber grade glycol specifications as to both iron content and titratable acidity.

3,732,321

# PROCESS FOR MAKING ALPHA-HALOALKENYL-AROMATICS

Charles F. Raley, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

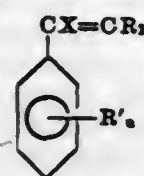
No Drawing. Continuation-in-part of application Ser. No. 691,689, Dec. 19, 1967. This application Mar. 13, 1970, Ser. No. 19,466

Int. Cl. C07c 25/28

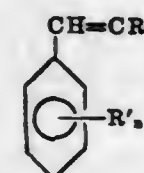
U.S. Cl. 260—651 R

1 Claim

Alpha-haloalkenylaromatics having the formula



are made by halogenating their corresponding alkenylaromatics having the formula



at a temperature between 300° and 700° C. for a time sufficient to produce the alpha-haloalkenylaromatic wherein each R and R' independently is any group inert under the reaction conditions, X is bromine or chlorine and n is an integer of from 0 to 5 inclusive.

3,732,322

# PROCESS FOR THE PRODUCTION OF CHLOROETHYLENES

Takeo Kawaguchi, Reiji Saito, Sanpei Watanabe, and Yoshitaka Suzuki, Minato-ku, Nagoya, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Minato-ku, Tokyo, Japan

No Drawing. Filed Aug. 19, 1969, Ser. No. 851,467

Int. Cl. C07c 21/00

U.S. Cl. 260—654 D

1 Claim

Chloroethylenes, trichloroethylene, tetrachloroethylene, etc. are prepared in a high yield by pyrolysis, in vapor phase, of tetrachloroethane, pentachloroethane or mixtures thereof.

No carbon is seen to be by-produced.

3,732,323

# METHOD OF PRODUCING 3-PHENYL-1-BUTENE

Atsumu Osaki, Tokyo, Tsutomu Mizoroki, Yokohama, and Ken-Ichi Maruya, Tokyo, Japan, assignors to President of Tokyo Institute of Technology, Tokyo, Japan

No Drawing. Filed Mar. 10, 1972, Ser. No. 233,778

Claims priority, application Japan, July 28, 1971, 46/56,650

Int. Cl. C07c 3/18

U.S. Cl. 260—668 B

8 Claims

A method of selectively producing 3-phenyl-1-butene by codimerization of styrene with ethylene in the presence of boron trihalide and  $\delta$ -aryl nickel(II) halide.

3,732,324

# PROCESS FOR PRODUCING OIL-SOLUBLE SULFONATE FEEDSTOCK

Stephen E. McGuire and Carl D. Kennedy, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

No Drawing. Filed Apr. 2, 1971, Ser. No. 130,832

Int. Cl. C07c 3/56

U.S. Cl. 260—671 G

14 Claims

An olefinic material containing from about 20 to about 36 carbon atoms is contacted with an arene compound in the presence of a catalyst system which includes a complex of aluminum chloride and nitromethane to thereby alkylate the arene compound. The product is fractionated to yield an alkylate having a boiling point of at least 200° C. at 20 mm. Hg pressure, which alkylate is useful as a feedstock for producing oil-soluble sulfonates.

3,732,325

# HYDROCARBON SEPARATION PROCESS

Joe M. Pharis, Lockport, Robert F. Zabransky, Hinsdale, and Donald B. Broughton, Evanston, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 28, 1970, Ser. No. 101,676

Int. Cl. C07c 7/12

U.S. Cl. 260—674 SA

8 Claims

A process for the separation of aromatic hydrocarbons which process comprises the adsorption of selected feed components followed by desorption of selected feed components from a solid adsorbent through the use of a desorbent material. The process allows the adsorbent which has just contacted feed stock and which selectively adsorbs a selected component therefrom to be contacted with a quantity of selectively adsorbed feed component to remove undesired raffinate components which are either

adsorbed by the adsorbent or present within the interstitial void spaces between the adsorbent particles prior to recovery of the extract material in a desorption step. The selectively adsorbed feed component can be taken from either a product extract stream or directly from the portion of the adsorbent in which the desorption step takes place.

3,732,326

# SELECTIVE SORPTION OF LESS POLAR MOLECULES WITH CRYSTALLINE ZEOLITES OF HIGH SILICA/ALUMINA RATIO

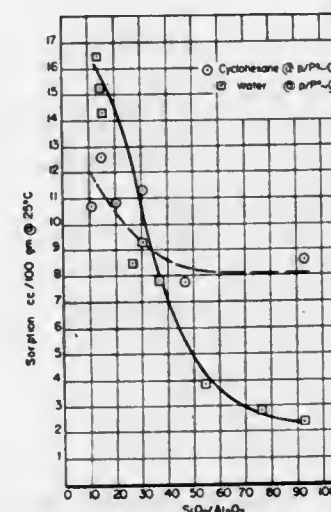
Nai Yuen Chen, Titusville, N.J., assignor to Mobil Oil Corporation

Filed May 19, 1970, Ser. No. 38,811

Int. Cl. C10g 25/04

U.S. Cl. 260—676 MS

10 Claims



A method of selectively sorbing a compound of low polarity in admixture with a compound of the same or greater polarity which comprises passing the mixture over a crystalline aluminosilicate having a silica/alumina mole ratio of at least 35.

3,732,327

# OXIDATIVE-DEHYDROGENATION CATALYSTS

Emory W. Pitzer, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed June 4, 1971, Ser. No. 150,235

Int. Cl. C07c 11/12

U.S. Cl. 260—680 E

11 Claims

The properties of a lithium-tin-phosphorous catalyst active for the oxidative dehydrogenation of hydrocarbons are improved by the deposition of oxides of aluminum and calcium on the catalyst.

3,732,328

# PROCESS FOR THE PRODUCTION OF OCTADIENES

Donald Wright, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Oct. 8, 1970, Ser. No. 79,323

Claims priority, application Great Britain, Oct. 17, 1969, 51,151/69; Apr. 28, 1970, 20,368/70; July 27, 1970, 36,198/70

Int. Cl. C07c 11/12

U.S. Cl. 260—680 B

6 Claims

A process for the production of an octadiene selected from the group consisting of octa-1,6-diene, octa-1,7-diene, monomethylocta-1,6-diene, monomethylocta-1,7-diene, dimethylocta-1,6-diene and dimethylocta-1,7-diene which comprises contacting butadiene and/or isoprene at a temperature of 20 to 200° C. with a  $10^{-1}$  to  $10^{-5}$  molar

concentration of a platinum, palladium, or ruthenium compound selected from the group consisting of halides, alkanoates containing up to 6 carbon atoms, acetylacetonates, bisbenzonitrile palladium (II) and lithium palladous chloride, in a polar solvent and in the presence of formic acid.

3,732,329

# HYDROGENATION PROCESS UTILIZING HOMOGENEOUS COPPER CATALYSTS

Judith G. Thatcher and William R. Deever, Richmond, Va., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed Dec. 28, 1970, Ser. No. 102,166

Int. Cl. C07c 5/02, 11/02

U.S. Cl. 260—683.9

13 Claims

This invention relates to process for hydrogenating unsaturated organic molecules such as olefins and diolefins to their saturated derivatives utilizing homogeneous catalysts comprised of cuprous halides complexed with ligands containing organic radicals bonded to elements, in the trivalent state, selected from Group Va (excluding nitrogen and bismuth), particularly those of the phosphine and phosphite type.

3,732,330

# CURABLE COMPOSITIONS CONTAINING HYDROGEN-FUNCTIONAL ORGANOPOLYSILOXANES

Alan E. Mink and Darrell D. Mitchell, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed Mar. 8, 1972, Ser. No. 232,962

Int. Cl. C08g 47/02

U.S. Cl. 260—825

11 Claims

Trimethylsilyl-terminated methylhydrogensiloxo diphenylsiloxo copolymers containing from about 20 to 45 mol percent diphenylsiloxo units give increased strength and flexibility when used as the curing agent for vinyl-functional organopolysiloxanes.

3,732,331

# PROCESS FOR THE PRODUCTION OF PLASTICS AND LACQUER RESINS FROM BASIC NITROGEN-CONTAINING GLYCIDYL COMPOUNDS AND DICARBOXYLIC ANHYDRIDES

Johannes Wollner, Moers-Kapellen, Martin Cherubim, Rheinkamp-Eick, and Friedrich Henn, Homberg-Niederrhein, Germany, assignors to Deutsche Texaco Aktiengesellschaft, New York, N.Y.

No Drawing. Filed Aug. 10, 1970, Ser. No. 62,692

Int. Cl. C08g 45/06

U.S. Cl. 260—830 TW

12 Claims

This invention concerns a process for increasing the hardening rates in the preparation of epoxide resins using dicarboxylic anhydrides as hardening agents. The increase in hardening rates is achieved by reacting mixtures of basic nitrogen-containing glycidyl compounds with dicarboxylic anhydrides. An optional aspect of the inventive process is to conduct the above reaction in the presence of alkyl resins and/or solvents.

3,732,332

# PRODUCTION OF LOW MOLECULAR WEIGHT POLYANHYDRIDES AND EPOXY COMPOSITIONS DERIVED THEREFROM

Omer E. Curtis, Jr., Morristown, Harold W. Tuller, Long Valley, Charles T. O'Neill, Dover, and Ralph W. Nussbaum, West Orange, N.J., assignors to Allied Chemical Corporation

No Drawing. Filed Oct. 16, 1970, Ser. No. 81,616

Int. Cl. C08g 45/04

U.S. Cl. 260—837 R

16 Claims

Polyanhydrides are produced by a novel bulk polymerization procedure from maleic monomers and alkyl styrenes. The polyanhydrides, of low molecular weight and containing maleic monomer to alkyl styrene in a ratio greater than 1 to 1, are particularly useful as hardeners for epoxy resin-containing compositions and give



rise to epoxy compositions which result in cured products exhibiting high heat distortion temperatures and excellent electrical and self life properties.

### 3,732,333 FORMALDEHYDE BLOCK COPOLYMERS AND PROCESSES

Gerald J. Mantell, Kansas City, Mo., and Wayne E. Smith, Shawnee, Francis R. Galliano, Prairie Village, and David Rankin, Kansas City, Kans., assignors to Gulf Oil Corporation, Pittsburgh, Pa.  
No Drawing. Filed Oct. 2, 1963, Ser. No. 313,192  
Int. Cl. C08g 3/00

U.S. Cl. 260—874 6 Claims  
This invention relates to novel block copolymers of formaldehyde and to processes for preparing such copolymers. More specifically the invention concerns block copolymers of formaldehyde containing the grouping A—B which includes both A—B type block copolymers and B—A—B type block copolymers.

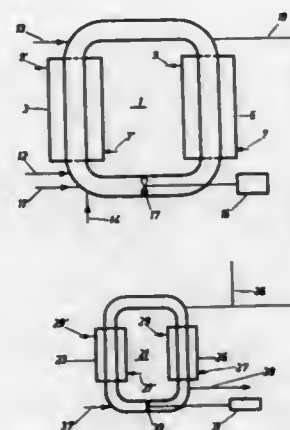
### 3,732,334 GRAFT COPOLYMERIC LUBRICATING OIL ADDITIVES

Ernst Koch, Traisa Über Darmstadt, and Ulrich Schoedel, Rossdorf, Germany, assignors to Rohm GmbH, Darmstadt, Germany  
No Drawing. Continuation-in-part of abandoned application Ser. No. 792,762, Jan. 21, 1969. This application June 16, 1971, Ser. No. 153,899  
Claims priority, application Germany, Jan. 23, 1968, P 17 45 359.7  
Int. Cl. C08f 29/50, 33/08

U.S. Cl. 260—875 8 Claims  
Graft copolymers useful as lubricating oil additives and prepared by grafting an imidazole having an olefinically unsaturated group in the 1-position, e.g. a 1-vinyl-2-alkyl-imidazole, on a backbone polymer comprising acrylate, methacrylate, fumarate, and/or itaconate esters.

### 3,732,335 PROCESS FOR THE PREPARATION OF BLOCK POLYMERS

Jean Pierre Hermans, Strombeek-Bever, and Emile Leblon and Marcel Le Jeune, Brussels, Belgium, assignors to Solvay & Cie, Brussels, Belgium  
Filed May 26, 1971, Ser. No. 146,933  
Claims priority, application Luxembourg, May 28, 1970, 61,007/70  
Int. Cl. C08f 1/42, 15/04, 19/04  
U.S. Cl. 260—878 B 18 Claims

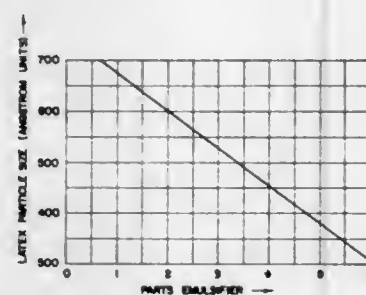


Polypropylene modified by a random copolymer of propylene and a second  $\alpha$ -olefin is prepared by a two-stage process. In the first stage, propylene is polymerized in the presence of violet  $TiCl_3$  and dialkylaluminum

monochloride until polypropylene in an amount of about 80 to 99% by weight of the total quantity of polymer to be prepared has been formed. A second  $\alpha$ -olefin and a second activator constituted by trialkylaluminum is then added to the system and in a second stage, the polymerization is continued, propylene being polymerized with the second  $\alpha$ -olefin to form a random copolymer in an amount of 1 to 20% by weight of the total quantity of polymer to be prepared.

### 3,732,336 METHACRYLONITRILE POLYMERIZATION PROCESS

June T. Duke, Chagrin Falls, and Dorothy C. Prem, Warrensville Heights, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio  
Filed June 2, 1971, Ser. No. 149,256  
Int. Cl. C08f 15/22, 15/36, 19/16  
U.S. Cl. 260—881 7 Claims



A polymerization process is described in which methacrylonitrile homopolymers and copolymers are prepared by free radical polymerization at improved rates by conducting the polymerization in aqueous emulsion in the presence of some preformed seed polymer having small particle size.

### 3,732,337 THERMOPLASTIC CROSSLINKED POLYESTER MATERIAL AND METHOD OF MOLDING

William J. Hellman, Allison Park, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.  
No Drawing. Continuation-in-part of application Ser. No. 849,180, Aug. 11, 1969. This application Aug. 27, 1971, Ser. No. 175,759  
The portion of the term of the patent subsequent to Feb. 15, 1989, has been disclaimed  
Int. Cl. C08f 37/18

U.S. Cl. 260—897 B 12 Claims  
A polyanhydride, such as a copolymer of maleic anhydride and an  $\alpha$ -olefin, when heated together with a polymeric polyol, such as polyvinyl alcohol, yields a polyester crosslinked material. When heated to a temperature in excess of 80° C., this crosslinked polyester material flows and can be molded. On slow cooling, this material may again become crosslinked and insoluble in solvents such as acetone.

### 3,732,338 MIXTURES OF ETHYLENE-PROPYLENE RUBBERS AND POLYPENTENAMERS

Dieter Thelsen, Remscheid, Friedrich Haas, Cologne, and Manfred Beck, Odenthal-Globusch, Germany, assignors to Bayer Aktiengesellschaft  
No Drawing. Filed Dec. 20, 1971, Ser. No. 210,163  
Claims priority, application Germany, Dec. 24, 1970, P 20 63 716.5  
Int. Cl. C08f 29/12

U.S. Cl. 260—897 11 Claims  
Rubber mixtures of  
(a) 5–95% by weight of ethylene-propylene rubber and  
(b) 95–5% by weight of polypentenamer.

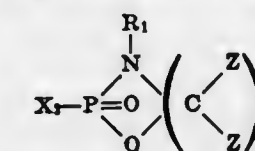
3,732,339  
FILAMENTS AND FILMS OF ACRYLONITRILE  
POLYMERS WHICH ARE FREE FROM VACUOLES  
Carlhans Suling and Helmo Logemann, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany  
No Drawing. Filed Mar. 25, 1971, Ser. No. 128,180  
Claims priority, application Germany, Mar. 26, 1970, P 20 14 764.2  
Int. Cl. C08f 29/56

U.S. Cl. 260—898 13 Claims  
Vacuole free filaments and films of acrylonitrile homopolymers and copolymers containing at least 80% acrylonitrile, which contain 0.1 to 4% of a copolymer of acrylonitrile and dimethylacrylamide.

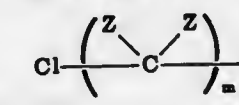
### 3,732,340 N'-O-PROPYLENE PHOSPHORIC ACID ESTER DIAMIDES

Herbert Arnold, Heidelberg, Norbert Brock, Uerentrop, and Friedrich Bourseaux and Heinz Bekel, Brackwede, Westphalia, Germany, assignors to Asta-Werke Aktiengesellschaft Chemische Fabrik, Brackwede, Westphalia, Germany  
No Drawing. Continuation-in-part of applications Ser. No. 650,232, June 30, 1967, and Ser. No. 71,339, Sept. 11, 1970. This application Jan. 14, 1971, Ser. No. 106,569  
Int. Cl. C07d 105/04; A01k 27/00

U.S. Cl. 260—936 7 Claims  
There are provided new N-substituted amides and esteramides of phosphoric acid of the Formula I:



wherein  $R_1$  is a lower alkyl group having from 1 to 4 carbon atoms being substituted with one or several halogen atoms, Z is hydrogen or a lower alkyl group having from 1 to 4 carbon atoms, m is 2 or 3 and  $X_2$  is the ethylene imino group or the group having the formula:



wherein R is hydrogen or a lower alkyl group having from 1 to 4 carbon atoms which may be substituted with a chlorine atom or a hydroxy group, and Z and m have the above-given meaning.

Each of these products is useful as a cytostatically effective compound and is used in the manner exemplified hereinafter with respect to test animals, e.g. rats, according to known techniques for administering test dosages.

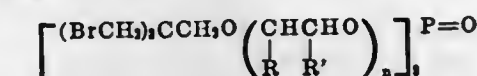
### 3,732,341 (ALKYL AND O-ALKYLOXY ALKYL)-O-ALKYL- S-(1,2,2-TRICHLORO-ETHYL)-THIONOETHYL PHOSPHORIC AND PHOSPHONIC ACID ESTERS

Wilhelm Sirrenberg, Sprockhovel, Ingeborg Hammann, Cologne, and Bernhard Homeyer, Opladen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany  
No Drawing. Filed Jan. 30, 1970, Ser. No. 7,263  
Claims priority, application Germany, Feb. 4, 1969, P 19 05 356.6  
Int. Cl. C07f 9/08; A01n 9/36

U.S. Cl. 260—950 6 Claims  
(Alkyl and O-alkyl)-O-alkyl-S-(1,2,2-trichloroethyl)-thionoethyl phosphoric and phosphonic acid esters, i.e. (alkyl, O-alkyl and O-alkoxy-alkyl)-O-(alkyl and alkoxy-alkyl)-S-(1,2,2-trichloro-ethyl)-thionoethyl phosphoric and phosphonic acid esters, which possess arthropodicidal, especially insecticidal and acaricidal, properties, and which may be produced by conventional methods.

3,732,342  
BROMINATED PHOSPHATES  
Carl L. Gibbons and Charles E. Reineke, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.  
No Drawing. Filed Nov. 2, 1970, Ser. No. 86,339  
Int. Cl. C07f 9/08

U.S. Cl. 260—950 3 Claims  
Compounds useful as fire retardant plasticizers for polyvinyl chloride and as fire retardants for latex having the formula



wherein R and R' are independently for each of the n units H or methyl provided that both R and R' are not methyl in any one unit, and n is an integer of 1–10 have been discovered.

3,732,343  
1-HALO-2-ARYLOXY-VINYL (2)-PHOSPHATES  
Henry Martin and Jozef Drabek, Basel, Switzerland, assignors to Ciba-Gelby AG, Basel, Switzerland  
No Drawing. Filed Aug. 17, 1970, Ser. No. 64,648  
Claims priority, application Switzerland, Aug. 18, 1969, 12,553/69; Sept. 25, 1969, 14,452/69  
Int. Cl. C07f 9/08; A01n 9/36

U.S. Cl. 260—951 18 Claims  
1-halo-2-aryloxy-vinyl(2)-phosphates are very effective compounds for combating pests, such as insects, nematodes and representatives of the order Acarina as well as plant-pathogenic bacteria and fungi. The new phosphates may be used in the form of pesticidal preparations.

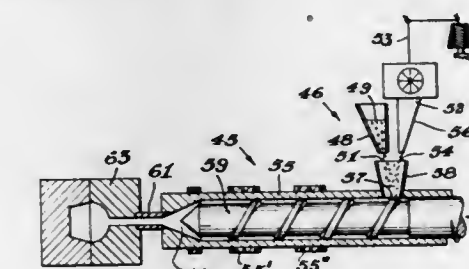
### 3,732,344 PREPARATION OF PHOSPHOROAMIDOTHIONATE BY ANHYDRIDE ACYLATION

James L. Platt, Jr., San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.  
No Drawing. Filed July 21, 1971, Ser. No. 164,895  
Int. Cl. C07f 9/02, 9/24

U.S. Cl. 260—984 7 Claims  
N-acyl derivatives of O,O-dialkyl phosphoroamidothionate are prepared by reacting O,O-dialkyl phosphoroamidothionate with an anhydride in the presence of a catalytic amount of a strong acid at a temperature of from 20–90° C.

3,732,345  
METHOD FOR THE INCORPORATION OF FILAMENTARY MATERIAL IN A RESINOUS MATRIX  
James L. Amos, Midland, and Arnett L. Bird and Robert P. Snyder, Saginaw, Mich., assignors to The Dow Chemical Company, Midland, Mich.  
Continuation of application Ser. No. 532,819, Jan. 7, 1966, which is a continuation-in-part of application Ser. No. 342,659, Feb. 5, 1964, which in turn is a continuation-in-part of application Ser. No. 302,504, Aug. 16, 1963. This application Apr. 16, 1970, Ser. No. 29,095  
Int. Cl. B29f 1/02, 3/02; C08f 45/10

U.S. Cl. 264—329 28 Claims



Glass reinforced thermoplastics are formed by directly adding chopped filaments and particulate thermoplastic



resin to heat fabricating apparatus such as an extruder or pre-plasticizing injection molding machine under non-stratifying conditions to provide a glass reinforced molded article.

3,732,346

# METHOD TO PRODUCE SPUN-DRAWN POLYCAPROLACTAM YARN HAVING IMPROVED RESISTANCE TO OZONE FADING

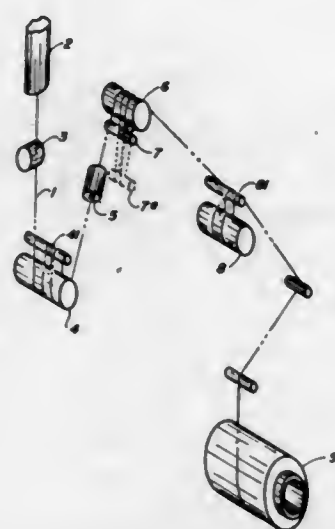
William Cyrus Mallonee, Chester, and Peter Reginald Saunders, Richmond, Va., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Aug. 10, 1970, Ser. No. 62,304

Int. Cl. D01d 5/12; B29c 17/02

U.S. Cl. 264—210 F

1 Claim



A continuous process and its product for spinning and drawing polycaprolactam filaments is disclosed. The method is the coupled or continuous process of extruding filaments, cooling and applying finish, then immediately drawing the filaments. The improved resistance to ozone fading is accomplished by feeding the filaments after the finish applying step with a heated feed roll through an air cooling jet to a cooled draw roll and withdrawing filaments to a second draw roll, then winding the filaments into a package.

3,732,347

# METHOD FOR VULCANIZING OPEN END BELTING

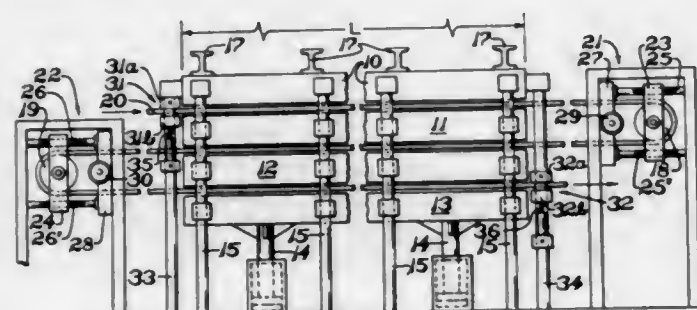
David G. Hunt, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Original application Jan. 22, 1969, Ser. No. 793,033, now Patent No. 3,647,342. Divided and this application June 3, 1971, Ser. No. 149,835

Int. Cl. B29h 7/22

U.S. Cl. 264—231

2 Claims



A method for curing long lengths of reinforced elastomeric, open end, conveyor belting in a multiple-decked vulcanizing press. The portions of the belt being cured

are subjected to substantially uniform stretch prior to closing the press by outrigger rollers over which the belt is trained as it passes continuously from one platen to another. When the portions between the press platens are cured, the belting is advanced longitudinally over the rollers to permit vulcanizing the portions previously extending over the rollers.

3,732,348

# METHOD FOR THE PRODUCTION OF A STRIP OF LAMINATE MATERIAL FROM A MATERIAL CAPABLE OF BEING HEAT FORMED

Rolf Lennart Ignell, Lund, Sweden, assignor to Sobrefina SA, Fribourg, Switzerland

Filed May 12, 1969, Ser. No. 823,593

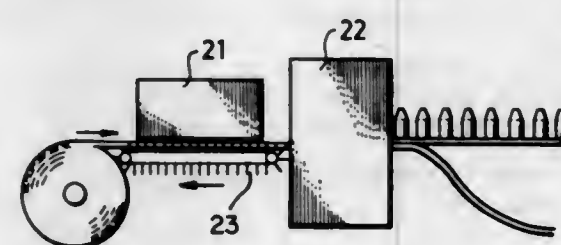
Claims priority, application Sweden, May 21, 1968,

6,841/68

Int. Cl. B29d 7/22; B44d 1/092, 1/16

U.S. Cl. 264—134

9 Claims



A method for producing laminated strip material by applying at least one layer of a polymer to a different base polymer layer and heating the composite layers to sinter the layers together, the heated composite layer being capable of being formed into objects.

3,732,349

# PROCESS FOR SIMULTANEOUSLY SHEARING AND QUENCHING POLYMER FILMS

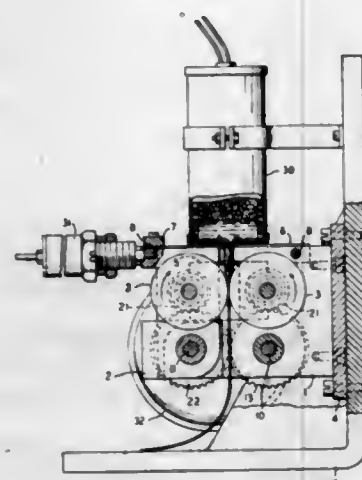
Ho-Sou Chen, Summit, Ti Kang Kwel, Millington, and Tsuey Tang Wang, Stirling, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Jan. 7, 1971, Ser. No. 104,708

Int. Cl. B29c 15/00; B29d 7/14

U.S. Cl. 264—175

4 Claims



A process is described for producing polymer films with improved mechanical properties using substantially crystalline polymers. This is achieved by exposing molten polymer simultaneously to high shearing and quenching rates by contacting the molten polymer with a dry metallic surface which presses against the molten polymer. This process also increases the transparency of the polymer film.

## ELECTRICAL

3,732,350

### POWER CONTROL

Geoffrey Hoyle, and David Melvin Longbottom, both of Sheffield, England, assignors to The British Iron and Steel Association, London, England

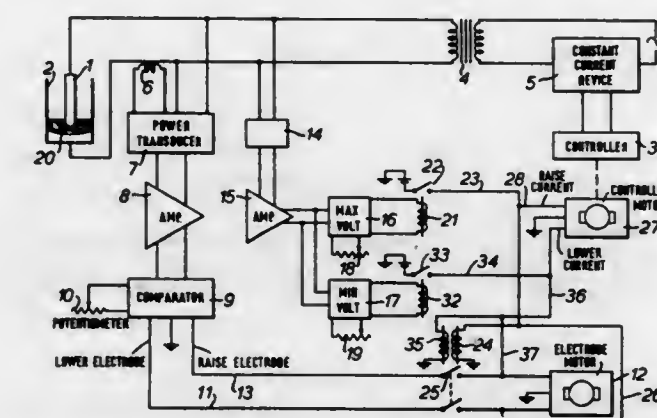
Filed Nov. 18, 1971, Ser. No. 199,914

Claims priority, application Great Britain, Dec. 3, 1970, 57452/70

Int. Cl. H05b 3/60

U.S. Cl. 13—9

9 Claims



Electroslag refining plant comprising an electrode, a mould for containing a bath of molten electrically-conductive slag into which the electrode depends and below which an ingot of refined material is formed, means for maintaining the supply of electric current to the electrode at a pre-determined value, means for detecting changes in the power supplied by the electrode to the slag bath, means for causing movement of the electrode relative to the formed ingot to maintain the power supplied at a required value, means for detecting movement of the electrode outside of pre-determined limits of maximum and minimum distances from the formed ingot and, upon such movement being detected, for returning the electrode to a position within said maximum and minimum distances and for re-setting the value of the current supply so that the required value of power supply can be met by movement of the electrode within the pre-determined limits.

3,732,351

### CONTROL SYSTEM FOR ARC VOLTAGE OF A PLASMA ARC TORCH

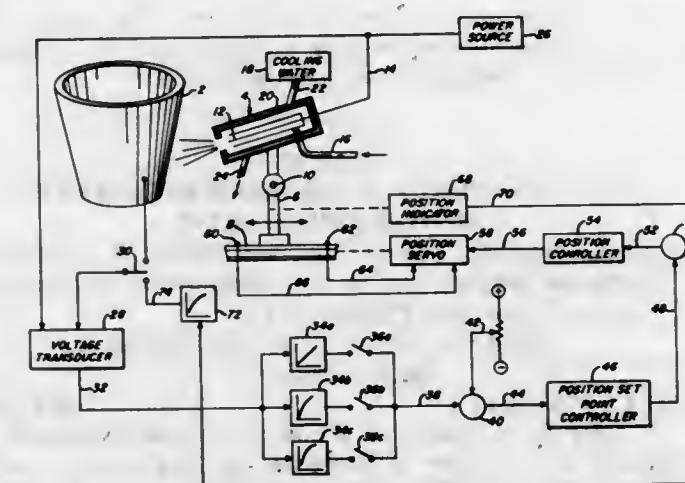
Ronald G. Schultz, Bay Village, Ohio, assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 18, 1972, Ser. No. 254,588

Int. Cl. H05b 7/00

U.S. Cl. 13—13

5 Claims



A control system for the arc voltage drop in a furnace heated by a plasma arc torch has a voltage transducer provid-

3,732,352

### CONSTRUCTION FOR END OF CABLE SHEATH AND METHOD OF WELDING SHEATH

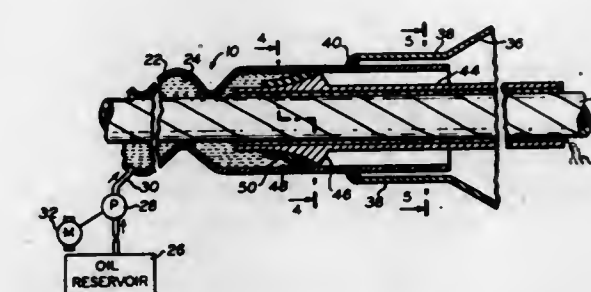
Attila Dima, Piscataway, and George S. Eager, Jr., Upper Montclair, both of N.J., assignors to General Cable Corporation, New York, N.Y.

Filed Sept. 2, 1971, Ser. No. 177,383

Int. Cl. H02g 15/20, 1/14

U.S. Cl. 174—10

10 Claims



This application for welding an oil impermeable sheath of a high voltage power cable uses a tube inserted into the clearance between the core and the sheath of the cable to shut off oil circulation through this clearance immediately inside the sheath. The tube extends beyond the end of the sheath and oil flows from the end of the cable during the welding operation even though the space within the sheath immediately under the region of welding is free of oil. The sheath can be welded to a joint housing without oil contamination of the weld and the invention prevents vaporization of oil and possible blow-out of near molten areas of the sheath adjacent to the weld.

3,732,353

### MOISTURE SEAL AND FIRE BARRIER FOR ELECTRICAL BUS DUCT

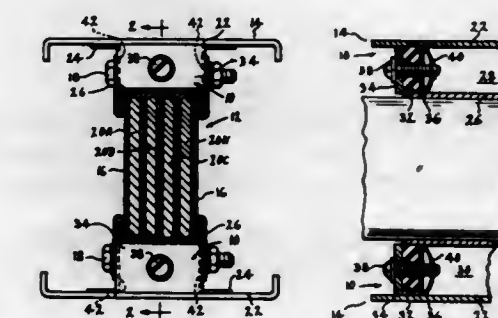
Martin F. Koenig, Milwaukee, Wis., and Manuel Issa, deceased, late of Milwaukee, Wis. (by Patrick T. Sheedy, administrator), assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed March 22, 1972, Ser. No. 237,025

Int. Cl. H02g 5/06

U.S. Cl. 174—68 B

12 Claims



A sealing device, including a resilient sealing member interposed between a pair of retaining plates and a through bolt



threadably mounted to a bowed metallic clamping member, is installed inside the ends of the hat sections of a bus duct above and below the edges of the bus bars. As the through bolt is tightened, the sealing member is squeezed into sealing engagement with the inside walls of the hat section to provide a moisture-proof seal and the edges of the clamping member bite into the inside walls of the hat section to secure the device in place and provide a metal-to-metal fire barrier.

3,732,354

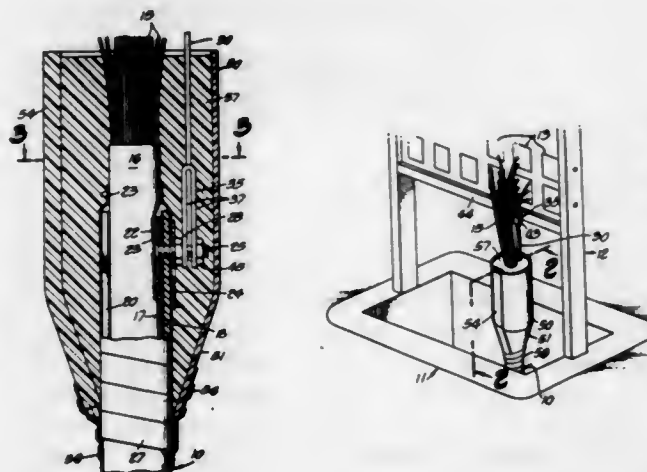
## CABLE END SEAL, SUPPORT AND GROUNDING ASSEMBLY

John T. Thompson, 244 Loring St., Los Angeles, Calif., and George W. Gillemot, 2331 20th St., Santa Monica, Calif.  
Filed Jan. 19, 1971, Ser. No. 107,794

Int. Cl. H02g 15/02

U.S. Cl. 174-78

14 Claims



Means for hermetically sealing, suspending and grounding a shielded multi-conductor cable relative to a pedestal-type terminal board facility. The components utilized for these purposes include a first solderless terminal assembly embracing and clamping the cable shield and sheath together, a pair of compressible solderless terminals telescoped over the opposite ends of a combination cable suspension and grounding conductor strap anchorable at one end to the clamping bolt of the first solderless terminal assembly and the other end to the terminal board facility. A slit sleeve loosely embraces the cable end and is charged with potting compound thereby hermetically sealing together the cable end, the sleeve and the adjacent components of the suspension unit and precluding the entry of moisture into the cable.

3,732,355

## INHIBITABLE RANDOM PULSE GENERATOR

Hyacinth E. Harna, Cicero, and Richard G. Merrell, Darien, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

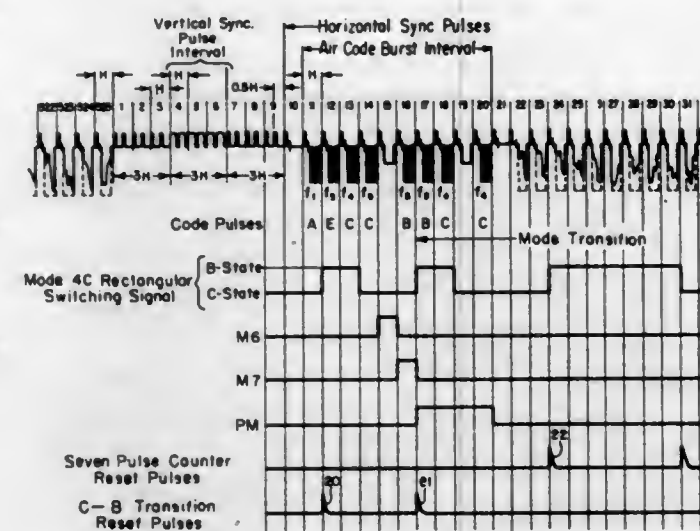
Filed Oct. 22, 1971, Ser. No. 191,670  
Int. Cl. H04n 1/44; H03b 29/00

U.S. Cl. 178-5.1

12 Claims

An inhibitable random pulse generator for use in a subscription television system or the like generates an output pulse indicative of a random one of a series of possible counting states, one or more of which may be inhibited to narrow selection to the remaining states. A counter included in the generator first has random noise applied to it for a predetermined period of time, leaving the counter in an unpredictable random counting state. Stepping pulses are then applied to step the counter to the first uninhibited state, at which time counting action ceases and a representative output pulse is

dom counting state. Stepping pulses are then applied to step the counter to the first uninhibited state, at which time counting action ceases and a representative output pulse is



developed. Provision is made for disabling the application of noise during the first predetermined period to obtain non-random operation of the counter for test purposes.

3,732,356

## COLOR AMPLIFIER

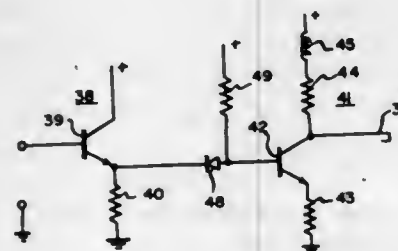
Lester Tucker Matzek, Lombard, Ill., assignor to Warwick Electronics Inc., Chicago, Ill.

Filed June 2, 1971, Ser. No. 149,300

Int. Cl. H04n 9/12

U.S. Cl. 178-5.4 R

8 Claims



A transistorized color amplifier for the color circuit of a color television receiver with a current biased diode limiter circuit for preventing saturation of the amplifier.

3,732,357

## SELF-STARTING SYNCHRONOUS INTEGRATED MOTOR-WHEEL DRIVE

Frank C. Rushing, Ellicott City, and Robert R. Aulhouse, Linthicum Heights, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 10, 1971, Ser. No. 197,304

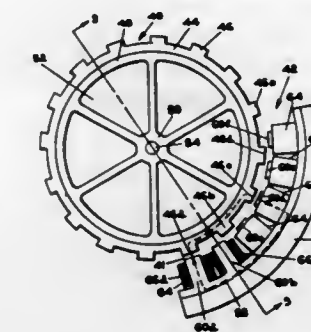
Int. Cl. H04n 9/00

U.S. Cl. 178-5.4 CF

18 Claims

A color filter wheel for a color television system is integrated into a motor to decrease size and weight, and to minimize noise associated with bearings and gears. The wheel is rotatably mounted on a frame and has rotor poles mounted concentrically about its axis of rotation and stator poles mounted on the frame in operative spaced relationship to the rotor poles. Different pairs of stator poles are sequentially

aligned with different pairs of rotor poles as the wheel rotates and are sequentially energized by a pulsating DC source for causing rotation of the filter wheel. Means are provided for



varying the frequency of the pulsating DC source for ease of starting the wheel and for synchronizing the wheel rotation with the scanning frames of the television camera.

3,732,358

## AUTOMATIC CHROMA CONTROL CIRCUITS

Leopold Albert Harwood, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

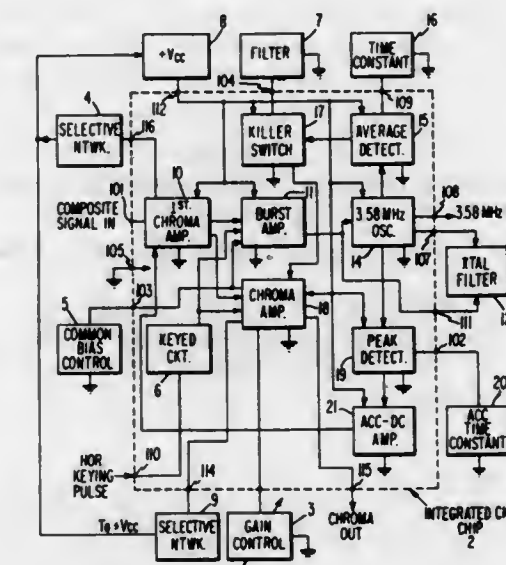
Division of Ser. No. 822,951, May 8, 1969, Pat. No. 3,604,842.

This application April 14, 1971, Ser. No. 134,036

Int. Cl. H04n 9/48

U.S. Cl. 178-5.4 AC

4 Claims



Automatic chroma control circuitry employs a peak detector circuit, operated from a chroma oscillator configuration, which oscillator exhibits a varying amplitude response determined by a narrow band filter included in an a.c. feedback path for the oscillator and arranged to selectively filter signal frequencies within the narrow bandpass as coupled thereto during the oscillatory burst interval. The bandpass filtered signals, including noise components serving to vary the peak amplitude of the oscillator cause the detector to provide an output a control voltage proportional to the highest peak of the oscillator. This control voltage is applied to a chroma amplifier stage for varying the gain in accordance with varying oscillator amplitude.

3,732,359

## BEAM INDEX COLOR TELEVISION DISPLAY DEVICE

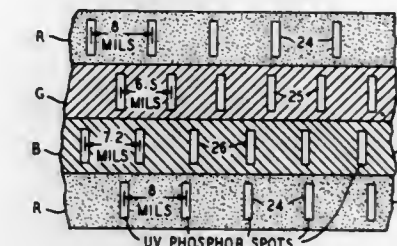
Yen-Sun Chen, Fanwood, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed April 19, 1972, Ser. No. 245,452

Int. Cl. H04n 9/24

U.S. Cl. 178-5.4 H

2 Claims



The beam index concept for color television display tubes has been known for some time, and although this color display approach is fundamentally more attractive than the commercially favored three-gun shadow mask tube, techniques for producing the indexing signal have been inadequate. According to the invention, index signals in a single-gun tube with horizontal phosphor stripes, operating in a line (color)-sequential mode, are generated by UV phosphor bars spaced uniformly along each color stripe but with different spacings for each color. As the beam scans a stripe, an optical signal is generated with a frequency corresponding to the periodicity of the phosphor index bars. The optical signal is detected with a UV detector. The amplitude of each frequency will indicate the beam size and vertical position. The index signals are fed to a signal processor which, by simple filtering, will generate error correction signals which are in turn fed to the deflection circuit to correct the beam position. The use of the optical index signal ensures isolation of the beam index signal from the video.

3,732,360

## COLOR TELEVISION SYSTEM HAVING APERTURE CORRECTION

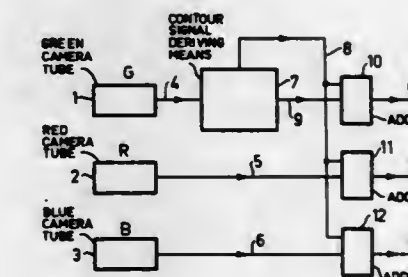
Hendrik Breimer, and Sing Liang Tan, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Phillips Corporation, New York, N.Y.

Continuation of Ser. No. 624,944, March 21, 1967, abandoned. This application Feb. 15, 1972, Ser. No. 226,432  
Claims priority, application Netherlands, March 26, 1966, 6604020

Int. Cl. H04n 5/14

U.S. Cl. 178-5.4 R

6 Claims



In a color television camera system of the type having camera tubes for the production of red, green and blue color signals, contour signals derived from only one of the color signals are added to all of the color signals.



3,732,361

**COLOR VIDEO SIGNAL MAGNETIC RECORDING-REPRODUCING SYSTEM HAVING A FUNCTION OF OPTIMUM RECORDING CURRENT LEVEL SETTING**  
Satoshi Makara, Tokyo, Japan, assignor to Nippon Electric Company Limited, Tokyo, Japan

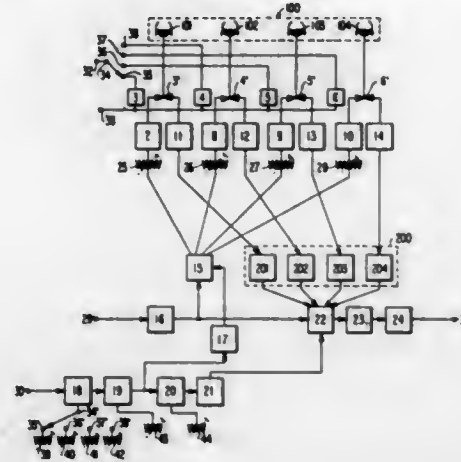
Filed March 22, 1971, Ser. No. 126,862

Claims priority, application Japan, March 25, 1970, 45/25447

Int. Cl. H04n 9/02

U.S. Cl. 178-5.4 CD

6 Claims



Disclosed is a system and method, applicable to color video magnetic recording and reproducing systems, for determining the optimum recording current for each head of a multi-head assembly to produce optimum picture quality. According to the teachings of the invention the scanning tracks of adjacent heads are made to at least partially overlap by causing the magnetic tape to move at a speed slower than normal. A first head records an FM signal modulated by a color test signal while the adjacent head producing an overlapping scanning track reproduces it. The level of the chroma signal of the reproduced and demodulated color test signal is compared with the test signal to control the level of the recording current.

3,732,362

**SIGNAL PROCESSING SYSTEM FOR MAGNETIC RECORDING AND REPRODUCING APPARATUS**  
Hisao Kinjo, Minami-ku, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Kanagawa-ku, Yokohama City, Japan

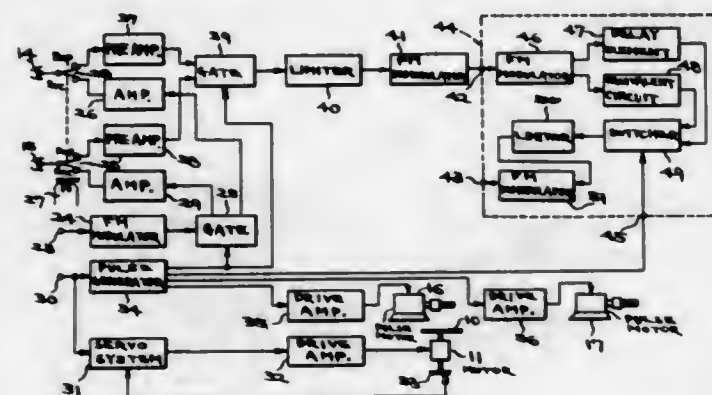
Filed Aug. 11, 1969, Ser. No. 848,900

Claims priority, application Japan, Aug. 14, 1968, 43/57478

Int. Cl. H04n 5/78; G11b 21/02

U.S. Cl. 178-6.6 DD

7 Claims



This is a signal processing system for magnetic recording and reproducing apparatus using a circular, rotary magnetic body on which video signals, for example, are recorded and reproduced a plurality of magnetic heads intermittently and alternately move radially over said rotary magnetic body, each

field of the video signals being recorded in one concentric circular track. Slow motion playback or still playback of the signal recorded in circular said track is effected by reproducing the signal a plurality of times. This signal processing system synchronizes and shape field setting pulses by frame pulses of an external reference synchronizing signal. The relation between odd number fields and even number fields of a reproduced video signal can be made to agree with the relation between odd number fields and even number fields of the external reference synchronizing signal.

3,732,363

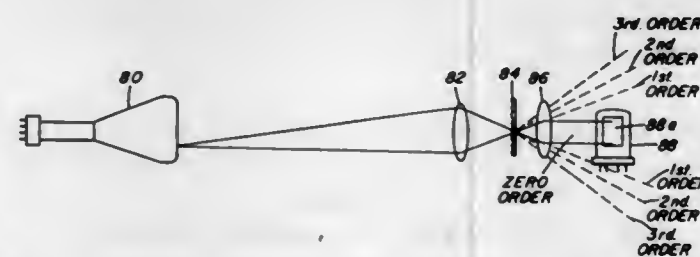
**INFORMATION RECORD UTILIZING DIFFRACTION GRATING AND METHODS OF RECORDING AND REPRODUCING THE INFORMATION THEREOF**  
William E. Glenn, Jr., Stamford, Conn., assignor to Columbia Broadcasting System, Inc., New York, N.Y.

Filed Aug. 16, 1971, Ser. No. 171,809

Int. Cl. G01d 15/10; G11b 7/26

U.S. Cl. 178-6.6 TP

19 Claims



In a system for recording and reproducing picture information, a record medium utilizing diffraction gratings modulated in accordance with the picture information which, upon reproduction effected by directing light therethrough, the zero-order diffracted light is modulated in accordance with the picture information. The picture information-representing diffraction grating is initially recorded on a master from which release prints may be made on inexpensive sheet plastic material, for example, by mechanical embossing techniques.

3,732,364

**MAGNETIC TAPE RECORDING AND REPRODUCING SYSTEM**  
Toshimichi Terada, Inagi-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

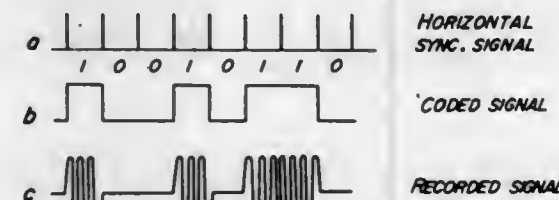
Filed April 18, 1972, Ser. No. 245,155

Claims priority, application Japan, April 21, 1971, 46/25238

Int. Cl. H04n 5/62

U.S. Cl. 178-6.6 A

6 Claims



A magnetic tape recording and reproducing system wherein a television signal and digital information are recorded in multiplex recording on the same area of a magnetic tape. In recording, according to an external instruction specifying a picture frame and digital information to be recorded, the horizontal sync. signal for the specified picture frame is extracted, and the extracted horizontal sync. signal is used to produce shift pulses determining the region for recording digital information. The digital information which is separate-

ly recorded is read out in accordance with the shift pulses thus produced, and the digital signal thus read out is used to modulate a sinusoidal signal at a frequency outside of the frequency band of the television signal for recording of the modulated signal in superimposition upon the television signal on the same area of the magnetic tape.

In reproduction, the recorded digital information signal is separated through a tuned amplifier, and the digital information and the television signal are recovered through a sequence of process similar to that at the time of the recording.

3,732,365

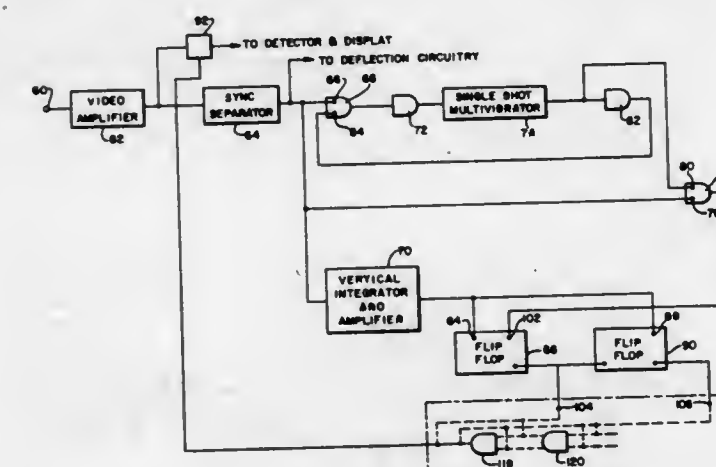
**SELECTIVE BLANKING OF VIDEO DISPLAY**  
Frederick D. Rando, Cherry Hill, and William P. Rogers, Collingswood, both of N.J., assignors to Ultronic Systems Corporation, Moorestown, N.J.

Division of Ser. No. 756,916, Sept. 3, 1968, Pat. No. 3,624,516. This application July 1, 1971, Ser. No. 158,677

Int. Cl. H04n 5/24

U.S. Cl. 178-6.8

4 Claims



Alphanumeric information supplied in the form of electrical signals from a plurality of input sources can be fed to a central control unit and rearranged therein for subsequent transmission to one or more video display monitors, each monitor employing a separate cathode ray tube. Each source can be assigned a preselected portion of the display area on each tube whereby each tube can display the information from each of the sources in its preassigned area in the form of a complete display of all of the sources apparently simultaneously.

Our invention is adapted for use in systems as described above. It employs circuitry located partially in the common unit and partially in each monitor for the selective blanking of one or more display areas in one or more tubes. In other words, information from some of the sources may be displayed by any one monitor while at the same time information from others of the sources can be blanked out on the same monitor. To this end, control pulses identified with corresponding input sources are sequentially introduced at the unit for transmission to all of the monitors. Circuitry at each monitor can be selectively enabled to detect such control pulses and to utilize the detected pulses for selective blanking.

3,732,366

**VIDEO PATTERN RECOGNITION SYSTEM**  
Victor W. Bolle, c/o Oklahoma State University School of Electrical Engineering, Stillwater, Okla.

Filed Aug. 13, 1971, Ser. No. 171,547

Int. Cl. G06k 9/08, 9/12; H04n 7/18

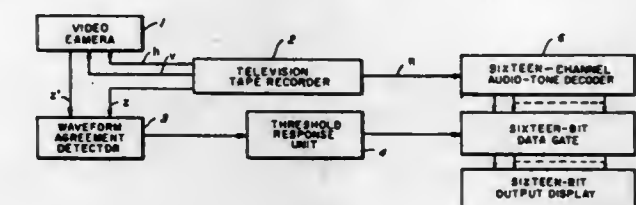
U.S. Cl. 178-6.8

14 Claims

This invention comprises a video camera and a video tape carrying previously recorded video patterns, and means for comparing the camera-generated signal pattern with the

played-back tape recorded signal pattern to see whether they are similar. The sweep signals of the camera are slaved to the playback device so that the sweeps are synchronous. The brightness signals are continuously compared and an average judgment made of the similarities of the two patterns.

Means are provided to normalize the pattern generated by the camera as regards size, angular position and position in the field of view.



Two principal applications of this system are described. These are:

- Searching a pre-recorded file of patterns on video tape for frames which are similar to a pattern exposed to the camera, and
- Comparing a current pattern of a field of view with a pattern recorded at a previous time of the same field of view, to indicate changes in the camera-produced pattern.

3,732,367

**APPARATUS FOR FACSIMILE USING A PRISM-SHAPED FIBER OPTICS**

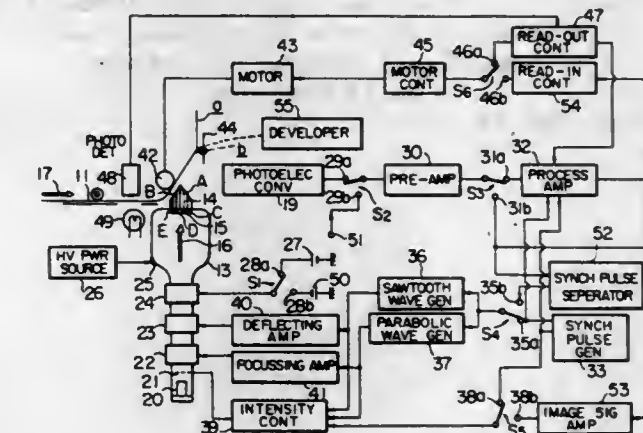
Akio Teranishi, and Eiichi Miyazaki, both of Kadoma, Japan, assignors to Matsushita Electric Industrial Company, Limited, Kadoma City, Osaka, Japan

Continuation-in-part of Ser. No. 97,064, Dec. 15, 1970, abandoned. This application April 7, 1972, Ser. No. 242,009

Int. Cl. H04n 5/68, 5/84

U.S. Cl. 178-6.8

1 Claim



A read-in and read-out apparatus for a facsimile system which comprises a cathode ray tube having a prism-shaped fiber optics faceplate, feeding means for advancing an information medium closely adjacent to one of the slanting end faces of the fiber optics faceplate, and control means for controlling the cathode ray tube to emit a flying-spot from the one of the slanting end faces in read-in operation and emit a flying-spot from the other slanting end face in read-out operation.

3,732,368

**SURVEILLANCE UNIT FOR SCANNING AN AREA UNDER SURVEILLANCE**

Salim S. Mahleb, Hackensack, N.J., assignor to Telesphere Technology, Inc., Hackensack, N.J.

Filed April 23, 1971, Ser. No. 136,737

Int. Cl. H04n 5/00

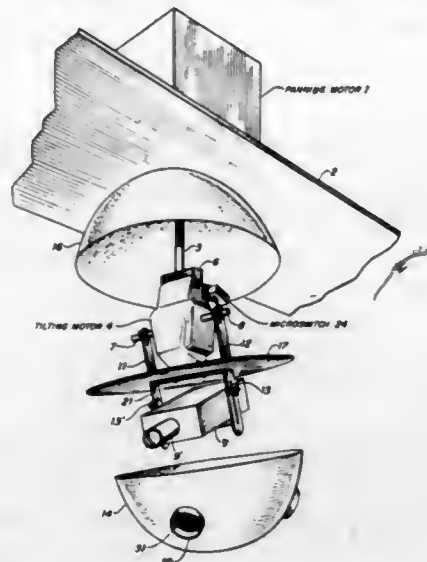
U.S. Cl. 178-7.81

20 Claims

A generally spherical surveillance unit is disclosed which is supported from the ceiling by a vertically oriented surveil-



lance unit support shaft which rotates the entire surveillance unit in the panning mode either manually or automatically and which supports the weight of the surveillance unit. A TV camera or other surveillance subunit is coupled to a tilting motor which is mounted inside a spherical enclosure and



which in turn is supported by the support shaft. The tilting motor tilts the camera along with the spherical enclosure surrounding the surveillance unit to provide for tilting of the unit along with panning of the unit for maximum coverage. The entire unit is "mod" in appearance and is unobtrusive in the performance of its scanning functions.

3,732,369

## COORDINATE DIGITIZER SYSTEM

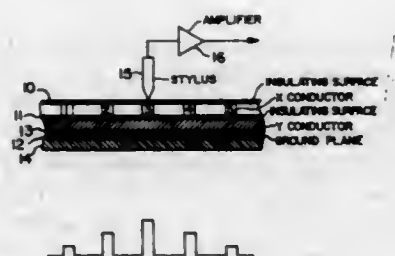
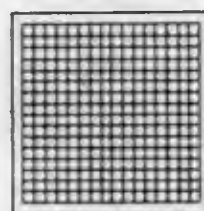
William L. Cotter, Beverly, Mass., assignor to Welland Investment Trust, Newton, Mass., a part interest; William F. Kenney, Westwood and Martin H. Reiss, Newton, Mass.

Filed April 5, 1971, Ser. No. 130,969

Int. Cl. G08c 21/00

U.S. Cl. 178-18

13 Claims



A coordinate digitizer employs a stylus whose position on a platen is converted into digitized coordinates by utilizing the signals capacitively coupled to the stylus. The platen has a coarse grid formed by two crossed sets of parallel wires regularly spaced along the coordinate axes. The platen also has a fine grid of crossed sets of parallel wires spaced more closely along the coordinate axes than the coarse grid wires. The wires in a fine grid set are constituted by four groups of wires. To digitize the stylus position along one coordinate axis, all the wires of a group are electrically pulsed together, each

group being pulsed in turn. The wires of the coarse grid are then pulsed, one at a time, in sequence. The signals detected by the stylus from the pulsing of the fine wires are used to establish a "fine" digitized position that periodically recurs along the coordinate axis. The signals detected by the stylus from the pulsing of the coarse wires are used to establish a "coarse" digitized position that uniquely fixes the fine position on the coordinate axis. The system then scans the wire of the other coordinate axis in the same manner to digitize the position of the stylus on that axis. The system alternately scans the coordinate axes to repetitively digitize the position of the stylus with sufficient rapidity to track the movements of the stylus.

3,732,370

## EQUALIZER UTILIZING A COMB OF SPECTRAL FREQUENCIES AS THE TEST SIGNAL

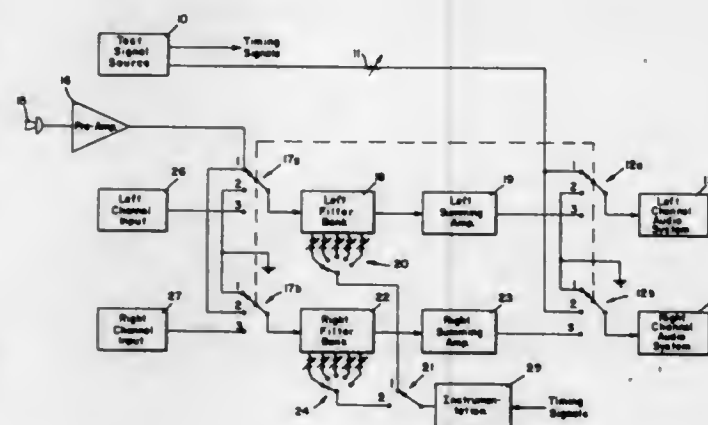
Jack Sacks, Palos Verdes Estates, Calif., assignor to United Recording Electronic Industries, Hollywood, Calif.

Filed Feb. 24, 1971, Ser. No. 118,454

Int. Cl. H03j 5/24

U.S. Cl. 179-1 D

14 Claims



A system and method is described for electronically equalizing the composite transfer function of a loud speaker system and room which receives the sound generated by the speaker system. A test signal source is broadcast into a room through the normal loud speaker amplifier system. A substantially flat microphone and preamplifier is used to detect the system and feed the detected audio signal through a bank of audio filters substantially covering the low, middle, and high range audio spectrum from approximately 30 cycles to 20 kilohertz (KHZ) by using approximately three narrow band peaking filters per octave. The power in the bandwidth of each filter is detected and measured against a known reference and the individual gain of each of the filters is adjusted to obtain a substantially flat acoustic response. The normal conventional input sound source, be it a tuner or tape deck, is then fed through the adjusted bank of narrow band filters directly into the audio sound system for broadcast into the room in the conventional manner.

3,732,371

## WIDE DYNAMIC RANGE NOISE MASKING COMPANDOR

Richard S. Burwen, 12 Holmes Road, Lexington, Mass.

Filed May 10, 1971, Ser. No. 141,544

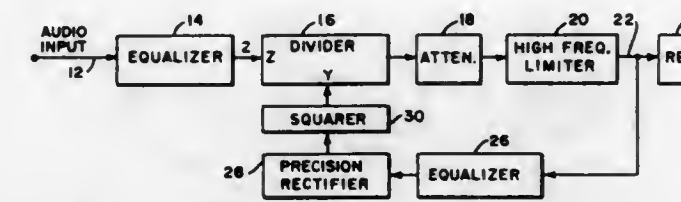
Int. Cl. H04b 1/64

U.S. Cl. 179-1 R

24 Claims

A noise masking compandor for greatly reducing the noise added to a wide dynamic range audio signal in passing through a noisy channel, such as a tape recorder. The audio signal, having a dynamic range of approximately 90 db, is com-

pressed to a dynamic range of approximately 30 db for transmission through the noisy channel then subsequently expanded in a complementary fashion to its original 90 db range to provide a faithful reproduction of the original signal without noticeable noise. Compression and expansion result from high precision rectifiers to minimize distortion, and are



further achieved without the need for maintaining precisely constant input and output levels for the noisy channel to avoid frequency response distortion. A high degree of high and low frequency signal preemphasis is provided in the compression and expansion characteristic without creating overload problems for the noisy channel.

3,732,372

## MULTI-UNIT INTERCOM SYSTEM

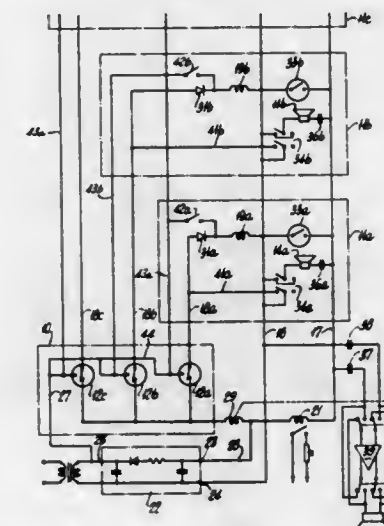
Frank Tramontano, Forest Hills, N.Y., assignor to E.R.L. Electronic Products, Inc., Forest Hills, N.Y.

Filed Sept. 14, 1971, Ser. No. 180,413

Int. Cl. H04m 9/02

U.S. Cl. 179-2 A

10 Claims



A multi-unit intercom system is disclosed in which a plurality of remote stations can be signaled from a common station. Switches are provided at the remote stations for persons located there to either control a two-way communications link between the particular remote station and the common station or operate an electrical device such as a door latch for admitting the person at the central station to a facility.

3,732,373  
TONE CONTROL CIRCUITS

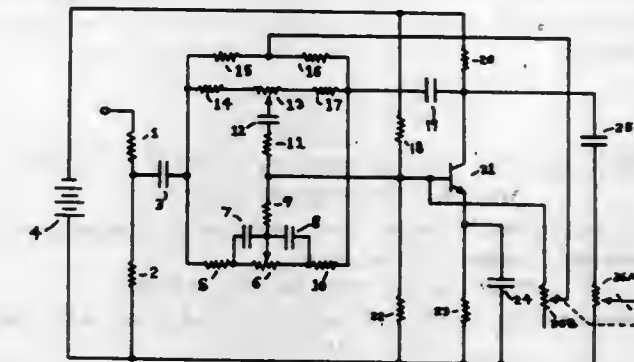
Willis Guild Boyden, 24 Press Avenue, Norwood, Mass.

Filed Oct. 12, 1971, Ser. No. 188,229

Int. Cl. H03g 5/00

U.S. Cl. 179-1 D

1 Claim



A combined tone and volume control circuit in which two ganged potentiometers are used to simultaneously vary the volume of and effect of the tone control on a signal.

3,732,374

## COMMUNICATION SYSTEM AND METHOD

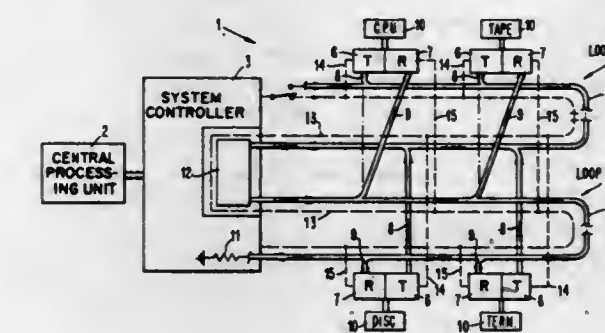
Edouard Y. Rocher, Ossining, and Stanley E. Schuster, Granite Springs, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1970, Ser. No. 103,243

Int. Cl. H04j 3/08

U.S. Cl. 179-15 AL

30 Claims



A multi-loop multiplex communication system is disclosed wherein a plurality of remote transmitting terminals are connected via a loop to a system controller and wherein a plurality of remote receivers are connected via a second loop to the same system controller. In operation, all communications between devices associated with the first loop, the second loop and the system controller are carried out via assigned time slots in a system time frame. Under control of the system controller, all communications between devices associated with the first loop and devices associated with the second loop are carried out via non-assigned time slots in the system time frame. When device-to-device communications are being carried out, means are provided at the system controller for connecting the first and second loop in series converting the two loops from their essentially parallel operation when devices associated with either loop interact with the system controller. In one embodiment, a variable time delay is provided at the system controller called a compensation delay which, regardless of the loop lengths, in conjunction with the propagation delay, makes the total delay a constant value. This permits the use of the same assigned time slot by the transmitter and receiver associated with a given device and which are connected to different loops. In another embodiment, the delay arrangement is eliminated by providing a third cable which is



in parallel with both loops and which provides a bit, byte and frame synchronization for all devices associated with both loops. In the latter arrangement, however, device-to-device communication is still carried out using nonassigned time slots while device-to-system controller and system controller-to-device communications are still carried out on assigned time slots. A controller switching arrangement is shown along with an example of a typical terminal device and, further, a method for operating the multi-loop multiplex communication system is disclosed.

3,732,375

# **PAIRED SIGNAL TRANSMISSION SYSTEM UTILIZING QUADRATURE MODULATION**

Michio Kuribayashi, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

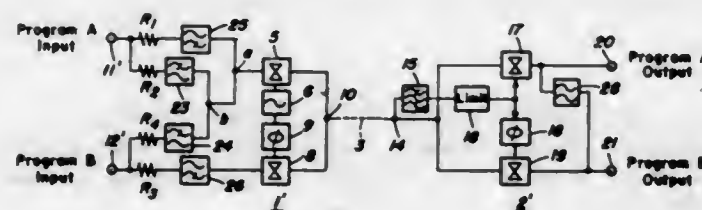
Filed Jan. 22, 1970, Ser. No. 4,872

Claims priority, application Japan, Jan. 24, 1969, 44/4706

Int. Cl. H04h 5/00

U.S. Cl. 179-15 BT

1 Claim



Signal transmission systems for the transmission of a pair of information signals are provided in accordance with the teachings of the present invention wherein a pair of carrier signals in quadrature phase relation are amplitude modulated, respectively, by the pair of information signals. One of the carrier signals, a double sideband signal obtained from amplitude modulating such one carrier signal with one of the pair of information signals and a double sideband signal obtained by amplitude modulating the other of the carrier signals with the other of the information signals which has had the low frequency components removed therefrom are transmitted as quadrature modulation signals to at least one receiving station over a predetermined transmission path. At the receiving station, one of the carrier signals is regenerated from the quadrature modulation signals received thereby and such regenerated carrier signal is relied upon to accomplish the demodulation of the quadrature modulation signals received.

3,732,376

# **TIME DIVISION MULTIPLEX CODER**

Andre Edouard Joseph Chatelet, Montrouge, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed March 10, 1972, Ser. No. 233,648

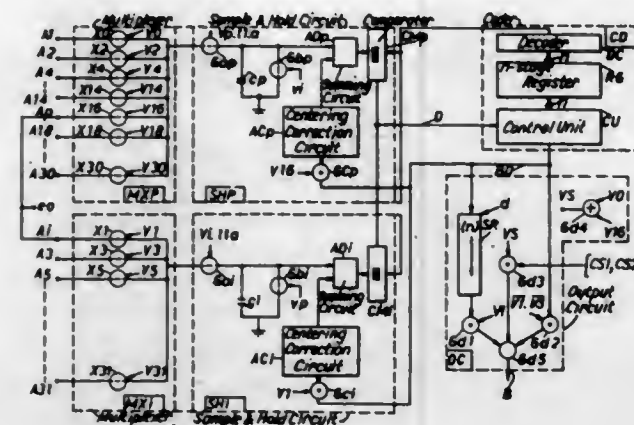
Int. Cl. H04j 3/12

U.S. Cl. 179-15 BY

10 Claims

The coder disclosed has two sample and hold circuits, one of which is primarily for sampling the analog signals for even numbered input sources and the other of which is for sampling the analog signals of odd numbered input sources. In addition, there is provided a coder centering circuit associated with each of the sample and hold circuits and a single feedback type coder coupled to each of the sample and hold circuits and each of the coder centering correction circuits. Two even numbered channels V0 and V16 are employed for the transmission of signalling and synchronization data while an odd numbered channel V1 and an even numbered channel V16 is employed to actuate the two centering circuits. The even numbered channel sample and hold circuit has one odd numbered input signal coupled thereto during channel time V0,

the analog coder centering reference signal coupled thereto during channel time V16 and the even numbered analog input signals coupled thereto during the remainder of the even numbered channel time. The odd numbered channel sample and hold circuit has the analog coder centering reference signal coupled thereto during channel time V1 and the remainder of



the odd numbered analog input signals coupled thereto during the remainder of the odd numbered channel time slots. A delay arrangement is coupled to the output of the coder so that the output code occurring in channel time V0 is delayed to occur in time slot V1 thereby leaving the even numbered channel time V0 and V16 for the transmission of signalling and synchronization codes.

3,732,377

# **OUTGOING TRUNK MARKER**

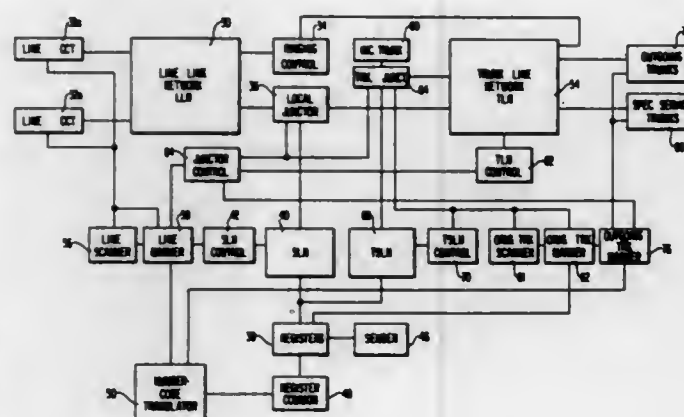
Otto Altenburger, and David W. Stoddard, both of Rochester, N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Dec. 31, 1970, Ser. No. 103,267

Int. Cl. H04q 3/54

U.S. Cl. 179-18 R

18 Claims



A marker circuit, particularly an outgoing trunk marker, provides marking signals, and other signals for servicing a plurality of equipment. For outgoing trunk marking purposes, battery marking signals are employed to mark a designated outgoing trunk group out of up to 100 groups on a time division multiplex basis. Revertive and paystation call features, in addition to fault detection circuitry are also incorporated into the marker.

3,732,378

# **PROCESS AND APPARATUS FOR THE REGENERATION OF RECTANGULAR SIGNALS**

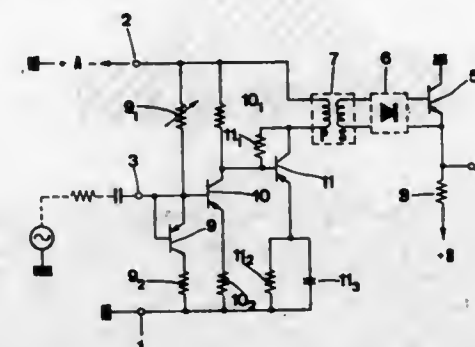
Robert Jean Chaumont, Sceaux, and Gilbert Louis Bargeton, Paris, both of France, assignors to Societe dite: Societe Anonyme de Telecommunications, Paris, France

Filed March 17, 1971, Ser. No. 125,041

Int. Cl. H04m 1/36; H04i 27/06

U.S. Cl. 179-16 EA

10 Claims



The present invention relates to a process and a transistorized device for improving the reproduction of the duration of successive signals of a train of impulses such as are utilized, for example, in automatic telephonic systems for the transmission of call signals on each of the channels of a carrier current multiplex signal in which the rectangular signals of a train of rectangular impulses are generated by modulating the amplitude of a sinusoidal wave, the frequency of which is high by comparison with the recurrence frequency of said impulses, and in which the duration of the regenerated impulses is determined by the time-interval between the passage of a threshold value by an impulse, on one hand, when that impulse passes from zero to maximum value and, on the other hand, when that impulse passes from its maximum value to zero, while according to the invention, the threshold value is varied in the same direction as the variations in its maximum value of this impulse during the time this impulse passes from maximum value to zero.

3,732,379

# **DISTRIBUTION BOARD**

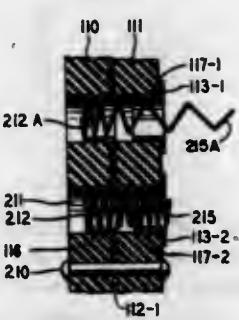
Joseph Patrick Focarile, Tennent, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed March 23, 1971, Ser. No. 127,139

Int. Cl. H04q 1/14

U.S. Cl. 179-91

5 Claims



A main distributing frame for a telephone central office is disclosed in which quasi-permanently wired cross-connections may be automatically effected or removed. Connections are made by inserting a coiled, spring-like conductor into a recess equipped with the terminals between which a connection is to be completed. After being inserted to the proper depth, the conductor is allowed to partially unwind thereby allowing it to make a wiping engagement with the terminals in the recess. Connections are taken down by grasping one end of the coiled conductor and pulling it out of the recess in such a manner

that it tends to unwind as pulled. Advantageously both the insertion and removal of the coiled conductors may be made by automatically controlled means. Removed conductors may be discarded.

3,732,380

# **SAMPLE AND HOLD REMOTE CONTROL FOR FM TAPE DECKS**

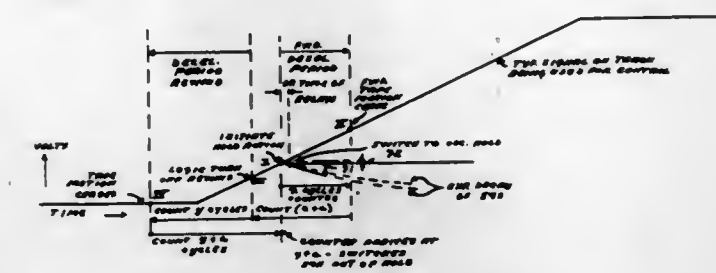
Robert L. Kimball, 725 Saddlewood Avenue, Dayton, Ohio

Filed Jan. 4, 1972, Ser. No. 215,346

Int. Cl. G11b 15/20

U.S. Cl. 179-100.2 B

5 Claims



When the hold button is pushed the signals to the FM discriminators are switched from the signals on the tape to the signals from the record oscillators, which are tracking the signals on the tape (the recording heads are disconnected), and the output from the record oscillators provide constant hold signals. As the tape coasts to a stop the cycles of FM signal on the tape are counted by a counter. When the tape is rewound the total number of FM cycles the tape runs (including in the backward direction rewind coast) is counted. Then when the tape is placed in forward position again when the position on the tape passes the playback heads at which the hold was initiated the held signals are removed and normal operation continues from substantially the position at which the hold was initiated.

3,732,381

# **SYSTEM FOR CORRECTING FOR DOPPLER SHIFT FREQUENCY ERROR OF TRANSMITTED SIGNALS**

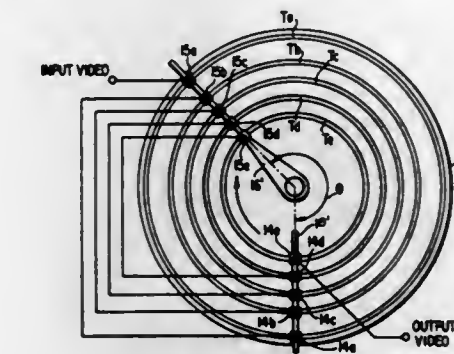
George F. Newell, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 24, 1970, Ser. No. 75,197

Int. Cl. G11b 5/52, 21/00

U.S. Cl. 179-100.2 K

2 Claims



A system for correcting the error in frequency of color television signals received from space vehicles resultant from a Doppler shift in frequency from the desired frequency of the signals as initially transmitted. A rotating magnetic recording disk includes two magnetic recording heads positioned at the same radius and angularly separated relative to the axis of rotation of the disk for communicating with a common recording band of the disk. The received signal is recorded by one head and read by the other, one head being fixed in position and the other being angularly movable about the disk to



provide a time delay of controllable duration of the signal, between recording and reading thereof. Means are provided for adjusting the rate of change of the angular separation of the heads as a function of the Doppler shift frequency error, thereby to produce an output signal from the read head of the desired initial frequency. An embodiment with a plurality of heads in cascade is included.

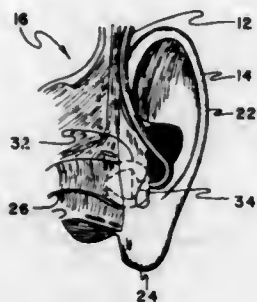
3,732,382

## HEARING AID EAR PIECE

William L. DeWitt, P. O. Box 518, Roscommon, Mich.  
Filed Nov. 1, 1971, Ser. No. 194,267  
Int. Cl. H04r 1/10

U.S. Cl. 179-182 R

9 Claims



A relatively light weight plastic ear piece having a spherical configuration as positioned in the interior portion of the concha behind the tragus over the auditory canal orifice. The diameter of the ear piece is large enough to permit snug engagement between the tragus and concha while preventing it from wedging in the auditory canal, so that a clearance exists between the canal and the atmosphere to prevent pressure differentials therebetween.

3,732,383

## MULTIPLE INTEGRAL TIMERS WITH IMPROVED HOUSING SUPPORT PLATE

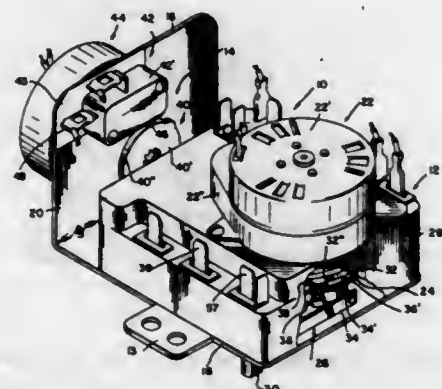
Elmo W. Voland, Indianapolis, and Noel C. Mullikin, Beech Grove, both of Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Sept. 28, 1970, Ser. No. 75,854

Int. Cl. H01h 43/10

U.S. Cl. 200-38 R

2 Claims



At least two timing mechanisms are carried by a single base member. Each of the timing mechanisms include program means responsive to constant speed drive means, switch means responsive to the program means, electrical terminals electrically connected to the switch means, and electrical leads electrically connecting the timing mechanisms together.

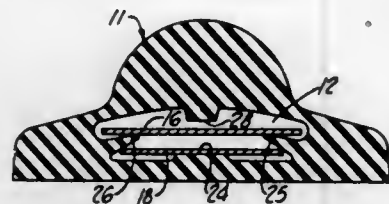
3,732,384

## LINEAR SWITCH

Gustave Fischel, 1064 South Holt Avenue, Los Angeles, Calif.  
Filed June 29, 1971, Ser. No. 157,932  
Int. Cl. H01h 13/16

U.S. Cl. 200-86 R

1 Claim



A linear switch having a pair of elongated superposed metal strip conductors positioned within a centrally located cavity formed within a resilient nonconductive casing. The lower conductor strip is supported within the cavity by a longitudinally extending rib or anvil-like portion which is integral with the casing. The upper conductor strip is supported within the cavity in a normally spaced relationship with the lower conductor strip by a pair of yieldable flanges which are integral with the casing and which protrude into the cavity a limited distance.

3,732,385

## GAS-BLAST SWITCH

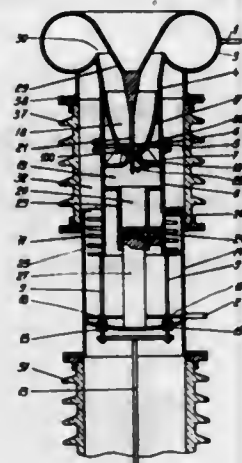
Viktor Herbert Stephanides, 8002 Zurich, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland  
Filed March 6, 1972, Ser. No. 232,125

Claims priority, application Switzerland, May 5, 1971, 6650/71

Int. Cl. H01h 33/82

U.S. Cl. 200-148 R

5 Claims



A gas-blast switch comprising a switching pin and an electrode having a burning-off surface, the switching pin and electrode being electrically conductively connected with one another when the switch is in a closed condition. Drive means serve for carrying out relative separation movement of the switching pin and electrode away from one another during switching-out or disconnection of the gas-blast switch in order to extend or draw in the lengthwise direction the arc prevailing between the switching pin and the electrode during such separation movement, the arc being flushed by a flowing stream of extinguishing gas. The burning-off surface of the electrode is arranged in a widened discharge channel of a Laval nozzle directly after the narrowest location or throat of such nozzle, the switching pin during the switching-out operation being retracted in the flow direction of the extinguishing gas into the discharge channel of the Laval nozzle.

3,732,386

## ALTERNATE ACTION SWITCH WITH BINDING PREVENTING ARRANGEMENT

Masao Ohkita, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

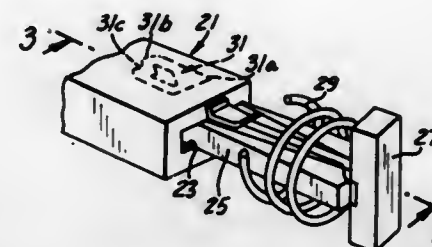
Filed April 1, 1970, Ser. No. 24,656

Claims priority, application Japan, April 25, 1969, 44/37786

Int. Cl. H01h 13/56

U.S. Cl. 200-153 J

11 Claims



A pushbutton switch in which the pushbutton, when pushed, will alternate between an outer position and an inner position, the structure for effecting this movement exerting a minimal frictional force on the pushbutton of the switch as it moves from one operative position to the other and being so arranged as not to take up any more space than the switch proper. A heart-shaped channel is formed on an inner wall of the pushbutton body, a driving member is carried by the push rod and has a part received in that channel so as to operatively coact therewith, and a spring is mounted on an end of the switch body so as to engage and slide over the driving member as the pushbutton moves while at the same time urging the driving member against the push rod. Preferably the push rod is provided with a channel within which the driving member is received, thereby to further minimize the space taken up by the operating parts.

3,732,387

## KEY SWITCH

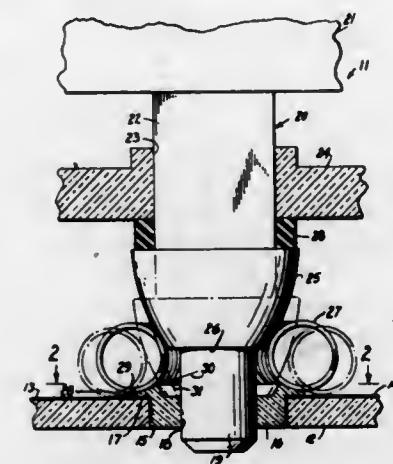
William A. Berry, Covina, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.

Filed Oct. 22, 1971, Ser. No. 191,915

Int. Cl. H01h 1/20, 13/52

U.S. Cl. 200-159 R

5 Claims



A key switch incorporated with a printed circuit board having conductors thereon and a bearing member loosely fitted in a hole formed between adjacent terminal ends of the conductors. A depressible key is slideable in the bearing member and has a generally conical surface engaging an expandable toroidal contact spring member which rests on an outwardly tapering surface of the bearing member. As the key is depressed the conical surface thereof expands the spring member downwardly over the surface of the bearing member and into bridging contact with the conductors.

3,732,388

## UNITARY INSULATING HOUSING FOR ROCKER SWITCHES

William Eric Taylor, Walsall, England, assignor to George Turnock Limited and Henry Charles Shelton, London, England

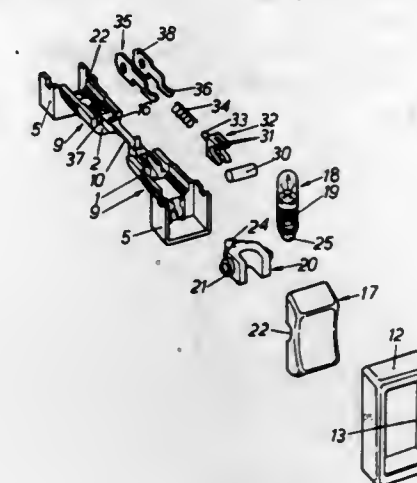
Filed July 26, 1971, Ser. No. 166,042

Claims priority, application Great Britain, July 29, 1970, 36,601/70

Int. Cl. H01h 9/02

U.S. Cl. 200-168 C

9 Claims



A rocker switch has a rocker housing and a cylindrical switch housing extending from the rocker housing. A switch mechanism is mounted in the switch housing and is operated by a rocker mounted at least partially within the rocker housing to pivot about an axis. The cylindrical switch housing is smaller than the rocker housing so that the switch housing can be inserted in a hole in a face to project through the hole and be located with the rocker housing abutting the face. Also the two housings are formed as integral parts of a switch body comprising a pair of moulded shells arranged on opposite sides of a plane including the axis of the cylindrical switch housing.

3,732,389

## TOUCH ENTRY SWITCH ARRAY

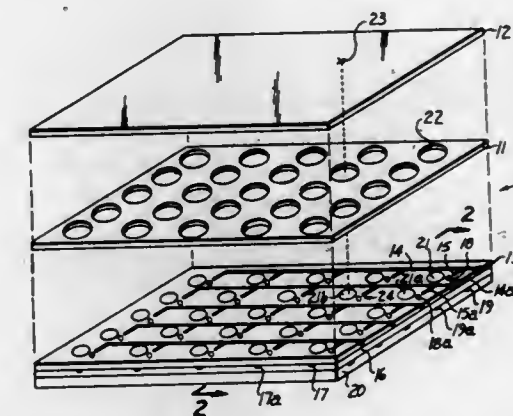
George R. Kaelin, and David M. Platt, both of Woodland Hills, Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Feb. 14, 1972, Ser. No. 225,826

Int. Cl. H01h 9/16

U.S. Cl. 200-167 A

6 Claims



A touch entry switch array comprising a layer of non-conductive material is sandwiched between two conductive layers. Orthogonally disposed conductors are arranged in a matrix and adapted to make electrical connection by deforming an upper resilient, transparent or translucent layer through respective apertures to establish electrical contact. Indicator means is provided to indicate through the apertures the actual



tion of the associated switch. In one form of the device, the orthogonal conductors are supported on the lower layer and the upper layer is constructed of transparent or translucent conductive material which may be deformed through the apertures to operate the associated switch. In another form of the invention, one set of conductors is supported on the upper layer to be deformed through the apertures to contact conductors on the lower layer.

### 3,732,390 KEYSWITCH

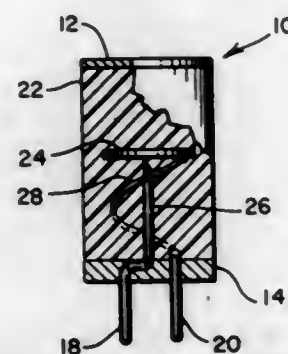
Phillip J. Novak, Granger, Utah, assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 27, 1971, Ser. No. 212,015

Int. Cl. H01h 3/12, 9/04

U.S. Cl. 200-168 G

2 Claims



An electromechanical switch that includes a floating contact suspended in an elastic material above a fixed contact is disclosed. Finger pressure compresses the elastic material forcing the floating contact to make electrical contact with the fixed contact completing the switch circuit.

### 3,732,391 METHOD OF SOLID PHASE WELDING FOR PIPES

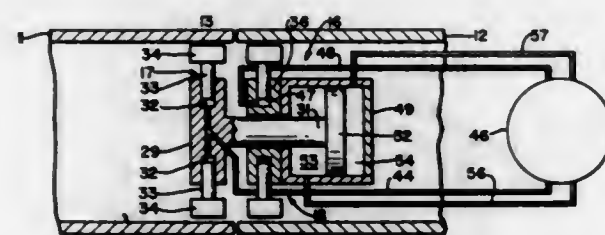
Jean La Force, P.O. Box C, Inverness, Calif., and Carl Stringer, P.O. Box 755, Pearland, Tex.

Filed June 1, 1971, Ser. No. 148,572

Int. Cl. B23k 31/06

U.S. Cl. 219-67

2 Claims



Solid phase or pressure welding of adjacent pipe ends is accomplished by placing a pair of expandable elements maintained in axial alignment within the pipe ends and radially expanding the elements into firm grasping relationship with the interior bore walls of the respective pipe ends. Thereafter, the elements are axially moved together to place and hold the pipe ends in axially aligned abutment and create upset pressure in the region of the abutting ends while heat is applied thereto to produce a solid phase welded joint between the pipe ends.

### 3,732,392 POLARITY REVERSAL SYSTEM FOR ELECTRICAL DISCHARGE MACHINING APPARATUS

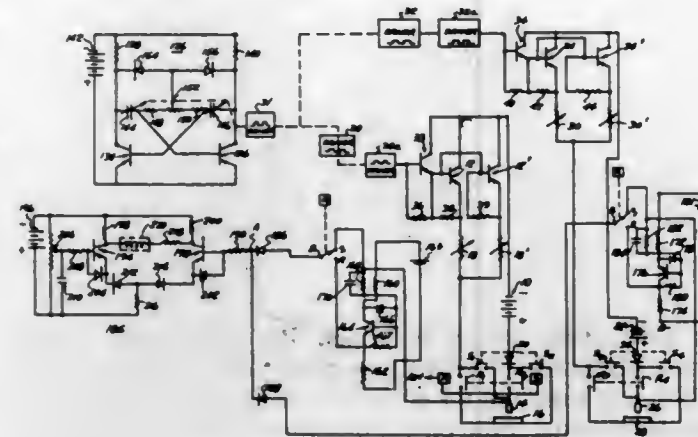
Dalton R. Verner, Orchard Lake, Mich., assignor to Elox Inc., Davidson, N.C.

Filed March 10, 1971, Ser. No. 122,830

Int. Cl. B23p 1/08, 1/14

U.S. Cl. 219-69 C

19 Claims



A control system is provided with an electronic switch control network for maintaining a constant polarity gap output signal from a single or multiple electrode gap system independently of whether the electrical power conducting leads from the power source are connected to one or the other of the EDM gap elements. The gap output signal which is ordinarily representative of gap voltage is then utilized in other associated EDM circuits such as for an example power feed control networks and machining pulse cut-off control networks to regulate their operation.

### 3,732,393 ELECTRIC ARC WELDING PROCESS

Gunther Wilkens; Hansfriedrich Lehmler, and Alfred Krah, all of Frankfurt/Main, Germany, assignors to Messer. Griesheim GmbH, Frankfurt/Main, Germany

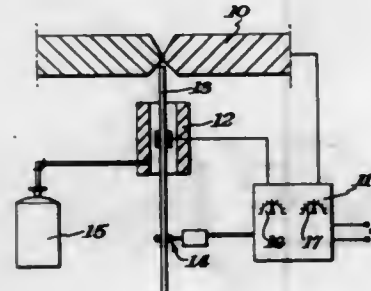
Filed Aug. 31, 1971, Ser. No. 176,578

Claims priority, application Germany, Sept. 3, 1970, P 20 43 640.2

Int. Cl. B23k 9/00

U.S. Cl. 219-137

10 Claims



An electric arc welding process for welding together sheets of unalloyed or low alloyed structural steel utilizes a consumable wire electrode under shielded gas and is characterized in that the welding is conducted with a voltage of 25 to 40 V at a current density of 300-400 A/mm<sup>2</sup> wire electrode cross-section with the wire electrode having a diameter of about 0.8-1.2 mm and the shielded gas containing at least some CO<sub>2</sub>.

### 3,732,394 IRON

Maurice Cusworth, Garforth, near Leeds, England, assignor to Isaac Braithwaite & Son Engineers Ltd., Kendal, Westmoreland, England

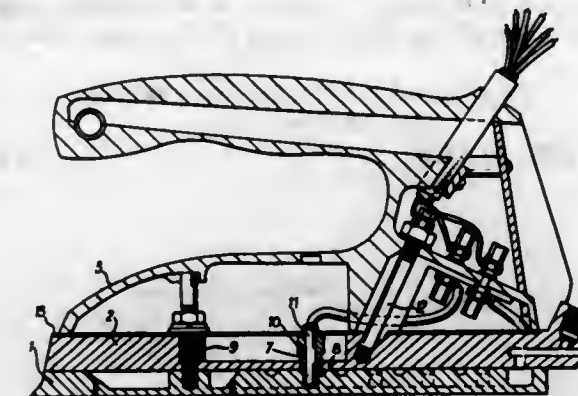
Filed Feb. 17, 1971, Ser. No. 115,979

Claims priority, application Great Britain, Feb. 19, 1970, 7,905/70

Int. Cl. D06f 75/26

U.S. Cl. 219-251

6 Claims



An iron including heating means and a sole plate wherein means for controlling the heating means is provided in the sole plate.

### 3,732,395 YARN HEATER

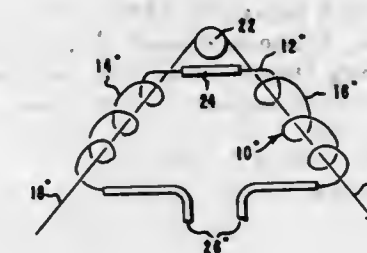
Israel A. David, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 22, 1971, Ser. No. 155,465

Int. Cl. F27b 9/06

U.S. Cl. 219-388

2 Claims



A yarn heater having substantially equidimensional, coiled lengths of electrical resistance wire interconnected by a coil-reversing loop is located coaxially of a running yarn and does not require a free end of yarn for stringup.

### 3,732,396 STEAM VESSEL FOOD WARMER

Jacob S. Tucker, 4421 Granada Boulevard, Apt. 322, Warrensville Heights, Ohio

Filed Sept. 13, 1971, Ser. No. 179,704

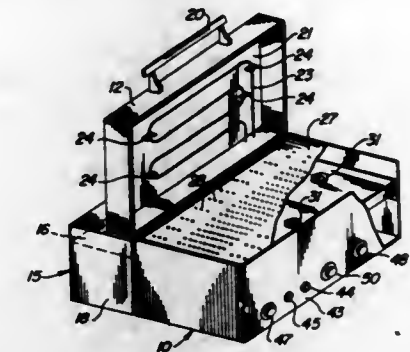
Int. Cl. F27d 11/02

U.S. Cl. 219-401

8 Claims

Steam heating apparatus for heating frozen and refrigerated foods to render them appetizing both in appearance and taste. Long and short steam heating periods are provided as well as a sear heater for browning meat, bread and the like. A short or long period of steam heating operation is initiated by depressing an appropriate switch associated with a timer

which in turn controls a time delay relay. The second time delay relay controls operation of a motor driven pump which pumps water during a given interval to atomizing nozzles. The atomizing nozzles are mounted on a lower heating plate in a steam housing and direct atomized water droplets to an upper



heated plate provided with apertures. The water droplets are converted into steam by contact with one or both of the hot plates. Steam rises through the apertures in the top plate to heat the food positioned thereon. Sear heating is controlled by a sear timer and is independent of the steam heating cycles.

### 3,732,397 INHERENT REDUNDANCY ELECTRIC HEATER

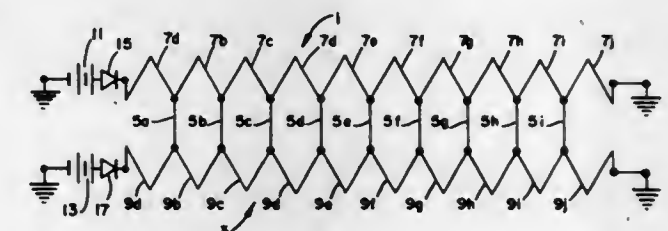
James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Bruce H. Kernodle, Palm Beach Gardens, Fla.

Filed March 30, 1972, Ser. No. 239,576

Int. Cl. H05b 1/02

U.S. Cl. 219-477

9 Claims



A cross-wound electrical heater comprising two resistance coils wound together with opposite pitches and electrically connected at their crossing points. Each element is supplied by a separate power supply of the same magnitude, and each power supply is isolated from reverse currents by a diode. Failure of one of the windings results in only a moderate change in output power.

### 3,732,398 ELECTRICAL HEATING ELEMENT AND FITTING ASSEMBLY

James F. Pease, 100 View Point Drive, Dayton, Ohio  
Continuation-in-part of Ser. No. 194,742, Nov. 1, 1971, abandoned. This application April 17, 1972, Ser. No. 244,516  
Int. Cl. H05b 3/06

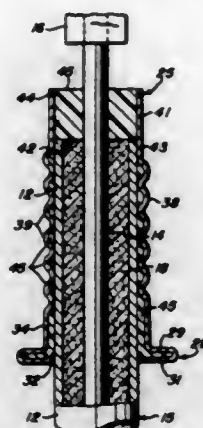
U.S. Cl. 219-536

9 Claims

A heating element includes an elongated tubular sheath which confines a resistance wire supported by a thermally conductive electrical insulation material which extends to a position flush with the end surface of the sheath. Each end portion of the heating element is supported by a bulkhead fitting which is formed of sheet metal and includes a tubular wall portion having helical convolutions defining external



threads. A radial flange portion projects outwardly from the tubular wall portion and forms an annular tapered hub portion firmly engaging the outer surface of the sheath. The flush end surfaces of the insulation material and the sheath are spaced



inwardly from the end surface of the fitting to define a cavity, and a thermosetting sealant material is disposed within this cavity and the space defined between the outer surface of the sheath and the helical convolutions.

3,732,399

COMBINED OVAL SLIDE RULE AND NOMOGRAPH

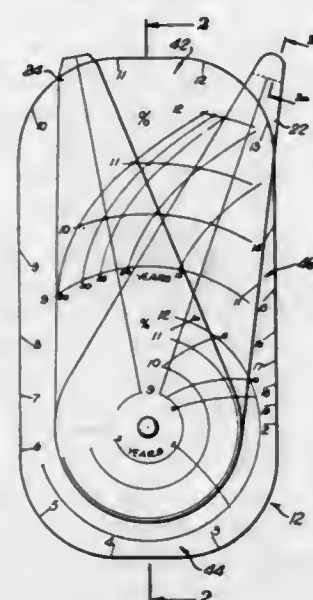
Donald G. Finley, 1658 Morse Drive, San Pedro, Calif

Filed Feb. 28, 1972, Ser. No. 229,945

Int. Cl. G06k 1/00

U.S. Cl. 235—61 B

5 Claims



A calculating device comprising a flat generally oval-shaped card member having a perimeter defining somewhat semicircular sections interconnected by a central elongated section. The central section is formed of a generally straight periphery. A pair of indicating arms are rotatable about a pivot point on the member. The pivot point may be along the longitudinal axis of the card member, and offset from the center of the member. In addition, a scale may be printed on one side of the periphery of the member. Moreover, the semicircular sections can be identical in size, and a scale printed on the other side of the member and adjacent the periphery of the member may be the reciprocal of the scale on the first side. In addition, the calculating device may be used as a loan payment computer for determining the periodic payments due on a predetermined loan. By providing the card member with a plurality of interest rate curves which are juxtaposed with a plurality of loan duration curves, the scale may be representative of periodic pay-

ments. Thus, by positioning one of the indicia arms at the intersection of the desired interest rate and loan duration, the resultant position on the scale would be representative of the periodic payment for the intersecting interest rate and loan duration.

3,732,400

PUNCHED CARD READER WITH A DRUM-SHAPED, ROTATABLE CARD MAGAZINE

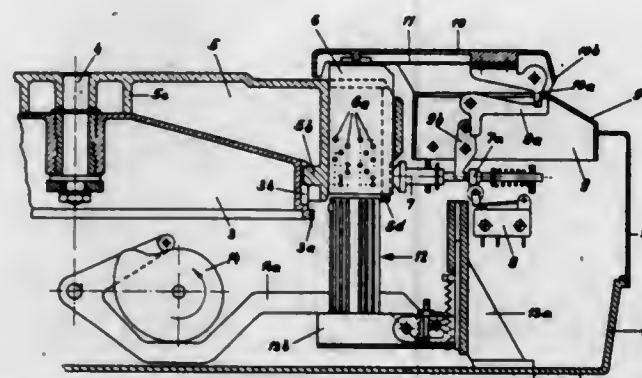
Bernhard Cramer, Pforzheim-Sonnenberg; Heinrich Deimling, Singen, and Rudi Hauf, Pforzheim, all of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed April 22, 1971, Ser. No. 136,464

Int. Cl. G06r 7/015

U.S. Cl. 235—61.11 B

7 Claims



A punched card reader wherein the cards are received in a horizontally arranged exchangeable carousel-type cassette which is provided, at its outer rim, with radial guide slots to be fed from above. The cards are evaluated by a contact spring set arranged below the path of rotation of the cards, which is vertically adjustable. It reads the cards successively during the periods of rest in a step-by-step reading cycle.

3,732,401

CODE READING APPARATUS

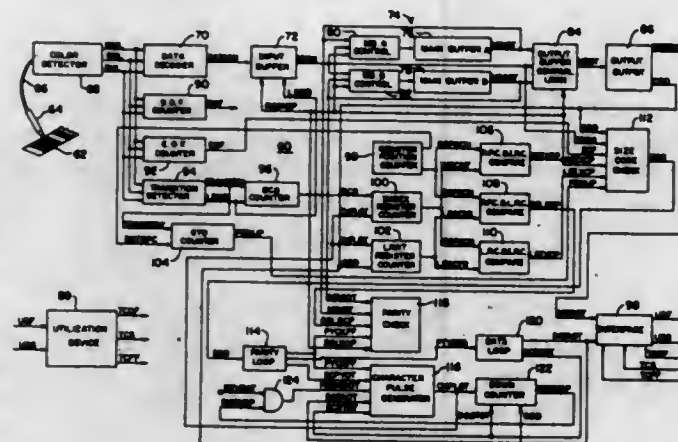
James P. Donohue, Fairborn; Ramesh S. Patel, Kettering, and Robert C. Gilberg, Dayton, all of Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Dec. 7, 1971, Ser. No. 205,544

Int. Cl. G06k 7/12

U.S. Cl. 235—61.11 E

6 Claims



A system for processing a color bar code read optically from a coded medium is disclosed. The system includes logic for determining the binary code from color signals and storage means for temporarily storing the binary code. Logic is also provided which allows the reading of a double field tag and

which checks the parity and the size of the captured message. Further, logic is provided for transmitting the captured message to a utilization device.

3,732,402

ELECTROMECHANICAL DEVICE FOR TAPE WINDING MECHANISM

Marcel-Louis Boyer, Chatillon, France, assignor to Compagnie Industrielle des Telecommunications Cit-alcotel, Paris, France

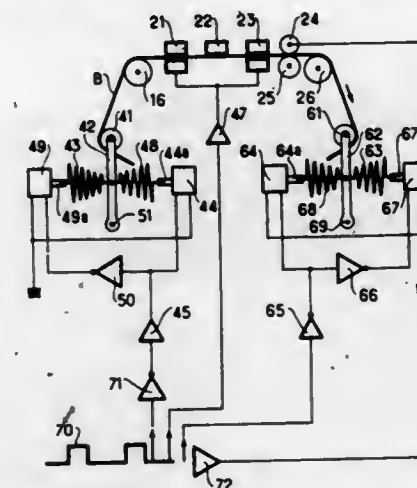
Continuation-in-part of Ser. No. 136,496, April 22, 1971. This application May 30, 1972, Ser. No. 257,900

Claims priority, application France, May 26, 1971, 7119073

Int. Cl. G06k 13/26; B65h 23/08

U.S. Cl. 235—61.11 R

9 Claims U.S. Cl. 235—113



An electromechanical device for a tape winding mechanism which adapts the step-by-step advance at very high speed and at low inertia to the control of the winding and unwinding spools which have a great inertia, in the case where the band must be periodically stopped for an instant, including lightweight pulley arrangements responsive to starting and stopping operations for automatically providing the required slack in the tape to overcome the difficulties created by the high inertia of the spools and wherein vibrations in the pulley arrangements are reduced to the maximum possible extent by the provision of pairs of coil spring members connected between the actuating solenoids and the pivot arms for the pulleys so that the required slack in the tape can be provided at high speed without harmful vibration.

3,732,403

REVERSIBLE COUNTER

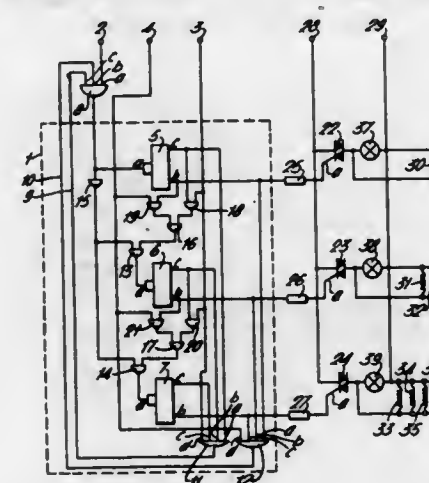
Flemming Thorsoe, Augustenborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Nov. 8, 1971, Ser. No. 196,594

Int. Cl. H03k 21/30

U.S. Cl. 235—92 PE

8 Claims



The invention relates to a reversible counter to which count-up and count-down impulses can be fed. Blocking signal.

means is provided in which the exceeding of the upper and lower limits of the counter is prevented. The blocking means is incorporated in a NAND element associated with the impulse input. The blocking means is influenced by the outputs of the binary stages of the counter being monitored and by the counting direction signal.

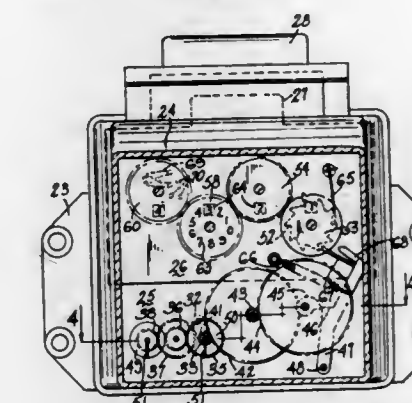
3,732,404  
METER DEVICE

Charles L. Jones, West Hartford, Conn., assignor to Ripley Company, Inc., Middletown, Conn.

Filed Sept. 20, 1971, Ser. No. 181,674

Int. Cl. G06c 27/00

9 Claims



A meter device for electrically reading incremental positions wherein the continuous rotation of a drive armature is converted to intermittent incremental rotation by a mechanism including a jumping cam, a lever arm having a cam follower responsive to the cam, a drive pawl member, a check pawl member which prevents forward motion of the ratchet wheel subsequent to each advancement by the drive pawl member, a detent for arresting reverse motion of the ratchet wheel subsequent to each advancement thereof, and including a plurality of wheel assemblies geared to the ratchet wheel and calibrated as to relative rates of rotation for incremental digital encoding.

3,732,405

APPARATUS FOR STATISTICAL TIME-SERIES ANALYSIS OF ELECTRICAL SIGNALS

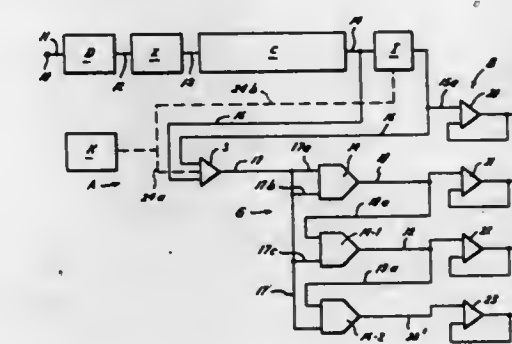
Carrington H. Stewart, Houston, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 11, 1971, Ser. No. 170,681

Int. Cl. G06g 7/62

U.S. Cl. 235—151.31

9 Claims



An apparatus for performing statistical time-series analysis of complex electrical signal waveforms, permitting prompt and accurate determination of statistical characteristics of the



3,732,406

# ANALOG MULTIPLIER AND SQUARE ROOT EXTRACTOR HAVING A PLURALITY OF STRAIN GAGES CONNECTED IN A BRIDGE CIRCUIT

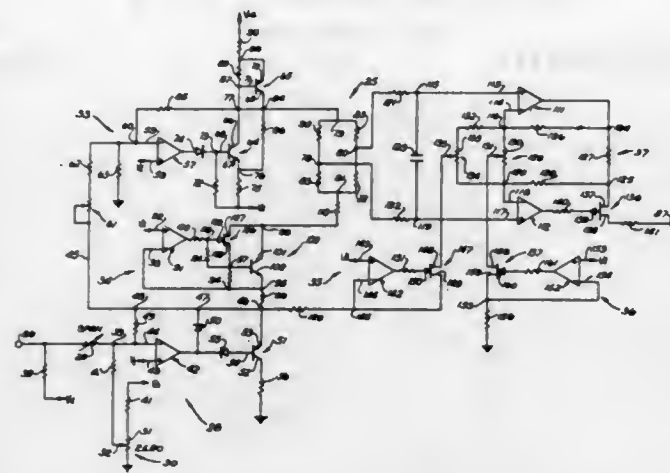
Gerald Lance Schlatter, Boulder, Colo., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 8, 1971, Ser. No. 160,750

Int. Cl. G06g 7/16, 7/20, 7/57; G011 1/22

U.S. Cl. 235-151.34

11 Claims



Computers for a mass flowmeter that produce a total pulse output directly proportional to total mass flow. Differential pressure (DP) unit and densitometer analog outputs are multiplied by passing a density current analog through the unit strain gage bridge. A square root extractor incorporating three integrators utilize the positive and negative sawtooth outputs of two integrators alternately as an input to the third. The absolute values of the sawtooth slopes is directly proportional to the DP-density product. The output of the third integrator is level detected to switch the two integrators on and off. The switching frequency is then directly proportional to the square root of the DP-density product, and the total switching count is directly proportional to the total mass flow.

3,732,407

# ERROR CHECKED INCREMENTING CIRCUIT

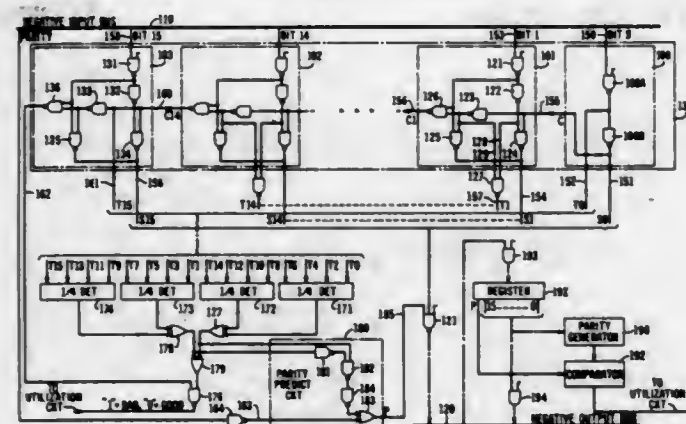
John Holt Brewster, Wheaton, and Ted Leroy Hoffman, Aurora, both of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 12, 1971, Ser. No. 198,211

Int. Cl. G06f 11/10

U.S. Cl. 235-153 BB

5 Claims



An add-one circuit having an error checking arrangement in which common circuits are employed to predict the parity of the output word of the add-one circuit and to assure that a single "0" to "1" transition occurs during each incrementing

operation. Single errors in the operation of the add-one circuit are fully detected by utilization of the transition detecting circuitry in combination with arrangements for comparing the predicted parity with the actual parity of the output word.

3,732,408

# OUTPUT DEVICE FOR ELECTRONIC DATA PROCESSING SYSTEMS

Hubertus Bettin, Braunschweig, Germany, assignor to Olympia Werke AG, Wilhelmshaven, Germany

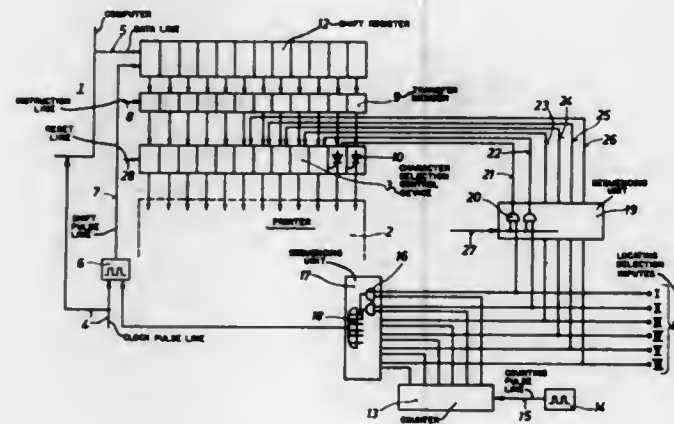
Filed March 16, 1971, Ser. No. 124,768

Claims priority, application Germany, March 16, 1970, P 20 12 305.1

Int. Cl. B41j 5/00, 5/04; G06f 5/02

U.S. Cl. 235-155

5 Claims



In a system for converting binary data into a decimal readout and in which the bits of a succession of binary words are fed in series into a shift register and fed out therefrom in parallel to control the selection of each decimal digit of the readout, a circuit for controlling the insertion of a decimal point at a selected location of the decimal readout by the application of a signal to a selected one of a plurality of selection inputs each corresponding to a respective location of the decimal readout, the circuit applying an additional shift pulse to the shift register for preventing the storage of a data bit in the shift register location corresponding to the selected decimal readout location and triggering the insertion of a decimal point at the selected readout location.

3,732,409

# COUNTING DIGITAL FILTERS

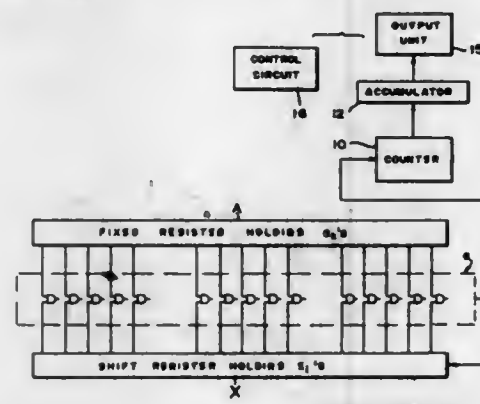
James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Shalhav Zohar, Sunland, Calif.

Filed March 20, 1972, Ser. No. 236,285

Int. Cl. G06f 7/38, 15/34

U.S. Cl. 235-164

24 Claims



Several embodiments of a counting digital filter of the non-recursive type are disclosed. In each embodiment two re-

gisters, at least one of which is a shift register, are included. The shift register receives  $J_x$ -bit data input words bit by bit. The  $k$ th data word is represented by the integer

$$x_k = \sum_{j=0}^{J_x-1} v_{kj}(-2)^j, \text{ wherein } v_{kj}=0, 1$$

In the shift register wherein the data words are fed in a monotonic word index sequence, they are separated by  $J_a-1$  spacing zero bits, where  $J_a$  represents the number of bits of each of  $K$  filter coefficients stored in the other register. The  $k$ th filter coefficient is represented by the integer

$$a_k = \sum_{j=0}^{J_a-1} u_{kj}(-2)^j \text{ wherein } u_{kj}=0, 1$$

An output sample  $y_m$  is computed as a function of  $J$  components in accordance with the expression

$$y_m = \sum_{r=0}^{J-1} (h_r)_m (-2)^r$$

$J$  is equal to  $J_a + J_x - 1$ . The  $(h_r)_m$ 's are functions of the bits of the coefficients and data words in accordance with the expression

$$(h_r)_m = \sum_{k=0}^{K-1} \sum_{j=0}^{J_a-1} u_{kj} v_{m-k-j, r-1}$$

Since the products in the last expression involve binary quantities only, each of them is determined as the output of a two-input AND gate. The double summation is carried out simply by counting all TRUE AND gates.

3,732,410

# SELF ADAPTIVE FILTER AND CONTROL CIRCUIT THEREFOR

Laurence Kenneth Mackechale, Granger, Ind., assignor to Commonwealth of Australia, C/-Postmaster-General's Department Research Laboratories, Melbourne, Australia

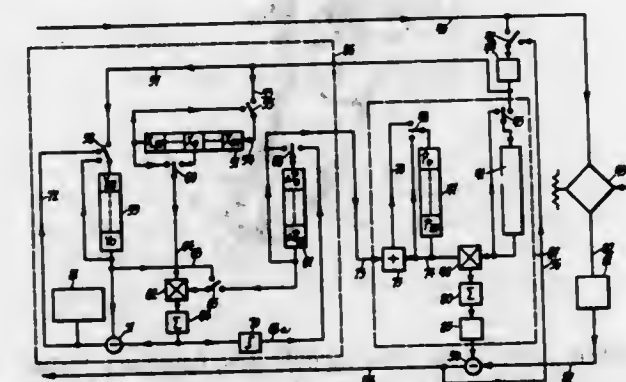
Filed Dec. 16, 1970, Ser. No. 98,800

Claims priority, application Australia, Dec. 22, 1969, 65671/69

Int. Cl. G06f 15/34; H04b 3/20

U.S. Cl. 235-181

25 Claims



A self-adaptive filter control circuit which operates to compute alterations to the impulse response of a network to alter that impulse response so that it bears a predetermined relationship to the impulse response of another network, the circuit operating to compute alterations by a process in which a

first value of an error function, taken by sampling signals related to the networks and being indicative of the state of divergence of the impulse responses from the predetermined relationship, is used to compute a necessary adjustment to the impulse response of the first network, and the value of the error function is progressively reduced by computation and by successive applications of computed alterations.

3,732,411

# SIGNAL INTEGRATING, STORING AND ANALYZING CIRCUIT

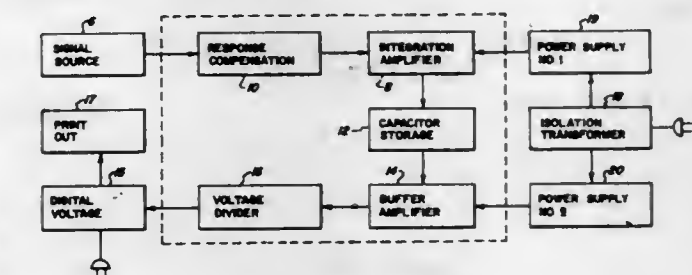
Courtland C. Galeener, Oklahoma City, Okla., assignor to Wilson Certified Foods, Inc., Oklahoma City, Okla.

Filed June 17, 1971, Ser. No. 154,121

Int. Cl. G06g 7/18; G01n 31/08

U.S. Cl. 235-183

12 Claims



A circuit for integrating, storing and analyzing a signal having a plurality of peaks, such as the output of a gas chromatographic detector, in which each of a plurality of storage capacitors is successively connected to an integrator for storing each signal peak integrated. The signals being integrated may be compensated in order that the stored integrals are all on the same basis, e.g., weight percent. After storage of all of the integrals, the total integral and each of the individual integrals may be read out through a buffer which operates to inhibit discharge of the storage capacitors during readout. A voltage control circuit applies a signal to the input of the buffer approximately equal to the value of the total integral to inhibit transients during readout. The values of the stored integrals may be read out in absolute or relative units, for example, each individual integral may be read out as a percentage of the value of the total integral.

3,732,412

# METHOD AND SYSTEM FOR PERSONNEL CONTROL WITH BLINDING ILLUMINATION

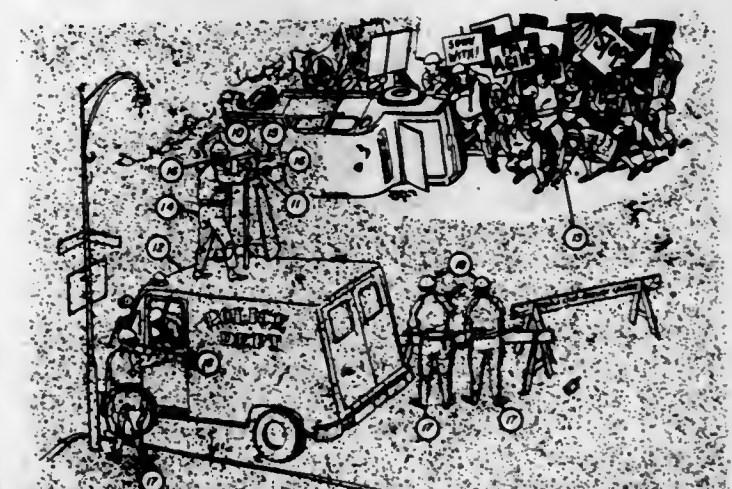
Jesse F. Tyroler, Dover, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed June 13, 1972, Ser. No. 262,405

Int. Cl. F21

U.S. Cl. 240-1 R

2 Claims



Unruly personnel, e.g. rioters, are subjected to continuous low intensity illumination of one part of the visible spectrum,



which is sufficient for identification purposes, simultaneously with flashes of high intensity light of a different part of the visible spectrum, the latter is sufficient to blind the eye temporarily to the low intensity illumination and cause movements to appear confused and chaotic in the flashing high intensity illumination, whereby the activity of the crowd is inhibited or arrested. Police equipped with goggles, which are transparent to the continuous low intensity illumination but opaque to the flashing high intensity illumination, can see adequately under such conditions to remove individual agitators.

3,732,413

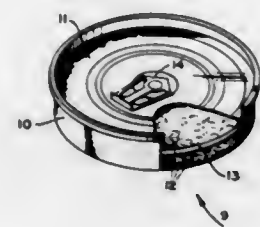
## LIGHT PRODUCING DEVICE

Sydney Sheffer; Steven M. Little, both of China Lake, Calif.; James H. Mills, Las Cruces, N. Mex., and Lee E. Humiston, China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 30, 1965, Ser. No. 492,359  
Int. Cl. F21v 9/16

U.S. Cl. 240—2.25

2 Claims



A hermetically sealed aluminum container provided with a pull-tab means for admitting air and a cotton wick soaked with tetrakis (dimethylamino)ethylene which when exposed to air produces a blue-green light. The device is a reliable map-reader or a non-beaming flashlight.

3,732,414

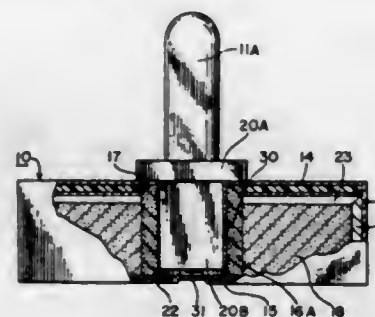
## PORTABLE ILLUMINATION DEVICE

Charles Franc, Box 36-R Wading River P.O., Long Island, N.Y.  
Filed March 19, 1971, Ser. No. 125,980

Int. Cl. F21l 7/00

U.S. Cl. 240—10.61

3 Claims



A portable illumination device consisting of a substantially flat battery having a top and bottom surface and having a bulb receiving means provided substantially in the center of the battery in which the positive and negative terminals of the battery are disposed. The bulb receiving means comprises a socket which is disposed co-axially within, and may be a metal socket, or integrally formed in, the carbon electrode of the battery. The socket forms the positive terminal of the battery, while a zinc can surrounding the battery forms the negative electrode.

3,732,415  
HEADLIGHT CONSTRUCTION

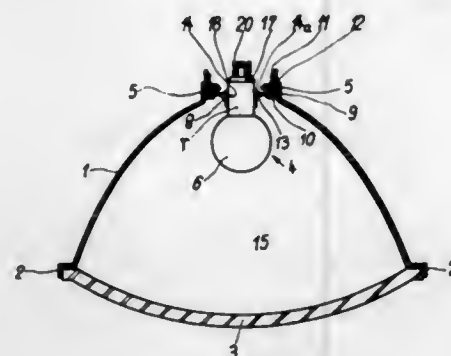
Gerhard Lindae, Leonberg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany  
Filed Sept. 25, 1970, Ser. No. 75,503

Claims priority, application Germany, Oct. 15, 1969, P 19 51 978.9

Int. Cl. F21v 13/04

U.S. Cl. 240—41 SC

10 Claims



A cupped reflector is provided in its crown with an opening and has an open side opposite the crown. Its inner reflecting surface is to be protected against deleterious matter in the ambient temperature. A lens seal-tightly closes the open side and an incandescent bulb is received in the reflector and includes a socket lodged in the opening of the crown and having a radially projecting circumferential flange encircling and seal-tight with the socket. Mounting means removably mounts the bulb in the opening in seal-tight cooperation of the socket and flange with the reflector so that the interior of the reflector is pressure-tightly and seal-tightly closed with respect to the ambient atmosphere.

3,732,416

## DISCLOSING LIGHT

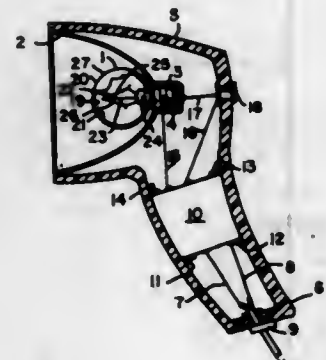
Emery G. Audesse, Salem; Arnold E. Westlund, Jr., Manchester, and Tadius T. Sadoski, Salem, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Nov. 26, 1971, Ser. No. 202,538

Int. Cl. A61b 1/06

U.S. Cl. 240—41.15

2 Claims



A lighting device for viewing calculus, (plaque), tartar, and the like on a person's teeth, the device utilizing a fluorescent lamp with a phosphor such as calcium strontium magnesium silicate, activated by europium, to emit light mainly in the 400 to 520 nanometers wavelength region, that is in the blue and green region, but not the yellow, to produce a yellow fluorescent emission from any calculus or tartar on the teeth. The teeth are first treated with a fluorescent material such as a weak sodium fluorescein solution to provide the calculus with phosphor material. In viewing, it is best to use a filter which excludes blue and green light in order to make the amount of

reflected light from the part of the teeth which do not have calculus on them as small as possible. This can be done by viewing the teeth in a dichroic reflector which passes blue and green but reflects yellow. The device can also be used for viewing other parts of the body, and for other purposes.

3,732,417

## SQUARE LITE PROJECTOR USING PRISMATIC LENS

Robert G. Nordquist, deceased, late of Springfield, Ohio (by Mattie L. Nordquist, executrix), assignor to Grimes Manufacturing Company, Urbana, Ohio

Filed June 16, 1971, Ser. No. 153,642

Int. Cl. F21v 13/04

U.S. Cl. 240—41.3

9 Claims



A reflector and lens projecting assembly is adapted to project a rectangular or square pattern of light from a conventional circular reflector. A prismatic lens having four 90° segments is positioned in front of the reflector and directs the light from the reflector into four mutually over-lapping segments in which radii of the unmodified pattern from the reflector form the boundaries of the square or rectangular pattern as modified by the lens. Embodiments are shown using light modifying prisms in which the thick portions of the prism are at the periphery of the lens and in which the thick portions of the prism are at the center of the lens.

3,732,418

## REPRODUCTION PROCESS USING INFRARED RADIATION

Erwin Lind, Wiesbaden-Biebrich, Germany, assignor to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany  
Filed Nov. 6, 1961, Ser. No. 150,141

Claims priority, application Germany, Dec. 17, 1960, K 42434

Int. Cl. G01n 21/34

U.S. Cl. 250—65 T

2 Claims

A method is disclosed of making an image on a layer, which comprises exposing a layer of polyethylene to infrared radiation in heat-conductive relation with a master to form a latent image, charging the layer with an electrostatic charge at a substantially later time to produce a charge image corresponding to the latent image, developing the charge image with a toner, and fusing the toner to said layer. A method of making an offset printing plate is also disclosed which comprises exposing a layer of cellulose acetate to infrared radiation in heat-conductive relation with a master to form a latent image corresponding to the master, charging the layer electrostatically at a substantially later time to produce a charge image, developing the charge image by applying a toner, fusing the toner to said layer and saponifying the surface of said layer to render the non-image areas hydrophilic thereby forming a layer suitable for use as an offset printing plate.

3,732,419

## SCINTILLATION CAMERA WITH IMPROVED RESOLUTION

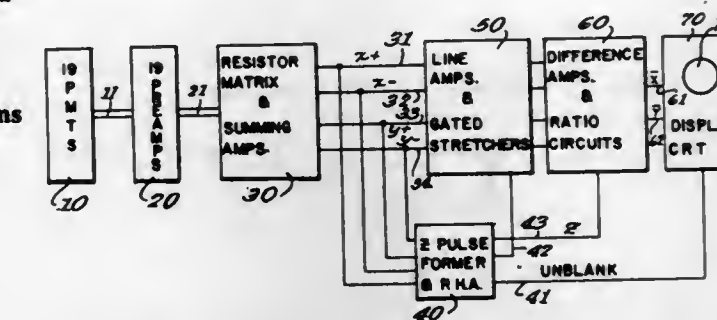
Gerardus H. Kulberg, Amstelveen, Netherlands, and Gerd. Muehlechner, Heidelberg, Germany, assignors to Nuclear-Chicago Corporation, Des Plaines, Ill.

Filed Oct. 12, 1970, Ser. No. 79,861

Int. Cl. G01t 1/20

U.S. Cl. 250—71.5 S

13 Claims



An Anger-type scintillation camera employing a threshold preamplifier at the output of each photomultiplier tube to eliminate the contribution of tubes distant from the location of each scintillation to the coordinate position signal, thereby improving the intrinsic resolution of the Anger-type detector.

3,732,420

## AUTOMATIC CALIBRATION SYSTEM FOR A SCINTILLATION DEVICE

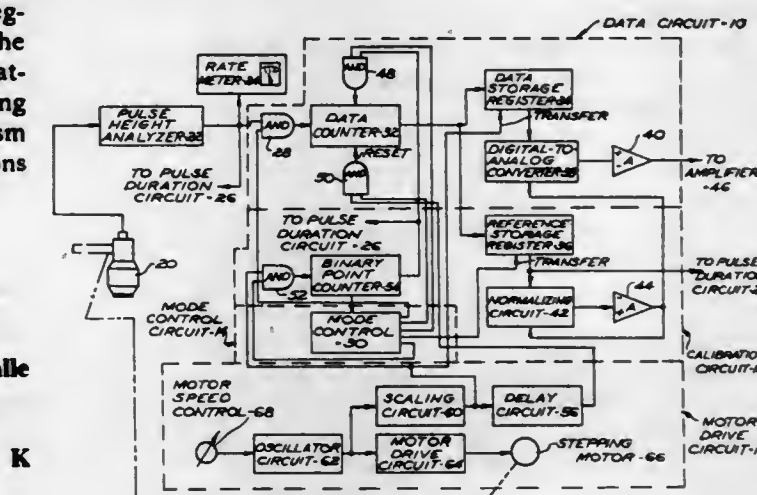
Carl J. Brunnett, Mayfield Heights, and Basil N. Ioannou, Bedford, both of Ohio, assignors to Picker Corporation, Cleveland, Ohio

Filed June 25, 1971, Ser. No. 156,912

Int. Cl. G01j 39/18

U.S. Cl. 250—71.5

15 Claims



A scintillation device, such as a scintillation scanner, having a calibrate system for automatically calibrating the value of data signals representative of measured radiation activity in response to the value of reference signals representative of the level of maximum radiation activity, i.e., signals representative of radiation activity at a calibration point or a "hot spot." The calibrate system utilizes circuitry for counting the number of signals which occur at the calibration point for a predetermined number of intervals of time, and then dividing the number of counted signals by the number of intervals of time to develop calibration signals having a high degree of statistical accuracy. The values of the data signals obtained during the normal operation are then calibrated with reference to the calibrate signals to that the data signals always remain within a preselected range of values regardless of the levels of measured radiation activity.



3,732,421

## COOLING APPARATUS

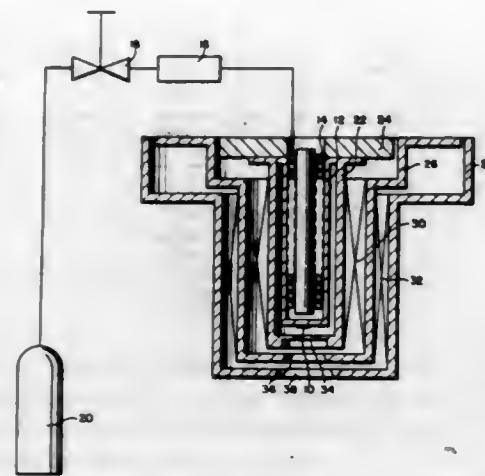
Wallace Y. Kunimoto, Goleta, and Joseph S. Buller, Santa Barbara, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed May 20, 1971, Ser. No. 145,363

Int. Cl. G01t 1/24

U.S. Cl. 250-83 R

10 Claims



A dewar surrounding a cold region and attached to a radiating surface adapted to be directed toward dark space, whereby the dewar insulates the cold region from surrounding heat sources in an atmospheric environment, and it conducts heat away from the cold region to the radiating surface in a space environment.

3,732,422

## COUNTER FOR RADIATION MONITORING

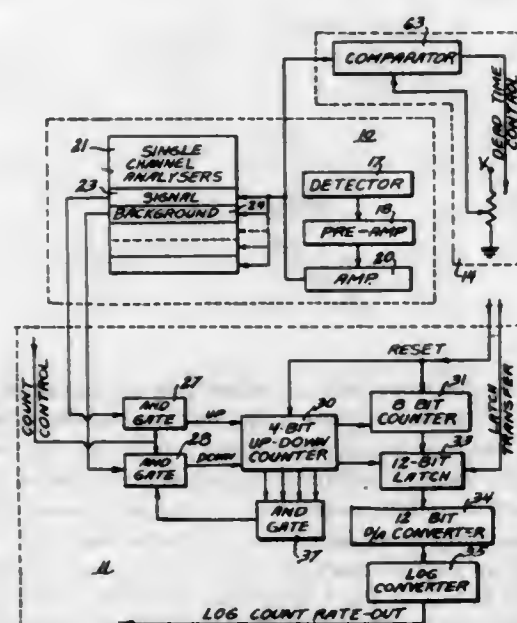
Glenn S. Brunson, Robert N. Curran, and Franklin H. Just, all of Idaho Falls, Idaho, assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed May 23, 1972, Ser. No. 256,062

Int. Cl. G01t 1/16

U.S. Cl. 250-83.3 R

7 Claims



A radiation counter repeatedly takes periodic samples by counting radiation pulses which are received during a predetermined period. The predetermined period is measured by a timing circuit. An amplitude measuring circuit measures the amplitude of the incoming radiation pulses and acts to dis-

able the timing circuit whenever a radiation pulse above a particular amplitude is received. By disabling the timing circuit, dead time, during which the counting circuit will not detect radiation pulses, is not counted as part of the predetermined counting period.

3,732,423

## SHIPPING CONTAINER FOR RADIOACTIVE MATERIAL

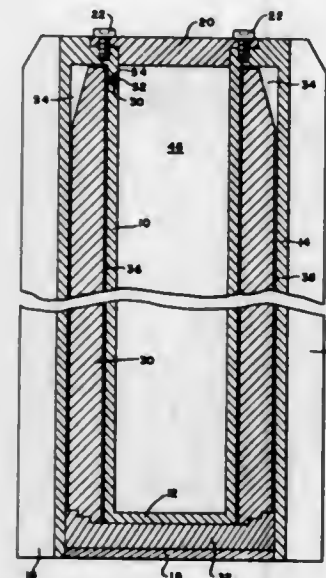
Reuben W. Peterson, Wilmington, Del., assignor to National Lead Company, New York, N.Y.

Filed May 24, 1971, Ser. No. 146,010

Int. Cl. G21f 5/00

U.S. Cl. 250-108 R

4 Claims



A body means includes inner and outer shell means having radiation shielding means therebetween and defining gaps at the interfaces between the shielding means and the shell means. Means is provided in said gaps having a thermal conductivity which is substantially greater than that of air and which inhibits corrosion of the radiation shielding means. Means is also provided for releasing the means in said gaps into the cavity within the body means at a predetermined temperature.

3,732,424

## STAR TRACKING DEVICE

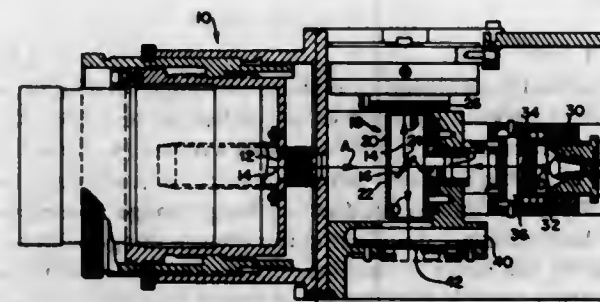
Waclaw Wojtulewicz, Paterson, N.J., assignor to The Singer Company, New York, N.Y.

Filed April 21, 1971, Ser. No. 136,009

Int. Cl. G01j 1/20

U.S. Cl. 250-203 R

5 Claims



A star tracking device in which a source of light is moved across a detector by being reflected from the front reflecting surface of an oscillating reflector placed in the path of the light. The detector generates an output signal which corresponds to the place of incidence thereon of the reflected light. A signal corresponding to the angular position of the reflector is produced utilizing light reflected from the rear side

thereof. Electronic circuitry utilizes the detector output signal and the angular position signal to supply a signal which corresponds to the position of the source of light relative to the device. A torque motor, utilizing a bifurcated torsion-bar-mounted armature, is provided for oscillating the reflector and includes redundant electromagnets for supplying motive force.

3,732,425

## LIGHT CONDUIT WITH DOUBLE CLADDING

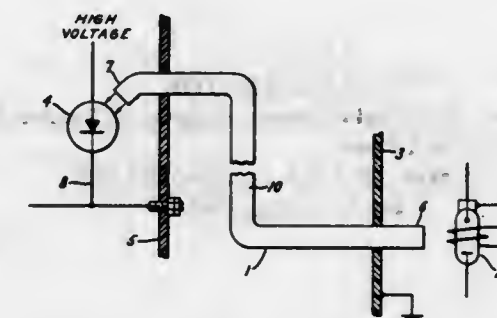
Frederick J. Ellert, Broomall, and Bernard D. Leete, Newtown Square, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Dec. 18, 1970, Ser. No. 99,621

Int. Cl. G02b 5/14; H01j 39/12

U.S. Cl. 250-217 S

7 Claims



An optical fiber is provided with an extra outer layer or cladding of a material which is chemically stable and protects the less stable inner optical glass from the adverse effects of moisture or chemicals in the environment when the material is an electronically conducting glass and both ends of the fiber are at substantially different electrical potentials, current in the outer cladding supports resistance heating to prevent the accumulation of moisture. The conductivity of the glass prevents the formation of localized high potential gradients. The fiber is particularly useful in providing a light link between two electrical circuits which are at substantially different electrical potentials.

3,732,426

## X-RAY SOURCE FOR GENERATING AN X-RAY BEAM HAVING SELECTABLE SECTIONAL SHAPES

Toshiaki Shimizu, Setagaya-ku, Tokyo, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

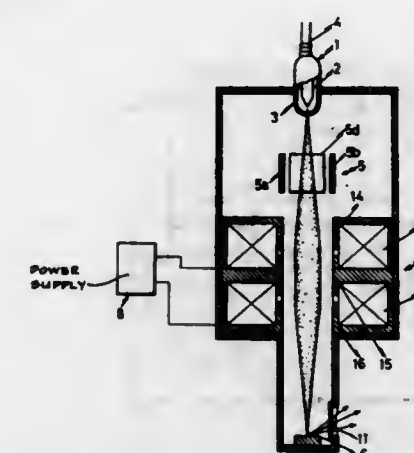
Filed July 30, 1971, Ser. No. 167,373

Claims priority, application Japan, July 30, 1970, 45/66867

Int. Cl. H01j 37/20

U.S. Cl. 250-90

4 Claims



This specification discloses an X-ray source comprising an electron gun, an astigmator, a condenser lens and a target. The astigmator comprises four electrodes to which a voltage is

supplied, said voltage determining the sectional shape of the electron beam passed through the astigmator. The electron beam passed through the astigmator is focused on the target by the condenser lens, the resultant impingement causing an X-ray to be generated from the target.

3,732,427

## INTEGRATED TRANSPORT SYSTEM FOR NUCLEAR FUEL ASSEMBLIES

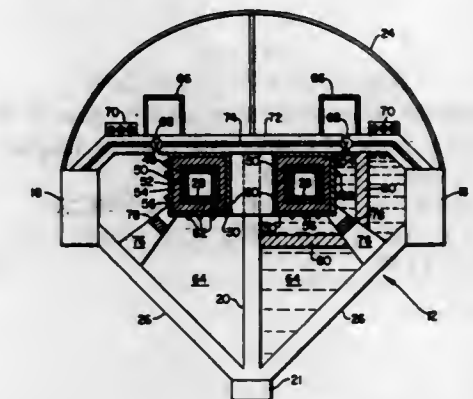
Arthur G. Trudeau, 17 Primrose St., Chevy Chase, Md., and Darrow F. Haagenen, P.O. Box 565, R.D. No. 3, Murraysville, Pa.

Filed March 17, 1971, Ser. No. 125,259

Int. Cl. G21f 5/00

U.S. Cl. 250-108 R

35 Claims



A transport system for conveying nuclear fuel assemblies from a nuclear power plant to a plant for reprocessing or to a burial ground comprising a unique two part shipping cask and a trailer transporter for the cask or casks, constructed on the single spar concept. The novel cask as well as the transporter are constructed with fast neutron as well as gamma ray attenuation materials thereby providing adequate shielding for the formidable array of radiation emitted by spent fuel assemblies used in recent advanced light water converter reactors as well as first generation fast breeder reactors. The trailer transporter may be interchangeably wheeled for transit over conventional roadways or railways, or a modified rail car may be provided onto which the entire cask and trailer transporter may be loaded. A plurality of such cars so loaded form a unit train, having a locomotive to haul the train and a control car immediately therebehind to monitor heat, radiation and stress parameters of each loaded car making up the unit train.

3,732,428

## ELECTRO-OPTICAL IMAGE COMPOSITE DISPLAY

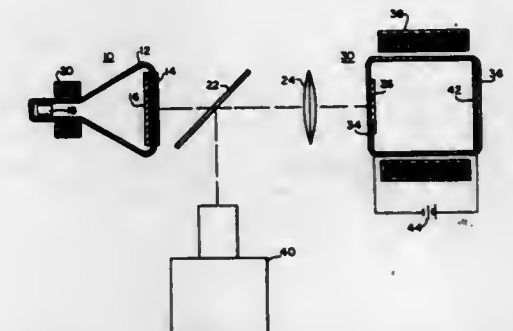
Murry J. Spangler, Elkton City, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 14, 1971, Ser. No. 106,329

Int. Cl. H01j 31/50; G02b 27/14

U.S. Cl. 250-213 VT

2 Claims





means of a cathode ray display device is superpositioned onto a second image derived from hard copy information such as slides, maps or other character information. The system is comprised of a cathode ray tube with suitable means for directing a first light image generated by the cathode ray tube onto the photocathode of an image intensifier. The second image which may be projected by means of a slide projector is also focused onto the photocathode of the image intensifier. These two images directed onto the photocathode generate an electron image corresponding to the composite image of the first and second image. This electron image is then accelerated and amplified through the image intensifier to provide a visible light display by means of a suitable phosphor positioned at the opposite end of the image intensifier with respect to the photocathode. This output visible image is a composite image of the first two images.

3,732,429

## LIQUID CRYSTAL DEVICE

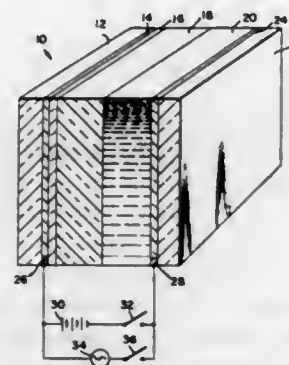
Morris Braunstein, Marina del Rey, and William P. Bleha, Jr., Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 12, 1971, Ser. No. 198,281

Int. Cl. G01t 1/16; G02t 1/28; H01j 31/50

U.S. Cl. 250-213 R

18 Claims



The liquid crystal device comprises a liquid crystal layer, a thin photoconductor layer, and a thin insulator layer sandwiched between the transparent supporting covers having a transparent electrically-conductive layer thereon. The photoconductor layer is cadmium sulphide (CdS) and the insulator layer is zinc sulphide (ZnS).

3,732,430

## PHOTOELECTRIC SCANNING APPARATUS

Friedrich Hujer, Grunwald, and Harald Fengler, Munich, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

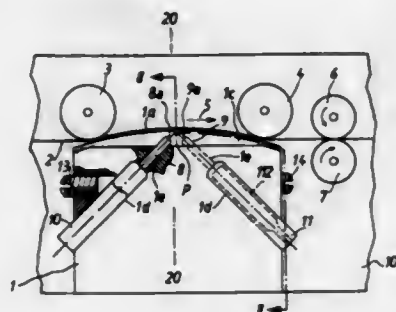
Filed Sept. 29, 1971, Ser. No. 184,797

Claims priority, application Germany, Oct. 2, 1970, P 20 48 414.4

Int. Cl. G01n 21/30

U.S. Cl. 250-219 FR

8 Claims



A photoelectric scanning apparatus which detects one or more rows of information encoded in or on travelling webs or

interconnected photographic films or prints has one or more pairs of mirror symmetrical light-conducting rods which are embedded in a support adjacent to the path of the web so that their axes intersect at a point of the path which is in line with the row of information to be scanned. The support is formed with two chambers each of which is located behind a different rod and each of which receives a removable clip. One of the clips contains one or more removable lamps and the other clip contains one or more removable photosensitive elements. A lamp in the properly inserted clip emits a light beam which passes through the respective rod and is normally reflected on the travelling web to thereupon pass through the other rod and to impinge on the photosensitive element behind the other rod. If the encoded information is in the form of notches or perforations, the reflection of light is interrupted whenever a notch or perforation register with the intersection of the axes of the rods whereby the photosensitive element generates a signal.

3,732,431

## PULSE GENERATOR

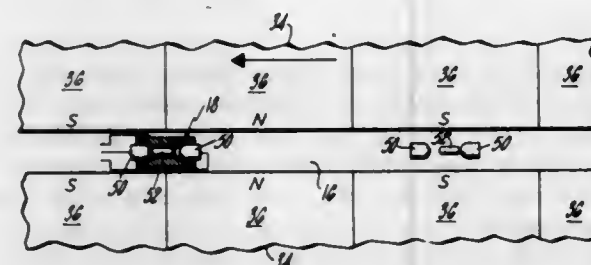
Frank P. Knox, Bloomfield, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed Sept. 27, 1971, Ser. No. 184,067

Int. Cl. G01p 3/48

U.S. Cl. 307-106

2 Claims



A pulse generator having a rotor with a pair of axially spaced coaxial magnet rings and a switch mounted between the spaced magnet rings having a pair of spaced fixed contacts and a shuttle reciprocable between the fixed contacts and magnetically operated back and forth by the rotor for generating an electrical signal for each predetermined angular increment of displacement of the rotor.

3,732,432

## TEMPERATURE CONTROL SYSTEMS

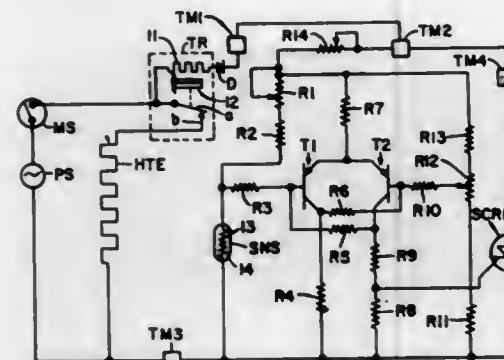
Harold A. Brouneus, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 4, 1972, Ser. No. 250,162

Int. Cl. H01h 35/00

U.S. Cl. 307-117

8 Claims



Temperature control systems or regulating circuits for use with electrical heating elements of burners of electric ranges, hot plates or cook-tops, such circuits and elements being directly energized from conventional or commercial sources

of power, such as 60 c.p.s. alternating current sources of 120 or 240 volts, and which systems provide high-temperature sensing and adequate temperature-limiting. An encapsulated high-temperature wire sensor is used in conjunction with thermal or electromagnetically actuated devices or relays, and solid state circuitry comprising a balanced amplifier-detector and at least one silicon controlled rectifier as a switch or switching device. The necessity for a step-down transformer is eliminated by the systems disclosed and an economic advantage is thereby attained. The control systems are especially suitable for use with electrically heated glass-ceramic cook-tops in order to provide higher temperatures and improved cooking performance when cooking vessels with non-flat bottoms are used with such cook-tops, while at the same time providing temperature-limiting of the burner system of the cook-tops for both electric heating-element protection and cook-top protection.

3,732,433

## COMBUSTION CONTROL CIRCUIT FOR A FUEL BURNER

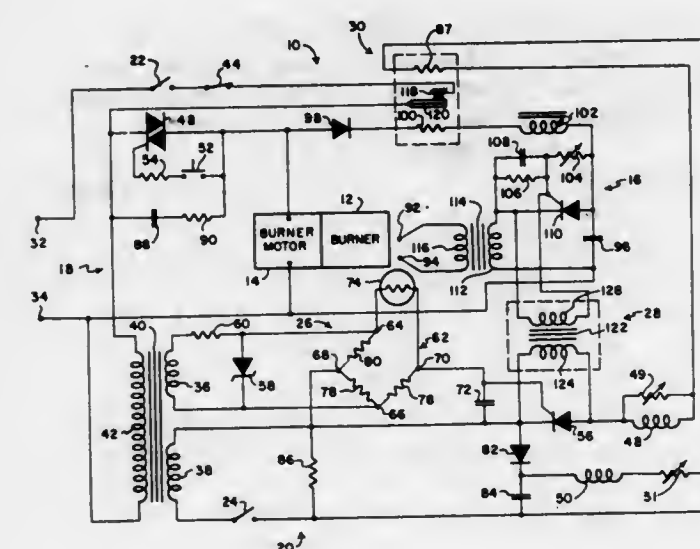
Ronald F. Lourigan, Kenosha, Wis., assignor to Webster Electric Company, Inc., Racine, Wis.

Filed May 25, 1972, Ser. No. 256,981

Int. Cl. H01h 35/00

U.S. Cl. 307-117

26 Claims



A combustion control circuit for an oil burner installation includes a triac for controlling the energization of both a burner motor and an ignition circuit. A control circuit carries out a safe start component check and then operates the triac when a thermostat closes and when no flame is detected at the burner. If ignition fails to take place in a trial-for-ignition period of predetermined time, a thermal switch is heated by a heater in the control circuit and opens to shut off the burner motor. However, if ignition takes place, flame is detected within the predetermined period by an improved, positively acting, reliable resistance bridge flame detector circuit. The flame detector circuit serves to render nonconductive a silicon controlled rectifier in the control circuit in order to disconnect the thermal switch heater while maintaining operation of the burner motor. Simultaneously, the ignition circuit is deenergized by a novel ignition disabling circuit connected between the silicon controlled rectifier and the ignition circuit. Failure of the triac in a short circuit condition prevents an unsafe condition due to connection of the thermal switch to the motor and due to the use of a second heater in circuit with the ignition circuit.

3,732,434

## PIPELINE PIGS

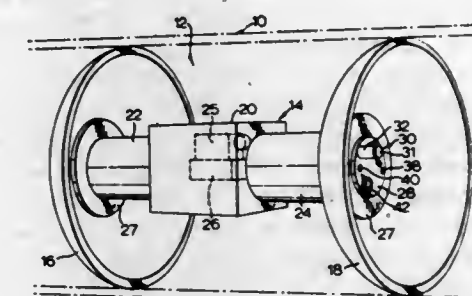
Hartley A. French, Willowdale, Ontario, Canada, assignor to Trans-Canada Pipe Lines Limited, Toronto, Ontario, Canada

Filed March 2, 1972, Ser. No. 231,217

Int. Cl. H01h 35/18

U.S. Cl. 307-118

6 Claims



This invention provides a pipeline pig for transporting electrical circuitry through a pipeline. The pipeline pig includes a pressure-sensitive switch on the housing which is designed to electrically activate the electrical circuitry when the internal pipeline pressure exceeds a predetermined level. When the pressure does not exceed that level, the electrical circuitry remains inactive.

3,732,435

## MOISTURE MEASURING AND CONTROL APPARATUS

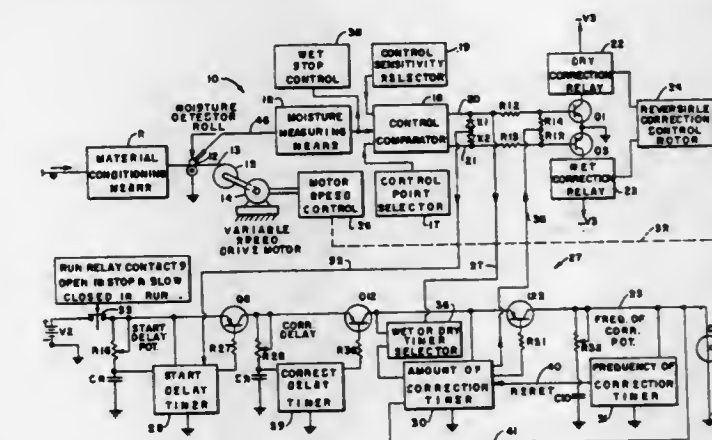
Charles F. Strandberg, Jr., and Robert C. Strandberg, both of Greensboro, N.C., assignors to Strandberg Engineering Laboratories, Inc., Greensboro, N.C.

Filed March 27, 1972, Ser. No. 238,114

Int. Cl. F26b 13/12

U.S. Cl. 307-118

20 Claims



An apparatus for measuring the moisture content of material being conveyed through a machine for conditioning the material to achieve a selected moisture content, and for controlling the speed at which the material is conveyed through the machine in order to subject the material to longer or shorter periods of exposure to the conditioner for the purpose of achieving the selected moisture content for the material. The apparatus includes: a moisture meter for measuring the moisture content of the material and producing an electric voltage signal which is related to the moisture content of the material, a reference signal generator which produces a reference voltage which is related to a selected moisture standard, a comparator which compares the measured moisture signal with the standard moisture signal and generates a dry condition signal when the measured moisture content is less than the standard moisture content by a predetermined amount and generates a wet condition signal when the measured moisture content exceeds the standard moisture content by a predetermined amount. Controls are provided which respond to the dry and wet condition signals in order to in-



crease the speed or decrease the speed at which the material is conveyed through the machine. Timers are provided by which the dry and wet condition signals are prevented from actuating the speed controls except after a start time delay sufficient to permit the material in the machine when the machine is started to clear the machine, and a correction time delay which insures that a condition requiring correction persists long enough to warrant correction. An amount of correction timer is actuated after the time delays which unblocks the controls and permits them to respond to the dry and wet condition signals for a predetermined time period. A frequency of correction timer is provided which is actuated at the end of the time period established by the amount of correction timer to recycle the amount of correction timer at reoccurring intervals of predetermined frequency. The timers are all connected to a common power source and are energized in sequence by plural series connected switches. A wet stop control is provided to shut down the machine in case an excessive moisture condition is measured which cannot properly be corrected by the automatic controls.

### ERRATUM

For Class 307-149 see:  
Patent No. 3,732,468

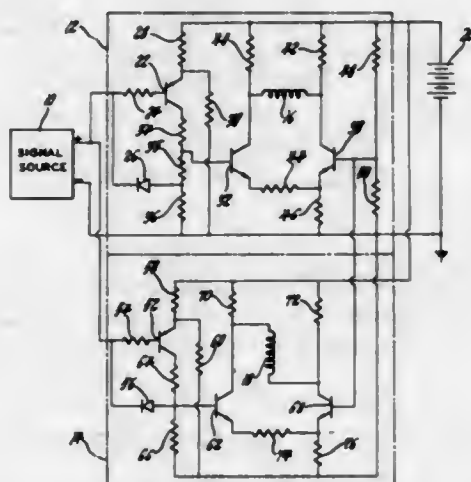
3,732,436

### APPARATUS FOR SUPPLYING CURRENT THROUGH A LOAD APPROXIMATING A SINGLE CYCLE OF A SINE WAVE IN RESPONSE TO AN INCREASING SIGNAL VOLTAGE

Robert B. Golenius, Davison, Mich., assignor to General Motors Corporation, Detroit, Mich.  
Division of Ser. No. 34,981, May 6, 1970, Pat. No. 3,636,447.  
This application Nov. 5, 1971, Ser. No. 196,015  
Int. Cl. G06g 7/12

U.S. Cl. 307-229

2 Claims



A wide angle electrical gauge having two coils whose magnetic axes are at right angles. A signal source supplies a signal whose magnitude is proportional to the magnitude of the condition to be indicated. A sine generator is responsive to the output of the signal source and controls the current through one of the coils in a manner such that the magnetic field along its magnetic axis varies in an approximated sinusoidal fashion. A cosine generator is responsive to the output of the signal source and controls the current through the remaining coil in a manner so as to generate a magnetic field along its magnetic axis which is phase shifted from the magnetic field generated by the sine generator so as to take the form of an approximated cosine waveform in relationship thereto. A magnetic armature aligns itself with the resultant of the two magnetic fields whose angular position corresponds to the magnitude of the condition being measured.

### 3,732,437 CONTROL CIRCUITRY FOR ANTI-LOCK BRAKE SYSTEM

Denis Sharp, Sussex, England, assignor to U.S. Philips Corporation, New York, N.Y.

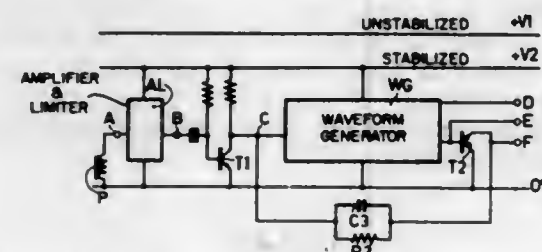
Filed March 15, 1971, Ser. No. 124,218

Claims priority, application Great Britain, March 18, 1970, 13,147/70

Int. Cl. H03d 13/00

U.S. Cl. 307-233

14 Claims



A control circuitry for anti-lock brake systems for wheeled vehicles. The control circuit comprises means for producing a waveform whose frequency is the same as that of an AC signal produced in response to wheel rotation, said waveform has a peak value which is a function of the instantaneous frequency of the AC signal. The control circuit can detect a predetermined rate of change of the wheel.

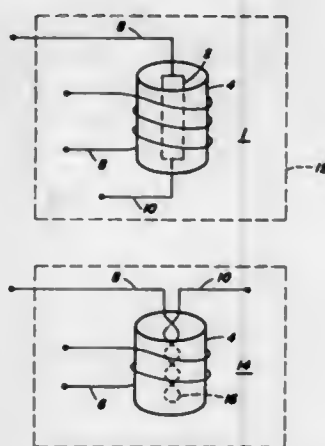
3,732,438

### SUPERCONDUCTIVE SWITCH APPARATUS

Robert C. Wright, Jr., 18 Lafayette Avenue, Hingham, Mass.  
Division of Ser. No. 750,568, Aug. 6, 1968, Pat. No. 3,646,363.  
This application July 26, 1971, Ser. No. 166,311  
Int. Cl. H03k 17/00, 3/38

U.S. Cl. 307-245

8 Claims



Apparatus is provided whereby the conductive state of means including an element capable of exhibiting the superconductivity is controlled by the maintenance of said means in intimate thermal communication with a paramagnetic salt. The temperature of such means thereby being discretely and selectively changed by the control of the magnetic state of said paramagnetic salt.

3,732,439

### PULSE PRODUCING CIRCUIT PARTICULARLY ADAPTED FOR BUTTON TYPE TELEPHONES

Noel M. Calvin, 2683 Buena Vista Way, Berkeley, Calif.

Filed Nov. 28, 1969, Ser. No. 880,592

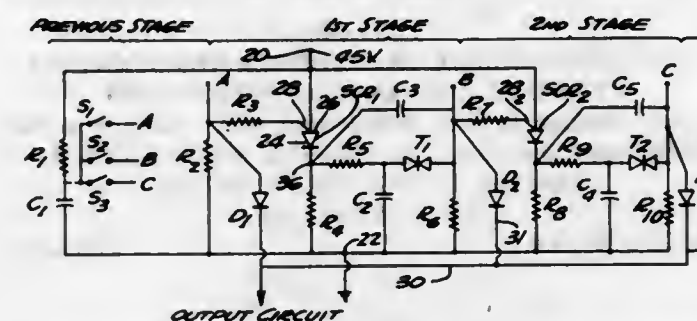
Int. Cl. H04k 23/30

U.S. Cl. 307-284

1 Claim

The invention is a chain counter circuit for producing output pulses adaptable for actuating a relay. The chain counter is particularly adapted to use with a button type telephone for

supplying numbers of pulses corresponding to digits required to the telephone line. The chain counter comprises 10 stages, each of which is similar to a mono-stable multi-vibrator. Each stage when activated by an incoming signal produces, after a



predetermined time delay, a pulse in the output circuit and a triggering pulse for activating the next stage in sequence. The stage then deactivates itself. The number of output pulses depends upon which stage is initially actuated.

3,732,440

### ADDRESS DECODER LATCH

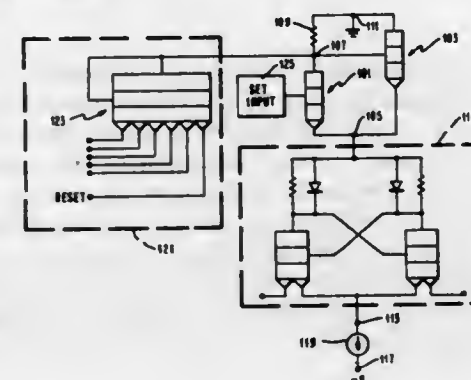
Steven Platt, Underhill, Vt., and Jehoshua N. Pomeranz, Suffern, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1971, Ser. No. 211,619

Int. Cl. H03k 3/286, 3/295; G11c 11/40

U.S. Cl. 307-289

4 Claims



A dual condition latch circuit is disclosed which changes from an unlatched to a latched condition when a set input is applied only when a signal input from a logic gate is at a first level, and remains in the latched position after the signal input is removed. A first and second transistor with their emitters commonly connected to a current source and the collector of the first transistor connected to the base of the second transistor with a resistor connected between the collector of the first transistor and a reference point and the collector of the second transistor connected directly to the reference point constitutes the basic latching circuit. A set input pulse is applied to the base of the first transistor and a signal input level from a logic device is applied to the base of the second transistor such that only when the signal input is at a first level does the second transistor switch "on" when the set input pulses the first transistor from a conducting to a nonconducting state. If the signal input is not at a first level when the set input pulses the first transistor, the second transistor does not switch "on" and the circuit remains in an unlatched condition.

3,732,441

### SURFACE WAVE INTEGRATABLE FILTER FOR COUPLING A SIGNAL SOURCE TO A LOAD

Fleming Dias, Palo Alto, Calif., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed May 7, 1971, Ser. No. 141,322

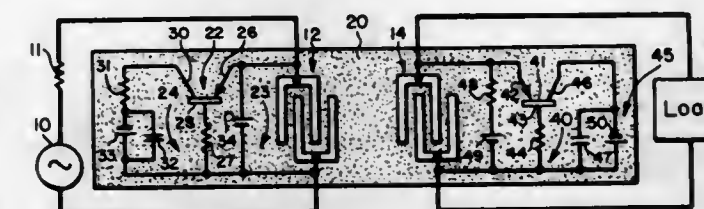
Int. Cl. H03h 7/44

U.S. Cl. 307-295

1 Claim

A surface-wave integratable filter includes spaced input and output transducers on a surface of a piezoelectric substrate. The input transducer responds to signals from a source for

launching acoustic surface waves in the substrate. The output transducer responds to the acoustic surface waves to develop an electrical signal for application to a load. Each transducer presents a predetermined clamped capacitance and a pair of transistors are included in the filter to compensate that capacitance. Each transistor has input and output signal cir-



cuits with an assigned one of the transducers coupled into its input signal circuit. Impedance means, common to the input and output signal circuits of each transistor, controls its operation to present, in parallel with its assigned transducer, an inductive reactance which at the frequency of the signals is substantially equal to the reactance of the clamped capacitance of its associated transducer.

3,732,442

### ELECTRICAL TIMING DEVICE

Keith Ronald Frederick Husbands, Sandiacre, and John Dawson, Kirby-In-Ashfield, both of England, assignors to Plessey Handel Und Investments A.G.

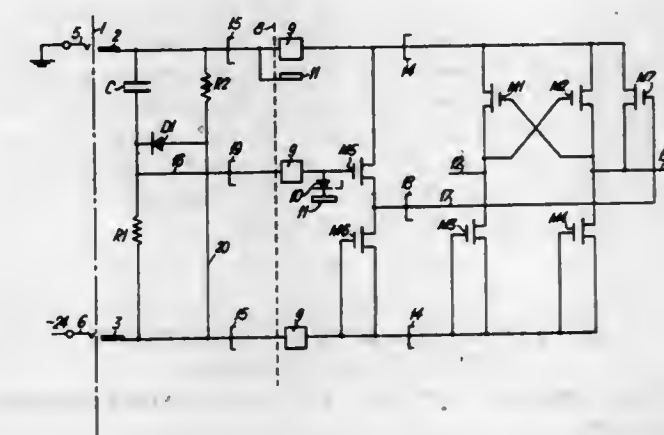
Filed June 22, 1971, Ser. No. 155,545

Claims priority, application Great Britain, July 14, 1970, 34,159/70

Int. Cl. H03k 5/153

U.S. Cl. 307-304

3 Claims



An electrical timing device comprising a capacitor, a timing resistor and a discharge circuit for the capacitor which is maintained ineffective as long as power supply is not interrupted. In a preferred application, the interval timed exceeds the change-over time of a bistable register, a priming signal applied to bias the register into a preferred state being terminated on the expiry of the interval.

3,732,443

### ON-OFF DETECTION DEVICE

Rodger T. Lovrenich, Temperance, Mich., assignor to Renko Associates, Grosse Pointe, Mich.

Filed May 12, 1971, Ser. No. 142,596

Int. Cl. H03k 17/00

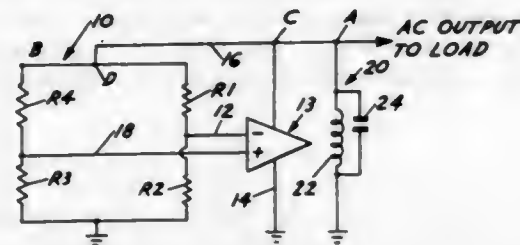
U.S. Cl. 307-308

10 Claims

The invention relates to an on-off detecting device embodying a Wheatstone Bridge, wherein one leg of the bridge accommodates a resistance effect element which changes re-



distance value upon sensing a phenomenon, the change of resistance driving a differential input, high gain, common mode



rejection amplifier into oscillation through positive feedback, and shutting off the amplifier through negative feedback.

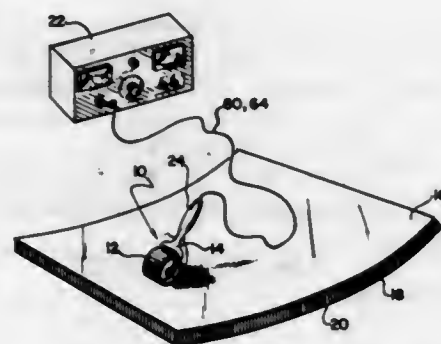
3,732,444

### TUBULAR TRANSDUCER AND DRY COUPLANT THEREFOR

Darrow L. Miller, Los Angeles, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.  
Division of Ser. No. 832,568, June 12, 1969, Pat. No. 3,678,737. This application April 30, 1971, Ser. No. 139,091  
Int. Cl. H01v 7/00

U.S. Cl. 310-8.1

2 Claims



A probe for nondestructive testing to identify internal structural defects comprises a tubular piezoelectric element adapted for low frequency vibration while moving in rolling contact over a workpiece surface. A dry adhesive couplant forms a mechanical bond between the piezoelectric element and the workpiece surface, and is also useful with disc-type probes known to the prior art, especially when the adhesive is coated with a layer of minute glass beads.

3,732,445

### ROTATING POLE RINGS SUPPORTED IN CONTACTLESS BEARINGS

Nickolaus Laing, Hofener Weg 35-37, Aldingen near Stuttgart, Germany

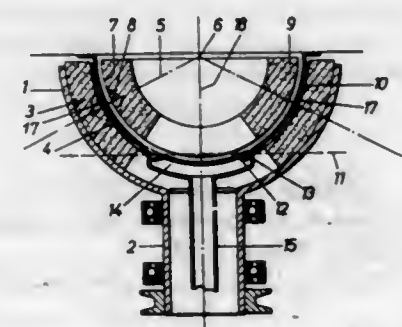
Filed Dec. 14, 1970, Ser. No. 97,771

Claims priority, application Austria, Dec. 16, 1969, 11681

Int. Cl. H02k 5/16

U.S. Cl. 310-90

17 Claims



A rotating magnetic machine having two pole rings defining a common air gap, said air gap being arranged on the surface

of a rotational body and at the same time defining the bearing gap for supporting the rotor of the machine and having a flowable material in the bearing gap for producing a hydrodynamic bearing film.

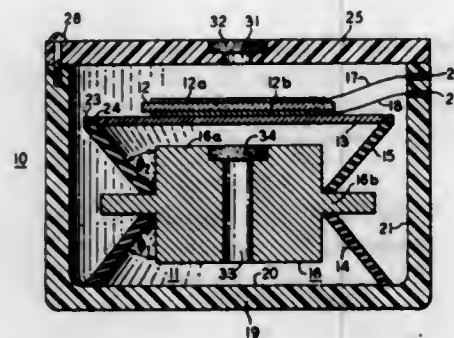
3,732,446

### ELECTROACOUSTIC TRANSDUCER RESISTANT TO EXTERNAL MECHANICAL VIBRATIONS

Herbert William Bryant, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Dec. 13, 1971, Ser. No. 207,003  
Int. Cl. H01v 7/00

U.S. Cl. 310-9.4

12 Claims



An electromechanical transducer element is supported within a transducer housing by a resilient mounting assembly which includes a mass element and a pair of conical washers. The washer stiffness and the mass element are adjusted for a natural resonant frequency below the transducer operating frequency band. Externally generated mechanical vibrations applied to the transducer housing are transmitted through the mounting assembly to the transducer largely at low frequencies, and thus do not interfere with transducer operation in the frequency band of interest.

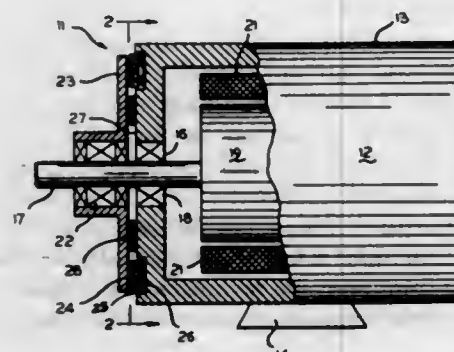
3,732,447

### CLUTCH AND BRAKE MOTOR ARRANGEMENT

Frank J. Perhats, 1280 Burr Oak Lane, Barrington, Ill.  
Filed Dec. 13, 1971, Ser. No. 207,002  
Int. Cl. H02k 7/10

U.S. Cl. 310-76

15 Claims



A motor brake arrangement comprising an electric motor having a brake disc attached to its shaft directly, or through a one-way clutch. The brake disc is pulled against brake pads to either stop the motor rotor quickly or to keep it from turning in one direction when the motor is not operated. Permanent magnetic means are used to assure sufficient frictional contact on the brake pads to stop or hold the motor shaft.

3,732,448

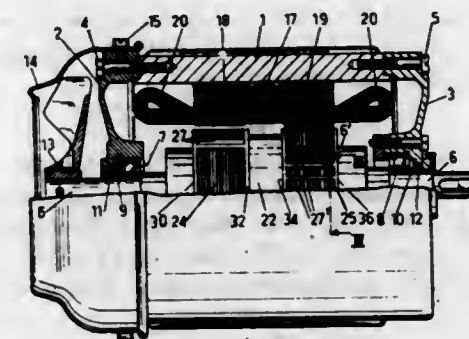
### SYNCHRONOUS ELECTRIC MOTOR

Lodewijk Schliehert, Dubbeldam, Netherlands, assignor to N.V. Electromotorenfabriek Dordt, Dordrecht, Netherlands  
Continuation-in-part of Ser. No. 2,195, Jan. 12, 1970, Pat. No. 3,614,496. This application April 6, 1971, Ser. No. 131,596  
Claims priority, application Netherlands, April 22, 1970, 70/05797

Int. Cl. H02k 12/00

U.S. Cl. 310-162

4 Claims



A polyphase synchronous A C motor having rectangular wave power input includes a stator having axially spaced core members, a D. C. winding between the core members and a polyphase winding extending through the core members. The rotor has two squirrel cage sections, one aligned within each core member and each squirrel cage section carries a pole piece. Each pole piece has a pair of diametrically opposed radially projecting poles and the poles of one pole piece are displaced 90° with respect to the poles of the other pole piece. The motor has a total of four circumferentially spaced poles and thus presents a pole pitch of 90° for each phase. The polyphase winding has at least one winding per phase. In one embodiment the poles have a circumferential width (90°) equal to the pole pitch and the polyphase windings have a like circumferential width. In another embodiment the poles have a circumferential width (60°) which is two-thirds of the pole pitch and, again, the polyphase windings have a like circumferential width.

3,732,449

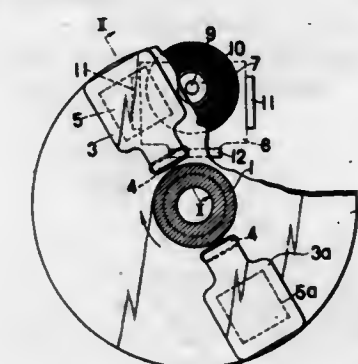
### ROTATIONAL ANGLE DETECTING DEVICE

Masaaki Oishi, Tokyo; Yoshinaga Takahashi, Yachiyo, and Keiichi Yoshizawa, Matsudo, all of Japan, assignors to Kabushiki Kaisha Hattori Tokiten, Tokyo, Japan  
Filed July 8, 1971, Ser. No. 160,756  
Claims priority, application Japan, July 9, 1970, 45/59473

Int. Cl. H02k 1/12

U.S. Cl. 310-259

6 Claims



A rotational angle detecting device comprising a rotor having a rotary disk carrying two L-shaped yokes and associated permanent magnets, disposed symmetrically relative to the axis of rotation thereof. A stator of the device has a stationary coil and a stationary yoke. The rotational yokes and magnets revolve past the stationary coil and stationary yoke. As the in-

dividual magnets move past the stationary coil, a closed magnetic path is formed through confronting faces of the movable and stationary yokes. As the magnets move past the stationary coil, the stationary coil cuts the magnetic flux instantaneously to produce a high induced voltage across the coil. The rotor is driven in timed relationship with a rotationally driven or rotary body so that the maximum induced voltage can be used in indicating an angular position of the rotary body with respect to a reference position.

3,732,450

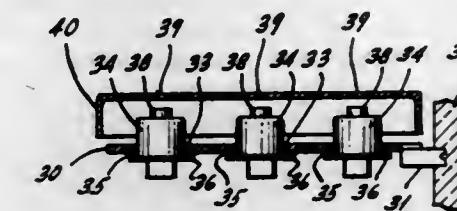
### ELECTRON GUN ASSEMBLY HAVING CATHODES INSULATIVELY MOUNTED IN METALLIC PLATE

Harvey F. Mayers, Huntingdon Valley, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa.  
Continuation of Ser. No. 873,361, Nov. 3, 1969, abandoned.  
This application Aug. 20, 1971, Ser. No. 173,697

Int. Cl. H01j 29/04, 29/50

U.S. Cl. 313-70 R

1 Claim



For the multi-gun assembly of a cathode ray tube, a unitary cathode mounting plate provided with integral beading spaced, and having three apertures — in either delta or in-line configuration — within which cathode eyelets are glass-frit mounted. Conventional cathode and cathode heater structure is associated with each of the eyelets insulatively secured to the plate by the glass frit.

3,732,451

### STEPPED SUPPORTS BETWEEN GLASS PLATE DISPLAY SCREEN AND CATHODE RAY TUBE FACEPLATE

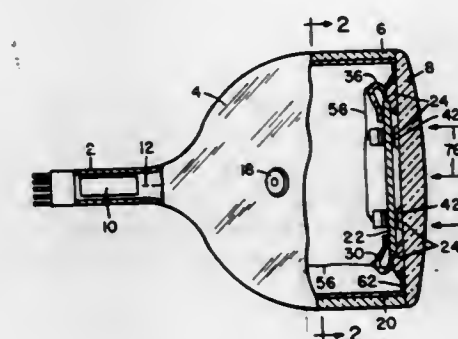
David R. Steinberg, and William T. Sutton, both of Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 16, 1970, Ser. No. 89,716

Int. Cl. H01j 29/12, 29/02, 29/18

U.S. Cl. 313-91

8 Claims



A planar member such as a phosphor coated fiber optic plate, having a thermal coefficient of expansion that is incompatible with that of a cathode ray tube envelope and faceplate, is accurately supported a precise distance from the inner surface of the faceplate by a plurality of step-shaped supports having a spacer portion disposed between the planar member and faceplate and a shoulder portion adjacent to the periphery of the planar member. Conductive spring clip means affixed to the supports apply a retaining force to the planar member and make electrical contact thereto.



3,732,452

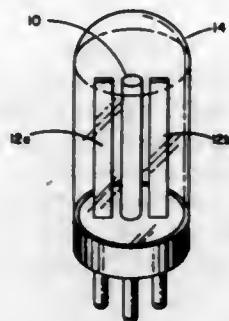
## ULTRAVIOLET RADIATION DETECTOR WITH 360° ANGULAR SENSITIVITY

Roger E. Axmark, Fridley, and Clifford W. Erickson, Minnetonka, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 24, 1971, Ser. No. 201,662  
Int. Cl. H01J 39/04

U.S. Cl. 313-98

11 Claims



An ultraviolet sensitive gaseous discharge detector has an essentially uniform 360° angular sensitivity. The detector has first and second anodes and a cathode which are aligned in a common plane. The first and second anodes have elongated cross-sections, with the elongated surfaces of the first and second anodes being aligned essentially parallel to the common plane. The cathode has an essentially circular cross-section and is disposed between the first and second anodes.

3,732,453

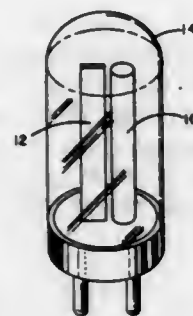
## WIDE ANGLE ULTRAVIOLET RADIATION DETECTOR

Robert G. Johnson, Minnetonka, and Benjamin T. McClure, Hopkins, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 24, 1971, Ser. No. 201,672  
Int. Cl. H01J 39/04

U.S. Cl. 313-100

10 Claims



An ultraviolet sensitive gaseous discharge detector has uniform sensitivity over a broad viewing angle. The cathode of the detector has an essentially circular cross-section while the anode has an elongated cross-section. The anode is aligned in a common plane with the cathode with the elongated surfaces of the anode being aligned essentially parallel to the common plane of the electrodes.

3,732,454

## GLOW DISCHARGE TUBE FOR ATOMIC LIGHT-ABSORPTION ANALYSIS

Hiroo Okagaki, Yoji Arai, both of Katsuta-shi; Sadami Tomita, and Akira Hosoya, both of Hitachi-shi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

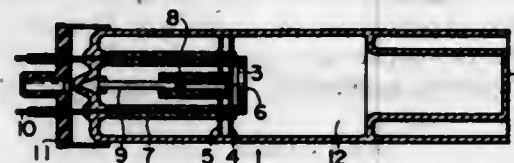
Filed Nov. 24, 1971, Ser. No. 201,663  
Int. Cl. H01J 61/04

U.S. Cl. 313-209

12 Claims

A glow discharge tube for atomic light-absorption analysis in which a hollow cathode for producing atomic light-absorption lines comprises a molded article of fine powder contain-

ing at least one metal element which produces the atomic light-absorption lines, the article being molded without heating it whereby the dislocation of atomic distance remains in



the crystalline lattice to improve the sputtering rate of the metal atom so that the density of metal atoms in the hollow of the hollow cathode is increased to enhance the light intensity of the atomic light-absorption lines.

3,732,455

## HALOGEN INCANDESCENT LAMP

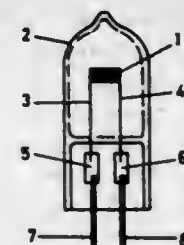
Gerhard M. Neumann, Munich, Germany, assignor to Patent-Treuhand-Gesellschaft für elektrische, Munich, Germany  
Filed Feb. 9, 1971, Ser. No. 113,980

Claims priority, application Germany, March 3, 1970, P 20 09 916.5

Int. Cl. H01J 61/16

U.S. Cl. 313-222

9 Claims



The halogen incandescent lamp has a tungsten filament and its halogen cycle takes place with fluorine participating therein. To prevent corrosive action of the fluorine on internal lamp components, the inert fill gas contains an additive of perhalogenated low molecular weight hydrocarbons with at least one fluorine atom per molecule in a concentration of from  $1 \times 10^{-4}$  to  $1 \times 10^{-3}$  gram atoms of fluorine, and from  $1 \times 10^{-4}$  to  $1 \times 10^{-3}$  gram atoms of at least one more halogen such as chlorine, bromine, or iodine per cc of bulb volume; preferably, difluorodibromomethane ( $\text{CF}_2\text{Br}_2$ ) is admixed to the fill gas. During lamp operation, a cyclic tungsten-fluorine process takes place close to the filament, the tungsten not included in this cycle is transported back to the filament by the second halogen.

3,732,456

## WIDEBAND DEFLECTION MODULATED SEMICONDUCTOR AMPLIFIER

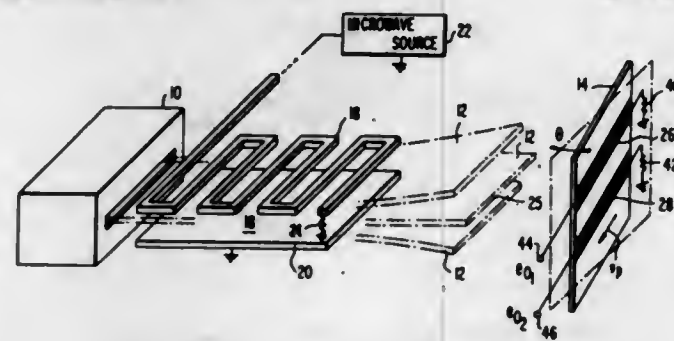
Daniel C. Buck, Hanover, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 27, 1971, Ser. No. 192,811

Int. Cl. H01J 23/16, 29/96

U.S. Cl. 315-3

12 Claims



Wideband performance is obtained in a deflection modulated microwave traveling wave electron beam semiconductor

3,732,459

## MAGNETRONS

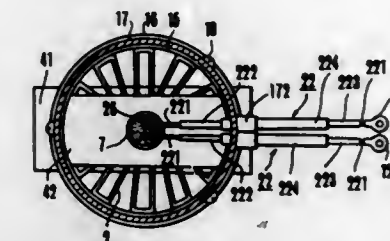
Tomokatus Oguro, Mobar; Mitsuru Watanabe; Hideo Takatsuki, Hitachi; Kunihiko Okamoto, Gakusuzumachi, and Teruo Suda, Matsudo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 20, 1971, Ser. No. 145,320

Claims priority, application Japan, May 20, 1970, 45/42462  
Int. Cl. H01J 25/50

U.S. Cl. 315-39.51

4 Claims



3,732,457

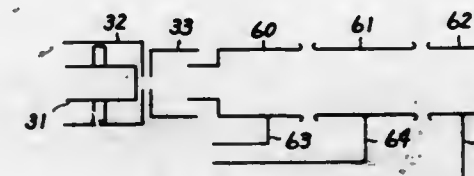
## ELECTRODE LENS POTENTIAL ARRANGEMENT FOR A POST-ACCELERATION PICTURE TUBE

Ichiro Ueno, and Kazuo Toya, both of Tokyo, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 27, 1971, Ser. No. 110,059

Claims priority, application Japan, Jan. 30, 1970, 45/8217  
U.S. Cl. 315-15

5 Claims



An electron gun for a post-acceleration picture tube comprises a first electrode to which a low voltage is applied, a second electrode to which a high voltage is applied and a third electrode to which an intermediate voltage is applied. The main lens of the electron gun is composed of the first, second and third electrodes. The electron gun is particularly useful in a post-acceleration shadow-mask type color picture tube.

In a magnetron having lead wires for passing heating current to the cathode filament, each of the lead wires comprises a coaxial cable including a core conductor for passing the filament heating current, at least one insulator layer having a large microwave loss surrounding the core conductor, and an outer conductor surrounding the insulator layer.

3,732,458

## CIRCUIT ARRANGEMENT FOR CORRECTING THE DEFLECTION OF AT LEAST ONE ELECTRON BEAM IN A TELEVISION PICTURE TUBE BY MEANS OF A TRANSDUCTOR

Jorg Wolber, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

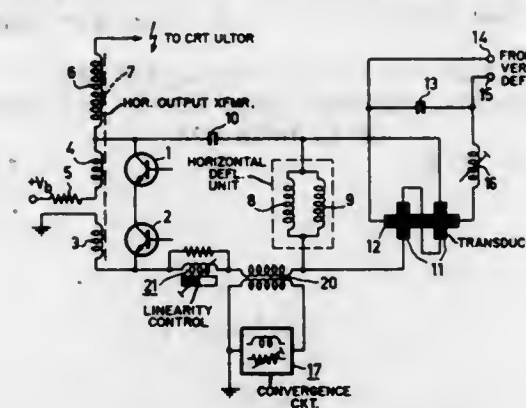
Filed July 16, 1970, Ser. No. 55,524

Claims priority, application Germany, Aug. 7, 1969, P 19 40 216.5

Int. Cl. H01J 29/76

U.S. Cl. 315-24

6 Claims



A circuit arrangement for raster correction in a television picture tube by means of a transducer whose power winding is connected in parallel with at least a portion of the line deflection coils, the line deflection generator having a low internal impedance. In order to increase this impedance a mainly inductive impedance is connected in series with the generator. In a picture tube employing at least two electron beams the series impedance may include the convergence circuit. As a result the convergence in the corners of the picture screen is also improved. The linearity control circuit may likewise form part of the series impedance.

3,732,460

## CIRCUIT FOR INSTANT RESTART OF HIGH PRESSURE DISCHARGE LAMP

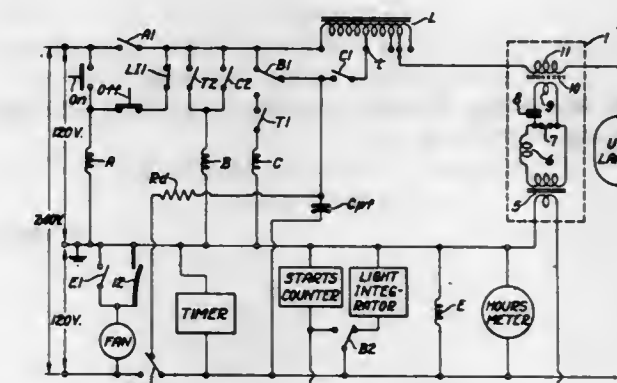
Hans L. Wattenbach, South Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 28, 1972, Ser. No. 221,662

Int. Cl. H05b 41/04

U.S. Cl. 315-123

4 Claims



In the running condition, a high pressure lamp is connected in series with an inductive reactor across the line (240 volts), and a power factor correcting capacitor is connected across the line. To assure instant starting whether the lamp is hot or cold, an igniter is energized which injects kilovolt radio frequency pulses in series with the reactor open circuit voltage across the lamp, and the reactor open circuit voltage is boosted a predetermined factor up to  $3 \times$  line voltage by temporarily connecting the power factor correcting capacitor to a tap in the inductive reactor.



3,732,461

## UNBALANCE DETECTION CIRCUITS FOR PLURAL PARALLEL LAMP SYSTEMS

Horst Bickl, Munich; Joachim Lange, Unterhaching; Heinrich Neumann, Munich; Bernhard Goschin, Munich, and Alois Rieder, Munich, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Munich, Germany

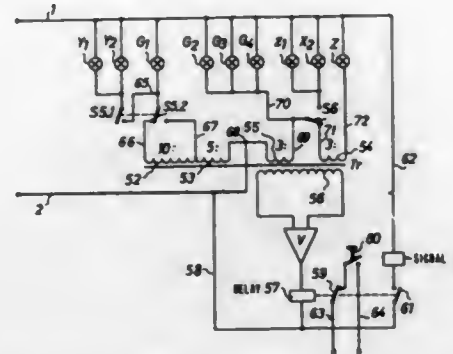
Filed Oct. 16, 1970, Ser. No. 81,267

Claims priority, application Germany, Nov. 25, 1969, P 19 59 016.0

Int. Cl. H01J 1/60; H05b 37/03

U.S. Cl. 315-130

2 Claims



An illumination installation, in particular for lighting a transparent table or support in step-by-step microfilm camera apparatus, such installation providing for the even illumination of a condenser of an image projecting apparatus. A plurality of lamps are distributed over the surface to be illuminated, the lamps being divided into at least two groups. In certain embodiments the current supply circuit for feeding the lamps is divided into two parallel circuits, each of which contains a resistor, there being an amplifier which scans the voltage drop at the resistors and operates an optical and/or acoustical signal transmitter upon an unbalance of the voltage drops through the respective resistors.

In another embodiment, the feeding of current to the lamps is divided into at least two parallel circuits, the passage of current through which is compared by a compensatory current transformer which controls a relay controlling an optical and/or acoustic signal transmitter and/or a switch controlling a further apparatus controlling circuit.

3,732,462

## BALLAST APPARATUS FOR OPERATING A PAIR OF GASEOUS DISCHARGE LAMPS

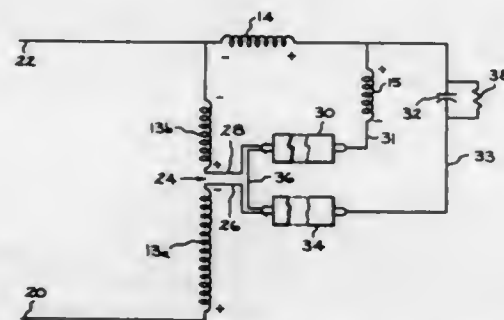
Frank A. Neusbaum, Danville, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed March 13, 1972, Ser. No. 234,176

Int. Cl. H05b 41/16

U.S. Cl. 315-257

4 Claims



A ballast apparatus for sequentially igniting and operating two gaseous discharge lamps includes a transformer having a primary winding with a tap dividing it into two primary winding portions. A first secondary winding is connected to the end of one primary winding portion remote from the tap. A second

secondary winding is connected to the first secondary winding and a first lamp can be connected between the second secondary winding and the primary winding tap. A capacitive reactance is connected to the first secondary winding and a second lamp can be connected between the capacitive reactance and the primary winding tap.

3,732,463

## GROUND FAULT DETECTION AND INTERRUPTION APPARATUS

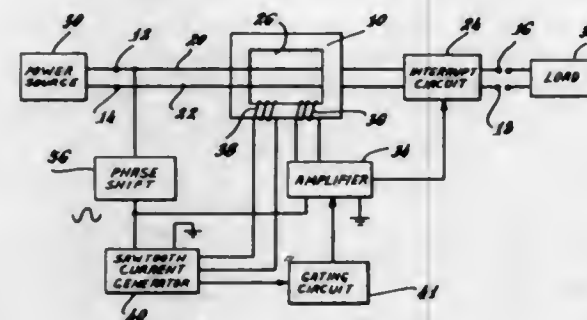
Brian Dale, Lynnfield, Mass., assignor to GTE Laboratories Incorporated, Bayville, N.Y.

Filed Jan. 3, 1972, Ser. No. 215,020

Int. Cl. H02h 3/26

U.S. Cl. 317-18 D

6 Claims



An apparatus for detecting a ground fault and for interrupting the supply of electrical energy upon detection of a fault is disclosed comprising a means for establishing a magnetic flux,  $\phi_d$ , which is representative of the difference in current flowing between two conductors, a means for establishing a reference magnetic flux,  $\phi_r$ , and means for sensing when  $\phi_d$  exceeds  $\phi_r$ , and for interrupting the application of electrical energy to a utility device when  $\phi_d$  exceeds  $\phi_r$ .

3,732,464

## DISTANCE RELAY SYSTEM

Yoshiteru Miki; Hiroshi Sasaki, both of Hitachi; Masami Okamura, Musashino, and Yoshifumi Oura, Yokohama, all of Japan, assignors to The Tokyo Electric Power Co., Chiyoda-ku; Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi and Hitachi, Ltd., all of Japan, part interest to each

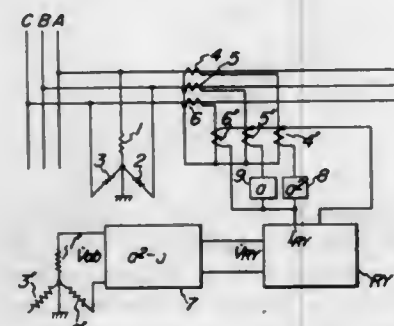
Filed Nov. 15, 1971, Ser. No. 198,787

Claims priority, application Japan, Nov. 19, 1970, 45/102362

Int. Cl. H02h 3/28

U.S. Cl. 317-27 R

7 Claims



A back up protective relay system using a distance relay for protecting transmission lines from faults occurring thereon which system responds only to unsymmetrical faults that give rise to negative-sequence current, is provided. As the polarity voltage is used a voltage relevant to the faulted phase.

3,732,465

## ELECTRONIC SENSING AND ACTUATOR SYSTEM

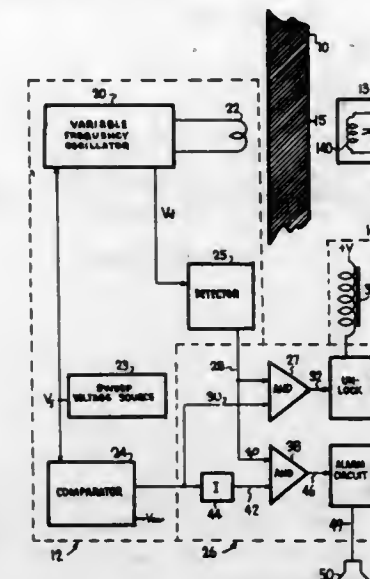
Ronald S. Palmer, San Jose, Calif., assignor to Charles A. Walton, Los Gatos, Calif.

Filed Sept. 20, 1971, Ser. No. 181,865

Int. Cl. E05b 49/00

U.S. Cl. 317-134

14 Claims



An electronic sensing and actuator control system for sensing an energy change dependant on the proximity of a coded member to a sensor mechanism, the mechanism including an electric field producing means operative over a range of continuously varying frequencies; the coded member including a passive energy absorbing circuit responsive to a predetermined frequency range and adapted for placement in proximity to said mechanism to create a variation in the energy level of said electric field producing means; detecting means for detecting variations in the energy level of said electric field; and control-actuator means adapted to respond to the detecting means.

3,732,466

## PROGRAMMER

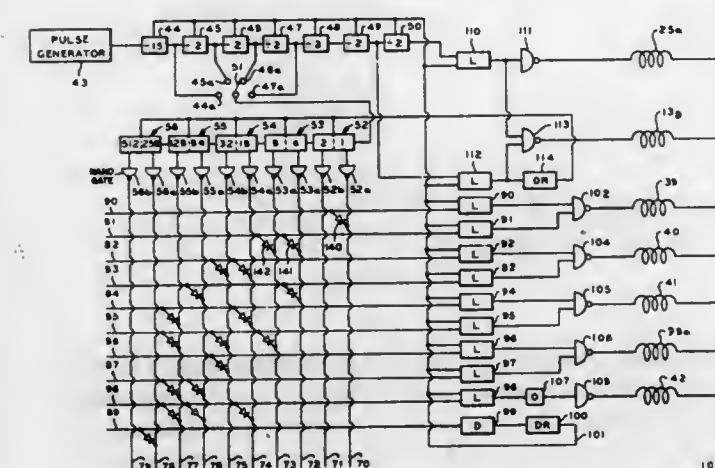
Daniel M. Vesper, and Vern A. Street, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed April 1, 1971, Ser. No. 130,250

Int. Cl. G01n 31/08; H01h 47/14

U.S. Cl. 317-140

7 Claims



A programmer is disclosed which utilizes a diode matrix. Pulses at a predetermined frequency are applied to the input of a counter which has a plurality of outputs. These outputs are applied to first terminals of the matrix so that signals are established representing consecutive time intervals. The matrix is provided with a plurality of outputs which are applied through latching circuits to provide control signals. The

input and output terminals of the matrix are selectively connected together by means of diodes so that output signals are established in any desired time sequence. This programmer can be employed to advantage to control a chromatographic analyzer.

3,732,467

## RELAY RELEASE DELAY CIRCUIT

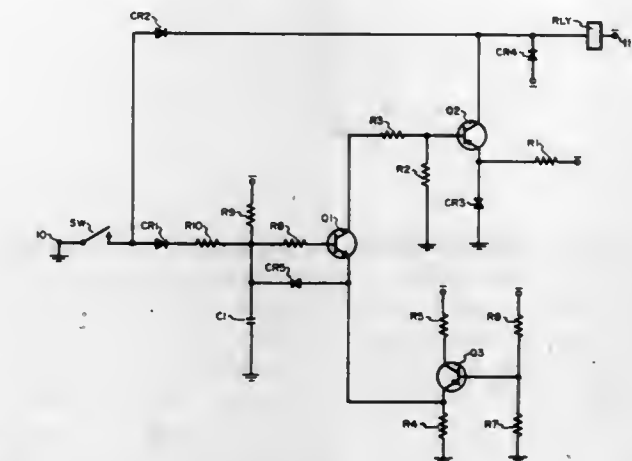
Jeffrey P. Mills, Forest Park, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, North Lake, Ill.

Filed May 3, 1971, Ser. No. 139,336

Int. Cl. H01h 47/18

U.S. Cl. 317-141 S

1 Claim



A circuit is disclosed that is connected to the driving conductor of a relay to increase the relay's release time. The circuit includes an RC timing circuit that is effective to maintain an amplifier circuit in a non-conductive state. The application of an operating potential to the driving conductor discharges the capacitor which switches the amplifier to the conductive state to maintain the relay operated for a period of time determined by the RC constants of the circuit. The circuit has a variable level limit for the capacitor charge to maintain the time interval constant in spite of voltage source variations.

3,732,468

## TIMING DEVICE FOR COOKING MEAT

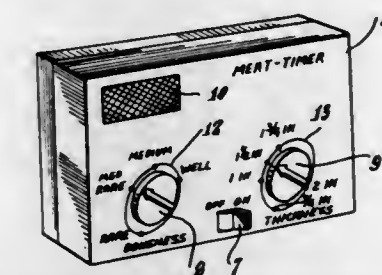
Allan E. Witt, Westport, and George M. Suhm, Bridgeport, both of Conn., assignors to Food Automation-Service Techniques, Inc., Bridgeport, Conn.

Continuation-in-part of Ser. No. 111,426, Feb. 1, 1971, abandoned. This application Feb. 16, 1972, Ser. No. 226,741

Int. Cl. G07c 1/02

U.S. Cl. 307-149

7 Claims



An alarm type timing device is provided for use in cooking meat. The device includes a non-linear, electronic circuit adapted to approximate the unusual nature of outdoor charcoal-grill type of cookery. The circuit is so designed as to act as a mathematical model for the meat being cooked and, using empirical data, takes into consideration the nature of the bed of charcoal, the desired "doneness", and the thickness of the meat, and thereby provides an alarm signal when the cooking is completed.



3,732,469

## CAPACITOR WITH CERAMIC CHIP HELD IN COMPRESSION BOTH Laterally AND AXIALLY BY A GLASS SLEEVE

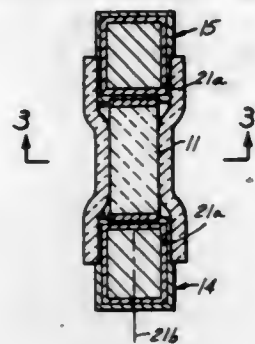
Alvin N. Watson, Glendora, Calif., assignor to Monolithic Dielectrics, Inc., Burbank, Calif.

Filed May 30, 1972, Ser. No. 257,921

Int. Cl. H01g 1/02

U.S. Cl. 317-261

9 Claims



A capacitor in which a ceramic chip is held compressively, both laterally and axially, between two metal heads by a peripheral glass sheath. A layer of malleable material is provided between the end faces of the chip and the head at each of the heads, and also a band of malleable metal extends peripherally around a cylindrical surface on each head which band is embraced by the glass sheath. The heads and sheaths are held together only by compressive force exerted by the sheath, the malleable metal providing a compressive jointer between the abutting faces resistive to thermal and mechanical shock. The metal also provides, between the sheath and heads, for relief of excessive forces due to variations and tolerances of the parts and for a reliable hermetic seal. The chip is laterally gripped by the glass sheath to hold it against shifting or tipping in the sheath, and the invention includes a method for shrinking the glass sheath onto the chip.

3,732,470

## ELECTROLYTIC DEVICE AND SEMICONDUCTOR OXIDE ELECTROLYTE THEREFOR

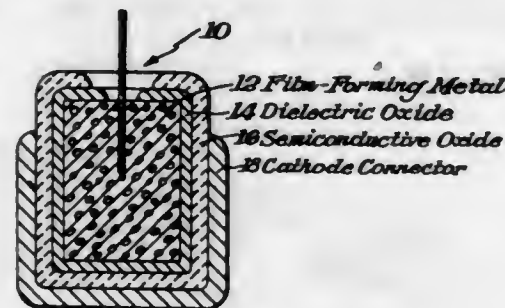
Preston Robinson, Bulkeley St., Williamstown, Mass.

Continuation-in-part of Ser. No. 767,516, Oct. 14, 1968, Pat. No. 3,631,302. This application Dec. 20, 1971, Ser. No. 210,083

Int. Cl. H01g 9/04

U.S. Cl. 317-230

4 Claims



A solid electrolytic capacitor is produced by competing electrolytic reactions that produce a dielectric film on the surfaces of a porous anode and a layer of semiconductive oxides on the dielectric film. Current is passed through the anode and a suitable cathode in an aqueous electrolyte containing a film-forming anion and cation capable of being oxidized to a semiconductive layer on the surface of the dielectric film. The thickness of the semiconductive layer is controlled by an intermediate step of depositing a given amount of a hydroxide of the cation on the dielectric film by reversing the current between the initial and final oxidation.

3,732,471

## METHOD OF OBTAINING TYPE CONVERSION IN ZINC TELLURIDE AND RESULTANT P-N JUNCTION DEVICES

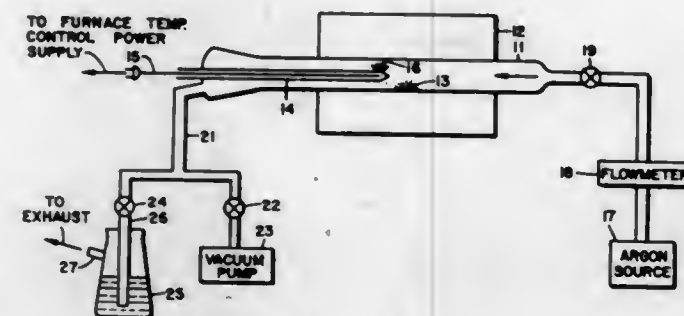
Shou-Ling Hou, Lexington, Mass.; James A. Marley, Jr., Saratoga, Calif.; Kenneth O. Beck, deceased, late of Billerica, Mass., and by Marilyn Beck, heir, Union, N.J., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 10, 1969, Ser. No. 875,068

Int. Cl. H01l 7/02

U.S. Cl. 317-234 R

9 Claims



A method of making p-n junction devices by bombarding a polished crystal of ZnTe with ions of an element selected from the Group VII A elements and p-n junction devices resulting from this method. When the crystal is held at an elevated temperature during the ion bombardment step, subsequent annealing is usually not necessary. When the crystal temperature is at room temperature or below during the ion bombardment step, type conversion can be obtained only by post implantation annealing. The particular type of p-n junction device and the characteristics thereof are determined by the particular schedule of annealing to which the implanted body is subjected.

3,732,472

## CURRENT SUPPLY AND COMMUTATION CIRCUIT OF ELECTRIC MOTOR

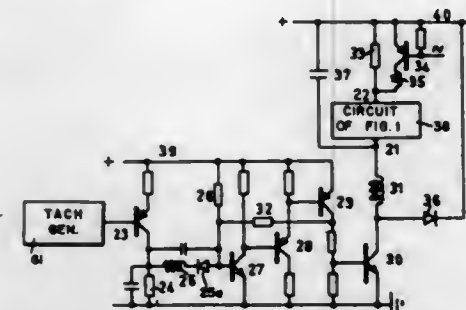
Robert Favre, Lausanne, Switzerland, assignor to Golay Buchel &amp; Cie S.A., Lausanne, Switzerland

Continuation-in-part of Ser. No. 676,871, Oct. 20, 1967, abandoned. This application June 15, 1970, Ser. No. 46,438. Claims priority, application Switzerland, Oct. 26, 1966, 15601/66

Int. Cl. H02k 37/00

U.S. Cl. 318-138

12 Claims



An electronic commutation circuit for a three phase electric motor is supplied with direct current by a circuit having a high internal non-ohmic impedance in relation to the impedance of the load. The supply circuit comprises an electronic interrupter, an inductance coil and a resistance in series with the motor commutation circuit. The supply circuit is opened when the current reaches a selected upper limit value and is closed when the current reaches a lower limit value thereby maintaining the current substantially constant. The limits may be made responsive to a motor function, for example speed or load. The switching of the commutating circuit is effected by transistors or thyristors under control of a cyclical impulse generator and distributor.

3,732,473

## INVERTER COMMUTING CAPACITOR CHARGE CONTROL CIRCUIT

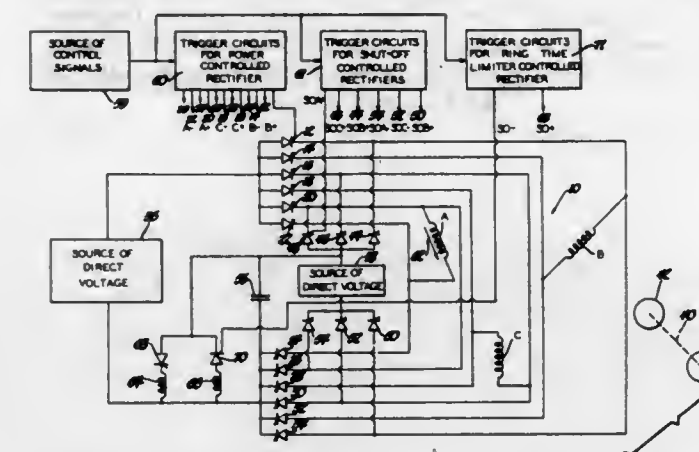
Richard W. Johnston, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 26, 1971, Ser. No. 175,136

Int. Cl. H02m

U.S. Cl. 318-227

2 Claims



An inverter commuting capacitor is connected in shunt with a series combination of an inductor and a controlled rectifier to limit the transient time of the commuting capacitor during commutation. Energy stored in the commuting capacitor is used to commute the inverter's power controlled rectifiers at predetermined times, and energy stored in the motor windings is transferred to the capacitor during the transient period of commutation to prepare the capacitor for the subsequent commutation. The inductor connected in shunt with the commuting capacitor increases the natural frequency of the LC circuit comprised of the commuting capacitor and the motor winding when the controlled rectifier connected in series with the inductor is gated conductive. In this manner, a reduction in the transient time of the capacitor is effected.

3,732,474

## POSITIONING CONTROL SYSTEM FOR A MACHINE THAT PERFORMS WORK ON A MOVING PART

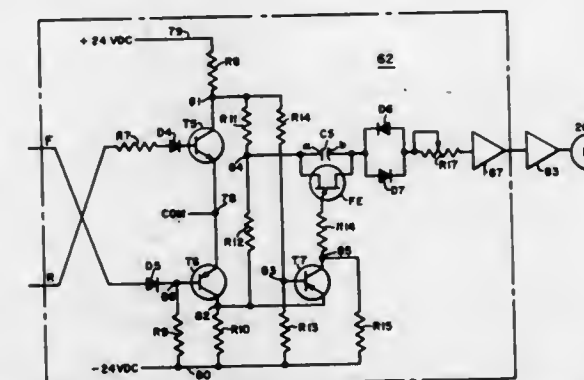
Ernest G. Anger, Wauwatosa; Giles J. Richards, Menomonee Falls; John F. Bloodgood, Fond du Lac, and Roy J. Geiger, Cedarburg, all of Wis., assignors to Square D Company, Park Ridge, Ill.

Division of Ser. No. 146,110, May 24, 1971, Pat. No. 3,686,556. This application May 1, 1972, Ser. No. 248,944

Int. Cl. H02p 5/06

U.S. Cl. 318-257

6 Claims



A programmable and manually operable control system for controlling the position of a machine relative to a workpiece so the machine may perform work at various locations on the workpiece while the workpiece is moved by the conveyor. The system includes a pair of synchro resolvers which provide output signals indicative of the position of the machine relative to a datum position and a pair of synchro resolvers which provide output signals indicative of the position of the conveyor rela-

tive to the datum position. The outputs of the machine indicating resolvers provide the inputs to the conveyor indicating resolvers and the outputs of the conveyor indicating resolvers are compared with command signals that are generated by a continuously recycling counter which has been preset by signals from a memory so the displacement between selected locations on the workpiece and the machine is electrically measured without using differential mechanical gearing. The control system is arranged so the machine will move synchronously with the workpiece, independently of the workpiece, and synchronously with the workpiece while the machine is moving from one preprogrammed location to a new preprogrammed location on the workpiece.

3,732,475

## MOTOR CONTROL CIRCUIT

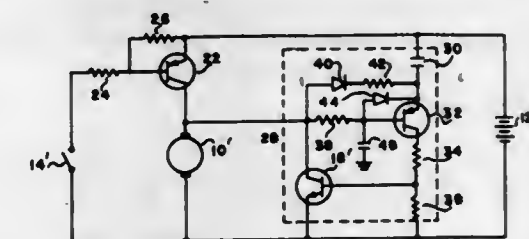
Leonardus Johannes Geerling, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed June 28, 1971, Ser. No. 158,923

Int. Cl. H02r 3/14

U.S. Cl. 318-275

8 Claims



A motor control circuit for rapidly starting and stopping a direct current motor in relation to a start-stop switch operation for energizing and de-energizing the motor is disclosed. The motor control circuit preferably includes a plurality of semiconductor switching means for controlling the power application thereto and also for applying dynamic braking thereto. The dynamic braking circuit means automatically shunts the armature of the motor for a predetermined time to be long enough to stop the motor when the start-stop switch disconnects the power thereto. The dynamic braking circuit means is energized by a separate power source for the predetermined time rather than the electromotive force generated from the motor.

3,732,476

## LOW COST SWITCHING ARRANGEMENT FOR APPLIANCE MOTOR SPEED CONTROL

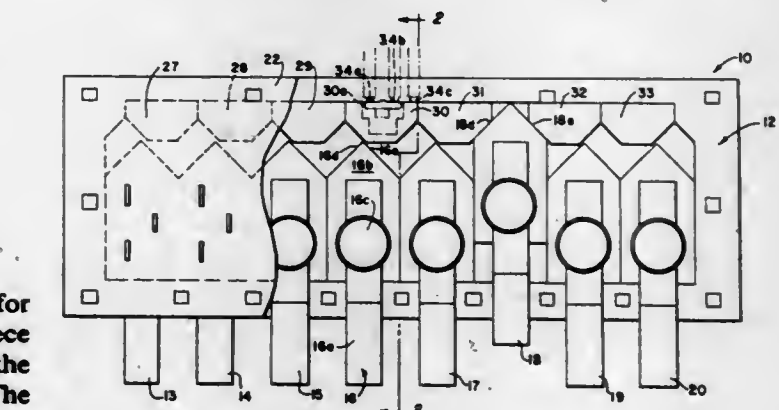
Carmen P. Calrelli, Farmington, Conn., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.

Continuation-in-part of Ser. No. 858,431, Sept. 16, 1969, abandoned. This application May 21, 1971, Ser. No. 145,925

Int. Cl. H01h 9/26

U.S. Cl. 318-305

11 Claims



A switching arrangement for a motor control system for a small appliance such as a blender is provided which includes a



housing and a plurality of longitudinally movable, push button-operated switch actuators located therein. Each actuator carries a switch contact which, together with a corresponding set of contacts associated with the housing, forms a control switch. The actuators are adapted to cooperate with a plurality of laterally displaceable blocks to provide positive lock-out of the other actuators when one actuator is depressed unless a further actuator is positively actuated. The control switches operated by the actuators control the energization of the stator windings associated with the motor and a contact located on one of the blocks together with a housing-mounted contact forms a range switch for controlling the connection of a diode into the motor control circuit. The provision of two taps on one stator winding enables a system of eight actuator-operated control switches and the range switch to provide seven motor speeds as well as disconnection of the motor.

3,732,477

# SIGNALLING AND CONTROLLING DEVICE FOR MAGNETIC TAPE APPARATUS

Rodolfo Ciatelli, Rome, Italy, assignor to Autovox S.p.A., Rome, Italy

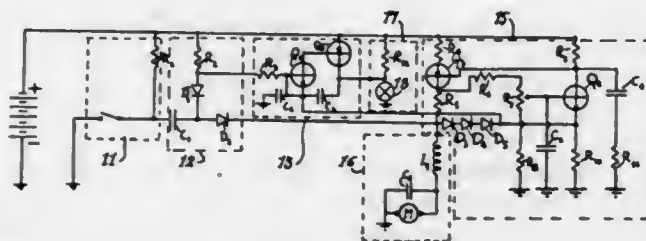
Filed March 3, 1969, Ser. No. 803,691

Claims priority, application Italy, Oct. 9, 1968, 40331 A/68

Int. Cl. G03b 1/02; B65h 59/38

U.S. Cl. 318—463

2 Claims



An apparatus for monitoring various conditions of tape feed in a magnetic tape transport as indicated by the take-up reel speed. A commutator detects the speed of the take-up reel and controls a multivibrator which deactivates the tape transport drive motor and flashes an alarm lamp when the take-up reel speed, as represented by the detector output, deviates from a preselected norm.

3,732,478

# HIGH GAIN NULL-BALANCE SERVO SYSTEM

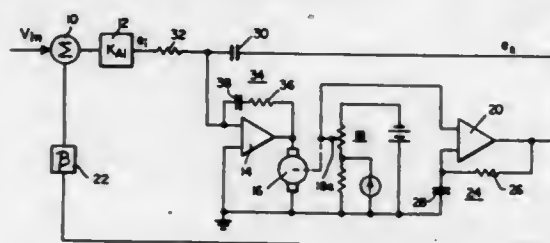
Samuel J. MacMullan, Newtown, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Continuation-in-part of Ser. No. 126,667, March 22, 1971, abandoned. This application April 3, 1972, Ser. No. 240,637

Int. Cl. G05b 5/01

U.S. Cl. 318—616

29 Claims



A multi-loop, high-gain null-balance servo measuring system having low sensitivity to parameter variations and comprising a pre-amplifier, a post-amplifier and a DC motor for driving an adjustable circuit element. The circuit element is driven by the motor in response to an error signal equal to the difference at null between an unknown input signal and a restoring signal provided by the overall system or outer loop feedback which represents the position of the adjustable circuit element. Reactive means are provided for establishing a

least one inner loop feedback path for applying velocity and acceleration signal components to the input of the post-amplifier.

3,732,479

# SYNCHROS

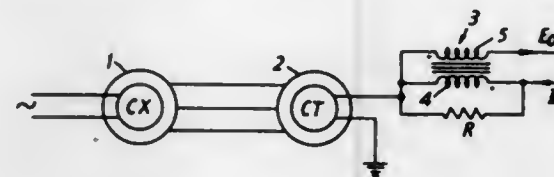
Willis Guy Wing, Glen Head, N.Y.; George Edward March Baker, and Rodney Frank Smith, both of Crowthorne, England, assignors to Sperry Rand Limited, London, England

Continuation-in-part of Ser. No. 820,584, April 30, 1969, abandoned. This application June 11, 1970, Ser. No. 45,528

Int. Cl. G05b 1/12

U.S. Cl. 318—654

6 Claims



A synchro-torquing device having a control transmitter synchro, a control receiver synchro connected to receive a data output signal from the transmitter synchro, and means for supplying a torquing current to the receiver synchro, electrical means being provided to obviate the effect of the torquing current on the data signal output from the receiver, whereby there is provided a control synchro system from which can be obtained current-controlled torque outputs from either transmitter or receiver without having to employ a separate torque motor.

3,732,480

# OPEN LOOP STEPPING MOTOR ACCELERATION-DECELERATION CONTROL

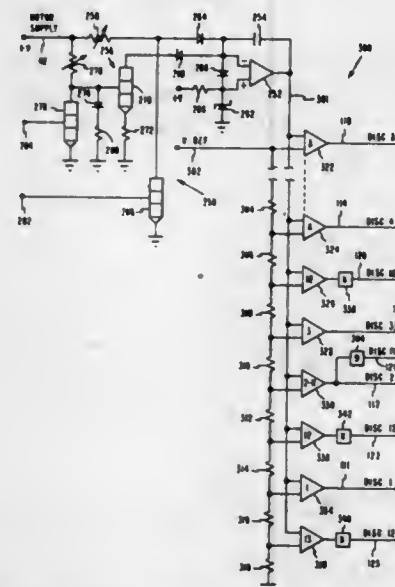
Kenneth E. Hendrickson, Rochester, and Larry F. Mattson, Pine Island, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed March 1, 1971, Ser. No. 120,031

Int. Cl. H02k 37/00

U.S. Cl. 318—696

16 Claims



A logic control method and system for controlling the operation of a stepping motor having a known load to provide incremental motion of the motor without feedback. Time is measured whenever the motor is accelerating or decelerating and pulses are generated whenever predetermined periods of time have passed. The pulses are used to selectively energize windings of the motor in sequence to provide maximum acceleration; to reach running velocity without excessive

overshoot or hunting; and to provide controlled deceleration to bring the motor to rest at any one of a plurality of equilibrium angles.

3,732,481

# METHOD AND APPARATUS FOR CHARGING BATTERIES

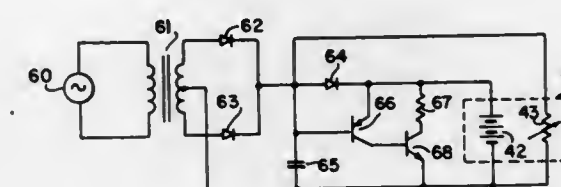
Joseph A. Mas, 3 Maple Way, Woodbury, N.Y.

Filed May 7, 1970, Ser. No. 35,352

Int. Cl. H02j 7/10

U.S. Cl. 320—14

2 Claims



A method and apparatus for rapidly charging a battery. During the charging process, the battery is caused to accept and store the desired charging current by producing discharge pulses whose rate and/or durations vary in accordance with the relative magnitudes of the charging current and the acceptance current level of the battery.

3,732,482

# TWO TERMINAL NETWORK WITH NEGATIVE IMPEDANCE

Alois Marek, Nussbaumen, Switzerland, assignor to Brown, Boveri & Company Limited, Baden, Switzerland

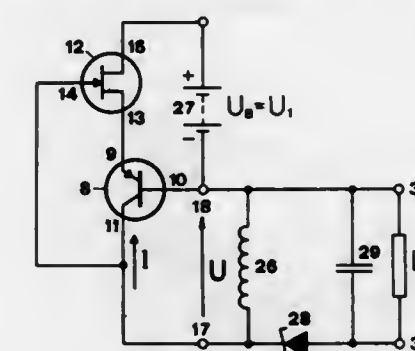
Division of Ser. No. 122,058, March 8, 1971, abandoned. This application May 30, 1972, Ser. No. 257,603

Claims priority, application Switzerland, March 23, 1970, 4329/70

Int. Cl. H02m 3/22

U.S. Cl. 321—2

5 Claims



The present negative impedance two terminal network is embodied by two three terminal amplifiers, for example, one of which is a field effect transistor and the other is a bi-polar transistor, wherein the emitter-collector circuit of the bi-polar transistor and the source-drain circuit of the field effect transistor are connected in series with each other. The two terminals of the network are formed by the base and by the collector of the bi-polar transistor. Said collector is also connected to the gate terminal of the field effect transistor. A control voltage source is preferably connected between said base of the bi-polar transistor and the drain terminal of the field effect transistor, whereby said negative impedance is differentially adjustable by varying the control voltage.

3,732,483

# MAGNET-TYPE AC GENERATOR FOR A BREAKERLESS-TYPE IGNITION SYSTEM

Mitsuo Katsumata, Numazu, Japan, assignor to Kokusan Denki Co., Ltd., Numazu, Japan

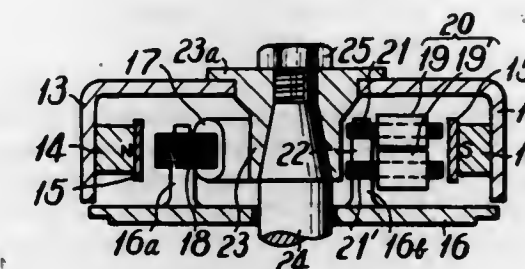
Filed Sept. 20, 1971, Ser. No. 182,076

Claims priority, application Japan, Sept. 21, 1970, 45/92857; Oct. 22, 1970, 45/104267; June 14, 1971, 46/51018

Int. Cl. H02p 9/00

U.S. Cl. 322—91

15 Claims



A magnet-type AC generator for a breakerless-type ignition system comprising a capacitor, an ignition coil including primary and secondary coils, a thyristor for discharging said capacitor through the primary coil of said ignition coil and a spark plug connected to the secondary coil of said ignition coil in which said generator comprises a stator including a capacitor charging winding or windings and a thyristor firing winding or windings, and a rotor including a multi-pole magnetic field means which has a plurality of poles for cooperating with said capacitor charging and thyristor firing windings.

3,732,484

# DELAYED ACTION LOAD SWITCH

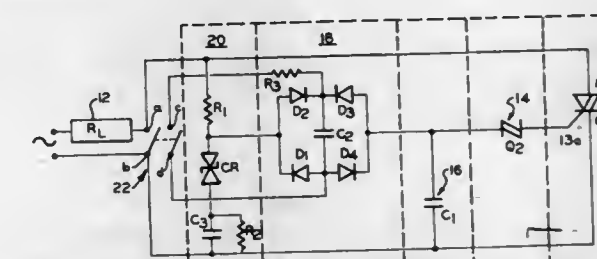
Joseph V. McKenna, Franklin Lakes, N.J., assignor to Mc-Wilker Enterprises, Little Falls, N.J.

Filed Oct. 20, 1971, Ser. No. 190,966

Int. Cl. G05f 3/04

U.S. Cl. 323—19

4 Claims



A delayed-action load switch for A-C operation including a trigger-controlled bilateral solid-state power switch, e.g., a triac, connected in series with a load, and in parallel with a manually-operable on-off switch across an A-C source. A charge-storage capacitor discharges through a bilateral breakover device (e.g., an avalanche switch) to trigger the triac to conduction when the charge on the capacitor reaches a threshold value. The capacitor is charged on each cycle from the A-C source through a bias accumulation network which builds up a D-C potential, increasing with each cycle in opposing the charging of the capacitor so that the threshold value is attained progressively later in each cycle and the proportion of the cycle during which the triac is conductive is gradually reduced to zero.



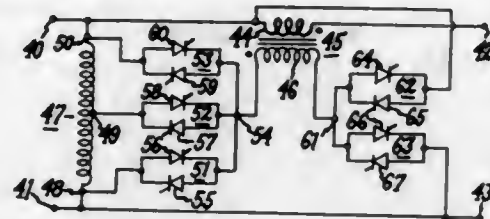
3,732,485

**ELECTRICAL APPARATUS HAVING INVERSE PARALLEL CONNECTED PAIRS OF THYRISTORS**  
 Clarence J. Kettler, Becket, Mass., assignor to General Electric Company

Filed Dec. 29, 1971, Ser. No. 213,334  
 Int. Cl. G05f 1/30

U.S. Cl. 323—43.5 S

2 Claims



Voltage regulator apparatus for an alternating current electrical system which includes a secondary of a transformer connected in series with the line. A voltage of either polarity or no voltage is applied to the primary of the transformer through a plurality of pairs of inverse parallel connected thyristors. The thyristors are gated in such an order so as to assure commutation of any prior conducting thyristor.

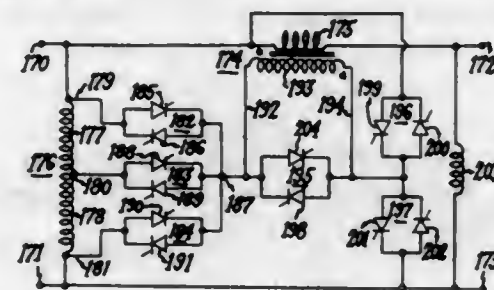
3,732,486

**ELECTRICAL APPARATUS WITH THYRISTOR CIRCUIT**  
 Charles W. Schoendube, Lee, Mass., assignor to General Electric Company

Filed Dec. 29, 1971, Ser. No. 213,338  
 Int. Cl. G05f 1/20

U.S. Cl. 323—43.5 S

6 Claims



Voltage regulator apparatus for an alternating current electrical system which includes a secondary of a transformer connected in series with the line. A voltage of either polarity or no voltage is applied to the primary of the transformer through a plurality of pairs of inverse parallel connected thyristors. The thyristors are gated in an order to assure commutation of any prior conducting thyristor.

3,732,487

**METHOD AND APPARATUS FOR ELECTRICALLY COUPLING AN OUTPUT VOLTAGE FROM A VARIABLE INDUCTION DEVICE TO LOAD**

Donald S. Roselle, Owego, N.Y., assignor to Magnetech Industries, Inc., Montrose, Pa.

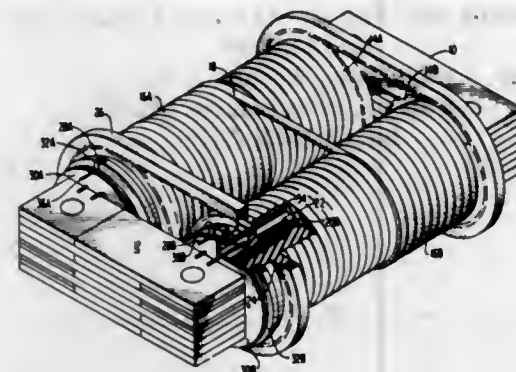
Filed Aug. 12, 1971, Ser. No. 171,206  
 Int. Cl. H01f 21/04

U.S. Cl. 323—54

25 Claims

Apparatus for electrically connecting the output voltage from a movable coil of a variable induction device to an external load. The movable coil is preferably mounted on two spaced, rotatable drums and is linked by a cyclically varying magnetic flux. The resulting output voltage is variable in response to rotation of the drums. A ring and brush arrangement, one of which moves with the movable coil, establishes a current path between the movable coil and the external load through wiping engagement therebetween. The ring is a closed, electrically conductive loop preferably having a

predetermined electrical resistance between points spaced circumferentially thereof, and is positioned in flux linking relation to the cyclically varying magnetic flux operatively associated with the movable coil. The electromotive force in-



duced into the ring thereby modifies the output voltage generated by the movable coil in response to rotation of the movable coil providing a highly accurately selectable output voltage.

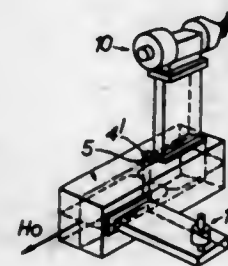
3,732,488

**ELECTRON SPIN INDUCTORS AT MICROWAVES**  
 Caffero Franconi, Via delle Epodi 13B, Cagliari, Italy  
 Continuation of Ser. No. 863,970, Oct. 10, 1969, abandoned.

This application April 13, 1972, Ser. No. 243,796  
 Claims priority, application Italy, Oct. 5, 1968, 40247 A/68  
 Int. Cl. G01n 27/78

U.S. Cl. 324—5 R

11 Claims



Resonant structures supporting two decoupled degenerate orthogonal modes of oscillation of microwaves for magnetic resonance spectrometers employing the Bloch spin induction principal are disclosed. The bimodal microwave cavities used therein include a region where the sample of matter containing the spins under study is placed within the bimodal cavity to be stimulated by the microwave field of the first mode. The energy emitted by the stimulated spins is extracted from the second mode of said bimodal cavities. Balanced mode coupling to the cavities and multiple bimodal cavity systems sharing a unimodal region are disclosed together with means for reducing the cross coupling of the orthogonal modes inside the bimodal structure.

3,732,489

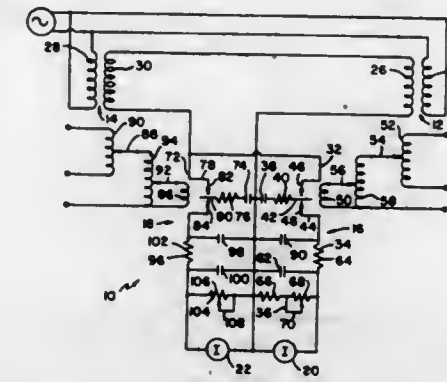
**TRANSFORMER PHASE ANGLE ERROR AND RATIO CORRECTION FACTOR TRANSDUCER**

Jerry G. Nelson, Romulus Township, Wayne County, and Alfredo Francesconi, Detroit, both of Mich., assignors to The Detroit Edison Company, Detroit, Mich.

Filed Feb. 7, 1972, Ser. No. 223,918  
 Int. Cl. G01r 31/06; G01r 29/20

U.S. Cl. 324—55

10 Claims



An electronic circuit for and method of simultaneously providing the ratio correction factor and phase angle error for a test transformer relative to a standard transformer by continuously determining the vector components of the signal resulting from comparison of the voltage across the secondary windings of the standard transformer, the ratio correction factor and phase angle error of which are known, and a test transformer, the ratio correction factor and phase angle error of which is unknown, by sampling a plurality of single cycles of the resulting signal voltage at predetermined points in the resulting signal 90° displaced from each other at each of which one of the ratio correction factor and phase angle error provide no signal voltage and filtering the sample signals to provide direct current signals varying over time which are proportional to the ratio correction factor and phase angle error of the test transformer relative to the standard transformer.

3,732,490

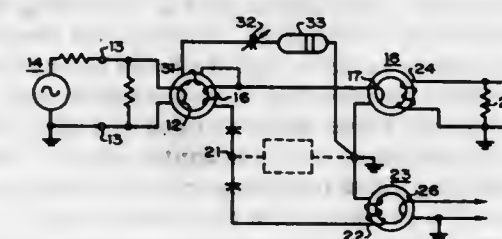
**IMPEDANCE PROBE FOR SWEEPED NETWORK ANALYZER SYSTEM**

Julius K. Botka, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed June 7, 1971, Ser. No. 150,702  
 Int. Cl. G01r 27/00

U.S. Cl. 324—57 R

13 Claims



A probe for use with a network analyzer for measuring the impedance and phase of a network or component under test over a wide swept frequency band comprising three transformers; a driver transformer for supplying power to a current loop including the test terminals connected across the device under test; a current measurement transformer in the current loop for measuring the current supplied from the driver transformer to the device under test, and a voltage measurement transformer coupled across the test terminals for measuring the voltage across the device. An adjustable balancing circuit including an additional winding on the driver transformer is utilized for balancing out the effect of parasitic capacitance across the test terminals. A small coupling circuit is provided between the current loop and the voltage measurement chan-

nel to compensate for the slight voltage drop in series with the device under test due to the probe tip socket and also for undesired leakage between the driver, current, and voltage measurement circuits of the probe structure. An annular grounding ring utilized on the measurement end of the probe is included in the current measurement circuit and the voltage measurement circuit, equal portions of the ring being included in each of said two circuits as measured from the null or midpoint of the grounding ring.

3,732,491

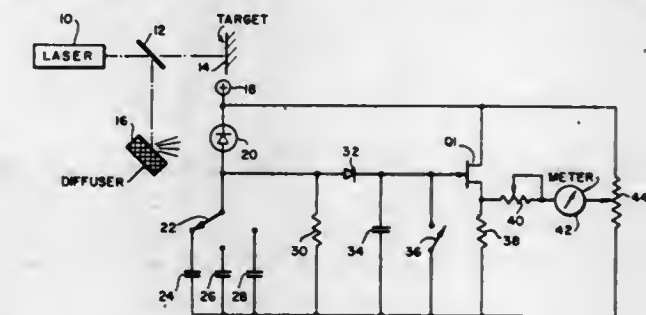
**LASER ENERGY MONITOR CIRCUIT**

Albert D. Battista, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Jan. 21, 1971, Ser. No. 108,367  
 Int. Cl. G01r 19/16, 31/00

U.S. Cl. 324—102

1 Claim



A laser energy monitor circuit. A fixed fraction of the energy output of a laser is diffused and then directed to a photodiode, and the diode output current is integrated. The integrated signal is transferred to a peak detector which, in turn, drives an FET transistor. The output of the transistor, which may persist for many minutes even in the case of a nanosecond laser pulse, drives a meter and thus provides an extended visual indication of the energy in the pulse.

3,732,492

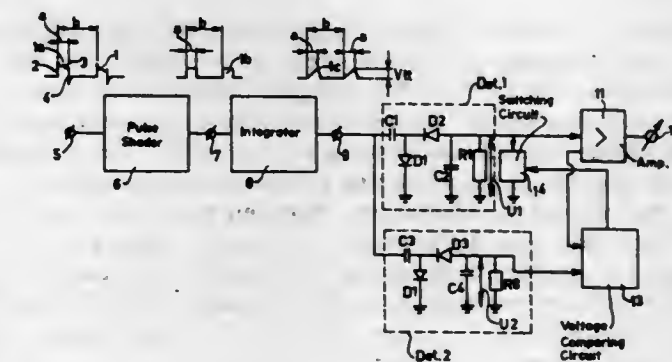
**ELECTRIC FUEL INJECTION TESTER**

Herman Robert Geul, Leiden, Netherlands, assignor to Sun Electric Corporation, Chicago, Ill.

Filed Sept. 3, 1970, Ser. No. 69,284  
 Int. Cl. G01r 19/16

U.S. Cl. 324—103 P

2 Claims



This invention relates to a device for measuring the varying time duration of opening of electronically controlled injection valves of fuel injection systems for internal combustion engines under actual running conditions. To this end, the electrical square wave pulses which control the opening of the valves are converted into sawtooth pulses with a peak amplitude which is proportional to the width of the control pulses, and thus with the duration of opening of the injection valves. This amplitude of the sawtooth pulses is measured and the resulting output signal is supplied to an indicating instrument of which the scale is marked in time units.



3,732,493

## ELECTRICAL COMPENSATING CIRCUIT

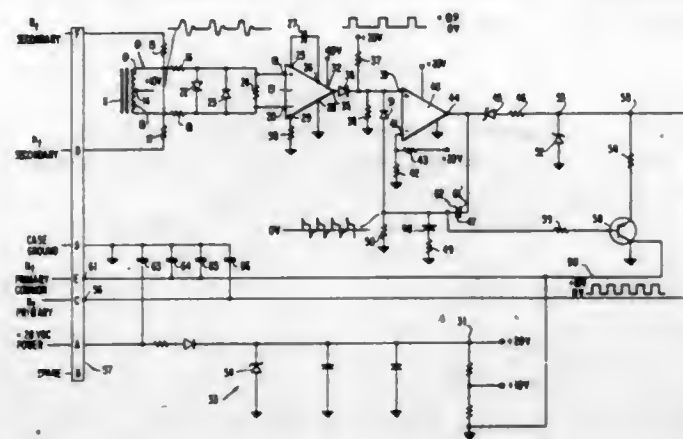
William H. Pelkey, Winoski, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed March 12, 1971, Ser. No. 123,718

Int. Cl. G01p 3/48

U.S. Cl. 324-166

6 Claims



A circuit which reconditions a pulsed signal of varying duty cycles to a signal of 50% duty cycle by utilizing a feedback network. The network generates a correcting signal to any deviation to maintain a 50 percent duty cycle at the output.

3,732,494

## PICK-UP ADAPTOR FOR SENSING SPEED

James W. Dragon, Arlington Heights, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

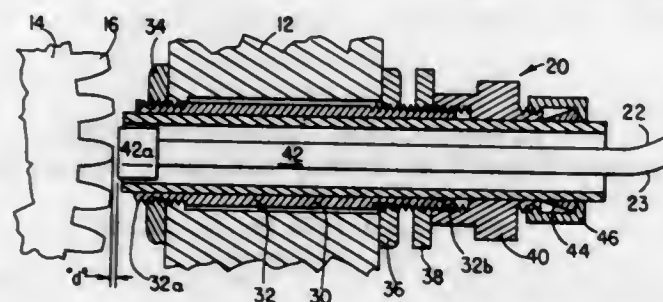
Continuation of Ser. No. 63,095, Aug. 12, 1970, abandoned.

This application June 13, 1972, Ser. No. 262,215

Int. Cl. G01p 3/48

U.S. Cl. 324-173

6 Claims



A pick-up mounting adaptor is positioned through a support housing of an engine so that a pick-up probe can be precisely spaced from the teeth on the ring gear behind the housing to develop pulses usable to operate a tachometer to indicate engine speed. The precise spacing of the end of the pick-up probe from the teeth on the ring gear is obtained without seeing the respective relationships between the pick-up probe and the ring gear by providing calibrated threads on the mounting adaptor for the probe so that after abutment of the probe with the ring gear, it can be threadably retracted from contact therewith a predetermined number of turns to provide the accurate spacing necessary.

3,732,495

## SIGNAL TRANSMISSION AND MODULATION TECHNIQUE THEREFOR

Daniel D. McRae, West Melbourne; Carmen J. Palermo, Melbourne Beach, and Majella G. Pelchat, Indiantonic, Fla., assignors to Radiation, Inc., Melbourne, Fla.

Filed July 20, 1970, Ser. No. 56,527

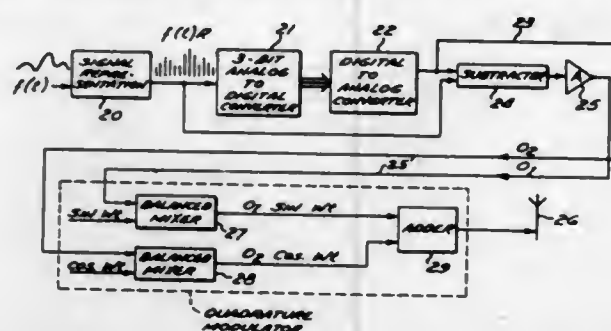
Int. Cl. H04b 1/00

U.S. Cl. 325-60

12 Claims

Two separate signals are derived as indicative of the information content of each of a plurality of discrete time samples

of an input waveform. One of these signals effectively constitutes a stretching of the respective sample, and hence of the input waveform, by designating the deviation of the sample amplitude (or other selected parameter) from an unknown one of a set of discretely increasing reference levels greater in number than two, in a magnified format. The second signal designates the reference level with respect to which the deviation



tion pertains, and thus resolves the ambiguity associated with the first signal. The first and second signals, or an appropriate combination thereof, are impressed on a carrier for transmission to a remote receiving station. Accompanying noise resulting from transmission is compressed in a ratio equal to the ratio of compression of the first signal at the receiving station, to reconstruct the original waveform.

3,732,496

## RADIO TRANSMITTER-RECEIVED INCLUDING MEANS FOR AUTOMATICALLY ADJUSTING THE TRANSMISSION LEVEL

Marcel Louis Boyer, Châtillon, France, assignor to C.I.T.-Compagnie Industrielle Des Telecommunications, Paris, France

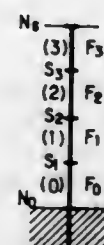
Filed Oct. 5, 1970, Ser. No. 78,100

Claims priority, application France, Oct. 3, 1969, 6933910

Int. Cl. H04b 1/62

U.S. Cl. 325-62

20 Claims



A radio transmitter-receiver including means for automatically adjusting the transmission level so as to bring the reception level in an associated transmitter-receiver receiving such transmission into a range limited at a lower end by a reference reception level by means of an attenuator providing a stepped variable attenuation level and controlled by a signal frequency received from the associated transmitter-receiver; and means for transmitting a signal frequency selected from a set of such frequencies in accordance with the level at which a transmission from the associated transmitter-receiver is received by means of a selector device comprising a set of threshold circuits corresponding to thresholds between said reference reception level and a saturation level limiting the range at an upper end.

3,732,497

## TRANSISTOR TRANSMITTER USING VARIABLE LINE LENGTH TUNER

James P. Campman, Silver Spring, Md., assignor to Vidar Laboratories, Inc., Kensington, Md.

Filed Feb. 10, 1971, Ser. No. 114,156

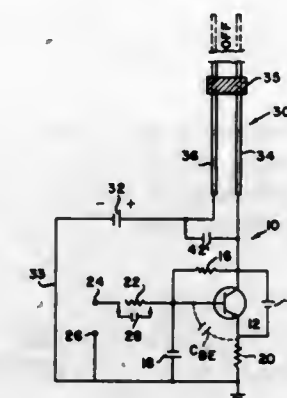
Int. Cl. H04b 1/04

U.S. Cl. 325-105

3 Claims

A transistor controlled transmitter whose modulation process occurs in the square law region by which is achieved

extremely sensitive frequency modulation without the necessity of pre-amplifying stages for the modulating signal. A resonant circuit consists of an LC combination, the reactance of which is variable to change the oscillation frequency in the continuous mode. The variable reactance has physical dimensions which have been calculated to give a frequency of oscillation selectively over the FM band with maximum sensitivity and frequency stability. Other functions accomplished by the



tuning means concomitant with the act of tuning include electromagnetic radiation of the modulated carrier wave with an essentially omnidirectional pattern, resonance of sufficient quality to smoothly adjust the frequency of oscillation, and control means having a unique position which obviates the need for a separate on-off switch.

3,732,498

## FINE-TUNING AND STEREO INDICATOR SYSTEM

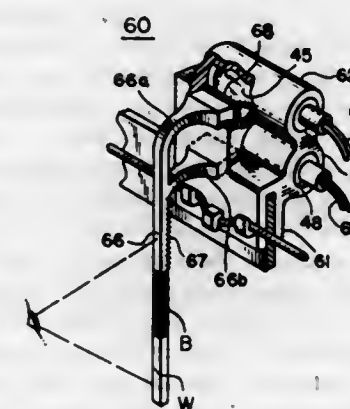
Orval E. Beckman, Wheaton, and Walter Klymkiw, Chicago, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Oct. 12, 1971, Ser. No. 188,051

Int. Cl. H04b 1/16

U.S. Cl. 325-398

3 Claims



A fine-tuning and stereo indicator system for an AM-FM radio receiver capable of receiving FM stereo broadcast signals. The indicator system utilizes two lamps integrally mounted within a dial pointer carriage assembly to illuminate a dial pointer exhibiting light-conductive properties. Whenever a monophonic radio signal is received, the dial pointer glows with a variable intensity representative of the received signal-strength, i.e., fine-tuning. Upon receiving a stereophonic broadcast signal, the fine-tuning lamp is extinguished, and the stereo indicator lamp is fully illuminated and subsequently filtered to impart a second distinctive color (e.g., red) to the dial pointer indicative of stereo reception.

3,732,499

## METHOD FOR TRANSMITTING PULSE LIKE SIGNALS

Curt Danell, Huddinge, and Peder Magnus Rodhe, Stockholm, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

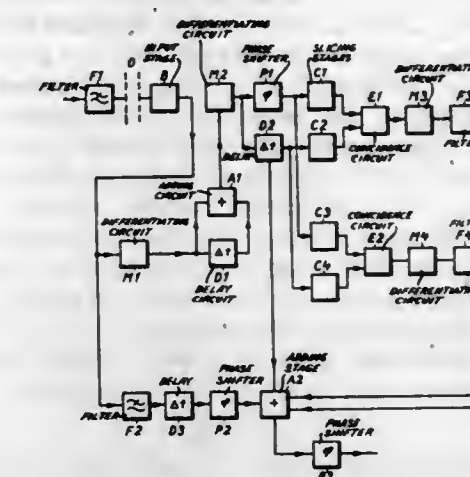
Filed May 20, 1971, Ser. No. 145,408

Claims priority, application Sweden, June 12, 1970, 8170/1970

Int. Cl. H04b 15/00

U.S. Cl. 328-165

6 Claims



This invention relates to a method of processing pulse like signals at the transmitter and receiver ends of a transmission medium so that the slope of the flanks of the transmitted pulses exceeds those transmittable by known methods by a medium with a limited band width. This is achieved by superposing overshoots on the pulses at the transmitter end of the transmission medium. These overshoots which have a frequency within the transmission band of the medium and consequently can be transmitted undistorted by the medium contain information about the slope of the flanks and amplitude of the original pulses at the transmitter end. These overshoots are then separated from the transmitted distorted pulses at the receiver end and a reshaping of the pulses is accomplished upon which frequency components are obtained from the overshoots, the amplitude and the time- and phase position of which have such values that the frequency components together with the transmitted distorted pulses form new pulses which well conform to the original pulses.

3,732,500

## SELECTION AND PROCESSING SYSTEM FOR SIGNALS, INCLUDING FREQUENCY DISCRIMINATOR

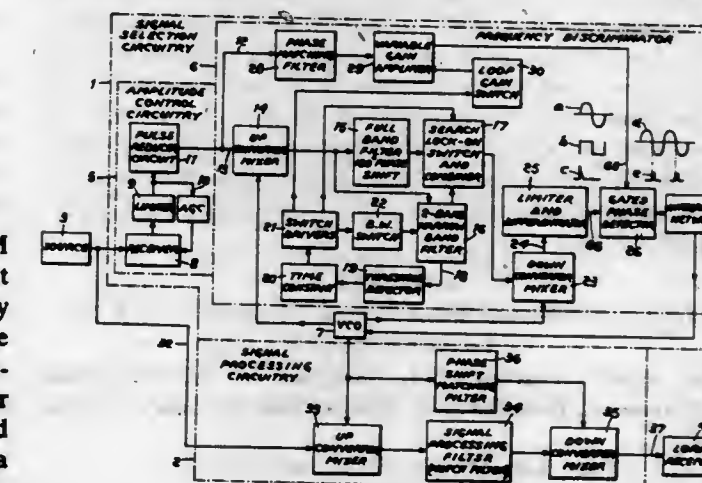
Milton Dishal, Upper Montclair, and Henri Baran, Parsippany, both of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sept. 27, 1968, Ser. No. 763,225

Int. Cl. H03b 1/04

U.S. Cl. 328-167

17 Claims



A signal selection and processing system for use with a broadband LORAN receiver in which the average of the



strongest interfering signal having a predetermined duty cycle sets the AGC level and, via a special frequency discriminator, controls the frequency of a voltage controlled oscillator (VCO). The VCO output is used to shift the entire band of input frequencies so that said strongest signals fall into the attenuating notch of a notch filter while passing the other signals to the LORAN receiver.

In said discriminator, signals are transmitted through one channel in which a certain phase shift is produced and a second channel which also produces the same phase shift plus an additional phase shift which varies  $180^\circ$  over the band of interest. Gating pulses are derived from the phase shifted signals in the second channel and gate out different portions of the signals in the first channel so that the output pulses are of different amplitude and polarity, depending on the input frequency. These output pulses are applied to an integrating network arranged to maintain its charge in the absence of an input signal. The integrated voltage controls the VCO frequency. Frequency search and lock-on are accomplished by switching broadband and narrow band phase shifting filters and varying the gain in the first channel to maintain stability. Up-and-down frequency conversions in said second channel are effected by said VCO. In another embodiment a single frequency conversion for both channels is employed.

3,732,501

# REDUNDANT OPERATIONAL AMPLIFIER CIRCUIT FOR SERVO CONTROL SYSTEMS

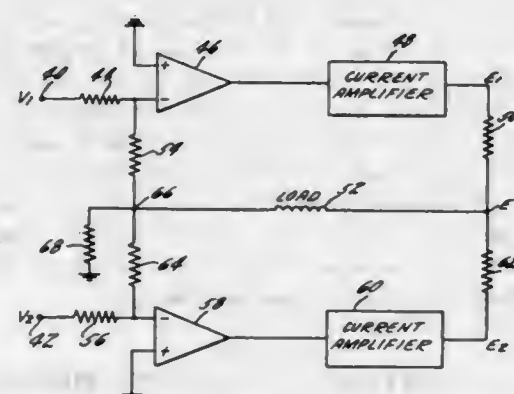
William C. Flacher, Jr., Monroe, Conn., and Frank W. Symons, Jr., Pennsylvania Furnace, Pa., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 27, 1971, Ser. No. 183,925

Int. Cl. H03M 3/68

U.S. Cl. 330-1 A

4 Claims



A redundant type servo valve control system is disclosed which employs a circuit comprising two simultaneously operating control loop channels for protecting against a failure in the control channel. Each channel includes an operational amplifier having one input terminal grounded and the other input terminal connected to a substantially identical input source of error signal. The output from each operational amplifier is fed back to its error signal input terminal through a servo valve load which is common to both channels. Only one feedback loop can be satisfied, so that one of the amplifiers is saturated and the other operates linearly to provide an output in such a manner as to control the amount of the output current from both amplifiers which flows through the servo valve load.

3,732,502

# DISTORTION COMPENSATED ELECTROMAGNETIC WAVE CIRCUITS

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed June 17, 1971, Ser. No. 154,017

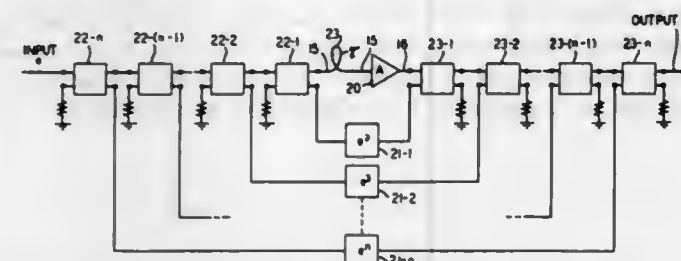
Int. Cl. H03H 1/26

U.S. Cl. 330-149

7 Claims

This application described predistortion and postdistortion compensation arrangements wherein compensation is

restricted to the nonlinear portion of the transfer characteristic of the network to be linearized. Accordingly, the compensating signal components employed correspond solely to



the distortion components of the transfer characteristic. To avoid dispersion effects, the dynamic characteristics of the compensating networks and the network to be linearized are substantially independent of time.

3,732,503

# PROXIMITY SWITCH INCLUDING VARIABLE FREQUENCY OSCILLATOR WITH FERRITE CONTROL ELEMENT

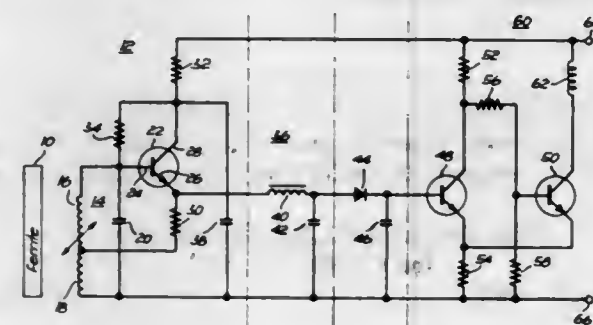
Werner Rapp, Suedmahrer Str. 26, 7340 Geislingen, and Werner Albrecht, Stuttgarter Str. 23, 7022 Leinfelden, both of Germany

Continuation-in-part of Ser. No. 8,493, Feb. 4, 1970, abandoned. This application Feb. 11, 1972, Ser. No. 225,453

Int. Cl. G08c 21/00; H01F 21/06; H03b 5/12

U.S. Cl. 331-65

5 Claims



A proximity switch is provided having an oscillator with a resonant circuit with a variable inductance. The output of the oscillator is fed through a low pass filter and rectifier to a switching circuit which is activated at a predetermined amplitude. The proximity switch is activated when a control body of non-magnetizable ferrite material is moved in close proximity to the inductor of the resonant circuit, thereby increasing the inductance and reducing the frequency of oscillation, and maintaining or increasing the amplitude of the output of the oscillator, the lower frequency and high amplitude signal being passed by the low pass filter and applied after rectification to activate the switch. The switch is not activated by electrically conductive materials because the frequency of the oscillator does not change and the amplitude of its output is damped, and it is not actuated by magnetic materials such as steel chips or permanent magnets because of high eddy current and hysteresis losses induced into the resonant circuit and damping of its output which fail to provide the output necessary to trigger the switch.

3,732,504

# POWER SUPPLY CIRCUIT FOR A HEATING MAGNETRON

Melvin L. Levinson, 1 Melner Street, Avenel, N.J.

Continuation-in-part of Ser. No. 608,886, Jan. 12, 1967, abandoned. This application July 14, 1969, Ser. No. 841,507

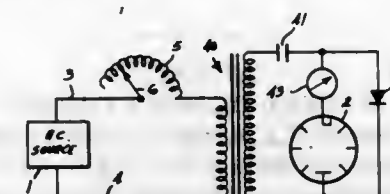
Int. Cl. H03b 9/10

U.S. Cl. 331-86

4 Claims

A power supply circuit for varying the power output of a heating magnetron which includes controlling a variable in-

ductance to tune a capacitance to resonance to vary the



power, and which comprises a variable inductance in series with the magnetron.

3,732,505

# END PUMP DEVICE FOR A LASER

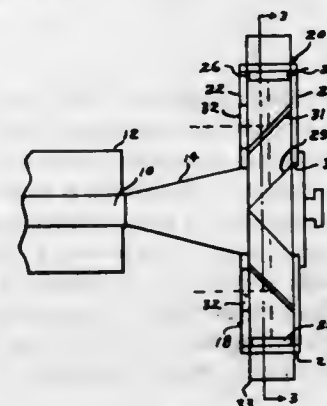
Paul M. Freedman, Las Vegas, Nev., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 7, 1972, Ser. No. 260,566

Int. Cl. H01s 3/09

U.S. Cl. 331-94.5

2 Claims



A light emitting diode system for pumping a solar pumped laser, having a housing attached to the light concentrating cone of the solar pumped laser with a removable light reflecting cone for directing light from light emitting diodes into the light concentrating cone. A plurality of light emitting diodes are positioned around the light reflecting cone with a filter element being positioned between the diodes and the reflecting cone.

3,732,506

# IMPULSE DURATION MODULATOR

Michel Jean-Marie Dupuy, Livry-Gargen, France, assignor to Roussel-Uclaf, Paris, France

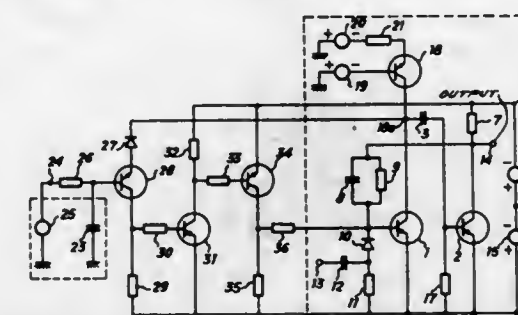
Filed Feb. 2, 1971, Ser. No. 111,984

Claims priority, application France, Feb. 10, 1970, 7004580

Int. Cl. H03k 7/08

U.S. Cl. 332-9 T

5 Claims



An impulse modulator including a monostable multivibrator having a charging capacitor, a voltage comparator, a constant current generator and first and second modulating voltage sources. The voltage comparator insures that the multivibra-

tor rapidly changes from its astable state to its stable state, and the duration of the astable period is proportional to the ratio of the first modulating voltage, and a constant voltage, to a second modulating voltage. Two modulators may be combined in an anticoincidence circuit to make the combined modulator output strictly proportional to the ratio of the first and second modulating voltages.

3,732,507

# AC POWER SUPPLY HAVING COMPUTER CONTROLLED FREQUENCY AND PHASE AND AMPLITUDE

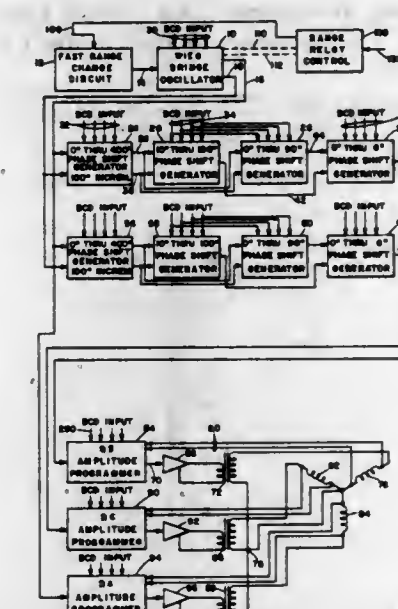
Robert A. Christiansen, and Dhanikodi Balasubramaniam, both of San Diego, Calif., assignors to California Instruments Co., a Division of Alken Industries, Inc., San Diego, Calif.

Filed Oct. 18, 1971, Ser. No. 190,246

Int. Cl. H03c 3/02

U.S. Cl. 332-16 R

19 Claims



An AC power supply for supplying single phase or multiple phase AC power with frequency, phase, and amplitude accurately programmed by digital computer command. The power supply utilizes a controlled pair of signals having a constant phase difference for all programmed frequencies, which are restructured to provide a programmed phase signal independent of the frequency by utilizing this input phase difference. The signals are increased or decreased in amplitude by an amplitude programmer that utilizes both a feedback signal from the load and a programmable forward gain amplifier to provide a rapid and controlled programmed amplitude output of the load. The power supply also utilizes a fast range changing circuit which allows the power supply to select frequency quickly in decade steps.

3,732,508

# STRIP LINE TO WAVEGUIDE TRANSITION

Yukio Ito, Tokyo; Hidemitsu Komizo; Takeshi Okamura, both of Kawasaki-shi, and Yasuji Simizu, Hiroshima-shi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 16, 1971, Ser. No. 208,609

Claims priority, application Japan, Dec. 23, 1970, 45/117120

Int. Cl. H01p 1/16, 3/08, 5/08

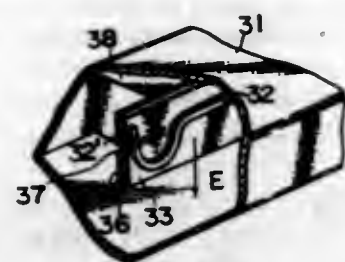
U.S. Cl. 333-21 R

10 Claims

Apparatus is disclosed for coupling a wave transmitted between a waveguide and a strip line. In particular, the strip line is composed of a conductor, a dielectric substrate and an earth (or ground) conductor. In accordance with teachings of this invention the coupling is achieved by inserting a slot mode



between the strip propagation mode and the waveguide mode in a strip line to waveguide transition. More specifically, a slot with adjacent sections either open-circuited or reactively shunted.

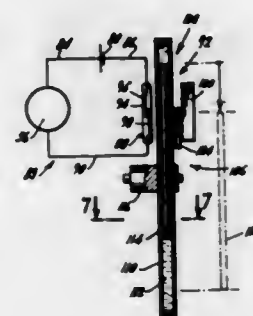


**3,732,511**  
**WAVEGUIDE MODE FILTER**  
Chi Fu Den, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed March 15, 1972, Ser. No. 234,867  
Int. Cl. H01p 1/16, 1/22  
U.S. Cl. 333-95 R 7 Claims

is formed in the earth conductor of the strip line and the slot is disposed to intersect or to traverse the strip line conductor to achieve the desired coupling.

**3,732,509**  
**APPARATUS TO PROVIDE PERIODIC MOVEMENT**  
Leroy F. Florant, Hempstead, and Joseph Glickstein, New York, both of N.Y., assignors to Synco-Mist Controls, Inc., New York, N.Y.  
Filed Jan. 18, 1971, Ser. No. 107,189  
Int. Cl. H01h 7/02

U.S. Cl. 335-59



13 Claims

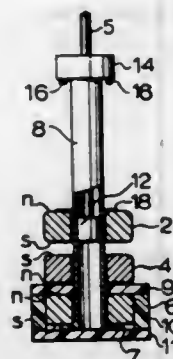
A waveguide mode filter comprises a plurality of very thin, narrow, axially oriented resistive strips deposited on the inner surface of a dielectric lined waveguide section. The circumferential surface impedance of the strips is essentially purely reactive while the longitudinal or axial surface impedance has significant resistive and reactive components. Thus the strips present high attenuation to non-TE<sub>01</sub> modes and low attenuation to the desired TE<sub>01</sub> modes thereby providing the same filtering function as helix waveguide while offering the manufacturing advantages of dielectric lined waveguide.

#### ERRATUM

For Class 335-59 see:  
Patent No. 3,732,509

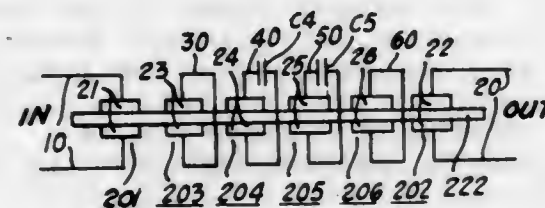
**3,732,512**  
**TRIP MECHANISM**  
Donald W. Puttick, 473 Brierwood Avenue, Ottawa, Ontario, Canada  
Filed Nov. 22, 1971, Ser. No. 200,877  
Claims priority, application Great Britain, Dec. 12, 1970, 59,192/70

Int. Cl. H01h 7/04  
U.S. Cl. 335-302 11 Claims



A trip mechanism which can be actuated by a magnet, by inertia, by a mechanical movement or by an electrical current, has powerful magnets in mutual repulsion constrained close together by the attraction of a short length of ferromagnetic material; this attraction balances the repulsion and allows energy to be stored in the magnetic field. When the balance is upset — which can be done in a number of ways — the magnet previously held by the short length of ferromagnetic material

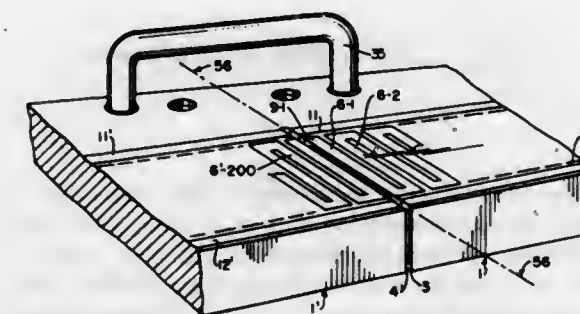
**3,732,510**  
**MULTISECTION PRECISION-TUNED MONOLITHIC CRYSTAL FILTERS**  
Warren Perry Mason, West Orange, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Oct. 12, 1970, Ser. No. 79,881  
Int. Cl. H03h 7/10, 9/00  
U.S. Cl. 333-72 9 Claims



In a monolithic crystal filter characterized by a combination of mass loading and acoustic coupling, passband shaping is enhanced by shunting one or more intermediate electrode pairs with a reactive element. Precision tuning is achieved by varying the plating on a desired intermediate filter section

is driven away by the stored energy and may be used to close a pair of circuit contacts.

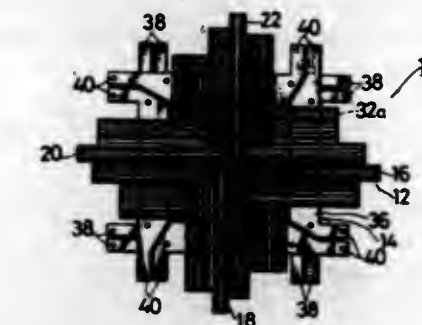
**3,732,513**  
**POSITION-MEASURING TRANSFORMER AND SCALE MEMBER**  
Clair L. Farrand, Bronxville, N.Y., assignor to Inductosyn Corporation, Valhalla, N.Y.  
Filed Oct. 14, 1971, Ser. No. 189,282  
Int. Cl. H01f 21/04  
U.S. Cl. 336-129 5 Claims



Disclosed is an improved scale winding member which is one member of a two-member position-measuring transformer. The two members are relatively movable with respect to each other in the direction of measurement. The scale winding member is formed from a plurality of individual units, frequently called bar scales or scale units. Each scale unit includes a winding section supported on a separate base. A plurality of the scale units are positioned end to end with the winding sections from each electrically interconnected to form the continuous scale winding. Each winding section includes active conductors, having a fine pitch, transverse to the direction of relative movement. The active conductors are connected in series by end conductors where the end conductors extend parallel to the direction of relative movement. Return conductors are positioned opposite and parallel to the end conductors to neutralize unwanted fields. The individual winding section on one scale unit is electrically connected to the individual winding section of an adjacent scale unit by pairs of interconnecting conductors. Each conductor in each pair is substantially identically arrayed in space to mate with the other conductor in the pair and each conductor conducts with a current equal to but in the opposite direction of the current in the other conductor of the pair to neutralize unwanted coupling. The pairs of conductors are formed with one conductor from one scale unit and the other conductor from the abutting scale unit. The interconnecting conductors from return conductors on each unit are paired together as are interconnecting conductors from end conductors so that all paired conductors carry equal current.

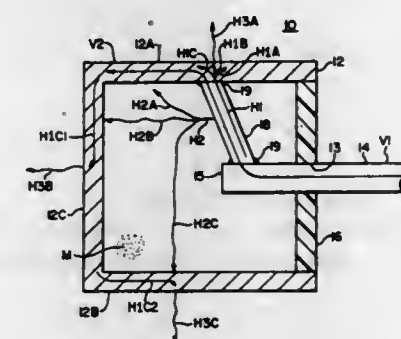
**3,732,514**  
**TRANSFORMERS**  
Ryoda Sato, 1-8-25 Ohama, Amagasaki, Japan  
Filed June 30, 1971, Ser. No. 158,334  
Claims priority, application Japan, July 7, 1970, 45/67768; Oct. 2, 1970, 45/86772  
Int. Cl. H01f 27/28  
U.S. Cl. 336-172 8 Claims

Electric transformers, such as for spot welding machines and the like, which have at least the secondary winding di-



current at a low voltage, such as one-half, one-third or one-fourth turns.

**3,732,515**  
**CURRENT LIMITING FUSE INCLUDING RADIALLY DISPOSED FUSE ELEMENTS**  
Donald D. Blewitt, Pittsburgh, and Woodrow G. Shaw, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.  
Filed Feb. 25, 1972, Ser. No. 229,363  
Int. Cl. H01h 85/04  
U.S. Cl. 337-166 10 Claims



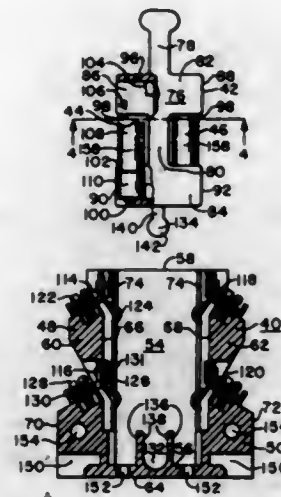
A current limiting fuse having one or more fuse elements disposed for more efficient transfer of heat so that greater electrical current may be continuously conducted through the fuse for a given cross-section of fusible material. Two electrodes or terminals are provided, one of which is cup-shaped or which is tubularly shaped and closed by electrically conducting material at one end. The second electrode projects into the recess created by the cup-shaped electrode and is spaced from it. An electrically insulating support-cover or spacer is provided at the open end of the cup-shaped electrode. This spacer has a central hole or opening to accommodate the projecting electrode or terminal. An array or assembly of fuse elements is disposed upon the enclosed portion of the protruding electrode. Each fuse section is joined at its other end to the inner perimeter of the cup-shaped electrode. The fusible elements may be arranged as spokes on a wheel between a central hub and an outer ring, the central hub being mounted on the inwardly protruding electrode and the outer ring being disposed to make contact with the outer or cup-shaped electrode. The enclosure formed by the cup-shaped electrode, the insulating spacer and the protruding electrode is filled with a granular pulverulent such as quartz sand for electrical arc quenching.

**3,732,516**  
**COMPACT CARTRIDGE-TYPE FUSE HOLDER**  
Jordan F. Puetz, Milwaukee, Wis., assignor to Square D Company, Park Ridge, Ill.  
Filed Nov. 8, 1971, Ser. No. 196,342  
Int. Cl. H01h 85/02  
U.S. Cl. 337-194 12 Claims

A compact cartridge-type fuse holder assembly which is particularly adapted to be mounted adjacent a side wall of an



electromagnetic device. The assembly includes a receptacle and an insulating holder which positions one or two cartridge type fuses in the receptacle so the axes of the fuses extend perpendicular to a base of the receptacle. Electrical contact with



terminal portions of the fuse is made by fingers positioned within the receptacle. The fingers are electrically connected to wire connecting terminals located externally on the molded housing for the receptacle.

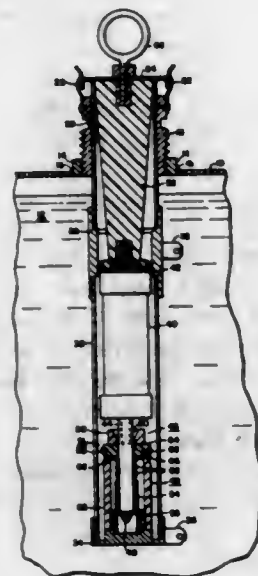
### 3,732,517 PROTECTIVE FUSE

August I. Keto, Sharon, and John J. Astleford, Jr., Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 15, 1971, Ser. No. 198,791  
Int. Cl. H01h 85/38

U.S. Cl. 337-278

13 Claims



A load break protective fuse assembly having arc snuffing means. The arc snuffing means seals the lower contact structure of the fuse assembly, when the fuse member is withdrawn, to prevent the escape of ionized gas into the fuse assembly casing. A de-ionizing chamber and a gate member having a hinged door thereon may be used in conjunction with the arc snuffing means.

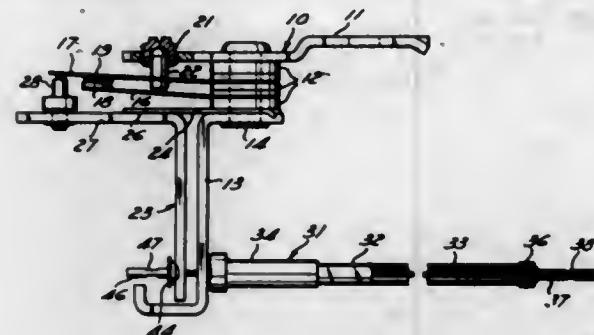
### 3,732,518 THERMOSTAT WITH MULTI-POSITION SENSING ELEMENT

Edward G. Them, and Gerald R. Wharton, both of Mansfield, Ohio, assignors to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed July 13, 1972, Ser. No. 271,400  
Int. Cl. H01h 37/36

U.S. Cl. 337-394

13 Claims



A probe-type thermostat is disclosed in which the probe is mounted for swiveling movement in a manner in which the thermostat calibration is not adversely affected. The probe includes a tube mounted on the thermostat base for swiveling movement about a first center and a rod connected to the thermostat operator for swiveling movement about a second center. The two centers are substantially coincident when the switch operates, and the range of swiveling movement is arranged so that the probe remains substantially aligned with the locus of movement of the second center.

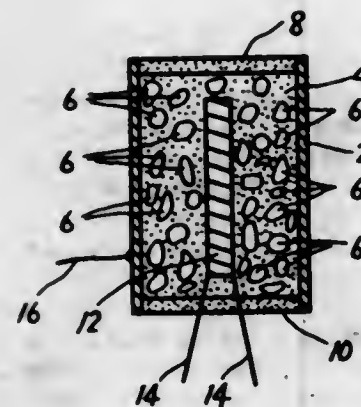
### 3,732,519 SEMICONDUCTOR GAS DETECTING DEVICE

Naoyoshi Taguchi, 6-8, 2-chome Hyuga, Tarumi-ku, Kobe, Japan

Filed Sept. 23, 1970, Ser. No. 74,749  
Int. Cl. H01c 13/00

U.S. Cl. 338-34

7 Claims



A gas detecting device formed of a porous, highly permeable, metal oxide semiconductor formed by mixing semiconductor particles with inorganic materials which will render the semiconductor highly porous or by intermixing the semiconductor with materials which can be evaporated or otherwise removed by heating to a temperature below the sintering temperature of the semiconductor. The resultant semiconductor material is contained within a suitable housing that will permit gases to flow readily through the semiconductor and appropriate electrodes are affixed to the semiconductor to measure a change in resistance in the presence of reducing gases. Heating means may be utilized to stabilize the resistance of the semiconductor material during operation and such heating means may comprise at least one of the electrodes.

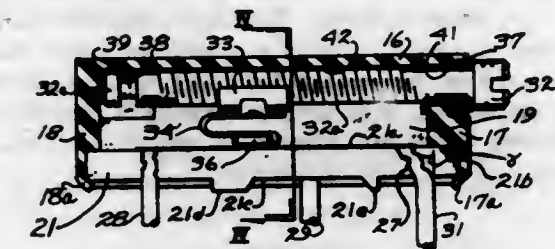
### 3,732,520 VARIABLE RESISTANCE CONTROL AND METHOD OF ASSEMBLING SAME

John D. Van Benthuyssen, and Thomas R. Beaver, both of Elkhart, Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed Jan. 2, 1969, Ser. No. 788,592  
Int. Cl. H01c 9/02

U.S. Cl. 338-180

8 Claims



A housing encloses a lead screw, a contactor driven by the lead screw, and a collector and resistive path wipingly engaged by the contactor. A plurality of lead wires are anchored in cavities in a ceramic substrate which supports the resistive path and collector. At least one of the cavities is disposed at an angle to the resistive path supporting planar surface of the substrate and the lead wire disposed therein egresses therefrom adjacent to an end of the substrate. The threaded portion of the lead screw is supported in a journal bearing having a curved surface with a curvature that is approximately equal to or less than twice the reciprocal of the nominal diameter of the lead screw. The tail end of the lead screw is grooved and a thrust bearing integral with the housing interfits with the groove and prevents axial movement of the lead screw relative to the housing. A sealing member and the lead screw are assembled with the housing by positioning the sealing member on the lead screw and inserting the tail end of the lead screw through an opening while maintaining the longitudinal axis of the lead screw at an angle relative to the centerline of the opening. When the sealing member is compressed between the head of the lead screw and the housing, the tail end of the lead screw is moved in a direction transverse to the longitudinal axis of the lead screw so as to interfit the thrust bearing with the groove in the lead screw.

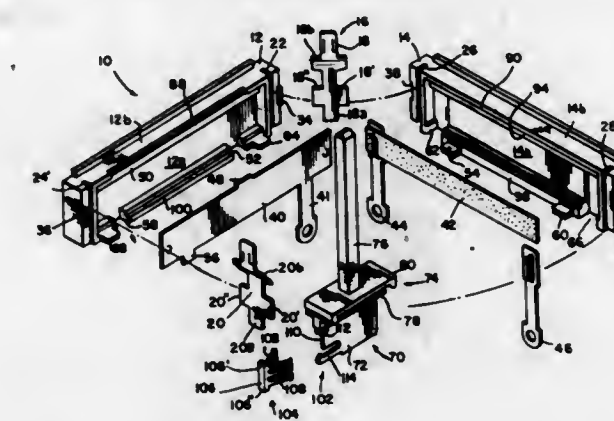
### 3,732,521 MOUNTING MEANS AND SLIDEABLE ELECTRICAL CONTACT FOR LINEAR POTENTIOMETER

Edgar F. Hausman, and George O. Puerner, both of Frankfort, Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed May 3, 1971, Ser. No. 139,509  
Int. Cl. H01c

U.S. Cl. 338-202

7 Claims



A slider is mounted in a slot and moveable lengthwise between a resistor and collector strip. The slider includes an electrical contact carrying blade extending between the resistor and collector strips and includes means to trap an elec-

trical contact means to the blade. The housing for the potentiometer includes two cooperating members, the members being secured together by potentiometer mounting means engaging the two members at opposed ends.

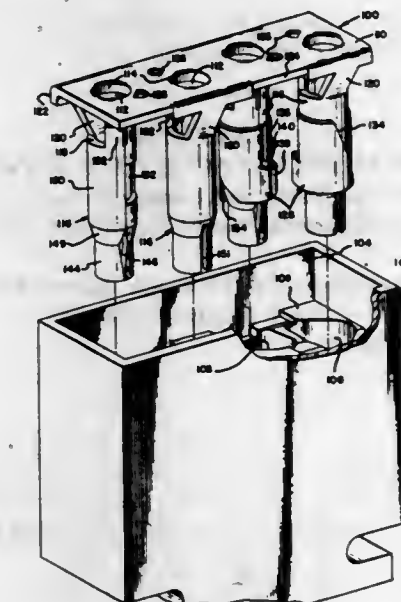
### 3,732,522 MULTIPLE SOCKET TERMINAL STRIP FOR TERMINAL JUNCTION MODULE

Ronald Groff Hartwell, Hummelstown, and Arley Keener Miller, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed March 17, 1972, Ser. No. 235,695  
Int. Cl. H01r 31/08

U.S. Cl. 339-19

9 Claims



A plurality of stamped and formed cylindrical contact sockets are integral with a metallic bus strip and extend away from corresponding circular openings within the bus strip with a leading edge spaced from a drawn lip defining the circular openings. Each socket is connected to the strip by a connecting strap extending from one side of the socket to a side edge of the strip and an integral supporting leg extends from the leading edge of each socket on the side opposite the connecting strap toward the respective openings. A terminal pin retention spring surrounding each socket prevents removal of an inserted contact terminal pin and the removal force is transmitted directly from the socket body through the leg to the bus strip to resist socket deformation.

### 3,732,523 BUS DUCT SYSTEM INCLUDING IMPROVED PLUG-IN POWER TAKE-OFF MEANS

Samuel S. Fouse, and James R. Kotala, both of Aliquippa, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 12, 1971, Ser. No. 188,076  
Int. Cl. H01r 13/60

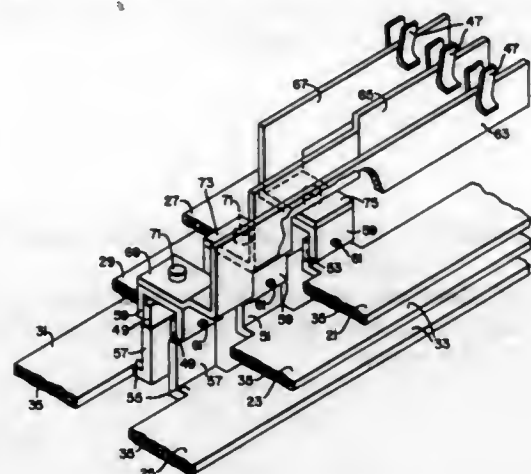
U.S. Cl. 339-22 B

9 Claims

A unitary section of bus duct with plug-in power take-off outlets in which there are a set of a plurality of elongated unitary bus bars having a pair of opposite wide faces and a pair of opposite narrow faces, the bus bars being disposed in an elongated housing in which there are spaced openings in the housing sides facing the wide faces of the bus bars, which openings



are adapted for use with an adapter and a plug-in element, and



conductor means leading from each bus bar to a corresponding plug-in element in the openings.

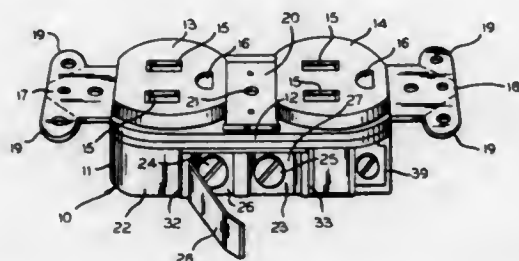
3,732,524

**ELECTRICAL RECEPTACLE WITH SAFETY COVER**  
Alan B. Reed, Oak Park, and George R. Eckart, Lake Zurich, both of Ill., assignors to Daniel Woodhead, Inc., Northbrook, Ill.

Filed Nov. 25, 1970, Ser. No. 92,813  
Int. Cl. H01r 13/44

U.S. Cl. 339-44 R

2 Claims



Electrical receptacle having terminal posts in a recess in the side of the receptacle body, and a hinged or removable safety cover for said recess extending across the terminal posts.

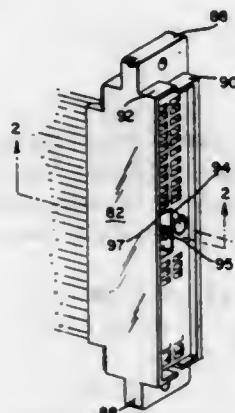
3,732,525

**ELECTRICAL CONTACT TERMINAL AND CONNECTOR**  
Homer Ernst Henrichsen, Carlisle, and Clyde Thomas Carter, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed March 26, 1971, Ser. No. 128,439  
Int. Cl. H01r 9/08, 13/58, 25/00

U.S. Cl. 339-49 R

5 Claims



Hermaphroditic electrical terminal comprises web having sidewalls extending from the longitudinal edges thereof. Means extend from one end of the web for securing the ter-

minial to a conductor and contact springs are provided at the other end of the terminal. These contact springs comprise planar extensions of the sidewalls which project forwardly and are reversely bent inwardly and towards the rearward end of the terminal in converging relationship to the axis thereof. Two electrical terminals of this type can be mated with each other by positioning them in opposed inverted relationship and moving them together so that one contact spring and one sidewall of each terminal are received between the contact springs of the other terminal. Terminals disclosed can also receive other electrical contact terminals of types that are commonly used on the present day computer and peripheral computer equipment. A connector housing is also disclosed having cavities which are adapted to receive electrical terminals in accordance with the invention.

3,732,526

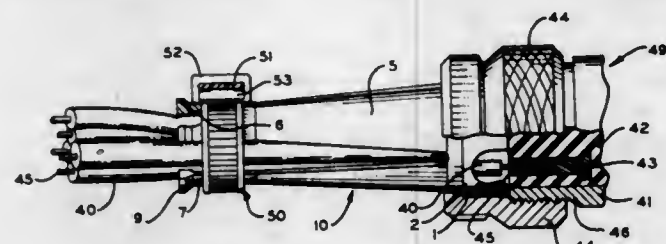
**ELECTRICAL CONNECTOR WITH IMPROVED CABLE SUPPORT**

Stephen Punako, Bainbridge, N.Y., assignor to The Bendix Corporation

Filed June 25, 1971, Ser. No. 156,638  
Int. Cl. H01r 13/58

U.S. Cl. 339-101

16 Claims



A plastic conduit affixed to and extending from the end of an electrical connector to prevent radial, axial and rotational forces acting on the electrical wires leading to the connector from reaching the connection of the connector contacts and electrical wires. The plastic cable support includes a plurality of axial slots that permit the cable support to be compressed into the wires passing through the conduit and at least one radial shoulder on the inside of the compressible portion so that the wires may be retained in a fixed position. The plastic cable support prevents radial, axial and rotational forces from reaching the connection of the wires to the contacts.

3,732,527

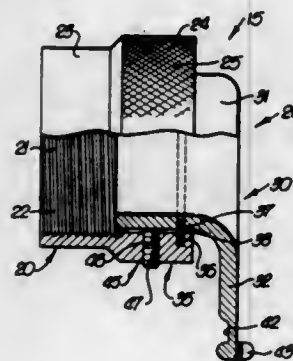
**STRAIN RELIEF CLAMP**

Thomas L. McKnight, Lake San Marcos, Calif.  
Continuation-in-part of Ser. No. 859,923, Sept. 22, 1969, abandoned. This application May 4, 1971, Ser. No. 140,091

Int. Cl. H01r 13/58

U.S. Cl. 339-103 M

5 Claims



A strain relief clamp for a wire bundle which may be disposed at an angle to the axis of a mating connector including a cylindrical collar for connection to the mating connec-

tor, a wire guide having a tubular portion located concentrically within the cylindrical collar and secured to the collar by a snap ring within aligned circumferential grooves in each, and an arm portion joined to the tubular portion and extending outwardly at an angle to the axis of the guide, the wire guide being rotatable to a position where the arm portion is aligned with the wire bundle prior to or after the collar has been loosely connected to the mating connector whereupon the guide may be non-rotatably locked relative to the mating connector and a bundle binder attaches the wire bundle to the arm portion.

3,732,528

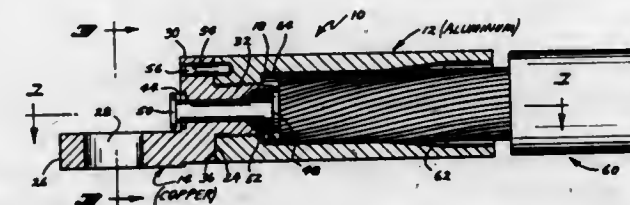
**BI-METAL TERMINAL LUG**

Ottomar H. Vetter, Minneapolis, Minn., assignor to United Carr Incorporated, Boston, Mass.

Filed Dec. 9, 1970, Ser. No. 96,414  
Int. Cl. H01r 11/08, 11/12

U.S. Cl. 339-113 R

7 Claims



An aluminum barrel member has an opening at one end into which the bared end of an aluminum cable is inserted. Threaded into the other end of the barrel member is the shank of a copper tongue member having a flat portion circumjacent thereto which provides a relatively broad surface contact with the barrel member. A spring-biased indicator plug extends through the shank and is pushed outwardly when the cable end has been fully inserted. After insertion, the barrel member is crimped tightly against the cable.

3,732,529

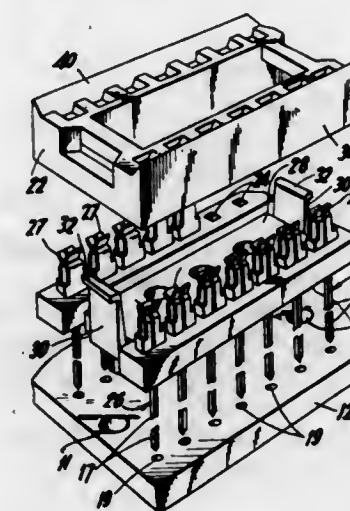
**INTEGRATED CIRCUIT SOCKET**

Lawrence P. Weisenburger, Ottsville, Pa., assignor to Arics Electronics Inc., Frenchtown, N.J.

Filed Dec. 22, 1970, Ser. No. 100,743  
Int. Cl. H01r 23/02, 13/12

U.S. Cl. 339-192 R

15 Claims



A socket assembly for receiving electronic components and comprised of a base having channels therethrough receiving a terminal comprised of an upper receptacle and a terminal post extending through the channels and from beneath the base, and of an upper housing mating with the base and including channels receiving the receptacles of the electrical terminals and terminating in openings at the top of the housing for accepting the pins of the electronic component. The housing is removable for the easy replacement of the terminals and is

held in place by laterally deflectable interior arms on the base having hook portions engaging a shoulder in the housing.

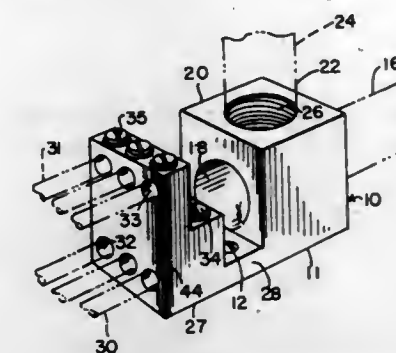
3,732,530

**CONNECTOR FOR HIGH AMPERAGE APPLICATIONS**  
Richard L. Linn, Northbrook, and Gerald J. Shea, Buffalo Grove, both of Ill., assignors to Underwriters Safety Device Company, Chicago, Ill.

Filed Jan. 31, 1972, Ser. No. 221,918  
Int. Cl. H01r 9/00

U.S. Cl. 339-198 N

9 Claims



A unitary connector particularly suitable for high amperage applications is disclosed. It provides a high density of smaller conductor connections per length of connector. In spite of the high density, the connection of any one conductor can be adjusted without disturbing the connection of any other conductor. The connector greatly facilitates visual inspection of all connections for confirmation of the completeness and security of each connection. The connector body can be made from metal extrudate, and current passing through the integral connector does so without passing across butting interfaces between elements within the connector assembly.

3,732,531

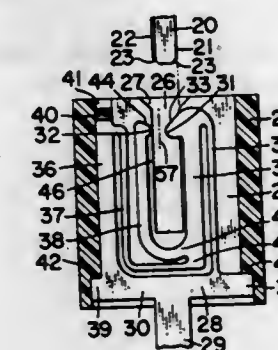
**ELECTRIC CONTACTS**

Jean Claude Bouley, Jura, France, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed June 16, 1971, Ser. No. 153,574  
Int. Cl. H01r 9/08

U.S. Cl. 339-217 R

7 Claims



This invention is an electrical connector for receiving and contacting a mating electrical connector such as a printed circuit board. The connector has a contact element including a terminal portion which is kept in a rigid, well-defined position and a contact portion which is moveable in order to provide proper contact with the mating electrical connector. The connector has a body of insulating material having an opening for the mating electrical connector and has a slot intersecting the opening with the contact element disposed therein. The contact element has a positioning portion which is engageable with the mating electrical connector for automatically positioning the contact portion of the contact element against the contact surface of the mating electrical connector. In one embodiment of the invention, the contact element can be held in



one of two different positions for making contact with the mating connector in one of two different positions.

3,732,532

## ULTRASONIC DOPPLER INSTRUMENT

John J. Flaherty, Elk Grove Village, and Richard M. Soble, both of Chicago, Ill., assignors to Magnaflex Corporation, Chicago, Ill.

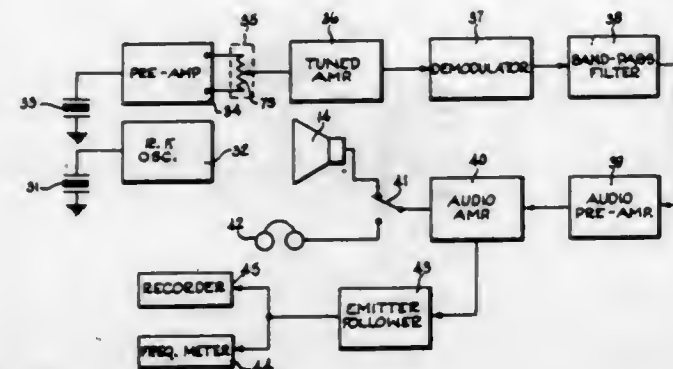
Continuation of Ser. No. 658,117, Aug. 3, 1967, abandoned.

This application March 19, 1971, Ser. No. 126,336

Int. Cl. A61b 5/02; G01s 9/66

U.S. Cl. 340-1 R

14 Claims



Medical ultrasonic doppler instrument in which transmitting and receiving transducers are mounted within a hollow casing on wave-transmission means of solid material cemented within one end of the casing and having planar surface means, preferably at an angle, to engage the skin of a living body being tested. Important features relate to the provision of wave absorbent material between the case and the wave-transmission means, the provision of a barrier between separate solid members to form the wave-transmission means, and the use of a biased amplifier-detector or a product detector.

3,732,533

## UNDERWATER EXPLOSIVE-ACOUSTIC TRANSDUCER AND SYSTEMS

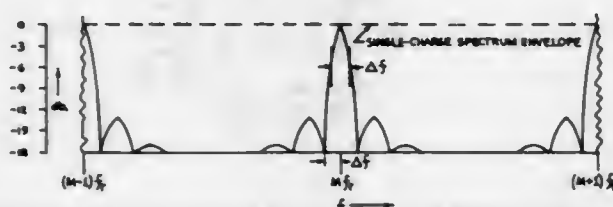
David Epstein, and Sidney Epstein, both of Brooklyn, N.Y., assignors to Vadys Associates, Ltd., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 367,607, May 12, 1964, abandoned. This application April 4, 1966, Ser. No. 541,918

Int. Cl. G01s 9/66

U.S. Cl. 340-3

7 Claims



An underwater sonic detection system wherein underwater pulses are generated in uniformly spaced selected time sequence to produce a water traversable multi-line spectrum made up of a plurality of discrete reflectable narrow band consecutively sequenced harmonic sonic frequencies of substantially uniform energy content and receiver means are employed to (a) discriminatorially sense reflections thereof from a target engaged thereby or (b) sense the relative radial velocity component of an engaged target in a transient type Doppler system or (c) sense emanated-vibratory frequency modes induced in a target engaged thereby.

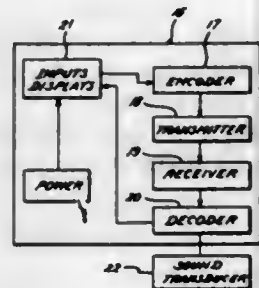
3,732,534  
ACOUSTICAL UNDERWATER CONTROL APPARATUS  
Paul C. Koomey, Houston, Tex.; Alan J. Streb; George S. Stivers, both of Baltimore, Md., and Theodore R. Barker, III, Pasadena, Md., assignors to Global Marine, Inc., Los Angeles, Calif.

Division of Ser. No. 504,742, Oct. 24, 1965, Pat. No. 3,405,387. This application July 3, 1967, Ser. No. 650,814

Int. Cl. H04b 1/100

U.S. Cl. 340-5 R

16 Claims



An acoustical control apparatus for controlling the operation of underwater valve equipment from the surface by coded acoustical signals and monitoring the status of the equipment by acoustical signals. A radioisotope thermoelectric generator positioned underwater continuously charging a battery which powers a pump for maintaining hydraulic pressure in an accumulator for actuating an underwater valve, all of which is controlled and monitored about the water surface by the use of coded acoustical signals.

3,732,535

## SPHERICAL ACOUSTIC TRANSDUCER

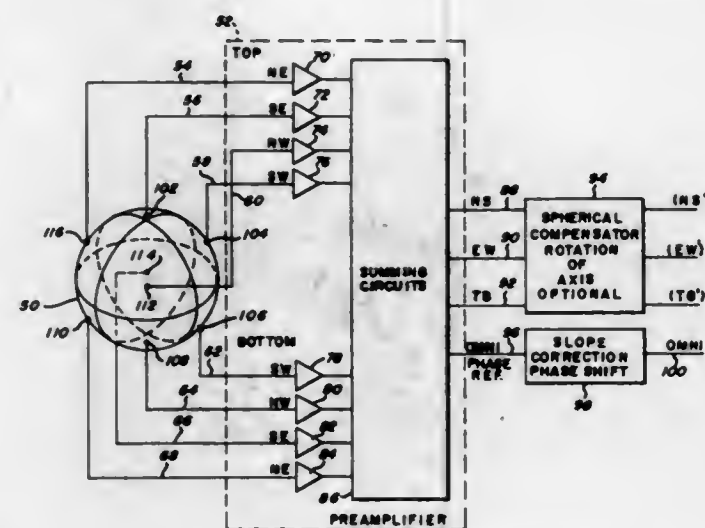
Stanley L. Ehrlich, Middletown, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed Aug. 15, 1969, Ser. No. 850,478

Int. Cl. G01v 1/00

U.S. Cl. 340-10

17 Claims



A spherical acoustic transducer formed from electromechanically active material and having a common electrode attached to one surface as a voltage reference and a distribution of electrodes attached to other surfaces so that the radial and circumferential vibrating modes of the acoustically excitable sphere are detectable and resolvable as to bearing angle over  $4\pi$  steradians.

3,732,536

## PASSIVE OBJECT DETECTION APPARATUS INCLUDING AMBIENT NOISE COMPENSATION

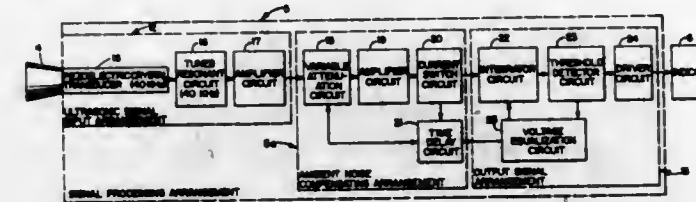
Vincent E. Larka, Burlington, and Larry Wilham, Sandwich, both of Mass., assignors to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Sept. 18, 1970, Ser. No. 73,316

Int. Cl. H04b 1/100

U.S. Cl. 340-16 R

22 Claims



An ambient noise compensating arrangement for use in a passive ultrasonic vehicle detection apparatus carried by a vehicle for compensating for ambient background noise present during the detection of vehicles located in predetermined regions of surveillance rearward of the subject vehicle. Prior to the detection of the presence of a vehicle in one of the regions of surveillance, the prevailing ambient background noise is sensed by a signal-receiving horn member mounted on the subject vehicle and processed by an input signal arrangement coupled to the horn member to produce a noise voltage signal representative of the ambient background noise. The noise voltage signal is applied to a field effect transistor the resistance of which is increased in response to the noise voltage signal by an amount sufficient to essentially fully attenuate the noise voltage signal.

When a vehicle subsequently enters the region of surveillance rearward of the subject vehicle, after the aforementioned ambient noise compensation, various signals including ultrasonic signals generated inherently by the vehicle, due to a combination of factors such as engine and body vibrations, and engine and tire noises, are received by the signal-receiving horn member and applied to a piezoelectric crystal transducer provided in the input signal arrangement. The piezoelectric transducer has a predetermined resonant frequency equal to the frequency of particular ultrasonic signals generated inherently by all existing engine-driven road vehicles. The piezoelectric transducer operates in response to the various signals received from the horn member to produce an output voltage which is greatest for ultrasonic signals of the predetermined resonant frequency. The output voltage produced by the piezoelectric transducer is then processed to provide an indication to the operator of the subject vehicle of the presence of the vehicle in the region of surveillance.

3,732,537

## ROTATING WARNING LIGHT WITH AN INTEGRATED SPOTLIGHT

William D. Freeman, 3640 Overton Crossing, Memphis, Tenn.

Filed May 7, 1971, Ser. No. 141,262

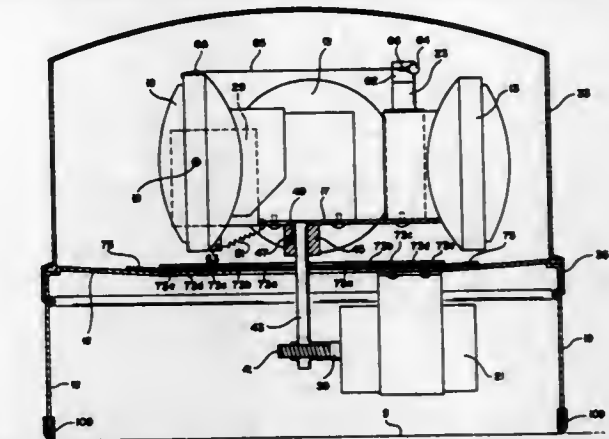
Int. Cl. B60q 1/52; F21m 3/00

U.S. Cl. 340-50

13 Claims

A rotating warning light intended to be mounted on the roof of a vehicle which includes four rotating lightbulbs facing outwardly in four different directions. Three of the lightbulbs have colored lenses, e. g., red or blue, and the remaining lightbulb has a clear lens defining a spotlight under certain conditions. The device includes structure for (1) remotely moving the spotlight about a horizontal axis so the beam therefrom may be lowered or raised; (2) continuous operation of the four lightbulbs simultaneously while they rotate, thus providing a highly conspicuous wig-wag effect; (3) selectively reversing the direction of rotation of the platform supporting the four lightbulbs, thus facilitating optimum maneuverability of the spotlight; (4) continuous operation of the spotlight while simultaneously flashing the colored lights, thus provid-

ing a warning signal while utilizing the spotlight feature; (5) continuous operation of the spotlight while the colored lights



3,732,538

## ELECTRONIC VEHICLE SEAT OCCUPANT SENSOR

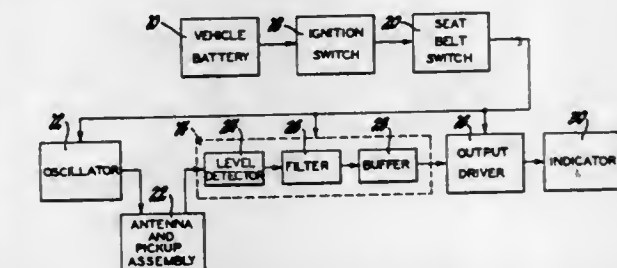
Arden G. Gilman, Oak Creek, and John A. Morrell, Green-dale, both of Wis., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 23, 1972, Ser. No. 228,544

Int. Cl. G06b 21/00

U.S. Cl. 340-52 E

3 Claims



An electrical antenna system including first and second elements is embedded in the seat of a vehicle with the first element being coupled to the output of a controlled AC source which supplies thereto a controlled alternating signal. The second element of the antenna system is connected to the input of a high impedance detector. A wire mesh capacitively coupled the two elements and the signal coupled from the first element to the second element is detected by the detector. When a human is in proximity to the wire mesh, the capacitance characteristic of the human capacitively loads the antenna to the vehicle chassis which decreases the signal input to the detector. An indicator is responsive to the output of the detector to provide an indication when the signal input to the detector decreases due to the presence of the human in the proximity of the wire mesh to indicate the presence thereof. Distributed multiple wire antennas with and without conductive wire mesh and single wire antenna systems are described.

3,732,539

## SAFETY LIGHT SYSTEM FOR TRUCKS

Herbert D. Easterly, 2515 Cliffbourne St. N.W., Apt. 5, Washington, D.C.

Filed May 19, 1971, Ser. No. 144,781

Int. Cl. B60q 1/54

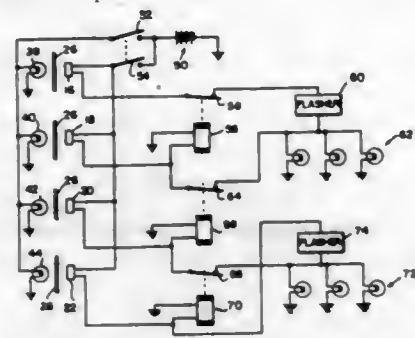
U.S. Cl. 340-62

5 Claims

A speed signal system for a vehicle and particularly for a truck comprising a speedometer mechanism including the usual movable indicator mounted and arranged to move along a path to provide a visual indication of the speed at which the vehicle is traveling, a plurality of switches disposed in spaced apart relationship along the path to provide electrical outputs



representing the speed of such a vehicle, and an actuator for the switches movable along with the said indicator. A plurality of signal lights are provided and circuits operatively connect



the signal lights to the switches. Four such switch means may be used to indicate very low speed, low to intermediate speed, normal operating speed, and excessive speed, respectively.

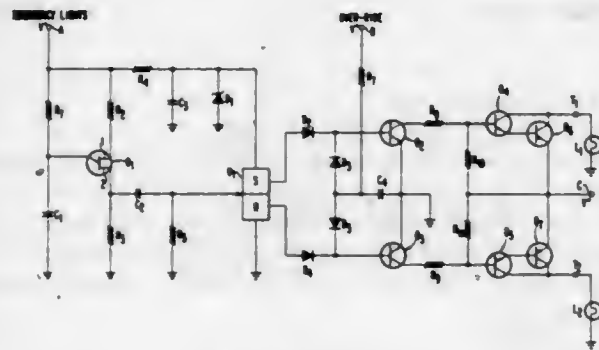
3,732,540

## EMERGENCY WARNING LIGHT SWITCHING SYSTEM

Robert F. Platte, 810 Kay Court, Laurel, Md.  
Filed Nov. 16, 1970, Ser. No. 89,562  
Int. Cl. B60q 1/46

U.S. Cl. 340-76

10 Claims



An emergency warning light switching system for motor vehicles employs a solid state oscillator circuit which controls the alternate energization of vehicle lamps, such as, the vehicle headlamps. A unijunction transistor oscillator-bistable multivibrator arrangement supplies alternate pulses to a gate network. The pulses are amplified and alternately supplied to the vehicle lamps. An oscillator over-ride arrangement is provided, whereby the vehicle lamps may be energized simultaneously.

3,732,541

## METHOD AND APPARATUS FOR EVALUATING REPETITIVELY TRANSMITTED SIGNALS

Gunter Neubauer, Konstanz, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed April 26, 1971, Ser. No. 137,144

Claims priority, application Germany, April 27, 1970, P 20 20 413.1; Oct. 22, 1970, P 20 51 848.3

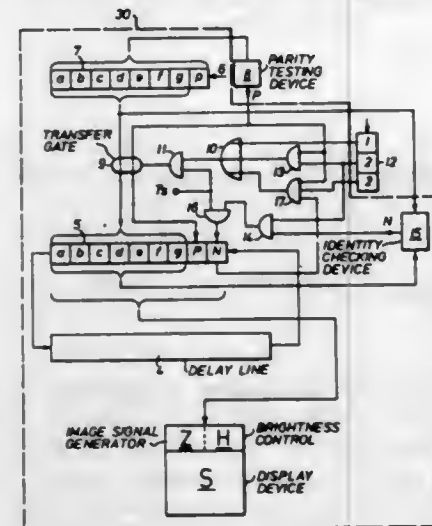
Int. Cl. G06f 11/00; G08c 25/00

U.S. Cl. 340-146.1 BA

8 Claims

A method and apparatus for correcting or at least detecting, at a receiver, errors in a sequence of data words each sent together with an associated parity test signal over a transmission channel between a transmitter and the receiver, the error correction or at least detection being performed by subjecting each received word to a parity test and delivering the received words, together with a signal indicating the result of their individual parity tests, into a memory, sending the words and their associated parity test signals a second time over the transmission channel, subjecting the words received during

the second transmission to a parity test and comparing each word with the word received during the first transmission, replacing, in the memory, a word received during the first transmission by the word received during the second transmission only when the word received during the second transmission does not have a parity error, causing the words to be sent



3,732,542

## ELECTRONIC IDENTIFICATION KEY ACTUATED CONTROL SYSTEM

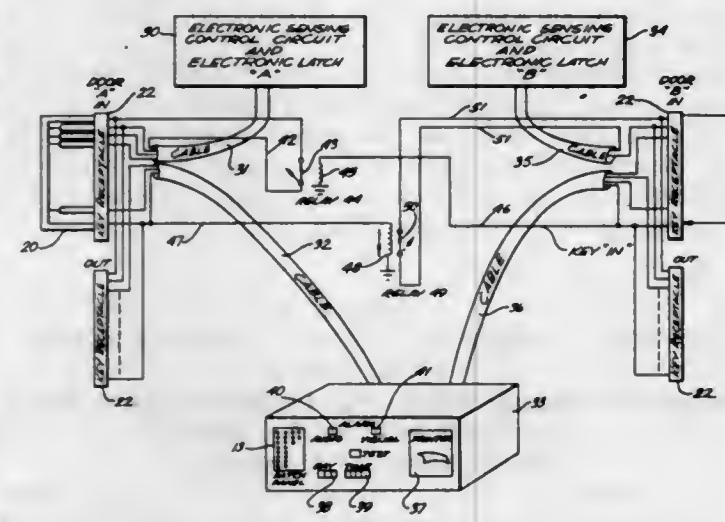
Robert A. Hedin, San Pedro, Calif., assignor to R. B. Phinizy, Anaheim, Calif.

Filed May 6, 1970, Ser. No. 35,061

Int. Cl. H04q 3/00

U.S. Cl. 340-149 A

8 Claims



An electrical control system includes a controlled device, a key for generating electrical signals representative of actuating and identification information, means for selecting identification information desired to be voided and means responsive to the generation of voided identification information to prevent operation of the controlled device. Sensing means are provided for sensing the actuating information and providing an output control signal for actuating the controlled device, and gating means gates voided identification information to the means responsive to the generation of the voided signals to prevent the sensing means from actuating the controlled device.

3,732,543

## LOOP SWITCHING TELEPROCESSING METHOD AND SYSTEM USING SWITCHING INTERFACE

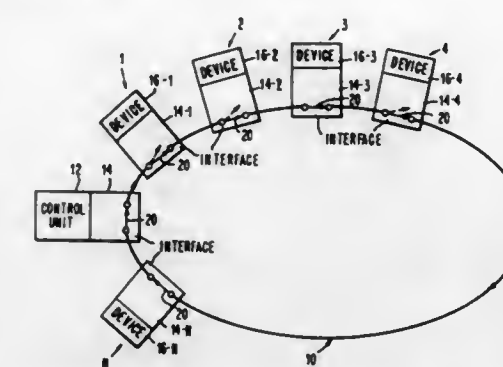
Edouard Y. Rocher, Ossining, and Stanley E. Schuster, Granite Springs, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1971, Ser. No. 158,320

Int. Cl. H04j 5/00; G06f 9/00

U.S. Cl. 340-172.5

4 Claims



A method and system is described for handling digital information in the form of addressed messages. The system includes a master communication loop such as a transmission cable. A plurality of sub-loops as well as devices are connected to the master loop through suitable interface units and sub-loop control units. In each of the sub-loops a plurality of devices capable of transmitting and receiving digitally coded messages are connected to the sub-loops through interface units. Two special characters precede the message and permits a sub-loop control unit to take control of the loop to transmit messages and to obtain further messages from the devices in the associated sub-loop. When a unit is permitted to transmit, it produces and transmits a third special character which is received by the other interfaces or stations which are ready to transmit and informs the other interfaces that they may not transmit. After an interface transmits its message or messages, it produces the first and second special characters which is received by the next interface in the loop that is ready to transmit and in this manner, the sequence of transmission is passed around the loop under the control of the interfaces in the loop.

3,732,544

## COMPUTER-CONTROLLED ARTICLE MERCHANDISING SYSTEM FOR PRESCRIPTION DRUGS AND LIKE ARTICLES

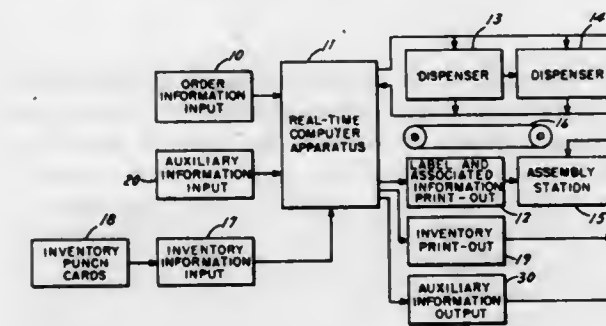
Donald R. Obland, 2940 So. Glencoe, Denver, Colo.

Filed Nov. 25, 1970, Ser. No. 92,550

Int. Cl. G06f 9/00; G05b 15/00

U.S. Cl. 340-172.5

12 Claims



An automatic merchandising system for prepackaged articles such as prescription drugs. The drugs are stored in individual prepackaged units on a continuous strip which is wound on a reel in an individual dispenser unit for each type of drug. An information input device, preferably a typewriter input apparatus, receives the order information and converts

the information to computer language signals. A real-time central computer control apparatus stores the information and a print-out device reads the order information from the computer and prints it on a label. The dispensing units respond to the computer apparatus to select an ordered quantity and type of drug with the ordered drug and label being delivered to a common assembly point where the pharmacist will bring them together and deliver them to the customer. The computer memory stores information relating to dispenser unit inventory which is readily obtainable from the computer apparatus for inventory control purposes. Auxiliary information input and output devices are operatively associated with the computer apparatus and operate independently of the dispenser units.

3,732,545

## DIGITAL DISPLAY SYSTEM

Isao Hatano, Akira Nagano, and Kiyoshi Koya, Kyoto-fu, Japan, assignors to Omron Tateisi Electronics Co., Kyoto-shi, Kyoto-fu, Japan

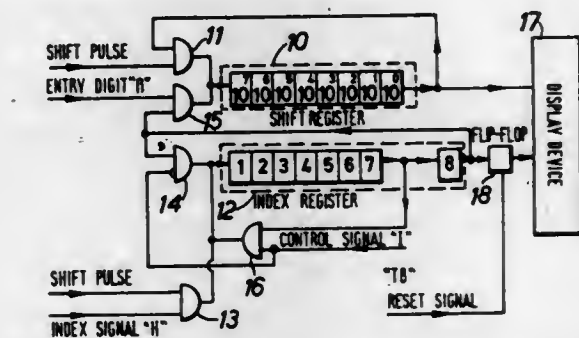
Filed Dec. 24, 1970, Ser. No. 101,276

Claims priority, application Japan, Dec. 26, 1969, 44/1045

Int. Cl. G06f 3/14; G06k 15/18

U.S. Cl. 340-172.5

2 Claims



A digital display system for use in electronic calculating machines and having the features that the highest significant digit of the specific number entered in the calculator is displayed at the leftmost of a display window unit, with the least significant digit at the rightmost side and that unnecessary "0" figures other than those included in the specific number are erased.

3,732,546

## INFORMATION STORAGE AND RETRIEVAL SYSTEM

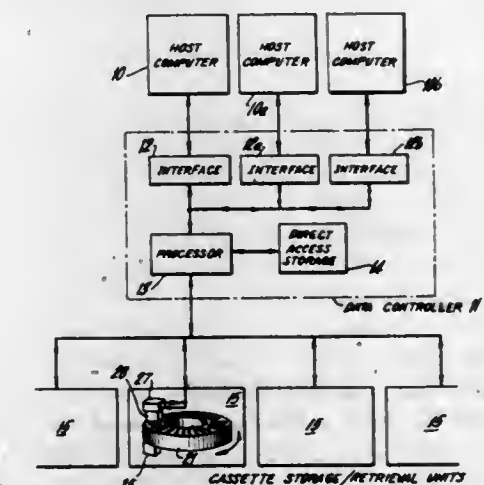
David G. Ronkin, 15-70 208th Street, Bayside, N.Y., and David J. Schwartz, 8 Colgate Road, Greenlawn, N.Y.

Filed Feb. 4, 1971, Ser. No. 112,542

Int. Cl. G06f 13/08

U.S. Cl. 340-172.5

33 Claims



Disclosed is a high capacity, random access, alterable magnetic memory system employing sets of rotatable annular ar-



rays of multi-track tape cassettes serving as the storage media. Under control of a data controller, containing a small programmable computer and direct access storage disc or drum, the cassette arrays are each rotated to bring addressed cassettes into engaging relationship with respective tape transports which receive the requisitioned cassette, position a read/write, write/read head assembly in registration with the addressed track, and drive the tape. An interface system in the controller couples the memory system to one or more host computers of the user for reading data from or writing data on the tape, without the need to stop the tape at the addressed data block site.

3,732,547

## TRAFFIC DATA GATHERING APPARATUS

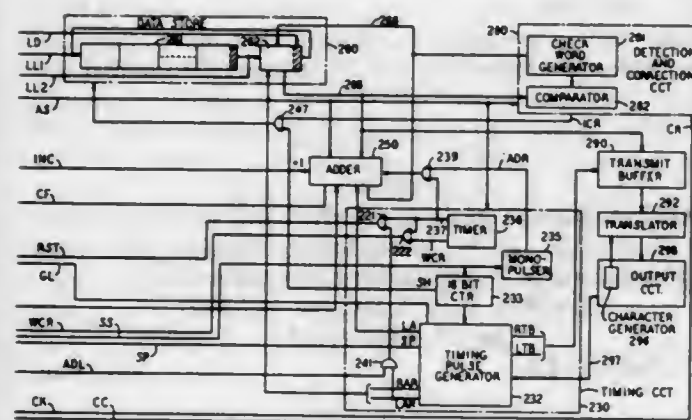
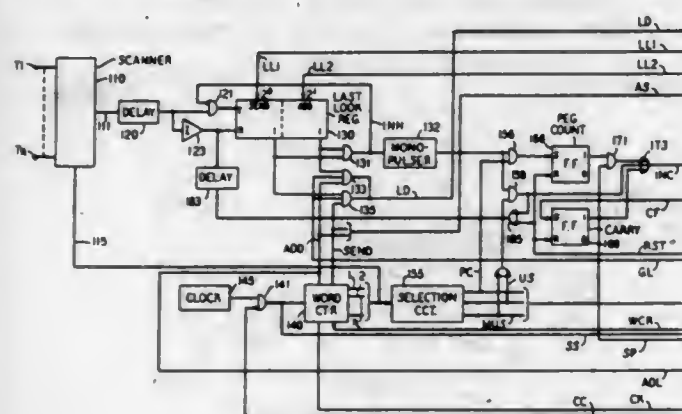
Richard Henry Etra, New York, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 28, 1971, Ser. No. 157,410

Int. Cl. G06F 3/04

U.S. Cl. 340-172.5

11 Claims



A portable traffic data gathering apparatus employs a recirculating memory and common scanning and control circuitry for accumulating both peg count and usage data in a form suitable for transmission to a central point for processing by electronic data processing equipment. Dynamic and static storage are interleaved in the memory to permit the accumulation of one period of data concurrently with the transmission of a previously accumulated period of data. Peg count is obtained by comparing current scan with previous scan, the previous scan or last look memory being stored as part of each data word. The last look memory is also used for input noise filtering, three successive data appearances being required before a count is made. Usage is obtained by scaling down the peg count scans using part of the dynamic and static data words. Detection and correction circuitry minimizes problems due to recirculating memory shifting malfunction.

3,732,548  
SWITCHING CENTER FOR A DATA NETWORK  
George Anselm Howells, Bishop's Stortford, and Elizabeth June Hunt, Harlow, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

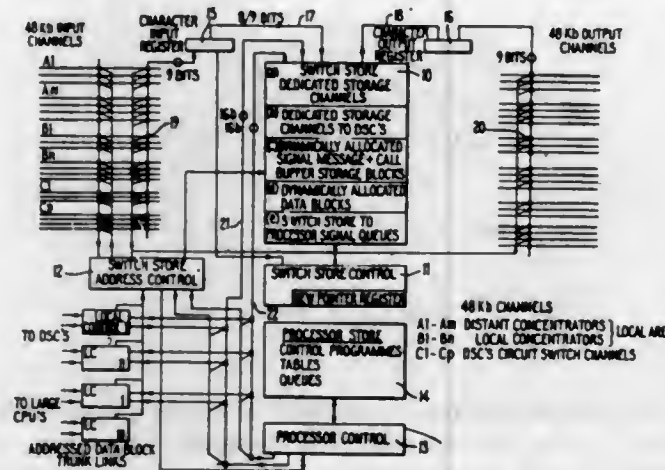
Filed Aug. 19, 1971, Ser. No. 17,333

Claims priority, application Great Britain, Aug. 20, 1970, 40,097/70

Int. Cl. H04q 11/00

U.S. Cl. 340-172.5

11 Claims



A switching center for a data network in which dedicated storage is provided for channels in each direction the channels handling a mixture of circuit switched (end-to-end connections) and packet switched (store and forward) messages. The switching center interconnects with other centers and with local area channels which may or may not have been concentrated.

3,732,549  
PROCESS AND APPARATUS FOR CONTROL OF DOMAIN WALLS IN THE FERROELASTIC-FERROELECTRIC CRYSTALS

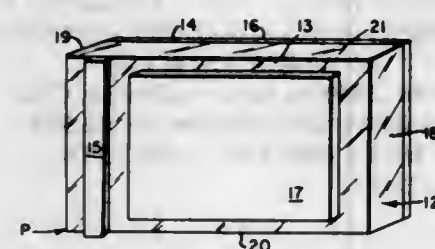
John R. Barkely, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 112,733, Feb. 4, 1971, abandoned. This application May 8, 1972, Ser. No. 251,055

Int. Cl. G11c 11/22

U.S. Cl. 340-173.2

34 Claims



An improved multistable element including a coupled ferroelectric/ferroelastic single crystal exhibiting uniaxial electric polarization, means to confine the domain walls to a preselected switching region of the crystal, means to control the movement of domain walls within the switching region including electrode means consisting of at least two electrodes on opposite faces of the crystal and an electric circuit between the electrodes to control the flow of charge between the electrodes and thereby control movement of the domain walls, optionally cooperating with means to apply mechanical stress to the crystal to move the domain walls, means to inhibit the nucleation of spurious domain walls within the crystal, and optionally means for the controlled nucleation of domain walls in the switching region. In combination with means for detecting the position of the domain wall the multistable element provides a multistable information processing apparatus and process.

3,732,550  
BISTABLE STORAGE ELEMENT WITH MAGNETIC DATA STORAGE  
Walter Haupt, Leverkusen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

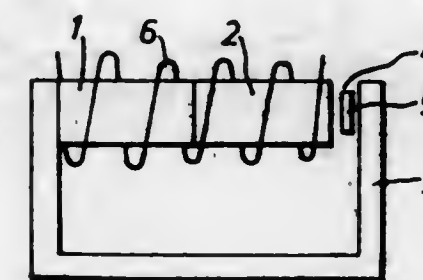
Filed Dec. 23, 1970, Ser. No. 100,885

Claims priority, application Germany, Jan. 23, 1970, P 20 02 936.1

Int. Cl. G11c 11/04

U.S. Cl. 340-174 ZB

9 Claims



A bistable storage element with magnetic data storage contains in its magnetic circuit magnetized cores with different coercivities  $H_1$  and  $H_2$  so that only one core can be remagnetized by an external magnetic field  $H$  of the value  $H_2 < H < H_1$ . An air gap is provided in the magnetic circuit within a magnetically controllable semiconductor component.

3,732,551  
MAGNETIC SINGLE WALL DOMAIN MEMORY  
Norihiko Homma, Kokubunji; Yoshitake Nono, Yokohama, and Shigeru Yoshizawa, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

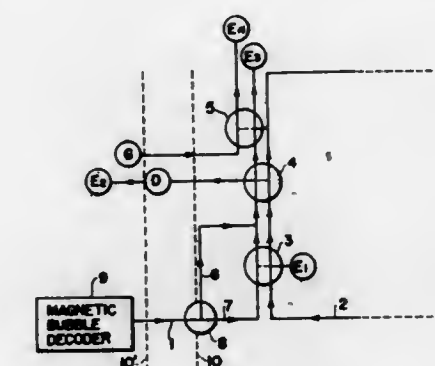
Filed Feb. 24, 1972, Ser. No. 229,090

Claims priority, application Japan, Feb. 24, 1971, 46/9192

Int. Cl. G11c 11/14, 19/00

U.S. Cl. 340-174 TF

8 Claims



In a memory device using magnetic bubble elements, a memory bubble within a memory loop and a control bubble from a decoder are caused to repel each other, to lead the memory bubble to an erase circuit and to erase it therein, and thereafter, the repelled control bubble and an information bubble are further caused to repel each other, to feed either of the bubbles into the memory loop and to thus effect write-in of the information.

Read-out of information is carried out such that a memory bubble within a memory loop and the control bubble are caused to repel each other, to detect either of the repelled bubbles by means of a detector.

3,732,552  
FLOATING MAGNETIC HEAD SYSTEM WITH VARIABLE CURVATURE SHOE  
Anthony W. Winkler, Emmenloot, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

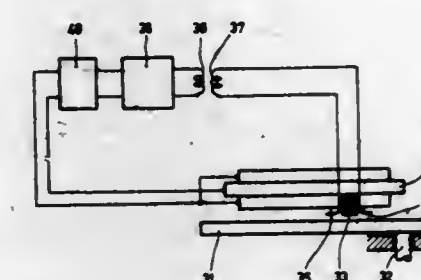
Filed Aug. 24, 1971, Ser. No. 174,419

Claims priority, application Netherlands, Aug. 29, 1970, 7012826

Int. Cl. G11b 5/60

U.S. Cl. 340-174.1 E

6 Claims



A floating magnetic head system operable on a fluid medium over the record surface of a rapidly moving magnetic carrier. The system comprises a magnetic head, a support member, and a biasing element to hold the support member at a desired distance from the record carrier against the medium flow. Means are provided to change the floating height of the magnetic head by varying the curvature of the support surface.

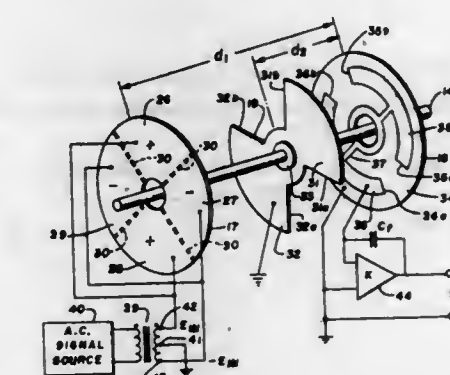
3,732,553  
CAPACITIVE PICK-OFF TRANSDUCER  
Edward V. Hardway, Jr., Houston, Tex., assignor to Spearhead, Inc., Houston, Tex.

Filed April 16, 1971, Ser. No. 134,818

Int. Cl. G08c 19/10

U.S. Cl. 340-200

17 Claims



A capacitive pick-off transducer is disclosed in which small relative movement between aligned capacitive elements is utilized to provide an electrical output signal responsive to such movement. The capacitive elements include a fixed driven element having  $2^n$  driven sectors each connected to one of two sources of input electrical signals of opposite phase, a fixed receptor element including  $2^{n-1}$  active areas connected to an electrical signal output circuit, and a moveable shield element between the driven and receptor elements and including  $2^{n-1}$  shielding lobes. Circuit means including a high gain amplifier with a negative feedback circuit are provided for maintaining the signal levels of the shield element and the active areas substantially lower than the absolute values (ignoring polarity) of the input signals, and preferably at or near ground.



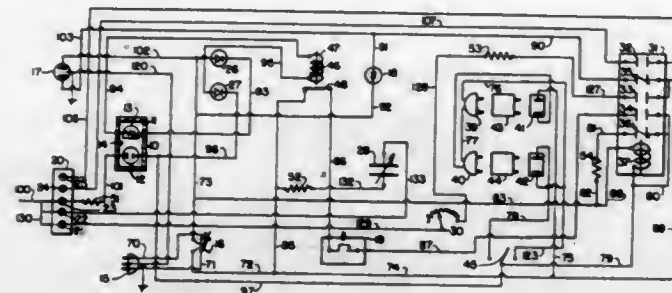
3,732,554

## ALARM UNIT

John A. Ginard, 3064 Albany Crescent, Bronx, N.Y.  
Continuation-in-part of Ser. No. 872,666, Oct. 30, 1969,  
abandoned. This application May 19, 1971, Ser. No. 145,072  
Int. Cl. G08b 13/26

U.S. Cl. 340—258 C

8 Claims



An electrically operated unit may be used as a switch in a wide variety of alarm, detection and like systems. The central element of the unit is a neon glow lamp connected between a hot line lead of an alternating current source and a potential load lead, the potential load lead being connected to a sensitivity lead. On the application of an external capacitance to the sensitivity lead capacitive reactance decreases to more brightly light the lamp to activate a photoconductive cell to operate the switch function of the unit. A potentiometer and a variable capacitor are connected between the hot line lead and the potential load lead so as to form a parallel circuit with the lamp with reference to the external capacitance applied to the sensitivity lead. The potentiometer and the variable capacitor regulate the brightness of the lamp and thereby the threshold of activation and the sensitivity of the unit. Other elements in the circuitry of the unit test its function and enable it to reset itself.

3,732,555

## SELECTIVE INTRUSION ALARM SYSTEM

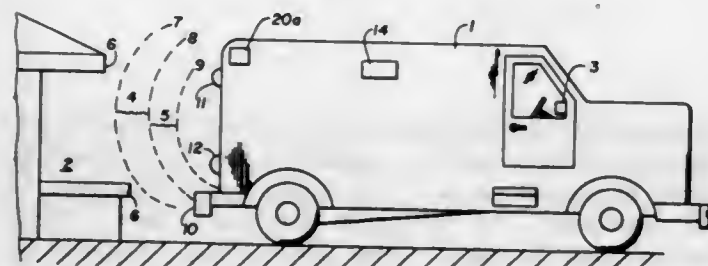
Harry F. Strenglein, Clearwater, Fla., assignor to Sperry Rand Corporation, New York, N.Y.

Filed March 13, 1972, Ser. No. 234,172

Int. Cl. G08b 13/24

U.S. Cl. 340—258 B

8 Claims



A radio object detection, communication, and alarm system for aiding in maneuvering a truck for the delivery of goods at an unloading platform and for protecting the open truck from unauthorized entry during unloading includes portable radio communication means for inhibiting alarm operation when authorized personnel are present in a protected zone.

3,732,556

## SWIMMING POOL ALARM SYSTEM

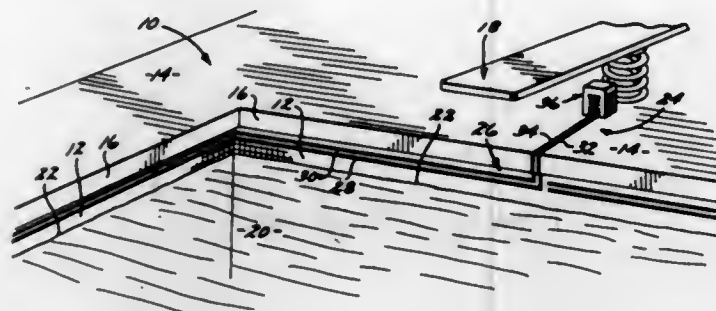
Nelson P. Caprillo, 14170 Remington Street, Arleta, Calif.;  
David Snyder, 22530 Schoolcraft Street, Canoga Park,  
Calif., and John P. Husko, 18433 Collins Street, Tarzana,  
Calif.

Filed June 25, 1971, Ser. No. 156,670

Int. Cl. G08b 13/16

U.S. Cl. 340—261

14 Claims



A swimming pool alarm system for instantly providing an audible or other alarm in response to a person or other object falling into the water. According to the invention, the alarm is adapted to be energized and held in the energized state by electronic switching means that switches from its "off" to its "on" condition in response to a trigger pulse from normally open sensor conductor means which is closable by a momentary splash of water thereon. Such sensor conductor means substantially completely circumscribes the pool closely spaced above the normal water level thereof, whereby the splash or wave motion from an object falling into the pool any place about the periphery thereof will momentarily close the sensor conductor means and thereby turn the switching circuit means "on" to actuate the alarm.

3,732,557

## INCREMENTAL POSITION-INDICATING SYSTEM

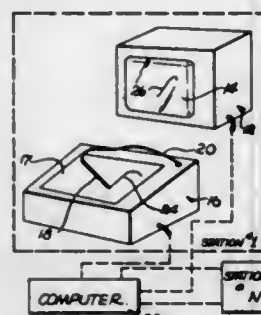
David C. Evans, and Ivan E. Sutherland, both of Salt Lake City, Utah, assignors to Evans & Sutherland Computer Corporation, Salt Lake City, Utah

Filed May 3, 1971, Ser. No. 139,434

Int. Cl. G08b 5/36

U.S. Cl. 340—324 R

9 Claims



A system for digitally manifesting the position of a probe with reference to aligned sets of conductors. Orthogonally arranged sets of index conductors in a tablet, and circular structures with parallel sets of conductors are shown for shaft-position encoder applications. Individual conductors in space-related, aligned, repeating sets are separately energized by phase-displaced signals which are proximity sensed to provide a phase-modulated signal that is digitally detected to manifest relative displacement. Incremental information may be supplemented by absolute position information, and the representative phase-modulated signals may be transmitted over long-distance communication links.

3,732,558

## HIGHWAY SIGN SYSTEM

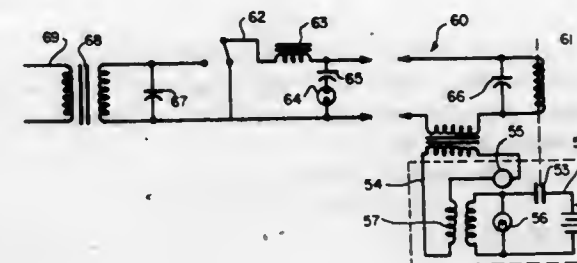
James Robert Justice, Roanoke, Va., assignor to The Headway Company, Roanoke, Va.

Filed Feb. 9, 1971, Ser. No. 114,011

Int. Cl. G09f 13/04

U.S. Cl. 340—330

13 Claims



A remotely controlled sign system for informing motorists of limited access highways of the facilities available at each exit. The system has a signboard with a plurality of individually lit panels, each advertising a different facility. Each panel is operated by a remotely controlled circuit which also informs the facility operator whether the panel is lit or unlit.

3,732,559

## SEGMENTED BINARY RATE MULTIPLE-BEAM DISPLAY SYSTEM

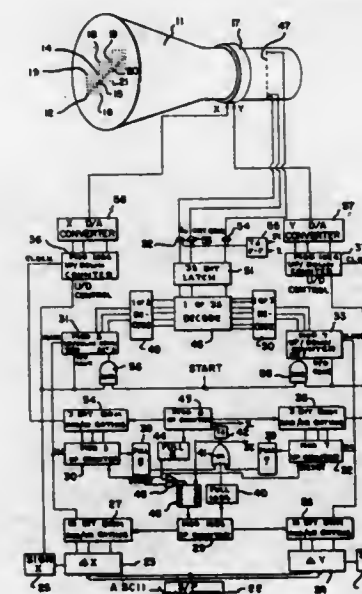
William Ernest Eichelberger, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.

Filed June 7, 1971, Ser. No. 150,636

Int. Cl. G06f 3/14

U.S. Cl. 340—324 AD

5 Claims



A character generator system produces a visual vector display in response to digital vector commands. A plurality of cathode ray beams impinge upon the display screen in a matrix array. The control grid has separate control elements

which selectively control the intensity of each of the beams. The deflection system positions the matrix array of cathode ray beams to different locations on the display screen. A segmented binary rate multiplier responds to the digital vector commands to produce intensity control signals which are applied to the control elements to selectively intensify the cathode ray beams to produce a vector segment having a starting point and a terminating point and which extends across the matrix array. The binary rate multiplier also produces deflection signals which position the array so that the starting point of the vector segment across a new array coincides with the terminating point on the previous array.

3,732,560

## ROTATABLE INDICATOR HAVING LIGHT-EMITTING DIODE BACK-LIGHTING

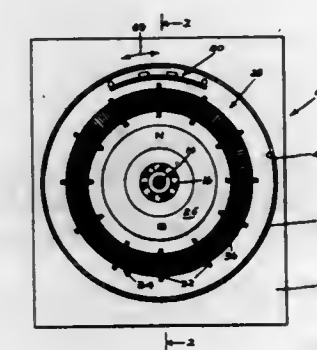
Phillip L. Harden, and Samuel M. Thomas, Jr., both of Fort Wayne, Ind., assignors to Bowmar Instrument Corporation, Fort Wayne, Ind.

Filed Dec. 11, 1970, Ser. No. 97,168

Int. Cl. G01d 11/28; H05b 33/00

U.S. Cl. 340—373

7 Claims



A rotatable indicator, such as a rotatable magnetic position indicating wheel, including a cylindrical drum having opaque and translucent areas defining indicia on the outer drum surface, the drum being rotatably mounted on a supporting member. At least one solid state light-emitting device is provided, such as a light-emitting diode. The light-emitting device is supported on the supporting member within the drum and exposed to the inner surface thereof so that light emitted by the device back-illuminates the indicia on the drum.

3,732,561

## ELECTROMAGNETIC CONTROLLED WHEEL INDICATOR

Peter J. McGinnis, Chester Township, Delaware County, Pa., assignor to Litton Precision Products, Inc., Beverly Hills, Calif.

Filed Sept. 29, 1970, Ser. No. 76,494

Int. Cl. G08b 5/24

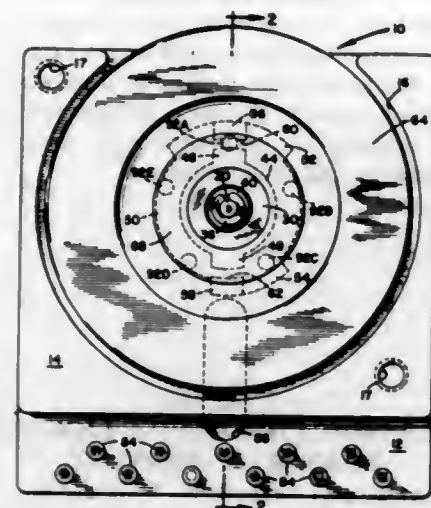
U.S. Cl. 340—378 R

9 Claims

An electromagnetic wheel indicator having an alphanumeric indicating wheel disposed about a rotor that is rotatably mounted within a stator. The stator is provided with inwardly directed radial stator poles wound with individual coils, each encompassing more than one stator pole. A permanent mag-



net forming part of the rotor is provided with two, opposite pole faces; the first of which is as wide as the width between



the more than one stator pole about which each coil is wrapped, while the second is at least one stator pole width narrower than the first.

3,732,562

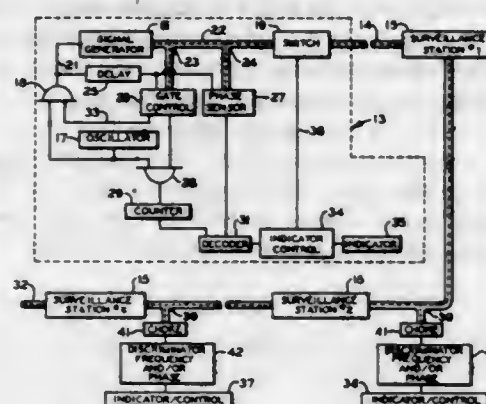
## SURVEILLANCE SYSTEM

Robert Charles Faber, 2549 Goddard Road, Toledo, Ohio, and Stephen B. Miller, 113-27th Street, Apt. B, Manhattan Beach, Calif.

Filed Aug. 19, 1970, Ser. No. 65,184  
Int. Cl. G08b 5/22

U.S. Cl. 340—408

17 Claims



A surveillance system having a primary station from which signals are issued upon a coaxial cable to one or more surveillance stations. Each surveillance station selectively can impose an impedance discontinuity upon the cable which gives rise to a characteristic signal reflection and a measurable interval from the signal issuance to its reflected return to the primary station. This interval is indicative of the separation of the primary and surveillance stations. Various forms of surveillance station actuator are contemplated for introducing the impedance discontinuities at the station in response to various

actuating conditions. The system also locates breaks or other impedance discontinuities in the cable at other than surveillance stations. Where discontinuities are controllable, as by surveillance station means, they can be varied from time to time to convey supplemental information to the primary station and they can be imposed for brief intervals to enable the continued monitoring of other surveillance stations beyond the activated station during the periods that activated station is not imposing a discontinuity.

3,732,563

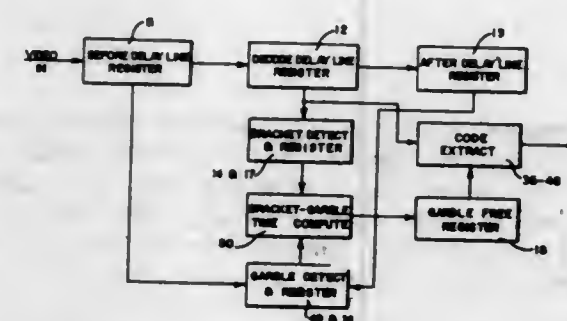
## PULSE TRAIN DECODER-DEGABLER

George P. Nelson, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 12, 1971, Ser. No. 161,672  
Int. Cl. G01s 7/28, 9/56

U.S. Cl. 343—6.5 LC

8 Claims



A decoder-degabler for increasing the decoding efficiency of IFF decoders in the presence of garbled signals. Three delay lines and logic circuitry are utilized to detect the presence of a garble condition and bracket decode condition. A coincidence means then determines if an established decoding criteria has been met whereby there is a degarbled bracket decode output to permit decoding of the pulse train data input.

3,732,564

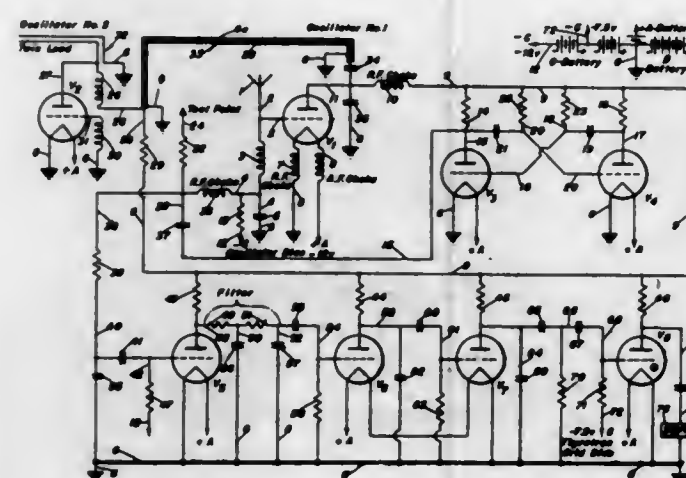
## PULSE DOPPLER FUZE

John H. Kuck, and William M. McCord, both Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed April 10, 1971, Ser. No. 220,312  
Int. Cl. G01s 9/04; F42c 13/04

U.S. Cl. 343—7 PF

4 Claims



1. In a proximity fuze circuit, an antenna a normally ineffective superregenerative radio frequency oscillator coupled to

said antenna, said oscillator generating a radio signal to be radiated by said antenna and developing a detected output correlative to the difference between said generated signal and any reflected portion thereof intercepted by said antenna during the period of effectiveness of said oscillator, a multivibrator coupled to said oscillator for applying periodic impulses of a constant duration and repetition rate thereto thereby rendering said oscillator effective for a predetermined period after each of the applied impulses, a second radio frequency oscillator coupled to said superregenerative oscillator and operating at substantially one-half of the natural frequency of said superregenerative oscillator, a source of electricity energizing said superregenerative oscillator, said second oscillator, and said multivibrator, said second oscillator providing a second harmonic signal to said superregenerative oscillator having an amplitude level large relative to the level of any spurious noises thereby to effect constancy in the initiation of each period of effectiveness and to render said detected output insensitive to weak external signals, such as spurious jamming signals.

3,732,565

## SPECTRUM ANALYSIS SYSTEMS USING OPTICAL CORRELATION TECHNIQUES PARTICULARLY USEFUL IN PULSE MODULATED DOPPLER RADAR SYSTEMS

Leonides Symancic; Christian Pepin, and Claude Skenderoff, all of Paris, France, assignors to Thomson-CSF, Paris, France

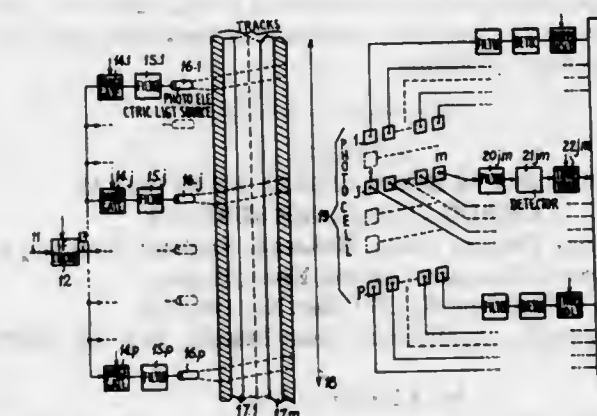
Filed July 23, 1971, Ser. No. 165,529

Claims priority, application France, July 23, 1970, 70,27248

Int. Cl. G01s 9/44

U.S. Cl. 343—9

5 Claims



System of spectrum analysis using optical correlation in real time with non-coherent light, comprising a moving plan with tracks, each track representing a frequency corresponding to the central frequency of a sample of the spectrum analyzed considered displaced in frequency by a predetermined frequency value  $\Delta F$ . Transducer means convert the signal which frequencies are within the spectrum to be analyzed, into an optical modulated beam; photocell receivers in a correlation plane are followed by identical filters centered on  $\Delta F$  and having a band corresponding to the width of a sample. The filter is followed by a detection circuit. The invention is particularly applicable to a pulse Doppler radar system.

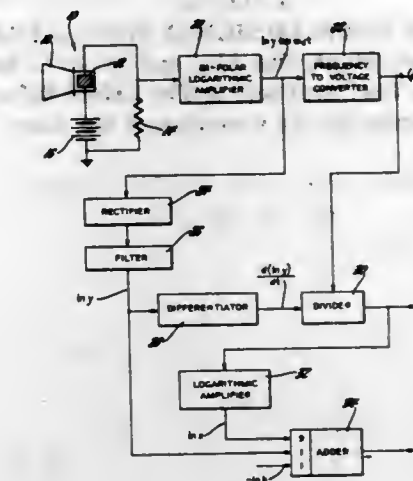
3,732,566  
CONTINUOUS WAVE RANGING RADAR

Norman W. Schubring, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 12, 1971, Ser. No. 188,172  
Int. Cl. G01s 9/50

U.S. Cl. 343—9

3 Claims



A continuous wave ranging radar system in which a transmitted constant amplitude continuous wave is combined with the reflected wave from an object to produce a waveform having a beat frequency equal to the Doppler difference frequency or the relative velocity between the radar system and the object and an amplitude which is an inverse function of the distance therebetween. The relative velocity is obtained from the beat frequency and is divided by the time derivative of the logarithm of the amplitude of the combined wave to obtain the distance between the radar system and the object. The logarithm of the amplitude of the combined wave is also combined with the logarithm of the distance between the radar system and the object to obtain the radar cross-sectional area of the object.

3,732,567

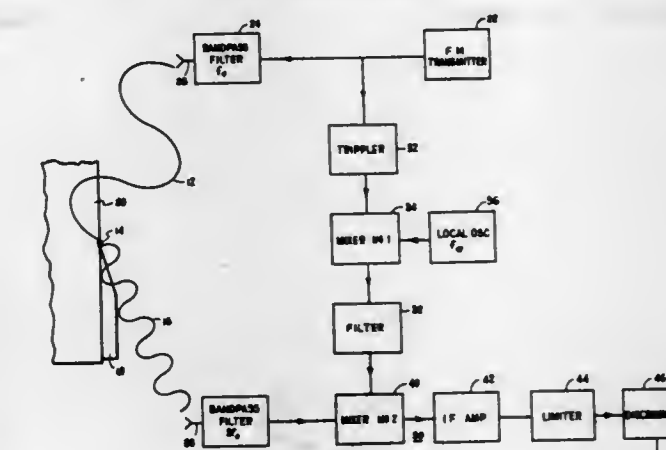
## JUNCTION RANGE FINDER

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of; Sarto Morissette, Thetford Mines, Quebec, Canada; Ronald G. Sea, Newport Beach, Calif., and Marvin J. Frazier, Wood Dale, Ill.

Filed Sept. 21, 1970, Ser. No. 73,922  
Int. Cl. G01s 9/23

U.S. Cl. 343—14

2 Claims



An apparatus for locating an electrically nonlinear object and determining the distance to the object by transmitting an



FM signal in the vicinity of the nonlinear object causing a signal of a higher harmonic to be reflected by the nonlinear object. A receiver is provided for receiving the higher harmonic reflected signal and comparing such with the initial exciting signal so as to produce a signal, the amplitude of which is directly proportional to the distance to the object.

3,732,568

## PULSE DOPPLER SIGNAL SIMULATOR

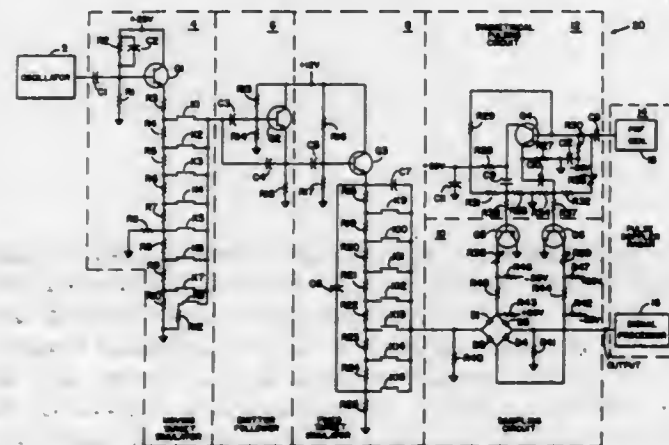
Hollis W. O'Mary, Huntsville, Ala., and James L. Morris, Farmers Branch, Tex., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 8, 1970, Ser. No. 70,168

Int. Cl. G01s 7/40

U.S. Cl. 343-17.7

7 Claims



A device for providing signals which may be connected to the signal processing portion of a doppler radar to test the performance of the signal processor. The device may provide any preselected clutter level or target sizes. An audio signal is supplied to stage 1. The target size, a.c. signal level, is chosen by the appropriate set of relay contacts and is connected to stage 3 via a buffer stage 2. A preselected clutter level is supplied by stage 3. The continuous target size and clutter level outputs are converted to video pulses in coincidence with the input pulses from the pulse repetition frequency (PRF) generator of the doppler radar. The video pulses are supplied to the processor of the radar.

3,732,569

## AERIAL FIELD SIMULATION

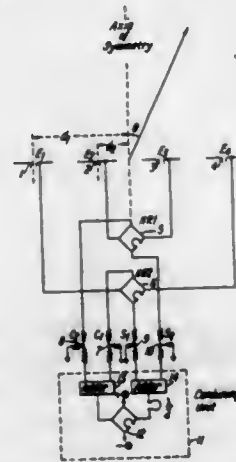
Robin Ashley Collins, Welwyn Garden City, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed July 21, 1971, Ser. No. 164,758

Int. Cl. G01f 7/40

U.S. Cl. 343-100 AP

4 Claims



Any arbitrary antenna array distribution can be represented as the sum of a symmetric and an antisymmetric function. The

radiation at any point in the far field of the aerial array can then be simulated by adding together the symmetric and antisymmetric outputs in quadrature with the correct amplitude. This simplifies the construction of subsequent combining units since these reproduce the far field at any point by amplitude weighting along without the need for differential phasing.

3,732,570

## REMOTE RADIO WINCH CONTROL UNIT

Antonio Francesco Fiorentino, 2373 Cranbrook Street, Cranbrook, British Columbia, Canada

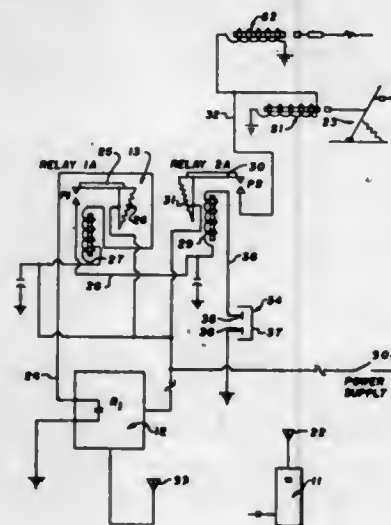
Filed July 1, 1971, Ser. No. 158,835

Claims priority, application Canada, Jan. 8, 1971, 102214

Int. Cl. H04b 7/00; H04q 7/02

U.S. Cl. 343-225

6 Claims



A remote control for winches having "Winch-In," "Free-Spooling" and "Brake-On" operating conditions includes a hand-held transmitter and a receiver on the winch. The receiver selectively operates "Winch-In" and "Free-Spooling" solenoid controls and an engine accelerator control on the winch engine. A "Manual-Remote" selector linkage assembly is provided to permit either manual control or remote control operation, and a quick-release linkage assembly permits immediately emergency alteration of the winch control to "Free-Spooling" condition.

3,732,571

## MICROWAVE HORN AERIAL WITH SPIRAL CORRUGATED INNER SURFACE

Noel William Thomas Neale, Halestead, England, assignor to The Marconi Company Limited, Essex, England

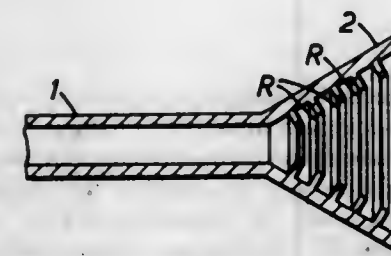
Filed Nov. 5, 1971, Ser. No. 196,665

Claims priority, application Great Britain, Nov. 24, 1970, 55,767/70

Int. Cl. H01q 13/00

U.S. Cl. 343-786

6 Claims



A microwave horn aerial is corrugated on its inner surface by being formed, e.g. by a screw cutting operation with a single start spiro helical groove or by moulding on a mandrel. In the latter case manufacture is relatively easy because the mandrel can be withdrawn by unscrewing it.

3,732,572

## LOG PERIODIC ANTENNA WITH FORESHORTENED DIPOLES

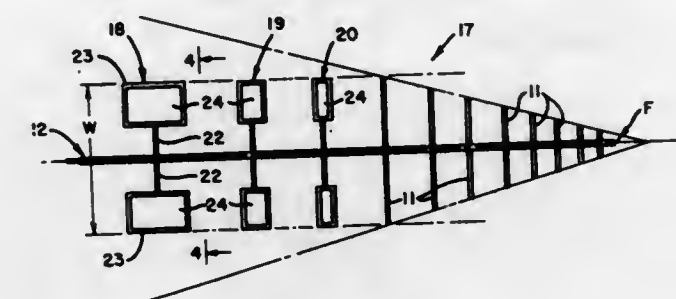
Samuel Chung-Shu Kuo, Cupertino, Calif., assignor to GTE Sylvania Incorporated, Mountain View, Calif.

Continuation-in-part of Ser. No. 50,782, June 19, 1970, abandoned. This application Nov. 22, 1971, Ser. No. 200,681

Int. Cl. H01q 11/10

U.S. Cl. 343-742.5

7 Claims



A log periodic antenna comprising foreshortened dipoles, each having a profile corresponding to the interior cross section of a hollow ridged waveguide. One or more of the elements of the array, usually those which are resonant at relatively low frequencies (HF and low VHF bands) are so foreshortened and each is formed with conductive wire for an open-type element or conductive sheet or film for a solid type dipole. The dipole has the profile of the interior cross section of either a double ridged or a single ridged waveguide and is oriented with the plane of the dipole either parallel to or transversely of the plane containing the axis of the array. A coplanar array of log periodic dipole arrays consisting of such foreshortened dipoles exhibits substantially improved gain and radiation pattern characteristics as compared to a coplanar array of conventional log periodic dipole arrays.

3,732,573

## ELECTROGRAPHIC PRINTER MATRIX CIRCUIT

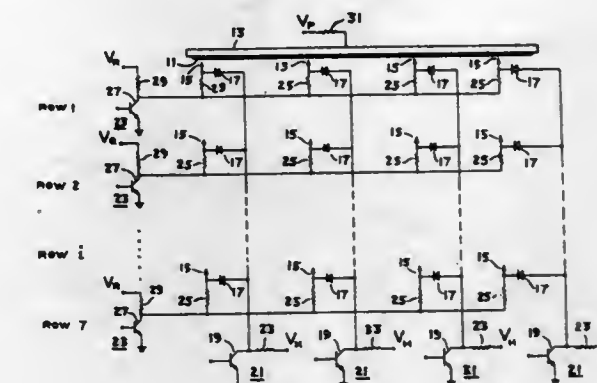
Joseph Merka, Northvale, and James L. Hudson, Montclair, both of N.J., assignors to Ing. C. Olivetti & C., S.P.A., Ivrea, Italy

Filed Aug. 11, 1971, Ser. No. 170,804

Int. Cl. G01d 15/06; H04i 15/34

U.S. Cl. 346-74 ES

4 Claims



An electrographic printer having a multiplex matrix type driving circuit for the printing styli, thereby reducing the number of high voltage switches needed to drive the styli. The styli are grouped into N groups, each containing M styli. A first set of N selectively actuatable driving circuits are connected by unidirectionally conductive means to the styli of the corresponding groups, and a second set of M selectively actuatable driving circuits are connected by resistive means to the corresponding styli from each of the groups. Means are also provided for selectively simultaneously activating one of said driving circuits from said first set, and selected ones of said driving circuits from said second set, for depositing charge on the paper in image configuration.



# DESIGNS

MAY 8, 1973

226,831  
CONSOLE

Davis B. Allen, New York, N.Y., assignor to The General Fireproofing Company, Youngstown, Ohio  
Filed Oct. 8, 1970, Ser. No. 25,379  
Term of patent 14 years  
Int. Cl. D6-04

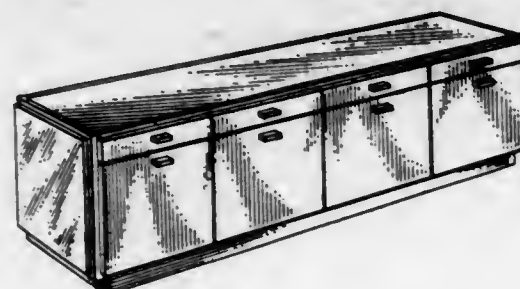
U.S. Cl. D6-159



226,832  
CONSOLE

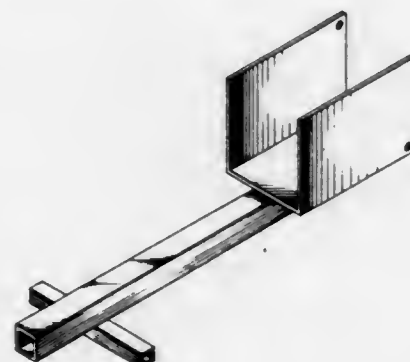
Davis B. Allen, New York, N.Y., assignor to The General Fireproofing Company, Youngstown, Ohio  
Filed Oct. 8, 1970, Ser. No. 25,386  
Term of patent 14 years  
Int. Cl. D6-04

U.S. Cl. D6-159



226,833  
CONCRETE RAFTER SUPPORT  
Marvin L. Rich, 1018 Opal, Boise, Idaho 83705  
Filed Apr. 9, 1971, Ser. No. 132,926  
Term of patent 14 years  
Int. Cl. D8-08

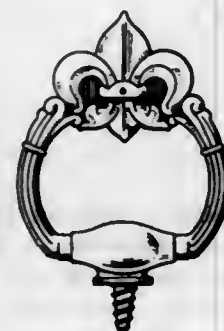
U.S. Cl. D8-235



226,834  
HANGER, FOR PICTURES, MIRRORS, PLAQUES,  
OR THE LIKE

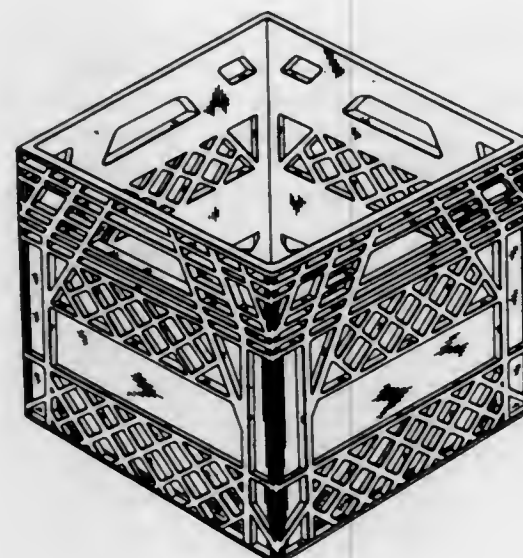
L. Richard Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.  
Filed June 11, 1971, Ser. No. 152,481  
Term of patent 14 years  
Int. Cl. D8-08

U.S. Cl. D8-257



226,835  
BOTTLE CRATE  
John D. Van Geem, 3931 Parkside Ave.,  
Erie, Pa. 16508  
Filed Feb. 23, 1971, Ser. No. 118,209  
Term of patent 14 years  
Int. Cl. D9-03

U.S. Cl. D9-177



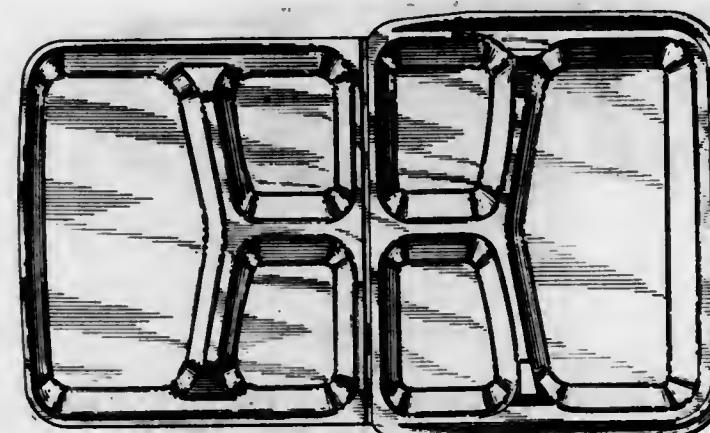
MAY 8, 1973

U. S. PATENT OFFICE

713

226,836  
COVERED HOT FOOD TRAY  
Steve Cyr and Mark Whelan, Chippewa Falls, Wis.,  
assignors to Standard Oil Company, Chicago, Ill.  
Filed Jan. 29, 1971, Ser. No. 111,166  
Term of patent 14 years  
Int. Cl. D9-03

U.S. Cl. D9-185



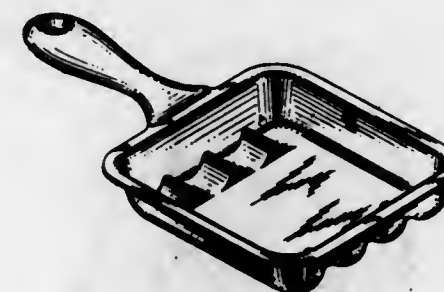
226,837  
COMBINED DISPLAY AND PACKAGING  
CONTAINER FOR FOOD OR THE LIKE  
Peter J. Le Cody, 5412 W. Ferdinand St.,  
Chicago, Ill. 60644  
Filed Apr. 1, 1971, Ser. No. 130,557  
Term of patent 14 years  
Int. Cl. D9-03

U.S. Cl. D9-220



226,838  
COMBINED PET FOOD BAR DISPLAY TRAY AND  
FEEDER OR SIMILAR ARTICLE  
William Ruskin, Brooklyn, N.Y., assignor to Hartz  
Mountain Pet Foods, Inc., New York, N.Y.  
Filed Sept. 15, 1971, Ser. No. 180,956  
Term of patent 14 years  
Int. Cl. D9-04; D30-03

U.S. Cl. D9-244



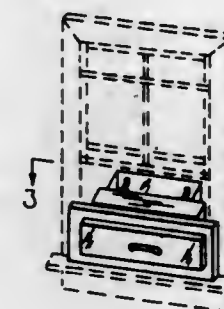
226,839  
COMBINATION CLOSURE AND SUPPORT HOOK  
FOR A COLLAPSIBLE TUBE  
Harold B. Jennings, 1602 Travis Heights Blvd.,  
Austin, Tex. 78704  
Filed June 14, 1971, Ser. No. 153,125  
Term of patent 14 years  
Int. Cl. D9-07

U.S. Cl. D9-261



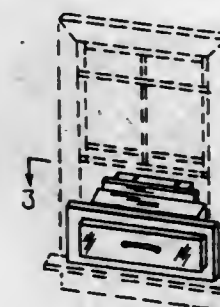
226,840  
RETRACTABLE WINDOW CASE STRUCTURE  
AND SUPPORT THEREFOR  
John P. Francis, 20 Boston St., Haverhill, Mass. 01830  
Continuation-in-part of design application Ser. No.  
179,248, Sept. 9, 1971. This application Sept. 27,  
1971, Ser. No. 184,328  
Term of patent 14 years  
Int. Cl. D25-02

U.S. Cl. D13-1 M



226,841  
RETRACTABLE WINDOW CASE STRUCTURE  
AND SUPPORT THEREFOR  
John P. Francis, 20 Boston St., Haverhill, Mass. 01830  
Continuation-in-part of design application Ser. No.  
179,248, Sept. 9, 1971. This application Sept. 27,  
1971, Ser. No. 184,329  
Term of patent 14 years  
Int. Cl. D25-02

U.S. Cl. D13-1 M



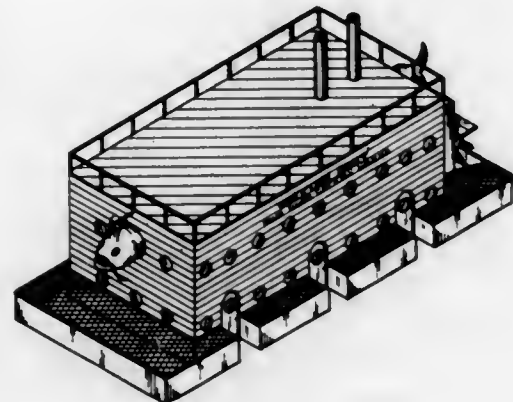


226,842

**RESTAURANT**

Ralph P. Armstrong, 1403 Maple Ave.,  
La Marque, Tex. 77568  
Filed Oct. 29, 1971, Ser. No. 194,093  
Term of patent 14 years  
Int. Cl. D25-03

U.S. Cl. D13-1 B



226,843

**RESTAURANT BUILDING**

Thomas C. Katris, 8225 Kraay St.,  
Munster, Ind. 46321  
Filed Mar. 7, 1972, Ser. No. 232,647  
Term of patent 14 years  
Int. Cl. D25-03

U.S. Cl. D13-1 B

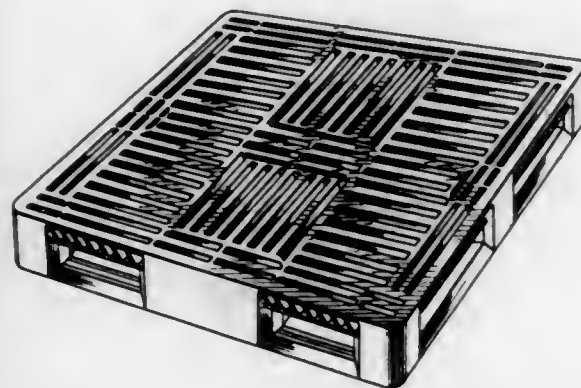


226,844

**PALLET**

Theodor M. Box, 1108 Alleen Road, Brielle, N.J.  
Filed Oct. 22, 1971, Ser. No. 191,965  
Term of patent 14 years  
Int. Cl. D12-99

U.S. Cl. D14-3 N

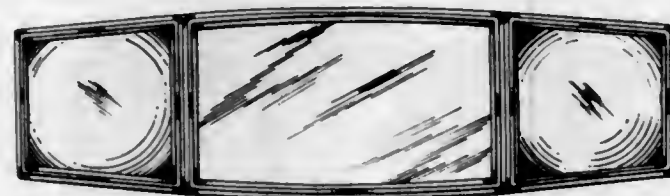


226,845

**AUTOMOTIVE REAR VIEW MIRROR**

Sol H. Lapidus, Great Neck, N.Y., assignor to Blue Fox  
Industries, Inc., Brooklyn, N.Y.  
Filed Aug. 4, 1971, Ser. No. 169,166  
Term of patent 7 years  
Int. Cl. D12-08

U.S. Cl. D14-6 M

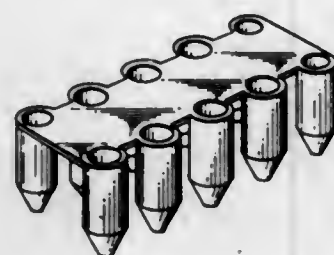


226,846

**MOULD UNIT PRIMARILY FOR USE IN ENCAPSULATING SCIENTIFIC SPECIMENS**

Albert Rosenberg, 6 Boston Gardens,  
Brentford, England  
Filed Sept. 18, 1970, Ser. No. 25,064  
Claims priority, application Great Britain Mar. 18, 1970  
Term of patent 14 years  
Int. Cl. D24-99

U.S. Cl. D16-1

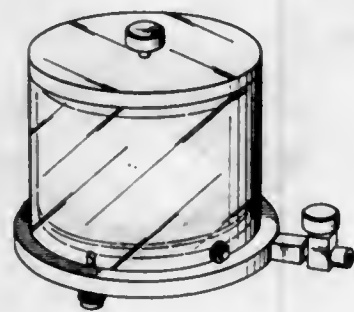


226,847

**BAROMETER TEST CHAMBER**

James Robert King, Van Nuys, and Gerald D. Myers,  
Sepulveda, Calif., assignors to King Nutronics Corporation, Van Nuys, Calif.  
Filed May 5, 1972, Ser. No. 250,863  
Term of patent 14 years  
Int. Cl. D10-05

U.S. Cl. D16-2 C

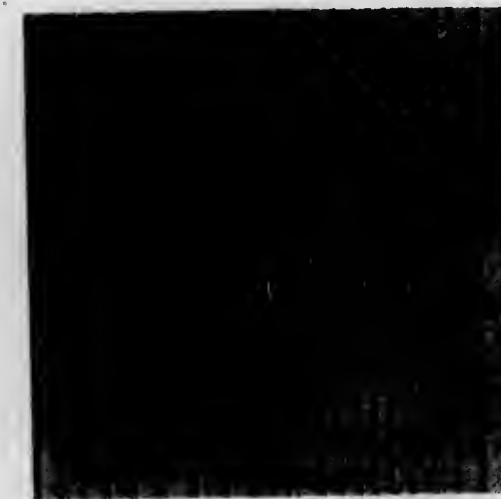


226,848

**WALL PANEL**

Francis E. Dreazy, Riverside, Calif., assignor to Evans  
Products Company, Portland, Oreg.  
Filed May 26, 1971, Ser. No. 147,290  
Term of patent 14 years  
Int. Cl. D25-01

U.S. Cl. D18-2 B

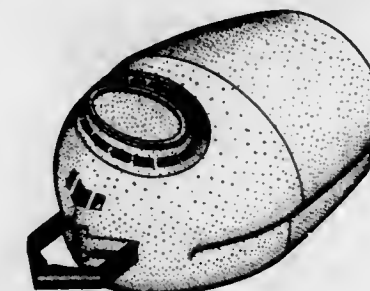


226,849

**BAIT BUCKET**

Richard G. Woolworth and Anthony J. Souza, Lancaster,  
and Harper Landell, Fort Washington, Pa., assignors  
to Woodstream Corporation, Lititz, Pa.  
Filed Apr. 13, 1971, Ser. No. 133,779  
Term of patent 14 years  
Int. Cl. D22-05

U.S. Cl. D22-18

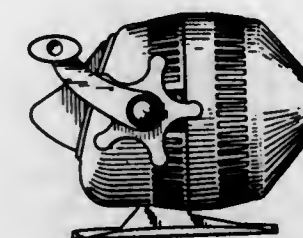


226,850

**CLOSED FACE SPINNING REEL**

R. Dell Hull, Rte. 1, Box 310, Catoosa, Okla. 74015  
Filed Nov. 8, 1971, Ser. No. 196,868  
Term of patent 14 years  
Int. Cl. D22-05

U.S. Cl. D22-25

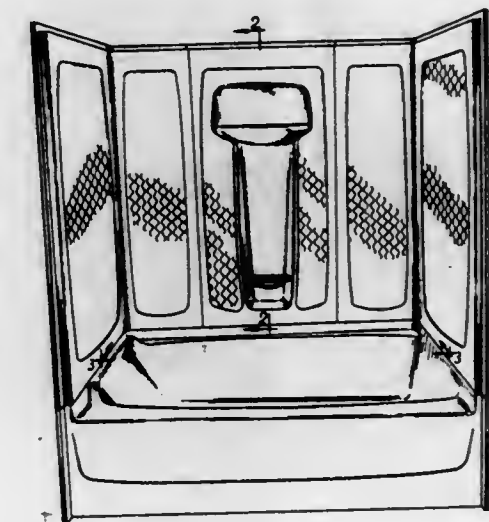


226,851

**BATHTUB AND SHOWER ENCLOSURE COMBINATION**

Stanley F. Korol, Mansfield, Ohio, assignor to Borg-  
Warner Corporation, Chicago, Ill.  
Filed Feb. 28, 1972, Ser. No. 230,171  
Term of patent 14 years  
Int. Cl. D23-02

U.S. Cl. D23-49

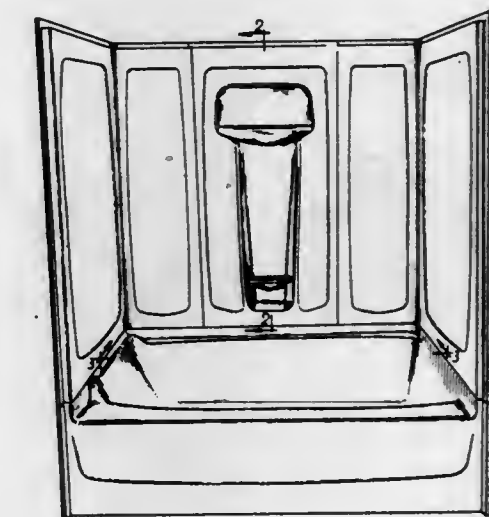


226,852

**BATHTUB AND SHOWER ENCLOSURE COMBINATION**

Stanley F. Korol, Mansfield, Ohio, assignor to Borg-  
Warner Corporation, Chicago, Ill.  
Filed Feb. 28, 1972, Ser. No. 230,173  
Term of patent 14 years  
Int. Cl. D23-02

U.S. Cl. D23-49



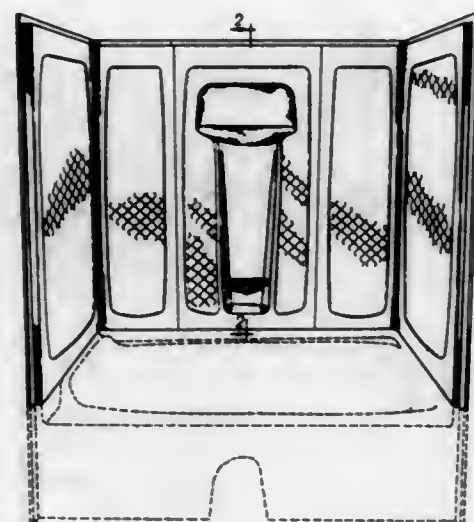


226,853

**SHOWER ENCLOSURE**

Stanley F. Korol, Mansfield, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.  
 Filed Feb. 28, 1972, Ser. No. 230,172  
 Term of patent 14 years  
 Int. Cl. D23-02

U.S. Cl. D23-69

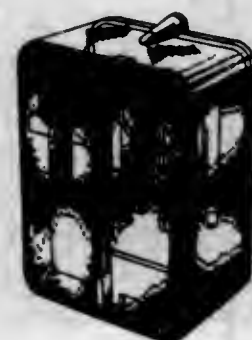


226,855

**AIR FRESHENER CONTAINER**

Paul E. Rosen, 1541 W. Ashcroft Ave., Fresno, Calif. 93705  
 Filed May 17, 1971, Ser. No. 144,354  
 Term of patent 14 years  
 Int. Cl. D23-99

U.S. Cl. D23-150



226,856

**ELECTRICAL CABLE CLAMP**

Alfonso Leto, 12255 Gerald Ave., Granada Hills, Calif. 91344, and Frank Leto, 8936 Amestoy Ave., Northridge, Calif. 91324  
 Filed May 10, 1971, Ser. No. 142,123  
 Term of patent 14 years  
 Int. Cl. D13-03; D8-08

U.S. Cl. D26-1 A

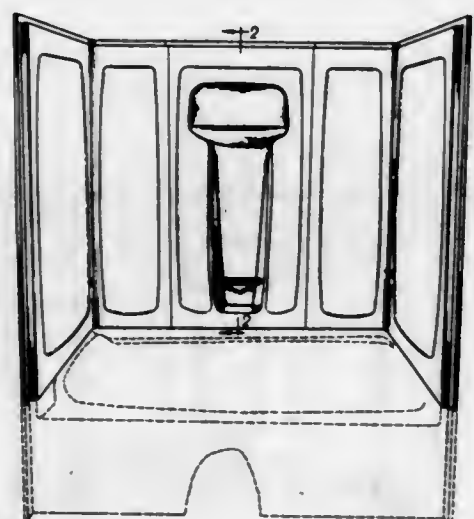


226,854

**SHOWER ENCLOSURE**

Stanley F. Korol, Mansfield, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.  
 Filed Feb. 28, 1972, Ser. No. 230,183  
 Term of patent 14 years  
 Int. Cl. D23-02

U.S. Cl. D23-69

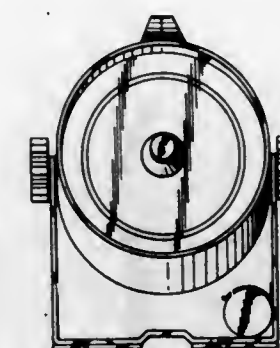


226,857

**SONIC FISH DETECTOR**

Jan A. Van Den Broek, Ann Arbor, and George W. Toma, Dexter, Mich., assignors to Transidyne General Corporation, Ann Arbor, Mich.  
 Filed June 1, 1971, Ser. No. 149,120  
 Term of patent 14 years  
 Int. Cl. D10-04

U.S. Cl. D26-1 Q

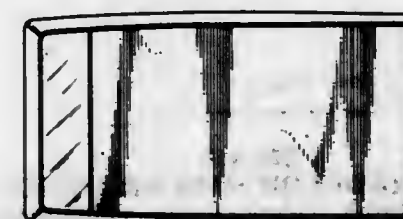


226,858

**CASING FOR AN ELECTRONIC CALCULATOR**

Edward T. Liljenwall, Sunnyvale, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.  
 Continuation-in-part of design application Ser. No. 111,787, Feb. 1, 1971. This application June 28, 1972, Ser. No. 266,946  
 Term of patent 14 years  
 Int. Cl. D14-02

U.S. Cl. D26-5 C

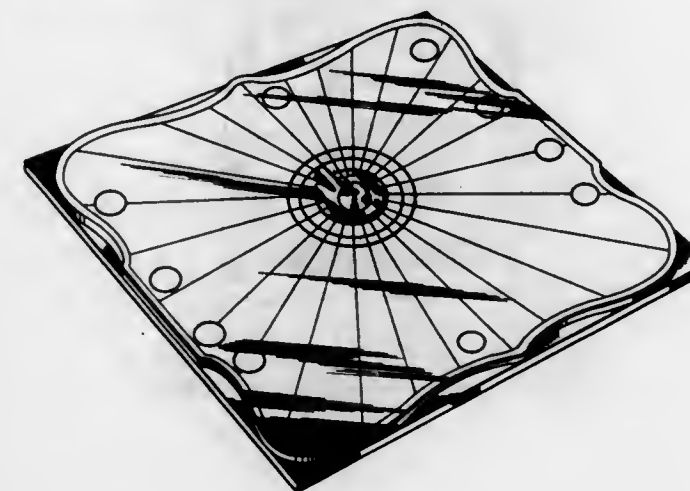


226,859

**GAME BOARD WITH POINTER**

Jacob B. Burke, 6771 Yellowstone Blvd., Forest Hills, N.Y. 11375  
 Filed Mar. 19, 1971, Ser. No. 126,395  
 Term of patent 14 years  
 Int. Cl. D21-01

U.S. Cl. D34-5

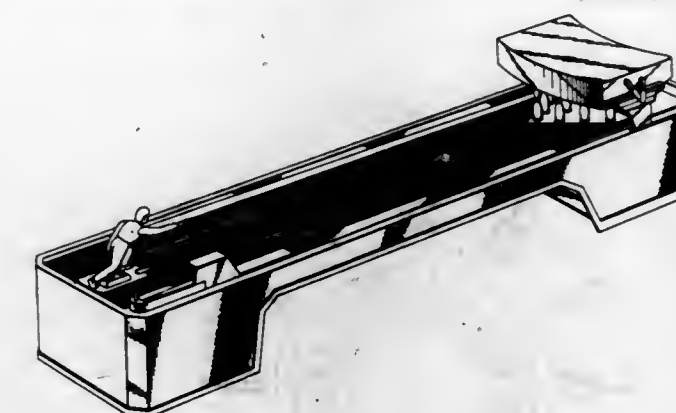


226,860

**BOWLING GAME APPARATUS**

Taketora Maeda, Tokyo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan  
 Filed Sept. 21, 1971, Ser. No. 182,573  
 Term of patent 14 years  
 Int. Cl. D21-01

U.S. Cl. D34-5 BB

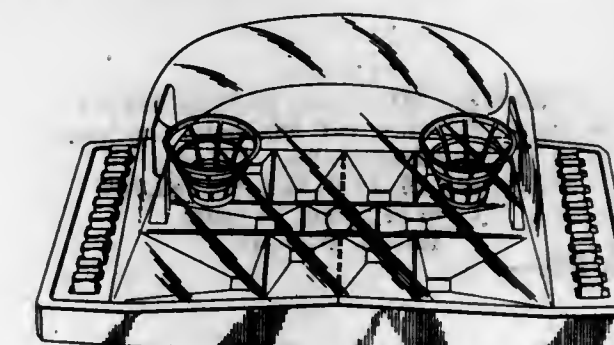


226,861

**BASKETBALL GAME BOARD**

Teruo Matsumoto, Tokyo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan  
 Filed Jan. 13, 1972, Ser. No. 217,717  
 Term of patent 14 years  
 Int. Cl. D21-01

U.S. Cl. D34-5 SS

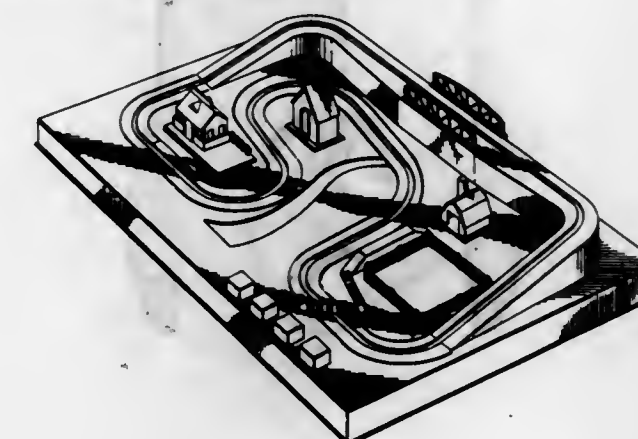


226,862

**TOY TRACKWAY**

Eijiro Tomiyama, Tokyo, Japan, assignor to Tomy Kogyo Co., Ltd., Tokyo, Japan  
 Filed Jan. 4, 1972, Ser. No. 215,452  
 Term of patent 14 years  
 Int. Cl. D21-01

U.S. Cl. D34-15 MM

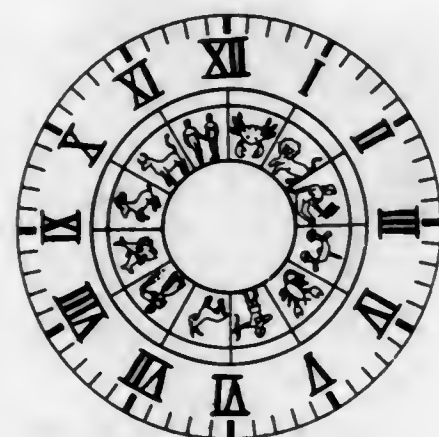




226,863

**ZODIAC CLOCK FACE**Lewis E. Zorzy, 20 Waterside Road,  
Marblehead, Mass. 01945Continuation-in-part of design application Ser. No.  
18,420, July 25, 1969. This application Oct. 26,  
1970, Ser. No. 25,655Term of patent 14 years  
Int. Cl. D10—07

U.S. Cl. D42—1



226,864

**STRINGED MUSICAL INSTRUMENT**Walter J. Pelensky, 19C Manheim Gardens,  
Philadelphia, Pa. 19144

Filed Sept. 20, 1971, Ser. No. 182,280

Term of patent 14 years

Int. Cl. D17—03

U.S. Cl. D56—1 A



226,865

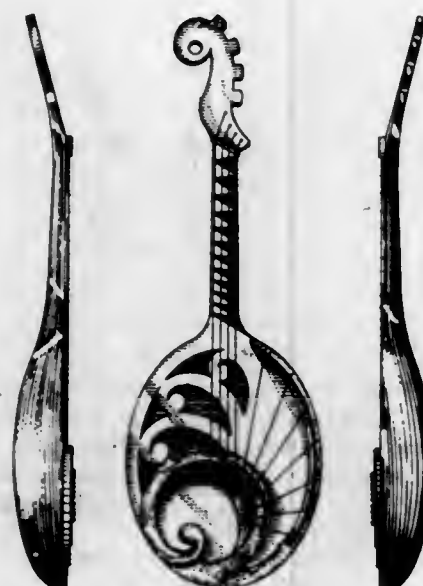
**STRINGED MUSICAL INSTRUMENT**Walter J. Pelensky, 19C Manheim Gardens,  
Philadelphia, Pa. 19144

Filed Sept. 20, 1971, Ser. No. 182,281

Term of patent 14 years

Int. Cl. D17—03

U.S. Cl. D56—1 A



226,866

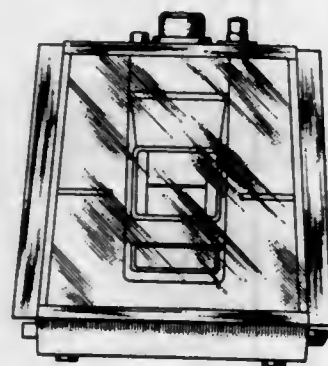
**TABLE RADIO OR SIMILAR ARTICLE**Akira Katoh, Tokyo, Japan, assignor to  
General Electric Company

Filed May 28, 1971, Ser. No. 148,292

Term of patent 14 years

Int. Cl. D14—03

U.S. Cl. D56—4 B



226,867

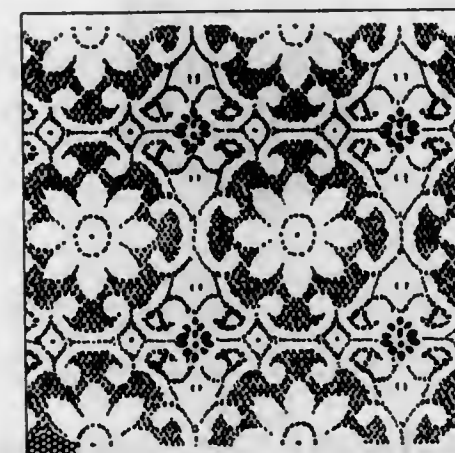
**PAPER TOWELING**Mary Ellen Wassenberg, Green Bay, Wis., assignor to  
Fort Howard Paper Company, Green Bay, Wis.

Filed Mar. 25, 1971, Ser. No. 128,210

Term of patent 14 years

Int. Cl. D6—13

U.S. Cl. D59—2 A



226,868

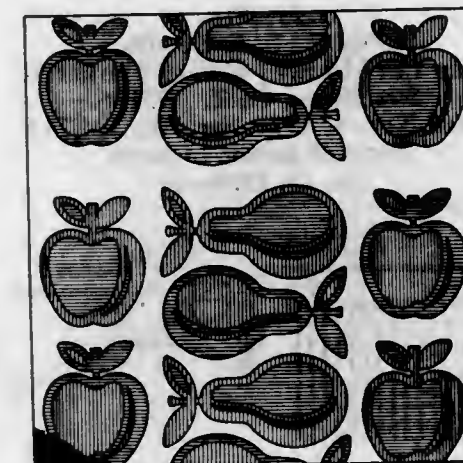
**PAPER TOWELING**Nicholas Sidjakov, Sausalito, Calif., assignor to Fort  
Howard Paper Company

Filed Apr. 19, 1971, Ser. No. 135,537

Term of patent 14 years

Int. Cl. D5—03

U.S. Cl. D59—2



226,869

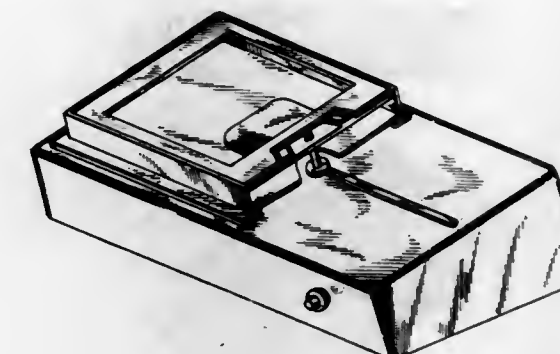
**SHUTTLE-TYPE PICTURE VIEWER**John H. Weggeland, P.O. Box 204,  
Lehigh Acres, Fla. 33936

Filed Nov. 4, 1970, Ser. No. 25,831

Term of patent 14 years

Int. Cl. D16—03

U.S. Cl. D61—1



226,870

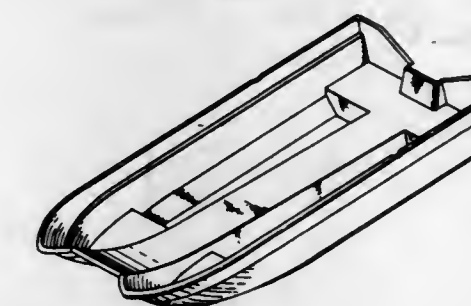
**BOAT**David T. Livingston, 4338 SW. Willow St.,  
Seattle, Wash. 98116

Filed Aug. 2, 1971, Ser. No. 168,520

Term of patent 14 years

Int. Cl. D12—06

U.S. Cl. D71—1 Q



226,871

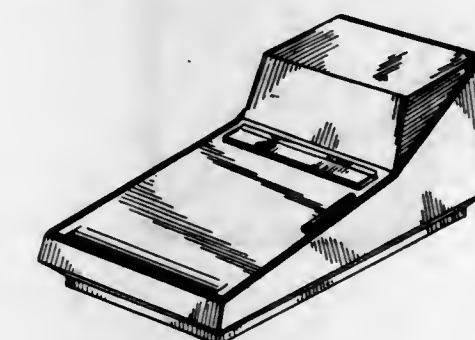
**MEMO PAPER HOLDER**William Macowski, Caldwell, N.J., assignor to Ketcham  
& McDougal, Inc., Roseland, N.J.

Filed Apr. 7, 1971, Ser. No. 132,260

Term of patent 14 years

Int. Cl. D19—02

U.S. Cl. D74—1 C





226,872

**CAMP STOVE**Raymond E. Benson, Oak Park, Ill., assignor to  
Olin Corporation

Filed May 21, 1971, Ser. No. 145,999

Term of patent 14 years

Int. Cl. D7—02

U.S. Cl. D81—10 G



226,873

**PRE-FABRICATED SAUNA THERAPY BATH UNIT**

Cleo D. Mathis, 1808 Potrero Ave.,

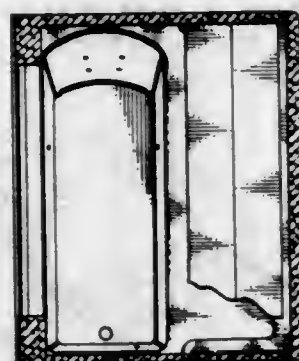
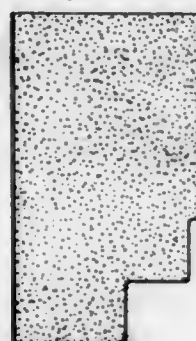
South El Monte, Calif. 91733

Filed Mar. 26, 1971, Ser. No. 128,653

Term of patent 14 years

Int. Cl. D23—02; D24—99

U.S. Cl. D83—1 C



226,874

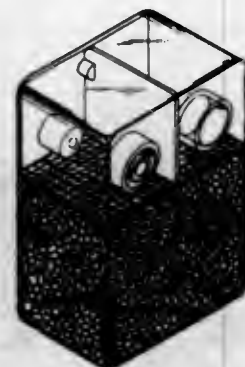
**DISPOSABLE FILTER CANISTER FOR A  
BREATHING SYSTEM**Gale E. Dryden, Indianapolis, Ind., assignor to Dryden  
Corporation, Indianapolis, Ind.

Filed May 28, 1971, Ser. No. 148,271

Term of patent 14 years

Int. Cl. D24—01

U.S. Cl. D83—1 G



226,875

**PORTABLE FLEXIBLE BODY-MASSAGE DEVICE**

Chester M. Haworth, Jr., 4002 S. Clay St., Denver, Colo.

80101, and Frank R. Larmer, 10613 W. 101 Terrace,

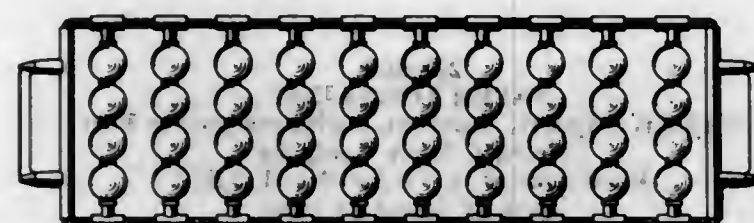
Overland Park, Kans. 66214

Filed Feb. 9, 1972, Ser. No. 225,010

Term of patent 14 years

Int. Cl. D24—04

U.S. Cl. D83—1 T



226,876

**FOLDABLE COMB**

Willie Lee Morrow, 4167-9 Market St.,

San Diego, Calif. 92106

Filed Nov. 1, 1971, Ser. No. 194,794

Term of patent 14 years

Int. Cl. D28—03

U.S. Cl. D86—8



226,877

**POWER DRIVEN HAIR COMB**

James E. Tucker, Chicago, Ill., assignor to

The Gillette Company, Boston, Mass.

Filed Apr. 10, 1972, Ser. No. 242,913

Term of patent 14 years

Int. Cl. D28—03

U.S. Cl. D86—8



226,878

**FACE SHIELD**

Charles R. Jageman, 2710 W. 31st St.,

Erie, Pa. 16506

Filed Sept. 3, 1971, Ser. No. 177,921

Term of patent 14 years

Int. Cl. D28—03

U.S. Cl. D86—10 A



226,879

**LUGGAGE CASE**

Thomas D. Tweedle, 2226 Fairgreen Ave.,

Monrovia, Calif. 91016

Filed Feb. 10, 1971, Ser. No. 114,409

Term of patent 14 years

Int. Cl. D3—01

U.S. Cl. D87—5 F



226,880

**LOOSE-LEAF BINDER**

Harlow G. Wetmore, Delmar, N.Y., assignor to Buchan

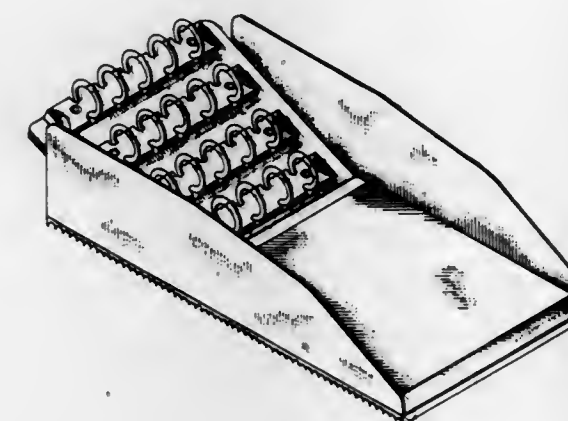
Loose Leaf Records Company, Clifton Heights, Pa.

Filed Apr. 27, 1972, Ser. No. 248,358

Term of patent 14 years

Int. Cl. D19—04

U.S. Cl. D97—1



226,881

**LOOSE-LEAF BINDER**

Harlow G. Wetmore, Delmar, N.Y., assignor to Buchan

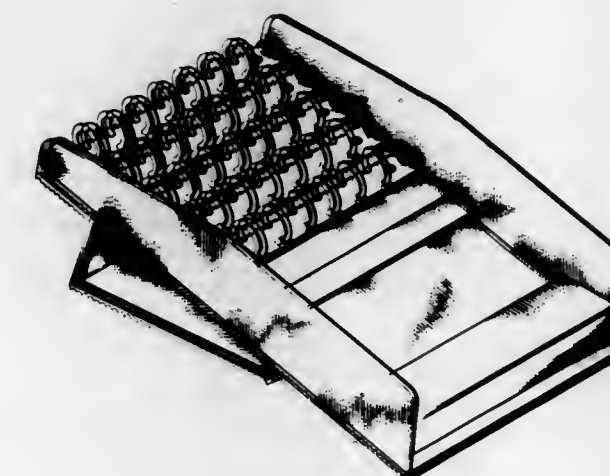
Loose Leaf Records Company, Clifton Heights, Pa.

Filed Apr. 27, 1972, Ser. No. 252,971

Term of patent 14 years

Int. Cl. D19—04

U.S. Cl. D97—1





# LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF MAY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. & M. Cousin et Cie, Etablissements Cousin Freres: See—  
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- Aasen, Torulf F.; Kiernan, Philip; and Mogil, Bernard, to Copystatics Manufacturing Corporation. Exposure control system for reproduction device. 3,731,611, Cl. 95-62.000.
- AB Tetra Pak: See—  
Holmstrom, Sven Nils Hakan; and Olsen, Jan-Erik, 3,732,050.
- Abbott, Charles N., to Dayton Bright Copper Company. Copper plating. 3,732,151, Cl. 204-52.00r.
- Acaba, Peter. Air pollution control device. 3,732,075, Cl. 23-284.000.
- Ace Controls, Inc.: See—  
Bindon, Glyn A., 3,731,770.
- Acker, Robert H.; and Murphy, Francis H., to Singer Company, The, mesne. Star tracker system. 3,731,544, Cl. 74-5.220.
- Ackerfeldt, Bo Ingemar, to U.S. Natural Resources, Inc. Sawing system for sawing of logs sorted to diameter class. 3,731,578, Cl. 83-731.000.
- Ackerman, Bernard, to Electro-Catheter Corporation. Method of making a catheter. 3,731,376, Cl. 29-624.000.
- Ackerman, James H., to Sterling Drug Inc. Iodinated bis(aminobenzoic acids) and esters thereof. 3,732,293, Cl. 260-516.000.
- Acme Visible Records, Inc.: See—  
Fleischhauer, Eugene T., 3,731,789.
- Acme-Cleveland Corporation: See—  
Barkhurst, Ernest F., 3,731,565.
- Addison, Christopher D., to Sun Oil Company of Pennsylvania. Scraper assembly for process vessels. 3,731,339, Cl. 15-246.500.
- Addmaster Corporation: See—  
Berry, William A., 3,732,387.
- Addressograph-Multigraph Corporation: See—  
Artl, Kenneth M., 3,731,358.
- Adkinson, Archie D., Jr. Door lock. 3,731,965, Cl. 292-292.000.
- Advanced Drainage Systems, Inc.: See—  
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- Aerojet-General Corporation: See—  
Gold, Marvin H.; and Marcus, Henry J., 3,732,289.
- Grakauskas, Vytautas; and Remanick, Allen H., 3,732,291.
- Ag-Pak, Inc.: See—  
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- Ageev, Georgy Sergeevich; Kuptsov, Ivan Pavlovich; and Jusim, Lev Veniaminovich, to Vsesojuzny Gosudarstvenny Ordena Lenina Proektiny Institute "Teploelektroproekt". Method of forming structures by deposition. 3,731,492, Cl. 61-30.000.
- Agence Nationale de Valorisation de la Recherche (Anvar): See—  
Paris, Rene A.; Thibaudon, Dominique; Roubin, Marc P.; and Paris, Jacques M., 3,732,091.
- Agfa-Gevaert Aktiengesellschaft: See—  
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- Hujer, Friedrich; and Fengler, Harald, 3,732,430.
- Wick, Richard; and Bestenreiner, Friedrich, 3,731,994.
- Agrico Chemical Company, mesne: See—  
Breathitt, Harvie W., Jr.; Evans, Robert D.; and Houston, Wesley M., 3,732,090.
- Agusta, Benjamin; Bardell, Paul H.; Castrucci, Paul P.; Henle, Robert A.; and Pecorato, Raymond P., to International Business Machines Corporation. Menolithic integrated structure including fabrication and packaging therefor. 3,731,375, Cl. 29-577.000.
- Akgulian, Sahag C.; Haffner, Donald G.; and Heth, Sherman C., to Jacobsen Manufacturing Company. Convertible gang lawn mower. 3,731,469, Cl. 56-7.000.
- Aktiebolaget Bahco Ventilation: See—  
Gustavsson, Karl Axel Goran, 3,731,811.
- Aktiebolaget Leo: See—  
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- Aktiengesellschaft Brown Boveri & Cie: See—  
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- Albrecht, Werner: See—  
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- Alessio, Eugene T. Animal cage. 3,731,657, Cl. 119-17.000.
- Alexeff, Alexander V., to Alexeff-Snyder Enterprises, Inc. Tensioning apparatus. 3,731,889, Cl. 242-156.200.
- Alexeff-Snyder Enterprises, Inc.: See—  
Alexeff, Alexander V., 3,731,889.
- Alfa Romeo S.p.A.: See—  
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- Alfa-Laval AB: See—  
Jenssen, Sverre Knut, 3,731,737.
- Allcock, Harry Rex, to Firestone Tire & Rubber Company, The. Cross-linking of phosphazene polymers. 3,732,175, Cl. 260-2.00p.
- Allen and Hanburys Limited: See—  
Lunts, Lawrence H. C.; and Toon, Paul, 3,732,300.
- Allen Electric and Equipment Company: See—  
Haley, David M.; and Bergantzel, Richard P., 3,731,331.
- Allen, Herbert, to Cameron Iron Works, Inc. Rotary operator. 3,731,599, Cl. 92-122.000.
- Allen, Sam, & Son: See—  
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- Allied Chemical Corporation: See—  
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- Curtis, Omer E., Jr.; Tuller, Harold W.; O'Neill, Charles T.; and Nussbaum, Ralph W., 3,732,332.
- Fuhrmann, Robert; Koff, Fred W.; and Pisanchyn, John, 3,732,303.
- Mallonee, William Cyrus; and Saunders, Peter Reginald, 3,732,346.
- O'Brien, John B.; Stone, Herman; and Ulmer, Harry E., 3,732,220.
- Radke, Donald G., 3,731,949.
- Spatz, Sydney M.; Bailey, Maurice E.; and Evans, Francis E., 3,732,239.
- Young, David Edward; Anderson, Lowell Ray; Gould, Douglas Eugene; and Fox, William Burke, 3,732,274.
- Allis-Chalmers Corporation: See—  
Walberg, Maynard E., 3,731,746.
- Allis-Chalmers Manufacturing Company: See—  
Gruenberger, Lawrence M., 3,731,951.
- Allmanna Svenska Elektriska Aktiebolaget: See—  
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- Almog, Ehud. Panel constructions. 3,732,138, Cl. 161-43.000.
- Alps Electric Co., Ltd.: See—  
Ohkita, Masao, 3,732,386.
- Altenburger, Otto; and Stoddard, David W., to Stromberg-Carlson Corporation. Outgoing trunk marker. 3,732,377, Cl. 179-18.00r.
- Altmann, Conrad, to Eastman Kodak Company. Electrostatographic compensation apparatus. 3,732,003, Cl. 355-3.000.
- Aluminum Company of America: See—  
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- Alza Corporation: See—  
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- Ambrus, Sandor: See—  
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- American Can Company: See—  
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- White, Robert F.; Tavares, John F.; and Gann, Bernard M., 3,731,320.
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- Amos, James L.; Bird, Arnett L.; and Snyder, Robert P., to Dow Chemical Company, The. Method for the incorporation of filamentary material in a resinous matrix. 3,732,345, Cl. 264-329.000.
- AMP Incorporated: See—  
Hartwell, Ronald Groff; and Miller, Arley Keener, 3,732,522.
- Henschen, Homer Ernst; and Carter, Clyde Thomas, 3,732,525.
- Ampex Corporation: See—  
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- Amsted Industries Incorporated: See—  
George, Howard Edward; and Guertin, Jean Marie, 3,732,045.
- Amtel, Inc.: See—  
Rottleuthner, Heinz H., 3,731,355.
- Anderson, Carl W., Jr., to Susquehanna Corporation, The. Gas source. 3,731,843, Cl. 222-3.000.
- Anderson, Earl R., to Brex Corporation; trustee. Sizer conveyor. 3,731,798, Cl. 209-98.000.
- Anderson, Frank R.; and Castro, Albert J., to Westates Space-Era Products Inc. Ribbon-inking machine. 3,731,649, Cl. 118-6.000.
- Anderson, Lowell Ray: See—



Young, David Edward; Anderson, Lowell Ray; Gould, Douglas Eugene; and Fox, William Burke, 3,732,274.

Andreassen, Bjorn Arild: See—  
Edlund, Ove Harald; and Andreassen, Bjorn Arild, 3,731,816.

Andrews, Clarence W., Jr. Bench for simulating and developing swimming movements, 3,731,921, Cl. 272-71.000.

Anger, Ernest G.; Richards, Giles J.; Bloodgood, John F.; and Geiger, Roy J., to Square D Company. Positioning control system for a machine that performs work on a moving part, 3,732,474, Cl. 318-257.000.

Anheuser-Busch, Inc.: See—  
Teng, James; Rha, Chokyun; Scallet, Barry L.; and Stubits, Marcella C., 3,732,205.

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Anjac Mfg. Co., Inc.: See—  
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Annett, Leland W.; and Wallin, George J., to Minnesota Mining & Manufacturing Company. Sound-slide projector, 3,732,000, Cl. 353-19.000.

Appenzeller, Valentin; and Leifeld, Ferdinand, to Textilausrüstungs-Gesellschaft Schroers & Co. Apparatus for textile dyeing, 3,731,503, Cl. 68-295.000.

Appleton Machine Company: See—  
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Arikawa, Masayasu; and Iio, Katsuro, to Kobe Steel Ltd. One-side back bead forming butt-welding process using a thermosetting backing composite, 3,731,868, Cl. 228-50.000.

Arkansas Rock and Gravel Co.: See—  
Holland, John H.; and Fox, Gene O., 3,731,825.

Arnold, Herbert; Brock, Norbert; Bourseaux, Friedrich; and Bekel, Heinz, to Asta-Werke Aktiengesellschaft Chemische Fabrik. N, O-propylene phosphoric acid ester diamides, 3,732,340, Cl. 260-936.000.

Arnold, Joe F., to United Aircraft Corporation. Reflecting means for beam control utilizing movable members for adjustment, 3,731,991, Cl. 350-294.000.

Arnold, Loren Glenn: See—  
Sullivan, James Franklin; and Arnold, Loren Glenn, 3,731,748.  
Sullivan, James Franklin; and Arnold, Loren Glenn, 3,731,749.

Arnold, Robert J., to Universal Oil Products Company. Rubber formulations containing thiosulfonate esters, 3,732,192, Cl. 260-79.50b.

Artl, Kenneth M., to Addressograph-Multigraph Corporation. Roll for pressure fusing toner at elevated temperatures, 3,731,358, Cl. 29-132.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: See—  
Umamura, Yukio, 3,731,602.

Ashida, Keiichi: See—  
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Aulthouse, Robert R.: See—  
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Autelca AG: See—  
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Awe, Russell C.; Burton, James C.; and Blank, Thomas G., to Modine Manufacturing Company. Tube and fin heat exchanger, 3,731,732, Cl. 165-181.000.

Axelrod, Sydney, to United States of America, Army. Waterproofing mortar ammunition, 3,731,634, Cl. 102-103.000.

Axmark, Roger E.; and Erickson, Clifford W., to Honeywell Inc. Ultraviolet radiation detector with 360 angular sensitivity, 3,732,452, Cl. 313-98.000.

Baba, Theodore B., to National Distillers and Chemical Corporation. Continuous process for the production of alfin polymers, 3,732,194, Cl. 260-82.100.

Bach, Hartwig C., to Monsanto Company. Polyamide acids of certain tetracarboxylic acid and certain azo containing diamines, 3,732,200, Cl. 260-144.000.

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Bailey, Maurice E.: See—  
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- Boyer, Marcel-Louis, to Compagnie Industrielle des Telecommunications Cit-alcatel. Electromechanical device for tape winding mechanism. 3,732,402, Cl. 235-61.11f.
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- Brackman, Donald Alvin, to Hobart Manufacturing Company, The. Charging apparatus. 3,731,345, Cl. 17-32.000.
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- Bryne, Michael D., to Brymill Corporation. Venting cryosurgical instrument. 3,731,690, Cl. 128-303.100.
- Bubley, Henry J.; and Oltra, Claude H., to American Screen Process Equipment Company. Glider press. 3,731,623, Cl. 101-114.000.
- Buchalter, Gilbert. Cane or crutch tip. 3,731,698, Cl. 135-62.000.
- Buchel, Karl Heinz: See—  
Regel, Erik; Eue, Ludwig; and Buchel, Karl Heinz, 3,732,232.
- Buchel, Karl Heinz; Meiser, Werner; Plempel, Manfred; and Metzger, Carl, to Farbenfabriken Bayer Aktiengesellschaft. Phenyl-imidazolyl-acetic or propionic acid derivatives. 3,732,242, Cl. 260-309.000.
- Buchholz, William. Power module. 3,732,042, Cl. 417-477.000.
- Buchwald, Henry: See—  
Blackshear, Perry J.; Dorman, Frank D.; Blackshear, Perry L., Jr.; Buchwald, Henry; and Varco, Richard L., 3,731,681.
- Buck, Daniel C., to Westinghouse Electric Corporation. Wideband deflection modulated semiconductor amplifier. 3,732,456, Cl. 315-3.000.
- Buck, James R., to Buck Tool Company. Hydraulically actuated tool collet. 3,731,942, Cl. 279-4.000.
- Buck Tool Company: See—  
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- Bueler, Richard C., to Wagner Electric Corporation. Control valve and system. 3,731,981, Cl. 303-22.00f.
- Buell Industries: See—  
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- Buerger, Gert: See—  
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- Bulanda, John Jean: See—  
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- Buller, Joseph S.: See—  
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- Bunker Ramo Corporation: See—  
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- Burcham, Harry Logan, to Valley Tow-Rite, Inc. Adjustable load stabilizing trailer hitch. 3,731,950, Cl. 280-406.00a.
- Burford, John Reginald: See—  
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- Burgdorf, Jochen, to ITT Industries, Inc. Two-circuit wheel cylinder. 3,731,596, Cl. 92-52.000.
- Burgess, Oakley B., 51% to Shook, Alvin L. Hedge trimmer. 3,731,476, Cl. 56-237.000.
- Burke, David C.: See—  
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- Burke, William F.; Greenwood, Robert C.; and Jones, Thomas E., to Pan-Nova, Inc. Coin operated fluid dispenser. 3,731,777, Cl. 194-13.000.
- Burlington Industries, Inc.: See—  
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- Burns, Frederick B.: See—  
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- Burroughs Corporation: See—  
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- Burroughs, Robert K.; and Wakefield, Timothy A., to LeBlond, R. K., Machine Tool Company. Measuring method and apparatus. 3,731,388, Cl. 33-125.00m.
- Burrows, Merwyn L.; and Furby, Neal W., to Chevron Research Company. Poly(alkoxy) siloxane fluid composition containing a phenolic crystallization inhibitor. 3,732,169, Cl. 252-78.000.
- Burrows, Frederick J., to Teledyne Mid-American Corporation. Container and cap combination to indicate tampering. 3,731,849, Cl. 222-153.000.
- Burton, James C.: See—  
Awe, Russell C.; Burton, James C.; and Blank, Thomas G., 3,731,732.
- Burwell, Garwood N., to Rails Company, The. Adjustable fastener assembly for concrete ties. 3,731,875, Cl. 238-346.000.
- Burwen, Richard S. Wide dynamic range noise masking compandor. 3,732,371, Cl. 179-1.00f.
- Busbey, William F.; and Hopkins, Donald L., to Caterpillar Tractor Co. Summing valve arrangement. 3,732,036, Cl. 417-216.000.
- Busch, Robert Edward, to RCA Corporation. Method for dicing materials having a hexagonal crystal structure. 3,731,861, Cl. 225-2.000.
- Bustraen, Daniel J.; Gossie, Mijo A.; Sundstrom, Roy N.; and Wisner, William R., to Corning Glass Works. Article handling apparatus and method. 3,731,862, Cl. 225-4.000.
- Butler, Joseph W., to Lear-Siegler, Inc. Fluid coupling. 3,731,705, Cl. 137-614.060.
- Butler, Thomas J. Cupola structure. 3,731,910, Cl. 266-15.000.
- Buttery, Kenneth T., to Brown Company. Compartmented ice cream carton with interior vertical support and divider, dual opening means and reclosure means. 3,731,870, Cl. 229-27.000.
- Buttery, Kenneth T.; and Haas, Richard G., to Brown Company. Compartment front opening carton with interior vertical divider. 3,731,871, Cl. 229-27.000.
- Bysouth, Peter Thomas; and Clarke, Robert William, to British Drug Houses Limited, The. 3-Cyclohexyl phenyl 2-hydroxypropyl 4 phenyl piperazines. 3,732,229, Cl. 260-268.0ph.
- Cailley, Jean-Pierre, to Societe des Accumulateurs Fixes et de Traction (Societe Anonyme). Electrochemical cells comprising current collector member embedded into the protruding edges of the electrodes. 3,732,124, Cl. 136-13.000.
- Cairrelli, Carmen P., to McGill Manufacturing Company, Inc. Low cost switching arrangement for appliance motor speed control. 3,732,476, Cl. 318-305.000.
- Caldwell, Jack N. Batting practice device. 3,731,925, Cl. 273-26.00e.
- Caleener, Courtland C., to Wilson Certified Foods, Inc. Signal integrating, storing and analyzing circuit. 3,732,411, Cl. 235-183.000.
- California Instruments Co.: See—  
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- Callahan, George G., to Carrier Corporation. Modular multizone, zone logic control center. 3,731,730, Cl. 165-22.000.
- Callum, George William, to Lamson Paragon Limited. Photo-composing machines. 3,732,009, Cl. 355-43.000.
- Calton, Marion A.; and Weiss, Carl D., to Production Technology Inc., mesne. Friction welding sintered materials. 3,731,959, Cl. 287-189.36b.
- Calvin, Noel M. Pulse producing circuit particularly adapted for button type telephone. 3,732,439, Cl. 307-284.000.
- Cameron Iron Works, Inc.: See—  
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- Camp, Dennis W.: See—  
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- Campbell, Donald S., to Ecodyne Corporation. Salt platform seal arrangement. 3,732,165, Cl. 210-190.000.
- Campbell, James A., to Westinghouse Air Brake Company. Brake rigging for railway car trucks. 3,731,766, Cl. 188-52.000.
- Campbell Soup Company: See—  
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- Gageant, Louis M.; and Greet, William E., 3,731,715.
- Campman, James P., to Vidar Laboratories, Inc. Transistor transmitter using variable line length tuner. 3,732,497, Cl. 325-105.000.
- Canadian Patents and Development Limited: See—  
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- Canas-Rodriguez, Antonio; and Leeming, Peter Rodway, to Pfizer Inc. 3-Substituted-1-phenyl indolinones. 3,732,248, Cl. 260-325.000.
- Candy, William R. Header-spoon with flexible trailing bait. 3,731,419, Cl. 43-42.280.
- Cantella, Michael J.; and Stewich, Max W., to United States of America, Army, mesne. Spatial discrimination system for use with pulsed optical energy and television pick-up tubes. 3,731,892, Cl. 244-3.160.
- Carabateas, Philip M., to Sterling Drug Inc. 1,2,3,10,11,11a-Hexahydro-5H-pyrrolo[2,1-c][1,4]benzodiazepine-5,11-diones. 3,732,212, Cl. 260-239.30f.
- Carbonell, Marlene. Bathtub scrubber. 3,731,334, Cl. 15-50.00f.
- Carborundum Company, The: See—  
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- Carlo Erba S.p.A.: See—  
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- Carlson, Alton R.: See—  
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- Carlson, Duane G., to International Business Machines Corporation. Acoustic filter. 3,731,759, Cl. 181-50f.



Carlson, Floyd E. Pump displacement control. 3,732,037, Cl. 417-217,000.

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Carothers, Frank S., Jr., to General Motors Corporation. Fuel control valve. 3,732,039, Cl. 417-300.000.

Carpenter, James H., Jr., and Nalley, Don B., to Carborundum Company. The. Centrifugal blasting apparatus for removing Wustite scale. 3,731,432, Cl. 51-9.000.

Carr, Harry A. Keeper accessory for various types of conventional tools. 3,731,722, Cl. 145-50.0da.

Carr, Norman L.; Roe, Warren A., Jr.; and Stauffer, Harry C., to Gulf Research & Development Company. Thermally efficient nonpolluting system for production of substitute natural gas. 3,732,085, Cl. 48-214.000.

Carrier Corporation: See—  
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Caveney, Jack Edward; Moody, Roy A.; and Bulanda, John Jean, to Panduit Corporation. Cable tie. 3,731,347, Cl. 24-16.0pb.

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Cecil, Richard R.; and Fink, Thomas E., to Esso Research and Engineering Company. Two-stage hydrodesulfurization process with hydrogen addition in the first stage. 3,732,155, Cl. 208-210.000.

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Chatterjee, Pronoy Kumar, to Personal Products Company. Fluid absorption and retention products and methods of making the same. 3,731,686, Cl. 128-285.000.

Chaumont, Robert Jean; and Bargeton, Gilbert Louis, to Societe d'ite: Societe Anonyme de Telecommunications. Process and apparatus for the regeneration of rectangular signals. 3,732,378, Cl. 179-16.0ea.

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Chen, Ho-Sou; Kwei, Ti Kang; and Wang, Tsuey Tang, to Bell Telephone Laboratories, Incorporated. Process for simultaneously shearing and quenching polymer films. 3,732,349, Cl. 264-175.000.

Chen, Nai Yuen, to Mobil Oil Corporation. Selective sorption of less polar molecules with crystalline zeolites of high silica/alumina ratio. 3,732,326, Cl. 260-676.0ms.

Chen, Richard, to Polaroid Corporation. Temperature sensitive pressure-applying members for a photographic processing liquid. 3,732,099, Cl. 96-29.00r.

Chen, Yen-Sun, to Bell Telephone Laboratories, Incorporated. Beam index color television display device. 3,732,359, Cl. 178-5.40h.

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Chrip, Billie R. Automatic chalkboard erasing apparatus. 3,731,335, Cl. 15-97.00r.

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Gramig, Harry A., to Springer Company, Inc. Adapter connector. 3,731,718, Cl. 141-384.000.

Gramza, Eugene P.; and Schreiber, David D., to Eastman Kodak Company. Photoconductive composition and method. 3,732,180, Cl. 260-33.60r.

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Granskog, Roland; and Degerman, Rolf, to Linden-Alimak AB. Mining equipment suspended from roof-mounted rails. 3,731,976, Cl. 299-18.000.

Grant, Perry J., to Klammer, Reuben B.; d/b/a Klammer, Reuben, & Associates. Game bap having a maze. 3,731,933, Cl. 273-113.000.

Grayson, Bobby W., to Sellers and Brace. Non-stretching explosive cord. 3,731,626, Cl. 102-27.00r.

Greene, Oscar; deceased (by Pelz, Robert L.; and Greene, Robert S.; executors). Theft-preventive attachment for locks. 3,731,506, Cl. 70-97.000.

Greene, Robert S.: See—  
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Greene, Woodrow P., to Snow Products, Inc. Artificial ski slope. 3,731,923, Cl. 272-56.500.

Greenwood, Kenneth: See—  
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Greenwood, Robert C.: See—  
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Greet, William E.: See—  
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Gregor, Vaughn. Modular distributor system for bulk material. 3,731,787, Cl. 198-82.000.

Griesser, Otto, to International Standard Electric Corporation. Apparatus for marking insulated electrical conductors. 3,731,655, Cl. 118-624.000.

Griffin, Lucy E. Music teaching aid. 3,731,581, Cl. 84-471.000.

Griffin, Nicholas E. Disposable container. 3,731,869, Cl. 229-22.000.

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Guarasi, Joseph S. Portable hair wash sink attachment. 3,731,325, Cl. 4-159.000.

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Guerga, Michel Henri; and Hallier, Bernard Lucien Desire, to International Standard Electric Corporation. Apparatus for casting of ceramics. 3,732,048, Cl. 425-174.400.

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Gullickson, Cecil F. Sight and sound teaching aid for keyboard instruments. 3,731,582, Cl. 84-478.000.

Gunia, Klaus, to Friedr. Remy Nachfolger GmbH. Apparatus for the continuous manufacture of precast reinforced concrete products, particularly slabs and beams. 3,732,052, Cl. 425-219.000.

Guptill, Frank E., Jr.: See—  
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Gustavson, Karl Axel Goran, to Aktiebolaget Bahco Ventilation. Apparatus for adjusting the concentration of a circulating liquid suspension to a determined, constant value. 3,731,811, Cl. 210-194.000.

Gutman, Arnold D.; and Baker, Don R., to Stauffer Chemical Company. Certain oxime esters and their use as acaricides and in controlling fungi and bacteria. 3,732,306, Cl. 260-566.00e.

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Habermann, Helmut. Magnetic bearing block device for supporting a vertical shaft adapted for rotating at high speed. 3,731,984, Cl. 308-10.000.

Hackley, Kenneth Lewis, to Champion International Corporation. Reinforced page and method of printing on same. 3,732,061, Cl. 432-10.000.

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Haley, David M.; and Bergantzel, Richard P., to Allen Electric and Equipment Company. High speed overhead car wash apparatus. 3,731,331, Cl. 15-21.00d.

Hall, Lewis William, to Maple Press Company. The. Book nipping apparatus. 3,731,617, Cl. 100-215.000.

Hall, Richard L.; and Miller, Carl F., to Westinghouse Electric Corporation. Printed circuit board manual assembly director device. 3,731,363, Cl. 29-203.00b.

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Hallum, Charles E., to Philco-Ford Corporation. Supersonic power amplifiers. 3,731,699, Cl. 137-81.500.

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Hamon, Maurice, to Societe Hamon Sobelco S.A. Drift eliminators for atmospheric cooling tower. 3,731,461, Cl. 55-222.000.

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Hauenstine, Edgar F.; and Puerner, George O., to Mallory, P. R., & Co., Inc. Mounting means and slideable electrical contact for linear potentiometer. 3,732,521, Cl. 338-202.000.

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Haugwitz, Rudiger D.; and Narayanan, Venkatachala L., to Squibb, E. R., & Sons, Inc. Thiazolo(3,4-a) benzimidazole derivatives and process. 3,732,240, Cl. 260-306.700.

Haupt, Walter, to Farbenfabriken Bayer Aktiengesellschaft. Bistable storage element with magnetic data storage. 3,732,550, Cl. 340-174.00b.

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Haury, Vernon E.; and Frankel, Milton B., to North American Rockwell Corporation. Gun propellant containing nitroplasticized nitrocellulose and triaminoguanidine. 3,732,131, Cl. 149-18.000.

Havstad, Harold R., to Hudson Oxygen Therapy Sales Company. Unitary core for molding a nasal cannula. 3,731,900, Cl. 249-177.000.

Hawke, David L.; to N.L. Industries, Inc. Anodized magnesium and magnesium alloys. 3,732,152, Cl. 204-56.00m.

Hawkins, Jerry D.; and Keinanen, Henry J., to Continental Can Company, Inc. Easy opening container. 3,731,835, Cl. 220-53.000.



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Hellerbach, Joseph; and Walser, Armi, to Hoffmann-La Roche Inc. 1-Acyloxyether-1,4-benzodiazepin-2-ones and methods for their preparation. 3,732,211, Cl. 260-239.30d.

Helsley, Grover C.; Lunsford, Carl D.; and Richman, John A., Jr., to Robins, A. H., Company, Incorporated. 3-Di-substituted methylene pyrrolidines wherein the 1- or N-lower-alkyl substituent contains at least two carbon atoms. 3,732,246, Cl. 260-326.800.

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Henrick, Clive A.; and Siddall, John B., to Zeecon Corporation. Triolefinic aliphatic nitriles. 3,732,282, Cl. 260-465.900.

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Hickman, Richard W.; Rocheleau, Antoni A.; and Spitz, David A., to Industrial Nucleonics Corporation. Dryer performance indicator. 3,731,520, Cl. 73-73.000.

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Hirst, Archie, J.; deceased (by Hirst, Renate; legatee), to Dunlop Holdings Limited. Springs. 3,731,913, Cl. 267-63.00r.

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Holmstrom, Sven Nils Hakan; and Olsen, Jan-Erik, to AB Tetra Pak. Apparatus for forming preferably cup-shaped hollow bodies by drawing a material capable of being formed by heat. 3,732,050, Cl. 425-289.000.

Holub, Fred F.; and Hoback, John T., to General Electric Company. Process for making polyimide prepolymer and product produced thereby. 3,732,188, Cl. 260-78.0va.

Homeyer, Bernhard: See—  
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- Langley, Robert; and McKay, Robert Bruce, to Ciba-Geigy AG. Chemical process. 3,732,118, Cl. 106-309.000.
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- Larson, Charles L., to Jeddeloh Bros. Sveded Mills, Inc. Sheet release from vacuum conveyor. 3,731,918, Cl. 271-74.000.
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- Wolf, Arnold M.; and Richter, John G., to Electrospace Corporation. Printing apparatus and controlling circuit therefor. 3,731,780, Cl. 197-49.000.
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## LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM  
DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 8TH DAY  
OF MAY, 1973

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Abramson, Robert F., to International Business Machines Corp. Sinc/cosine transform—a continuous fourier transform. T910,009, 5-8-73, Cl. 444-1.  
Bicron Corp.: See—  
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Suscheck, Harry, and J. M. Menefee, to Bicron Corp. Housing for radiation detector. T910,007, 5-8-73, Cl. 250-71.50.  
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## LIST OF REISSUE PATENTEEES

TO WHOM  
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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Atlantic Richfield Co.: See—  
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Cummins Engine Co., Inc.: See—  
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Enos, Carl E., to Cummins Engine Co., Inc. High traction vehicle. Re. 27,642, 5-8-73, Cl. 115-1.  
Hoeker, Gerald R., to American Gage and Machine Co. Digital readout device with light guides. Re. 27,641, 5-8-73, Cl. 340-378.  
Logan, Campbell F. Inflatable float boom. Re. 27,640, 5-8-73, Cl. 61-1.  
Myers, Joseph D. Process and apparatus for collection of metal containers. Re. 27,643, 5-8-73, Cl. 194-4.  
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Roach, William J. Pipetting system. Re. 27,637, 5-8-73, Cl. 73-426.6.  
Thomas, Owen H., T. A. Beck, and R. F. Wickman, to Atlantic Richfield Co. Moving bed process using sieve catalyst to make xylenes by toluene disproportionation and transalkylation with C<sub>6</sub>-C<sub>10</sub> alkylbenzenes. Re. 27,639, 5-8-73, Cl. 260-672.  
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## LIST OF DESIGN PATENTEEES

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# CLASSIFICATION OF PATENTS

ISSUED MAY 8, 1973

NOTE.—First number, class; second number, subclass; third number, patent number

|          |           |          |           |           |           |           |           |           |           |           |           |           |           |           |           |           |  |
|----------|-----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--|
| CLASS 2  |           |          | 592       | 3,731,373 | CLASS 52  |           |           | 58        | 3,731,438 | CLASS 70  |           |           | 471,003   | 3,731,572 | CLASS 102 |           |  |
| 2.1R     | 3,731,319 | 599      | 3,731,374 | 13        | 3,731,438 | 58        | 3,731,438 | 544       | 3,731,573 | 24R       | 3,731,625 |           |           |           |           |           |  |
| 205      | 3,731,320 | 624      | 3,731,376 | 61        | 3,731,439 | 63        | 3,731,505 | 558       | 3,731,574 | 27R       | 3,731,626 |           |           |           |           |           |  |
| 211      | 3,731,321 | 626      | 3,731,377 | 71        | 3,731,440 | 97        | 3,731,506 | 587       | 3,731,576 | 49.2      | 3,731,627 |           |           |           |           |           |  |
| CLASS 3  |           |          | 629       | 3,731,378 | 204       | 3,731,441 | 358       | 3,731,507 | 599       | 3,731,577 | 49.3      | 3,731,628 |           |           |           |           |  |
| 1        | 3,731,322 | CLASS 30 |           |           | 232       | 3,731,442 | CLASS 71  |           |           | 731       | 3,731,578 | 49.7      | 3,731,629 |           |           |           |  |
| 2        | 3,731,323 | 29.5     | 3,731,379 | 309       | 3,731,443 | CLASS 72  |           |           | 802       | 3,731,579 | 52        | 3,731,630 |           |           |           |           |  |
| CLASS 4  |           |          | 124       | 3,731,381 | 316       | 3,731,444 | 8         | 3,732,089 | CLASS 84  |           |           | 64        | 3,731,631 |           |           |           |  |
| 18       | 3,731,324 | 381      | 3,731,380 | 391       | 3,731,445 | CLASS 73  |           |           | 403       | 3,731,580 | 65        | 3,731,632 |           |           |           |           |  |
| 159      | 3,731,325 | CLASS 32 |           |           | 486       | 3,731,446 | 9         | 3,731,508 | 471       | 3,731,581 | 67        | 3,731,633 |           |           |           |           |  |
| 203      | 3,731,326 | 22       | 3,731,383 | 489       | 3,731,447 | 60        | 3,731,509 | 478       | 3,731,582 | 103       | 3,731,634 |           |           |           |           |           |  |
| CLASS 5  |           |          | 27        | 3,731,384 | 594       | 3,731,448 | 71        | 3,731,510 | CLASS 85  |           |           | 1R        | 3,731,635 |           |           |           |  |
| 345      | 3,731,327 | 631      | 3,731,384 | 631       | 3,731,449 | 92        | 3,731,511 | 13        | 3,731,583 | CLASS 104 |           |           | 172B      | 3,731,636 |           |           |  |
| CLASS 8  |           |          | 648       | 3,731,385 | 648       | 3,731,450 | 203       | 3,731,512 | CLASS 86  |           |           | 199A      | 3,731,637 |           |           |           |  |
| 149.1    | 3,732,072 | CLASS 33 |           |           | 23        | 3,731,451 | 295       | 3,731,513 | 1         | 3,731,584 | CLASS 105 |           |           |           |           |           |  |
| 183      | 3,732,073 | 1PT      | 3,731,386 | 29        | 3,731,452 | 306       | 3,731,514 | 1.5R      | 3,731,585 | CLASS 106 |           |           | 19        | 3,732,115 |           |           |  |
| CLASS 9  |           |          | 76R       | 3,731,387 | 354       | 3,731,516 | 354       | 3,731,515 | CLASS 88  |           |           | 39.7      | 3,732,116 |           |           |           |  |
| 310AA    | 3,731,328 | 125M     | 3,731,388 | 37        | 3,731,453 | 367       | 3,731,517 | CLASS 89  |           |           | 73.2      | 3,732,117 |           |           |           |           |  |
| CLASS 10 |           |          | 189       | 3,731,389 | 402       | 3,731,518 | 468       | 3,731,519 | 1K        | 3,731,588 | 309       | 3,732,118 |           |           |           |           |  |
| 121      | 3,731,329 | CLASS 34 |           |           | 24        | 3,731,456 | CLASS 73  |           |           | 1R        | 3,731,587 | CLASS 108 |           |           |           |           |  |
| 1AD      | 3,731,330 | 5        | 3,731,391 | 24        | 3,731,456 | 1E        | 3,731,521 | 163       | 3,731,590 | 41C       | 3,731,589 | 157       | 3,731,639 |           |           |           |  |
| CLASS 13 |           |          | 10        | 3,731,392 | CLASS 55  |           |           | 19        | 3,731,522 | CLASS 90  |           |           | 18R       | 3,731,640 |           |           |  |
| 9        | 3,732,350 | 33       | 3,731,393 | 33        | 3,731,458 | 45.1      | 3,731,523 | 1.6       | 3,731,591 | CLASS 91  |           |           | 25        | 3,731,641 |           |           |  |
| 13       | 3,732,351 | 64       | 3,731,394 | 64        | 3,731,457 | 49.5      | 3,731,524 | 411A      | 3,731,592 | CLASS 92  |           |           | 221       | 3,731,642 |           |           |  |
| CLASS 15 |           |          | 92        | 3,731,395 | 94        | 3,731,459 | 71.4      | 3,731,525 | 487       | 3,731,593 | CLASS 112 |           |           | 61        | 3,731,644 |           |  |
| 21D      | 3,731,331 | 179      | 3,731,396 | 179       | 3,731,460 | 71.4      | 3,731,526 | 36        | 3,731,594 | CLASS 114 |           |           | 162       | 3,731,645 |           |           |  |
| 21E      | 3,731,332 | 222      | 3,731,397 | 222       | 3,731,461 | 119A      | 3,731,527 | 37        | 3,731,595 | CLASS 115 |           |           | 206A      | 3,731,646 |           |           |  |
| 50R      | 3,731,334 | 228      | 3,731,398 | 228       | 3,731,462 | 147       | 3,731,528 | 120       | 3,731,596 | CLASS 116 |           |           | 1R        | Re.27,642 |           |           |  |
| 97R      | 3,731,335 | 238      | 3,731,399 | 238       | 3,731,463 | 150       | 3,731,529 | 125       | 3,731,598 | CLASS 117 |           |           | 1.7       | 3,732,119 |           |           |  |
| 167R     | 3,731,336 | 270      | 3,731,399 | 270       | 3,731,464 | 153       | 3,731,530 | 58.1      | 3,731,600 | CLASS 118 |           |           | 16        | 3,732,120 |           |           |  |
| 220A     | 3,731,337 | 299      | 3,731,400 | 299       | 3,731,465 | 189       | 3,731,531 | 4.5       | 3,731,610 | CLASS 119 |           |           | 36.8      | 3,732,141 |           |           |  |
| 236R     | 3,731,338 | 386      | 3,731,401 | 386       | 3,731,466 | 194A      | 3,731,532 | 10CE      | 3,731,601 | CLASS 120 |           |           | 65.2      | 3,732,121 |           |           |  |
| 246.5    | 3,731,339 | 459      | 3,731,402 | 459       | 3,731,467 | 231R      | 3,731,533 | 10CT      | 3,731,602 | CLASS 121 |           |           | 122PF     | 3,732,122 |           |           |  |
| 257      | 3,731,340 | CLASS 36 |           |           | 1         | 3,731,468 | 273       | 3,731,534 | 11R       | 3,731,603 | CLASS 122 |           |           | 5         | 3,731,647 |           |  |
| 345      | 3,731,340 | 2.5AH    | 3,731,405 | 10.4      | 3,731,469 | 342       | 3,731,535 | 18P       | 3,731,604 | CLASS 123 |           |           | 6         | 3,731,648 |           |           |  |
| CLASS 16 |           |          | 67D       | 3,731,406 | 10.5      | 3,731,470 | 351       | 3,731,536 | 42        | 3,731,606 | CLASS 124 |           |           | 5         | 3,731,649 |           |  |
| 82       | 3,731,341 | CLASS 37 |           |           | 11.3      | 3,731,472 | 382       | 3,731,537 | 62        | 3,731,607 | CLASS 125 |           |           | 48        | 3,731,650 |           |  |
| 144      | 3,731,342 | 43B      | 3,731,407 | 14.4      | 3,731,473 | 421.5R    | 3,731,538 | 4.5       | 3,731,610 | CLASS 126 |           |           | 49.5      | 3,731,651 |           |           |  |
| 163      | 3,731,343 | 91       | 3,731,408 | 27.5      | 3,731,475 | Re.27,637 | 3,731,539 | 10CE      | 3,731,601 | CLASS 127 |           |           | 63        | 3,731,652 |           |           |  |
| CLASS 17 |           |          | 104       | 3,731,409 | 237       | 3,731,476 | 457       | 3,731,540 | 89R       | 3,731,612 | CLASS 128 |           |           | 429       | 3,731,653 |           |  |
| 11       | 3,731,344 | 327R     | 3,731,477 | 327R      | 3,731,477 | 493       | 3,731,541 | 11R       | 3,731,603 | CLASS 129 |           |           | 504       | 3,731,654 |           |           |  |
| 32       | 3,731,345 | 58.7     | 3,731,478 | 58.7      | 3,731,478 | 504       | 3,731,543 | 18P       | 3,731,604 | CLASS 130 |           |           | 624       | 3,731,655 |           |           |  |
| 49       | 3,731,346 | 131      | 3,731,479 | 131       | 3,731,479 | 516R      | 3,731,542 | 516R      | 3,731,606 | CLASS 131 |           |           | 637       | 3,731,656 |           |           |  |
| CLASS 23 |           |          | 144       | 3,731,411 | CLASS 57  |           |           | 5.22      | 3,731,544 | CLASS 132 |           |           | 5         | 3,731,657 |           |           |  |
| 230B     | 3,732,077 | CLASS 40 |           |           | 23C       | 3,731,474 | 24        | 3,731,545 | 42        | 3,731,608 | CLASS 133 |           |           | 17        | 3,731,657 |           |  |
| 230R     | 3,732,074 | 106.21   | 3,731,412 | 106.21    | 3,731,412 | 34        | 3,731,481 | 62        | 3,731,609 | CLASS 134 |           |           | 61        | 3,731,658 |           |           |  |
| 232R     | 3,732,076 | 152      | 3,731,413 | 152       | 3,731,413 | 116R      | 3,731,480 | 89R       | 3,731,612 | CLASS 135 |           |           | 32EA      | 3,731,659 |           |           |  |
| 253TP    | 3,732,079 | 301      | 3,731,414 | 301       | 3,731,414 | 127B      | 3,731,482 | 62        | 3,731,611 | CLASS 136 |           |           | 41.42     | 3,731,660 |           |           |  |
| 284      | 3,732,075 | 358      | 3,731,415 | 358       | 3,731,415 | CLASS 60  |           |           | 89R       | 3,731,612 | CLASS 137 |           |           | 43C       | 3,731,661 |           |  |
| 288F     | 3,732,080 | CLASS 42 |           |           | 39.05     | 3,731,485 | 242.3     | 3,731,550 | CLASS 96  |           |           | 50B       | 3,731,662 |           |           |           |  |
| 288R     | 3,732,078 | 42R      | 3,731,416 | 42R       | 3,731,416 | 39.16R    | 3,731,483 | 29R       | 3,732,099 | CLASS 97  |           |           | 98        | 3,731,663 |           |           |  |
| 288S     | 3,732,081 | 75B      | 3,731,418 | 75B       | 3,731,418 | 39.23     | 3,731,484 | 35.1      | 3,732,097 | CLASS 98  |           |           | 102       | 3,731,664 |           |           |  |
| 304      | 3,732,082 | 75C      | 3,731,417 | 75C       | 3,731,417 | 39.51R    | 3,731,486 | 38.4      | 3,732,100 | CLASS 99  |           |           | 136       | 3,731,665 |           |           |  |
| CLASS 24 |           |          | 42.28     | 3,731,419 | CLASS 43  |           |           | 45R       | 3,732,098 | CLASS 100 |           |           | 179H      | 3,731,666 |           |           |  |
| 16PB     | 3,731,347 | 51       | 3,732,084 | 51        | 3,732,084 | 54.6E     | 3,731,487 | 76C       | 3,732,102 | CLASS 101 |           |           | 198DB     | 3,731,667 |           |           |  |
| 140      | 3,731,350 | CLASS 44 |           |           | 95        | 3,731,488 | 477       | 3,731,554 | 83        | 3,732,109 | CLASS 102 |           |           | 92R       | 3,731,668 |           |  |
| 205R     | 3,731,349 | CLASS 45 | 3,731,489 | CLASS 46  | 317       | 3,731,490 | 491       | 3,731,555 | 116       | 3,732,111 | CLASS 103 |           |           | 1R        | 3,731,669 |           |  |
| CLASS 28 |           |          | 1R        | 3,731,420 | CLASS 61  |           |           | 573       | 3,731,556 | 140R      | 3,732,112 | CLASS 104 |           |           | 32EA      | 3,731,670 |  |
| 72.2R    | 3,731,352 | 10       | 3,731,421 | 10        | 3,731,421 | CLASS 62  |           |           | 109       | 3,732,103 | CLASS 105 |           |           | 41.42     | 3,731,660 |           |  |
| 76R      | 3,731,351 | 28       | 3,731,422 | 28        | 3,731,422 | CLASS 63  |           |           | 109       | 3,732,104 | CLASS 106 |           |           | 43C       | 3,731,661 |           |  |
| CLASS 29 |           |          | 40        | 3,731,423 | 30        | 3,731,492 | CLASS 64  |           |           | 115P      | 3,732,106 | CLASS 107 |           |           | 50B       | 3,731,662 |  |
| 25.13    | 3,731,353 | 40       | 3,731,423 | 40        | 3,731,423 | CLASS 65  |           |           | 115P      | 3,732,106 | CLASS 108 |           |           | 98        | 3,731,663 |           |  |
| 25.42    | 3,731,354 | 77       | 3,731,424 | 77        | 3,731,424 | CLASS 66  |           |           | 115R      | 3,732,106 | CLASS 109 |           |           | 102       | 3,731,664 |           |  |
| 90       | 3,731,355 | 119      | 3,731,426 | 119       | 3,731,426 | CLASS 67  |           |           | 2E        | 3,732,108 | CLASS 110 |           |           | 136       | 3,731,665 |           |  |
| 96R      | 3,731,356 | 220      | 3,731,425 | 220       | 3,731,425 | CLASS 68  |           |           | 83        | 3,732,109 | CLASS 111 |           |           | 179H      | 3,731,666 |           |  |
| 116AD    | 3,731,357 | 239      | 3,731,427 | 239       | 3,731,427 | CLASS 69  |           |           | 116       | 3,732,111 | CLASS 112 |           |           | 198DB     | 3,731,667 |           |  |
| 132      | 3,731,358 | 243LV    | 3,731,428 | 243LV     | 3,731,428 | CLASS 70  |           |           | 140R      | 3,732,111 | CLASS 113 |           |           | 92R       | 3,731,668 |           |  |
| 148.4B   | 3,731,359 | CLASS 47 |           |           | 47        | 3,731,429 | CLASS 71  |           |           | 150R      | 3,732,112 | CLASS 114 |           |           | 1R        | 3,731,669 |  |
| 156.8B   | 3,731,360 | CLASS 48 |           |           | 214       | 3,732,085 | CLASS 72  |           |           | 174       | 3,732,113 | CLASS 115 |           |           | 32EA      | 3,731,670 |  |
| 197      | 3,732,083 | CLASS 49 |           |           | 419       | 3,731,430 | CLASS 73  |           |           | 192       | 3,732,114 | CLASS 116 |           |           | 41.42     | 3,731,660 |  |
| 200D     | 3,731,361 | CLASS 50 |           |           | 420       | 3,731,431 | CLASS 74  |           |           | 275       | 3,731,613 | CLASS 117 |           |           | 43C       | 3,731,661 |  |
| 200P     | 3,731,362 | CLASS 51 |           |           | 9         | 3,731,432 | CLASS 75  |           |           | 459       | 3,731,615 | CLASS 118 |           |           | 50B       | 3,731,662 |  |
| 203B     | 3,731,363 | CLASS 52 |           |           | 34K       | 3,731,433 | CLASS 76  |           |           | 539       | 3,731,615 | CLASS 119 |           |           | 98        | 3,731,663 |  |
| 240      | 3,731,364 | CLASS 53 |           |           | 95LH      | 3,731,434 | CLASS 77  |           |           | 126       | 3,731,616 | CLASS 120 |           |           | 102       | 3,731,664 |  |
| 241      | 3,731,365 | CLASS 54 |           |           | 129       | 3,731,435 | CLASS 78  |           |           | 215       | 3,731,617 | CLASS 121 |           |           | 136       | 3,731,665 |  |
| 423      | 3,731,366 | CLASS 55 |           |           | 209DL     | 3,731,436 | CLASS 79  |           |           | 229A      | 3,731,618 | CLASS 122 |           |           | 179H      | 3,731,666 |  |
| 447      | 3,731,367 | CLASS 56 |           |           | 361       | 3,731,437 | CLASS 80  |           |           | CLASS 101 |           |           | 198DB     | 3,731,667 |           |           |  |
| 470.1    | 3,731,368 | CLASS 57 |           |           | 28        | 3,732,086 | CLASS 81  |           |           | CLASS 102 |           |           | 92R       | 3,731,668 |           |           |  |
| 509      | 3,731,369 | CLASS 58 |           |           | 33        | 3,732,087 | CLASS 82  |           |           | CLASS 103 |           |           | 1R        | 3,731,669 |           |           |  |
| 570      | 3,731,370 | CLASS 59 |           |           | 261       | 3,732,088 | CLASS 83  |           |           | CLASS 104 |           |           | 32EA      | 3,731,670 |           |           |  |
| 577      | 3,731,371 | CLASS 60 |           |           | 198       | 3,731,502 | CLASS 84  |           |           | CLASS 105 |           |           | 41.42     | 3,731,660 |           |           |  |
| 590      | 3,731,372 | CLASS 61 |           |           | 205R      | 3,731,503 | CLASS 85  |           |           | CLASS 106 |           |           | 43C       | 3,731,661 |           |           |  |



|           |           |           |           |           |        |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|--------|-----------|-----------|-----------|-----------|-----------|
| 284       | 3,731,685 | CLASS 169 | 35        | 3,731,785 | 278    | 3,731,842 | 83R       | 3,732,421 | 326.8     | 3,732,247 |
| 285       | 3,731,686 | 2R        | 40        | 3,731,786 | 83.3R  | 3,732,422 | 327R      | 3,732,250 |           |           |
|           | 3,731,687 | CLASS 172 | 82        | 3,731,787 | 90     | 3,732,426 | 340       | 3,732,252 |           |           |
| 287       | 3,731,688 | 7         | 103       | 3,731,788 | 108R   | 3,732,423 | 340.5     | 3,732,253 |           |           |
| 303.1     | 3,731,689 |           | 160       | 3,731,789 | 67     | 3,731,843 |           | 3,732,254 |           |           |
| 351       | 3,731,690 |           | 219       | 3,731,790 | 86     | 3,731,844 | 203R      | 3,732,424 | 343.2R    | 3,732,251 |
|           | 3,731,691 | 311       | 38R       | 3,732,383 | 94     | 3,731,847 | 213VT     | 3,732,428 | 343.6     | 3,732,255 |
|           | 3,731,692 | 314       | 86R       | 3,732,384 | 129    | 3,731,848 | 213R      | 3,732,429 | 346.3     | 3,732,256 |
| 21B       | 3,731,693 | 401       | 148R      | 3,732,385 | 153    | 3,731,849 | 217S      | 3,732,430 | 346.4     | 3,732,257 |
|           |           | 457       | 153J      | 3,732,386 | 193    | 3,731,850 | 219FR     | 3,732,430 | 348C      | 3,732,258 |
| 118       | 3,731,694 | 26        | 159R      | 3,732,387 | 213    | 3,731,851 |           | 3,732,259 | 396R      | 3,732,259 |
|           |           | CLASS 173 | 167A      | 3,732,389 | 318    | 3,731,852 | 118       | 3,731,903 | 397.4     | 3,732,261 |
| 6         | 3,731,695 | 10        | 168C      | 3,732,388 | 386    | 3,731,853 | 315       | 3,731,904 | 397.45    | 3,732,260 |
|           |           | 68B       | 168G      | 3,732,390 | 386.5  | 3,731,854 | 333       | 3,731,905 | 404.5     | 3,732,262 |
| 19        | 3,732,123 | 78        |           | 3,732,394 | 394    | 3,731,855 |           | 407       | 3,732,263 |           |
| 80        | 3,731,696 | 6         | CLASS 175 | 3,732,143 | 477    | 3,731,856 | 32.7E     | 3,732,167 | 408       | 3,732,264 |
| 138       | 3,731,697 | 45        | CLASS 176 | 3,732,152 | 96     | 3,731,857 | 63.7      | 3,732,168 | 409       | 3,732,265 |
|           |           | 285       | CLASS 177 | 3,732,153 | 2B     | 3,731,858 | 78        | 3,732,169 | 413       | 3,732,267 |
| 62        | 3,731,698 | 192       | CLASS 178 | 3,732,154 | 42.06  | 3,731,859 | 95        | 3,732,170 |           |           |
|           |           | 195R      | CLASS 179 | 3,732,155 | 42.06  | 3,731,860 | 105       | 3,732,171 | 429.7     | 3,732,268 |
| 13        | 3,732,124 | 165       | CLASS 180 | 3,732,156 | 2      | 3,731,861 | 316       | 3,732,172 | 438.5C    | 3,732,270 |
| 162       | 3,732,125 | 5.1       | CLASS 181 | 3,732,157 | 2      | 3,731,862 | CLASS 254 | 3,731,906 | 453R      | 3,732,271 |
|           |           | 5.1AC     | CLASS 182 | 3,732,158 | 4      | 3,731,863 | CLASS 255 | 3,731,907 | 454A      | 3,732,272 |
| 268       | 3,731,701 | 5.4CD     | CLASS 183 | 3,732,159 | 20     | 3,731,864 | CLASS 256 | 3,731,908 | 456R      | 3,732,273 |
| 343       | 3,731,702 | 5.4CF     | CLASS 184 | 3,732,160 | 19     | 3,731,865 | CLASS 257 | 3,731,909 | 463       | 3,732,274 |
| 384.2     | 3,731,703 | 5.4H      | CLASS 185 | 3,732,161 | 6      | 3,731,866 | CLASS 258 | 3,731,910 | 465B      | 3,732,275 |
| 612.1     | 3,731,704 | 5.4R      | CLASS 186 | 3,732,162 | 50     | 3,731,867 | CLASS 259 | 3,731,911 | 465C      | 3,732,280 |
| 614.06    | 3,731,705 | 6.6DD     | CLASS 187 | 3,732,163 | 22     | 3,731,868 | CLASS 260 | 3,731,912 | 465D      | 3,732,278 |
| 624.27    | 3,731,706 | 6.6TP     | CLASS 188 | 3,732,164 | 27     | 3,731,869 | 2A        | 3,732,174 | 465E      | 3,732,277 |
| 625.66    | 3,731,707 | 6.6A      | CLASS 189 | 3,732,165 | 37R    | 3,731,870 | 2P        | 3,732,175 | 465.8A    | 3,732,276 |
| 809       | 3,731,699 | 6.8       | CLASS 190 | 3,732,166 | 41R    | 3,731,871 | 2.5AP     | 3,732,176 | 465.8D    | 3,732,281 |
| 824       | 3,731,708 |           | CLASS 191 | 3,732,167 | 61B    | 3,732,399 | 17.2      | 3,732,177 | 465.9     | 3,732,282 |
| 833       | 3,731,700 |           | CLASS 192 | 3,732,168 | 61.11B | 3,732,400 | 23EM      | 3,732,178 | 466       | 3,732,283 |
|           |           |           | CLASS 193 | 3,732,169 | 61.11E | 3,732,401 | 24        | 3,732,179 | 468R      | 3,732,284 |
| 37        | 3,731,709 |           | CLASS 194 | 3,732,170 | 61.11R | 3,732,402 | 29.2EP    | 3,732,180 | 471C      | 3,732,285 |
| 143       | 3,731,710 |           | CLASS 195 | 3,732,171 | 91R    | 3,731,874 | 33.6R     | 3,732,181 | 476R      | 3,732,287 |
| 178       | 3,731,711 |           | CLASS 196 | 3,732,172 | 92PE   | 3,732,403 | 41B       | 3,732,182 | 486H      | 3,732,288 |
|           |           |           | CLASS 197 | 3,732,173 | 99     | 3,731,875 | 47EN      | 3,732,286 | 487       | 3,732,289 |
| 122R      | 3,731,713 |           | CLASS 198 | 3,732,174 | 75P    | 3,732,183 | 75P       | 3,732,183 | 507R      | 3,732,290 |
| 122W      | 3,731,712 |           | CLASS 199 | 3,732,175 | 75R    | 3,732,182 | 75R       | 3,732,182 | 515A      | 3,732,292 |
| 302       | 3,731,714 |           | CLASS 200 | 3,732,176 | 77.5AM | 3,732,186 | 77.5AM    | 3,732,186 | 516       | 3,732,293 |
|           |           |           | CLASS 201 | 3,732,177 | 77.5BB | 3,732,184 | 77.5BB    | 3,732,184 | 518A      | 3,732,294 |
| 107       | 3,731,715 |           | CLASS 202 | 3,732,178 | 77.5BF | 3,732,187 | 77.5BF    | 3,732,187 | 519       | 3,732,295 |
| 117       | 3,731,716 |           | CLASS 203 | 3,732,179 | 77.5CH | 3,732,185 | 77.5CH    | 3,732,185 | 524R      | 3,732,296 |
| 379       | 3,731,717 |           | CLASS 204 | 3,732,180 | 78UA   | 3,732,188 | 78UA      | 3,732,188 | 544M      | 3,732,297 |
| 384       | 3,731,718 |           | CLASS 205 | 3,732,181 | 78VA   | 3,732,189 | 78VA      | 3,732,189 | 556B      | 3,732,298 |
|           |           |           | CLASS 206 | 3,732,182 | 78.5R  | 3,732,190 | 78.5R     | 3,732,190 | 558A      | 3,732,299 |
| 22        | 3,731,719 |           | CLASS 207 | 3,732,183 | 79     | 3,732,191 | 79        | 3,732,191 | 559H      | 3,732,301 |
| 3D        | 3,731,720 |           | CLASS 208 | 3,732,184 | 79.3MU | 3,732,193 | 79.3MU    | 3,732,193 | 559S      | 3,732,300 |
| 253E      | 3,731,721 |           | CLASS 209 | 3,732,185 | 79.5B  | 3,732,192 | 79.5B     | 3,732,192 | 561A      | 3,732,303 |
|           |           |           | CLASS 210 | 3,732,186 | 82.1   | 3,732,194 | 82.1      | 3,732,194 | 561N      | 3,732,302 |
| 50DA      | 3,731,722 |           | CLASS 211 | 3,732,187 | 93.7   | 3,732,196 | 93.7      | 3,732,196 | 561R      | 3,732,321 |
| 129       | 3,731,723 |           | CLASS 212 | 3,732,188 | 94.3   | 3,732,195 | 94.3      | 3,732,195 | 563R      | 3,732,304 |
|           |           |           | CLASS 213 | 3,732,189 | 94.9C  | 3,732,198 | 94.9C     | 3,732,198 | 564R      | 3,732,305 |
| 11.5R     | 3,732,126 |           | CLASS 214 | 3,732,190 | 112.5  | 3,732,199 | 112.5     | 3,732,199 | 566AE     | 3,732,306 |
| 12.4      | 3,732,127 |           | CLASS 215 | 3,732,191 | 144    | 3,732,200 | 144       | 3,732,200 | 566B      | 3,732,307 |
| 159       | 3,732,128 |           | CLASS 216 | 3,732,192 | 153    | 3,732,201 | 153       | 3,732,201 | 570.7     | 3,732,308 |
|           |           |           | CLASS 217 | 3,732,193 | 210R   | 3,732,202 | 210R      | 3,732,202 | 573R      | 3,732,291 |
| 2         | 3,732,129 |           | CLASS 218 | 3,732,194 | 210S   | 3,732,203 | 210S      | 3,732,203 | 583B      | 3,732,310 |
| 18        | 3,732,130 |           | CLASS 219 | 3,732,195 | 224    | 3,732,205 | 224       | 3,732,205 | 583R      | 3,732,311 |
|           |           |           | CLASS 220 | 3,732,196 | 233.3R | 3,732,208 | 233.3R    | 3,732,208 | 584R      | 3,732,312 |
| 19        | 3,732,132 |           | CLASS 221 | 3,732,197 | 233.5  | 3,732,206 | 233.5     | 3,732,206 | 594       | 3,732,313 |
| 7         | 3,731,724 |           | CLASS 222 | 3,732,198 | 239.3D | 3,732,207 | 239.3D    | 3,732,207 | 599       | 3,732,314 |
| 22        | 3,731,725 |           | CLASS 223 | 3,732,199 | 239.3T | 3,732,212 | 239.3T    | 3,732,212 | 600       | 3,732,315 |
|           |           |           | CLASS 224 | 3,732,200 | 239.5R | 3,732,210 | 239.5R    | 3,732,210 | 606.5P    | 3,732,316 |
| 6         | 3,732,133 |           | CLASS 225 | 3,732,201 | 240CA  | 3,732,213 | 240CA     | 3,732,213 | 607B      | 3,732,317 |
| 58        | 3,732,134 |           | CLASS 226 | 3,732,202 | 240H   | 3,732,221 | 240H      | 3,732,221 | 607R      | 3,732,318 |
| 72        | 3,732,135 |           | CLASS 227 | 3,732,203 | 243R   | 3,732,215 | 243R      | 3,732,215 | 614R      | 3,732,319 |
|           |           |           | CLASS 228 | 3,732,204 | 247.1  | 3,732,222 | 247.1     | 3,732,222 | 637R      | 3,732,320 |
| CLASS 161 | 3,732,136 |           | CLASS 229 | 3,732,205 | 247.5R | 3,732,217 | 247.5R    | 3,732,217 | 654D      | 3,732,322 |
| 2         | 3,732,137 |           | CLASS 230 | 3,732,206 | 248AS  | 3,732,219 | 248AS     | 3,732,219 | 668B      | 3,732,323 |
| 43        | 3,732,138 |           | CLASS 231 | 3,732,207 | 248NS  | 3,732,218 | 248NS     | 3,732,218 | 671G      | 3,732,324 |
| 170       | 3,732,139 |           | CLASS 232 | 3,732,208 | 249.8  | 3,732,220 | 249.8     | 3,732,220 | 672T      | 3,732,325 |
| 175       | 3,732,140 |           | CLASS 233 | 3,732,209 | 251.5  | 3,732,224 | 251.5     | 3,732,224 | 674SA     | 3,732,326 |
|           |           |           | CLASS 234 | 3,732,210 | 256.4F | 3,732,225 | 256.4F    | 3,732,225 | 676MS     | 3,732,327 |
| 374       | 3,732,142 |           | CLASS 235 | 3,732,211 | 256.4N | 3,732,226 | 256.4N    | 3,732,226 | 680B      | 3,732,328 |
| 154       | 3,731,727 |           | CLASS 236 | 3,732,212 | 260    | 3,732,228 | 260       | 3,732,228 | 683.9     | 3,732,329 |
| 281       | 3,731,728 |           | CLASS 237 | 3,732,213 | 268PH  | 3,732,229 | 268PH     | 3,732,229 | 825       | 3,732,330 |
|           |           |           | CLASS 238 | 3,732,214 | 279R   | 3,732,230 | 279R      | 3,732,230 | 830TW     | 3,732,331 |
| 16        | 3,731,729 |           | CLASS 239 | 3,732,215 | 283R   | 3,732,234 | 283R      | 3,732,234 | 837R      | 3,732,332 |
| 22        | 3,731,730 |           | CLASS 240 | 3,732,216 | 285.5  | 3,732,231 | 285.5     | 3,732,231 | 874       | 3,732,333 |
| 46        | 3,731,731 |           | CLASS 241 | 3,732,217 | 288R   | 3,732,232 | 288R      | 3,732,232 | 875       | 3,732,334 |
| 100       | 3,731,734 |           | CLASS 242 | 3,732,218 | 293.55 | 3,732,233 | 293.55    | 3,732,233 | 878B      | 3,732,335 |
| 110       | 3,731,735 |           | CLASS 243 | 3,732,219 | 294.8F | 3,732,234 | 294.8F    | 3,732,234 | 881       | 3,732,336 |
| 161       | 3,731,733 |           | CLASS 244 | 3,732,220 | 295R   | 3,732,235 | 295R      | 3,732,235 | 897A      | 3,732,338 |
| 166       | 3,731,736 |           | CLASS 245 | 3,732,221 | 296B   | 3,732,236 | 296B      | 3,732,236 | 897B      | 3,732,337 |
| 167       | 3,731,737 |           | CLASS 246 | 3,732,222 | 302R   | 3,732,237 | 302R      | 3,732,237 | 898       | 3,732,339 |
| 180       | 3,731,738 |           | CLASS 247 | 3,732,223 | 306.7  | 3,732,240 | 306.7     | 3,732,240 | 936       | 3,732,340 |
| 181       | 3,731,732 |           | CLASS 248 | 3,732,224 | 308B   | 3,732,238 | 308B      | 3,732,238 | 950       | 3,732,341 |
|           |           |           | CLASS 249 | 3,732,225 | 134    | 3,732,348 | 134       | 3,732,348 |           |           |
| 5         | 3,731,739 |           | CLASS 250 | 3,732,226 | 175    | 3,732,349 | 175       | 3,732,349 |           |           |
| 120       | 3,731,740 |           | CLASS 251 | 3,732,227 | 210F   | 3,732,346 | 210F      | 3,732,346 |           |           |
| 272       | 3,731,741 |           | CLASS 252 | 3,732,228 | 231    | 3,732,347 | 231       | 3,732,347 |           |           |
| 304       | 3,732,166 |           | CLASS 253 | 3,732,229 | 329    | 3,732,345 | 329       | 3,732,345 |           |           |
| 315       | 3,731,742 |           | CLASS 254 | 3,732,230 | 15     | 3,731,910 | 15        | 3,731,910 |           |           |
|           |           |           | CLASS 255 | 3,732,231 | 23M    | 3,731,911 | 23M       | 3,731,911 |           |           |
|           |           |           | CLASS 256 | 3,732,232 | 38     | 3,731,912 | 38        | 3,731,912 |           |           |

|           |           |           |           |           |           |           |           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| CLASS 267 | 63R       | 3,731,913 | 34        | 3,731,962 | 222       | 3,732,455 | 65        | 3,732,503 | 324AD     | 3,732,559 | 61        | CLASS 402 |
| 65R       | 3,731,914 | 144       | 3,731,963 | 3         | 3,732,456 | 86        | 3,732,504 | 324R      | 3,732,557 | 61        | 3,732,019 |           |
| CLASS 271 | 36        | 3,731,915 | 258       | 3,731,964 | 15        | 3,732,457 | 94.5      | 3,732,505 | 330       | 3,732,558 | 19        | CLASS 404 |
| 57        | 3,731,916 | 292       | 3,731,965 | 24        | 3,732,458 | 9T        | 3,732,506 | 373       | 3,732,560 | 57        | 3,732,020 |           |
| 74        | 3,731,918 | 20        | 3,731,966 | 39.51     | 3,732,459 | 16R       | 3,732,507 | 378R      | Re.27,641 | 19        | 3,732,021 |           |
| CLASS 272 | 56.5      | 3,731,923 | 1R        | 3,731,967 | 123       | 3,732,460 | 21R       | 3,732,508 | 408       | 3,732,561 | 90        | 3,732,023 |
| 57B       | 3,731,919 | 15        | 3,731,968 | 130       | 3,732,461 | 257       | 3,732,462 | 72        | 3,732,510 | 113       | 3,732,022 |           |
| 57E       | 3,731,920 | 10        | 3,731,968 | 18D       | 3,732,463 | 27R       | 3,732,464 | 95R       | 3,732,511 | 118       | 3,732,024 |           |
| 69        | 3,731,917 | 23R       | 3,731,970 | 134       | 3,732,465 | 140       | 3,732,466 | 59        | 3,732,509 | 6.5LC     | 3,732,563 |           |
| 71        | 3,731,921 | 139       | 3,731,971 | 141S      | 3,732,467 | 141S      | 3,732,467 | 302       | 3,732,512 | 7PF       | 3,732,564 |           |
| 81        | 3,731,922 | 216       | 3,731,972 | 230       | 3,732,470 | 230       | 3,732,471 | 129       | 3,732,513 | 9         | 3,732,565 |           |
| CLASS 273 | 1E        | 3,731,924 | 1H        | 3,731,973 | 234R      | 3,732,471 | 261       | 172       | 3,732,514 | 14        | 3,732,567 |           |
| 26E       | 3,731,925 | 17R       | 3,731,974 | 138       | 3,732,472 | 138       | 3,732,472 | 166       | 3,732,515 | 17.7      | 3,732,568 |           |
| 26R       | 3,731,927 | 8         | 3,731,975 | 227       | 3,732,473 | 227       | 3,732,473 | 194       | 3,732,516 | 100AP     | 3,732,569 |           |
| 95A       | 3,731,928 | 18        | 3,731,976 | 257       | 3,732,474 | 257       | 3,732,474 | 278       | 3,732,517 | 225       | 3,732,570 |           |
| 95R       | 3,731,929 | 31        | 3,731,977 | 275       | 3,732,475 | 275       | 3,732,475 | 394       | 3,732,518 | 786       | 3,732,571 |           |
| 102.1C    | 3,731,932 | 108SC     | 3,731,978 | 303       | 3,732,476 | 303       | 3,732,476 | 34        | 3,732,519 | 792.5     | 3,732,572 |           |
| 113       | 3,731,933 | CLASS 301 | 3,731,978 | 463       | 3,732,477 | 463       | 3,732,477 | 180       | 3,732,520 | CLASS 346 | 3,732,573 |           |
| 131AB     | 3,731,934 | CLASS 303 | 3,731,979 | 616       | 3,732,478 | 616       | 3,732,478 | 202       | 3,732,521 | 74ES      | 3,732,573 |           |
| 136F      | 3,731,935 | 21F       | 3,731,979 | 654       | 3,732,479 | 654       | 3,732,479 | 19        | 3,732,522 | CLASS 350 | 3,731,986 |           |
| 149P      | 3,731,936 | 22R       | 3,731,981 | 696       | 3,732,480 | 696       | 3,732,480 | 22B       | 3,732,523 | 150       | 3,731,986 |           |
| CLASS 274 | 10R       | 3,731,937 | 33        | 3,731,982 | 14        | 3,732,481 | 14        | 44R       | 3,732,524 | 187       | 3,731,987 |           |
| 23R       | 3,731,938 | 106       | 3,732,431 | 18        | 3,732,482 | 18        | Re.27,638 | 49R       | 3,732,525 | 188       | 3,731,988 |           |
| CLASS 277 | 12        | 3,731,940 | 117       | 3,732,432 | CLASS 321 | 2         | 3,732,482 | 101       | 3,732,526 | 216       | 3,731,989 |           |
| 15        | 3,731,941 | 118       | 3,732,433 | 91        | 3,732,483 | 91        | 3,732,483 | 103M      | 3,732,527 | 221       | 3,731,990 |           |
| 34        | 3,731,939 | 149       | 3,732,434 | 19        | 3,732,484 | 19        | 3,732,484 | 113R      | 3,732,528 | 294       | 3,731,991 |           |
| 235R      | 3,731,941 | 229       | 3,732,436 | 43.5S     | 3,732,485 | 43.5S     | 3,732,485 | 192R      | 3,732,529 | 310       | 3,731,992 |           |
| CLASS 279 | 4         | 3,731,942 | 233       | 3,732,437 | CLASS 323 | 54        | 3,732,487 | 198N      | 3,732,530 | 165       | 3,731,993 |           |
| 11.35C    | 3,731,944 | 245       | 3,732,438 | 5R        | 3,732,488 | 5R        | 3,732,488 | 217R      | 3,732,531 | CLASS 352 | 3,731,994 |           |
| 11.35D    | 3,731,943 | 284       | 3,732,439 | 55        | 3,732,489 | 55        | 3,732,489 | 1R        | 3,732,532 | 38        | 3,731,994 |           |
| 11.35T    | 3,731,945 | 289       | 3,732,440 | 57R       | 3,732,490 | 57R       | 3,732,490 | 5R        | 3,732,533 | 87        | 3,731,995 |           |
| 24        | 3,731,946 | 295       | 3,732,441 | 102       | 3,732,492 | 102       | 3,732,492 | 10        | 3,732,534 | 91        | 3,731,996 |           |
| 36R       | 3,731,947 | 304       | 3,732,442 | 103P      | 3,732,493 | 103P      | 3,732,493 | 16R       | 3,732,536 | 140       | 3,731,997 |           |
| 150AB     | 3,731,948 | 308       | 3,732,443 | 166       | 3,732,494 | 166       | 3,732,494 | 52E       | 3,732,538 | CLASS 353 | 3,731,999 |           |
| CLASS 280 | 406A      | 3,731,950 | 10        | 3,731,984 | CLASS 324 | 62        | 3,732,495 | 62        | 3,732,539 | 18        | 3,731,999 |           |
| 461A      | 3,731,951 | 194       | 3,731,985 | 173       | 3,732,496 | 173       | 3,732,496 | 76        | 3,732,540 | 19        | 3,732,000 |           |
| CLASS 285 | 3         | 3,731,952 | 8.1       | 3,732,444 | CLASS 325 | 60        | 3,732,495 | 146.1BA   | 3,732,541 | 101       | 3,732,001 |           |
| 12        | 3,731,953 | 12        | 3,732,445 | 62        | 3,732,496 | 62        | 3,732,496 | 149A      | 3,732,542 | 3         | 3,732,002 |           |
| 111       | 3,731,954 | 76        | 3,732,446 | 105       | 3,732,497 | 105       | 3,732,497 | 172.5     | 3,732,543 | 101       | 3,732,003 |           |
| CLASS 287 | 190       | 3,732,448 | 92        | 3,732,448 | 398       | 3,732,498 | 398       | 3,732,498 | 10        | 3,732,535 | CLASS 355 | 3,732,004 |
| 20.926    | 3,731,956 | 259       | 3,732,449 | 165       | 3,732,499 | 165       | 3,732,499 | 16R       | 3,732,536 | 1         | 3,732,002 |           |
| 87        | 3,731,957 | 70R       | 3,732,450 | 167       | 3,732,500 | 167       | 3,732,500 | 52E       | 3,732,538 | 3         | 3,732,003 |           |
| 189.36B   | 3,731,959 | 91        | 3,732,451 | 1A        | 3,732,501 | 1A        | 3,732,501 | 62        | 3,732,539 | 14        | 3,732,004 |           |
| 189.36F   | 3,731,961 | 98        | 3,732,452 | 149       | 3,732,502 | 149       | 3,732,502 | 76        | 3,732,540 | 17        | 3,732,006 |           |
| 189.36H   | 3,731,958 | 100       | 3,732,453 | CLASS 331 | 3,732,503 | 3,732,503 | 3,732,503 | 149A      | 3,732,542 | 22        | 3,732,008 |           |
| CLASS 289 | 17        | 3,731,960 | 209       | 3,732,454 | CLASS 332 | 173.2     | 3,732,549 | 172.5     | 3,732,543 | 344       | 3,732,060 |           |
| 57B       | 3,731,919 | 15        | 3,731,968 | 18D       | 3,732,463 | 27R       | 3,732,464 | 59        | 3,732,509 | CLASS 408 | 3,732,025 |           |
| 57E       | 3,731,920 | 10        | 3,731,968 | 134       | 3,732,465 | 140       | 3,732,466 | 302       | 3,732,512 | 124       | 3,732,026 |           |
| 69        | 3,731,917 | 23R       | 3,731,970 | 140       | 3,732,466 | 141S      | 3,732,467 | 129       | 3,732,513 | CLASS 415 | 3,732,027 |           |
| 71        | 3,731,921 | 139       | 3,731,971 | 141S      | 3,732,467 | 230       | 3,732,470 | 172       | 3,732,514 | 51        | 3,732,027 |           |
| 81        | 3,731,922 | 216       | 3,731,972 | 230       | 3,732,470 | 234R      | 3,732,471 | 166       | 3,732,515 | 111       | 3,732,029 |           |
| 1E        | 3,731,924 | 1H        | 3,731,973 | 261       | 3,732,469 | 138       | 3,732,472 | 194       | 3,732,516 | 197       | 3,732,028 |           |
| 26E       | 3,731,925 | 17R       | 3,731,974 | 138       | 3,732,472 | 227       | 3,732,473 | 278       | 3,732,517 | 219       | 3,732,030 |           |
| 26R       | 3,731,927 | 8         | 3,731,975 | 227       | 3,732,473 | 257       | 3,732,474 | 394       | 3,732,518 | 97        | 3,732,031 |           |
| 95A       | 3,731,928 | 18        | 3,731,976 | 257       | 3,732,474 | 275       | 3,732,475 | 34        | 3,732,519 | 144       | 3,732,032 |           |
| 95R       | 3,731,929 | 31        | 3,731,977 | 275       | 3,732,475 | 303       | 3,732,476 | 180       | 3,732,520 | 244       | 3,732,033 |           |
| 102.1C    | 3,731,932 | 108SC     | 3,731,978 | 463       | 3,732,477 | 616       | 3,732,478 | 202       | 3,732,521 | CLASS 417 | 3,732,034 |           |
| 113       | 3,731,933 | CLASS 301 | 3,731,978 | 463       | 3,732,477 | 616       | 3,732,478 | 19        | 3,732,522 | 6         | 3,732,034 |           |
| 131AB     | 3,731,934 | CLASS 303 | 3,731,979 | 654       | 3,732,479 | 696       | 3,732,480 | 22B       | 3,732,523 | 143       | 3,732,035 |           |
| 136F      | 3,731,935 | 21F       | 3,731,979 | 696       | 3,732,480 | 14        | 3,732,481 | 44R       | 3,732,524 | 216       | 3,732,036 |           |
| 149P      | 3,731,936 | 22R       | 3,731,981 | 14        | 3,732,481 | 2         | 3,732,482 | 101       | 3,732,525 | 217       | 3,732,037 |           |
| CLASS 274 | 10R       | 3,731,937 | 33        | 3,731,982 | CLASS 321 | 2         | 3,732,482 | 103M      | 3,732,527 | 222       | 3,732,041 |           |
| 23R       | 3,731,938 | 106       | 3,732,431 | 18        | 3,732,482 | 18        | Re.27,638 | 113R      | 3,732,528 | 282       | 3,732,038 |           |
| CLASS 277 | 12        | 3,731,940 | 117       | 3,732,432 | CLASS 322 | 91        | 3,732,483 | 192R      | 3,732,529 | 300       | 3,732,039 |           |
| 15        | 3,731,941 | 118       | 3,732,433 | 91        | 3,732,483 | 19        | 3,732,484 | 198N      | 3,732,530 | 391       | 3,732,040 |           |
| 34        | 3,731,939 | 149       | 3,732,434 | 19        | 3,732,484 | 43.5S     | 3,732,485 | 217R      | 3,732,531 | 477       | 3,732,042 |           |
| 235R      | 3,731,941 | 229       | 3,732,436 | 43.5S     | 3,732,485 | 54        | 3,732,487 | 1R        | 3,732,532 | CLASS 425 | 3,732,043 |           |
| CLASS 279 | 4         | 3,731,942 | 233       | 3,732,437 | CLASS 323 | 54        | 3,732,487 | 5R        | 3,732,534 | 77        | 3,732,044 |           |
| 11.35C    | 3,731,944 | 245       | 3,732,438 | 5R        | 3,732,488 | 55        | 3,732,489 | 10        | 3,732,535 | 111       | 3,732,045 |           |
| 11.35D    | 3,731,943 | 284       | 3,732,439 | 57R       | 3,732,490 | 57R       | 3,732,490 | 16R       | 3,732,536 | 117       | 3,732,046 |           |
| 11.35T    | 3,731,945 | 289       | 3,732,440 | 102       | 3,732,492 | 102       | 3,732,492 | 52E       | 3,732,538 | 140       | 3,732,047 |           |
| 24        | 3,731,946 | 295       | 3,732,441 | 103P      | 3,732,493 | 103P      | 3,732,493 | 62        | 3,732,539 | 144       | 3,732,047 |           |
| 36R       | 3,731,947 | 304       | 3,732,442 | 166       | 3,732,494 | 166       | 3,732,494 | 76        | 3,732,540 | 192       | 3,732,048 |           |
| 150AB     | 3,731,948 | 308       | 3,732,443 | 173       | 3,732,495 | 173       | 3,732,495 | 146.1BA   | 3,732,541 | 192       | 3,732,049 |           |
| CLASS 280 | 406A      | 3,731,950 | 10        | 3,731,984 | CLASS 324 | 62        | 3,732,495 | 149A      | 3,732,542 | 219       | 3,732,052 |           |
| 461A      | 3,731,951 | 194       | 3,731,985 | 173       | 3,732,496 | 173       | 3,732,496 | 172.5     | 3,732,543 | 289       | 3,732,050 |           |
| CLASS 285 | 3         | 3,731,952 | 8.1       | 3,732,444 | CLASS 325 | 60        | 3,732,495 | 10        | 3,732,535 | 19        | 3,732,053 |           |
| 12        | 3,731,953 | 12        | 3,732,445 | 62        | 3,732,496 | 62        | 3,732,496 | 16R       | 3,732,536 | 308       | 3,732,055 |           |
| 111       | 3,731,954 | 76        | 3,732,446 | 105       | 3,732,497 | 105       | 3,732,497 | 52E       | 3,732,538 | 352       | 3,732,056 |           |
| CLASS 287 | 190       | 3,732,448 | 92        | 3,732,448 | 398       | 3,732,498 | 398       | 3,732,498 | 62        | 3,732,004 | 393       | 3,732,054 |
| 20.926    | 3,731,956 | 259       | 3,732,449 | 165       | 3,732,499 | 165       | 3,732,499 | 76        | 3,732,540 | 407       | 3,732,051 |           |
| 87        | 3,731,957 | 70R       | 3,732,450 | 167       | 3,732,500 | 167       | 3,732,500 | 146.1BA   | 3,732,541 | CLASS 431 | 3,732,057 |           |
| 189.36B   | 3,731,959 | 91        | 3,732,451 | 1A        | 3,732,501 | 1A        | 3,732,501 | 149A      | 3,732,542 | 19        | 3,732,057 |           |
| 189.36F   | 3,731,961 | 98        | 3,732,452 | 149       | 3,732,502 | 149       | 3,732,502 | 172.5     | 3,732,543 | 93        | 3,732,058 |           |
| 189.36H   | 3,731,958 | 100       | 3,732,453 | CLASS 331 | 3,732,503 | 3,732,503 | 3,732,503 | 10        | 3,732,535 | 286       | 3,732,059 |           |
| CLASS 289 | 17        | 3,731,960 | 209       | 3,732,454 | CLASS 332 | 173.2     | 3,732,549 | 172.5     | 3,732,543 | 344       | 3,732,060 |           |
| 57B       | 3,731,919 | 15        | 3,731,968 | 18D       | 3,732,463 | 27R       | 3,732,464 | 59        | 3,732,509 | CLASS 432 | 3,732,062 |           |
| 57E       | 3,731,920 | 10        | 3,731,968 | 134       | 3,732,465 | 140       | 3,732,466 | 302       | 3,732,512 | 13        | 3,732,064 |           |
| 69        | 3,731,917 | 23R       | 3,731,970 | 140       | 3,732,466 | 141S      | 3,732,467 | 129       | 3,732,513 | 16        | 3,732,061 |           |
| 71        | 3,731,921 | 139       | 3,731,971 | 141S      | 3,732,467 | 230       | 3,732,470 | 172       | 3,732,514 | 29        | 3,732,063 |           |
| 81        | 3,731,922 | 216       | 3,731,972 | 230       | 3,732,470 | 234R      | 3,732,471 | 166       | 3,732,515 | 45        | 3,732     |           |



# GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

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|               |           |           |           |           |           |
|---------------|-----------|-----------|-----------|-----------|-----------|
| 1 : 3,731,351 | 3,731,683 | 3,732,254 | 3,731,396 | 3,731,906 | 3,731,842 |
| 3,731,531     | 3,731,694 | 3,732,262 | 3,731,467 | 3,731,925 | 3,731,858 |
| 3,731,628     | 3,731,697 | 3,732,264 | 3,731,526 | 3,731,991 | 3,731,863 |
| 3,731,761     | 3,731,699 | 3,732,272 | 3,731,527 | 3,732,033 | 3,731,864 |
| 3,731,964     | 3,731,709 | 3,732,278 | 3,731,567 | 3,732,060 | 3,731,874 |
| 3,731,974     | 3,731,718 | 3,732,282 | 3,731,576 | 3,732,090 | 3,731,895 |
| 3,732,061     | 3,731,722 | 3,732,288 | 3,731,594 | 3,732,179 | 3,731,897 |
| 3,732,062     | 3,731,724 | 3,732,289 | 3,731,648 | 3,732,200 | 3,731,902 |
| 3,732,077     | 3,731,725 | 3,732,290 | 3,731,651 | 3,732,256 | 3,731,920 |
| 3,732,261     | 3,731,766 | 3,732,291 | 3,731,690 | 3,732,495 | 3,731,932 |
| 3,732,568     | 3,731,777 | 3,732,304 | 3,731,708 | 3,732,555 | 3,731,959 |
| 2 : 3,731,551 | 3,731,787 | 3,732,306 | 3,731,714 | 3,732,577 | 3,731,962 |
| 3,731,477     | 3,731,798 | 3,732,313 | 3,731,778 | 3,731,750 | 3,731,995 |
| 3,731,867     | 3,731,813 | 3,732,317 | 3,731,931 | 3,731,901 | 3,732,036 |
| 3,731,936     | 3,731,818 | 3,732,344 | 3,731,961 | 3,731,923 | 3,732,037 |
| 3,732,094     | 3,731,830 | 3,732,354 | 3,731,999 | 3,731,410 | 3,732,045 |
| 3,732,160     | 3,731,840 | 3,732,370 | 3,732,173 | 3,731,658 | 3,732,046 |
| 6 : Re.27,637 | 3,731,850 | 3,732,384 | 3,732,279 | 3,732,422 | 3,732,047 |
| Re.27,642     | 3,731,869 | 3,732,387 | 3,732,297 | 3,732,297 | 3,732,072 |
| 3,731,319     | 3,731,885 | 3,732,389 | 3,732,363 | 3,731,346 | 3,732,081 |
| 3,731,327     | 3,731,890 | 3,732,391 | 3,732,364 | 3,731,347 | 3,732,109 |
| 3,731,331     | 3,731,900 | 3,732,397 | 3,732,404 | 3,731,398 | 3,732,123 |
| 3,731,334     | 3,731,903 | 3,732,399 | 3,732,431 | 3,731,412 | 3,732,133 |
| 3,731,359     | 3,731,905 | 3,732,409 | 3,732,468 | 3,731,416 | 3,732,171 |
| 3,731,379     | 3,731,933 | 3,732,413 | 3,732,476 | 3,731,422 | 3,732,192 |
| 3,731,380     | 3,731,934 | 3,732,421 | 3,732,501 | 3,731,424 | 3,732,193 |
| 3,731,387     | 3,731,950 | 3,732,429 | 3,731,339 | 3,731,428 | 3,732,206 |
| 3,731,390     | 3,731,955 | 3,732,439 | 3,731,631 | 3,731,434 | 3,732,207 |
| 3,731,426     | 3,731,966 | 3,732,441 | 3,732,280 | 3,731,435 | 3,732,257 |
| 3,731,427     | 3,731,978 | 3,732,444 | 3,732,395 | 3,731,470 | 3,732,263 |
| 3,731,431     | 3,731,988 | 3,732,465 | 3,732,423 | 3,731,476 | 3,732,265 |
| 3,731,437     | 3,731,992 | 3,732,469 | 3,732,549 | 3,731,515 | 3,732,267 |
| 3,731,438     | 3,731,998 | 3,732,490 | 3,731,333 | 3,731,523 | 3,732,296 |
| 3,731,448     | 3,732,001 | 3,732,507 | 3,731,425 | 3,731,546 | 3,732,305 |
| 3,731,453     | 3,732,012 | 3,732,527 | 3,731,943 | 3,731,573 | 3,732,314 |
| 3,731,483     | 3,732,021 | 3,732,542 | 3,732,539 | 3,731,623 | 3,732,325 |
| 3,731,522     | 3,732,023 | 3,732,556 | 3,732,567 | 3,731,638 | 3,732,355 |
| 3,731,548     | 3,732,026 | 3,732,572 | Re.27,640 | 3,731,667 | 3,732,356 |
| 3,731,559     | 3,732,065 | 3,731,675 | 3,731,399 | 3,731,684 | 3,732,407 |
| 3,731,563     | 3,732,074 | 3,731,348 | 3,731,466 | 3,731,689 | 3,732,447 |
| 3,731,574     | 3,732,076 | 3,731,404 | 3,731,491 | 3,731,711 | 3,732,462 |
| 3,731,595     | 3,732,079 | 3,731,543 | 3,731,582 | 3,731,720 | 3,732,467 |
| 3,731,615     | 3,732,110 | 3,731,758 | 3,731,583 | 3,731,747 | 3,732,494 |
| 3,731,622     | 3,732,130 | 3,731,764 | 3,731,600 | 3,731,748 | 3,732,498 |
| 3,731,626     | 3,732,131 | 3,731,797 | 3,731,611 | 3,731,749 | 3,732,524 |
| 3,731,632     | 3,732,132 | 3,731,812 | 3,731,620 | 3,731,775 | 3,732,530 |
| 3,731,644     | 3,732,169 | 3,731,935 | 3,731,633 | 3,731,806 | 3,732,532 |
| 3,731,649     | 3,732,230 | 3,732,406 | 3,731,671 | 3,731,808 | 3,731,323 |
| 3,731,661     | 3,732,234 | 3,732,544 | 3,731,687 | 3,731,832 | 3,731,326 |
| 3,731,673     | 3,732,241 | Re.27,638 | 3,731,743 | 3,731,835 | 3,731,328 |
| 3,731,682     | 3,732,244 | 3,731,360 | 3,731,872 | 3,731,838 | 3,731,518 |

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| 3,731,659      | 3,731,591      | 3,731,698      | 3,731,899      | 3,731,904 | 3,732,310      |
| 3,731,773      | 3,731,647      | 3,731,710      | 3,731,914      | 3,731,967 | 3,732,319      |
| 3,731,831      | 3,731,653      | 3,731,715      | 3,731,915      | 3,731,973 | 3,732,337      |
| 3,731,881      | 3,731,660      | 3,731,716      | 3,731,922      | 3,731,986 | 3,732,381      |
| 3,732,031      | 3,731,681      | 3,731,754      | 3,731,924      | 3,732,086 | 3,732,425      |
| 3,732,039      | 3,731,691      | 3,731,790      | 3,731,927      | 3,732,098 | 3,732,427      |
| 3,732,088      | 3,731,728      | 3,731,793      | 3,731,971      | 3,732,115 | 3,732,450      |
| 3,732,125      | 3,731,763      | 3,731,814      | 3,731,985      | 3,732,119 | 3,732,478      |
| 3,732,161      | 3,731,770      | 3,731,851      | 3,731,990      | 3,732,120 | 3,732,515      |
| 3,732,204      | 3,731,779      | 3,731,861      | 3,732,003      | 3,732,136 | 3,732,517      |
| 3,732,219      | 3,731,795      | 3,731,875      | 3,732,005      | 3,732,140 | 3,732,522      |
| 3,732,236      | 3,731,803      | 3,731,930      | 3,732,006      | 3,732,141 | 3,732,523      |
| 3,732,246      | 3,731,805      | 3,731,960      | 3,732,010      | 3,732,151 | 3,732,525      |
| 3,732,383      | 3,731,821      | 3,732,013      | 3,732,014      | 3,732,157 | 3,732,529      |
| 3,732,410      | 3,731,852      | 3,732,044      | 3,732,019      | 3,732,158 | 3,732,561      |
| 3,732,520      | 3,731,870      | 3,732,084      | 3,732,038      | 3,732,172 | 44 : 3,732,535 |
| 3,732,521      | 3,731,871      | 3,732,111      | 3,732,042      | 3,732,174 | 45 : 3,731,371 |
| 3,732,560      | 3,731,871      | 3,732,112      | 3,732,075      | 3,732,191 | 3,731,479      |
| 19 : 3,731,344 | 3,731,888      | 3,732,116      | 3,732,087      | 3,732,195 | 3,731,680      |
| 3,731,473      | 3,731,896      | 3,732,128      | 3,732,108      | 3,732,222 | 3,732,184      |
| 3,731,504      | 3,731,910      | 3,732,139      | 3,732,114      | 3,732,224 | 46 : 3,731,946 |
| 3,731,555      | 3,731,928      | 3,732,152      | 3,732,162      | 3,732,270 | 47 : 3,731,381 |
| 3,731,706      | 3,731,937      | 3,732,176      | 3,732,163      | 3,732,271 |                |
| 3,731,719      | 3,731,942      | 3,732,194      | 3,732,167      | 3,732,281 | 3,731,497      |
| 3,731,745      | 3,731,948      | 3,732,209      | 3,732,180      | 3,732,286 | 3,731,581      |
| 3,731,917      | 3,731,949      | 3,732,214      | 3,732,188      | 3,732,316 | 3,731,762      |
| 3,732,208      | 3,731,952      | 3,732,215      | 3,732,189      | 3,732,336 | 3,732,069      |
| 20 : 3,731,400 | 3,731,954      | 3,732,220      | 3,732,212      | 3,732,347 | 3,732,537      |
| 3,731,668      | 3,731,970      | 3,732,240      | 3,732,217      | 3,732,351 | 48 : 3,731,335 |
| 3,731,822      | 3,731,972      | 3,732,245      | 3,732,239      | 3,732,380 | 3,731,442      |
| 21 : 3,731,451 | 3,731,979      | 3,732,250      | 3,732,283      | 3,732,396 | 3,731,456      |
| 3,731,496      | 3,731,996      | 3,732,268      | 3,732,293      | 3,732,398 | 3,731,459      |
| 3,731,781      | 3,732,017      | 3,732,274      | 3,732,372      | 3,732,401 | 3,731,533      |
| 3,731,921      | 3,732,025      | 3,732,292      | 3,732,374      | 3,732,417 | 3,731,584      |
| 3,732,266      | 3,732,041      | 3,732,298      | 3,732,377      | 3,732,420 | 3,731,597      |
| 22 : 3,731,340 | 3,732,056      | 3,732,299      | 3,732,432      | 3,732,460 | 3,731,599      |
| 3,732,073      | 3,732,071      | 3,732,301      | 3,732,440      | 3,732,518 | 3,731,614      |
| 3,732,155      | 3,732,078      | 3,732,303      | 3,732,446      | 3,732,562 | 3,731,635      |
| 3,732,320      | 3,732,082      | 3,732,311      | 3,732,449      | 3,732,562 | 3,731,739      |
| 24 : 3,731,363 | 3,732,083      | 3,732,312      | 3,732,481      | 3,731,443 | 3,731,740      |
| 3,731,373      | 3,732,187      | 3,732,326      | 3,732,487      | 3,731,752 | 3,731,741      |
| 3,731,377      | 3,732,321      | 3,732,332      | 3,732,509      | 3,731,817 | 3,731,742      |
| 3,731,432      | 3,732,330      | 3,732,349      | 3,732,513      | 3,731,825 | 3,731,753      |
| 3,731,464      | 3,732,342      | 3,732,352      | 3,732,526      | 3,731,887 | 3,731,809      |
| 3,731,676      | 3,732,345      | 3,732,358      | 3,732,533      | 3,731,939 | 3,731,845      |
| 3,731,717      | 3,732,392      | 3,732,359      | 3,732,543      | 3,732,059 | 3,731,857      |
| 3,731,721      | 3,732,436      | 3,732,365      | 3,732,546      | 3,732,067 | 3,731,893      |
| 3,731,876      | 3,732,443      | 3,732,368      | 3,732,547      | 3,732,150 | 3,731,907      |
| 3,732,137      | 3,732,473      | 3,732,379      | 3,732,554      | 3,732,324 | 3,731,940      |
| 3,732,357      | 3,732,489      | 3,732,412      | 3,732,547      | 3,732,327 | 3,732,040      |
| 3,732,428      | 3,732,566      | 3,732,414      | 37 : Re.27,643 | 3,732,366 | 3,732,405      |
| 3,732,456      | 3,731,423      | 3,732,424      | 3,731,324      | 3,732,411 | 3,732,534      |
| 3,732,497      | 3,731,494      | 3,732,484      | 3,731,411      | 3,732,466 | 3,732,553      |
| 3,732,540      | 3,731,751      | 3,732,500      | 3,731,502      | 3,731,382 | 49 : 3,732,390 |
| 3,732,563      | 3,731,756      | 3,732,502      | 3,731,517      | 3,731,640 | 3,732,557      |
| 3,732,564      | 3,731,796      | 3,732,504      | 3,731,524      | 3,731,860 | 50 : 3,731,419 |
| 25 : 3,731,320 | 3,731,975      | 3,732,510      | 3,731,785      | 3,731,884 | 3,731,823      |
| 3,731,444      | 3,732,000      | 3,732,511      | 3,731,859      | 3,731,918 | 3,732,493      |
| 3,731,537      | 3,732,165      | 3,732,573      | 3,732,435      | 3,732,475 | 3,731,354      |
| 3,731,588      | 3,732,452      | 3,732,018      | 3,732,451      | 3,731,329 | 3,731,493      |
| 3,731,618      | 3,732,453      | 3,732,018      | 3,732,559      | 3,731,332 | 3,731,528      |
| 3,731,669      | 3,732,480      | 36 : 3,731,321 | 3,731,468      | 3,731,361 | 3,731,529      |
| 3,731,800      | 3,732,528      | 3,731,325      | 3,731,569      | 3,731,368 | 3,731,570      |
| 3,731,847      | 3,731,827      | 3,731,336      | 3,731,599      | 3,731,449 | 3,731,646      |
| 3,731,892      | 28 : 3,731,341 | 3,731,358      | 3,731,388      | 3,731,519 | 3,731,789      |
| 3,732,002      | 29 : 3,731,405 | 3,731,413      | 3,731,402      | 3,731,530 | 3,731,815      |
| 3,732,033      | 3,731,679      | 3,731,679      | 3,731,436      | 3,731,534 | 3,731,843      |
| 3,732,063      | 3,731,696      | 3,731,696      | 3,731,463      | 3,731,535 | 3,731,846      |
| 3,732,095      | 3,731,696      | 3,731,696      | 3,731,511      | 3,731,571 | 3,732,164      |
| 3,732,099      | 3,731,746      | 3,731,746      | 3,731,520      | 3,731,617 | 3,732,247      |
| 3,732,100      | 3,731,760      | 3,731,760      | 3,731,525      | 3,731,625 | 3,732,329      |
| 3,732,101      | 3,731,841      | 3,731,841      | 3,731,541      | 3,731,654 | 3,732,346      |
| 3,732,103      | 3,731,873      | 3,731,873      | 3,731,536      | 3,731,670 | 3,732,358      |
| 3,732,159      | 3,731,965      | 3,731,965      | 3,731,560      | 3,731,692 | 3,731,454      |
| 3,732,233      | 3,731,981      | 3,731,981      | 3,731,564      | 3,731,771 | 53 : 3,731,652 |
| 3,732,233      | 3,732,022      | 3,731,415      | 3,731,565      | 3,731,783 | 3,731,826      |
| 3,732,369      | 3,732,113      | 3,731,447      | 3,731,568      | 3,731,828 | 55 : 3,731,338 |
| 3,732,371      | 3,732,121      | 3,731,458      | 3,731,575      | 3,731,849 | 3,731,462      |
| 3,732,373      | 3,732,166      | 3,731,495      | 3,731,612      | 3,731,908 | 3,731,469      |
| 3,732,382      | 3,732,205      | 3,731,498      | 3,731,621      | 3,731,953 | 3,731,471      |
| 3,732,416      | 3,732,333      | 3,731,506      | 3,731,650      | 3,731,968 | 3,731,472      |
| 3,732,438      | 3,731,429      | 3,731,634      | 3,731,657      | 3,732,029 | 3,731,514      |
| 3,732,463      | 3,731,590      | 3,731,663      | 3,731,674      | 3,732,030 | 3,731,550      |
| 3,732,470      | 3,731,824      | 3,731,677      | 3,731,700      | 3,732,064 | 3,731,557      |
| 3,732,471      | 3,732,505      | 3,731,678      | 3,731,705      | 3,732,066 | 3,731,672      |
| 3,732,483      | 3,731,376      | 3,731,685      | 3,731,734      | 3,732,070 | 3,731,695      |
| 3,732,486      | 3,731,378      | 3,731,688      | 3,731,735      | 3,732,085 | 3,731,732      |
| 3,732,491      | 3,731,385      | 3,731,729      | 3,731,736      | 3,732,089 | 3,731,755      |
| 3,732,536      | 3,731,420      | 3,731,730      | 3,731,765      | 3,732,092 | 3,731,855      |
| 26 : 3,731,356 | 3,731,505      | 3,731,738      | 3,731,769      | 3,732,097 | 3,731,951      |
| 3,731,369      | 3,731,509      | 3,731,759      | 3,731,774      | 3,732,134 | 3,732,024      |
| 3,731,439      | 3,731,513      | 3,731,767      | 3,731,792      | 3,732,154 | 3,732,127      |
| 3,731,487      | 3,731,521      | 3,731,780      | 3,731,834      | 3,732,175 | 3,732,353      |
| 3,731,490      | 3,731,544      | 3,731,782      | 3,731,836      | 3,732,177 | 3,732,433      |
| 3,731,512      | 3,731,545      | 3,731,801      | 3,731,839      | 3,732,199 | 3,732,474      |
| 3,731,542      | 3,731,585      | 3,731,802      | 3,731,854      | 3,732,216 | 3,732,516      |
| 3,731,562      | 3,731,587      | 3,731,819      | 3,731,880      | 3,732,226 | 3,732,538      |
| 3,731,572      | 3,731,616      | 3,731,862      | 3,731,889      | 3,732,227 | 3,731,943      |
|                | 3,731,629      | 3,731,866      | 3,731,894      | 3,732,258 |                |



## DESIGN PATENTS

|             |              |              |              |              |              |
|-------------|--------------|--------------|--------------|--------------|--------------|
| 6 : 226,847 | 8 : 226,879  | 25 : 226,874 | 226,832      | 226,852      | 226,865      |
| 226,848     | 226,875      | 226,840      | 226,834      | 226,853      | 226,878      |
| 226,855     | 12 : 226,869 | 226,841      | 226,838      | 226,854      | 226,839      |
| 226,856     | 16 : 226,833 | 226,863      | 226,845      | 40 : 226,850 | 226,842      |
| 226,858     | 17 : 226,837 | 226,857      | 226,859      | 42 : 226,835 | 53 : 226,870 |
| 226,868     | 226,872      | 34 : 226,844 | 226,880      | 226,849      | 55 : 226,836 |
| 226,873     | 226,877      | 226,871      | 226,881      | 226,864      | 226,867      |
| 226,876     | 18 : 226,843 | 36 : 226,831 | 39 : 226,851 |              |              |

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| 6 : 03,328 | 03,329 | 03,330 | 39 : 03,327 |  |  |
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## DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

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| 8 : T910,009 | 34 : T910,006 | 39 : T910,007 | T910,010 | 40 : T910,008 |  |
|--------------|---------------|---------------|----------|---------------|--|



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# PATENT OFFICE NOTICES

## Certificates of Correction for the Week of May 15, 1973

|            |           |           |           |
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| Re. 27,395 | 3,657,321 | 3,686,507 | 3,698,715 |
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| D. 225,323 | 3,659,285 | 3,687,326 | 3,699,331 |
| 3,452,409  | 3,660,544 | 3,687,397 | 3,699,487 |
| 3,476,720  | 3,661,187 | 3,687,491 | 3,700,737 |
| 3,553,394  | 3,661,743 | 3,688,070 | 3,700,904 |
| 3,562,174  | 3,662,539 | 3,688,140 | 3,700,992 |
| 3,563,773  | 3,662,993 | 3,688,386 | 3,701,249 |
| 3,572,892  | 3,665,099 | 3,688,652 | 3,701,536 |
| 3,577,447  | 3,666,152 | 3,688,683 | 3,701,988 |
| 3,581,259  | 3,669,936 | 3,688,810 | 3,702,407 |
| 3,590,228  | 3,671,289 | 3,688,830 | 3,702,587 |
| 3,593,484  | 3,671,646 | 3,688,974 | 3,702,737 |
| 3,606,374  | 3,672,155 | 3,689,573 | 3,702,830 |
| 3,606,396  | 3,673,061 | 3,689,717 | 3,703,082 |
| 3,607,382  | 3,673,224 | 3,689,813 | 3,703,187 |
| 3,615,545  | 3,673,302 | 3,690,362 | 3,703,193 |
| 3,615,578  | 3,675,247 | 3,691,004 | 3,703,223 |
| 3,615,626  | 3,676,115 | 3,691,195 | 3,703,435 |
| 3,615,915  | 3,676,279 | 3,691,518 | 3,703,440 |
| 3,618,878  | 3,676,499 | 3,691,875 | 3,703,932 |
| 3,623,938  | 3,676,552 | 3,692,579 | 3,704,207 |
| 3,624,159  | 3,677,521 | 3,692,615 | 3,704,311 |
| 3,625,314  | 3,678,569 | 3,692,948 | 3,704,364 |
| 3,625,339  | 3,679,430 | 3,692,720 | 3,704,577 |
| 3,626,041  | 3,680,336 | 3,692,929 | 3,704,595 |
| 3,626,929  | 3,680,580 | 3,693,270 | 3,704,761 |
| 3,627,666  | 3,681,465 | 3,694,132 | 3,704,802 |
| 3,627,719  | 3,681,490 | 3,694,240 | 3,705,477 |
| 3,632,208  | 3,681,500 | 3,694,675 | 3,705,555 |
| 3,632,212  | 3,681,609 | 3,694,915 | 3,705,919 |
| 3,634,865  | 3,681,801 | 3,694,928 | 3,705,951 |
| 3,635,657  | 3,683,185 | 3,695,087 | 3,705,969 |
| 3,635,780  | 3,684,197 | 3,695,941 | 3,706,013 |
| 3,637,631  | 3,684,783 | 3,695,968 | 3,706,626 |
| 3,637,700  | 3,684,794 | 3,697,574 | 3,706,846 |
| 3,640,118  | 3,685,045 | 3,697,801 | 3,706,913 |
| 3,641,234  | 3,685,248 | 3,697,958 | 3,706,979 |
| 3,644,513  | 3,685,345 | 3,698,037 | 3,706,997 |
| 3,649,399  | 3,685,413 | 3,698,055 | 3,707,069 |
| 3,652,692  | 3,685,518 | 3,698,067 | 3,707,229 |
| 3,654,990  | 3,685,766 | 3,698,257 | 3,707,358 |
| 3,655,722  | 3,685,770 | 3,698,350 | 3,707,470 |
| 3,655,799  | 3,685,879 | 3,698,481 | 3,707,512 |
| 3,657,213  | 3,686,264 | 3,698,638 | 3,707,592 |
| 3,657,219  | 3,686,497 | 3,698,700 |           |

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DOUGLAS J. CAMPION,  
Patent Program Coordinator,  
National Technical Information Service.

### U.S. DEPARTMENT OF TRANSPORTATION

Patent Counsel, 400 7th Street SW.,  
Washington, D.C. 20590

Patent application 230,702. Noncontracting Angular Position Detector. Filed Mar. 1, 1972. PC \$3/MF \$0.95.

Patent application 241,840. Anti-Reflective Glass. Filed Apr. 6, 1972. PC \$3/MF \$0.95.

Patent application 184,828. A Railroad Crossing Signalling System. Filed Sept. 29, 1972. PC \$3/MF \$0.95.

Patent application 229,084. Focusing Protective Enclosure for Ultrasonic Transducer. Filed Feb. 24, 1972. PC \$3/MF \$0.95.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
Assistant General Counsel for Patent Matters, NASA—  
Code GP-2, Washington, D.C. 20546

Patent application 326,364. Automatic Inoculating Apparatus. Filed Jan. 24, 1973. PC \$3/MF \$0.95.

Patent application 324,029. Technique for Recovery of Voice Data From Heat Damaged Magnetic Tape. Filed Jan. 16, 1973. PC \$3/MF \$0.95.

Patent application 315,070. Binary Concatenated Coding System. Filed Dec. 14, 1972. PC \$3.25/MF \$0.95.

Patent application 315,048. An Apparatus for Establishing Flow of Fluid Mass Having a Known Velocity. Filed Dec. 14, 1972. PC \$3.25/MF \$0.95.

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Patent application 370,419. Self-Cycling Fluid Heater. Filed Nov. 6, 1970. Patented Jan. 2, 1973. Not available NTIS.

[FR Doc. 73-7349; Filed 4-17-73; 8:45 am]

## PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

## CONDITION OF PATENT APPLICATIONS AS OF MAY 1, 1973

### PATENT EXAMINING GROUPS

Actual  
Filing Date  
of Oldest  
New Case  
Awaiting  
Action

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GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director..... 1-27-72  
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.

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HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director..... 12-15-71  
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.

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Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.

MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director..... 3-29-72  
Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.

Expiration of patents: The patents within the range of numbers indicated below expire during May 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,743,442 to 2,748,387, inclusive  
Plant Patents..... Numbers 1,472 to 1,480, inclusive



## PLANT PATENTS

GRANTED MAY 15, 1973

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

**3,331**  
**MINIATURE ROSE PLANT**  
Ralph S. Moore, 2519 E. Noble Ave.,  
Visalia, Calif. 93277  
Filed May 3, 1971, Ser. No. 139,794  
Int. Cl. A01h 5/00

**U.S. Cl. Pkt.—7**  
**1 Claim**  
1. A new and distinct variety (cultivar) of a miniature rose plant of hardy, dwarf, rounded, much branched, bush type, as illustrated and described, characterized by bush and flowers resembling the Yellow Necklace miniature rose (not patented) in general size and form, the color generally being deeper yellow with orange shadings, the general color effect of the bud and freshly opened flower being soft orange to gold yellow; and further characterized by a plant which is vigorous and compact in growth, easy to propagate from cuttings, with abundant medium small foliage of a light to medium green color and an abundance of bloom borne almost continuously throughout the growing season with flowers borne singly or several to the stem.

**3,332**  
**MAHONIA SHRUB**  
Lee W. Lenz, Claremont, Calif., assignor to Rancho Santa Ana Botanic Garden  
Filed June 4, 1971, Ser. No. 149,894  
Int. Cl. A01h 5/00

**U.S. Cl. Pkt.—54**  
**1 Claim**  
1. A new and distinct hybrid of the shrub genus Mahonia, substantially as shown and described, characterized by a combination of features not found combined in previously known members of the genus, these features being the shape and profusion of the flowers, physical characteristics of the branches, the shape and peculiar color of the fruit, and the combination of large size and dark green leaves.

**3,333**  
**CHRYSANTHEMUM PLANT**  
Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio  
Filed Aug. 11, 1971, Ser. No. 170,934  
Int. Cl. A01h 5/00

**U.S. Cl. Pkt.—80**  
**1 Claim**  
1. A new and distinct cultivar of chrysanthemum characterized as to uniqueness by its bright lavender pink flower color that is bright and lively even under incandescent lights, but during fading, still holds a uniform color during high temperature periods; unique large cactus-like decorative flowers three to four inches in diameter; plants that average 5 breaks per pinched plant; a spreading habit equal to or greater than the growth type of the Mandalay family; a unique deeply indented foliage, and by its early fast response, making it one of the most efficient varieties to grow from the standpoint of total crop time.

**3,334**  
**CHRYSANTHEMUM PLANT**  
Percy S. Helveston, Fort Myers, Fla., and Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Percy S. Helveston, Fort Myers, Fla.  
Filed Aug. 20, 1971, Ser. No. 173,704  
Int. Cl. A01h 5/00

**U.S. Cl. Pkt.—78**  
**1 Claim**  
1. A new and distinct cultivar of chrysanthemum characterized particular as to its uniqueness when compared to the parent cultivar Show-Off by its flowers which are yellow in color and slightly larger, and which do not mature as rapidly and hold their form longer when flowered in low light periods.

**3,335**  
**AZALEA PLANT**  
Thomas G. Harcharik, Salinas, Calif., and Walter W. Kincely, Barberton, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio  
Filed Aug. 25, 1971, Ser. No. 175,013  
Int. Cl. A01h 5/00

**U.S. Cl. Pkt.—57**  
**1 Claim**  
1. A new and distinct variety of azalea characterized particularly as to uniqueness when compared to its parent cultivar Whistler by its attractive medium pink color.

**3,336**  
**GRAPEVINE**  
John M. Garabedian, 3158 Hamilton St., Fresno, Calif. 93712  
Filed Aug. 26, 1971, Ser. No. 175,412  
Int. Cl. A01h 5/03

**U.S. Cl. Pkt.—47**  
**1 Claim**  
1. A grapevine of medium vigor, upright, open, hardy, and productive, with a medium size trunk, straight medium length canes, glabrous cordate leaves of medium size and medium green color, and bearing very early ripening grapes of very good quality; the grapes—in harvest maturity approximately three weeks before the Cardinal (unpatented)—being borne in long, tapering clusters of medium size and medium width, and the berries being dark red, strongly adherent, uniform, medium to large size, round to slightly elongated in form, with medium firm, tender, juicy, sprightly, vinous flesh.

**3,337**  
**CHRYSANTHEMUM PLANT**  
Douglas K. Dillon, Bloomsburg, Pa., and Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Douglas K. Dillon, Bloomsburg, Pa.  
Filed Sept. 14, 1971, Ser. No. 180,530  
Int. Cl. A01h 5/00

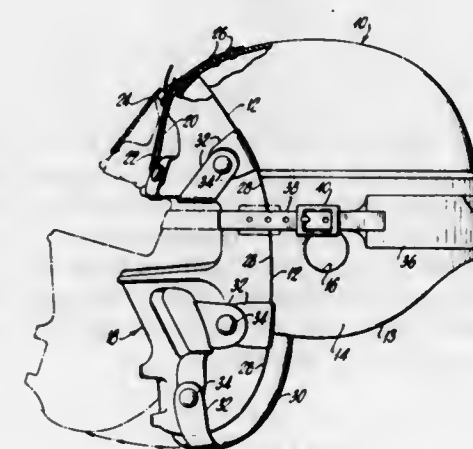
**U.S. Cl. Pkt.—79**  
**1 Claim**  
1. A new and distinct cultivar of chrysanthemum characterized particularly as to its uniqueness when compared to the parent cultivar Show-Off by its red-bronze flower color.

## PATENTS

GRANTED MAY 15, 1973

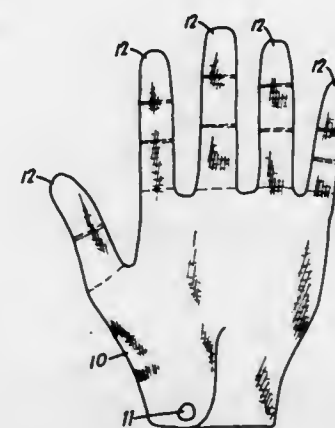
### GENERAL AND MECHANICAL

**3,732,574**  
**PROTECTIVE HEAD GEAR**  
Creighton J. Hale, Williamsport, Pa., assignor to Little League Baseball Inc., Williamsport, Pa.  
Filed Apr. 21, 1971, Ser. No. 136,137  
Int. Cl. A42b 1/08  
**U.S. Cl. 2—9**



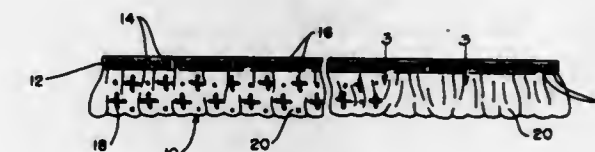
Protective head gear comprising a helmet having a face mask hingedly connected thereto at a central upper location, with the forward edge of the helmet being retained in substantial registration with the rear edge of said face mask portion by elastic connecting means.

**3,732,575**  
**SAFETY GLOVE**  
Steve Pakulak, Eugene, Oreg., assignor to Raymond Lee Organization, Inc., New York, N.Y.  
Filed Dec. 30, 1971, Ser. No. 213,977  
Int. Cl. A41d 19/00  
**U.S. Cl. 2—161 R**



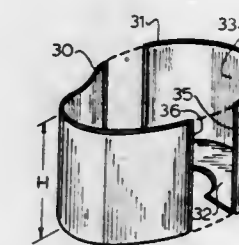
A safety glove, in which is embedded steel caps and steel cylinders located at the finger tips, and between the finger joints, respectively so as to protect the fingers of the wearer. The inner liner of the glove may be made of a cloth material and the outer covering of the glove may be leather, or for waterproof purposes, plastic or rubber.

**3,732,576**  
**ELASTIC FABRIC MATERIAL FOR HOME USE AND METHOD OF EMPLOYING SAME IN THE RECONSTRUCTION AND CONSTRUCTION OF GARMENTS**  
Mary L. Guthrie, 522 S. Ninth Street, Reading Pa.  
Filed June 17, 1971, Ser. No. 154,077  
Int. Cl. A41d 1/14  
**U.S. Cl. 2—221**



A fabric material for use as an elastic waistband for garments and primarily for the home repair of garments. The material consists of factory-prepared lengths of narrow fabrics having stretchable elastic bands, of less width than the fabric, secured adjacent a margin of the fabric by lines of stitches of a character to preserve the stretch characteristics of the band. In the method of employing the material, as in the repairing of a garment having a defective waistband, the original waistband is severed from the remainder of the garment and a free margin of the length of material is sewn to the margin of the remainder of the garment defined by the severed edge. This requires only the stitching of cloth to cloth thus avoiding the sewing of an elastic band to cloth, an operation which the usual home sewing machine is not equipped to perform. The fabric material may also be employed in the home construction of new garments and may be supplied with, or without, other materials in the form of a kit.

**3,732,577**  
**WATER SAVING CUP DEVICE FOR TOILET TANKS**  
Jacob R. Moon, Hillsborough, N.C., assignor to Moon Water Saver, Inc., Hillsborough, N.C.  
Filed Apr. 19, 1972, Ser. No. 245,532  
Int. Cl. E03d 7/20, 1/22, 1/30  
**U.S. Cl. 4—18**



A thin, flexible-walled, cup-like vessel surrounds a flush valve in a conventional closet water tank forming an open ended water column extending upward around the valve assembly thereby preventing water stored in the base of the tank outside the column from being discharged during flushing.



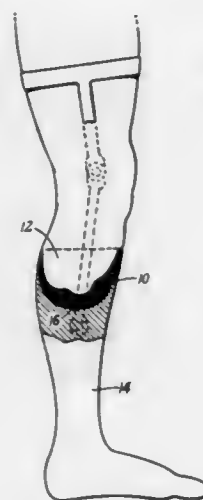
3,732,578

**DIAGNOSTIC AND INTERFACIAL PAD FOR USE WITH THE SOCKET OF A PROSTHETIC DEVICE**

Herman G. Pollack, 44 Stoneham Drive, West Hartford, Conn.  
 Filed Mar. 1, 1971, Ser. No. 119,751  
 Int. Cl. A61f 1/02; A61b 5/10

U.S. Cl. 3-19

8 Claims U.S. Cl. 4-159



An interfacial pad adapted to be inserted between a prosthetic device and a body member is provided comprising a relatively low density, substantially non-resilient, deformable foam pad exhibiting a cushioning characteristic and a memory characteristic responsive to locally applied forces.

**ERRATUM**

For Class 4-18 see:  
 Patent No. 3,732,577

3,732,579

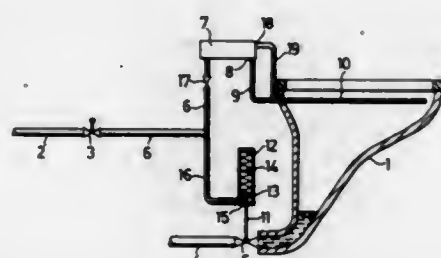
**VACUUM WATER-CLOSET**

Claes G. Gustaf Allander, and Lars E. Bengtsson, both of Stockholm, Sweden, assignors to AB Gustabsbergs Fabriker, Gustabsberg, Sweden

Filed June 22, 1971, Ser. No. 155,557  
 Int. Cl. E03d 1/36

U.S. Cl. 4-41

3 Claims



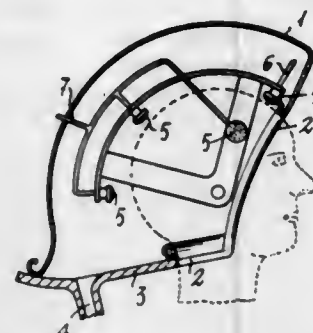
A vacuum water-closet, wherein a buffer receptacle is connected to a flush-water feed pipe between an inlet valve and a flushing nozzle, said buffer receptacle delivering a predetermined quantity of water to the water-closet after each closing of said inlet valve.

3,732,580

**HAIR WASHING MACHINE**

Ernesto Fava, Via Arce 40, Salerno, Italy  
 Filed June 18, 1971, Ser. No. 154,465  
 Claims priority, application Italy, July 1, 1970, 26824 A/70  
 Int. Cl. A61h 33/00

7 Claims



Automatic hair washing device comprising a helmet having a plurality of showers, an electric circuit for water heating with power dissipation depending on the water temperature, and an electric circuit for selectively supplying water only to some showers at a time and alternating pure water with water containing hair treatment solutions. Hair washing is carried out with said hair continuously moved by alternate water jets, so that the cleaning thereof is perfect.

3,732,581

**POOL COVER**

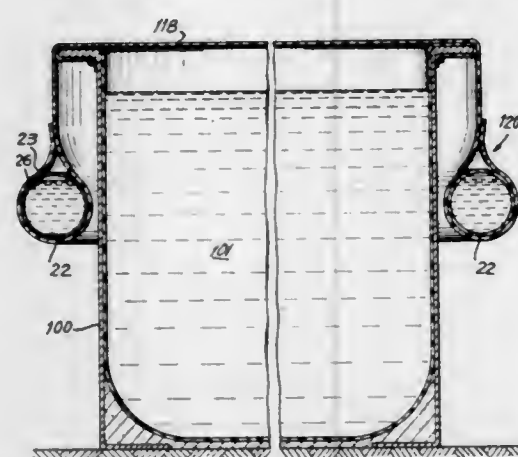
Joseph J. Pitti, Wantagh, and George A. Tassone, Brooklyn, both of N.Y., assignors to Atreo Manufacturing Co., Inc., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 57,279, July 22, 1970, Pat. No. 3,667,070. This application Aug. 9, 1971, Ser. No. 169,973

Int. Cl. E04h 3/16, 3/18

U.S. Cl. 4-172.12

9 Claims



A pool cover for keeping soot and other particles out of a pool and for preventing unwanted usage of the pool. The pool cover is made of a flexible, durable material and has a central cover portion adapted to rest on the surface of the pool. A border region is secured to the outer edge of the central cover portion and retains a plurality of separate and independent liquid containers capable of being filled with a suitable liquid, such as water. The border region of the pool cover rests on, or is draped over, the peripheral edge of the pool and is too heavy to be removed by a child of tender years. If one of the liquid containers inadvertently ruptures, the others will not be affected and the pool cover will be maintained in place.

3,732,582

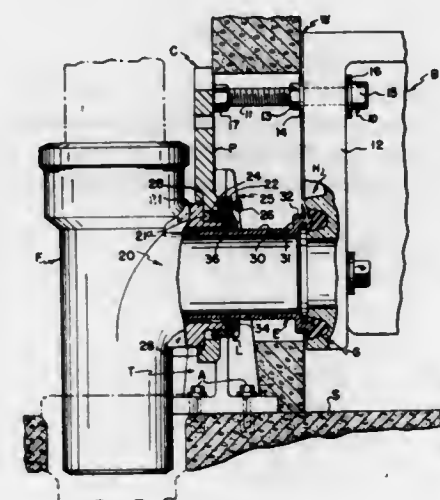
**CLOSE CLOSET FITTING AND CLOSET CARRIER WITH BOWL CONNECTION**

Roger L. Mielbeck, La Porte, and Nicholas G. Scheuer, Michigan City, both of Ind., assignors to Josam Manufacturing Co., Michigan City, Ind.

Filed Jan. 6, 1971, Ser. No. 104,323  
 Int. Cl. E03d 11/00

U.S. Cl. 4-252 R

5 Claims



In a close type soil line closet fitting and closet bowl carrier combination for a wall hung bowl, the fitting has a bowl connection branch having external front lug formations engaging the carrier back, and having an externally threaded reduced end projecting through a carrier aperture to receive, axially adjustably telescoped in the branch, a male threaded bowl-coupling extension threaded through a female-threaded reduced portion of a collar as a compression nut with a counterbore threaded onto the branch end and advanceable into the carrier aperture; whereby a gasket in the counterbore bottom circumferentially seals the branch end with the extension. The collar, to serve as a fitting-clamping lock nut, has three equally angularly spaced radial lugs through which set screws are threaded against the carrier. The extension passage inside diameter contracts at its outer end to provide a reinforcing thickened wall section and a broader gasket sealing end face.

3,732,583

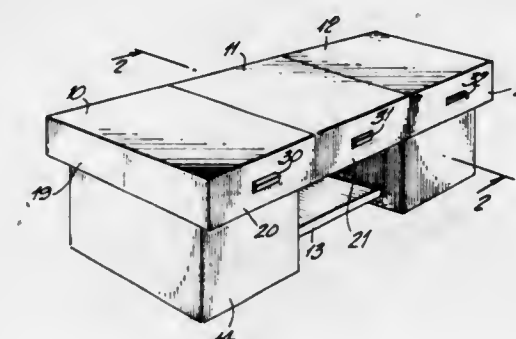
**CONVERTIBLE TABLE BED**

Emelba E. Jones, 1633 47th St., Los Angeles, Calif.

Filed Aug. 23, 1971, Ser. No. 174,072  
 Int. Cl. A47c 13/35, 4/02

U.S. Cl. 5-3

4 Claims



This invention is the combination of a table and a bed, with removable table tops which are stored in a recess in the base structure, said table tops completely enclosing the bed area.

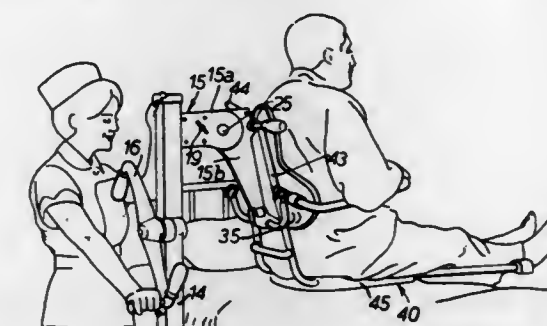
3,732,584

**APPARATUS FOR HANDLING DISABLED PERSONS**

David Richard James, Hasfield, Gloucester, England, assignor to Mecanoids Limited, Gloucester, England  
 Filed June 21, 1971, Ser. No. 155,037  
 Int. Cl. A61g 1/02, 7/10

U.S. Cl. 5-81

14 Claims



The invention relates to apparatus for handling hospital patients or other persons who are disabled or infirm.

The apparatus comprises a lifting arm having a free end portion movable with respect to the remainder of the arm to either of two operative positions. In one operative position the arm is adapted for the attachment of patient support means employing a sling arrangement, and in the other operative position the arm is adapted for the attachment of a rigid patient support member.

When a rigid support member is used it is desirably in the form of a legless chair. The apparatus is preferably of mobile form, comprising a wheeled chassis with an upstanding column from which the arm projects.

3,732,585

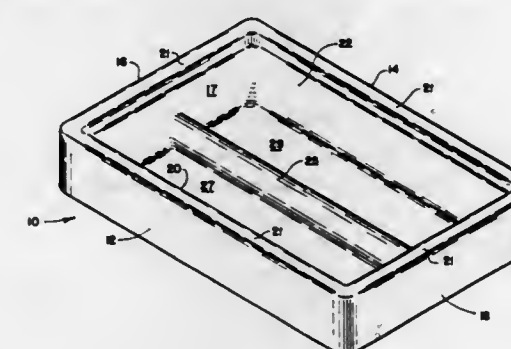
**FLUID-FILLED BED**

Vivian D. Krehbiel, P. O. Box 2099, Wichita, Kans.

Filed June 21, 1971, Ser. No. 154,963  
 Int. Cl. A47c 27/08

U.S. Cl. 5-348 WB

10 Claims



A bed with a supporting frame having two adjacent compartments for supporting and containing to separate fluid-filled bags positioned in side-by-side abutting relation. The bags are partially separated by a rib extending upward from the bottom of the supporting frame.

3,732,586

**MATTRESS CONSTRUCTION**

Louis Elliott Frey, 1271 East Sixth Street, Los Angeles, Calif.

Filed Aug. 6, 1971, Ser. No. 169,652  
 Int. Cl. A47c 23/00

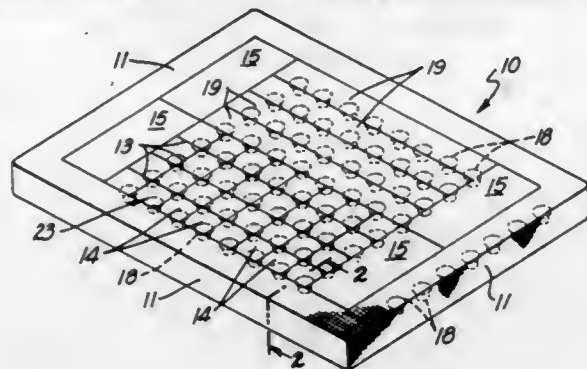
U.S. Cl. 5-345

9 Claims

A mattress formed of soft, low density resilient foam material which conforms to the body weight and contour. The upper portion of the mattress is divided into a plurality of separate



portions which are individually compressible in respect to body weight. A plurality of partially compressed coil springs are mounted within cylindrical slits formed in the lower part of



the mattress beneath each separate portion. The springs provide added strength for body support and assure prompt return of the upper part of the resilient material to its normal shape when weight is removed from it.

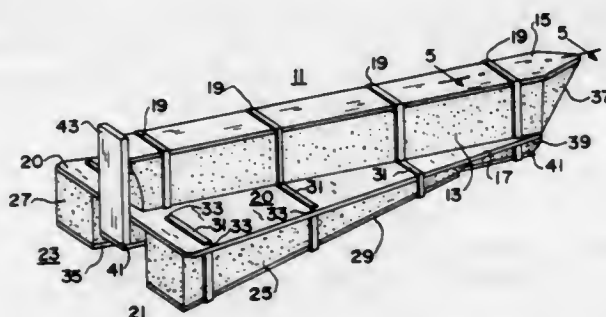
3,732,587

## LIGHTWEIGHT VEHICLE

Harold A. Fletcher, Route 2, Box 142, Tulalake, Calif.  
Filed Aug. 13, 1971, Ser. No. 171,648  
Int. Cl. B63b 5/24

U.S. Cl. 9-6

2 Claims



A lightweight vehicle constructed from a portion of styrofoam material sandwiched between a pair of stiff outer members held together by a plurality of straps made from non-rusting material wrapped around the outer surface of the stiff members and the styrofoam material.

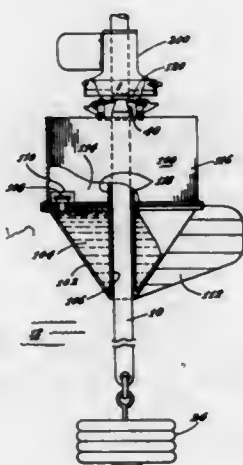
3,732,588

## PAYLOAD DEPLOYMENT SYSTEM

John E. Mitchell, Huntington Beach, Calif., assignor to The Blome Company, Inc., Huntington Beach, Calif.  
Filed Nov. 16, 1970, Ser. No. 89,586  
Int. Cl. B63b 21/52

U.S. Cl. 9-8 R

16 Claims



A payload deployment system includes an elongated shaft member having a positive buoyancy relative to the environ-

ment in which the payload is to be deployed. This elongated shaft member includes at least one recessed portion forming a latching station. A payload having a positive buoyancy relative to the environment has a portion surrounding the elongated shaft member to allow the payload to be guided for deployment by the elongated shaft member. At the top of the payload there is a series of dogs or latches for latching with the recessed portion of the elongated shaft member. A deployment and retrieval device having a negative buoyancy great enough to overcome the positive buoyancy of the payload is placed over the shaft to force the payload to various positions along the shaft and to operate the latches on the payload.

3,732,589

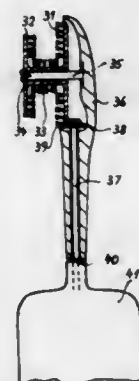
## TREATMENT APPLIANCE FOR TEETH AND THE LIKE

Alfred J. Burki, Forchstrasse 428, Zollikon, Switzerland  
Filed Nov. 19, 1970, Ser. No. 91,102  
Claims priority, application Switzerland, Nov. 20, 1969, 17284/69

U.S. Cl. 15-22 R

Int. Cl. A46b 13/02

4 Claims



The present invention has reference to a treatment appliance and like tool, especially for treating teeth of human beings and generally for simultaneously applying said tool to a variety of treatment surfaces. The appliance is equipped to this end with various brush or polishing bristles which are prearranged in a specific pattern to and for cooperation with each other. An array of disk- or plate-shaped carrier or carriers together with one or more roller-shaped carriers, both retaining bristles thereon, is provided which facilitates access to various faces of a tooth or like object in one operational step, said brushes being continuously driven to efficiently clean and brush without any dexterity and skill on the part of the operator.

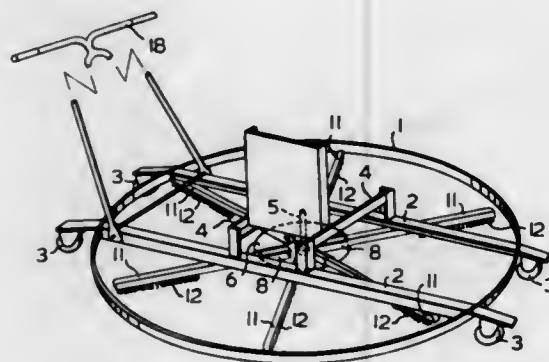
3,732,590

## SWEEPER

Elae Horst, P. O. Box 18, Wallenstein, Ontario, Canada  
Filed June 2, 1971, Ser. No. 149,307  
Claims priority, application Canada, June 3, 1970, 084535  
Int. Cl. A47l 11/164

U.S. Cl. 15-49 R

2 Claims



This invention relates to a rotary brush sweeper which is particularly suitable for cleaning the aisles of poultry sheds,

the sweeper including a rotatable disc carrying a number of radially extending wire brushes, the disc being provided with means inhibiting movement of the arms in horizontal plane but permitting limited movement thereof in a vertical plane so as to cater for differences in height of obstructions encountered by the bristles during operation.

3,732,591

## CAP HAVING A REMOVABLE WIPING BLADE

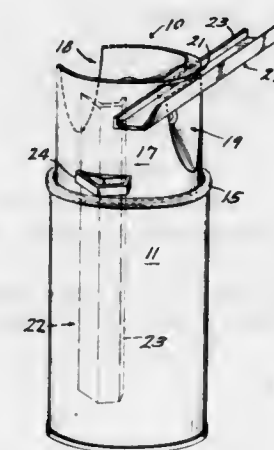
Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Oct. 20, 1971, Ser. No. 190,776

Int. Cl. A46b 11/02; A47l 1/08

U.S. Cl. 15-245

2 Claims



A cap for a fluid dispensing container having a body and flange members on the body for holding the cap adjacent a dispensing area of the container is disclosed. An elongate slot in the body removably retains a resilient blade member for wiping a liquid dispensed from the container or off the surface onto which it is dispensed. A cleat on the body carries the blade member in a storage position when the blade is not in use.

3,732,592

## CHIP REMOVER

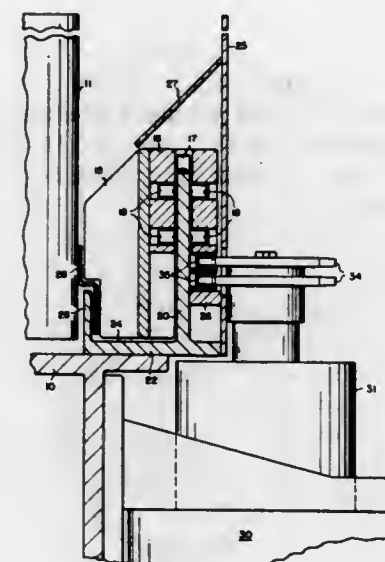
Worthy J. Forward, Jr., Rochester, N.Y., assignor to USM Corporation, Rochester, N.Y.

Filed Aug. 2, 1971, Ser. No. 167,899

Int. Cl. B23b 41/00

U.S. Cl. 15-246.5

3 Claims U.S. Cl. 16-72



The table of a vertical boring mill has a trough surrounding it; and a plurality of paddles are mounted on paddle carriers to

3,732,593

## PAINT ROLLER AND TRAY AND CLEANER THEREFOR

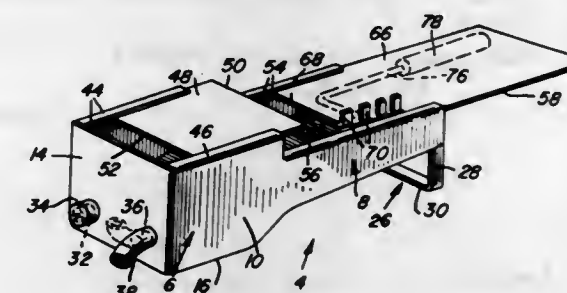
Arne Habostad, 6000 24th Avenue, N.W., Seattle, Wash.

Filed May 12, 1971, Ser. No. 142,593

Int. Cl. B44d 3/12

U.S. Cl. 15-257.06

9 Claims



A roller brush-type painter's tray which is structurally similar to commonly used trays while the user is painting and which is unique in that the respective end portions have spaced parallel coplanar properly paired tracks. These tracks are provided with first and second lids, one of which is associated with the relatively deep sump and the other one with the elongated relatively shallow roller brush trough-like guide. These lids are in different planes when in use, and when closed they permit the nozzle of a garden hose to be passed through spaced ends of the lids in a manner to spin the confined roller brush. The force-fed stream of water acting on the turning brush will clean the brush and also the interior surfaces of the rim-like wall of the overall tray.

3,732,594

## CLOSER HARDWARE FOR SLIDING SASH AND THE LIKE

Roy Mills, Rossville, Ind., assignor to Dorex Products, Inc., Arlington, Tex.

Filed Aug. 19, 1971, Ser. No. 172,999

Int. Cl. E05f 1/08

3 Claims U.S. Cl. 16-72

11 Claims



Horizontal movement of a part is achieved by a spring-actuated slide vertically movable in a guide connected with one such part, a link being pivotally attached at one end to said



slide and having its other end pivotally attached to another part. The link is nearly, but not quite, on dead center in each of nearly horizontal and nearly vertical positions in which the said parts are relatively open and closed, the final movement of the actuated part toward either extreme position being gentle and substantially free of impact. It is broadly immaterial whether the part to which one end of the link is pivoted is a sash or a frame, or whether bias is provided by a compression spring, a tension spring, or an elastomeric spring.

3,732,595

## FIBER SHATTERING PROCESS

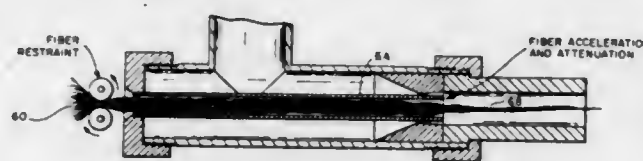
Preston F. Marshall, Walpole, Mass., assignor to The Kendall Company, Boston, Mass.

Filed Aug. 9, 1971, Ser. No. 169,941

Int. Cl. D01g 1/02

U.S. Cl. 19—3

7 Claims



A high-velocity jet stream of textile-length fibers is caused to impinge onto a rigid airfoil at a velocity above the critical velocity at which the viscoelastic flow property of the fibers can exert itself, with a consequent shattering of a substantial portion of the fibers into fibers of shorter length. The shorter length fibers may be decelerated and diffused into a plenum chamber, from which they may be removed in the form of a fibrous web.

3,732,596

## TOP ROLL LOADING SYSTEM FOR DRAFTING UNITS

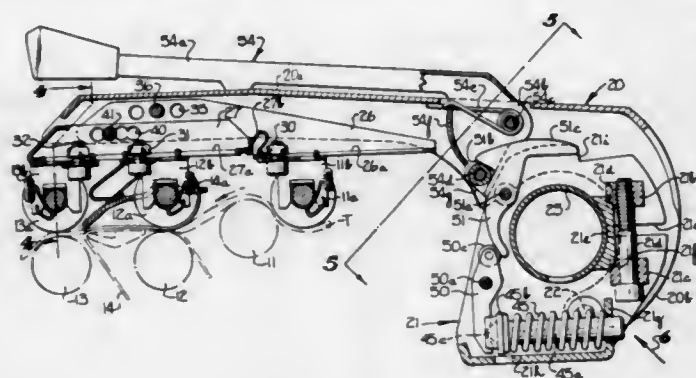
Stefan Stanoff, Herzogenaurach, Germany, assignor to Industriewerk Schaeffler, OHG, Herzogenaurach, Germany

Filed June 16, 1971, Ser. No. 153,608

Int. Cl. D01h 5/46

U.S. Cl. 19—267

15 Claims

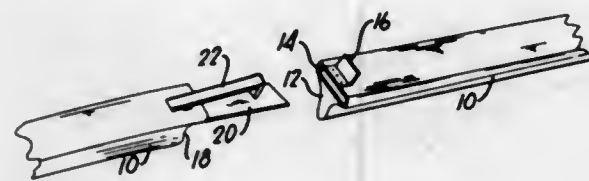


A guide arm of a top roll loading system of a drafting unit is pivotally mounted on a bracket, with the pivot thereof positioned a substantial distance below and rearwardly of the plane of all of the drafting rolls so that yieldable force applied to the guide arm is transmitted to the top rolls in an inclined downward and forward direction, as is particularly desirable where the back or feed top roll is offset rearwardly of the back or feed bottom roll of the drafting unit. Also, a novel compound linkage connects a yieldable force means to a latch arm pivoted on the guide arm and is so designed that a compression spring or a pressurized pneumatic bag or tube may be used alternatively as the yieldable force means therefor by a simple interchange of parts.

3,732,597  
EASILY INSTALLED FAN BELT  
Martin Epstein, Rockville Center, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.  
Filed June 29, 1971, Ser. No. 157,884  
Int. Cl. F16g 7/04

U.S. Cl. 24—31 B

1 Claim



An automotive fan belt having in cross section the general shape of a T and having opposite ends provided with snap fasteners or screw clamps for joining said ends.

3,732,598

## FREE CABLE WINCH

Charles Hatay, Buefingen Bei, Germany, assignor to Decauville, Corbell, France

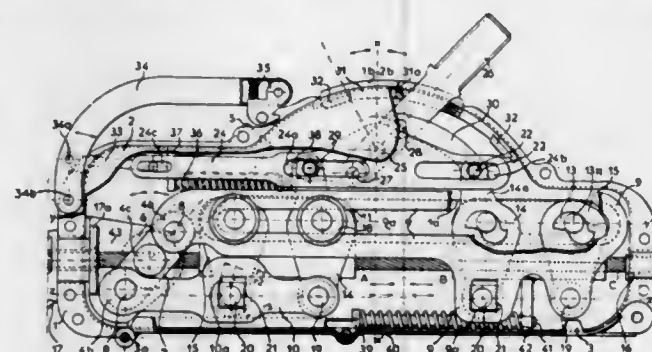
Filed July 29, 1971, Ser. No. 167,392

Claims priority, application France, July 29, 1970, 7027876

Int. Cl. B65h 17/36

U.S. Cl. 24—68 D

19 Claims



The invention relates to a free cable winch. Each pair of jaws 11, 14 is guided by two pairs of rollers 18 which run in guideways 1a, 2a formed in the cheeks of the winch case to ensure rectilinear traction of the cable C, with substantially no flexing of the cable between the two pairs of jaws. The invention can be applied to powerful winches with consequent low wear of the cable.

3,732,599

## DECORATIVE PIN

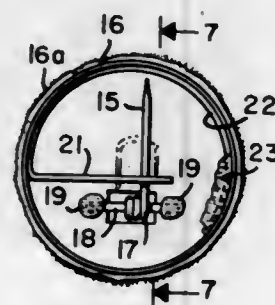
Ray J. Morissette, 29 Loma Avenue, La Selva Beach, Calif.

Filed July 30, 1971, Ser. No. 167,628

Int. Cl. A44b 1/18; A44c 1/00

U.S. Cl. 24—103

3 Claims



Decorative fastening devices for holding sheets, blankets and the like from separating and at the same time to present a

decorative appearance. These pins include two principal parts, one of which is on the bottom of the sheet and the other of which is on the top. The top part is provided with a decorative body and a releasable clutch or grip for receiving the pin which is attached to the bottom part. The bottom part is provided with a recessed member for pivotally supporting the pin. The pin is spring biased so that when it is released from the clutch of the top member it is rotated on its pivot and the sharp point thereof is moved into said recess. The pin is also provided with an actuating member which is exposed on the outside of the bottom part and presents a grip whereby the pin may be rotated manually into its working position.

3,732,600

## ATTACHMENT ASSEMBLY

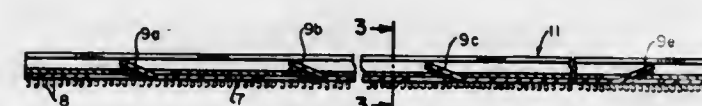
Joseph Perina, Huntington, N.Y., assignor to American Velcro, Inc., Manchester, N.H.

Continuation-in-part of Ser. No. 108,128, Jan. 20, 1971, abandoned. This application Apr. 15, 1971, Ser. No. 134,189

Int. Cl. A44b 17/00

U.S. Cl. 24—204

12 Claims



An attachment assembly for hooking elements of a separable fastener member is disclosed which comprises a first member having a plurality of said hooking elements projecting from one surface thereof and second member attached to the first member by means of at least two selectively orientated tangs projecting from the opposite surface of the first member and extending through corresponding receiving holes in the second member.

3,732,601

## STRINGER FOR A SLIDE FASTENER

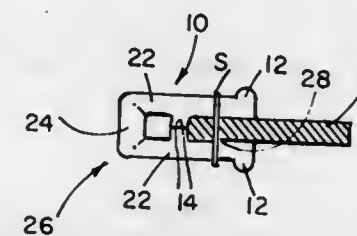
Fred H. Rojahn, 107 Jefferson Terrace, Springfield, N.J.

Filed Oct. 8, 1970, Ser. No. 79,123

Int. Cl. A44b 19/10, 19/14

U.S. Cl. 24—205.13 D

11 Claims



A stringer blank for a slide fastener having an extruded elongated body provided with transversely spaced slider guide members projecting outwardly from one side thereof adjacent to the longitudinal edge portions of the body, and abutment members projecting outwardly from the opposite side thereof. A plurality of longitudinally spaced slots is formed in the stringer blank to provide a series of transverse, substantially parallel ladder-like portions, wherein each of these portions includes a centrally enlarged element to define an interlocking head member. The stringer blank is bent in half with one guide member overlying the other guide member, and with the abutment members contacting each other to define a stringer provided with a series of projection elements having the interlocking head member at the free end thereof and an open

receiving slot at the opposite end thereof. The receiving slot is adapted to house the tape or fabric to which the stringer is attached by conventional stitching. The abutment members position the fabric relative to the interlocking head member to provide a uniform spacing therebetween. The receiving slot may be provided with an enlarged recess to receive an elongated bead formed on the edge of the fabric.

3,732,602

## SUBMERSIBLE CREMATORY URN

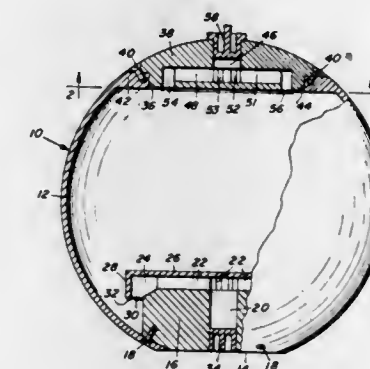
Alexander Vigh, 555 Fairlawn Parkway, Saddle Brook, N.J.

Filed May 28, 1971, Ser. No. 147,800

Int. Cl. A61g 17/08

U.S. Cl. 27—1

20 Claims



A submersible urn, preferably spherical in shape for containing cremated remains for burial at sea is disclosed. The urn is constructed with an air vent at the top, ballast at the bottom, and a water inlet port whereby water may enter the urn so that it will sink. The urn is constructed of a degradable material whereby chemical action of the water in which it is submerged will dissolve it over a period of time.

3,732,603

## METHOD AND APPARATUS FOR LAYING DOWN THE FIBER HAIRINESS OF TEXTILE YARNS

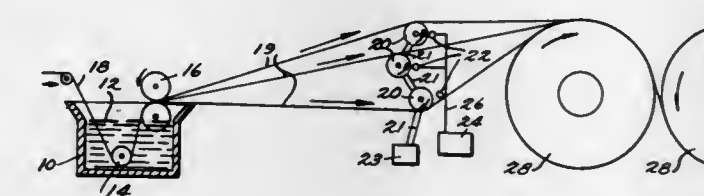
Walter F. Ilman, Greensboro, and Clarence R. Hyder, Burlington, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Nov. 12, 1971, Ser. No. 198,277

Int. Cl. D06c 29/00

U.S. Cl. 28—28

17 Claims



The surface hairiness, or fuzziness of staple spun yarn is reduced during a sizing operation by passing individual strands of the wet sized yarn through and in contact with the surfaces of the specially designed circumferential grooves in the surface of a cylindrical roller rotating in a direction opposite to the direction of the yarn's travel so that the higher linear speed of the roller exerts a strong opposing wiping, squeezing force on the yarn moving counter to the surface speed of the inner walls of the grooves of the roller.

Under certain circumstances, where modified performance is desired, the grooved roller may be rotated in the same direction as the yarn travels.



3,732,604

**METHOD OF SEVERING PILE LOOPS IN THE PREPARATION OF SEPARABLE FASTENERS**

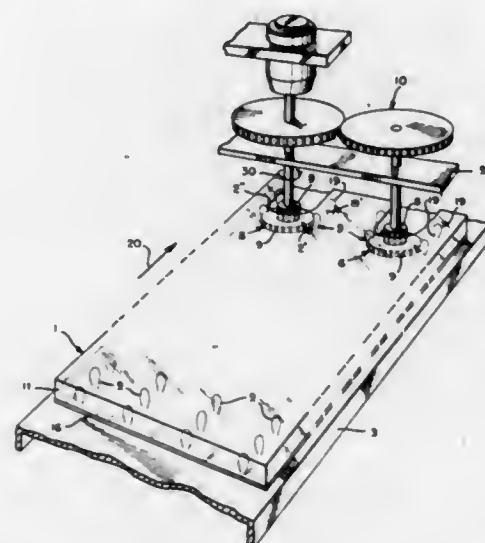
George H. Erb, Rutland, Vt., assignor to American Velcro, Inc., New York, N.Y.

Division of Ser. No. 835,204, June 20, 1969, abandoned. This application Jan. 6, 1971, Ser. No. 104,448

Int. Cl. D06c 13/00

U.S. Cl. 28—76 P

8 Claims



A method for uniformly cutting loop-shaped elements upstanding from a foundation sheet by encasing a plurality of filamentary loops in a medium capable of retaining them in a relatively immovable state prior to subjecting portions thereof to a cutting action. In a particular embodiment the loops are cut or milled to form the hook member of a hook and loop type fastener.

3,732,605

**METHOD OF MAKING ROLLER BEARING CAGE-AND-ROLLER UNIT**

Hudson B. Scheifele, 30651 Ponds View Drive, Franklin, Mich.

Filed Nov. 3, 1971, Ser. No. 195,188

Int. Cl. B21d 53/12

U.S. Cl. 29—148.4 C

3 Claims



An annular sheet-metal roller-riding cage has a tubular portion with a multiplicity of circumferentially-spaced openings providing pockets for the rollers. Each opening or pocket has opposite cage-support surfaces disposed tangential to the roller mounted therein. The rollers are held in assembly by a corresponding number of L-shaped tabs, two for each roller, with arms extending radially from the tubular portion of the cage and located at the opposite ends of the roller. The free ends of the L-shaped tabs form tongues extending axially toward one another from the opposite sides of the tubular portion and are disposed at the opposite side of the pitch circle of the set of rollers from the tubular portion of the cage, thereby effecting retention of the rollers in the cage. The opposite

sides of the tongues have surfaces converging toward the tubular portion. The tubular portion of the cage is positioned inward of the pitch circle of rollers seated in a two-flanged inner race, or outward of the pitch circle of rollers seated in a two-flanged outer race. Before assembly, the L-shaped tabs are disposed at obtuse angles to the tubular portion of the cage. Upon inserting the rollers in the pockets and seating them in a roller bearing race having fixed flanges on both ends, the opposite sets of roller-retaining tabs are bent axially toward one another to place their free ends or tongues between the rollers for retention and spacing thereof. This assembly is then mounted in a race with a fixed flange on one end and with a flangeless opposite end. The invention thus provides a roller-riding cage with a minimum clearance between it and the lowermost rollers yet accurately located in a radial direction. This is done by causing the normal flat surfaces of the cage support portion on the roller pockets to come into contact with the body of the rollers adjacent the periphery of the tubular portion of the cage which is closest to the pitch circle of the set of rollers so as to minimize the clearance between the cage support surface and the rollers for a given radial movement of the cage.

3,732,606

**METHOD OF MAKING BEARINGS**

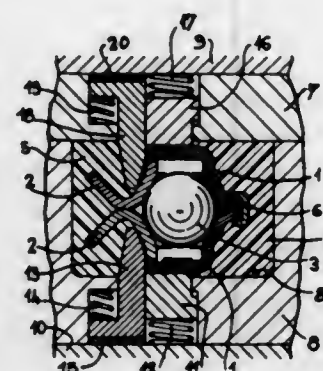
Hubert de Germond, "Les Presles", Methon-Saint-Bernard, France

Filed July 2, 1971, Ser. No. 159,412

Int. Cl. B23p 11/00

U.S. Cl. 29—148.4 A

2 Claims



A method for the manufacture of bearings, of the type in which rolling members are retained between two pairs of races. A cage constituted by two pairs of races and intermediate rolling members is placed within a mould which has two wedge like elements. As the mould is closed these two elements expand the cage radially outward. Plastics material is then injected into the mould on either side of the cage to encase same.

3,732,607

**APPARATUS FOR THE MANUFACTURE OF GALVANIC CELLS**

Faast Khatovich Nablullin, 3, Mytischinskaya ulitsa 14-a, kv. 90; Zoya Mikhailovna Buzova, 3 Mytischinskaya ulitsa, 14-a, kv. 98; Efim Mikhailovich Gertsik, Razumovskaya naberezhnaya, 14, kv. 34; Boris Vasilievich Marfin, Sushevsky val., 23, kv. 116, all of Moscow; Vyacheslav Anatolevich Rabinovich, Balashikhin I, ulitsa Sovetskaya, 16, kv. 6, Moskovskaya obl., and Ivan Ivanovich Koval, N-Peschanyaya ulitsa, 23/7 kv. 369, Moscow, all of U.S.S.R.

Continuation of Ser. No. 870,939, July 17, 1969, abandoned, which is a division of Ser. No. 642,415, May 31, 1967, Pat. No. 3,506,750. This application Jan. 26, 1972, Ser. No. 220,904

Int. Cl. H01m 35/30

U.S. Cl. 29—204 D

7 Claims

Apparatus for the manufacture of galvanic cells comprising a support pusher for a casing and a positive electrode of a gal-

3,732,609

**METHOD OF MAKING CURVED STAIRCASE**

Adam Cirmek, Jr., Lambertville, Mich., and Vernon C. Stiles, Toledo, Ohio, assignors to Stile-King Stairs, Inc. and Scholz Homes, Inc., Toledo, Ohio

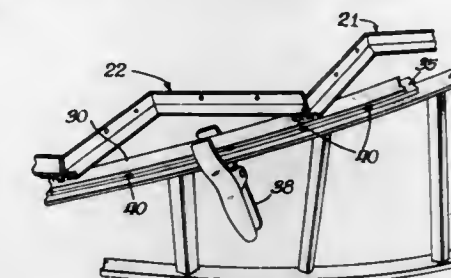
Division of Ser. No. 734,413, June 4, 1968, Pat. No. 3,616,585.

This application Mar. 2, 1970, Ser. No. 20,261

Int. Cl. B23p 19/00

U.S. Cl. 29—428

6 Claims



Right-angle braces are formed of two sections of angle iron mitered together. One leg of the brace is adapted to receive the riser of a stair, and the other leg is adapted to receive the tread of the stair. A number of these braces, each designed to define one side of a step in a curved staircase, are mounted on a flat metal bar to form a flat string for the staircase. A similar flat metal bar is placed in a jig at the pitch and curvature the finished staircase is intended to assume; and the formed string is placed in the jig with the two flat bars engaging each other throughout their lengths. The two bars are then welded together to form a lamination while in the jig to provide the curved horse for one side of the staircase with the laminated bars retaining the desired curve and pitch after removal from the jig. Another metal horse is similarly formed for the other side of the staircase, but in a separate jig of different curvature. After the two curved horses are installed, the treads and risers are attached to a pair of associated braces by screws inserted from beneath the metal frames.

3,732,608

**METHOD OF MAKING A PRECISION POSITIONING APPARATUS**

George S. Knopf, Dayton, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

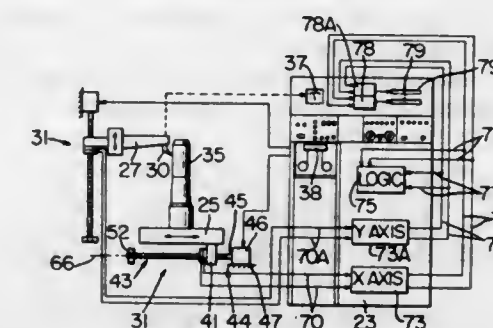
Division of Ser. No. 824,243, May 13, 1969, Pat. No.

3,641,535. This application Feb. 22, 1971, Ser. No. 117,823

Int. Cl. B23q 17/00

U.S. Cl. 29—407

7 Claims



A positioning apparatus, and method of making same are disclosed, the apparatus including two relatively movable threaded nut and screw members with one of the members having detectable means thereon at intervals about the thread crests and the other having reading head means capable of detecting the detectable means wherein such apparatus is capable of precisely relatively moving its members by relative rotation therebetween and indicating both the magnitude and direction of movement of one member with respect to the other by detection of the detectable means.

In the method of making the apparatus, the reading head means is also capable of being energized to place the detectable means about the thread crest and the method includes the steps of relatively rotating the nut and screw member, measuring intervals of relative axial movement as a result thereof, and energizing the reading head means at such intervals, so that detectable means are placed at positions precisely corresponding to said axial intervals.

3,732,610

**METHOD FOR LINING A HOT TOP CASING WITH INSULATING PANELS AND RING**

Joseph Perri, Coraopolis, Pa., assignor to The Union Commerce Bank, Cleveland, Ohio

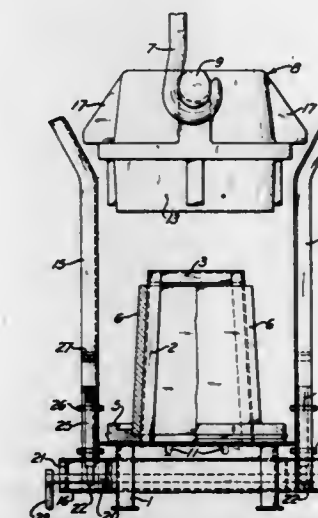
Division of Ser. No. 842,076, July 2, 1969, Pat. No. 3,675,304, which is a continuation-in-part of Ser. No. 726,115, May 20, 1968, abandoned. This application Aug. 25, 1971, Ser. No.

174,797

Int. Cl. B21d 39/02

U.S. Cl. 29—463

4 Claims



A method is disclosed for lining a hot top casing with insulating panels supported on edge in an upwardly tapered configuration corresponding to the size and shape of the opening in the casing. The casing is lowered around the panels to provide a press fit.



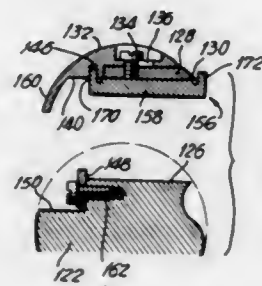
3,732,611

**BLADE-ADJUSTING METHOD FOR ROTARY CUTTERS**  
 Takashi Watanabe, Nagoya, Japan, assignor to Kabushiki Kaisha Towa Denki, Nagoya-shi, Aichi-ken, Japan  
 Division of Ser. No. 809,281, March 21, 1969, Pat. No. 3,600,816. This application Jan. 13, 1971, Ser. No. 106,196  
 Claims priority, application Japan, Apr. 5, 1968, 43/22042; Apr. 5, 1968 43/26699; Apr. 5, 1968, 43/26698; July 30, 1968, 43/53369

Int. Cl. B23q 3/00

U.S. Cl. 29—467

6 Claims



A method for adjusting a blade of a rotary cutter. The blade is removable from the body of the cutter when an edge of the blade is sharpened. A positioning member is adjustably connected with the blade member, and a gauge is provided for adjusting the positions of the blade member and positioning member one with respect to the other while they are still separate from the cutter body so that the relative positions of the blade and positioning members will situate the cutting edge of the blade at the proper location with respect to the positioning member. The cutter body has a locating part which locates the positioning member at a predetermined location on the cutter body, so that in this way when the parts are reassembled with the positioning member situated at this predetermined location, the blade will automatically assume its proper cutting position at the cutter body.

3,732,612

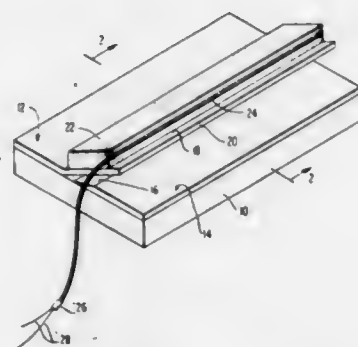
**METHOD FOR EXPLOSIVE BONDING OF METALS**  
 Wayne E. Simon, Evergreen, Colo., assignor to Martin Marietta Corporation, New York, N.Y.

Filed June 2, 1971, Ser. No. 149,287

Int. Cl. B23k 21/00

U.S. Cl. 29—470.1

8 Claims



A strip of low detonation velocity explosive overlies spaced overlapping portions of metal bodies to be bonded and a narrow cord of high detonation velocity explosive extends in the direction of the weld along one edge of the low detonation velocity strip such that initial ignition of the high detonation velocity explosive cord creates a detonation front which moves across the weld at an angle whose tangent is the ratio of the detonation velocities of the two explosives to prevent deformation of weld geometry ahead of detonation.

3,732,613

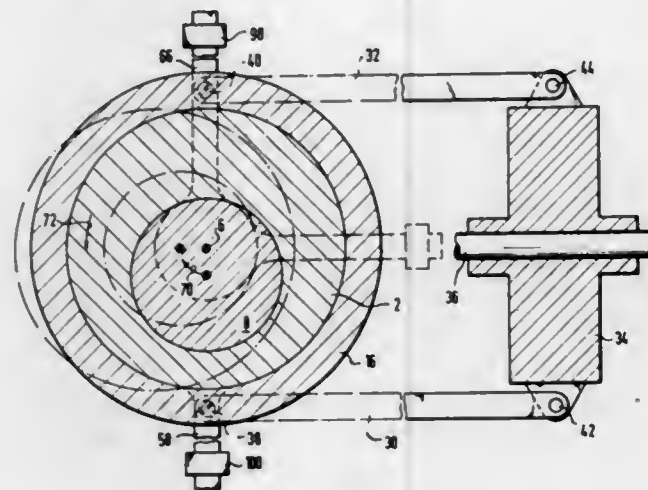
**METHOD AND DEVICE FOR FRICTION WELDING**  
 Karl-Heinz Steigerwald, Prinzenreihe 15, Starnberg, Germany  
 Filed Dec. 17, 1970, Ser. No. 98,528

Claims priority, application Germany, Dec. 18, 1969, P 19 63 546.2

Int. Cl. B23k 27/00

U.S. Cl. 29—470.3

24 Claims



The method of friction welding is applicable to surfaces to be welded with any type of marginal boundary. Two workpieces to be welded together are arranged against each other at the surfaces to be welded and are heated to welding temperature by a relative oscillatory movement along such surfaces. The relative oscillatory movement is effected by way of relative rotatory movement with the workpieces remaining substantially parallel to each other.

A device for carrying out the method comprises a workpiece holder driven by an eccentric body rotatable about an axis. A circular rotatory path is defined on the body and the eccentricity of this path is adjustable relatively to said axis, the holder being movable at least two-dimensionally in a plane corresponding to the orientation of the surface to be welded. The holder is guided on the path of progression of the eccentric body so that, upon rotation of that body, all parts of the holder perform rotatory movements of equal size and circular shape with a radius equal to the adjusted eccentricity of the eccentric body.

3,732,614

**METHOD FOR MAKING MOTOR SHELLS AND THE LIKE**

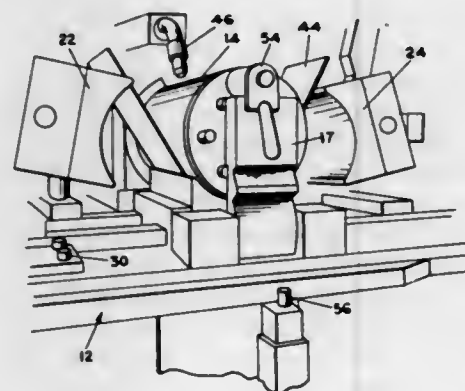
Henry E. Boutell, Norton Shores, Mich., assignor to EMF, Inc., Muskegon, Mich.

Filed Sept. 10, 1970, Ser. No. 71,185

Int. Cl. B23k 31/02

U.S. Cl. 29—477

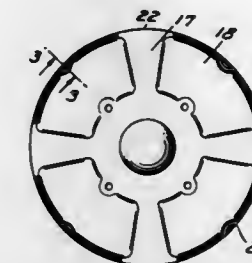
12 Claims



Tubular shells are made from pre-cut blanks of basically flat sheet stock by placing the blanks in an indexed position,

clamping the blanks tangentially against a forming arbor, and then forcing shaped jaws having an end configuration complementary to the outer periphery of the arbor against the unclamped portions of the blank to progressively bend the blank and wrap the same about the arbor, in a manner which brings the ends of the blank together closely adjacent one another but at least slightly spaced apart. The space between the ends of the blank are then secured together by welding, in a manner which deposits welding material in the space between the ends of the blank, thereby producing a circumferentially continuous tubular wall. The secured blank is then forced endwise off the arbor and over a sizing plate which accurately sizes the interior of the tubular shell. The blanks are pre-cut by use of a shearing die which simultaneously coins the sheared end and bends the same slightly to promote precise circularity when the end extremities are welded together.

consists of a circular shell which encircles the stator and two end members which engage into the inside of the shell and contain a bearing for supporting an end of the shaft. The shell has a plurality of notches at each end for receiving mating projections on the end member, thus securing the end member



3,732,615

**METHOD FOR PRODUCING STANDING WAVE OF SOLDER AND PROTECTIVE FILM MEANS**

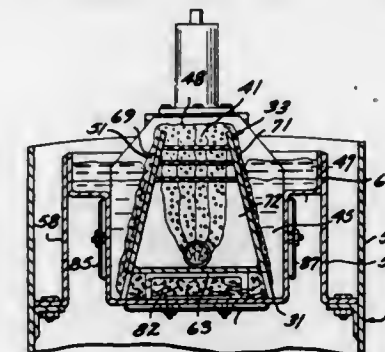
Robert D. Fitzsimmons, Windham, N.H., assignor to Gale Systems, Inc., Andover, Mass.

Division of Ser. No. 782,824, Dec. 11, 1968, Pat. No. 3,589,590. This application May 14, 1971, Ser. No. 143,461

Int. Cl. B23k 31/02, 35/12

U.S. Cl. 29—503

5 Claims



A method for producing a standing wave of solder and oil compound of a selected ratio and including the steps of placing molten solder in a soldering apparatus of the type that includes a sump having a fountain disposed therein and formed with an inlet disposed in the lower portion of such sump and an outlet disposed in the lower portion thereof and filling such sump with sufficient solder to cover the inlet. A layer of oil compound or other protective film means having a lesser specific gravity than the solder is then placed on the solder and the solder is pumped through the fountain at a rate sufficient to cause the solder emitted from the outlet to form a standing wave and then spill downwardly around the fountain and through the layer of oil compound at a rate sufficient to pull a sufficient amount of oil compound downwardly therewith and into the inlet to cause the mixture passing through the fountain to maintain the selected ratio of solder to oil compound.

against relative rotational movement. The shell also has a plurality of slots in each end which serve to define a portion of the shell which can be deformed radially inward after assembly of the end members to secure the end members against axial movement.

3,732,617

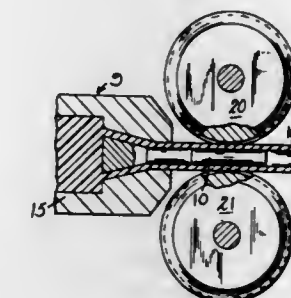
**METHOD OF PRODUCING A TUBULAR MAGNET**  
 Robert L. Rowe, Sea Gull Hill Road, North Haven, Sag Harbor, N.Y., and Donald Peccerilli, 37 Susquehanna Avenue, West Haven, Conn.

Division of Ser. No. 684,800, Nov. 21, 1967, Pat. No. 3,640,657. This application June 22, 1970, Ser. No. 59,814

Int. Cl. H01f 3/08, 7/06

U.S. Cl. 29—608

3 Claims



An apparatus for aligning magnetic particles in a base material formed into a substantially cylindrical member, comprising a soft magnetic core adapted to be positioned within the confines of the member, and means positioned to apply an orienting magnetic field through the walls of the member while it is positioned about said core.

3,732,616

**METHOD OF MAKING END FRAME STRUCTURES FOR ELECTRIC MOTORS**

Alfred Masrodonato; Kurt Porter, both of Owosso, and Robert R. Rhoads, Corunna, all of Mich., assignors to Universal Electric Company, Owosso, Mich.

Division of Ser. No. 740,338, June 26, 1968, Pat. No. 3,567,973. This application Feb. 25, 1971, Ser. No. 118,596

Int. Cl. H02k 15/00, 15/14, 15/16

U.S. Cl. 29—596

6 Claims

In one form the electric motor comprises an improved frame which rotatably supports the rotor shaft. This frame

3,732,618

**ADJUSTABLE PIPE GROOVER AND CUT-OFF**  
 Robert H. Lorenz, 1888 Lakewind Drive, Pontiac, Mich.

Filed Dec. 18, 1970, Ser. No. 99,478

Int. Cl. B23d 21/04

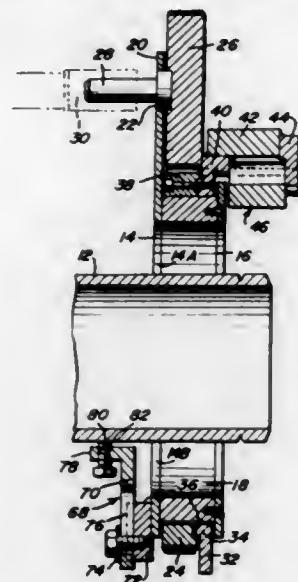
U.S. Cl. 30—97

6 Claims

A pipe receiving tool which incorporates a driven ring gear carrying an adjustable knife mounting arm for travel about the



pipe in cutting engagement therewith. The knife mounting arm can adjustably mount two knives so as to simultaneously



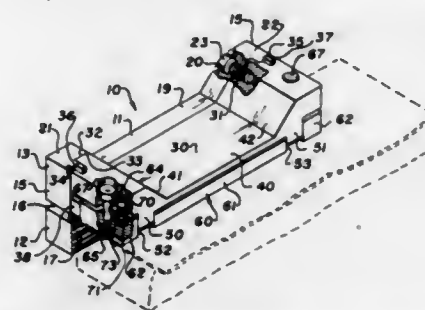
groove and cut-off a pipe, or can carry a single knife to perform either function by itself.

3,732,619

**TOOL FOR TRIMMING LAMINATED PLASTIC SHEETS**  
Detlef Grueber, North Vancouver, British Columbia, Canada,  
assignor to Arlyn Industries Ltd., British Columbia, Canada  
Filed June 1, 1971, Ser. No. 148,537  
Int. Cl. B26b 29/00

U.S. Cl. 30—287

5 Claims



A tool for trimming the overhanging edge of a sheet laid on an object, such as a counter, flush with a side edge of the article. The tool includes a reference surface adapted to move along the side surface, and a depressible surface substantially at right angles to the reference surface and adapted to ride on the surface of the sheet to be cut. At least one cutting tool is mounted in the device with its cutting edge positioned to cut into the sheet when the tool is depressed.

3,732,620

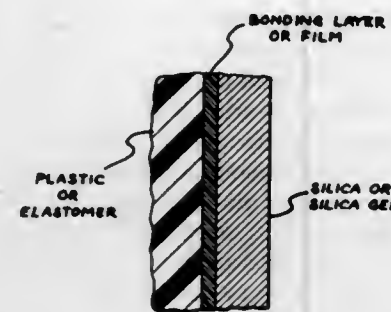
**METHOD OF TREATING PLASTIC AND ELASTOMERIC MATERIALS AND ARTICLES PRODUCED THEREBY**  
Robert D. Misch, and Donald A. Daus, both of Chicago, Ill.,  
assignors to MBT Corporation, Chicago, Ill.  
Division of Ser. No. 8,530, Feb. 4, 1970, Pat. No. 3,637,416,  
and a continuation-in-part of Ser. No. 636,258, May 5, 1967,  
which is a continuation-in-part of Ser. Nos. 473,212, July 19,  
1965, abandoned, and Ser. No. 524,454, Feb. 2, 1966,  
abandoned, which is a continuation-in-part of Ser. No.  
231,299, Oct. 17, 1962, abandoned. This application June 9,  
1971, Ser. No. 151,242  
Int. Cl. A61c 13/00

U.S. Cl. 32—2

3 Claims

A method of improving the surface characteristics of plastics and elastomers which in its preferred aspects includes

the steps of forming a bonding or coupling film on the surface of a plastic or elastomeric material and thereafter contacting the film with a compound or a mixture of compounds, or a



solution thereof, capable of forming a deposit or coating of silica or silica gel thereon, and articles produced in accordance with the method.

3,732,621

**PERMANENTLY IMPLANTABLE FIXTURE MEANS FOR PROTHESIS AND THE LIKE**

Bertil I. Bostrom, Taby, Sweden, assignor to AGA Aktiebolag, Lidingo near Stockholm, Sweden

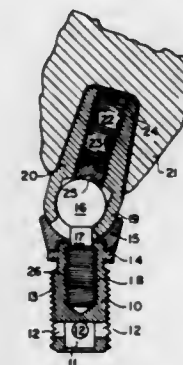
Filed Mar. 12, 1971, Ser. No. 123,707

Claims priority, application Sweden, Mar. 25, 1970, 4210/70

Int. Cl. A61c 13/00

U.S. Cl. 32—10 A

20 Claims



As a permanently implantable fixture means for prosthesis and the like in a human body, especially for implanting a dental prosthetic structure, a means composed by at least two parts has been proposed for attaching the prosthetic structure to bone tissue. A first part of the attachment unit is intended to be applied in such a way in the bone tissue that it will remain embedded in said tissue during all of the time required for healing the damage which occurs when the first part is attached to the bone and while the bone tissue grows into the attachment, and a second part of the attachment unit, serving as mounting unit for the prosthetic structure and so shaped that it may be attached to the first part of the attachment unit and pass through such weak tissue covering the bone tissue. The mounting unit is intended to combine the attachment unit inserted into the bone tissue with a prosthetic structure located outside of the weak tissue.

Such permanently implantable attachment means have been used for permanently attaching dental prosthetic structure to the jawbone in human bodies. The jawbones rather often have a narrow cross-section, and the longitudinal direction of the cross-section may be diverge sharply at different parts of the same jaw and/or the same jawbone but especially between the upper jaw and the lower jaw. This, among other reasons, results in so-called over-bite or under-bite, respectively. As the attachment units must, for technical reasons, be well centered in the jawbone, the longitudinal directions of the attachment units will not always be in align-

ment mutually in the same jaw, nor between the upper jaw and the lower jaw. This is a serious disadvantage, because the longitudinal direction of the teeth in the prosthetic structure should be in alignment with the longitudinal direction of the attachment unit. A compromise between these demands either a weak or completely unsatisfactory attachment in the jawbone or non-aligned prosthetic structure. Therefore, there is a need for an attachment means of the kind indicated above, in which the said first part attached to the jawbone may form an angle with the said second part to which the prosthetic structure is attached.

3,732,622

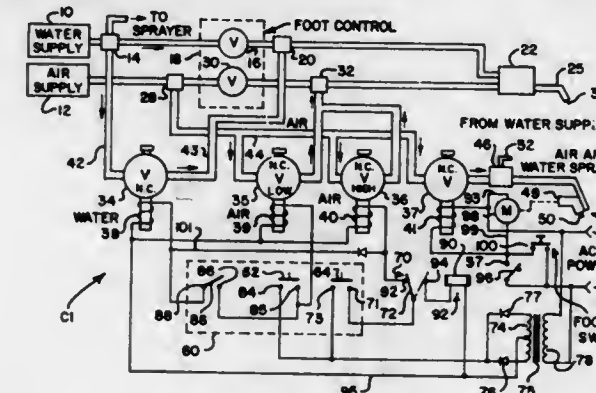
**CONTROL SYSTEM FOR DENTAL DRILL OPERATION**  
Chester B. Jackson, 22 Orchard Drive, Woodbury, N.Y.

Filed Feb. 12, 1971, Ser. No. 115,001

Int. Cl. A61c 19/02

U.S. Cl. 32—22

10 Claims



A dental drill control system has air and water lines connected to air and water supply sources. Solenoid controlled adjustable valves are connected to the air and water supply sources for passing air and water at selected volume rates to a turbine control box for a high speed drill. A hand held switch assembly has switches connected to the solenoids of the valves for selectively passing air at high or low volume rate to the turbine control box accompanied by water flow or without water flow. An existing foot control may by-pass these valves for foot control of air and water supply to the turbine control box. A switch operated relay may pass power to a motor driving a low speed drill and to another solenoid valve passing air to an air and water sprayer under control of one of the hand held switches. An existing foot switch can by-pass the relay to operate the low speed drill and sprayer independently of the hand held switches.

3,732,623

**ROTARY MOVEMENT DISTANCE MEASUREMENT DEVICE**

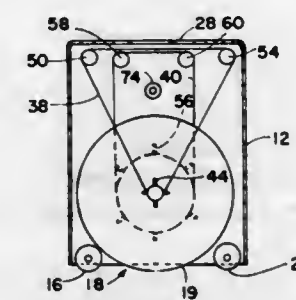
John H. Bopst, III, 409 Chalfonte Drive, Catonsville, Md.

Filed Aug. 19, 1971, Ser. No. 173,111

Int. Cl. G01b 3/12

U.S. Cl. 33—141 R

3 Claims



A rolling-contact adding and subtracting distance measurer comprising a pair of differently graduated endless tapes driven

by unequal size sprocket-pulleys integral with a drive wheel rotatively mounted in a palm-sized case, with a portion of the wheel rim protruding from the bottom of the case; idlers carry the tapes in a flat run past an observation window in the top of the case; anti-tip rollers keep the case aligned with the surface to be measured in a typical embodiment.

3,732,624

**SPINDLE FOR DIAL INDICATOR GAUGE**

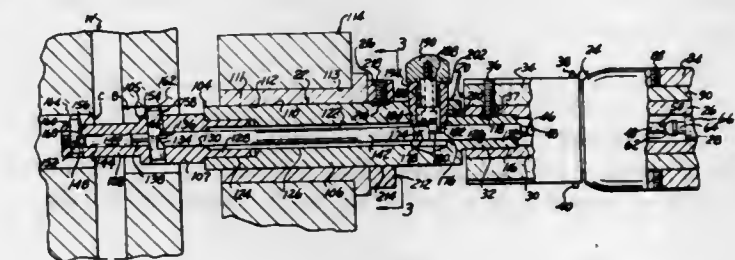
Andrew Elsele, Desert Hot Springs, Calif., assignor to Dunn Tool Company, Livonia, Mich.

Filed Oct. 20, 1971, Ser. No. 191,041

Int. Cl. G01b 5/00, 5/24

U.S. Cl. 33—174 Q

12 Claims



Adapted to be mounted in a reference bore of a master fixture is a hole-location and concentricity-measuring spindle having a hollow supporting shaft with a large-diameter cylindrical rearward pilot portion, an intermediate-diameter middle portion and a small diameter forward portion. The intermediate and small diameter portions are provided respectively with axially-spaced parallel transverse bores containing respectively a first hole-location measuring pin or probe and a second hole-location measuring pin or probe. Each probe is slotted transversely intermediate its opposite ends to provide a sharp contact edge engageable with a flat-topped half-conical cam surface on a motion-transmitting rod which is reciprocable in a longitudinal bore of the hollow spindle. These two half-conical cam surfaces are disposed 90° apart from one another around the rod, which near its rearward end is provided with a pair of flat-bottomed diametral notches also disposed 90° apart from one another in co-planar relationship with the flat tops of the half-conical cam portions. A rotatable probe selector knob on its inner end has a crank pin selectively and successively slidably engageable with the flat bottoms of the two notches with the result of rotating the rod to engage one of the probes with its conical cam while disengaging the other probe from its conical cam. The reduced-diameter inner end of the hollow shaft is adapted to be mounted in the handle socket of a conventional relatively-rotatable dial indicator holder operatively connecting the reciprocable motion-transmitting rod with the reciprocable operating plunger of the dial indicator.

3,732,625

**PIPELINE PIG**

Burton Vernooy, Tulsa, Okla., assignor to T. D. Williamson, Inc., Tulsa, Okla.

Filed Oct. 12, 1970, Ser. No. 79,808

Int. Cl. G01b 3/12, 7/04

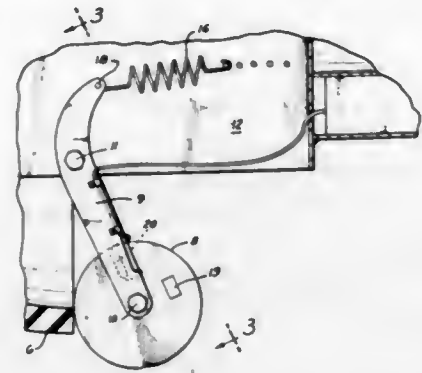
U.S. Cl. 33—141.5

3 Claims

A pipeline pig is provided with a wheel mounted thereon to roll along the inner wall of the pipeline. A magnet is carried by the wheel for movement past a magnetic flux responsive switch carried by the wheel mounting mechanism so that as



the wheel revolves, the magnet moves past the switch to actuate it and thereby provide a signal proportioned to the



distance moved by the pig without any appreciable drag or torsional load on the wheel so as to cause it to tend to skid without rotation along the pipeline.

3,732,626

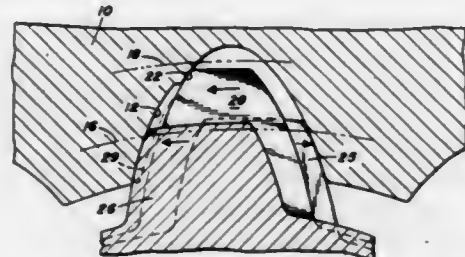
**SPLINE WEAR MEASUREMENT GAGE**

John W. Miller, Jr., Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 22, 1969, Ser. No. 793,149  
Int. Cl. G11b 5/16

U.S. Cl. 33—179.5 R

6 Claims



An involute-spline, wear-step measurement gage comprising three coaxial and relatively rotatable splines. Springs are provided to bias a first spline in one rotary direction and the other two splines in the opposite direction when the gage has been placed on or in the spline to be measured and actuated. The first spline engages the unworn (non-drive) surface of the spline being measured and the other two splines are of different radial dimensions so that one of them engages the wear step and the other engages the unworn portion of the original involute, i.e., the form clearance, adjacent the wear step. A dial indicator arrangement registers the difference in positioning of these latter two splines in terms of the magnitude of the wear step.

3,732,627

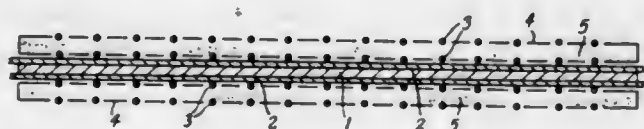
**REMOVAL OF A LIQUID PHASE FROM A MATERIAL**

Reinhold Adolf Philipp Wertheim, 1 Hillmont Road, Esber, Surrey, England

Filed Nov. 23, 1970, Ser. No. 91,756  
Int. Cl. F26b 3/00

U.S. Cl. 34—9

18 Claims



This invention relates to a process and apparatus for removing a liquid phase from a material comprising a liquid phase

and a solid phase. This is achieved by bringing a desiccant into close proximity with a liquid-permeable emitter against which is the material to be treated. The desiccant is sufficiently close for the liquid to be drawn off in the form of a vapor, directly onto or into the desiccant.

3,732,628

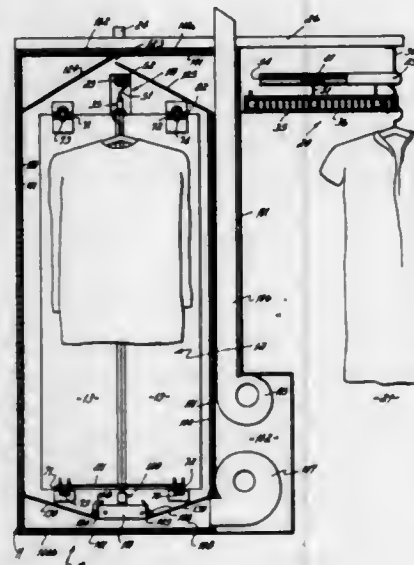
**GARMENT FINISHING TUNNEL**

Bertram G. Blevens; Marshall E. Wallace, both of Louisville, Ky., and Walter P. Goodman, New Albany, Ind., assignors to W. M. Cassell Manufacturing Company, Louisville, Ky.

Filed May 26, 1971, Ser. No. 147,014  
Int. Cl. F23n 5/24

U.S. Cl. 34—32

13 Claims



A garment finishing apparatus and method wherein suspended garments are conveyed through a thermally insulated chamber and subjected to a moisture treatment to remove wrinkles. The moisturizing treatment cycle is synchronized with the operation of the conveyor and the opening and closing of the chamber doors. A moisturizing atmosphere is created in the chamber by a novel steam-water mixing nozzle which injects moisture into the chamber at a high water-to-steam ratio while the chamber is maintained at a negative pressure. The chamber includes a drip-free inner ceiling and means to re-evaporate the moisture condensate, and exhaust and recirculating fans which operate during timed moisturizing, conditioning, and drying cycles.

3,732,629

**GAME CARD ASSEMBLY**

Erich A. Spitzner, Niles, Ill., assignor to Regal Games Mfg. Co., Chicago, Ill.

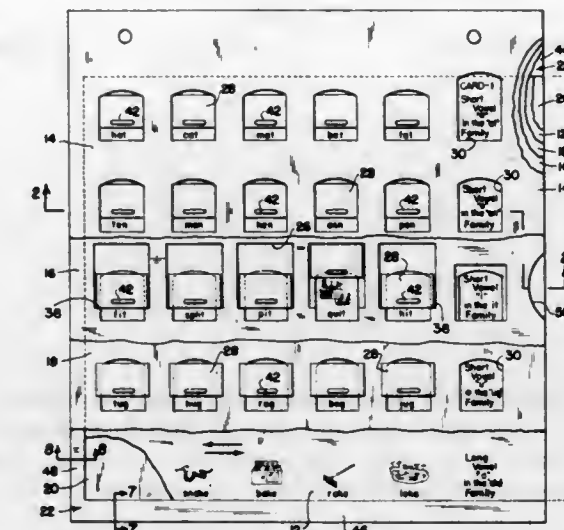
Filed Mar. 30, 1971, Ser. No. 129,402  
Int. Cl. A63M 3/06, 9/18

U.S. Cl. 35—9 E

1 Claim

A game card assembly consisting of a plurality of superposed sheets which define shuttered windows wherein the

shutters are individually movable between partially open and fully open positions. In their partially open positions respec-



tive items of information are displayed while in their fully open positions additional items which bear a relation to the first items are displayed.

3,732,630

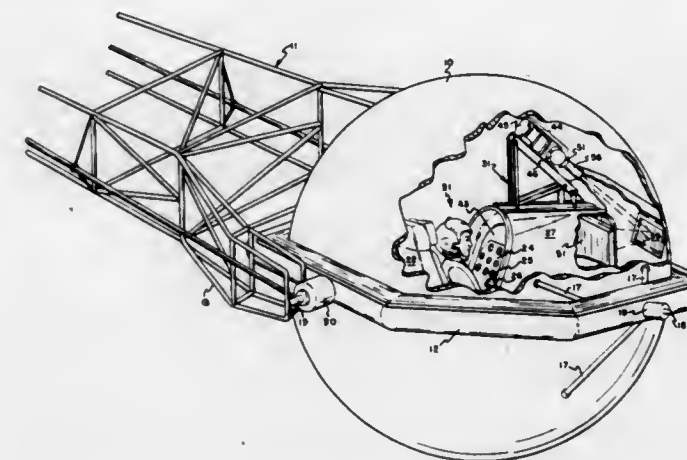
**VISUAL SIMULATOR**

Richard J. Crooble, Langhorne, and Louis A. Passavanti, Levittown, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 21, 1970, Ser. No. 82,655  
Int. Cl. G09b 9/08; B64g 7/00

U.S. Cl. 35—12 N

10 Claims



A visual simulation device for producing pictorial motions of the real world relative to the inside of a cockpit in terms of roll, pitch, yaw and altitude. A first attitude-direction indicator or "eight ball," positionable in accordance with computed flight parameters, is located on an instrument panel. The calibrated markings on a second eight ball, driven in parallel with the first, are replaced with a suitably scaled rendition of sky and terrain. An image of a portion of the second eight ball's surface is projected onto a screen by a zoom lens, located behind a central opening in a parabolic reflector and coiled light source. The screen is viewed by the pilot through a Fresnel lens. The zoom lens is controlled by the computed altitude. The visual simulator is fully compatible with a dynamic G environment such as that produced in a flight simulator gimbaled on the end of a centrifuge arm.

3,732,631

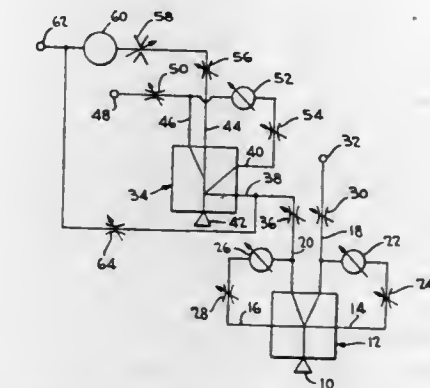
**FLUIDIC HEART SOUND SYNTHESIZING TECHNIQUES AND APPARATUS**

Mathew L. Petrovick, Cedar Hill, N.C., assignor to The United States of America as represented by the Secretary, Department of Health, Education and Welfare, Washington, D.C.

Filed Sept. 16, 1971, Ser. No. 181,004  
Int. Cl. G09b 23/28

U.S. Cl. 35—17

13 Claims



A novel method and apparatus for synthesizing the sound of a heart is disclosed. In the preferred structural embodiment, fluidic principles are employed and a fluidic system is constructed so as to include an oscillator, a controllable amplifier or wave shaping device, and a filling capacitance sound chamber or bladder, all interconnected one to the other by means of flexible and pliable tubing and impedance elements. Audible noise is generated in the system by periodically filling and discharging the sound chamber. Normal and clinical syndrome heart sounds can be synthesized from the audible noise by selectively varying switching of the Coanda air bubble within the fluidic amplifier, the flow rate, volume, and wave shape of the air or other fluid filling into and discharging from the chamber in a predetermined manner by means of adjusting system parameters. The sounds so produced can be monitored and utilized in medical training programs relating to cardiovascular sound diagnosis.

3,732,632

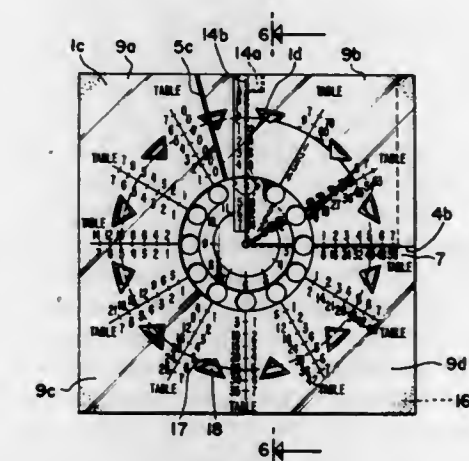
**TEACHING AID**

Charles A. Dyer, 711 Amsterdam Avenue, Apt. 16-I, New York, N.Y.

Filed June 18, 1971, Ser. No. 154,427  
Int. Cl. G09b 19/02

U.S. Cl. 35—31 A

5 Claims



A teaching aid mathematical calculator for adding, subtracting, multiplying, dividing, illustrating specific numbers divisible by a divisor, illustrating the remainder after division by any particular divisor, and in more complicated embodi-



ments, being set up for logarithmic or other relationships, the teaching aid typically and in one preferred embodiment including at least three separate sheets, the first two of which include slits from an outer edge to about at least their central portions, the two slit sheets being fitted together so that a wall of one extends through the slit of the other and vice versa, preferably with the slits at right angles to one another, and with a dial slide extending at least through an upper surface of one of the inserted sheets, with the third sheet being preferably in the form of a disk having a slit extending from about its center outwardly radially through the outer edge thereof, and being insertable between the first two sheets at a slit point of one of the sheets so as to be rotatable between the two sheets by manipulation of a dial system of apertures in the third sheet positioned to correspond to the rotary slot in at least one of the first two sheets, preferably the rotary slot extending through both of the first and second sheets, with numbers arranged in some mathematical relationship extending around the dial position and for each base number so located around the dial position additional numbers extending radially outwardly therefrom in accord with some mathematical relationship to the base number, and also the third disk sheet having also base numbers extending in some mathematical relationship around the dial position as base numbers, with additional numbers such as multiples thereof extending radially outward from each base number of the third sheet, such that by dialing specific numbers toward and to a zero point, for example, the numbers may be added, for example.

3,732,633

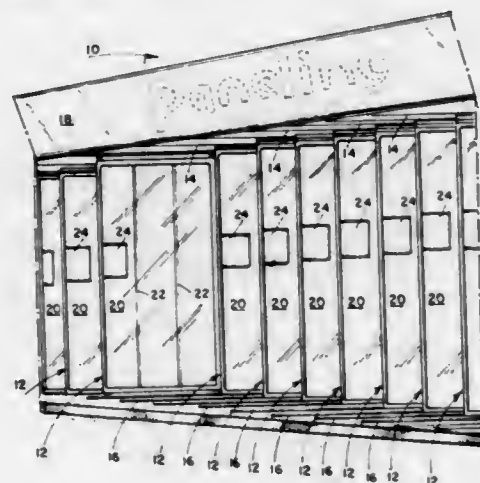
## SLIDING PANEL DISPLAY

Bern Margolis, Kew Gardens, and Irving B. Saunders, West Islip, both of N.Y., assignors to Ply & Gem Industries, Inc., Jamaica, N.Y.

Filed Sept. 14, 1971, Ser. No. 180,385  
Int. Cl. G09b 25/00

U.S. Cl. 35-55

7 Claims



A sliding panel display, or paneling exhibition apparatus, comprising a plurality of panels slidingly confined in a stepped array successively overlapping one another in generally and uniformly parallel relation. Each of the panels may be at least partially slidingly withdrawn independently relative to one another in parallel relation and each includes a reinforcing frame which acts to prevent edge distortion or warping of the panels. Each of the reinforcing frames is independently slidingly supported on respective tracks which act as guides for permitting the independent withdrawal of the framed panels relative to one another. The panels generally extend in vertical relation and in respective parallel directions mutually inclined relative to a vertical plane passing through a common point on each of the panels.

3,732,634

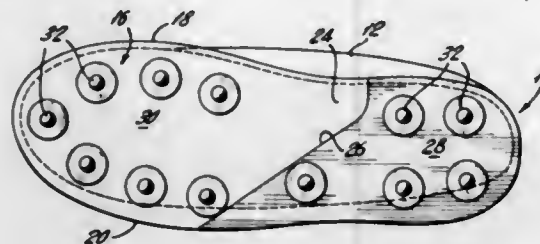
## SHOE CONSTRUCTION

Richard M. Jacobson, Sharon, Mass., assignor to Kayser-Roth Corporation, New York, N.Y.

Filed Sept. 9, 1971, Ser. No. 178,963  
Int. Cl. A43b

U.S. Cl. 36-2.5 AH

7 Claims



A shoe construction which retards and opposes rolling over toward the outer side of the shoe. An upper which is adapted to receive a foot is connected with a sole which extends beneath the upper. The sole has an inner flange extending longitudinally along the upper at an inner side thereof and an outer flange extending longitudinally along the upper at an outer side. These flanges extend between the toe and heel regions of the upper and they project beyond an exterior surface of the upper. The outer flange extends beyond the exterior surface of the upper to an extent greater than the inner flange so that the outer flange is wider than the inner flange to restrain a backward roll tendency.

3,732,635

## SKIING BOOT

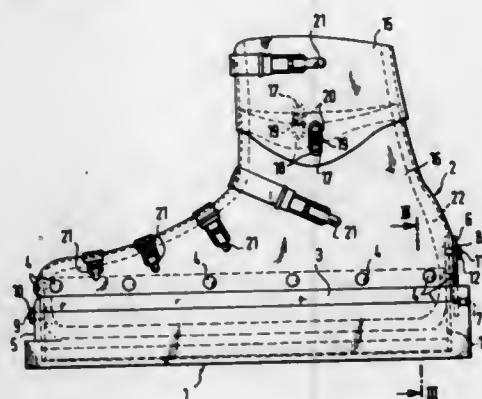
Hannes Marker, Hauptstrasse 51-53, Garmisch-Partenkirchen, Germany

Filed May 18, 1971, Ser. No. 144,486  
Claims priority, application Germany, May 20, 1970, P 20 24 573.2

Int. Cl. A43b

U.S. Cl. 36-2.5 AL

11 Claims



The boot comprises a virtually rigid sole and an upper which extends above the ankle of the foot. The upper is held to be angularly adjustable relative to the sole of the boot about an axis which extends in the longitudinal direction of the boot and is adapted to be fixed in any angularly adjusted position, and/or the upper portion of the upper is similarly held relative to the lower part of the upper.

3,732,636

## UNITIZED BODY STRUCTURE FOR EARTH MOVING APPARATUS

Howard E. Stuller, and Glenn E. Walser, both of Lubbock, Tex., assignors to Clark Equipment Company, Buchanan, Mich.

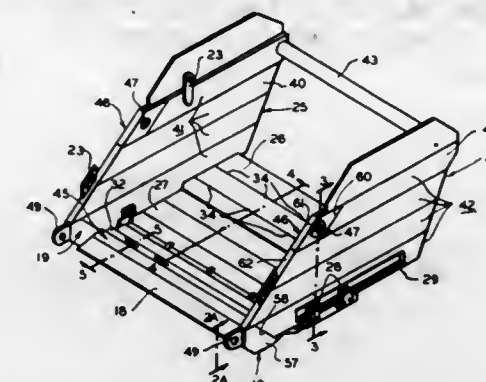
Filed Oct. 4, 1971, Ser. No. 185,986  
Int. Cl. E02f 5/00; B62d 27/00

U.S. Cl. 37-124

13 Claims

An earth moving apparatus, such as a self-loading scraper, where the scraper body, primarily the side walls, is made of

prefabricated panels constructed of rectangular tubes joined in side-by-side relationship by straight line fillet welds produc-



ing a high strength, rigid unitized body lending itself to automatic welding fabrication.

3,732,637

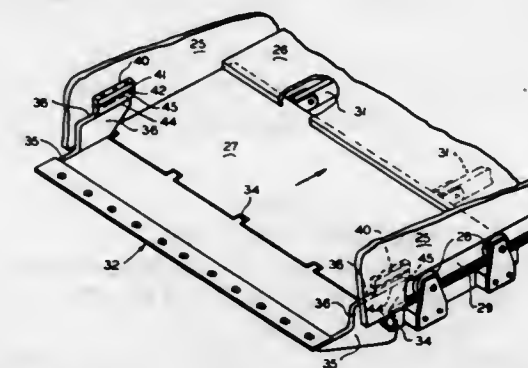
## INBOARD STRIKE-OFF BLADE ACTUATING MECHANISM

Franka D. Whitworth, Lubbock, Tex., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Oct. 4, 1971, Ser. No. 186,135  
Int. Cl. E02f 5/00

U.S. Cl. 37-124

5 Claims



An actuating mechanism for the strike-off blade of a self-loading scraper where the blade, hinged on the rolling bottom door, is raised and lowered by cam elements inboard of the scraper side walls as the door is moved.

3,732,638

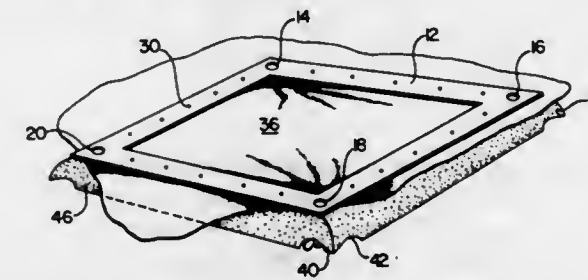
## SANDWICH EMBROIDERY FRAME

Hope Hanley, Parcellville, Va., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 17, 1972, Ser. No. 244,435  
Int. Cl. D06c 3/08

U.S. Cl. 38-102.91

7 Claims



An embroidering frame of the type adapted for supporting a portion of an embroidering canvas, so that the canvas threads are properly aligned longitudinally and laterally. The frame includes an upper template having studs extensible between the intersecting threads of the canvas, the studs then registering with apertures in a lower frame base, so as to align the canvas for embroidery work.

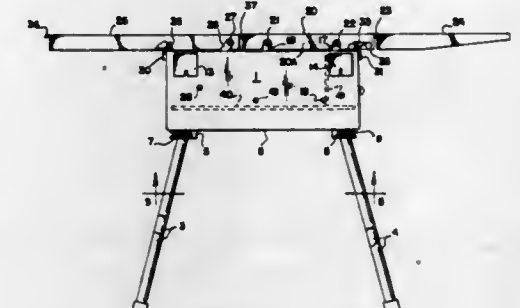
3,732,639

COLLAPSIBLE IRONING BOARD FOR TRAVELERS  
Ronald R. Elder, Eugene, Oreg., assignor to Harrison B. Webber, Deadwood, Oreg., a part interest

Filed June 22, 1972, Ser. No. 265,320  
Int. Cl. D06f 81/00

U.S. Cl. 38-139

8 Claims



An ironing board for travelers having foldable and positionable sections swingably mounted to a case for concealment therein during transport. A remaining ironing board section is positionable from its operative position into a case closing position. Latch means on the case retain the ironing board sections both in operative positions and in their collapsed configurations. Detachable leg structures and an iron may be stowed within the case for transport. Alternative means are provided for support of the case at a height convenient for ironing.

3,732,640

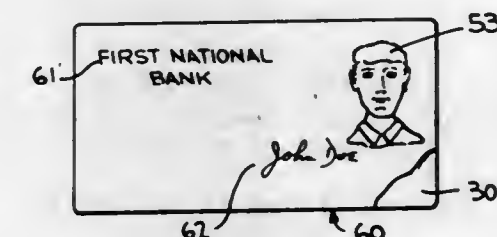
## INDIVIDUAL IDENTIFICATION DEVICE

Donald H. Changnon, Worth, Ill., assignor to U.S. Research & Development Corp., Des Plaines, Ill.

Filed Aug. 5, 1970, Ser. No. 61,150  
Int. Cl. G09f 3/02

U.S. Cl. 40-2.2

17 Claims



An improved individual identifying device (e.g., a credit card) comprising a support base (e.g., an opaque vinyl plastic plate), an individual identifying image (e.g., individual photograph and/or signature) imposed photographically with photosensitive ink on the support base, and a transparent protective cover (e.g., vinyl plastic) laid down (e.g., by laminating) over the image, wherein the support base and the image imposed thereon and the transparent protective cover are unified into an indivisible combination whereby any attempt to alter the photographic image would deform the identification device.

3,732,641

## TRIGGER SAFETY FOR HANDGUNS

Michael Adajian, East Hill Road, Canton, Conn.  
Filed Oct. 18, 1971, Ser. No. 190,341

Int. Cl. F41c 27/10, 17/02

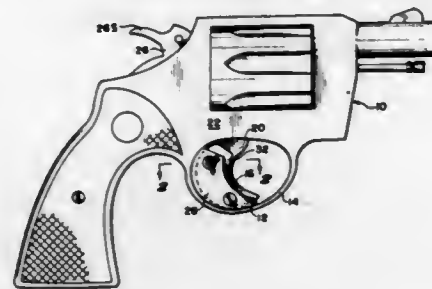
U.S. Cl. 42-1 Y

11 Claims

A trigger safety lock for firearms in which an insert fits in place between the guard and trigger at the rear of the trigger and within the confines of the guard as held in place by flanges



engaging the sides of the trigger to block trigger actuation. The insert presents a puzzle to the uninitiated as to its release,



yet for the initiated, is easily and quickly released and falls out of the way for immediate use of the firearm.

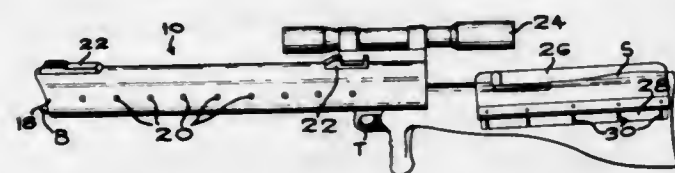
3,732,642

## DUAL SIGHT ATTACHMENT FOR A GUN

Charles W. Bray, 4466 Fillmore Street, Agnew, Calif.  
Filed May 12, 1971, Ser. No. 142,480  
Int. Cl. F41g 1/00, 1/38

U.S. Cl. 42-1 S

3 Claims



A dual sight attachment for a gun including a body member rotatably supported on the gun barrel enabling either of two sights to be brought into operative disposition.

3,732,643

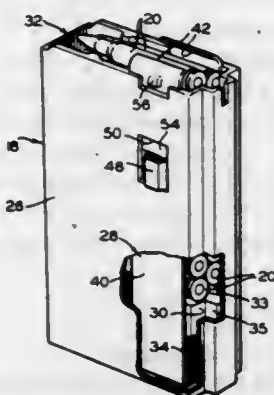
## CARTRIDGE MAGAZINE

Warren W. Wells, Slivis, Ill., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 17, 1968, Ser. No. 760,320  
Int. Cl. F41c 25/02

U.S. Cl. 42-50

10 Claims

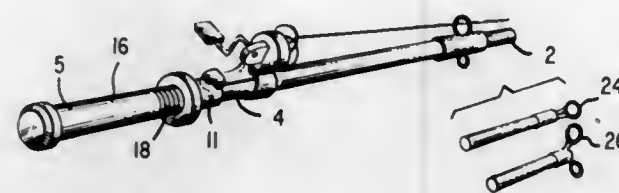


A cartridge magazine includes a case fabricated from plastic with an insert of metal installed therein to bear the high stresses applied to the magazine and the impact contacts of firearm structures therewith.

3,732,644  
FISHING ROD  
Arthur Kavanagh, 393 West Palmer Avenue, Morrisville, Pa.  
Filed Mar. 23, 1971, Ser. No. 127,272  
Int. Cl. A01k 87/04, 87/06

U.S. Cl. 43-22

1 Claim



An improved fishing pole is provided with means for selectively mounting a fishing reel at various locations spaced circumferentially and longitudinally along the pole. The pole may be provided with line guide means having eyelets of different sizes and designs circumferentially arranged along the intermediate length of the pole to correspond with the location of the associated reel. A unique tip line guide may be provided which may be stationary or of a swivel nature. The improved fishing rod of the present invention enables a user to employ a single pole with various different types of fishing reels for meeting the needs dictated by the different types of fishing and the different types of terrain encountered during a fishing trip.

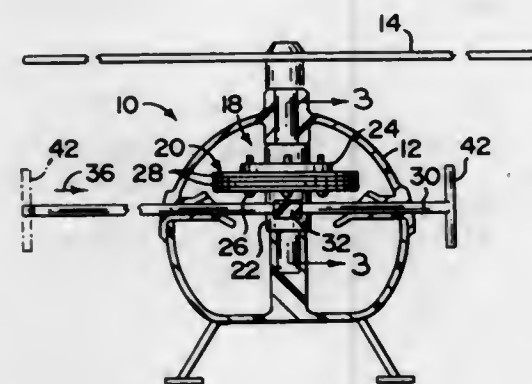
3,732,645

## FRICTION DRIVE TOY

Emanuel A. Winston, 871 Marion Avenue, Highland Park, Ill.  
Filed Mar. 31, 1971, Ser. No. 129,877  
Int. Cl. A63h 27/12

U.S. Cl. 46-75

8 Claims



A mobile toy of the type designed to move over a surface or through the air and comprising an energy storing rotary element in the form of a flywheel which, when set into rotational motion, provides energy to propelling means thereby causing movement of the toy. The flywheel includes a driving surface formed thereon and designed to movably engage a driving member in the form of an elongated, flexible shaft capable of at least partially surrounding the flywheel in cooperative relation to the driving surface. Guide means are provided to maintain the driving member in working engagement with the flywheel. Relative movement between the drive member and the flywheel causes rotation of the flywheel and movement of the toy.

3,732,646

## REFRIGERATOR DOOR CONSTRUCTION

Julius B. Horvay, and Earl H. Magester, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.  
Filed Dec. 23, 1971, Ser. No. 211,526  
Int. Cl. E06b 7/16

U.S. Cl. 49-487

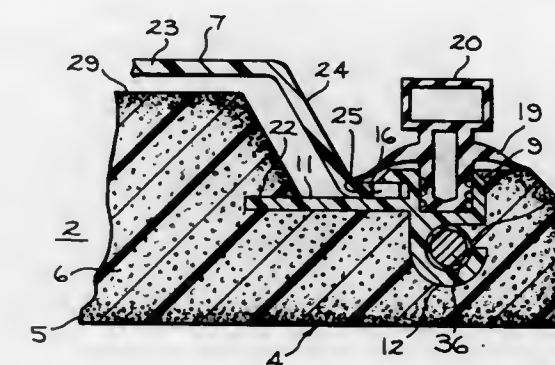
4 Claims

Robert L. Schaller, Camillus, N.Y., assignor to Sundstrand-Engelberg, Inc., Syracuse, N.Y.

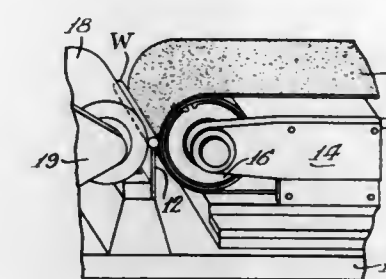
Filed Dec. 20, 1971, Ser. No. 209,683  
Int. Cl. B24b 5/30

U.S. Cl. 51-103 R

7 Claims



A refrigerator door for closing the access opening to a refrigerated cabinet comprising a smooth skinned foamed plastic body member forming the outer surface of the door, a liner forming the inner surface of the door and an insert molded into the body member having an exposed channel portion for receiving and anchoring the edges of the liner. The insert also preferably includes a hollow anchoring portion extending along one side of the body member, the ends of which receive a thimble forming part of the hinge structure for pivotally mounting the door on a cabinet.



A regulating wheel for backing up a tubular workpiece in opposition to a grinding wheel in a centerless grinding apparatus, including a drive shaft, a hub fixed on the drive shaft, a sleeve around the hub in spaced relation thereto and having a frictional work-engaging outer surface, resilient sealing rings around the hub at axially spaced positions and engaging the sleeve to define an annular fluid-tight chamber around the hub between the hub and the sleeve, conduit means through the shaft and the hub for supplying fluid under pressure to the fluid chamber to yieldably urge the sleeve to a position concentric with the hub, at least one radially disposed projection on the hub positioned loosely in a recess in the sleeve, to cause rotation of the sleeve with the hub while permitting radial movement of the sleeve eccentric to the hub, and snap rings in the sleeve engaging opposite ends of the hub to limit movement of the sleeve axially relative to the hub, whereby the sleeve on the rapidly rotating wheel is adapted to yield radially if the work is not precisely round.

3,732,647

## POLISHER-FINER MACHINE

Joe D. Stith, Muskogee, Okla., assignor to Coburn Manufacturing Company, Inc., Muskogee, Okla.  
Filed Aug. 5, 1971, Ser. No. 169,224  
Int. Cl. B24b 7/00, 9/00

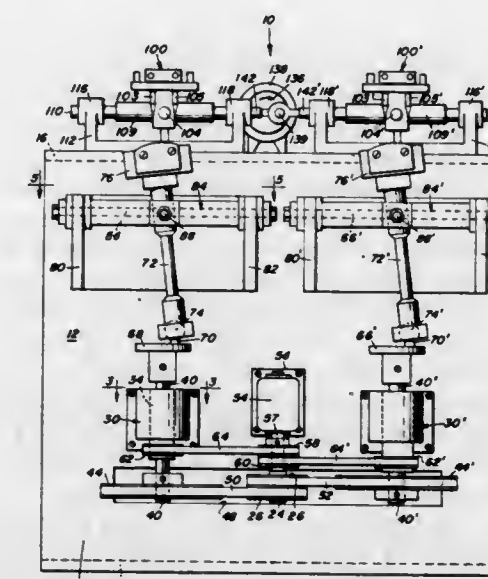
U.S. Cl. 51-54

12 Claims

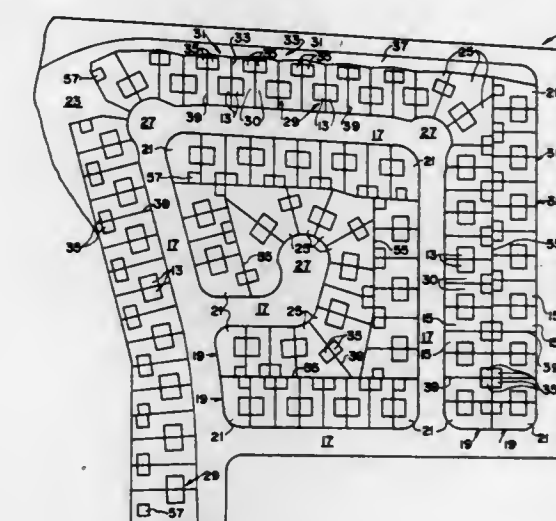
3,732,649  
BUILDING ARRANGEMENT  
Masud R. Mehran, P.O. Box 849, Livermore, Calif.  
Filed Mar. 12, 1971, Ser. No. 123,562  
Int. Cl. E04h 1/00

U.S. Cl. 52-169

3 Claims



An apparatus for engaging the lapping surface of a tool with a surface to be lapped by means of driving elements which cause a relative "break-up" motion between said surfaces.



A building arrangement wherein two adjacent house lots are provided with separate single family homes having separate house walls running along substantially the same portion of the common edge property line of the adjacent lots.



3,732,650

## PREFABRICATED EXTERIOR WALL UNIT

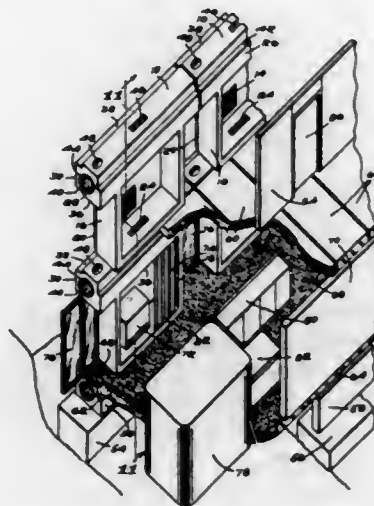
Willard E. Gwilliam, Plymouth; Carl S. Buchman, Sharon, both of Mass., and Robert Hall, West Haven, Conn., assignors to Universal Prestressed Concrete Co., Inc., Plymouth, Mass.

Filed Jan. 18, 1971, Ser. No. 107,331

Int. Cl. E04b 2/66

U.S. Cl. 52—221

10 Claims



A prefabricated exterior wall unit for use in constructing a multi-story building. The wall units are approximately one story high, are erected side-by-side and are stacked either in vertical alignment or offset. Each wall unit has an exterior panel, flanges extending inwardly from the panel side and bottom edges, and a horizontal top support member at the top of and extending inwardly from the exterior panel. The top support member has formed therein an air or water duct for communication with remotely located heating or cooling equipment. The wall unit is adapted to be enclosed with an interior door to house room heating and cooling units and to provide a storage area.

3,732,651

## FIBERGLASS SHOE FOR SANDING TOOLS

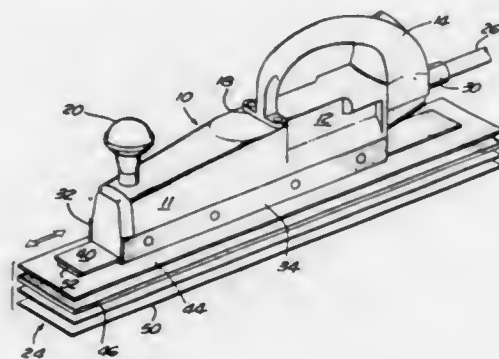
Harvey B. Rodstein, 6419 Shenandoah, Los Angeles, Calif.

Filed Sept. 9, 1970, Ser. No. 70,849

Int. Cl. B23b 23/04; B24d 11/02, 15/04

U.S. Cl. 51—358

2 Claims



A shoe for sanding and rubbing tools is made of laminations of fibre glass of predetermined thickness to provide the right amount of stiffness, flexibility and 100 percent memory. For orbital machines, a vinyl rubbing surface is bonded to the circular shoe with a peripheral edge part forming a tire bonded to the edge of the shoe.

3,732,652

## NON-WOVEN, SPONGE LAMINATED CLOTH

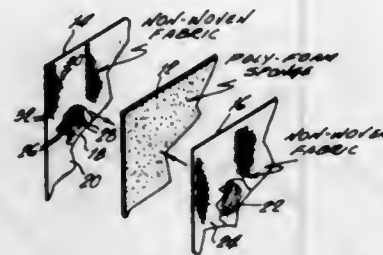
Henry P. Furgal, Barnardville; Pasquale J. Fallvenc, and Cesare N. Marchesani, both of Union City, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 14, 1971, Ser. No. 134,003

Int. Cl. B24d 11/00

U.S. Cl. 51—401

7 Claims



A heavy duty scouring cloth suitable for cleaning, dusting, or waxing, and especially adapted for use as a bathroom mat, table pad, or place mat, which includes an inner sponge layer laminated between outer non-woven fabric layers. The fabric layers are themselves formed of laminates of aligned fibers.

3,732,653

## BARRIER STRUCTURES AND CONNECTORS IN CONCRETE ASSEMBLIES

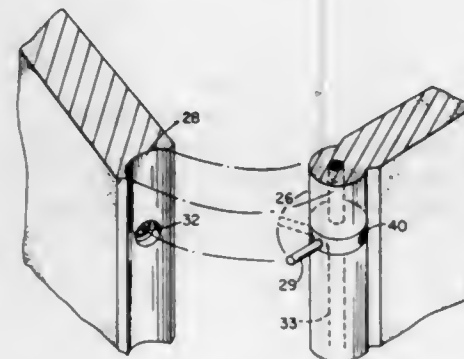
William H. Pickett, 44 Lake Road, Framingham, Mass.

Filed Apr. 10, 1970, Ser. No. 27,319

Int. Cl. E04b 17/14

U.S. Cl. 52—71

30 Claims



Permanent individual outdoor barrier members have a height to width ratio greater than two and a width to thickness ratio greater than 10. For many applications members are of precast reinforced concrete, between 5 to 8 feet high, 1 and 3 feet wide and three-quarters and 2 inches thick, joined at vertical edges with load-transferring self-adjusting joints. Other features of barrier members shown are: rotatable connections for absorbing expansion and contraction forces; wide range rotation for placement at various self-supporting angles; curved snug fitting, non-grouted sight-tight and load-transferring joints; stress transfer between reinforcement rods embedded in adjacent members; long walls without upright bracing or horizontal stringers, resting upon freezable ground without footings; push together, one-way fastening with female fasteners cast in the barrier members; joints formed by the members themselves and by intervening joint cylinders. Connectors enabling barrier construction and useful in other concrete assemblies employ a connector support embedded directly in but rotatable relative to concrete. It can be rotatable on and transfer stress directly to concrete reinforcement and have its surface conform to curved decorative or joint surfaces of the concrete member. The support can define a receiving slot for locking with a male connector, e.g., an extension of a reinforcement rod of another concrete member,

or it can carry a male connector. A female connector embedded in concrete provided with a yieldable void-producing member behind it receives male members, such as push-together male members of another concrete member.

3,732,654

## CYLINDRICAL STRUCTURE

Nariyoshi Tsurumi, Tokyo, Japan, assignor to Hitachi Shipbuilding and Engineering Co., Ltd., Osaka, Japan

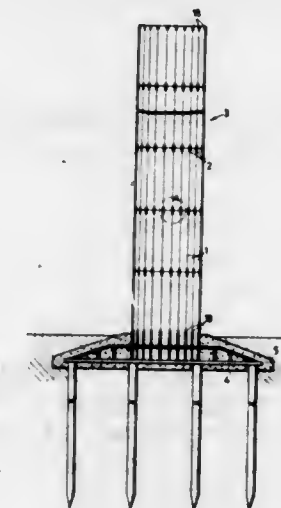
Filed Mar. 17, 1971, Ser. No. 125,171

Claims priority, application Japan, July 31, 1970, 45/67627

Int. Cl. E04c 3/06, 3/32

U.S. Cl. 52—245

7 Claims



Structural components are provided which are particularly suitable for assembling cylindrical structures such as chimneys. The components include an elongated beam having a generally H-shaped transverse cross section and a relatively short joint which also has a generally H-shaped transverse cross section. The beam includes longitudinally extending generally parallel flanges which are joined by a web portion, and each end of each flange is provided with longitudinal slots adjacent each side. The web may also be provided with a longitudinally extending slot at each end. The joint also includes spaced apart generally parallel flanges joined by a web portion. The structure is assembled by arranging a row of beams side by side and inserting the joints so that flanges thereof extend generally perpendicularly to the flanges of the beams and are received in the slots thereof. The joints may be secured to the beams, and thereafter another row of beams can be arranged end to end with the first row and joined thereto by the joints.

3,732,655

## SUSPENDED BUILDING CONSTRUCTION

David E. Termohlen, Atherton, and William G. Irvine, Cupertino, both of Calif., assignors to Daniel Aronson, Jr., Burlingame, Calif.

Continuation of Ser. No. 866,707, Oct. 15, 1969, abandoned.

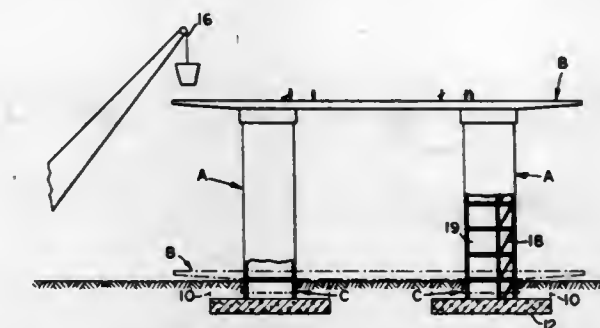
This application June 22, 1972, Ser. No. 265,113

Int. Cl. E04b 1/34; E04b 9/02

U.S. Cl. 52—73

5 Claims

A building is dependently supported from the top of at least one central pier or tower. At the topmost portion the pier is provided with girders which rest on top of the pier and span at their respective ends outwardly and immediately over the sides of the pier. The floors are dependently supported from the protruding girders at the top of the tower along hanger straps which are disposed immediately the sides of the pier. Floor supporting girders for each successive and depending



ing, and provide for pendulous movement of each of the floors with respect to the supporting pier to impart improved earthquake resistance to the structure.

3,732,656

## ROLL-UP CORRUGATED STEEL ROOFING SHEET MATERIAL

Eli I. Robinsky, 66 Lytton Boulevard, Toronto, Ontario, Canada

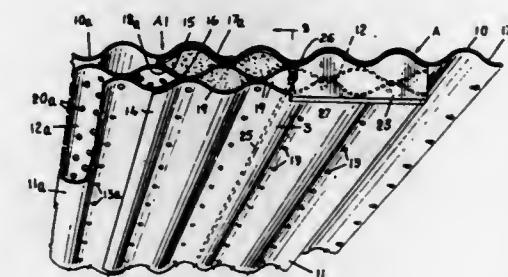
Filed Dec. 6, 1971, Ser. No. 204,875

Claims priority, application Canada, July 12, 1971, 117,912

Int. Cl. E04d 5/10

U.S. Cl. 52—108

9 Claims



A resilient corrugated building sheet having three or more plies of corrugated thin sheets secured together so that crests of one ply rests on the reverse crest of the contiguous ply, the crests of contiguous plies being the mirror image of each other thereby forming a plurality of open ended cells in parallel relationship. Each end of the cell is closed by an end plate, the end plates of each cell being interconnected by a tie to prevent displacement. The top ply is provided along one edge with an overhanging corrugation while the opposite edge is formed with a longitudinal socket. A plurality of sheets can be fitted together for roofing a building, a floor, decks for bridges, etc. For increased strength, the sheets can be formed in secondary corrugations and/or by filling the cells with a plastic material, formed in the cells or alternatively, with insulating material such as lightweight concrete.

3,732,657

## DEMOUNTABLE PARTITION ASSEMBLY AND STUDS THEREFOR

Nels Nelson, Des Plaines, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Oct. 5, 1970, Ser. No. 77,997

Int. Cl. E04b 2/78

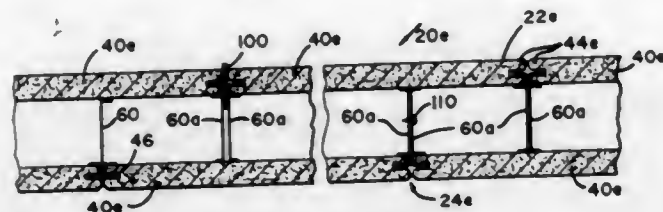
U.S. Cl. 52—241

13 Claims

A demountable partition assembly featuring two rows of partition members, such as wallboard panels, and floating studs, each stud of which interchanges only one row and abuts against, without interengaging, the other row. One form of the



stud interengages by a single flange a kerf in only one of the ribs defining a plurality of notches. At least one resiliently partition members, permitting selective accessibility to that deflectable fin element having a free end engaged within a



partition member. A reinforcing tab or flange is formed in the stud for abutting the back surface of the interengaged partition member.

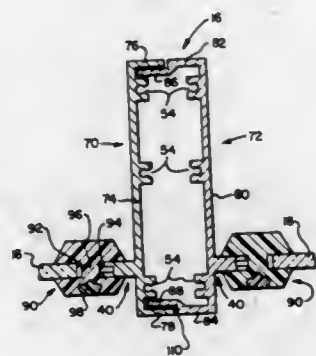
3,732,658

## STORE FRONT FRAMING SYSTEM

J. Thomas Sarvey, Lakewood, Ohio, assignor to The Standard Products Company, Cleveland, Ohio  
Continuation-in-part of Ser. No. 878,465, Nov. 20, 1969, abandoned. This application Sept. 24, 1971, Ser. No. 183,449  
Int. Cl. E04c 2/38, 2/46

U.S. Cl. 52—282

16 Claims



A system of standardized extrusions which may be utilized in framing systems for enclosing a wide variety of store front openings as well as other types of building wall openings. Each of the basic framing elements includes either a special gasket receiving flange or a spline receiving channel for cooperation with elastomeric panel mounting gaskets in sealing by retaining thin rigid construction panels in a desired mounted position. The system includes frame member elements for forming the framing system sills and jambs, divider elements for forming horizontal or vertical mullion structural members and adaptor clips for permitting various sizes of gaskets and glass panel combinations to be used with the system without the necessity for altering the dimension of the framing elements or the panel receiving flanges.

3,732,659

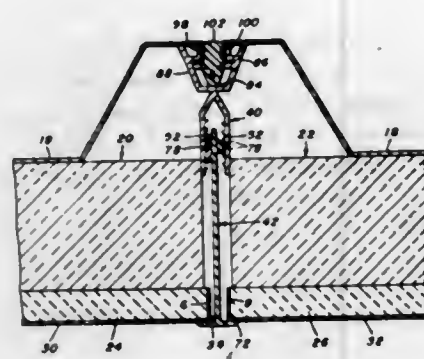
## ADJUSTABLE LOCKING ASSEMBLY

Robert L. LaBarge, Allegheny, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.  
Continuation-in-part of Ser. No. 128,920, March 29, 1971, abandoned. This application Apr. 27, 1971, Ser. No. 137,886  
Int. Cl. E04b 1/66

U.S. Cl. 52—461

19 Claims

An adjustable locking assembly having a female member provided with a base portion and a pair of spaced forwardly directed sidewalls, all cooperating to define a forwardly open channel. A male element, having a body portion and a locking portion, extending into the forwardly open channel. One of the elements having angularly transversely oriented resiliently deflectable fins and the other having a plurality of transverse



notch to establish locking assembly wherein separation of the male and female elements is resisted by resilient fin and notch engagement.

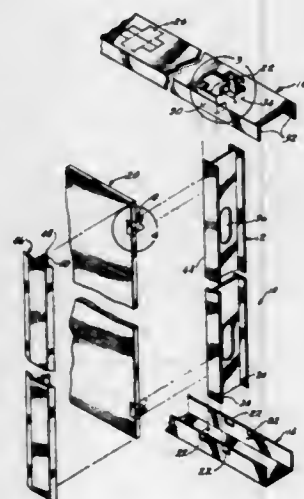
3,732,660

## NON PROGRESSIVE WALL CONSTRUCTION

George J. Byssing, 1549 Poppy Peak Drive, Pasadena, Calif.  
Continuation of Ser. No. 877,248, Nov. 17, 1969, abandoned.  
This application July 27, 1971, Ser. No. 166,422  
Int. Cl. E04b 2/82

U.S. Cl. 52—489

10 Claims



There is provided a non-progressive wall construction system inherently capable of being formed into a structure for supporting conventional rigid wallboards which attach to the support structure in any random fashion using interlocking clips.

3,732,661

## APPARATUS FOR MAKING A HEAT-SEALABLE BAG

Irving Goldberger, Island Park, and Murray Maltz, Brooklyn, both of N.Y., assignors to National Environmental Corp., Brooklyn, N.Y.

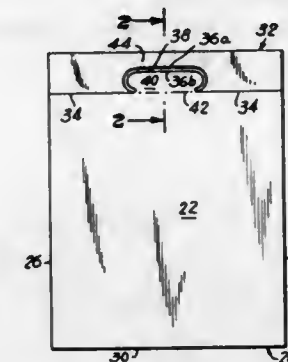
Filed Jan. 18, 1971, Ser. No. 107,290  
Int. Cl. B65b 61/14, 51/10; B65d 33/10

U.S. Cl. 53—134

3 Claims

An apparatus for manufacturing a bag comprising a heat-sealable thermoplastic sheet material and having an initially open end through which material is placed in the bag. The bag has a handle and is closed by heat sealing the initially open end thereof. The handle may be applied to the bag prior to the heat sealing thereof or the handle can be formed in the bag

simultaneously with the heat sealing thereof. The apparatus for sealing the bag and forming the handle therein includes a



support for the initially open end of the bag and a heat-sealing wire having a handle-forming portion for forming in the bag a handle simultaneously with the sealing of the bag.

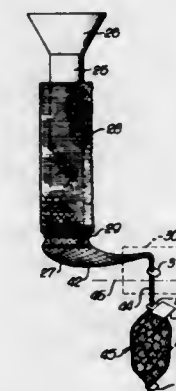
3,732,662

## METHOD OF FORMING, FILLING, CLOSING AND LABELLING TUBULAR NETTING BAGS

Floyd G. Paxton, P.O. Box 2098, Yakima, Wash.  
Filed July 30, 1971, Ser. No. 167,698  
Int. Cl. B65b 9/12

U.S. Cl. 53—14

3 Claims



Tubular netting is telescoped axially for storage purposes on a vertical hollow mandrel and is withdrawn from the lower end of this as needed in forming and filling bags. The method employs a label-bearing closure strip made of sheet plastic weakened transversely at intervals to facilitate its being divided progressively into a sequence of individual closures each of which is applicable to the tubular netting to close the same wherever the latter is bunched compactly in rope form. Alternate closures (even numbered) have cardboard labels about three inches square glued thereto. Odd numbered closures carry no labels.

A conventional plastic, label-bearing bag closure applicator is placed adjacent the lower end of the mandrel to facilitate feeding said closure-label strip to a convenient closure applying station.

The bag forming starts with the operator withdrawing a section of the tubular netting downwardly, bunching a lower end portion of this in rope form and closing it by applying closure number 1 thereto. A quantity of loose product suitable for net bagging is now introduced through the hollow mandrel into said closed bottom section of the tubular netting, and this section, so loaded, is spun in the hands to twist and bunch the netting in rope form for several inches just above the product. While so bunched, this portion of the tubular netting has applied thereto in rapid succession, and at points vertically spaced about two and one-half inches, closures numbers 2 and 3. The netting rope between these closures is then presented to a sharp blade mounted on one of the diverging guide plates of the applicator as the netting rope is withdrawn from the latter, after applying closure number 3, to sever said rope leav-

ing about three-quarters of an inch of the latter below closure number 3 and an inch and three-quarters of it above label-bearing closure number 2. The first netting bag formed and closed by the method is labelled by closure number 2 which also closes the top of the bag.

The method continues in like manner to divide the entire tubular netting into individual netting bags filled with loose product and closed at their bottoms by odd numbered non-label-bearing closures taken from said strip and at their tops by even numbered label-bearing closures.

3,732,663

## METHOD FOR PRODUCING CIGARETTE PACKAGES

Erwin Helmut Geldmacher, Tannenwaldallee 25, 638 Bad Homburg, Germany

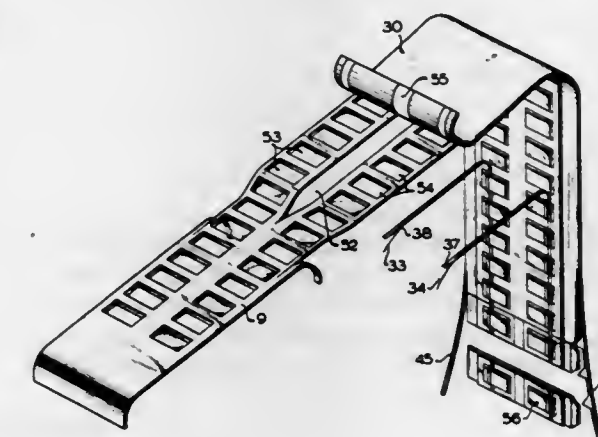
Filed May 6, 1970, Ser. No. 35,116

Claims priority, application Germany, May 8, 1969, P 19 23 588.2; Aug. 7, 1969, P 19 40 302.2; Aug. 7, 1969, P 19 40 312.4; Aug. 7, 1969, P 19 40 313.5

Int. Cl. B65b 19/02, 47/10; B65d 85/10

U.S. Cl. 53—14

22 Claims



The specification describes a method for the production of cigarette packages in which a first foil web of thermoplastic material, supplied from the supply roll, and having a width exceeding the length of the cigarettes to be packed, is pressed into troughs corresponding to the size of the cigarettes to be packed, cigarettes are placed in the troughs, a second flat web of foil supplied from a second supply roll is placed over the cigarettes to cover them and the webs are connected together. Following this the two webs are separated to form sections which constitute substantially complete packages. The shaping of the troughs accepting the cigarettes individually occurs in the one first foil web on a drum provided with molds which can be placed under suction.

3,732,664

## COLLATING AND INSERTING MACHINE CONTROL SYSTEM

Frank M. Blossom, Glen Ellyn, Ill., and John Silberbauer, St. Paul, Minn., assignors to The Reuben H. Donnelley Corporation, New York, N.Y.

Filed Mar. 25, 1971, Ser. No. 127,924

Int. Cl. B65b 57/16

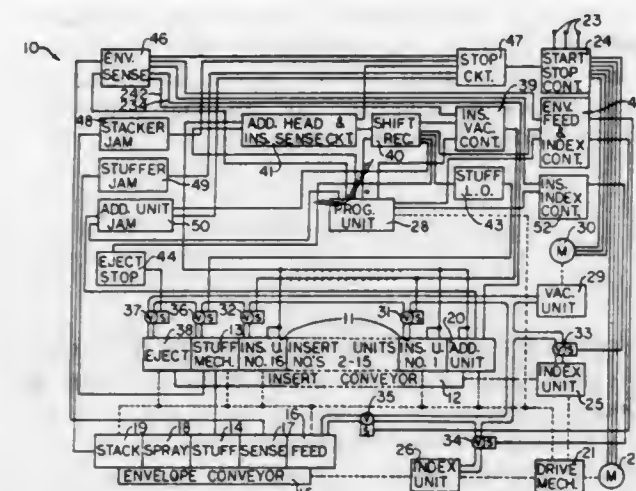
U.S. Cl. 53—57

29 Claims

Control system for a collating and inserting machine in which signals are produced from failures in the feed of addressed pieces, inserts, or envelope and are applied to shift register and logic circuitry to control the operation of feed and conveyor mechanisms in a manner such that random failures of feed mechanisms do not result in a defective final product or in a shut-down of the machine. After any such random



failure, any unnecessary succeeding operations are automatically locked out and any material accumulated from any incomplete operation is ejected. However, a counter for each



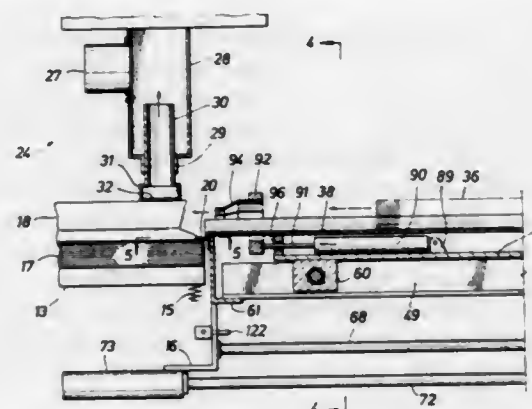
feed mechanism counts failures during consecutive cycles and the machine is automatically shut down when the count exceeds a certain number, determined by a selector switch for each feed mechanism.

### 3,732,665 PACKAGING APPARATUS FOR PACKAGING CONTINUOUS PRODUCTION OF A DISCRETE PRODUCT IN PREDETERMINED QUANTITIES

Robert W. Pitts, 7710 Barbenton, Houston, Tex.  
Filed Mar. 23, 1971, Ser. No. 127,309  
Int. Cl. B65b 57/10

U.S. Cl. 53-62

13 Claims



A packaging machine which incorporates a tray or trough which feeds continuous production of a discrete item to one of a pair of reciprocating trays, there being a gate and counter mechanism for determining the number of products on the reciprocating trays, one of the trays being loaded at a time. The gate closes to cut off additional products for one of the two trays which is then indexed to an out-of-the-way position to thereafter permit the counting and accumulation of products on the other of the two trays. For the tray which is indexed to the side, a ram mechanism drives all of the products off of the tray through a set of stuffing horns into an open container or bag. The machine includes a pair of bag openers which preferably cooperate with two stacks of closed bags. The topmost bag on each stack is opened. The ram drives the product into the open bag on one of the two stacks, and the filled bag is kicked from the table.

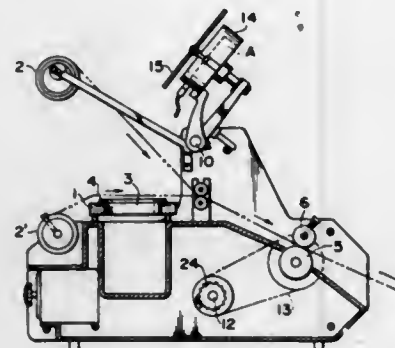
### 3,732,666 FILM PACKAGING MACHINE

Kei Nakamura, 183-99 Ohya Nishihirano Mikagesho, Higashinadaku, Kobe, Japan

Filed Jan. 6, 1971, Ser. No. 104,205  
Int. Cl. B65b 9/02, 51/30

U.S. Cl. 53-182

3 Claims



A film packaging machine which comprises a set of upper and lower roll sheets of synthetic resin, and a bed having a recess and disposed behind the roll sheets. The lower roll sheet passes along the bed, such as to cover the recess provided in the bed. A marginal elastic ring is disposed around the recess, and the lower roll sheet is adapted to put an article to be packaged over the recess. Means for passing upwardly the upper roll sheet above said bed are provided, to pile it upon the lower roll sheet at the back of the body. A feed roller and a press roller passes the pile therebetween. A cutter and a hot plate includes a cylindrical cutter on the outside and a ring-shaped hot plate on the inside, which constitutes a single body. A hand lever and a working shaft, the latter being turned back and forth by means of the hand lever. The working shaft interlocks with the cutter. Means are provided for conveying the upper and lower roll sheets backwardly upon lifting the cutter and the hot plate. An intermediate shaft is operated upon turning the working shaft. An interlocking device is arranged for transmitting the turning of the intermediate shaft of the feed roller. Means are arranged for pressing down the upper roll sheet upon moving downwardly the cutter and the hot plate. The upper roll sheet passes obliquely by the cutter and the hot plate, to wind back the upper roll sheet. Both the roll sheets are kept at rest without transmitting the turning of the working shaft to the intermediate shaft and, accordingly, to the feed roller by the free wheel fitted to the intermediate shaft. The upper roll sheet is piled upon the lower roll sheet for covering the article to be packaged. The cylindrical cutter and the ring-shaped hot plate cutting and heat-sealing simultaneously both roll sheets on the elastic ring, and the article is released out of the machine through the recess.

### 3,732,667 VACUUM CLEANER

Charles T. Fromknecht, and Martin E. Harbeck, both of Anderson, S.C., assignors to The Singer Company, New York, N.Y.

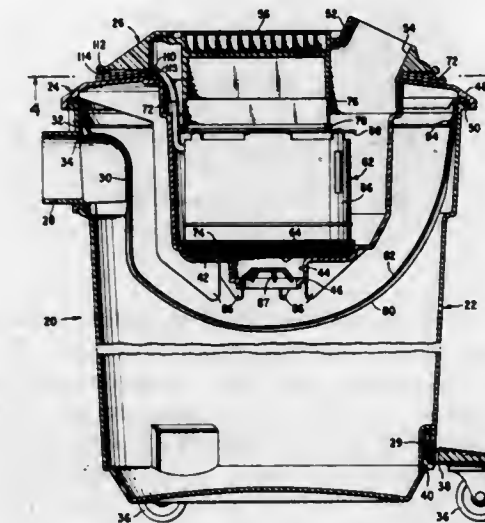
Filed Apr. 13, 1971, Ser. No. 133,655  
Int. Cl. B01d 46/02

U.S. Cl. 55-373

4 Claims

A vacuum cleaner including an open top dirt container having an air inlet located adjacent to the upper portion thereof and having a baffle mounted behind the suction inlet to direct the inlet air downwardly and circumferentially toward the lower walls of the container. A cover housing assembly is mounted in and removably secured to the upper peripheral portion of the dirt container by a pair of plastic latches having cam surfaces which snap over cooperating surfaces on the container. A top housing having a carrying handle and an ex-

haust port formed therein is secured to the cover housing by four screws to entrap the motor-blower unit and the latches therebetween. A peripheral slot within which the electric power cord of the motor-blower unit is adapted to be stored is formed between the peripheral edge of the top housing and the upper surface of the cover housing. The motor blower unit sits in a seat formed in the cover housing with its inlet commu-



nicating with the interior of the dirt container by means of an aperture formed within the seat, and has its discharge outlet in communication with the exhaust port of the top housing. Both a disposable paper filter and a cloth secondary filter may be mounted between the dirt container and the cover housing about the entire periphery thereof to prevent dirt from being drawn through the motor blower unit from the dirt container.

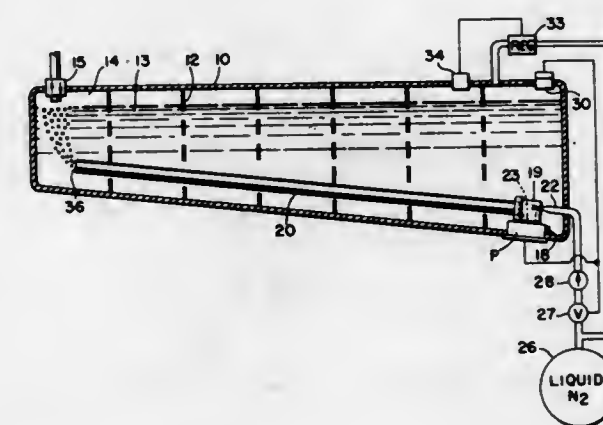
### 3,732,668 FUEL TANK INERTING SYSTEM

Richard A. Nichols, Santa Ana, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Feb. 24, 1971, Ser. No. 118,300  
Int. Cl. B01d 19/00

U.S. Cl. 55-160

8 Claims



A system for inerting aircraft fuel tanks comprising mixing of the fuel and an inert gas within a tube whereby the inert gas scrubs the fuel of oxygen dissolved therein and dilutes the same, the mixture being discharged from the tube into the fuel tank where the inert gas and the oxygen rise to the tank vapor space where a portion of the same may be vented to atmosphere but in any case the oxygen content in the vapor space is less than about 12 percent whereby flame and explosion cannot propagate within the tank.

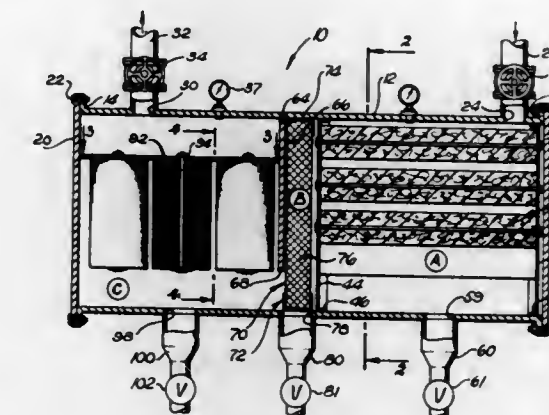
### 3,732,669 FUEL GAS SEPARATOR

R. William Chambers, Rialto, Calif., assignor to Separation and Recovery Systems, Inc., Santa Ana, Calif.

Filed Sept. 27, 1971, Ser. No. 183,832  
Int. Cl. B01d 50/00

U.S. Cl. 55-321

10 Claims



Apparatus for removing water, gasoline and solid particles from fuel gas as it flows therethrough, including a bank of filter cylinders for the removal of water and solid particles, a filter pad a baffle assembly for the removal of gasoline, and an assembly of non-wettable filter screens for the removal of additional solid particles.

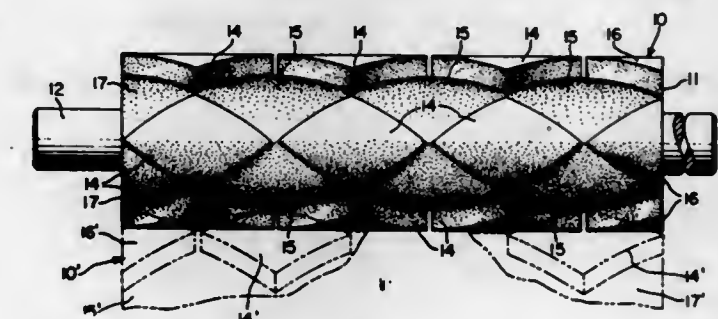
### 3,732,670 HAY CONDITIONER ROLL

Paul E. Milliken, Massillon, Ohio, and Larry L. Bell, Hanover Park, Ill., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 874,551, Nov. 5, 1969, abandoned.  
This application July 14, 1971, Ser. No. 162,553  
Int. Cl. A01d

U.S. Cl. 56-1

20 Claims



A molded rubber roll for use in conjunction with one or more additional rolls of similar construction on a hay conditioning machine. The roll has a plurality of circumferential rows of spaced apart radially outwardly extending lugs which intermesh with similar spaced apart lugs on a similar roll when a pair of such rolls are mounted in parallel relationship on a hay conditioning machine. The lugs may be of rectangular shape or may be molded in other shapes, such as diamonds, hexagons, parallelograms or X or L shapes. Some configurations may be made by molding the roll in one continuous length in its finished form. Other configurations may be made by molding or extruding a long length of axially ribbed stock having an axially splined center hole therethrough, then cutting the piece of stock transversely into separate segments and mounting the segments on a spline shaft with each segment being rotated circumferentially with respect to the adjacent segment so that the lugs of one segment are circumferentially offset from the lugs of the adjacent segment.



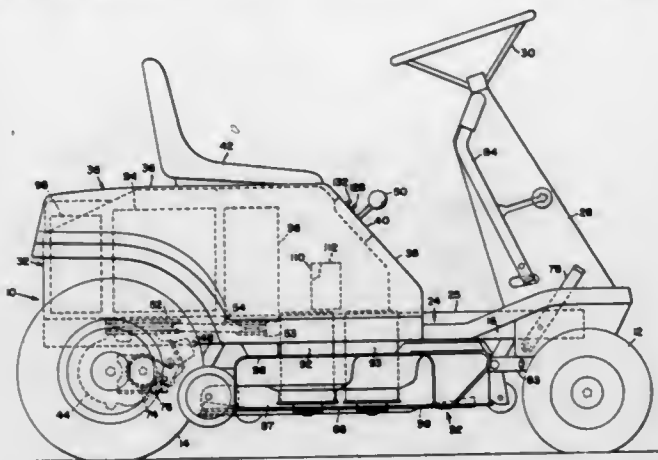
3,732,671

**ELECTRIC DRIVE RIDING MOWER**

David Thomas Allen, Horicon, Wis., and David Linley Apple, Coal Valley, Ill., assignors to Deere & Company, Moline, Ill.  
Filed Aug. 31, 1971, Ser. No. 176,603  
Int. Cl. A01d 69/04

U.S. Cl. 56—10.2

26 Claims



An electric drive riding mower has a mobile main frame mounted on a pair of rearward drive wheels and steerable front wheels and a rotary mower unit suspended from the main frame between the front and rear wheels. The drive wheels are driven by a direct current motor through a belt drive and a change speed mechanical transmission, and the mower unit includes a pair of rotary blades respectively driven and directly connected to a pair of direct current motors. The traction and mower motors are connectible to a series of batteries carried on the main frame through an electric control system, which includes a main switch and a mower switch actuable by the operator for controlling relays, which control the connection of the motors to the battery.

3,732,672

**STACK FORMING LOADER**

Raymond A. Adee, Newton; Dean P. Brooks, Hesston, and John Dale Anderson, Canton, all of Kans., assignors to Hesston Corporation, Hesston, Kans.  
Filed Oct. 22, 1970, Ser. No. 82,900  
Int. Cl. A01d 87/10

U.S. Cl. 56—13.3

4 Claims



A stacking implement picks the pre-cut crop off the ground, elevates the crop and blows it into a wagon. The crop is periodically compressed in the wagon, a crop-distributing deflector in the wagon is tilted in response to actuation of the compressor, and a stack unloading ramp is also raised and lowered by actuating the compressor.

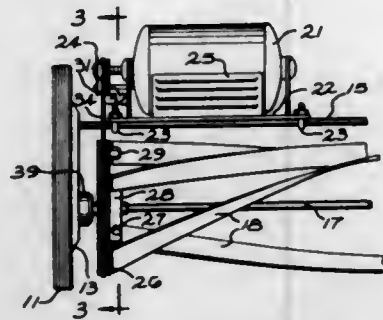
3,732,673

**MOTOR DRIVE FOR A LAWN MOWER**

Lucius A. Winn, Jr., 739 40th St., Oakland, Calif.  
Filed July 27, 1971, Ser. No. 166,362  
Int. Cl. A01d 55/20

U.S. Cl. 56—249

3 Claims



A motor is clamped on a fixed shaft extending between the wheels of a lawn mower. A belt is entrained about both a drive or first pulley on the motor shaft and a driven or second pulley on a rotary reel shaft that also extends between the wheels. An idler pulley is mounted on a shaft attached to the outer housing or frame such that the belt may be tightened by adjusting the clamp that secures the motor to the fixed shaft. The second pulley can be drivingly attached to the reel shaft by various means such as radial set screws disposed in a hub of the pulley and/or a protuberance formed on the pulley for cooperative engagement with the cutting reel of the mower to thereby turn the shaft and reel. Two unidirectional clutches (a right and a left) are arranged and oriented such that reel rotation in a forward direction will drive the wheels in a forward direction.

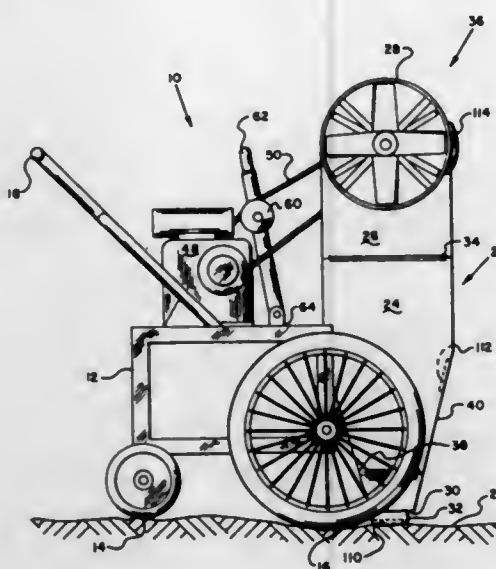
3,732,674

**ARTICLE SHREDDING MACHINE**

Calvin J. Gullory, 109 Avant St., West Monroe, La.  
Filed Apr. 14, 1972, Ser. No. 244,112  
Int. Cl. A01d 73/00

U.S. Cl. 56—13.1

7 Claims



An article shredding machine having new and novel means for guiding the articles to be shredded into the machine with means provided to pre-shred the articles prior to their introduction into the shredding mechanism. The improved shredding mechanism comprises a plurality of generally rectangular shaped blades rotating in juxtaposition to a plurality of generally rectangular shaped fixed blades. Also provided on the machine is a blower downstream of the shredding mechanism to blow the finely shredded particles away from the machine.

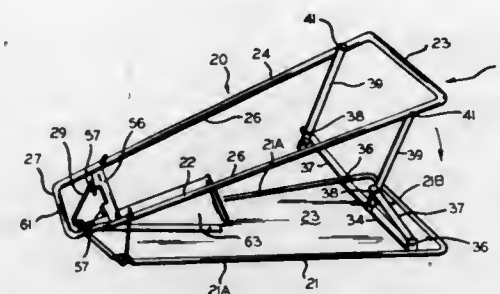
3,732,675

**CATCHER FOR ROTARY MOWER**

William H. Armstrong, Bloomfield Hills, Mich., assignor to Montgomery Ward & Co., Chicago, Ill.  
Filed Feb. 22, 1972, Ser. No. 227,818  
Int. Cl. A01d 35/22

U.S. Cl. 56—202

4 Claims



A grass cuttings catcher for a rotary type mower having a discharge opening consists of a pair of frames surrounded by a flexible shroud including means for securing one of the frames to the deck of the mower. The frame members and the shroud define a chamber for the storage of the cuttings. The shroud is provided with an end wall supported by the frame members and is formed from flexible material, including means for holding the end wall into position to the shroud. The catcher is supported as a cantilever from the mower deck, and the lower frame of the catcher is provided with a deflector causing the cuttings to be diverted upward within the chamber so as to fall to the lower part of the chamber at a point remote from the discharge opening of the mower. The catcher is also characterized by upper and lower frame members having a toggle connection therebetween whereby the catcher may be collapsed and stored readily.

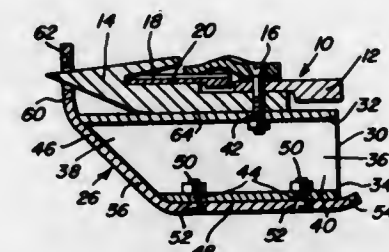
3,732,676

**GROUND ENGAGING SICKLE BAR SPACER**

Joseph P. Watson, Rt. 1, Box 43A, Elizabethtown, N.C.  
Filed Jan. 28, 1972, Ser. No. 221,539  
Int. Cl. A01d 55/10

U.S. Cl. 56—313

2 Claims



A readily attachable skid for a sickle bar and attachable to the latter with little effort generally centrally intermediate the opposite ends of the sickle bar. The skid or runner is dependently supported from the corresponding sickle bar and functions to maintain the central portion of the sickle bar at an elevation of at least three inches above the ground surface over which the lower portion of the skid or runner is moving. The skid is of a structure so as to be non-yielding and thereby eliminates sway and sag of the associated sickle bar and insures that the sickle bar will not have any of its cutting portions engaged with the ground due to slight irregularity in the ground surface or sag of the sickle bar.

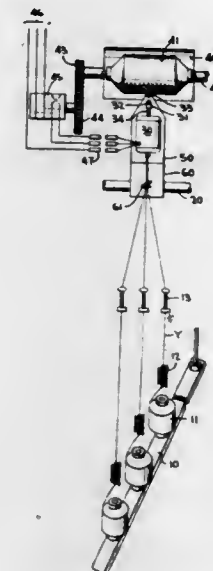
3,732,677

**YARN DUAL TWISTER AND DOUBLER**

Warren A. Seem, 2000 South Ocean Lane, North Wales, Pa.; Nicholas J. Stoddard, 307 Country Road, Berwyn, Pa., and Robert W. Stoddard, 1316 West Chester Pike, Apt. 12-H, West Chester, Pa.  
Filed Apr. 29, 1970, Ser. No. 32,875  
Int. Cl. D02g 1/04

U.S. Cl. 57—77.3

9 Claims



Disclosed is a textile yarn twisting apparatus consisting of a rotating hollow tube with a twist trapping device at one end thereof and means to periodically reverse the direction of rotation of said tube. The twisting apparatus may be positioned on the traverse mechanism of a yarn winding machine in close proximity to yarn take-up means, and serves to insert a measurable twist in the yarn. Disclosed is a method and apparatus for the insertion of a twist of alternately opposing directions in selected successive sections of textile yarn, while being advanced in a continuous process with or without the application of heat while under controlled tension. Also disclosed is a method and apparatus for producing a finished take-up package of yarn suitable for further handling or processing.

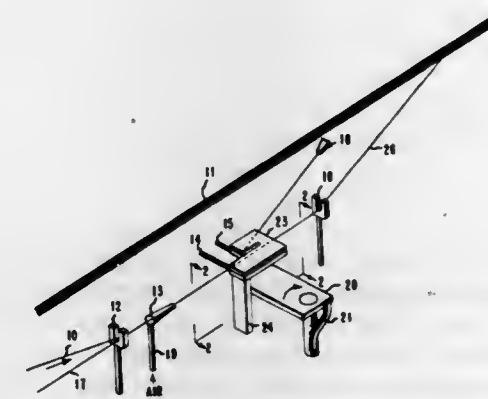
This abstract of the invention is furnished solely for the purpose of satisfying Rule 72(a).

3,732,678

**APPARATUS FOR JOINING FILAMENTS TO A TOW**  
Walter C. Berry, Jr., Staunton, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.  
Filed Nov. 4, 1971, Ser. No. 195,572  
Int. Cl. B65h 69/06

U.S. Cl. 57—22

2 Claims



An apparatus for merging a small bundle of continuous filaments into a moving tow of filaments. The filaments to be



added are merged and entangled by an air jet with a portion of the moving tow that has been temporarily separated from the main stream of the tow. After entanglement, the tangled mass strikes a guide which forces a movable support to give-way, allowing the loose end of the filaments to be added to be severed at a point close to the point of entanglement. This prevents the loose end from wrapping on a subsequent guide roll.

3,732,679

**WINDING APPARATUS FOR MAKING A WIRE HELIX**  
Hans-Ulrich Sohr, D-5408, Nassau, Lahn, Germany

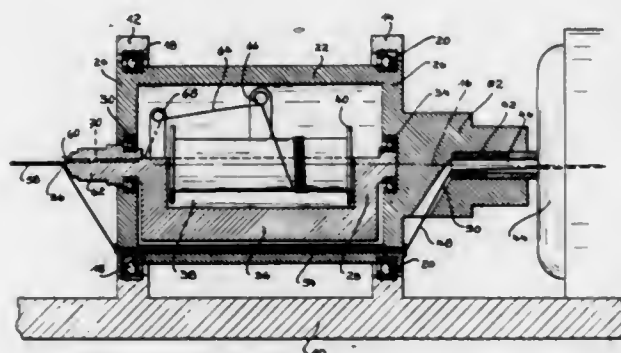
Filed May 14, 1971, Ser. No. 143,580

Claims priority, application Germany, May 14, 1970, P 20 23 560.3

Int. Cl. D02g 3/36; D02j 13/00

U.S. Cl. 57—34 HS

10 Claims



In an apparatus for making a wire helix by winding a wire about a mandrel by means of a rotating wire guide which withdraws wire from a storage reel, the mandrel is rotatably supported in the wire guide and has such a moment of inertia with respect to its axis of rotation that any torque transmitted by the rotating wire guide to the mandrel is insufficient to cause a revolving displacement of the latter.

3,732,680

**WIRE GUIDE FOR A CABLING MACHINE**

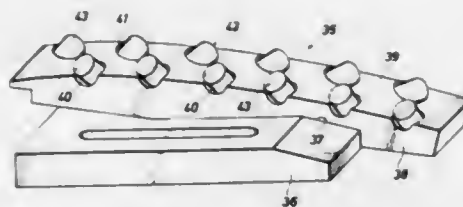
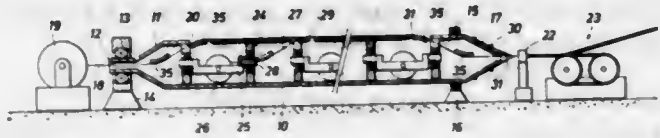
Miller M. Barrier, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Nov. 10, 1971, Ser. No. 197,326

Int. Cl. D07b 3/12

U.S. Cl. 57—58.34

6 Claims



In accordance with an illustrative embodiment of the present invention, a high speed tubular strander is adapted for making armored cable through the provision of roller guide assemblies that are fixed to the strander tube at stations where the core changes direction of longitudinal travel. Each guide assembly has rollers that engage the periphery of the core and function to impart thereto a component of lateral motion so as to drive the core in reverse rotation to that of the tube to eliminate undesirable twist in the finished cable.

**3,732,681**  
**OPEN-END SPINNING DEVICE WITH AN OPENING-UP ROLLER**

Gerhard Kutscher, and Rolf Wehling, both of Bremen, Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Germany

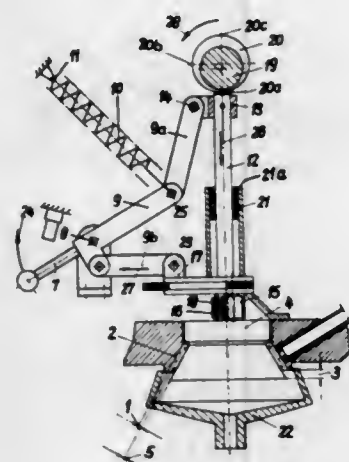
Filed Feb. 15, 1972, Ser. No. 226,627

Claims priority, application Germany, Feb. 23, 1971, P 21 08 481.1

Int. Cl. D01h 1/12

U.S. Cl. 57—58.95

11 Claims



An open-end spinning device with an opening-up roller, normally coaxial with the spinning turbine, for spinning staple fibers, according to which an axial adjustment of the opening-up roller can be effected while the spinning device is in operation, while an axial change in the cross section of the fiber conveying passage means is possible and the opening-up roller can be made accessible to the operator without disconnecting the opening-up roller from the device.

3,732,682

**METHODS OF AND APPARATUS FOR TWISTING AND STRANDING CABLE PAIRS IN A TANDEM OPERATION**

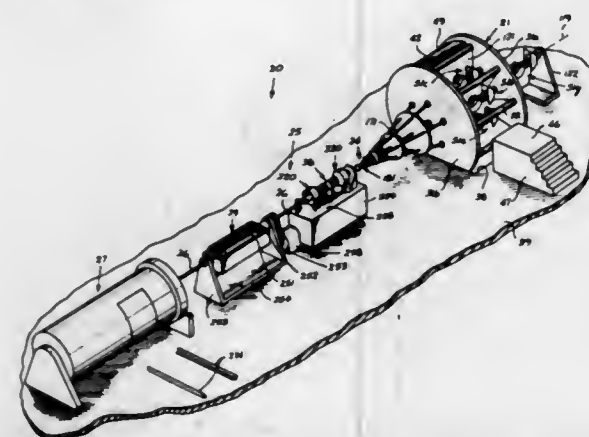
Francis N. Crotty; William C. Gause, and George E. Hartranft, all of Baltimore, Md., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed June 29, 1971, Ser. No. 157,947

Int. Cl. H01b 13/00, 13/04

U.S. Cl. 57—59

43 Claims



A twist is imparted in each pair of a plurality of pairs of insulated conductors for each revolution of an associated flier bow as each of the pairs pass over sheaves at opposite ends of the bow in a high speed twister. Each of the twisted pairs is passed from the twister along a predetermined path through an associated untwist-retwist device in which the twisted pair is untwisted by advancing successive sections of the individual conductors along separate paths and revolving the successive sections of the conductors being advanced along the separate paths about the predetermined path. Subsequent to the suc-

cessive sections of the individual conductors of each of the untwisted pairs being moved away from the associated untwist-retwist device, a double twist is imparted to each pair in a uniform distribution. The plurality of retwisted pairs are moved immediately into a strander to form a cable having a binding applied thereto to thereby retain the uniform distribution of twist.

3,732,683

**REGENERATED CELLULOSE FILAMENTS CONTAINING A FLAME-RETARDANT PHOSPHONITRILATE POLYMER AND AN ORGANIC PHOSPHATE SALT TO REDUCE FILAMENT TO METAL FRICTION**

Jay M. Feller, Wilmington, Del., assignor to FMC Corporation, Philadelphia, Pa.

Filed Mar. 25, 1971, Ser. No. 128,189

Int. Cl. C09k 3/28; D01f 3/12

U.S. Cl. 57—140 R

7 Claims

Regenerated cellulose filaments and filamentary articles wherein the filaments have dispersed therein a mixture of (1) a substantially water-insoluble, liquid, organic phosphonitriate polymer and (2) a substantially water-insoluble, organic phosphate salt, are disclosed herein.

3,732,684

**PRODUCT AND PROCESS**

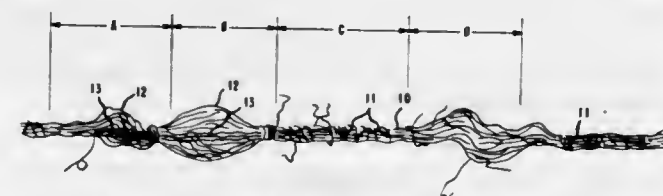
Tibor Cook, Chadds Ford, Pa., and Karl Franz, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 23, 1971, Ser. No. 118,032

Int. Cl. D02g 1/20, 3/04, 3/24

U.S. Cl. 57—140 BY

9 Claims



Novel fasciated yarns for the production of crepe fabrics are prepared from a combination of fibers of which from 1 to 40 percent by weight have an average shrinkage that is at least 5 percent above that of the average of the remaining fibers. These yarns exhibit a yarn shrinkage differential,  $\Delta S_{\text{yarn}}$ , of at least 5 percent and a standard deviation,  $\sigma$ , of at least 2.8 in short-term shrinkage variability.

3,732,685

**CLOCK MECHANISM**

Arthur W. Haydon, Middlebury, Conn., assignor to Tri-Tech, Inc., Westbury, Conn.

Continuation-in-part of Ser. No. 45,609, June 12, 1970, Pat.

No. 3,685,278. This application Apr. 3, 1972, Ser. No.

240,623

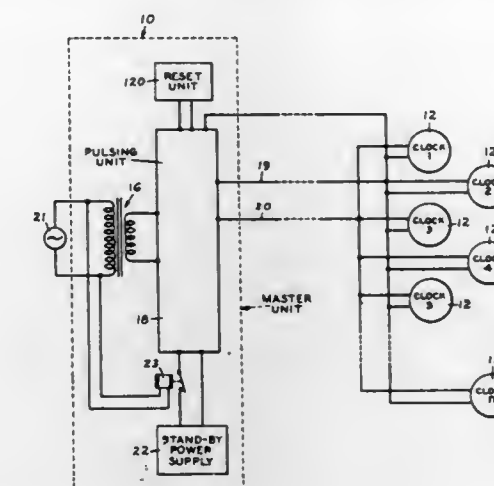
Int. Cl. G04c 11/04, 9/00

U.S. Cl. 58—26

21 Claims

A clock mechanism driven by a pulsed stepper motor and having planetary reduction gearing which provides a continuous but resilient connection between the motor and the minute hand of the clock at all times. The motor includes a permanent magnet rotor in direct driving relationship with the minute hand, and the rotor poles serve as a magnetic detent to hold the minute hand in discrete angular positions. The mechanism may be employed either in individual clocks or in the secondary clocks of a master-secondary clock system. In

these latter embodiments the secondary clocks additionally include a pair of switches respectively controlled by the minute



hand gearing and the hour hand gearing. The switches greatly facilitate the automatic resetting of the clocks in response to appropriate resetting signals from the master unit.

3,732,686

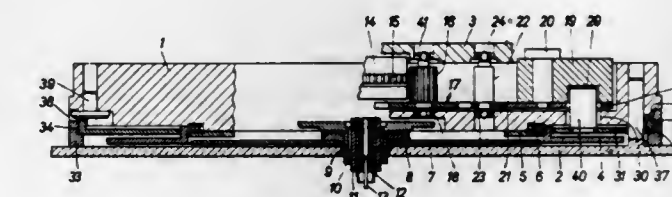
**WATCH MOVEMENT INCLUDING ALARM MECHANISM**  
Roland Zaugg, Grenchen, Switzerland, assignor to A. Schild S.A., Grenchen (Canton of Soleure), Switzerland

Filed Aug. 10, 1972, Ser. No. 279,298

Int. Cl. G04b 23/12

U.S. Cl. 58—57.5

8 Claims



A watch movement comprising an alarm mechanism provided with a vibrating membrane located above the bottom plate, characterized in that the vibrating membrane is an annular plate resting on a supporting ring which is fastened to the bottom plate and pressing against the dial.

3,732,687

**CALENDAR CORRECTION MECHANISM FOR TIMEPIECE**

Kenzi Miyasaka, Suginami-ku, Tokyo, and Hidetaka Tutiya, Akishima-shi, Tokyo, both of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Feb. 14, 1972, Ser. No. 225,962

Claims priority, application Japan, Feb. 17, 1971, 46/8285

Int. Cl. G04b 19/24

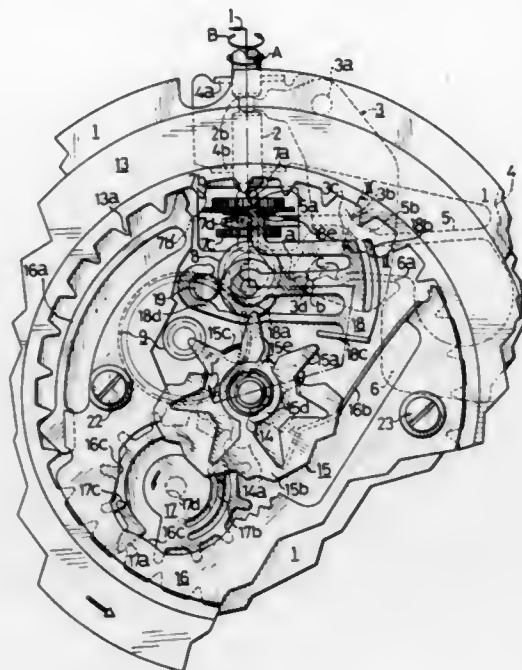
U.S. Cl. 58—58

7 Claims

A calendar display correction mechanism for a timepiece, comprising a manually operable and time-settable stem, a correction wheel adapted for being driven therefrom, a rotatable date calendar display dial, a rotatable day calendar display dial, first motion-transmitting means adapted for establishing a motion-transmitting relationship from said correction wheel to said date dial, second motion-transmitting means adapted for establishing a motion-transmitting relationship from said correction wheel through a day star wheel to said day dial, and mechanical switching means adapted for selective establish-



ment of either of said first or second motion-transmitting relationship responsive to the direction of rotation of said stem, said mechanism being characterized in that said correction



wheel is mounted on said stem for performing a unitary rotation therewith and that said mechanical switching means and said first and second transmission means are united into one and the same member.

3,732,688

## CONNECTING LINKS

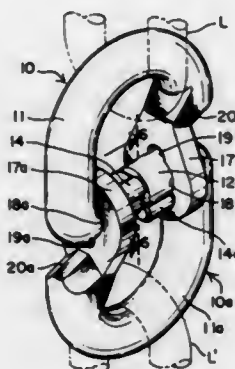
Tibor Horvath, 944 Avenue R, Brooklyn, N.Y.

Filed Feb. 22, 1971, Ser. No. 117,564

Int. Cl. F16g 15/04

U.S. Cl. 59—85

6 Claims



Identical, mating connecting links for chain each have a curved shank having ends terminating in an inwardly extending pintle and a plate containing a pintle receiving aperture. Each pintle has a lug formed on its inner end and each aperture has a keyway opening to receive a lug therethrough. The pintle of each link is driven through the plate aperture of the other link when the links are in a maximum folded position. When the lugs pass through the keyway apertures, the links are foldably connected with the inner end of the pintles butting each other and the lugs preventing inward sliding of the plates along the pintles.

### 3,732,689 COMPOUND DIESEL ENGINE OF ROTARY-PISTON TYPE

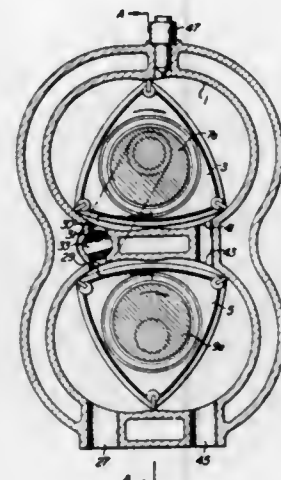
Hiroshi Tado, Suito, and Teruo Morimoto, Nagahama, both of Japan, assignors to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Filed May 24, 1971, Ser. No. 146,028

Int. Cl. F02b 41/02, 53/08

U.S. Cl. 60—15

1 Claim



A compound internal-combustion engine of rotary-piston type having two sets of juxtaposed rotary-piston engine units each including a housing with a bilobed epitrochoidal or approximately epitrochoidal inner surface and a substantially triangular shaped rotor rotatably mounted on an eccentric portion of a shaft journaled in said housing with the apexes thereof adapted to be moved in sliding contact with the inner surface of the housing. One of the engine units works as an internal-combustion engine and the other unit serves as a compressor. The shaft of the second unit runs in the same direction as that of the first unit but at twice the speed, and a rotary control valve is installed between the two units so that air compressed in the second unit is supplied synchronously to the rotation of the first unit.

3,732,690

### DEVICE FOR CONVERTING CALORIFIC ENERGY INTO MECHANICAL ENERGY

Roelf Jan Meijer, Emmasingel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

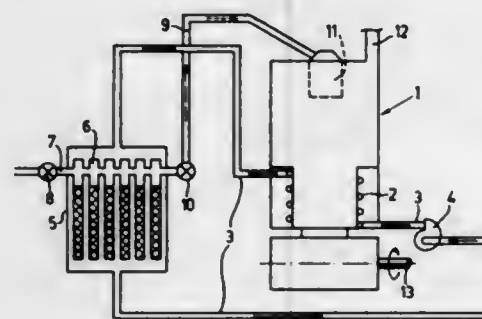
Filed Feb. 22, 1971, Ser. No. 117,503

Claims priority, application Netherlands, Mar. 6, 1970, 7003201

Int. Cl. F02g 1/00; F17c 11/00; F17d 1/04

U.S. Cl. 60—39.46

5 Claims



A device such as hot-gas engines, hot-gas turbine, and internal combustion engine for converting calorific energy into mechanical energy comprising at least one combustion

chamber for hydrogen and at least one cooler incorporated in a system of ducts for cooling medium; the combustion chamber can be made to communicate with a hydrogen container containing an alloy of A and B, in which the ratio A:B can vary from 1:3 to 2:17 in powder form, where A is Ca or one or more of the elements of the rare earths, combined with Th and/or Zr and/or Hf, and where B is mainly Ni and/or Co. The hydrogen container and a part of the system of ducts are constructed for heat exchange between the alloy in the hydrogen container and the medium in the system of ducts.

3,732,691

### METHOD AND APPARATUS FOR PRODUCING HIGH HYDRAULIC PRESSURE, PARTICULARLY FOR OPERATING A FORGING PRESS

Ernest Muller, Konigsberger Str. 18, Bad Breisig, Germany

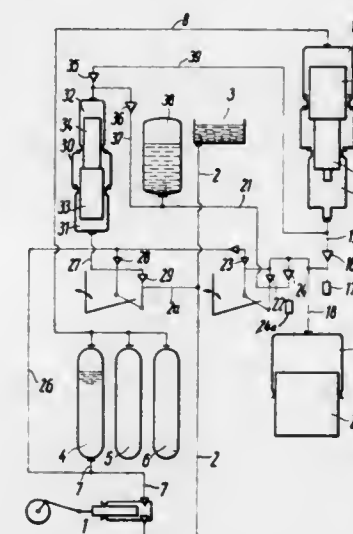
Filed Feb. 1, 1971, Ser. No. 111,182

Claims priority, application Germany, Mar. 19, 1970, P 20 13 120.8

Int. Cl. F15b 3/00

U.S. Cl. 60—51

9 Claims



A method for producing high hydraulic pressures for rapidly moving press pistons using a pressure transducer, for example, a piston of two distinct diameters moving in associated cylinders, comprises storing gas at high pressure in a storage container and feeding the high pressure gas to the pressure transducer during the operation thereof. The primary or large diameter part of the transducer is connected to a gas chamber under high pressure. The gas chamber is supplied with the gas at high pressure by a separate pump. The transmission ratio of the gas pressure to the liquid pressure in a pressure transducer varies between (1 to 2 and 1 to 5) 1:2 and 1:5. The apparatus includes an arrangement in which there is a second pressure transducer which is connected to the first transducer for effecting the return stroke thereof and which includes a secondary side which is in communication with the secondary side of the first transducer during the forward stroke thereof. During the return stroke, the secondary side of the second transducer is fed, for example, from an air vessel under pressure while the primary side is in communication with a high level pressure storage tank.

3,732,692

### ENERGY BEAM GENERATOR

Harold E. Norell, 9230 B Virginia Avenue, South Gate, Calif.

Filed Feb. 5, 1971, Ser. No. 113,004

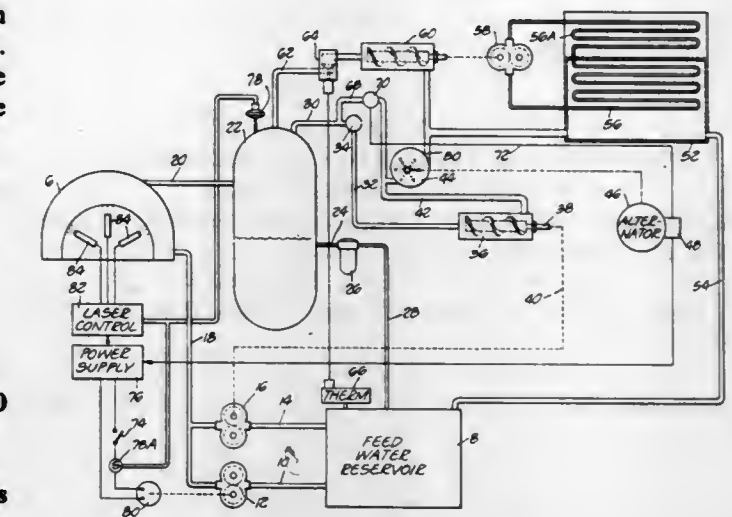
Int. Cl. F01d 13/02; F01k 21/00

U.S. Cl. 60—70

2 Claims

A power plant, particularly adaptable for vehicles including a closed recirculatory system for a liquid such as water, con-

vertible to a heated pressurized vapor, such as steam, wherein the liquid is vaporized by a light beam heat generator, such as a group of lasers or masers, which are directed against a



vaporizing chamber to produce steam without contaminating the atmosphere with products of combustion which result from the burning of fuels, such as gases and liquids.

3,732,693

### CONTROLLABLE SOLID PROPULSION SYSTEM

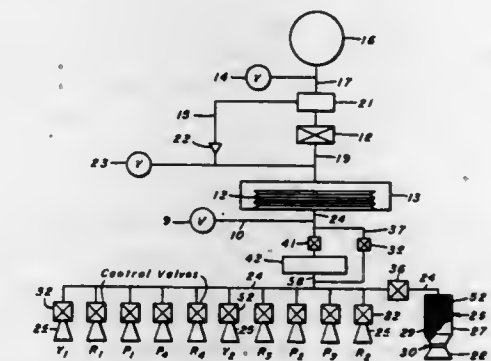
Ju Chin Chu, Post Office Box 3497, Orange, Calif.

Continuation-in-part of Ser. No. 677,920, Oct. 25, 1967, abandoned. This application Nov. 27, 1970, Ser. No. 93,359

Int. Cl. F02k 9/04

U.S. Cl. 60—207

15 Claims



A controllable solid propulsion system for aero-space vehicles, comprising a fuel in gel form contained in a collapsible bellows within a pressurizable fuel tank of small length-to-diameter ratio, means to pressurize the fuel tank and to force the fuel gel into the thrust chamber of a rocket motor containing a packed bed of granulated solid oxidizer. Reaction of the fuel gel and oxidizer provides propulsive reaction gases. The gel may be catalytically decomposed to gaseous reaction products for reaction with the oxidizer to provide increased thrust.

3,732,694

### METHOD FOR THE CATALYTIC DECOMPOSITION OF MONOPROPELLANT HYDRAZINE

Jack L. Blumenthal, Los Angeles, and Eugene D. Guth, Palos Verdes Estates, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jan. 18, 1968, Ser. No. 698,846

Int. Cl. C06d 5/04, 5/10

U.S. Cl. 60—218

6 Claims

This invention relates to a low cost spontaneous decomposition catalyst for hydrazine or mixtures containing hydrazine



hydrazine nitrate propellant fuels, which permits a low temperature ignition of the fuels and retains its activity after exposure to the propellant flame environment. The catalyst is produced by coating rhenium metal or a rhenium-molybdenum mixture on a support body such as alumina. Iron, nickel, copper, silver, gold, iridium, or ruthenium may be included as co-catalyst metals.

3,732,695

# METHOD AND APPARATUS FOR REDUCING ATMOSPHERIC POLLUTION

Gilbert Shaw, Middlebury, Vt., assignor to Gilbert Shaw Limited, Campbeltown, Argyll, Scotland

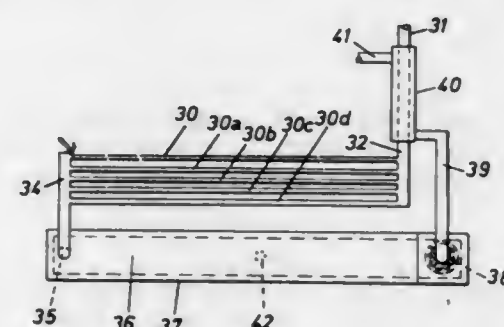
Filed Dec. 30, 1971, Ser. No. 214,235

Claims priority, application Great Britain, Jan. 9, 1971, 1,143/71

Int. Cl. F01n 3/02

U.S. Cl. 60—274

10 Claims



A process and apparatus for purifying the exhaust gases from an internal combustion engine wherein the exhaust gases are cooled through convection alone by means of ambient air in order to separate water of combustion and pollutants dispersed therein as an unseparated mixture from the residual exhaust gases followed by reheating the residual exhaust gases to prevent formation of an undesirable cooled exhaust gas blanket at road level.

3,732,696

# VEHICULAR AIR-POLLUTION PREVENTIVE

Kenji Masaki, Yokosuka City, Japan, assignor to Nissan Motor Company, Limited, Yokohama City, Japan

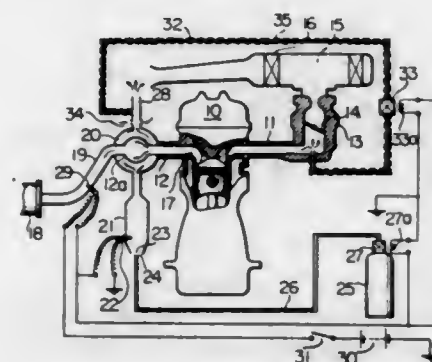
Filed May 5, 1971, Ser. No. 140,456

Claims priority, application Japan, June 2, 1970, 45/46866; Nov. 24, 1970, 45/102661; Nov. 24, 1970, 45/12662

Int. Cl. F02b 75/10; F02m 31/06

U.S. Cl. 60—274

28 Claims



Herein disclosed are arrangements for use in reducing concentrations of unburned hydrocarbons and carbon-monoxides contained in the exhaust gases from gasoline-powered internal combustion engines for motor vehicles especially during engine warm-up operation in which the unburned hydrocarbons

and carbon-monoxides are emitted in high concentrations due to the low temperatures of the engine exhaust gases and the engine cooling medium. Such arrangements are adapted to heat the engine exhaust gases when the exhaust gases and/or the cooling medium are maintained at temperatures lower than a predetermined level. The arrangements may be such that not only the engine exhaust gases but the engine cooling medium is heated concurrently yet independently, wherein only the exhaust gases may be heated if the temperature of the exhaust gases decreases under the predetermined level. Means may also be provided in combination with these arrangements so as to forcibly supply fresh air into the exhaust system for assisting in the re-combustion of the exhaust gases therein.

3,732,697

# WASTE DISPOSAL METHOD AND FACILITY

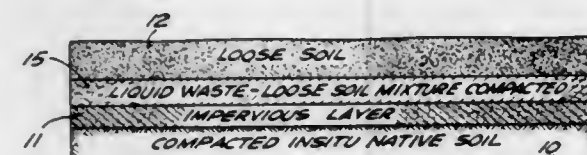
Rufus F. Dickson, 525 Arbolado Drive, Fullerton, Calif.

Continuation-in-part of Ser. No. 120,498, March 3, 1971, abandoned. This application Jan. 14, 1972, Ser. No. 217,737

Int. Cl. E02d 15/00

U.S. Cl. 61—35

11 Claims



The present invention relates to a waste disposal method and to a waste disposal facility.

3,732,698

# METHOD FOR STABILIZING SOILS AND ABATING ACTIVE SLIDES

Harpal S. Arora, Daly City, Calif., assignor to Edward D. Graf, Daly City, Calif.

Filed May 5, 1971, Ser. No. 140,624

Int. Cl. E01c 11/24; E02d 3/12, 3/14

U.S. Cl. 61—36 R

14 Claims

Stabilization of soil masses and abatement of active slides are accomplished by applying an aqueous solution, slurry or powder, of a chemical agent to the soil. The chemical agent is selected from ammonium, and mono, di, and trivalent metal salts of carboxylic acids, usually dicarboxylic acids of from two to six carbon atoms; ammonium and mono, di, and trivalent metal fluorides and polyfluorides; ammonium and mono, di, and trivalent metal fluoborates, fluosilicates and fluorophosphates; ammonium and alkali metal salts of phosphoric and polyphosphoric acids; sulfate salts of mono, di, and trivalent metals; cupric chloride; stannic (IV) chloride; and borate salts of metals.

3,732,699

# MINE ROOF SUPPORTS

James Gray Stevenson, Wigan, England, assignor to Gullick Dobson Limited, Wigan, England

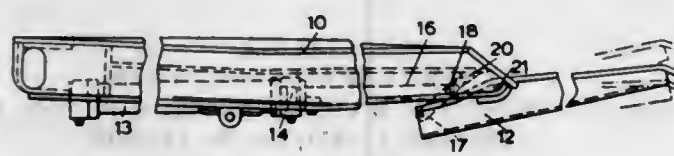
Filed Nov. 23, 1971, Ser. No. 201,444

Claims priority, application Great Britain, Dec. 2, 1970, 57,178/70

Int. Cl. E21d 17/02

U.S. Cl. 61—45 D

5 Claims



The invention is for a mine roof support comprising a roof engaging structure or canopy mounted on hydraulic prop

means and having an extension bar which can be advanced and set to the roof, following the passage of a mineral mining machine along the mineral face, so as to provide immediate roof support over the face conveyor and/or adjacent the coal face. A hydraulic ram for advancing the extension bar is connected to said bar by a lever device having a part which engages an abutment on the roof engaging member or canopy, at a predetermined amount of extension of the extension bar, so as automatically to cause the extension bar to tilt or move upwardly and be set against the roof by said advancing ram.

3,732,700

# UNDERWATER PIPELINE AND CABLE TRENCHING APPARATUS

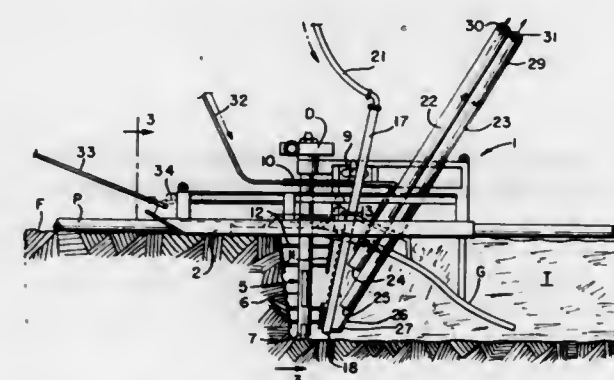
Robert P. Lynch, 5606 Farmwood Court, Alexandria, Va.

Filed Aug. 19, 1971, Ser. No. 173,161

Int. Cl. E02f 5/08, 16/1

U.S. Cl. 61—72.4

14 Claims



An underwater trenching apparatus includes a bottom-riding frame assembly provided with a rotary cutter member carried thereby. A plurality of vertical and horizontal rollers support and guide a pipeline above and adjacent to the cutting elements of the cutter member during advancement to the apparatus. Movable means are included to permit displacement of at least one of said rollers to allow lateral insertion or removal of the pipeline from within the confines of the plurality of rollers after the frame assembly is disposed upon the ocean floor in a straddling manner over the pipeline.

3,732,701

# UNDERWATER PIPELINE TRENCHING APPARATUS

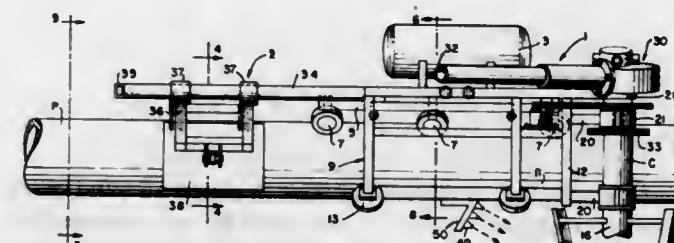
Robert P. Lynch, 5606 Farmwood Court, Alexandria, Va.

Filed Aug. 19, 1971, Ser. No. 173,160

Int. Cl. E02f 5/02, 1/00

U.S. Cl. 61—72.4

11 Claims



A pipeline trenching apparatus includes a carriage adapted to travel along the periphery of the pipeline. Rotary cutter drums advance with the carriage and are mounted upon frame elements pivotally attached to the carriage. Advancement of the apparatus is achieved by a reciprocating propulsion section connected to the carriage and provided with clamping elements alternately engaging and releasing the pipeline as the propulsion section is extended and retracted.

3,732,702

# COOLING COSMETIC CABINETS FOR BATHROOM

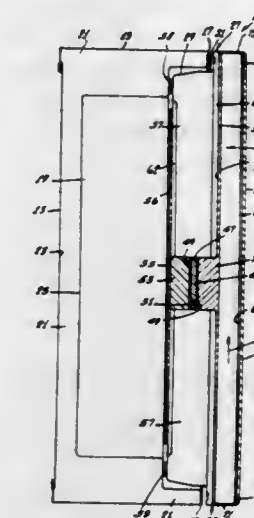
Kurt M. Deach, Adalbert Stifterstr. 3, Traunstein, Germany

Filed Dec. 22, 1969, Ser. No. 887,078

Int. Cl. F25b 21/02

U.S. Cl. 62—3

5 Claims



A cosmetic cabinet incorporating a Peltier cooling unit in the door thereof, the cooling unit removing heat from the interior of the cabinet and dissipating heat by means of a finned heat dissipator arrangement having a plurality of elongated vertically disposed cooling fins, the cabinet also incorporating a mirror at the outer surface of the cabinet's door, the rear surface of the mirror being adjacent the cooling fins whereby the mirror absorbs a portion of the heat dissipated by the cooling fins and prevents fogging of the mirror's outer surface.

3,732,703

# AIR CONDITIONING PLANT FOR BUILDINGS

Lars Vilhelm Nordstrom; Anders Johan Nilsson, both of Goteborg; Mats Erik Nilsson, Vasteras, and Sven Roland Persson, Vastra Frolunda, all of Sweden, assignors to Rinipa AB, Karnvedsgatan, Gotesborg, Sweden

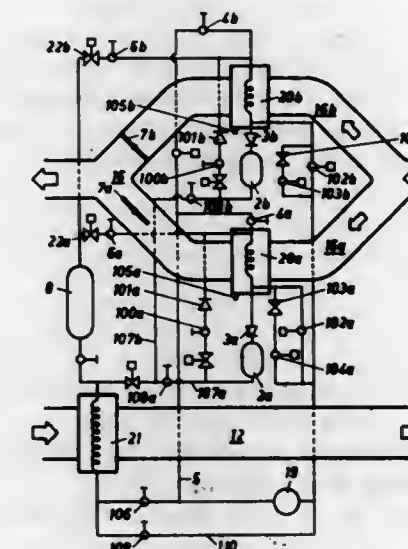
Filed June 28, 1971, Ser. No. 157,319

Claims priority, application Sweden, June 29, 1970, 8937/70

U.S. Cl. 62—324

Int. Cl. F25b 13/00

6 Claims



An air conditioning plant for a building basically contains one conduit for admitting air to the building and a further conduit for evacuating air therefrom. The heat applied to the in-



coming air largely remains in the out-going air, or may even on occasion have been increased. This heat content may be transferred back to the inlet air conduit by means of a heat pump having at least one heat exchanger in each conduit. A major problem in an installation of that type is the need for defrosting the evaporating heat exchangers in the exhaust conduit. This problem is solved by providing two heat exchangers in parallel in the exhaust conduit and arranged in such a manner that they will become operative alternately, one serving as evaporator, while the other is being defrosted. By suitable connections, the function of the two types of heat exchangers may be switched, whereby the exchanger in the inlet conduit, instead of working as a condenser, will serve as an evaporator, thereby to cool the in-coming air.

3,732,704

# REFRIGERATION SYSTEM INCLUDING REFRIGERANT METERING MEANS

Robert D. Morgan, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

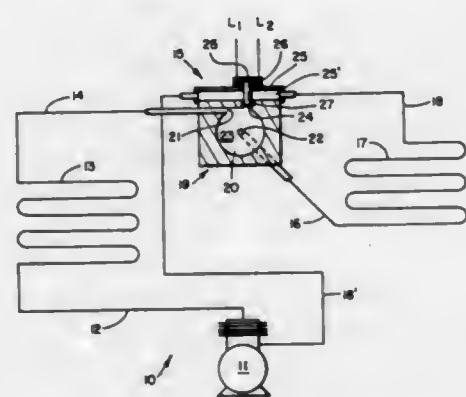
Filed Mar. 3, 1971, Ser. No. 120,573

Int. Cl. F25b 41/04

U.S. Cl. 62-202

3 Claims

perature duct air to effectively preclude condensation of moisture on the surface thereof confronting the chamber.



A refrigeration system including a refrigerant expansion or metering device. The system includes a compressor, a first heat exchanger and a second heat exchanger, the metering device being disposed between the first and second heat exchangers. The device includes a vortex chamber through which refrigerant is passed. Disposed within the vortex chamber is a heat sensitive plunger operable to vary the path of flow and to vary the rate of flow through the vortex chamber. Refrigerant is passed in heat transfer relation with the plunger which has a source of heat associated therewith. As the quality of the refrigerant varies, so does the heat transfer rate between the refrigerant and plunger.

3,732,705

# REFRIGERATION APPARATUS CONDENSATION PREVENTION MEANS

Wilfred W. McCullough, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 1, 1971, Ser. No. 203,556

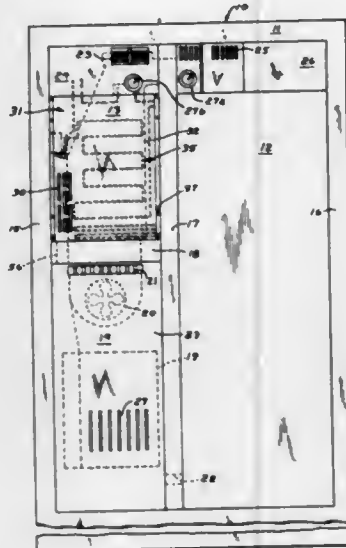
Int. Cl. F25d 21/06

U.S. Cl. 62-275

10 Claims

A refrigeration apparatus having wall means defining a chamber to be refrigerated. The chamber is refrigerated at least at times to an above-freezing temperature. A duct for conducting low temperature air is spaced adjacent the wall

means of the chamber externally thereof and means are provided for preventing chilling of the wall means by the low tem-



3,732,706

# ROTARY COUPLING

Reginald Evans, 20 13th Avenue, Edenvale, Transvaal Province, Republic of South Africa

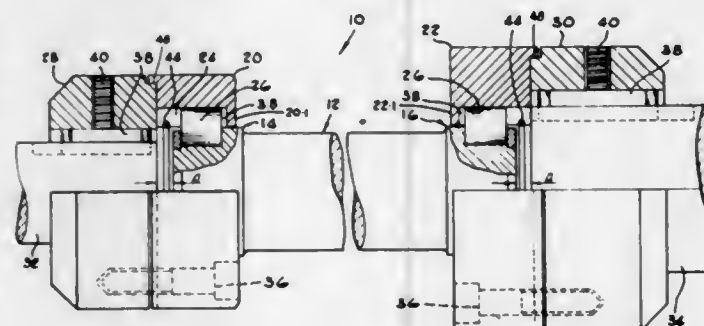
Filed July 14, 1971, Ser. No. 162,539

Claims priority, application Republic of South Africa, July 20, 1970, 704971

Int. Cl. F16d 3/50

U.S. Cl. 64-31

9 Claims



A rotary coupling of the spacer type in which an axial space between two aligned shafts is occupied by an intermediate member generally co-axial with the shafts. Two part outer rings surround the ends of the intermediate member, one part of each ring and the ends being formed with facing recesses which together define cavities in which captive driving elements are located. The other parts of the outer rings are releasably secured to the shafts and when the ring parts are released from one another the recessed ring parts can be moved towards one another over the intermediate member to enable the recessed ring parts and the intermediate member to be removed. The driving elements can be cylindrical and of self lubricating material.

3,732,707

# WEFT SUPPLYING DEVICE FOR A WARP KNITTING MACHINE

Stefan Furst, Moenchengladbach, Germany, assignor to Walter Reiners, Moenchengladbach, Germany

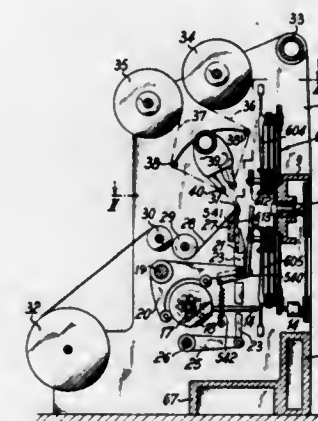
Filed Oct. 30, 1969, Ser. No. 872,705

Claims priority, application Germany, Nov. 2, 1968, P 18 06 505.9

Int. Cl. D04b 23/12

U.S. Cl. 66-84

5 Claims



Warp knitting machine having a zone wherein needles are disposed and means for supplying warp threads to the needles includes a device for filling a weft having first holder members for making the weft ready outside the needle zone, means for guiding the weft to the warp threads comprising a thread guide cooperating therewith for making the weft ready, the thread guide being displaceable in a closed travel path, means for feeding a plurality of wefts selectively to the thread guide for entrainment thereby in the closed travel path thereof, the thread guide having a clamping member for individually gripping the thread for each weft, second holder means located adjacent the travel path of the thread guide and adapted to receive from the latter the weft gripped by the clamping member, and a severing member coordinated with the first holder members for cutting into predetermined lengths the weft to be made ready, the severing member being connected to the displacement thread guide.

3,732,708

# KNIT PILE CARPET FABRIC

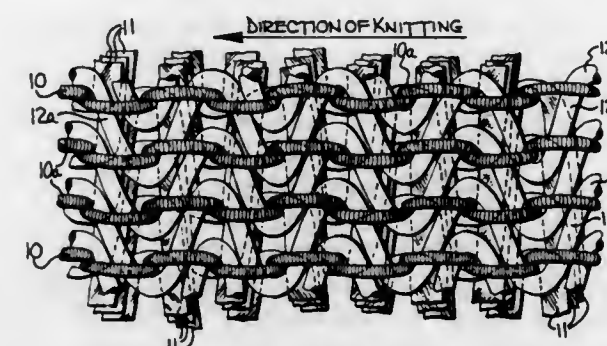
James E. Troy, Eden, N.C., assignor to Fieldcrest Mills, Inc., Eden, N.C.

Filed July 21, 1971, Ser. No. 164,526

Int. Cl. D04b 9/14, 21/02, 23/08

U.S. Cl. 66-191

4 Claims



A warp knit pile fabric and method of making the same wherein a base fabric is formed from spaced rows of warpwise extending chain stitches interconnected by laid in weft yarns, and through which chain stitches pile yarns are looped in overlying relation to the laid in weft yarns. Ribbon-like strands of plastic film material are utilized for forming the weft yarns and/or the chain stitch yarns, with all such ribbon-like strands being provided by slitting respective sheets of plastic material concurrently with the knitting operation.

3,732,709

# LOCK MEANS FOR RELATIVELY SLIDABLE CLOSURES

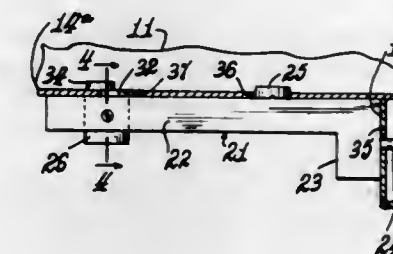
Clarence H. Kneebone, 945 Wayne Avenue, Deerfield, Ill.

Filed Jan. 20, 1971, Ser. No. 107,952

Int. Cl. E05b 65/08

U.S. Cl. 70-90

10 Claims



Lock means for slidable by-pass closures, such as doors and windows, comprised of a body adapted to be locked onto one of said closures in position to be abutted by the other closure.

3,732,710

# LOCKABLE STEERING COLUMN ASSEMBLY

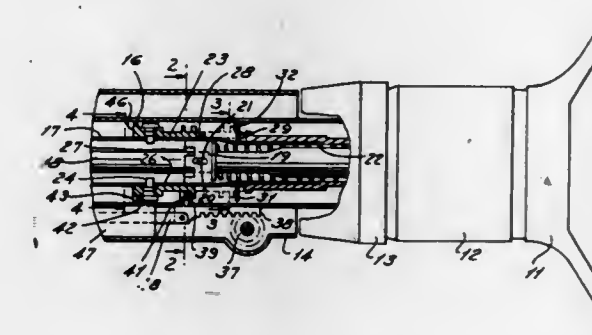
Alex Rhodes, Detroit, and James Rose, St. Clair Shores, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 25, 1971, Ser. No. 156,782

Int. Cl. B60r 25/04; E05b 65/12

U.S. Cl. 70-239

9 Claims



A lockable steering column assembly for an automotive vehicle including a steering shaft, a shift tube positioned about the steering shaft and an outer tube secured to the body of the vehicle enclosing the shift tube. The lock means includes a slotted collar rotatable with the steering shaft and a sleeve rotatable with the shift selector tube. The sleeve is engagable with the slotted collar and with the fixed outer tube to lock the assembly and to prevent normal operation of the vehicle.

3,732,711

# KEYHOLE COVER LOCK

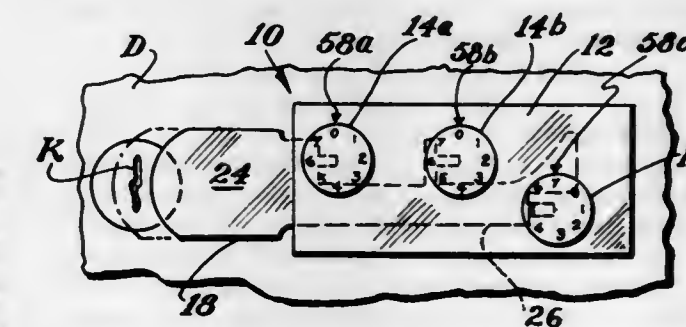
Martin Albert, 3260 Coney Island Avenue, Brighton Beach, N.Y.

Filed Sept. 7, 1971, Ser. No. 178,272

Int. Cl. E05b 13/00, 37/12

U.S. Cl. 70-425

10 Claims



A lockable cover for a keyhole is provided. The keyhole cover includes a housing that is secured to the outside surface



of the door adjacent the lock thereof. A plate that is slidably received in the housing is movable between covering and uncovering positions with respect to the keyhole. A plurality of tumblers are journaled in the housing with each of the tumblers being provided with a plurality of radially extending holes in the body portion thereof. All of the holes in the tumblers except one are relatively shallow in depth, the remaining hole in each of the tumblers being of greater depth sufficient to receive a plurality of pins that are integral and movable with the plate. The plate is normally in a covering position over the keyhole and can be moved therefrom to the uncovering position only when the greater depth hole in all of the tumblers is aligned with the pins on the plate.

The aforementioned Abstract is neither intended to define the invention of the application which, of course, is measured by the claims nor is it intended to be limiting as to the scope of the invention in any way.

3,732,712

## DOOR LOCK CYLINDER PLATE

Allan Miller, 5 Shaw Lane, Irvington, N.Y.

Filed Nov. 1, 1971, Ser. No. 194,170

Int. Cl. E05b 9/08

U.S. Cl. 70-452

4 Claims



A guard plate for a cylinder lock or the like includes a base and a mesa portion extending from the base and having an opening formed therein. When the plate is installed over the lock, that opening is in alignment with the axial end of the lock and the mesa portion prevents that axial end of the lock from being grasped and wrenched open, while permitting access to the lock for key operation through the opening. The guard plate further includes a second opening spaced relative to the first opening to permit the passage therethrough of a door handle. The openings are movable with respect to one another to permit the guard plate to be used on doors having different arrangements of the lock and door handle.

3,732,713

## INTEGRAL KEY PLATE FOR KEY CASES

Douglas J. Broughton, Agawam, Mass., assignor to Buxton, Incorporated, Agawam, Mass.

Filed Apr. 14, 1972, Ser. No. 244,033

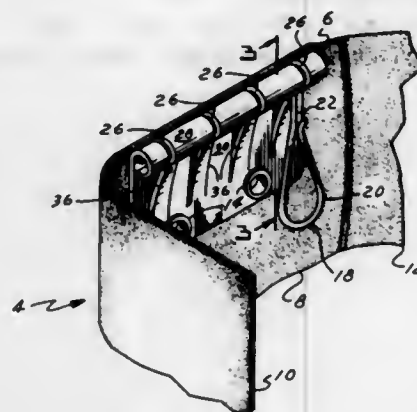
Int. Cl. A47g 29/10

U.S. Cl. 70-456 B

4 Claims

A key head for key cases formed of a unitary plate of spring metal having a tubular key loop retainer formed along its upper edge with laterally spaced slots opening into the tubular retainer and terminating at the inner ends thereof in enlarged access holes for insertion and removal of the head portion of a key loop. Spring fingers, struck from the plate, curve upwardly uniformly about a predetermined radius with their outer ends of a step configuration extending into the tubular retainer through said access holes. Each step portion blocks the inser-

tion and removal of key loops from the key head and is disposed to hold the major portion of the head above said ac-



cess holes serving as actuating means for the deflection of each spring finger by the head of a key loop for removal from the key head and reinsertion therein.

3,732,714

## METHOD AND APPARATUS FOR DEFORMING A FLAT ON PARTS OF METAL STRIP-TYPE TUBING WHILE LEAVING OTHER PARTS UNDEFORMED

Lester J. Tranel, St. Louis, Mo., assignor to Olin Corporation, New Haven, Conn.

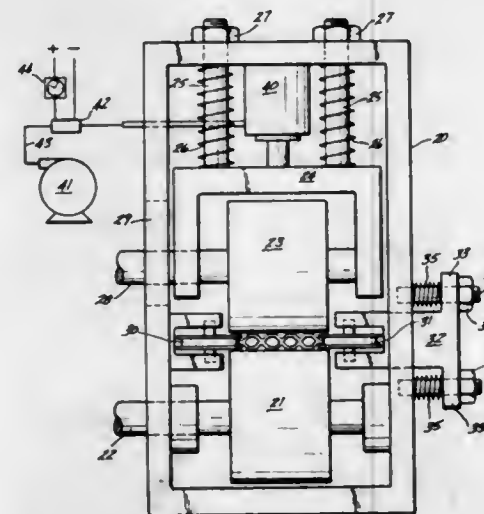
Division of Ser. No. 119,600, March 1, 1971, Pat. No.

3,712,372. This application May 4, 1972, Ser. No. 250,229

Int. Cl. B21h 8/00

U.S. Cl. 72-194

10 Claims



A method and apparatus for forming metal strip-type tubing suitable for use in heat exchangers. Deforming flats are formed on parts of a first surface and an opposing surface of the tubular passageways in the strip-type tubing while other parts of the tubing are left undeformed. The deformed flats are adapted to be bonded to flat type fin stock for heat exchange applications. The undeformed areas of the tubing are adapted to be bent without a significant pressure drop occurring in the bend area. The apparatus includes means for deforming the flat on the tubular passageways while restraining the edges of the strip-type tubing and further includes means for sequentially engaging and disengaging the deforming means from contact with the tubing.

3,732,715

## APPARATUS FOR PRESSING CONNECTOR MEMBERS ON STRUCTURAL ELEMENTS

Luis Ramirez Zamorano, San Borja 1358, Mexico City, Mexico

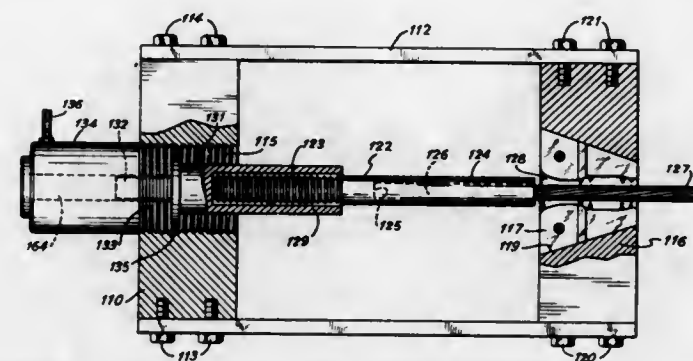
Filed July 22, 1970, Ser. No. 57,156

Claims priority, application Mexico, Mar. 4, 1970, 117,734

Int. Cl. B21c 23/00

U.S. Cl. 72-253

7 Claims



An extrusion die assembly having a composite extruding bore comprising a flared entrance section with a radius of curvature of approximately 0.2 times the diameter of the extrusion bore, a first conical extruding section which wall forms an angle about the axis of preferably 12°, a second conical extruding section with its wall forming an angle of preferably 6° about the axis, a third cylindrical extruding section with its wall forming an angle of 0° about the axis, an expanded section of a diameter substantially larger than the extruded diameter of the connector member, and a cylindrical guiding outlet section having a diameter slightly larger than the diameter of said cylindrical extruding section.

An apparatus for extrusion pressing connector members on structural members, which comprises a pair of dies as described above, a hydraulic cylinder and piston assembly, a pushing member attached to said piston, means for removably maintaining said dies in its operative position, and means for removing said dies from its operative position to a mutually spaced position to enable the removal of the extruded assembly.

3,732,716

## SECURING AN EXTRUSION PRESS RAM TO A THRUST MEMBER

Helmut Robra, Mulheim/Ruhr, Germany, assignor to Schloemann Aktiengesellschaft, Düsseldorf, Germany

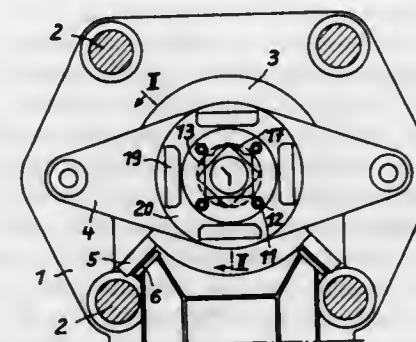
Filed Feb. 19, 1971, Ser. No. 116,878

Claims priority, application Germany, Feb. 20, 1970, P 70 06 133.5

Int. Cl. B21c 25/00

U.S. Cl. 72-273

11 Claims



It is known to retain a conical shoulder on the rear end of an extrusion press ram to a thrust member such as a cross-head

by means of a retaining ring which has a conical recess in its rear face corresponding to a ram shoulder, the retaining ring being tightened towards the thrust member in some suitable manner. I now provide a generally square rear end on the ram shoulder and give the retaining member a generally square opening for receiving the ram shoulder, so that the ram can be secured to the thrust member by inserting the rear end portion of the shoulder through the opening and turning the ram through about 45° before tightening the retaining member towards the thrust member.

3,732,717

## APPARATUS FOR THE PRODUCTION OF HELICALLY CORRUGATED METAL TUBING

Dieter Ahlvers, Mellendorf, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshütte, Hannover, Germany

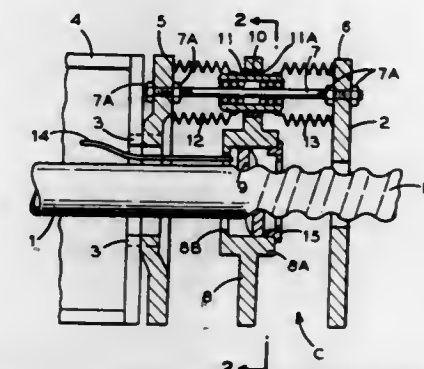
Filed Oct. 1, 1971, Ser. No. 185,637

Claims priority, application Germany, Oct. 7, 1970, P 20 49 235.7

Int. Cl. B21b 13/20

U.S. Cl. 72-77

6 Claims



Apparatus for corrugating metal tubing, particularly tubing having a longitudinally welded seam; the apparatus including a driven rotating head of annular form with the metal tubing passing axially through the opening of the head, an annular corrugating die holder being mounted on the head with a corrugating die mounted on the holder; the holder being arranged for axial movement as well as rotary movement whereby to compensate for irregularities in the metal of the tubing or in the welded seam thereof, as well as variations in the hardness of the metal of the tubing, to thereby insure the formation of helical corrugations in the tubing of precise uniformity in dimensions.

3,732,718

## CABLE CRIMPING DIE TOOL

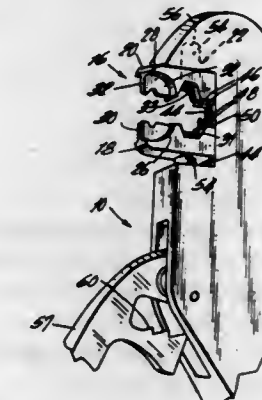
Louis Barberio, Bronx, and Americo Cornacchio, Mount Vernon, both of N.Y., assignors to Kings Electronics Co., Inc., Tuckahoe, N.Y.

Filed Apr. 1, 1971, Ser. No. 130,123

Int. Cl. B21d 9/08

U.S. Cl. 72-410

2 Claims



A cable crimping die tool is provided in which the split halves of the die are adapted to be moved together to perform



a crimping operation. One or more bores are provided in one of the halves of the die, and corresponding pins are provided in the other adapted to engage the bores to insure proper alignment of both portions of the die during a crimping operation.

3,732,719

## BOX-LOCK SPANNER SPRING

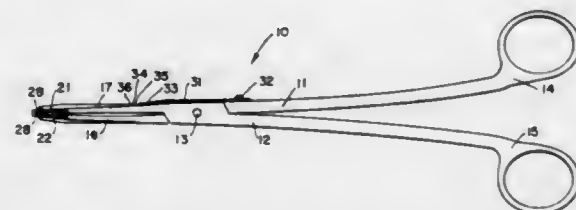
Joseph Peter Pallotta, Brooklyn, N.Y., assignor to Edward Weck & Company, Inc., Long Island City, N.Y.

Filed Dec. 24, 1970, Ser. No. 101,207

Int. Cl. B21d 9/08

U.S. Cl. 72-410

7 Claims



A surgical instrument of the forceps type having an improved biasing means. A leaf spring is mounted so as to span the forceps hinge and urge the jaws toward either an open or a closed position. The biasing means also governs the precise amount of opening normally permitted between the applicator jaws. A second embodiment employs a second spring acting in combination with the spanning spring to maintain the jaws normally open by a predetermined distance.

3,732,720

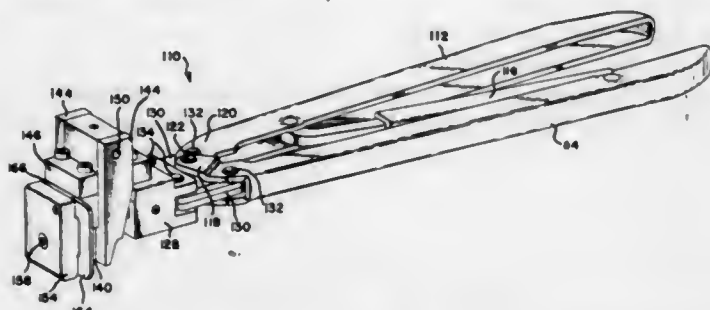
TOOL FOR CRIMPING JOINT FASTENERS OR THE LIKE  
Harold Edwin Cootes, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 25, 1971, Ser. No. 127,896

Int. Cl. B21d 9/08

U.S. Cl. 72-410

7 Claims



Crimping tool, for crimping joint fasteners for cabinet joints comprising a fixed pair having a supporting anvil thereon and a movable jaw on which crimping die surfaces are provided for crimping a structural member to a fastener. The anvil has a recess therein which is adapted to receive a projection on the fastener so that the crimping die surfaces on the movable jaw will engage the structural member at a precisely predetermined locations relative to the fastener member to which the structural member is being crimped.

3,732,721

## PORTABLE APPARATUS FOR FORMING BENDS IN CONCRETE REINFORCING RODS

Matt Cusimano, San Jose, Calif., assignor to Cusimano Tool Development Corp., San Jose, Calif.

Filed June 23, 1971, Ser. No. 155,812

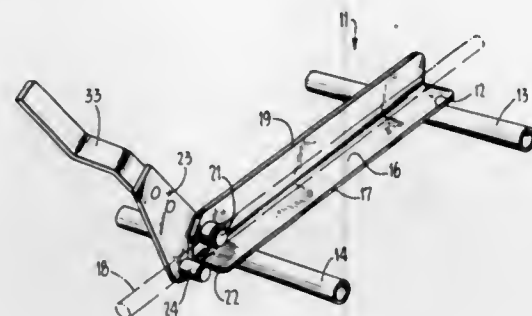
Int. Cl. B21j 13/08

U.S. Cl. 72-458

9 Claims

Lightweight apparatus for forming bends in concrete reinforcing rods at a construction site is described. The inner sur-

face of one of the legs of an elongated angle iron provides a platform for supporting a rod to be bent, and a first stud around which the rod is bent projects over the platform from the other leg adjacent an end of the angle iron. A lever plate is mounted on the exterior side of the second leg for pivotal mo-



tion about the axis of the first stud. A second stud projects from a location on the lever plate providing orbiting of the same around the first stud on pivotal motion of the lever plate to bend any rod between such studs around the first stud. The lever plate has an elongated handle attached to it to facilitate pivotal motion thereof by hand.

3,732,722

## MATERIAL HOLDER

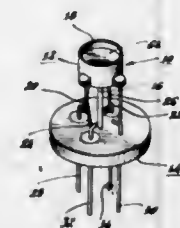
Stanley D. Norem, Bayside, N.Y.; Michael J. O'Neill, West Redding, and Robert S. Richmond, Westport, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Aug. 20, 1971, Ser. No. 173,465

Int. Cl. G01n 25/00

U.S. Cl. 73-15 B

12 Claims



A material holder for a differential scanning calorimeter includes a heater element and a sensor element, both selected to exhibit substantially the same predetermined thermal coefficient of expansion. A cylindrical member for housing the heater and sensor elements is also selected to exhibit substantially the same thermal coefficient of expansion as well as to provide structural rigidity. The cylindrical member is formed from one of the precious metals or an alloy thereof. The heater and the sensor elements are positioned within the cylindrical member by components that electrically isolate the heater element from the sensor element but thermally couple the two together, as well as by components that electrically insulate the heater and the sensor elements from each other and from the cylindrical member but thermally couple the two elements together. The positioning components are also selected to exhibit substantially the same thermal coefficient of expansion as the predetermined coefficient. Thus a plurality of components and elements are assembled in a housing so as to expand and contract substantially coextensively without rupturing. The differential scanning calorimeter may therefore be operated reliably at high temperatures.

3,732,723

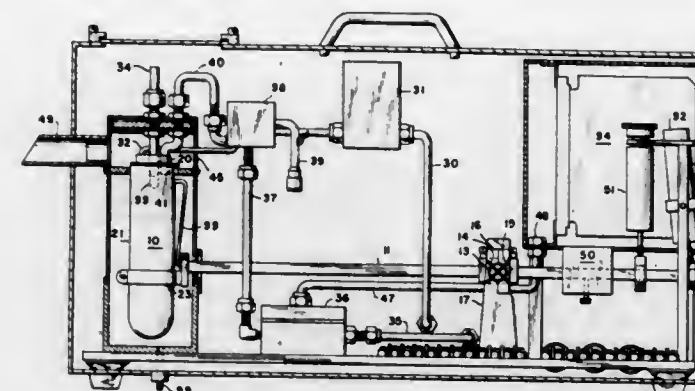
## APPARATUS FOR DETERMINING DISTILLATION CUT POINTS

Alvin D. Goolsby, Moraga, and Benjamin D. Stanton, Walnut Creek, both of Calif., assignors to Shell Oil Company, New York, N.Y.

Filed Aug. 13, 1970, Ser. No. 63,534

Int. Cl. G01n 25/08

U.S. Cl. 73-17 A



An apparatus for automatically performing distillation analysis of liquids wherein a sample of the liquid is vaporized while the temperature of the vapor and the weight of the sample are continuously measured and recorded. The data is supplied to a computer programmed to provide preset percent distillation points for the sample and hold circuits that can be set to trigger at any preselected boiling point or cut point.

3,732,724

## OPERATIONAL VISCOSIMETER

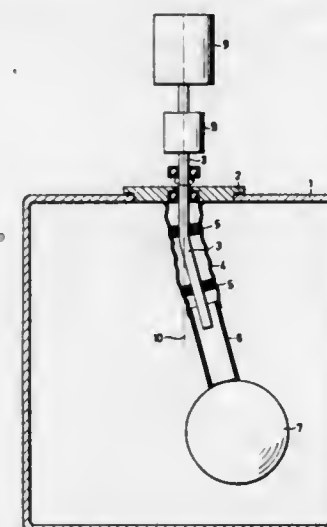
Werner Heinz, 72 Dabringhauserstrasse, Cologne-Dellbrück, Germany

Filed Feb. 1, 1971, Ser. No. 113,879

Int. Cl. G01n 11/10

U.S. Cl. 73-59

3 Claims



A viscosimeter of the type employed for measuring the viscosity of dough, semi-liquid artificial resins, paints, lubricating oils and lacquers is disclosed. The viscosimeter includes a chamber capable of being sealed to retain fluid under pressure. A drive shaft extends through an opening in one wall of the chamber. The shaft is bent at an acute angle at a distance spaced inwardly from the wall of the chamber. A tubular extension connects the shaft with a ball or paddle, or other measuring surface, which is rotated by the shaft. A flexible sleeve of substantially the same diameter as the tube extends between the end of the tube and the interior surface of the wall surrounding the shaft, thereby forming an effective rotary seal.

3,732,725

## METHOD AND APPARATUS FOR TESTING COMPRESSIVE STRENGTH OF CONCRETE AND THE LIKE

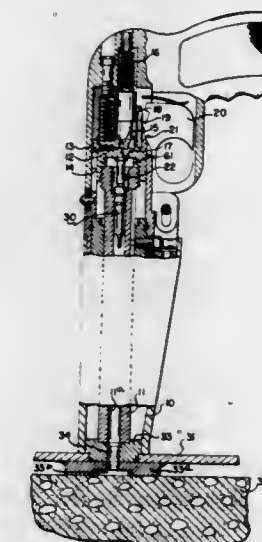
Fred W. Allen, Jr., Glastonbury; Rowland J. Kopf, Kenmore Apt. 3B, Lanning St., Southington, and Royal W. Thompson, Glastonbury, all of Conn., assignors to said Kopf, by said Allen and Thompson

Continuation of Ser. No. 834,945, June 20, 1969, abandoned, which is a continuation-in-part of Ser. No. 669,417, Sept. 21, 1967, abandoned. This application Feb. 18, 1971, Ser. No. 116,676

Int. Cl. G01n 3/42

U.S. Cl. 73-81

11 Claims



The mechanical probing of conglomeritic materials such as concrete for the determination of compressive strength involves the driving of one or more probes into the subsurface of the material under controlled conditions, to a depth below the shear cone inherent in the form of tension failure resulting from internal stresses caused by the probe penetration, and measuring the probe penetration which can be calibrated as reflective of the subsurface compaction and expressed in pounds per square inch compressive strength. Said probe penetration breaks the coarse ingredients of the conglomerate mass and rearranges the subsurface material into a compression stressed bulb. For more exact results the hardness of the coarse ingredients, in the form of the Moh's Scale rating is factored into the calibration process. Surface hardness and/or condition is unrelated to the resultant compaction bulb of the conglomerate mass and is disregarded. Preferably, three triangularly spaced probes are used for greater accuracy and measuring is done in such a way as to get a mechanical average of the penetration of the three probes and a coefficient of variation indication. For a given set of tests, and for most accurate results, all conditions are accurately controlled such as dimensions and hardness of the probe, the force effective to drive the probe including the powder charge, distance from the cartridge to a separable probe driving head, and clearance between the driving head and the bore, and uniform diameter of the probe driving head and the gun barrel bore.

3,732,726

## METHOD OF AND APPARATUS FOR DETERMINING THE INTERNAL DIAMETER OF PIPES

Franz Ferber, Dusseldorf, Germany, assignor to Vereinigte Deutsche Metallwerke, Frankfurt am Main-Heddernheim, Germany

Filed Dec. 4, 1970, Ser. No. 95,056

Claims priority, application Germany, Dec. 4, 1969, P 19 60 925.7

Int. Cl. G01n 29/00

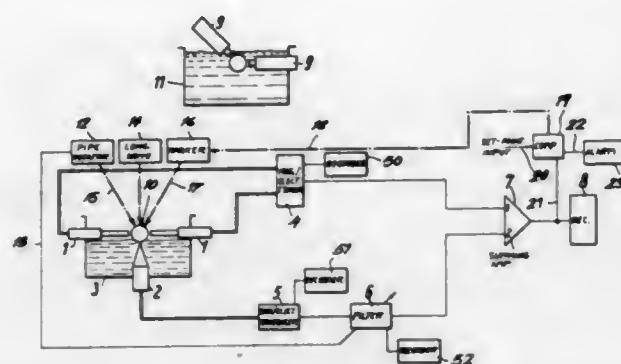
U.S. Cl. 73-67.5 R

11 Claims

A method of and an apparatus for measuring the internal diameter of a pipe in which two inductive displacement



pickups detect the external diameter of the pipe and an ultrasonic resonance system is employed for detecting the wall thickness, the pipe being axially shifted through the apparatus and being rotated about its axis concurrently. Periodic varia-



tion of the signal representing the wall thickness at a frequency equal to the angular velocity of the pipe are suppressed by filter means. The pipe may also be tested at the same time for longitudinal and transverse defects by means of ultrasonic waves.

3,732,727

#### METHOD AND APPARATUS FOR TESTING THE TENDERNESS OF MEAT

Larry C. Hinnergardt, Franklin, and Justin M. Tuomy, Framingham, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

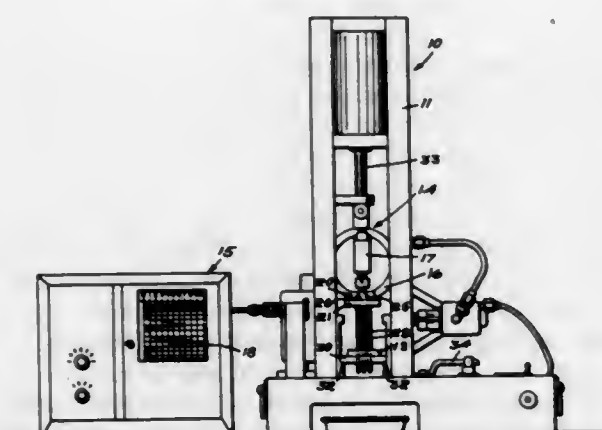
Continuation of Ser. No. 34,288, May 4, 1970, abandoned.

This application Dec. 7, 1971, Ser. No. 205,736

Int. Cl. G01n 3/42, 33/12

U.S. Cl. 73-81

6 Claims



A method for testing the tenderness of a slice of meat comprising supporting the slice of meat in a horizontal plane, piercing the slice of meat with a plurality of semi-blunt needle-like piercing means, detecting the maximum force required for piercing the slice of meat, and recording the maximum piercing force on a strip chart in an electronic recorder/indicator.

Apparatus for carrying out the method including a means for driving a test member into a slice of meat, means for detecting and indicating the force applied in driving the test member into the slice of meat, the test member having a head portion comprising a plurality of semi-blunt elongated needle-like elements of small diameter and a plate-like base portion for supporting the slice of meat while the needle-like elements are being driven through the slice of meat and through holes in the plate-like base portion.

#### 3,732,728 BOTTOM HOLE PRESSURE AND TEMPERATURE INDICATOR

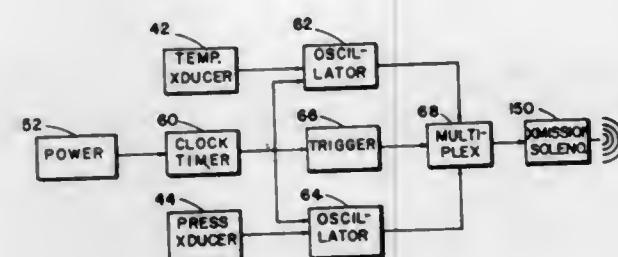
John R. Fitzpatrick, Tulsa, Okla., assignor to Douglas Fitzpatrick, Tulsa, Okla.; William N. Dawson and Robert S. Tyler, part interest to each

Filed Jan. 4, 1971, Ser. No. 103,721

Int. Cl. G01v 11/00

U.S. Cl. 73-151

39 Claims



A bottom hole indicator for determining the pressure and temperature at the bottom of a well bore, and which is particularly designed and constructed for substantially permanent bottom hole installation of the pressure and temperature sensing instrumentation utilizing existing oil well tubing as an information conductor, and the portability of the well head information collection and recording equipment for permitting frequent and economical measurements of reservoir pressure and temperature at the bottom of the well bore.

#### 3,732,729 SPEED SENSOR

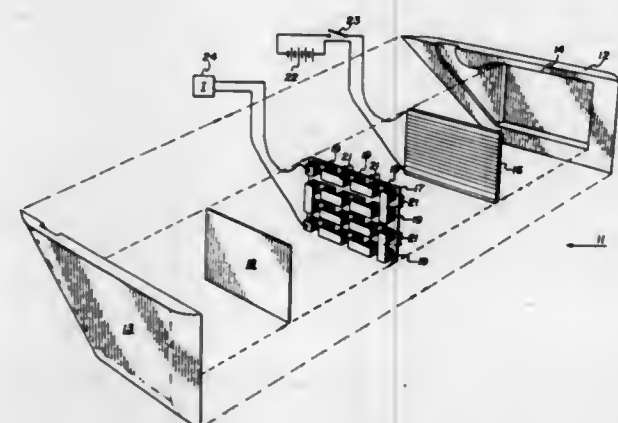
Norman D. Greene, Route 1, Box 148, Del Mar, Calif.

Filed Aug. 19, 1971, Ser. No. 172,997

Int. Cl. G01c 21/10

U.S. Cl. 73-181

3 Claims



A speed sensor for mounting on the hull of a boat for sensing the water speed of the boat in which a bank of semiconductor thermal junction units are mounted in a co-planer thermopile relationship being electrically connected serially; a heating pad mounted on one surface of the co-planer thermopile; and a copper plate juxtaposed to the heating pad and the opposite side of the co-planer thermopile.

3,732,730

#### WEATHER VANE AND VENT ASSEMBLY

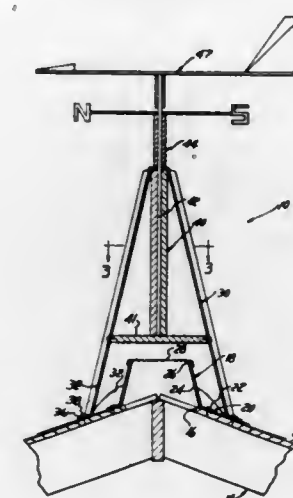
Stephen Kwolek, 8385 Woodcrest Drive, Westland, Mich.

Filed Nov. 22, 1971, Ser. No. 200,897

Int. Cl. G01p 13/02

U.S. Cl. 73-188

10 Claims



Apparatus that can be mounted over a vent opening in the roof of a building to provide ventilation and which also functions as a weather vane to indicate the direction of the wind.

3,732,731

#### BLUFF BODY FLOWMETER WITH INTERNAL SENSOR

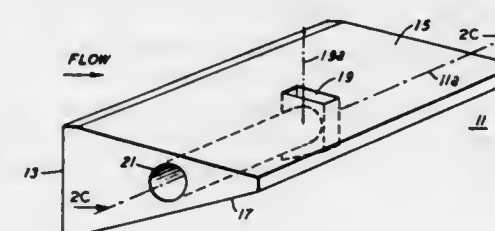
Theodore John Fussell, Jr., Bound Brook, Bridgewater Township, Somerset County, N.J., assignor to Eastech, Inc., South Plainfield, N.J.

Filed Feb. 2, 1971, Ser. No. 111,829

Int. Cl. G01f 1/00; G01p 5/10

U.S. Cl. 73-194 B

12 Claims



A bluff body flowmeter, including a bluff body having a planar base preferably disposed normal to fluid flow in a conduit and a pair of converging downstream surfaces, is provided in one embodiment with an elongated first aperture which extends between the downstream surfaces in the high turbulence flow zone. The longitudinal axis of the first aperture lies in a plane normal to the fluid flow and is itself normal to the transverse axis of the bluff body. In addition, the bluff body is provided with an elongated second aperture which communicates between the first aperture and the exterior of the conduit and which is adapted to receive a sensor for detecting fluid flow changes in the first aperture. In another embodiment, the bluff body base is convex in shape and the first and second apertures are located therein and the first aperture communicates with a periodic, low turbulence flow zone in order to improve signal quality. In still another embodiment, the longitudinal axis of the first aperture is disposed at an oblique angle to the transverse axis of the bluff body in order to detect vortex shedding at half its actual frequency.

3,732,732

#### TEMPERATURE MEASURING METHOD

William C. Trethewey, Newark, Ohio, assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio

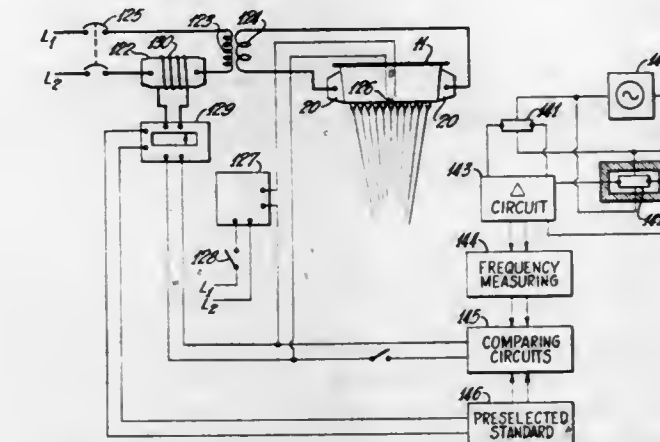
Division of Ser. No. 832,528, April 7, 1969, Pat. No.

3,582,298, which is a division of Ser. No. 591,906, Nov. 3, 1966, Pat. No. 3,467,325. This application Nov. 20, 1970, Ser. No. 91,475

Int. Cl. G01k 7/32; G05d 23/20

U.S. Cl. 73-362 R

2 Claims



This invention relates generally to frequency measuring apparatus and more particularly to the use of such frequency measuring apparatus in condition sensing apparatus which may be utilized for sensing a variable condition and controlling the variable condition. Further, the inventive concept is particularly applicable in fiber producing apparatus.

3,732,733

#### DIRECT-ACTING PRESSURE AND VACUUM SENSOR

Siegfried H. A. Schmaus, Philadelphia, Pa., and Franklin G. Reick, Westwood, N.J., assignor to said Schmaus by said Reick

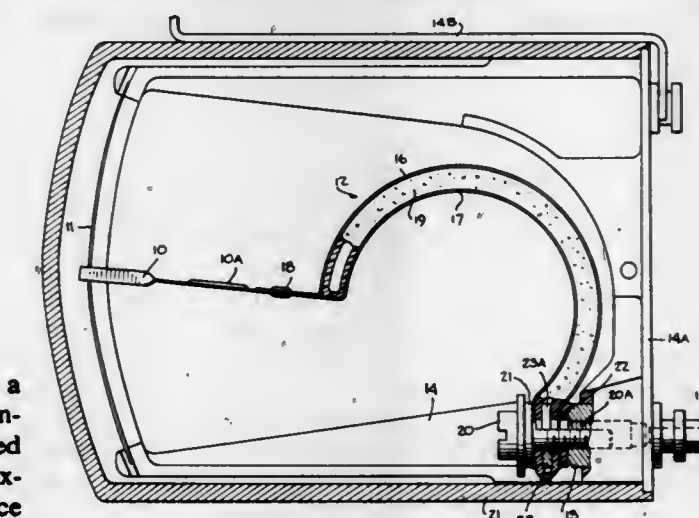
Continuation-in-part of Ser. No. 317, Jan. 2, 1970. This

application Sept. 3, 1971, Ser. No. 177,619

Int. Cl. G01f 7/04

U.S. Cl. 73-418

9 Claims



A direct-acting pressure and vacuum gauge operable in the low-pressure range and constituted by two cantilever springs having different lengths and spring rates. The two springs have similar curved formations and are maintained in spaced relation one within the other, to define a pressure region therebetween. Both springs are attached at one end to a fixed input socket, the free ends of the springs terminating in a common head from which a pointer is extended. Disposed within the pressure region and abutting the inner walls of the springs, is a flexible bladder forming an internal chamber communicating with the socket, whereby fluid fed into the chamber causes the springs to deflect as a function of fluid pressure, thereby moving the pointer to indicate pressure.



3,732,734

## MICROPIPETTE WITH DISPOSABLE TIPS

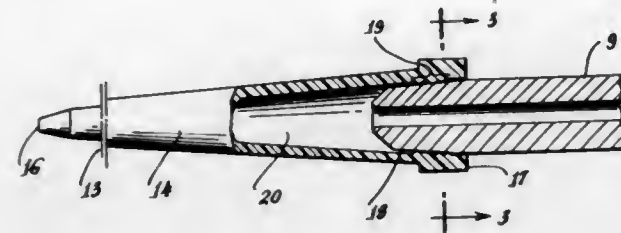
Souren Avakian, Westport, Conn., assignor to Centaur Chemical Co., Danbury, Conn.

Filed May 25, 1972, Ser. No. 256,992

Int. Cl. B0113/02

U.S. Cl. 73-425.6

6 Claims



A spring loaded plunger actuated vacuum pipette tube is disclosed for use in combination with removable disposable molded plastic tip members wherein a plurality of adjacent concentric internal annular rings are formed within the larger open end of the tip member, and annular rings being of successively decreasing diameter progressing inwardly, for cooperative airtight frictional engagement with a smoothly tapered end surface of the pipette tube.

The foregoing abstract is not to be taken either as a complete exposition or as a limitation of the present invention. In order to understand the full nature and extent of the technical disclosure of this application, reference must be had to the following detailed description and the accompanying drawing as well as to the claims.

3,732,735

## PIPETTES

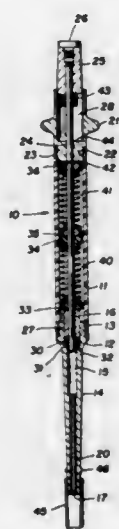
Jules Barry Cohen, Brooklyn, N.Y., assignor to Medical Laboratory Automation, Inc., Mount Vernon, N.Y.

Filed June 17, 1971, Ser. No. 154,021

Int. Cl. B0113/02

U.S. Cl. 73-425.6

2 Claims



A manual pipette having piston slideably mounted in a hollow barrel to first displace a measured quantity of air from the barrel and then draw a like quantity of liquid into the barrel from a container of liquid being pipetted. A spring biased seal is provided around the piston so that the seal remains airtight even after the seal becomes worn from protracted use.

3,732,736

## SYSTEM FOR ADSORPTION MEASUREMENT

Philemon Glaude, Groot; Walter Karcher, Alkmaar, and Robert Smets, Groot, all of Netherlands, assignors to European Atomic Energy Community (Euratom), Luxembourg

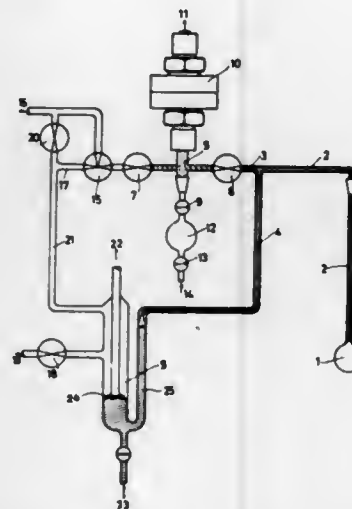
Filed Dec. 4, 1970, Ser. No. 95,316

Claims priority, application Luxembourg, Dec. 10, 1969, 59979

Int. Cl. G01n 15/08

U.S. Cl. 73-432 PS

7 Claims



The system measures by the adsorption of gas the specific surfaces of porous or divided solids. It injects equal quantities of adsorbate in stages into a sample-carrying chamber. These equal quantities of adsorbate come from a chamber of constant volume in which, before injection into the sample-carrying chamber, the adsorbate pressure is in each case equal to the pressure of equilibrium of the adsorption of the previous injection increased by a constant value.

3,732,737

## APPARATUS FOR USE IN WHEEL COUNTERBALANCING

Brian Michael Forster, Harthill, England, assignor to G.K.N. Birfield Transmissions Limited, Birmingham, England

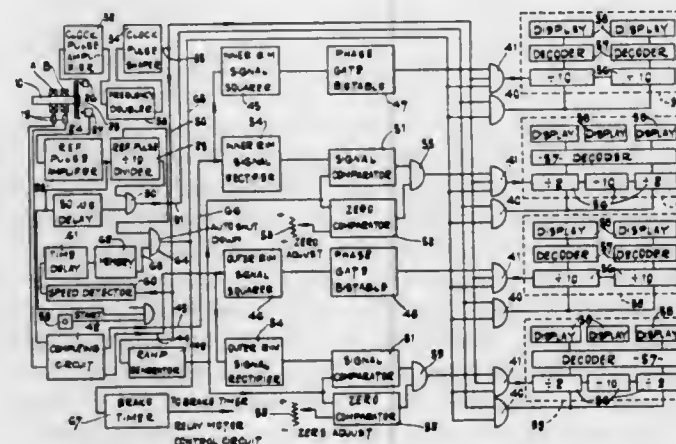
Filed Jan. 21, 1971, Ser. No. 108,552

Claims priority, application Great Britain, Jan. 27, 1970, 3,867/70

Int. Cl. G01m 1/22

U.S. Cl. 73-462

5 Claims



In apparatus for wheel counter-balancing a wheel to be balanced is mounted on a shaft for rotation therewith and a digital read-out is obtained for the positions and magnitudes of the weights required for balancing. Clock pulses for the digital read-out are derived from a pulse generator in driving connection with the shaft.

3,732,738

## TIMER

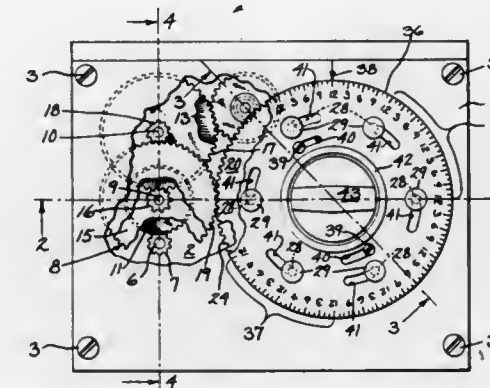
Edward C. Grout, Deerfield, Wis., assignor to Sta-Rite Industries, Inc., Delaven, Wis.

Filed May 24, 1971, Ser. No. 146,314

Int. Cl. G05g 21/00

U.S. Cl. 74-3.52

10 Claims



Two different gears mounted on the same axis and driven from a single power gear train to provide one gear as a slowly revolving timer with selectable pins triggering intermittent operation of the faster power output gear. The power output gear has a recess which interrupts its drive from a pinion rotated constantly by the gear train, and the triggering pin on the slow timing gear overtakes at a predetermined time setting and drives the output gear to effect re-engagement of the pinion therewith. An undercut portion of the gear recess radially beneath the portion of the gear teeth on the output gear disposed to be re-engaged by the drive pinion enables yielding of the gear teeth on the output gear to effect intermeshing of the gear teeth thereof with the gear teeth of the drive pinion in the event of conflict. The hub of the output gears extends axially through the slower timing gear and has a knob thereon for manual turning of the output gear during manual servicing, and the drive pinion is axially movable to disengage the same from the output gear during such manual servicing. The slow timer gear is spring biased axially to operative position and is manually movable axially against the spring and away from the output gear to free the timer train from the gear train and provide for pre-setting the time of day for triggering or initiating operation of the output gear. A spring biased arm on the output gear is engageable by a pin on the timer gear to initiate re-engagement of the output gear by the drive pinion, after which the output gear rotates through something less than a full revolution until the drive pinion registers with the recess therein, and the arm pivotally yields against its spring as it engages successive pins during such rotation of the output gear by the drive pinion. In one embodiment the arm is withdrawn from the path of the pin at all times except when a predetermined fact occurs.

3,732,739

## MONITORING OF GYROSCOPE ROTATION

John Russell Catford, Sittingbourne, and James Brotton, Chatham, both of England, assignors to Elliott Brothers (London) Limited, London, England

Filed July 21, 1971, Ser. No. 164,604

Claims priority, application Great Britain, July 21, 1970, 35,254/70

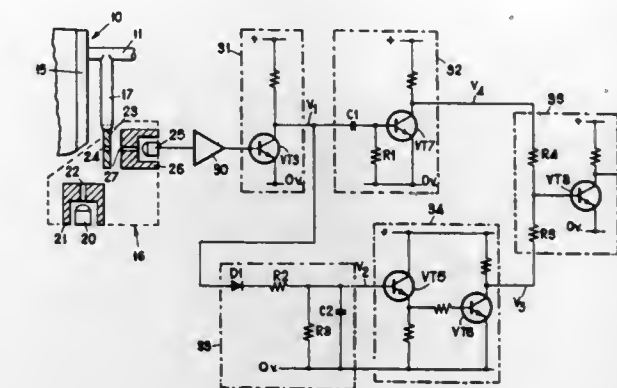
Int. Cl. G01c 19/28

U.S. Cl. 74-5.6

3 Claims

A gyroscope system including an arrangement for monitoring the rotation of the gyroscope rotor comprising sensing

means which produces an output signal corresponding to an optically coded band on the rotor. The sensing means is



suitably a light-sensitive device responsive to light reflected from the coded band.

3,732,740

## GEAR TRANSMISSION HAVING MECHANISM FOR REVERSE GRINDING

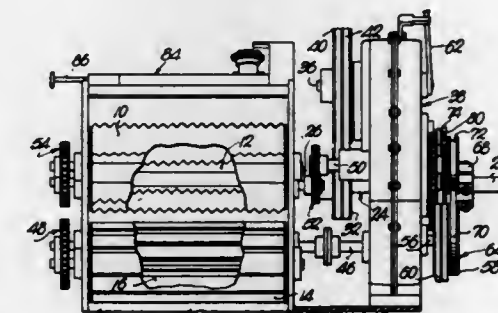
Ferol S. Fell, Newton, and William D. Long, Hesston, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Dec. 8, 1971, Ser. No. 206,028

Int. Cl. F16h 37/06

U.S. Cl. 74-15.2

9 Claims



During the sharpening of the cutter blades of a crop chopping rotor of a farm implement the rotor is rotated in reverse from the input shaft of a reversible transmission having a number of output shafts operably connected with certain components of the implement. Normally, the rotor is driven from a power shaft through a releasable coupling and the input shaft is rotated through a drive from the rotor shaft. Upon release of the coupling, connection of the power shaft with one of the output shafts and reversal of the transmission, the drive between the input shaft and the rotor shaft effects rotor reversal.

3,732,741

## DEVICES FOR CONTROLLING THE CARRIAGE OF A PORTABLE SHEAR

Paul Defontenay, Bourg-la-Reine, and Ian John Lewis, Les Lilas, both of France, assignors to Societe Anonyme dite: Wean Damiron, Paris and Redex, Val de Marne, France

Filed June 2, 1971, Ser. No. 149,148

Claims priority, application France, June 5, 1970, 7020827

Int. Cl. F16h 25/08

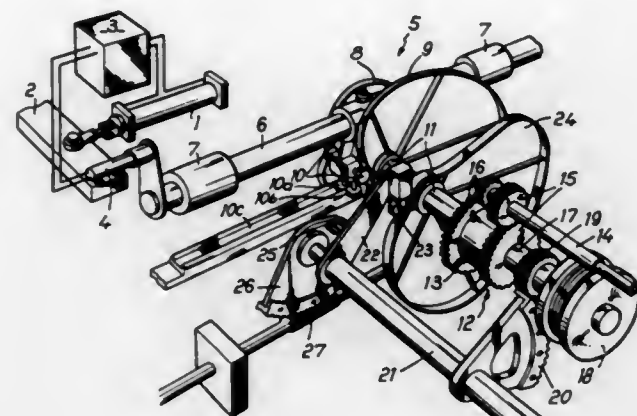
U.S. Cl. 74-55

5 Claims

This invention relates to a device for controlling the carriage of a portable shear, wherein it is actuated by a double-action jack fed by a hydraulic assembly piloted by a gap detec-



tor between the carriage and a movement simulator composed of a movable member, the displacement of which parallel to

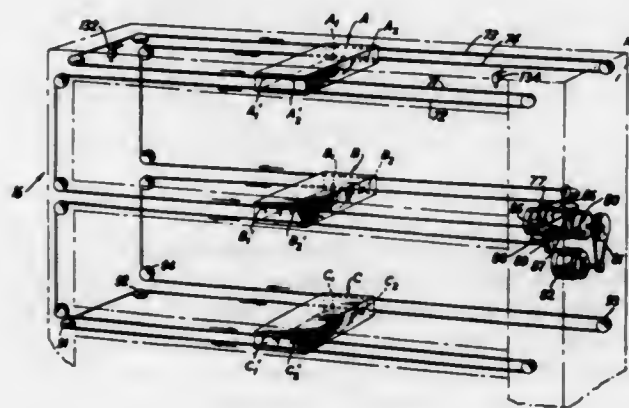


the carriage is controlled by a cam driven by means of a differential on which means enable the rotation of the cam to be braked or accelerated.

**3,732,742**  
**RANDOM ACCESS STORE FOR CARDS, FILE FOLDERS AND THE LIKE**  
John A. Castaldi, Brooklyn, N.Y., assignor to Supreme Equipment & Systems Corporation, Brooklyn, N.Y.  
Division of Ser. No. 877,571, Nov. 25, 1969, Pat. No. 3,595,388, which is a continuation-in-part of Ser. No. 430,330, Feb. 4, 1965, abandoned. This application Feb. 10, 1971, Ser. No. 114,235

Int. Cl. F16h 27/02  
U.S. Cl. 74—89.2

3 Claims

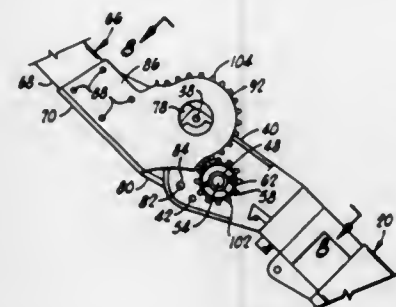
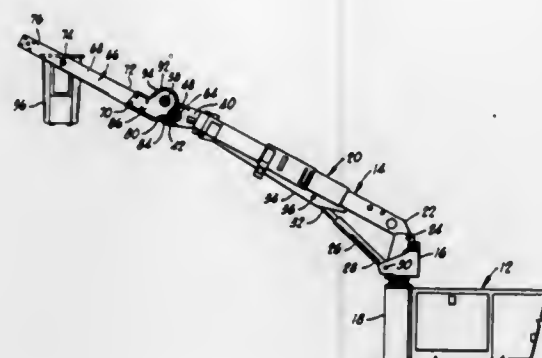


A random access store for cards, file folders and the like, in which the folders are stacked face-to-face. The folders are optically edge-coated and sensed simultaneously by a plurality of moving carriages, driven by a single cable, which continuously compares the sensed code to the command code and ejects the desired folder. The optical reader senses rectilinearly (along the same line as the light source) and the coded signal is automatically negated from mis-positioned folders. Folder alignment regardless of packing density is provided by magnetic clatching in cooperation with an array of folder guiding slots. Manual entry of the file folders into the store is random and may take place simultaneously with the automatic withdrawal. Towards this end, a feed-through access is provided which automatically gates and raises the magnetic clutches to permit ejection of the desired folder. Further refinements described include ejected folder collection; automatic input; a memory adjunct; and remote signalling.

**3,732,743**  
**EXTENDABLE BOOM APPARATUS**  
Donald R. Ballard, Route 1 Box 310A, Sapulpa, Okla.  
Filed Mar. 12, 1971, Ser. No. 123,770  
Int. Cl. F16h 27/02

U.S. Cl. 74—89.18

11 Claims

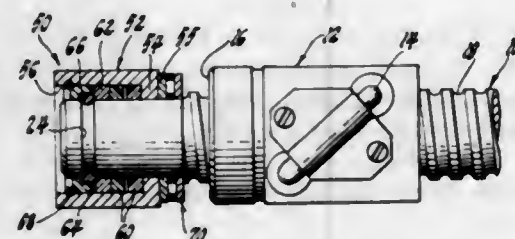


An extendable boom apparatus having a first boom member pivotally secured to and supported by a frame. A second boom member is pivotally secured at one end thereof to one end of the first boom member and is adapted to fold jack-knife fashion to a position parallel to the second boom member and, alternately, to an extended position in axial alignment with the second boom member. The alternate folding and extending of the apparatus is accomplished by means of a drive wheel, mounted on a transverse power driven shaft journaled in the end of the first boom member adjacent the second boom member, whose periphery is meshingly engaged with the arcuately shaped periphery of a plate fixedly secured to the second boom member. Apparatus is also disclosed which permits the drive wheel to be disengaged from the shaft so that the shaft is free to rotate within the drive wheel without imparting rotary motion thereto and thereby permitting the power driven shaft to be used for winch purposes.

**3,732,744**  
**STOP FOR SCREW AND NUT ACTUATOR**  
Dan R. Rowland, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.  
Filed Feb. 15, 1972, Ser. No. 226,426  
Int. Cl. F16h 1/18

U.S. Cl. 74—424.8 R

4 Claims



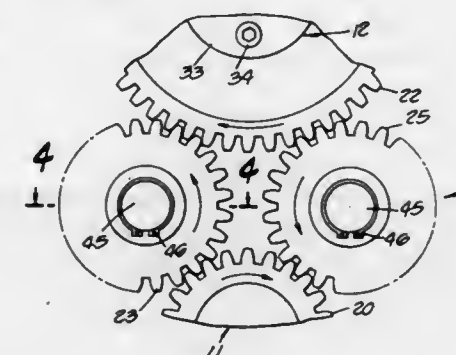
An improved stop adapted for incorporation into a screw and nut actuator assembly to non-jammingly arrest relative

axial motion between the screw and nut portions of the assembly, the stop including a cylindrical surface on the screw portion having formed therein a groove having a semicircular cross section, an annular stop ring having a circular cross section of diameter equal to the width of the groove disposed in the groove and defining a raised abutment on the screw including a shear section of maximum width at the cylindrical surface, an intermediate member disposed around the cylindrical surface inboard of the stop ring adapted for engagement on the latter generally at the shear section thereof, and an anti-friction bearing disposed between the intermediate member and the nut portion of the actuator assembly. When the nut portion engages the bearing the relative rotational motion component of the former is dissipated by the latter while an axial force is generated at the shear section of the stop ring and transferred to the nut portion through the intermediate member and the bearing to arrest axial motion of the nut portion.

**3,732,745**  
**CAMSHAFT DRIVE CONVERTER KIT AND METHOD**  
Maurus E. Jackson, 4919 Argus Drive, Los Angeles, Calif.  
Filed Dec. 1, 1971, Ser. No. 203,648  
Int. Cl. F16h 3/08; F01I 1/34, 1/02

U.S. Cl. 74—325

13 Claims



A camshaft drive converter kit and method for converting a vehicle engine camshaft from chain to gear drive without need for machining or otherwise altering the engine structure and simply by substituting kit components for chain drive components. The kit includes several idler gears having closely related but slightly different pitch diameters and one selected pair of which gears is best suited for use to interconnect the kit crankshaft and camshaft gears. Both idler gears are held assembled floatingly between the driving and driven gears and are held against axial displacement by the cover for the camshaft drive mechanism.

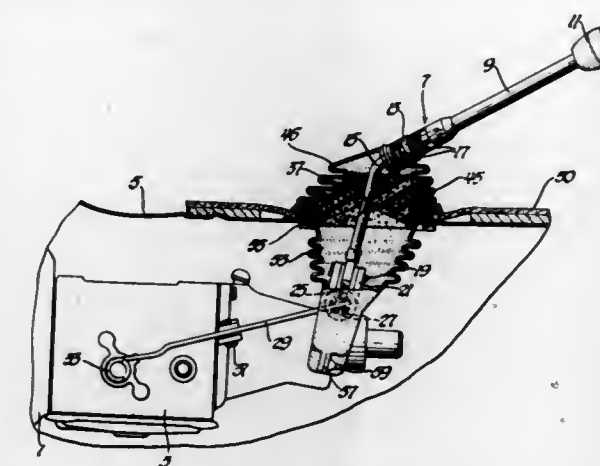
**3,732,746**  
**TRANSMISSION CONTROL LEVER ASSEMBLY**  
John D. Fitzpatrick, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.  
Filed July 29, 1971, Ser. No. 167,329  
Int. Cl. G05g 9/00

U.S. Cl. 74—473 R

4 Claims

A control lever adjustably mounted on a transmission extends through an opening formed in the floor of a vehicle and through a floor-mounted insulator closing the opening. The insulator is preferably a molded block of resilient material that lowers the intensity of any sound waves passing therethrough to the interior of the vehicle while yielding to allow all necessary control movements of the lever. The insulator yieldably

grips a portion of the lever above its mounting so that vibrations imparted to the lever are damped by the flexing of the

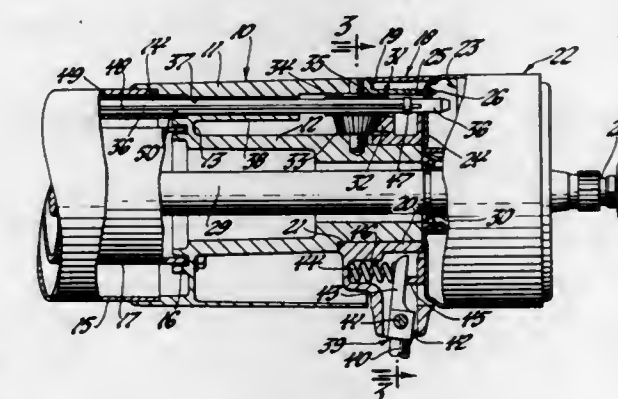


material of the insulator. Preferably the lever has parts separated by vibration damping members to further reduce lever vibration.

**3,732,747**  
**GEARSHIFT ARRANGEMENT**  
Henry I. Fiziks, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.  
Filed Jan. 28, 1972, Ser. No. 221,642  
Int. Cl. G05g 7/02

U.S. Cl. 74—487

4 Claims



The drawings illustrate a gearshift mechanism including a gearshift lever bowl assembly mounted above the upper column housing and encompassing a steering column-mounted gearing arrangement which is responsive to rotary movement of a manually actuated selector lever to axially actuate a cable extending to a transmission shift lever.

**3,732,748**  
**CONTROL DEVICE FOR THE MANUAL REGULATION OF THE SPEED OF COMPRESSION-IGNITION ENGINES**  
Paolo Cavalli, Brescia, Italy, assignor to Fiat Societa per Azioni, Turin, Italy  
Filed July 6, 1971, Ser. No. 159,906  
Int. Cl. F16c 1/22

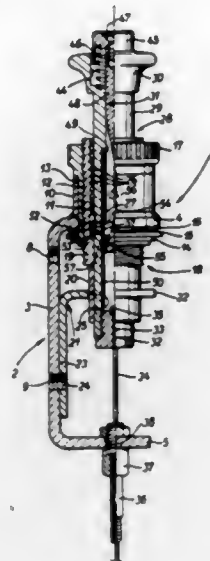
U.S. Cl. 74—502

10 Claims

The speed of a compression-ignition engine is regulated by a manually operable control device according to this invention which acts on a control lever in the engine fuel system to place the lever, with precision, selectively in engine stopped, idling speed and predetermined speed settings. The control device includes a movable body connected to an actuating cable and



carrying a spring-loaded latch which is engageable in a selected detent carried by a surrounding tubular body to



achieve the desired setting. The surrounding body is itself adjustable by screw action in a support so as to provide for fine adjustment of the actuating cable.

3,732,749

#### LEVER MECHANISM WITH VARIABLE MECHANICAL ADVANTAGE

Raymond Richard James Thatcher, Westdene, Brighton, Sussex; Anthony Gerald Richard Edms, Burgess Hill, Sussex, and Brian James Wheeler, Partridge Green, Sussex, all of England, assignors to Worcester Valve Company Limited, Haywards, Heath, Sussex, England

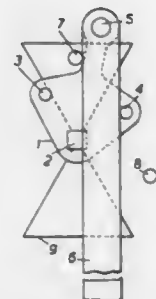
Filed Mar. 8, 1972, Ser. No. 232,805

Claims priority, application Great Britain, Mar. 11, 1971, 6,579/71

Int. Cl. G05g 7/04

U.S. Cl. 74—518

4 Claims



A lever mechanism for exerting variable torque about the axis of a valve spindle in which a stationary abutment member, a movable abutment member rotatable with the spindle, and a pivot pin are mounted on a valve with a lever arm which provides an initial mechanical advantage between the lever and the spindle until after some rotation has occurred, spindle and lever move in unison with a final mechanical advantage, the initial mechanical advantage being greater than the final mechanical advantage.

3,732,750

#### DIFFERENTIAL DRIVE ASSEMBLY

Raymond C. Posh, Livonia, Mich., assignor to Lear Siegler, Inc., Detroit, Mich.

Filed June 7, 1971, Ser. No. 150,318

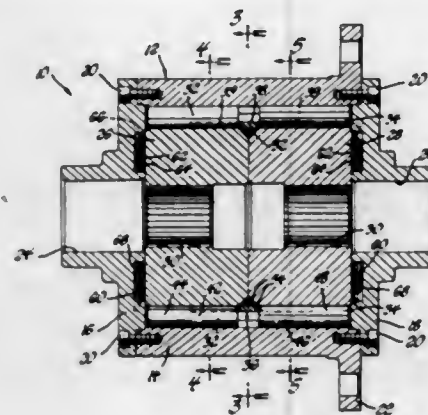
Int. Cl. F16h 35/04

U.S. Cl. 74—650

16 Claims

A differential drive assembly including a barrel-like housing surrounding a pair of juxtaposed coaxial sleeves internally

splined to receive axles. A first set of sprags or locking elements are disposed circumferentially about one of the sleeves between the circular outer surface of the sleeve and the housing and a second set of like sprags are similarly disposed between the housing and the other sleeve. In one embodiment a single cage member having a central band with fingers extending from opposite sides thereof is disposed between the sleeves and the housing to coact with the sprags, the sprags of this embodiment having arcuate surfaces disposed in recesses



in the housing having mating or the same arcuate surfaces so that each sprag rotates about a longitudinal axis. In the second embodiment there is included two similar cage members and the sprags have oppositely disposed arcuate surfaces which are interconnected by generally parallel and spaced side surfaces. The unitary cage members for coacting with both sets of sprags moves both sets of sprags in unison in one mode of operation and limits the amount of relative movement between the first and second sets of sprags when in the second mode of operation.

3,732,751

#### POWER TRAIN USING MULTIPLE POWER SOURCES

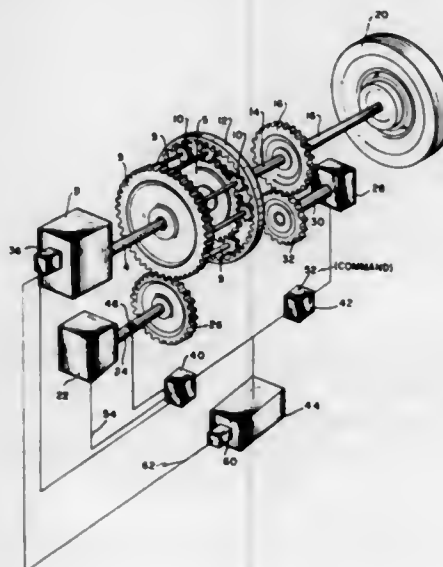
Baruch Berman; George Howard Gelb; Neal Allen Richardson, and Tsih C. Wang, all of Palos Verdes Peninsula, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 807,870, March 17, 1969, Pat. No. 3,566,717. This application Mar. 2, 1971, Ser. No. 120,261. The portion of the term of this patent subsequent to Mar. 2, 1988, has been disclaimed.

Int. Cl. F16h 37/08; B60k 1/04; B60l 11/12

U.S. Cl. 74—675

5 Claims



A power train is described which is comprised of a prime mover, two power converters, an epicyclic gear train, an ener-

gy storage device and associated control systems. In the preferred embodiment, the prime mover, an internal combustion engine, typically supplies power to the gear train which apportions mechanical power to one of the power converters—an electrical generator—or to the output shaft of the power train. Power from the generator is delivered to either or both the energy storage device, a battery, and the second power converter, an electrical motor-generator which is dynamically coupled to the output shaft.

The power train may be operated in one of two modes, in the first, the internal combustion engine runs at constant speed and relatively constant low power. Engine operation of this nature allows the use of small displacement engines burning lean fuel-air mixtures, thereby reducing engine exhaust emissions. Engine power output control in the first mode is accomplished by changing the loading of the generator on the engine in a feedback control manner. The motor-generator is controlled by the operator who uses a system which controls the flow of power from the generator and/or battery combination to the motor or the flow of power from the motor-generator to the battery. In the second mode of operation, all engine power is mechanically directed to the output shaft and the engine operates in a variable throttle manner. As in the first mode, output shaft peak power demands are satisfied by drawing power from the battery and therefore the engine throttle excursions are minimized. Excess engine power and regenerative power due to external forces acting on the output shaft can be transformed in the second power converter for storage in the energy storage device.

In either mode, it is possible to vary the power settings of the engine slowly to reflect the mean power demand on the power train. Typically the state of battery charge would be used as the control variable.

3,732,752

#### LOCKING TYPE DIFFERENTIAL GEAR MECHANISM

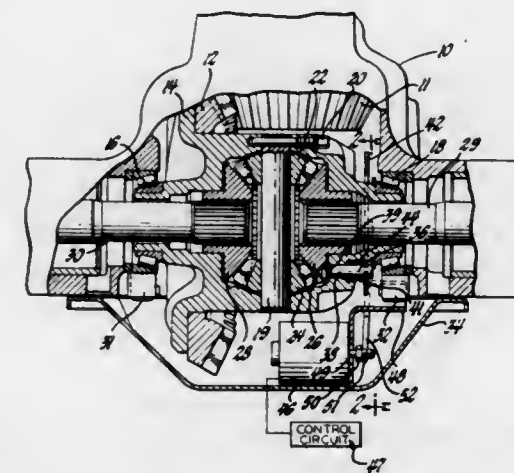
Theodore N. Louckes, Lansing; Ronald H. Haas, Okemos, and Morris J. Duer, Lansing, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed July 26, 1971, Ser. No. 165,981

Int. Cl. F16h 1/44

U.S. Cl. 74—710.5

5 Claims



A differential gear mechanism having a locking arrangement for selectively locking the mechanism's rotary case and one side gear including locking pins that are carried by the case and are normally biased to an unlocked position and a solenoid that operates through linkage to bias the locking pins to a lock position lockingly engaging the case to the one side gear with such linkage yielding when the locking pins are not aligned for such engagement to maintain the biasing force to effect engagement on alignment.

3,732,753

#### ELECTROHYDRAULIC TRANSMISSION CONTROL

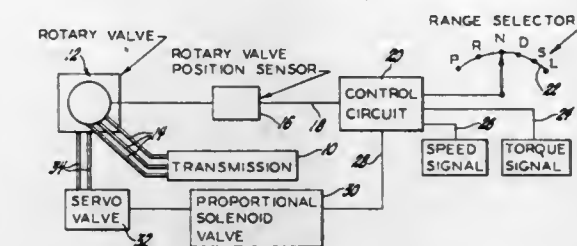
Howard E. Olsen, Iron Mountain, and Robert J. Petry, Berkley, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 7, 1972, Ser. No. 216,110

Int. Cl. B60k 21/00; F16h 3/74

U.S. Cl. 74—866

3 Claims



A closed loop control for an automotive vehicle transmission includes a hydraulically driven rotary valve for selectively connecting feed and exhaust hydraulic lines to the transmission brakes and clutches thereby selecting an operational mode of the transmission according to the rotational position of the valve. An electrical transducer produces a signal corresponding to the valve position. A control circuit responsive to the position of a manually controlled range selector, a transmission output speed signal and an input torque signal generates a voltage according to the desired operational mode and compares this voltage to that from the rotary valve position sensor. A control signal is generated according to the difference in these voltages which control signal actuates a proportional solenoid valve which in turn controls the position of a spool valve. The spool valve then hydraulically operates the rotary valve to move it to a position determined by the control signal so that the new position will be consistent with the operating mode selected by the control circuit.

3,732,754

#### ELECTRONIC GOVERNOR FOR AUTOMOTIVE AUTOMATIC TRANSMISSION

Yoichi Mori, Tsurumi-ku, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Kanagawa-ku, Yokohama City, Japan

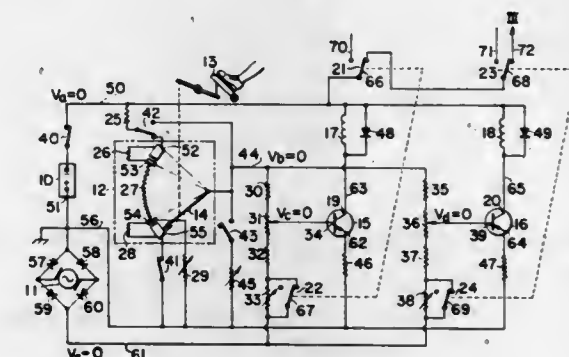
Continuation-in-part of Ser. No. 872,124, Oct. 29, 1967, abandoned. This application Jan. 26, 1972, Ser. No. 220,971

Claims priority, application Japan, Oct. 30, 1968, 43/78835

Int. Cl. B60k 21/02

U.S. Cl. 74—866

4 Claims



A control device for electronically controlling the gear shifts in an automotive automatic transmission in response to changes in the vehicle speed and in the displacement of the accelerator pedal. Signals are produced representing the changes at any given time in the vehicle speed and position of the accelerator pedal to raise the gear shifting point to higher vehicle speed particularly when the vehicle is running on an ascent or descent or when the engine is operating at a low temperature.



3,732,755

## DIGITAL SHIFT CONTROL FOR VEHICULAR TRANSMISSION

Willi Belg, Waggershhausen; Willi Kuhnle, Friedrichshagen, and Herbert Selbold, Mariabrunn, all of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Germany

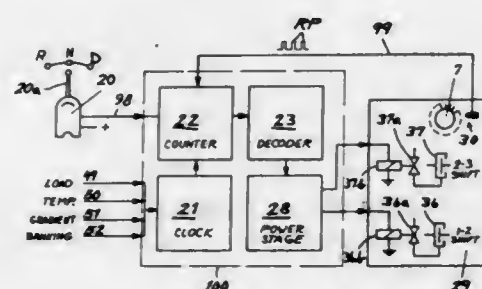
Filed Mar. 18, 1971, Ser. No. 125,633

Claims priority, application Germany, Mar. 19, 1970, P 20 13 079.4

Int. Cl. B60k 21/00

U.S. Cl. 74—866

7 Claims



To change the speed ratio of an automatically shiftable power train by which the torque of an engine is transmitted to the traction wheels of a vehicle, a logic circuit emits commands to respective solenoid valves in response to a combination of operating parameters such as vehicle speed, engine temperature, accelerator position and road gradient. Speed is measured by a pulse generator, coupled with the output shaft of the transmission, whose pulses are counted by an accumulator that is periodically reset by a timing circuit and whose count between resettings is fed to the logic circuit together with signals indicating the position of a manual speed selector. The remaining parameters are used to modify the rhythm of the timer or the operation of a decoder inserted between the accumulator and the logic circuit.

3,732,756

## RATCHET WRENCH

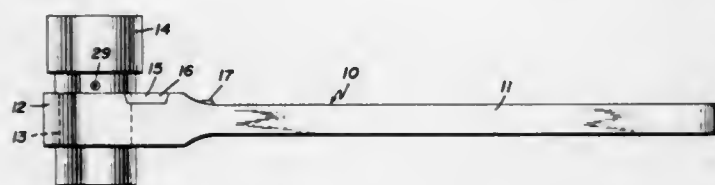
Harvey A. Thomasian, Northboro, Mass., assignor to Lowell Corporation, Worcester, Mass.

Filed Aug. 13, 1971, Ser. No. 171,649

Int. Cl. B25b 13/46

U.S. Cl. 81—62

2 Claims



A ratchet wrench having a ratchet element with a socket facing each side.

3,732,757

## HYDROSTATIC END PRESSURE BALANCING DEVICE FOR MACHINE TOOLS

Jean Claude Cottin, Paris 80, France, assignor to Produmat, Chateaufort en Thymers, France

Filed Dec. 2, 1971, Ser. No. 204,205

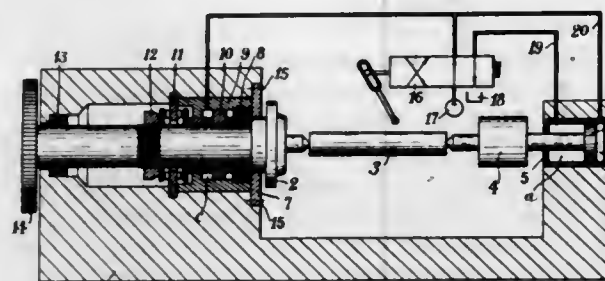
Int. Cl. B23b 3/00

U.S. Cl. 82—2

4 Claims

In this balancing device for equalizing the pressure exerted on the tailstock dead center and the workpiece holding spindle of a machine tool, the tailstock center is responsive to the action of a piston slidably mounted in a cylinder having its rear

chamber supplied with compressed hydraulic fluid and a distance-piece mounted about the spindle portion extending within the headstock urges said spindle through the medium of the inner race of the front bearing under the control of the



compressed hydraulic fluid supplied to a chamber formed at the front by said distance-piece. A manual control is provided for hydraulically actuating said dead center either in the clamping direction towards said workpiece holding spindle or in the release direction.

3,732,758

## PIPE CUTTING APPARATUS

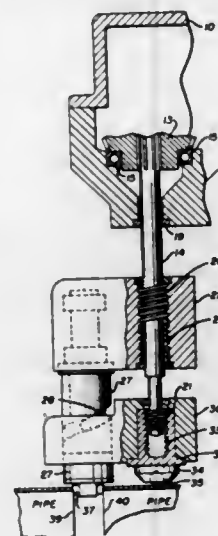
Michael S. Rinaldo, 1921 Sequoia Drive, Youngstown, Ohio

Filed Mar. 8, 1971, Ser. No. 121,885

Int. Cl. B23b 5/16

U.S. Cl. 82—4 C

5 Claims



Pipe cutting apparatus for use in a continuous pipe mill for squaring and/or chamfering the ends of pieces of pipe cut in the mill incorporates a rotatable cutting tool and means for advancing it into engagement with the trailing end and/or leading end of pieces of pipe to be squared and/or chamfered. The apparatus imparts rotation to the cutting tool simultaneously with motion advancing the cutting tool into engagement with the pipe ends.

3,732,759

## PISTON TURNING LATHE

Igor Nikolaevich Fedorenko, Zelle pereulok 34, kv. 1; Fedor Vasilievich Gurin, Kutuzovskiy prospekt, 2/1, kv. 187; Vadim Mikhailovich Smelyansky, Mikulsky pereulok, 13, kv. 1; Alexei Vasilievich Voronin, B. Pochtovaya ulitsa, 18/20, korpus 11, kv. 48, and Alexei Dmitrievich Kuranov, 1 Kirpichny pereulok, 19, kv. 9, all of Moscow, U.S.S.R.

Filed Oct. 5, 1971, Ser. No. 186,721

Int. Cl. B23b 5/24

U.S. Cl. 82—19

7 Claims

A piston-turning lathe comprising a head carrying the work spindle and a tool head provided with cutting tools for preliminary and finish machining of pistons during rotation of the spindle.

3,732,761

## CUTTING MATERIAL INTO LENGTHS

Harry Sanders, Water Orton, near Birmingham, England, assignor to Dunlop Holdings Limited, London, England

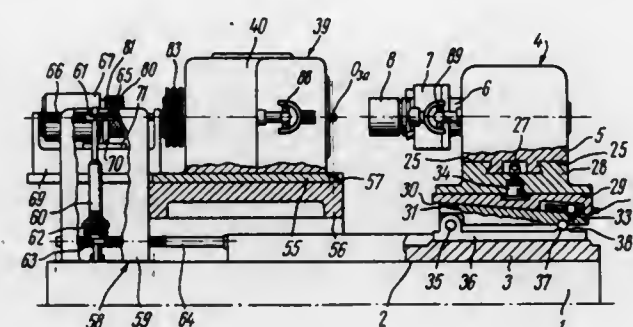
Filed May 7, 1970, Ser. No. 35,347

Claims priority, application Great Britain, May 13, 1969, 24,209/69

Int. Cl. B26d 5/40

U.S. Cl. 83—37

10 Claims



is, additionally, installed with a provision for inclining its axis in the same direction, and there is also a means for mutual relative turning of the work head and tool head spindles by the mechanism for setting the tool holders with the cutting tools for preliminary and finish machining.

3,732,760

## TOOL HOLDER

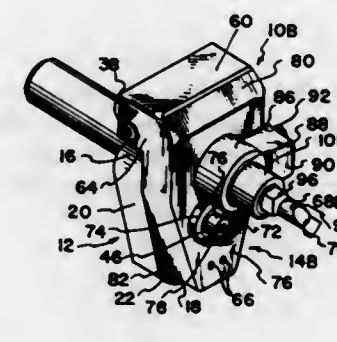
Wesley E. Parks, P.O. Box 132, Loveland, Colo.

Filed Feb. 10, 1971, Ser. No. 114,125

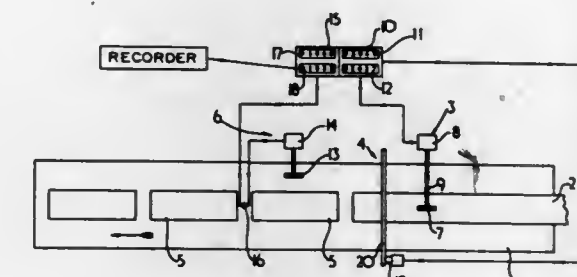
Int. Cl. B23b 29/10

U.S. Cl. 82—36 R

11 Claims



This invention relates to a tool holder for cutting tools and the like which includes a chuck piece fastenable into the chuck of a machine tool turret and a pair of interchangeable tool-carrying heads that are fastened to the chuck piece so that the tool can be adjusted in its position relative to the work piece. One of the tool-carrying heads holds an external cutting tool for essentially radial movement toward and away from the work piece while the other of said tool-carrying heads carries primarily a boring or inside cutting tool for generally axial movement parallel to the axis of rotation of the work piece. Both of the tool-carrying heads provide for three adjustments of the tool relative to the work piece, two of which are common and the other exclusive. Each includes a fine arcuate adjustment of the entire head relative to the chuck piece in a plane normal to the axis of rotation of the work piece and also a circular adjustment in this same plane by means of a rotatable eccentric pin selectively mountable in either of two positions in the head. The outside or turning tool head includes provision for coarse transverse straight-line adjustment of the tool toward and away from the work piece in a plane normal to the axis of rotation thereof; whereas, the inside or boring tool head contains means for moving the tool in a straight line longitudinally parallel to the tool rotation axis.



Method and apparatus for cutting material into lengths, particularly for cutting tread rubber strips for tires, to maintain the length equal to or substantially equal to a predetermined value independent of any errors which may occur due to for example to mechanical lags, poor lubrication or general wear. Cut lengths are measured and the measured size compared with a predetermined value, and any required correction applied to the cutter automatically.

3,732,762

## BLANKING DIE STRIPPING SYSTEM

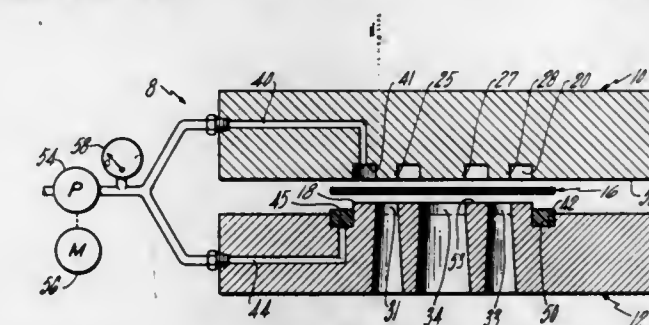
Edwin W. Plumb, Linden Road, Woodbury, Conn.

Filed Mar. 22, 1971, Ser. No. 126,571

Int. Cl. B26d 7/00

U.S. Cl. 83—98

9 Claims



A pair of opposed blanking die members for blanking sheet metal parts having a fluid supply conduit for supplying fluid under pressure to the die cavity for ejecting the blanked part therefrom and a fluid actuated stripper ring reciprocally mounted on the blanking punch for ejecting the sheet metal skeleton therefrom.

3,732,763

## STRIP WITHDRAWING DEVICE

Gerhard Smuda, Hamburg, Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Germany

Filed Apr. 26, 1971, Ser. No. 137,546

Claims priority, application Germany, April 25, 1970, P 20 20 398.9

Int. Cl. B26d 7/06

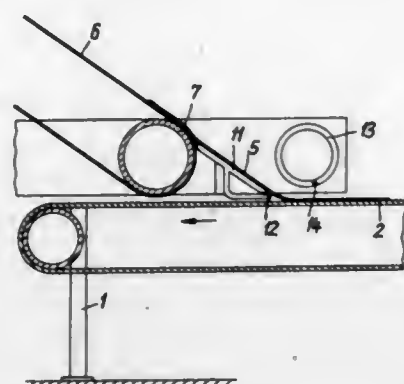
U.S. Cl. 83—98

6 Claims

For use in connection with the building up of tires, a device for withdrawing strips cut off at a bias on a strip cutting device, which includes an endless conveyor belt having one of its reversing drums arranged close to the strip cutting device with the axis of rotation of said one reversing drum substan-

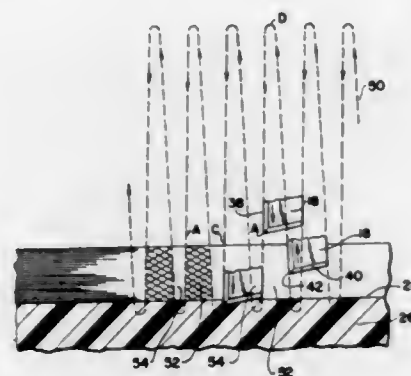


tially parallel to the bias cut edge of the cut off edge while adjacent the other reversing drum there is provided a chute



adapted to be pivoted into different directions for distributing cut off strips of web material over different processing paths.

**3,732,764**  
**APPARATUS AND METHOD FOR CUTTING SHEET MATERIAL WITH CHOPPING TYPE BLADE MOTION**  
Heinz Joseph Gerber, West Hartford, Conn., assignor to Gerber Government Technology, Inc., East Hartford, Conn.  
Filed Mar. 1, 1971, Ser. No. 119,792  
Int. Cl. B26d 1/00, 5/30  
U.S. Cl. 83—34

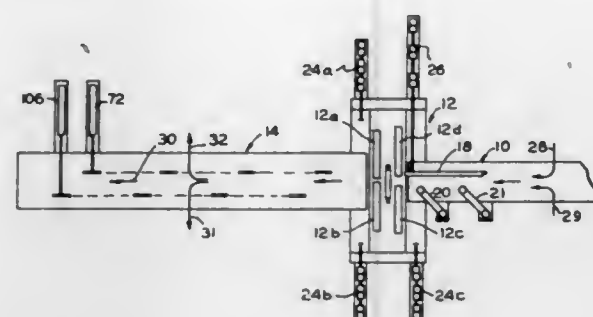


An apparatus and associated method for cutting sheet material spread in one or more layers over a supporting surface uses a reciprocating cutting tool cutter movable in two coordinate directions in the plane of the supporting surface to enable the cutting tool to follow a desired line of cut relative to the sheet material. The cutting tool has, at its lower end, a generally downwardly facing sharpened edge, and the stroke of the cutting tool is such that during a portion of each cycle of reciprocation it is located entirely out of the material being cut. During such portion of its cycle of reciprocation it is moved forwardly along the desired line of cut a substantial distance so that during its following downward movement through the material it encounters a substantial length of uncut material which is pressed between the sharpened lower end of the tool and the supporting surface so as to cut the material with a chopping action. The supporting surface is formed by a material which is penetrable by the lower end portion of the cutting tool, and at the lower limit of its reciprocation the lower end of the cutting tool does penetrate the supporting surface to assure cutting of the sheet material through its full vertical thickness.

**3,732,765**  
**SWEEP TABLE FOR WOOD-PROCESSING MILL**  
Rene Fritz, and Rene E. Fritz, both of Albany, Oreg., assignors to Albany International Industries, Inc., Albany, Oreg.  
Filed Nov. 24, 1971, Ser. No. 201,730  
Int. Cl. B27b 15/08, 31/08

U.S. Cl. 143—5

18 Claims

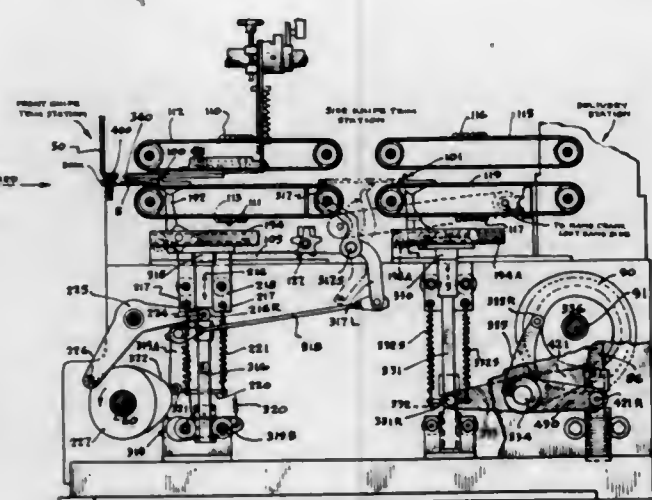


An outfeed conveyor table has two sets of sweep fingers positioned behind four ganged saws of a wood-processing mill. The saws are laterally adjustable to vary their spacing. Each set of sweep fingers can be aligned independently of the other set in a home position behind any one of the four saws and maintained in its selected home position by an independent set of networks which coordinates the movement of the set of fingers with any movement of its corresponding saw. Each finger set can also be positioned at either side of the conveyor path and swept to the opposite side to sweep all cut material laterally in either direction from the table. From any of their home positions, one finger set is adapted to sweep in one direction across the table while the other set is adapted to sweep in the opposite direction. Either or both sets of fingers can also be maintained in retracted positions to permit some or all cut pieces to pass downstream from the end of the conveyor table.

**3,732,766**  
**SHEET TRIMMING MACHINES**  
William B. McCain, Hinsdale; James F. Cosgrove, Western Springs, and Elmer D. Bewersdorf, Downers Grove, all of Ill., assignors to McCain Manufacturing Corp., Chicago, Ill.  
Filed Feb. 16, 1971, Ser. No. 115,174  
Int. Cl. B26d 5/42, 11/00

U.S. Cl. 83—104

6 Claims



A three-knife sheet trimmer is so constructed as to separate the drive for the knives (one front knife and two side knives) from the drive for the clamps which hold the sheets (e.g. the sheets of a book) stationary while being trimmed. The knives at the stations are operated out of phase, and the moving masses are therefore balanced compared to the previous form of these trimmers where all knives move in the same direction

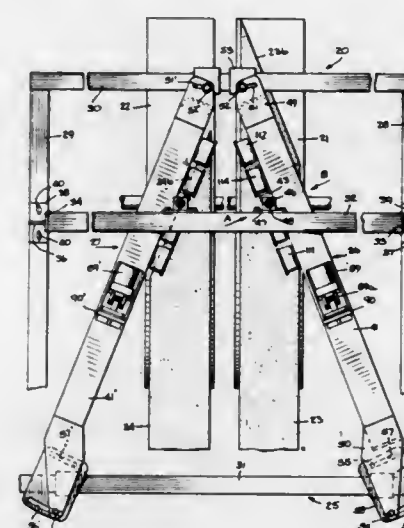
at the same time. Separating the drives also enables a book to be sooner advanced from the first knife station to the second knife station. This being so, there is a greater allowance of time in which to make the transfer, and hence there is no need to rush the book.

The stops at the several knife stations against which a book is advanced may be adjusted simultaneously, and the separate feed means which advance or feed the books first from the first knife station to the second knife station and then out of the second knife station, may be opened or spread apart simultaneously either for re-adjustment to accommodate books of a different size or for the purpose of clearing a jam.

**3,732,767**  
**CUT-TO-LENGTH APPARATUS FOR BIAS-CUT TIRE BELT PLY MATERIAL**  
William C. Habert, Fraser, Mich., assignor to Uniroyal, Inc., New York, N.Y.  
Filed Nov. 26, 1971, Ser. No. 202,163  
Int. Cl. B26d 7/10

U.S. Cl. 83—171

15 Claims



An apparatus for the contemporaneous bias-cutting of two elongated strips of rubberized tire belt or breaker ply material with reinforcing elements of opposed bias angles into relatively shorter belt ply-forming strips of predetermined lengths, each starting strip being cut from its middle toward its opposite edges. The apparatus includes two coaxial, rotatable, cylindrical drum-like anvils for the starting strips, and two pairs of normally retracted, non-rotary, heated cutting blades, the two blades of each pair being mounted for joint reciprocal opposed movements along a respective curved path the obliquity of the plane of which relative to the mid-circumferential plane of the associated drum can be adjusted, preferably about an axis located in the mid-circumferential plane of the associated drum and perpendicular to the drum axis, so as to correspond to any desired one of a range of such bias angles. The curvature of each path is such that in the mean adjusted position thereof it is disposed at a substantially constant spacing from the associated drum surface. The cutting blades of each pair are arranged to abut against each other at the mid-point of their respective path of movement, with the parting line of their cutting edge tip region in line with the associated pivot axis, so that any underlying strip is penetrated in the middle thereof when the blades are protracted against the associated drum surface. Suitable means are also provided for yieldingly urging the blades continuously into contact with the associated drum surfaces during the separating movements of the blades while performing the cutting operation so as to compensate for variations in the spacing between their paths of movement and the drum surfaces engendered by angular adjustments of the paths to other than the mean adjusted positions thereof.

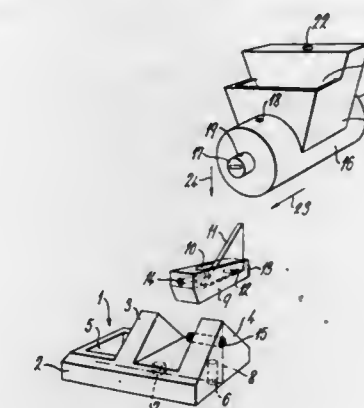
**3,732,768**  
**MICROTOME KNIFE MOUNT**  
Stuart Arthur Hodson, London, and John Marshall, Kent, both of England, assignors to National Research Development Corporation, London, England  
Filed Apr. 6, 1971, Ser. No. 131,697

Claims priority, application Great Britain, Apr. 7, 1970, 16,410/70

Int. Cl. G01n 1/06

U.S. Cl. 83—171

16 Claims



A knife mount is proposed for a microtome to be used for cutting ultra-thin sections. The proposed mount is formed with a trough for coolant, such as liquid nitrogen, and provided with a heater, the mount, including trough and heater, being symmetrical about a plane therethrough and adapted to support a knife by way of a connection disposed in the plane of symmetry. This knife mounting arrangement reduces the effects of differential expansion and contraction on the knife cutting edge disposition. In a preferred arrangement the knife cutting edge is parallel to the plane of symmetry, and the mount co-operates with a specimen holder to provide relative feeding movement perpendicular to said plane, and relative cutting movement perpendicular to the cutting edge and parallel to said plane.

**3,732,769**  
**DEVICE FOR APPLYING SLIDE TRANSPARENCY TO MOUNTING**

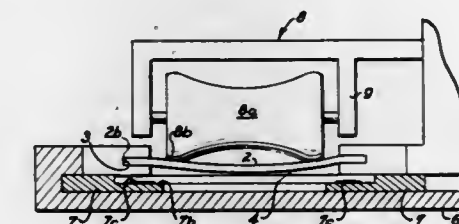
Johannes Loersch, Krefelder Strasse 40, Huls, Germany  
Filed Feb. 1, 1971, Ser. No. 111,204

Claims priority, application Germany, Jan. 30, 1970, P 20 04 095.3

Int. Cl. B26d 7/08

U.S. Cl. 83—176

5 Claims



A device for applying slide transparencies to a mount half, a slide tract being included wherein a strip of developed film is led by grooves to over a mount half having two adhesive points on opposite sides of the image window. The track terminates just short of a position directly over a recessed reception table to support the mount half. The film strip is bowed slightly downwardly in a trough-like manner as seen from above by a roller shaped as a hyperboloid which bears on the film strip at its edges just outside of each groove on the track containing the edges of the film. The arrangement provides support for



the film so that it extends over the mount half without bending upwardly or downwardly and, when positioned, as desired, is cut by a knife so as to be received in a recess therefor which surrounds the image window with a pair of self sticking adhesive points thereon securing the transparency precisely in place so that it is not dislodged on subsequent movement of the mount half.

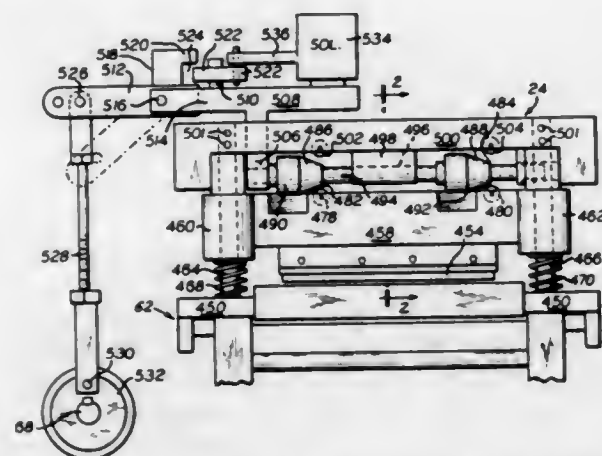
### 3,732,770 CUTTING MEANS

Gerald Ottavan, Ridgefield, N.J., assignor to Allamatic Corporation, Cliffside Park, N.J.

Division of Ser. No. 736,768, June 13, 1968, Pat. No. 3,567,148. This application June 15, 1970, Ser. No. 46,426  
Int. Cl. B26d 5/16

U.S. Cl. 83—572

3 Claims



A cutter for cutting labels as they move off a printing press without using shear. The cutter includes means for operating the cutter bar to separate labels singly or into groups. The cutter includes a movable die which is moved into and out of cutting relation with the label paper by means of a pair of eccentrically actuated links in order to apply uniform cutting pressure over the entire head of the movable die.

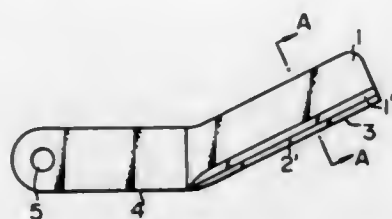
### 3,732,771

KNIVES FOR FIBER TOW-CUTTING APPARATUS  
Saijiro Kinoshita, and Katsumobu Shinmura, both of Matsuyama-shi, Ehime-ken, Japan, assignors to Teijin Limited, Osaka, Japan

Filed July 7, 1971, Ser. No. 160,293  
Claims priority, application Japan, Aug. 26, 1970, 45/74818  
Int. Cl. B26d 1/28

U.S. Cl. 83—663

9 Claims



In knives for the fiber tow-cutting for manufacturing staples by cutting synthetic tows, the improvement comprising  
i. making the blade body of such knives of a steel material having the following composition:

|                                                                       |                                             |
|-----------------------------------------------------------------------|---------------------------------------------|
| Content of C                                                          | 0.08 - 1.10% by weight                      |
| Content of Si                                                         | 0.15 - 0.80% by weight                      |
| Content of Cr                                                         | 0.40 - 1.80% by weight                      |
| Total content of Mn, P and S                                          | 0 - 1.75% by weight                         |
| Content of metallic impurities other than Fe and the above components | 0 - 5.00% by weight                         |
| Content of Fe                                                         | remainder of a total of 100% by weight; and |

ii. providing only on one side of such knives a metallic coating layer a thickness ranging from 2 microns to 50 microns and a Vickers hardness of above 700.

### 3,732,772

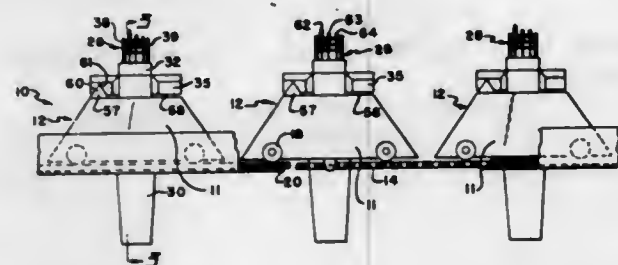
#### LOG CARRIAGE APPARATUS

Peter J. Neild, North Vancouver, British Columbia, Canada, assignor to MacMillan Bloedel Limited, Vancouver, British Columbia, Canada

Division of Ser. No. 726,996, May 6, 1968, Pat. No. 3,603,362.  
This application May 17, 1971, Ser. No. 144,047  
Int. Cl. B27b 29/08

U.S. Cl. 83—730

8 Claims



Apparatus including individual interconnected supporting units for gripping and transporting logs past cutting elements for accurate cutting thereof. The apparatus grips and holds each log in a substantially horizontal plane, the gripping taking place along the lower portion of the log so that cutting elements, such as saws and/or chipper heads, can cut the log from above and on both sides.

### 3,732,773

#### AUTOMATIC PAGE TURNER

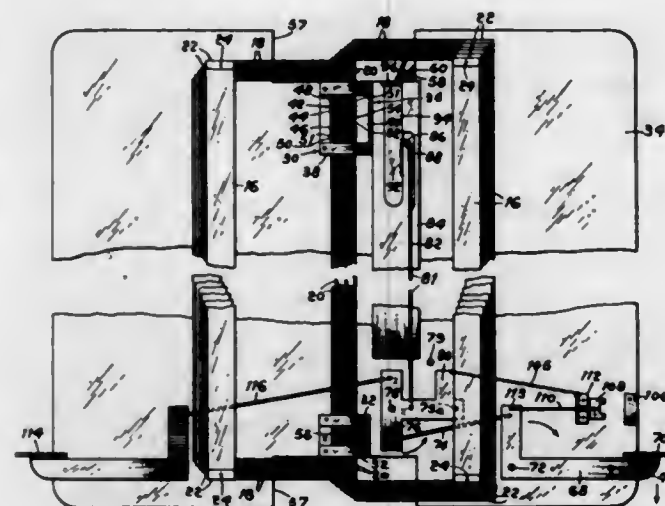
Aldo L. Bombardi, 202 Smull Avenue, North Caldwell, N.J.

Filed Sept. 10, 1971, Ser. No. 179,453

Int. Cl. G10g 7/00

U.S. Cl. 84—491

16 Claims



A plurality of vertically disposed resilient wire rods are pivotally mounted in bushings which are spaced along the ends of the rods and secured on a base plate. Each rod pivots about a separate vertical axis through the bushings and is spring biased toward one side of the base plate. The opposite ends of each rod are bent to extend horizontally, with each horizontal extension being spaced apart vertically to avoid interference with the other rods. A pair of vertically extending clear flexible plastic strips are secured between the ends of the opposite horizontal extensions of each rod. The plastic strips of each pair are positioned one above the other to engage the front and back faces of a page of a book or a sheet of music

which is inserted between the strips. The outer cover or pages are held in place against the base plate by clamps.

In the latched position, the rods are pivoted to the right side of the base plate with each upper horizontal extension engaging a corresponding individual slot in a vertically disposed latching bracket. A lever release mechanism operates a vertical control rod having a pawl at the end which engages the teeth of a slideable rack. The rack is moved upwardly against the horizontal wire rod extensions which are pushed out of the slots to permit the spring biased vertical rods to pivot back to the left with the pages carried between the plastic strips. Each movement of the lever causes the pawl to move the rack upwardly another notch against the next horizontal rod extension to successively release all of the rods and turn the pages from right to left back into the normal position.

### 3,732,774

#### AUTOMATIC RELOADING APPARATUS AND SHOTGUN SHELL DRIVE MEANS THEREFOR

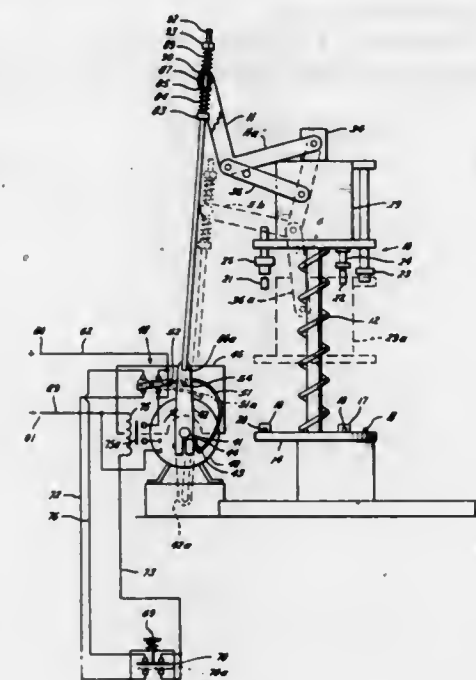
Tommy K. Griffin, 539 Hidden Valley Drive, Houston, Tex.

Filed May 5, 1971, Ser. No. 140,486

Int. Cl. F42b 33/02

U.S. Cl. 86—23

4 Claims



Automatic shotgun shell reloading apparatus and drive means therefor, wherein a shell reloading apparatus having plural sequential reloading stages is driven by operation of an electric motor one-half rotation at a time to give up and down movements to the operating lever of the shell reloading apparatus.

### 3,732,775

PRISM VIEWFINDER FOR MIRROR REFLEX CAMERAS  
Hans Warstat, Stuttgart, Germany, assignor to Fritz Victor Hasselblad, Goteborg, Sweden

Filed Apr. 20, 1971, Ser. No. 135,728

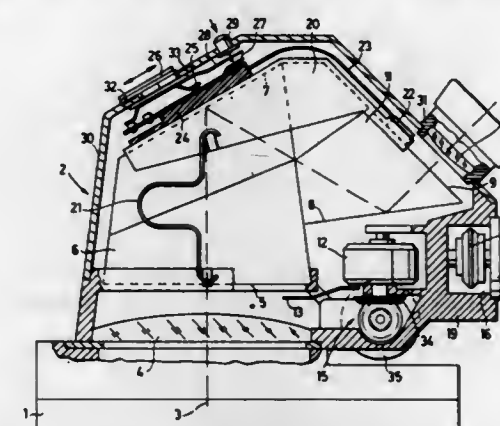
Claims priority, application Germany, Apr. 30, 1970, P 20 21 179.4

Int. Cl. G01j 1/16

U.S. Cl. 88—1.5 R

16 Claims

In a prism viewfinder for mirror reflex cameras having the roof edge of the prism displaced from and opposite to the ray incidence surface of the prism and a plane mirror surface substantially parallel to the ray incidence surface, laterally displaced from and within the range between the roof edge and the ray incidence surface and adapted to direct the ray path out of camera whereby the direction of emergence of the ray



path forms an angle of about 45° with respect to the direction of incidence of the ray path; the improvement in which at least the galvanometer of an electric exposure meter is substantially disposed between the plane mirror surface and a plane passing through the ray incidence surface. In the preferred embodiment, a viewfinder adjusting disc is combined with a field lens on the opposite side of the ray incidence surface and spaced therefrom, and measuring circuit components of the exposure meter are substantially disposed between the plane mirror surface and a plane passing through the adjusting disc.

### 3,732,776

#### BLANK FIRING ATTACHMENT

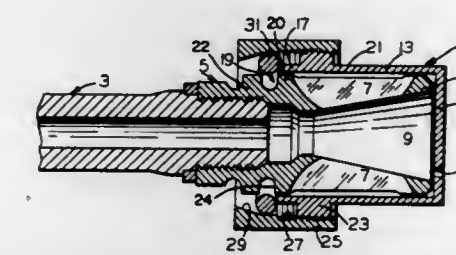
Robert E. Snodgrass, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 17, 1971, Ser. No. 181,486

Int. Cl. F41f 17/00

U.S. Cl. 89—14 E

8 Claims



A blank firing attachment is provided for automatic weapons which comprises a cylindrical member one end of which is open for slideable mounting on the muzzle end of the weapon barrel. A collet and split ring arrangement is associated with the open end of the member and is adjustable with respect thereto to hold the attachment on the muzzle end and effect substantial sealing engagement therewith whereby the expanding gases incident to firing blank ammunition are confined within the barrel for accomplishing automatic operation in a manner well-known in the art. The housing is also provided with vent means for controlled release of the gases within the barrel.

### 3,732,777

#### MISSILE LAUNCHING MECHANISM

Lawrence M. Ludwick, Costa Mesa, and Elmer E. Maisio, Fountain Valley, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 18, 1971, Ser. No. 172,799

Int. Cl. F41f 3/04

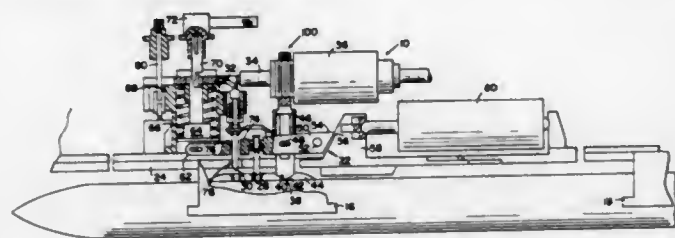
U.S. Cl. 89—1.807

3 Claims

A mechanism for supporting, restraining and firing a missile. The missile is supported on a launch rail and restrained



from movement by a detent holding means. After ignition, the missile is held until sufficient thrust is developed to overcome restraining force of the holding means. As the missile moves



forward on the launch rail a plate on the missile surface resets the detent holding means for operation by the following missile.

3,732,778

### DEVICE ON WEAPON BARRELS FOR REDUCTION OF THE ANGLE JUMP OF A PROJECTILE

Peter Bettermann, Bad Kreuznach; Heinz Reuschel, Tiefenbroich, and Manfred Wolf, Bad Kreuznach, all of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Germany  
Filed Feb. 27, 1970, Ser. No. 15,132

Claims priority, application Germany, Mar. 5, 1969, P 19 11 067.9

Int. Cl. F41f 17/02

U.S. Cl. 89-14 R

1 Claim



A device on gun barrels for the reduction of the angle jump of a projectile, which comprises at least one reinforcement member fitted to the forward range of a gun barrel, and is adapted to dampen bending oscillations occurring upon firing in the gun barrel.

3,732,779

### UNDER-CENTER GUN TOGGLE MECHANISM WITH TOGGLE BIASING MEANS AT GIVEN POSITION

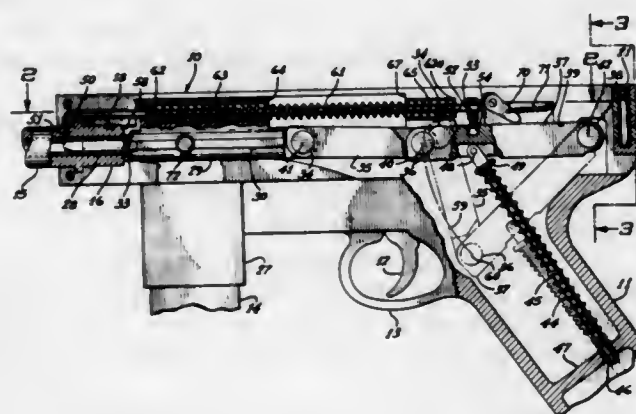
Walter E. Perrine, 11833 W. Olympic Boulevard, Los Angeles, Calif.

Filed Oct. 22, 1971, Ser. No. 191,619

Int. Cl. F41c 5/02

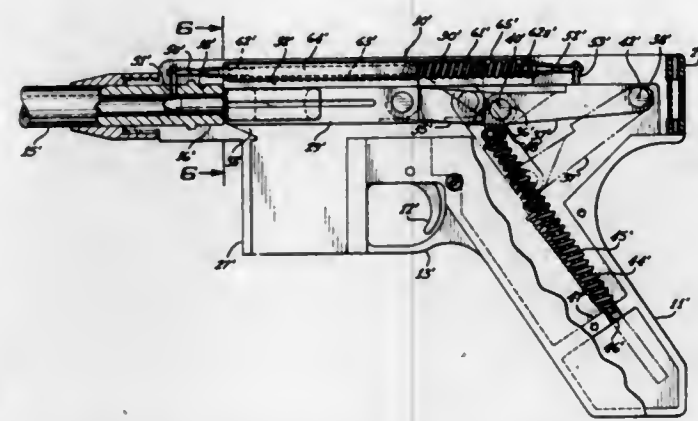
U.S. Cl. 89-189

8 Claims



A toggle action pistol in which an under-center toggle is tripped to recede into its handle by the effects of gas pressure

generated at the time of firing and employing a toggle biasing



means at a given position on the toggle mechanism.

3,732,780

### APPARATUS FOR PRODUCING VARIABLE RATIO GEARING

Robert Wydler, and Erhard Ruesch, both of Zurich, Switzerland, assignors to Maag Gear Wheel & Machine Company Limited, Zurich, Switzerland

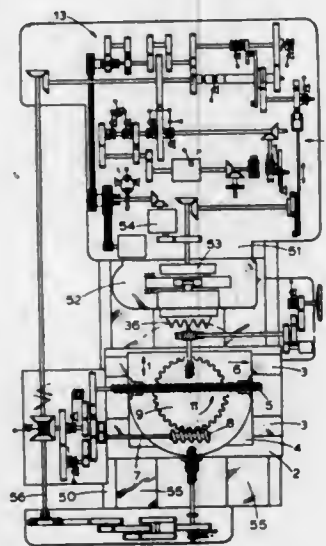
Filed Oct. 1, 1970, Ser. No. 77,242

Claims priority, application Germany, Oct. 9, 1969, P 19 50 959.2

Int. Cl. B23f 5/14

U.S. Cl. 90-8

5 Claims



A variable ratio gear component, such as a motor vehicle steering segment, is produced by arranging that relative motion between a workpiece forming the component and a tool includes a normal generating component and a graduated additional generating component, the latter being imparted to the workpiece tangentially to the generating path of the tool and workpiece. An adaptation of a gear cutting machine is described to provide for the inclusion of such an additional motion derived from the rotation of the workpiece relative to the table.

3,732,781

### KEY VISE

Phillip C. Hungerford, Jr., Cleveland; John L. Gereby, Wickliffe, and Robert H. Richens, Bedford Heights, all of Ohio, assignors to Cole National Corporation, Cleveland, Ohio

Filed Apr. 13, 1971, Ser. No. 133,581

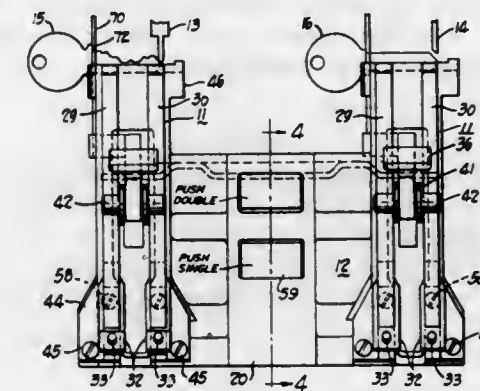
Int. Cl. B23c 1/16

U.S. Cl. 90-13.05

27 Claims

A key vise is disclosed for a key cutting machine. The vise utilizes beam springs acting on relatively movable first and

second jaws with an eccentric loading an intermediate point of the beam springs to tightly clamp a key between the vise jaws. A retention spring of small force initially holds the key in position in the vise before the jaws are clamped and a gauge means is provided to selectively position either single sided or dou-



ble-sided keys. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,732,782

### VARIABLE GAIN AMPLIFIER FOR HYDRAULIC SERVO-CONTROL SYSTEMS

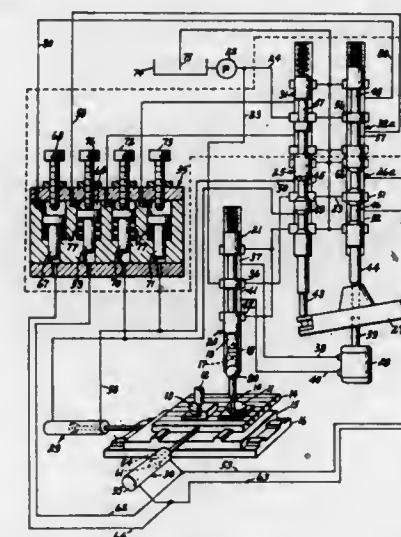
Wendell I. Evans, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Mar. 15, 1971, Ser. No. 124,165

Int. Cl. F01b 25/02; F15b 21/02; F15c

U.S. Cl. 91-6

1 Claim



An hydraulic servo-control system has a variable gain amplifier which generates a control force large enough to overcome static forces resisting movement of a machine slide and minimize the effect of forces which cause compression of the hydraulic fluid. The variable gain amplifier then operates at a lower gain level once the slide is in a kinematic state.

3,732,783

### FLUID CYLINDER HAVING SELF-LOCKING MEANS

Richard G. Emenaker, Romeo, Mich., assignor to Harry S. Nichols, Jr., Troy, Mich., a part interest

Filed Feb. 11, 1971, Ser. No. 114,575

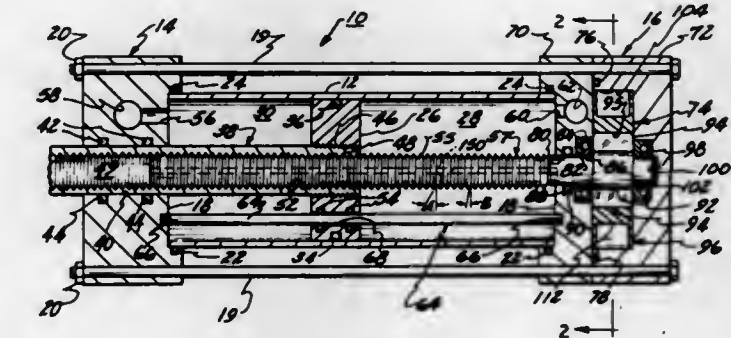
Int. Cl. F15b 15/26

U.S. Cl. 91-44

7 Claims

A fluid cylinder having a tubular housing with a piston reciprocally mounted therein and capable of fluid pressure

actuation in opposite directions. One side of the piston carries an actuating rod which slidably extends through one end of the tubular housing, while a coaxially aligned bore extending from the opposite side of the piston and into the actuating rod has a threaded surface adapted to receive a threaded member which, in turn, is rotatably carried at the other end of the tubu-



lar housing. The threaded surfaces of the piston bore and the rotatable threaded member engage in a self-locking relationship such that the piston is incapable of movement when subjected to fluid pressure unless the threaded member is initially and continually rotated. Means are provided for selectively rotating the threaded member upon fluid pressure actuation of the piston in either direction.

3,732,784

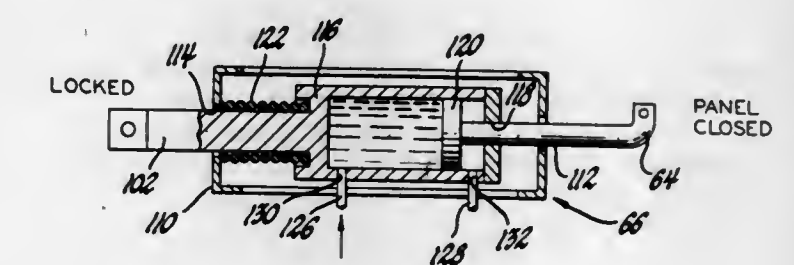
### SEQUENTIALLY OPERATING LINEAR ACTUATOR

Robert A. Vogele, Lathrup Village, Mich.; Richard W. Kirkman, Harpenden, England, and Alverson B. Williams, Warren, Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 860,907, Sept. 25, 1969, Pat. No. 3,622,197. This application Mar. 24, 1971, Ser. No. 127,535  
Int. Cl. F01b 7/10, 15/02

U.S. Cl. 92-65

2 Claims



A vehicle body closure includes a base having fore and aft pins to mate with holes in a vehicle body to locate the base in an opening in the vehicle body, a releasable top lock to secure the base to the body, and right and left flipper panels pivotally mounted thereto, with each flipper panel movable between a raised position opening half of the opening and a lowered closed position covering half of the opening. A door-controlled body-mounted sequentially-operating hydraulic linear actuator includes a spring-biased movable cylinder operably connected to a locking mechanism and a movable piston operably removably connected to a base-mounted raising mechanism through the aft pins to sequentially operate in one direction to unlock and then in the opposite direction to raise a flipper panel in response to differential fluid pressure and to operate in the one direction to lower the flipper panel and then in the opposite direction to lock it in response to opposite differential fluid pressure. The base and the flipper panels may also be removed giving a completely open body.



3,732,785

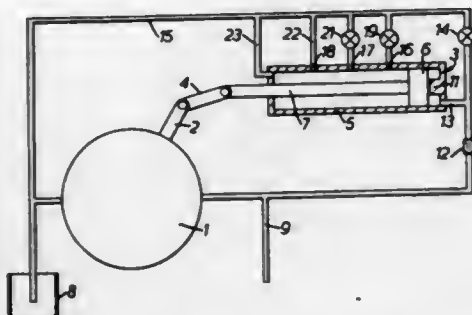
## FLUID PRESSURE APPARATUS

Kenneth Raymond Boydel, Tewkesbury, England, assignor to Dowty Technical Developments Limited, Brockhampton, England

Filed Apr. 30, 1971, Ser. No. 138,874  
Int. Cl. F01b 13/04

U.S. Cl. 91-506

13 Claims



A variable-displacement pump or a variable-displacement motor having a smoothly adjustable servo-motor for displacement adjustment and a plurality of separate manually operable controls for adjusting the servo-motor to any one of a number of preselected displacements for the pump or motor. For adjustment of the servo-motor to an intermediate displacement position, a valve means is provided actuable by the servo-motor at a position corresponding to a selected intermediate displacement, and a selecting valve co-operable with the valve means, said selecting valve having two settings, in one of which the valve means is rendered capable of controlling the pressure in a working volume of the servo-motor to arrest movement thereof substantially in the selected position, and in the other of which the valve means is rendered incapable of controlling the pressure in the working volume.

## ERRATUM

For Class 92-65 see:  
Patent No. 3,732,784

3,732,786

## MULTI-STAGE ROTARY JACKS

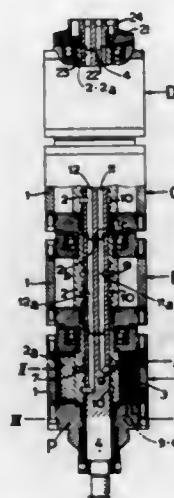
Albert Grosseau, Chaville, France, assignor to Citroen SA (Automobile Citroen, Berliet, Panhard), Paris, France

Continuation of Ser. No. 810,212, March 29, 1969, abandoned. This application May 13, 1971, Ser. No. 143,157  
Claims priority, application France, Mar. 29, 1968, 68146488

Int. Cl. F01b 15/00; F15b 11/18

U.S. Cl. 92-66

8 Claims



This invention relates to multi-stage rotary jacks, of the kind in which each stage has a vane that is capable of turning with

respect to the wall of a cylindrical casing, the vane or the casing constituting, as desired, a rotor and a stator and all the stages being coaxially aligned one above the other.

According to the invention, the stator and rotor members of each stage are idly mounted on a central shaft except for one of said members of an end stage and this excepted end member is keyed to the central shaft to rotate therewith but the rotor of each stage is keyed to the stator of one of its two contiguous stages so as to rotate therewith.

3,732,787

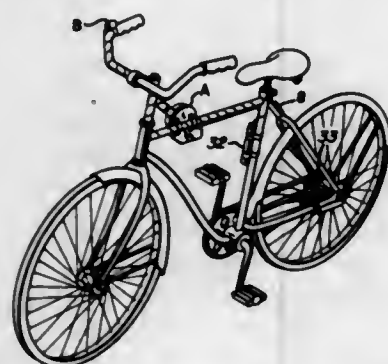
## BICYCLE SPEED CHANGE GEAR SHIFTING DEVICE

Elkichi Yamaguchi, Tokyo, Japan, assignor to Maruishi Cycle Industries Ltd., Tokyo, Japan

Filed Mar. 16, 1971, Ser. No. 124,715  
Int. Cl. F16d 71/00; B62m 9/04

U.S. Cl. 192-142 R

1 Claim



A bicycle change gear transmission according to which one end of a shift lever is secured to a winding drum to which one end of an inner wire connected to the change gear transmission is secured while a clutch drum is secured to the other end of said shift lever, and a rotary gear is interlocked with a motor through the intervention of a transmission gear train. Furthermore, a clutch spring has one end secured to the inner side face of said rotary gear and wound around the clutch drum, a control switch mechanism being mounted adjacent one handle of the bicycle handle bar while a spacer is located contiguously with said rotary gear and has a control plate provided with a set of contact pieces respectively having corresponding slots and projections and connected to said control switch mechanism through separate circuits, two operating switches being provided in said control switch mechanism and connected respectively to a driving circuit and a braking circuit so that the shift lever may be automatically displaced to its predetermined positions by operating said switches selectively.

3,732,788

## PAVEMENT JOINT SEALS

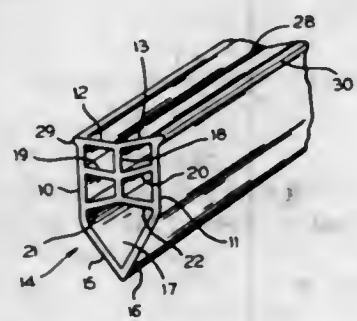
Delmont D. Brown, North Baltimore, Ohio, assignor to The D. S. Brown Company, North Baltimore, Ohio

Filed Apr. 26, 1971, Ser. No. 137,310

Int. Cl. E01c 11/10

U.S. Cl. 94-18

4 Claims



Elongated, hollow elastomer seals particularly useful for the sealing of concrete pavement joints, bridge deck joints, etc.

against intrusion by liquids and incompressible solids and embodying an elongated, preferably transversely concave top wall; an elongated bottom wall; substantially flat, elongated side walls; and an internal web structure embodying a vertical web substantially midway between the side walls with the lower end of the vertical web spaced from the bottom wall and at least two pairs of lateral webs extending from opposite sides of the vertical web, at least one of which pairs undergoes a toggle-like action when the seal is laterally compressed.

3,732,789

## METHOD OF AND DEVICE FOR PACKING ARTICLES

Franz Hartleib, Furstenu, Germany, assignor to Firma Maschinenbau Aachen-Furstenu Gesellschaft mit beschränkter Haftung, Aachen, Reichsweg, Germany

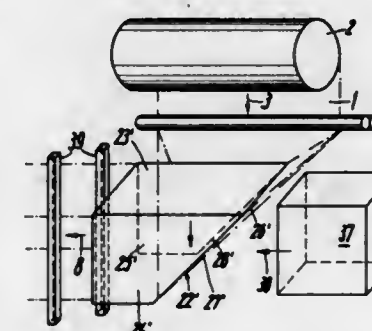
Filed Oct. 27, 1970, Ser. No. 84,427

Claims priority, application Germany, Oct. 27, 1969, P 19 53 969.6

Int. Cl. B31b 1/38

U.S. Cl. 93-82

12 Claims



A method of and apparatus for forming a channel from a web of packaging material by passing the web over a body of substantially the desired cross section of channel and having guide edges, and changing the direction of movement of the web to form the desired channel. The goods to be packaged are supplied to the zone of the body in the direction in which the formed channel leaves the body.

3,732,790

## CORRUGATED CONTAINER AND METHOD AND APPARATUS FOR MANUFACTURING THE SAME

Hajime Miyake, Osaka, and Akio Hayama, both of Japan, assignors to Kabushiki Kaisha Nisso, Osaka, Japan

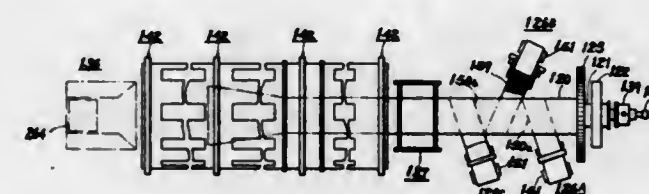
Filed Dec. 18, 1970, Ser. No. 99,634

Claims priority, application Japan, Dec. 25, 1969, 44/103793

Int. Cl. B31c 3/00

U.S. Cl. 93-94 R

4 Claims



The present invention relates to the stitchless tubular container and the stitchless box container and the method and the apparatus for manufacturing the same, which containers are produced from material strips by the successive process which comprises the step of making a tubular body, whereby the corrugated strips with their flutes obliquely or longitudinally flowed in the axial direction are superposed on the liner strips, the adjacent edges of adjacent convolutions thereof are overlapped each other, the step of making longitudinal creases on the tubular body, the step of gradually flattening the tubular

body thus obtained and finally severing said flat tubular body into individual corrugated containers.

3,732,791

## PAVEMENT AND RAILROAD BED CONSTRUCTION WITH LIGHT CONCRETE SUB-LAYER

Frieder Hohwiler, Wachenheim, Weinstrasse; Klaus Koehling, Frankenthal, Pfalz; Walter Schneider, and Dietrich Koenig, both of Ludwigshafen, Rhein, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Continuation of Ser. No. 746,010, July 19, 1968, abandoned.

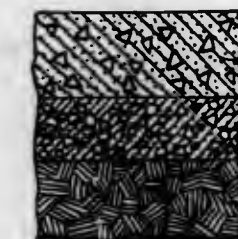
This application Mar. 4, 1971, Ser. No. 121,175

Claims priority, application Germany, July 27, 1967, P 16 58 436.4

Int. Cl. E01c 9/00

U.S. Cl. 404-31

10 Claims



Frost barrier for pavements and railroad bed in the form of a layer of light concrete containing particles of organic foam plastics.

3,732,792

## IMAGE PLANE PLATE

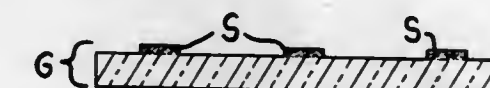
Milson S. Tarnopol, Brackenridge; Robert G. Twells, deceased, late of New Kensington, both of Pa. (by Dolores A. Twells, administratrix), and Ronald R. Rigby, Fulling Mill Lane, Ridgefield, Conn., assignors to PPG Industries Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 671,830, Sept. 29, 1967, abandoned. This application Dec. 14, 1970, Ser. No. 97,749

Int. Cl. G03: G03c 5/00; C03c 17/00

U.S. Cl. 95-1 R

5 Claims



An image plane glass plate used as a mask or template for printing patterns or circuits onto photosensitive material. A portion or zone of the glass plate is made substantially opaque to ultraviolet light by introducing an ion-exchanged zone in a portion including a surface of the glass. Portions of the zone may be then etched away in a circuit pattern, or the zone may take the form of a circuit pattern.

3,732,793

## CALIBRATED VARIABLE NEUTRAL DENSITY FILTER FOR A CAMERA

Patrick W. Tague, 2514-56th Avenue, SW., Seattle, Wash.

Filed Oct. 26, 1971, Ser. No. 192,525

Int. Cl. G02b 5/30

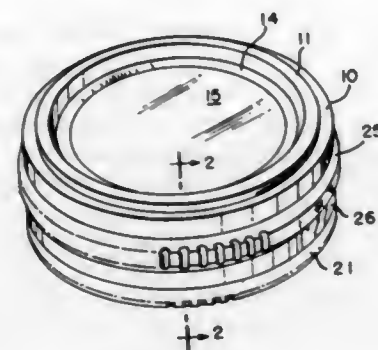
U.S. Cl. 95-1 R

3 Claims

A calibrated neutral density filter has two polarizing filter members mounted in filter ring supports for rotation relative to one another. Indicia on the filter supports relate the degree of rotation of the two polarizing filter members relative to each other as a function of f-stop. An outer concentric ring mounted for rotation over the filter support has indicia printed thereon corresponding to f-stop graduations on the filter support. A reference point on the filter support indicates the



*f*:stop correction necessary because of reduction of intensity of light through the two polarizing filter members. Setting of a predetermined *f*:stop reading on the concentric ring to the



reference point indicates the corrected *f*:stop reading for the camera for any degree of rotation of the polarizing filters relative to each other.

3,732,794

## CAMERA BODY RELEASE LEVER MECHANISM

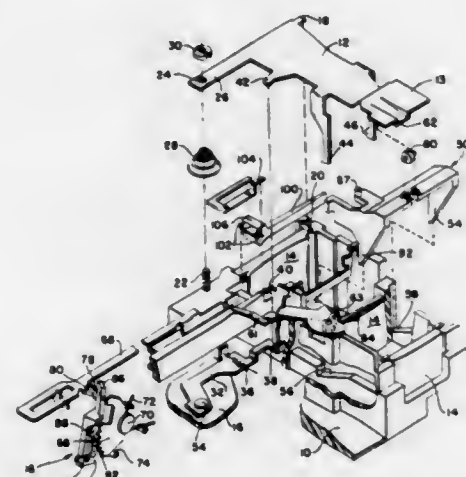
David E. Beach, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 16, 1972, Ser. No. 235,142.

Int. Cl. G03b 15/04, 17/20

U.S. Cl. 95—11 L

6 Claims



A camera includes an exposure mechanism and a member movable to sense the existence or non-existence of a predetermined camera condition. A shutter release button is movable to operate the exposure mechanism. The shutter release button is interconnected with the sensing member by a rocker member which amplifies the shutter release button's movement to minimize the travel of the button necessary to operate the sensing member. Means are provided for adjusting the sequence of operation of the exposure mechanism and the sensing member.

3,732,795

## ELECTRIC CELL CASE FOR USE IN CAMERA

Susumu Fukuda, and Takahiko Kakel, both of Hyogo, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Kanagawa, Japan

Filed Oct. 22, 1970, Ser. No. 83,048

Claims priority, application Japan, Oct. 22, 1969, 44/100534

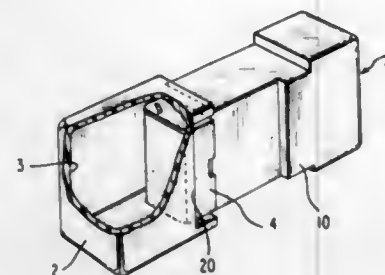
Int. Cl. G03b 19/02

U.S. Cl. 95—11 R

6 Claims

An electric cell case is used in a still camera having a slide case with a case body secured to one side of the camera body

facing the slide case and a cover hinged to the case body. The cover is adapted to open and close within the slide case for



quick replacement of cells, opening with a finger by releasing a snap latch, and is closed automatically by returning the slide case to a fit-in position relative to the camera body.

3,732,796

## LINE TRACING SYSTEMS USING LASER ENERGY FOR EXPOSING PHOTO-SENSITIVE SUBSTRATES

Raymond Marcy, Paris, France, assignor to Thomson-CSF, Paris, France

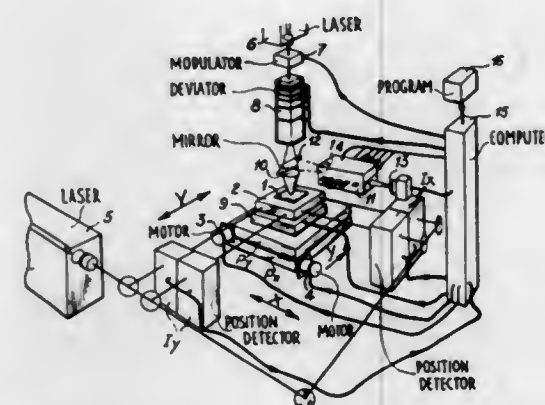
Continuation-in-part of Ser. No. 5,619, Jan. 26, 1970, Pat. No. 3,632,205. This application July 8, 1971, Ser. No. 160,725

Claims priority, application France, July 9, 1970, 7025559; Aug. 14, 1970, 7030040

Int. Cl. G03b

U.S. Cl. 95—12

9 Claims



The invention relates to systems for automatically tracing onto a photo-sensitive substrate various patterns such as used in the manufacture of integrated circuits. The system according to the invention comprise means for displacing the substrate along two mutually perpendicular directions, means for controlling said displacements in relation to a program supplied from a computer and as a function of monitoring signals supplied from position detection means; the laser tracing beam is digitally deviated along a line parallel to one of said directions and under the control of the substrate motion along said other direction.

3,732,797

## DIAPHRAGM DEVICE FOR A CAMERA

Tomoshi Takigawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1970, Ser. No. 103,027

Claims priority, application Japan, Jan. 9, 1970, 45/3255; Jan. 9, 1970, 45/3256

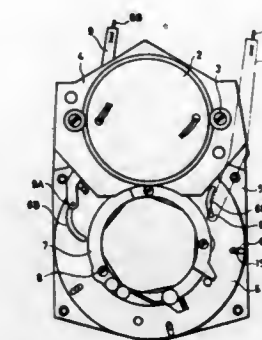
Int. Cl. G03b 9/02

U.S. Cl. 95—64 R

5 Claims

In the disclosed diaphragm assembly, a diaphragm control ring that moves to open and close the diaphragm blades, forms several cam grooves. Each groove is capable of receiving an

indicator extension. In this way the diaphragm assembly is adapted to operate with various types of cameras having dif-



ferent diaphragm indicator mechanisms. Each groove engages the mechanism which extends toward that groove.

3,732,798

## PHOTOGRAPHIC DEVELOPING SINK

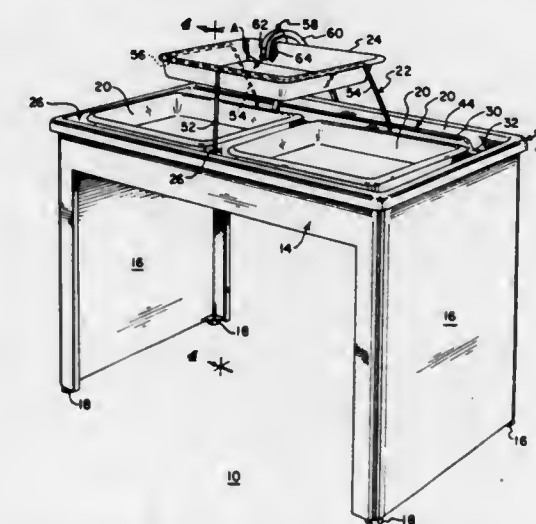
Charles J. Leonhart, Carol Stream, and Johnny Larsen, Chicago, both of Ill., assignors to The Nuarc Company, Chicago, Ill.

Filed Apr. 10, 1972, Ser. No. 242,661

Int. Cl. G03g 3/00

U.S. Cl. 95—89

7 Claims



A photographic developing sink comprising an integrally molded sink top having a recess formed therein for holding a quantity of liquid and tray support means formed in the recess for holding at least one film developing tray in contact with the liquid contained therein. A drain and dump trough is formed in the sink adjacent one side of the recess for receiving any liquid dumped from the tray and from said recess. Dam and spillway means is provided between the recess and drain for regulating the upper level of liquid in the recess and liquid supply means is provided for introducing liquid into the recess to flow into contact with the tray and over the spillway into the trough.

3,732,799

## AIR CONDITIONING TERMINAL UNITS

Hendrik J. Spoormaker, Pretoria, Republic of South Africa, assignor to Anilbema (Proprietary) Ltd., Pretoria, Transvaal, Republic of South Africa

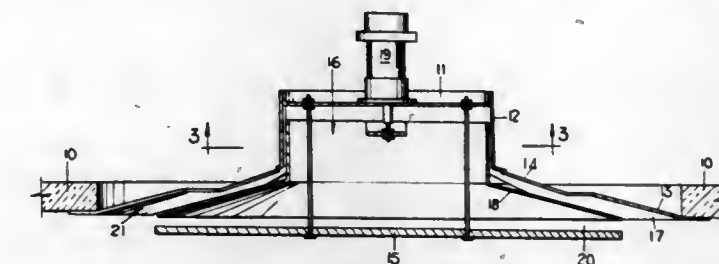
Continuation of Ser. No. 809,916, March 24, 1969, abandoned. This application June 11, 1971, Ser. No. 152,432

Int. Cl. F24f 13/06

U.S. Cl. 98—38

8 Claims

Conditioned air is supplied through a terminal unit mounted in a ceiling with a ceiling space above it. The unit is arranged



aperture in the ceiling in variable amounts by the flow of conditioned air through the aperture.

3,732,800

## VENTILATION LOUVER GRILLS

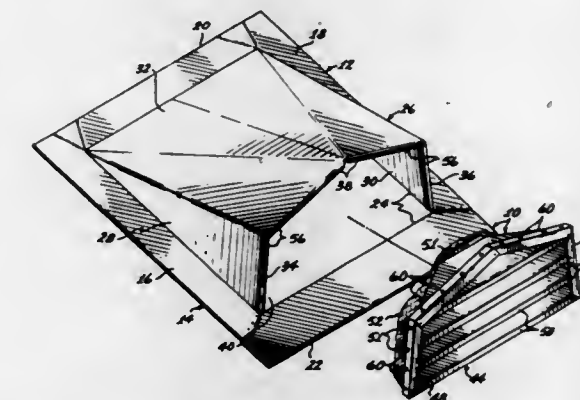
Robert J. Goettel, 7824 North 36th Drive, Phoenix, Ariz.

Filed Aug. 13, 1970, Ser. No. 63,393

Int. Cl. F24f 7/00

U.S. Cl. 92—42

4 Claims



Ventilation louver grills are disclosed in which a frame is provided with one half of a friction lock mechanism formed adjacent to an air flow opening, and the other half of the friction lock mechanism is formed on a louver means so that the louvers may be easily assembled to the frame.

3,732,801

## VEHICLE PASSENGER COMPARTMENT PRESSURE RELIEF SYSTEM

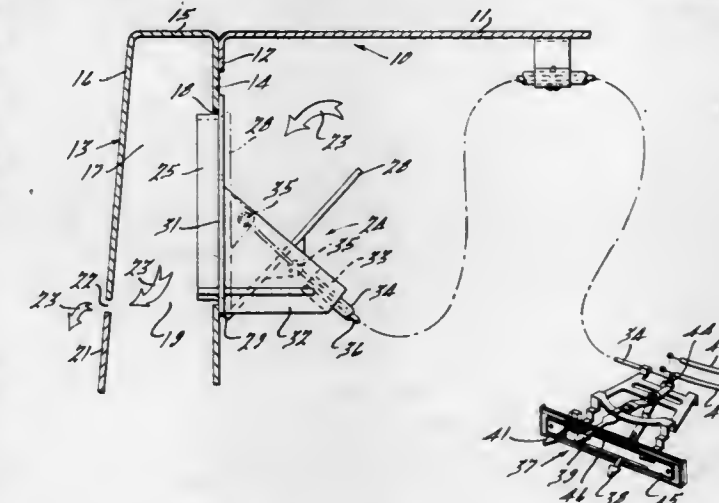
Stanley B. Wallis, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed July 19, 1971, Ser. No. 163,860

Int. Cl. B60h 1/24

U.S. Cl. 98—2.05

2 Claims



A vehicle passenger compartment pressure relief system comprising a valve controlled discharge outlet in a body panel



through which air may be exhausted to the atmosphere. The opened or closed position of the valve is correlated with the position of a control lever operable to regulate the heat output of the vehicle heating unit. The control lever is movable between cool and warm positions with the exhaust valve correspondingly being wholly opened in a full cool position and wholly closed in a full warm position of the control lever.

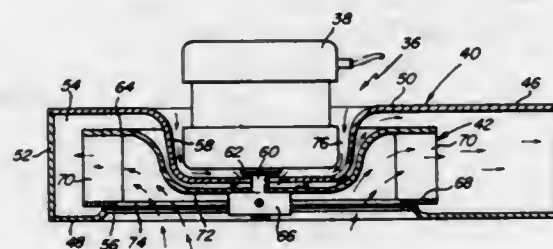
### 3,732,802 VENTILATING HOOD AND BLOWER DEVICE THEREFOR

Dezso S. Kristof, Orefield, Pa., assignor to Caloric Corporation, Tipton, Pa.

Filed Mar. 18, 1971, Ser. No. 125,750  
Int. Cl. F23j 11/00

U.S. Cl. 98—115 K

4 Claims



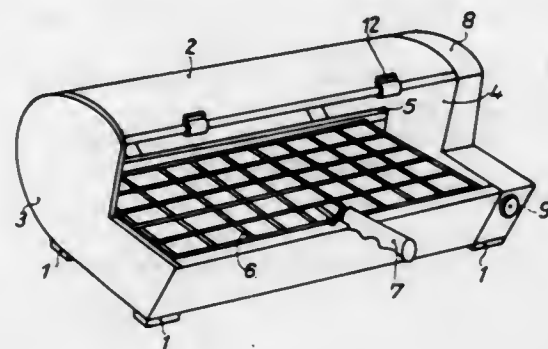
A kitchen ventilating hood for handling the forced circulation of air and more particularly a motor-blower unit therefor wherein means is provided for cooling the motor.

**3,732,803**  
**DEVICE FOR TOASTING AND/OR GRILLING**  
Heinrich-Jullius Buxmann, Steinbach/Taunus, Germany, assignor to Braun A.G., Frankfurt/Main, Germany  
Filed Feb. 8, 1971, Ser. No. 113,372  
Claims priority, application Luxembourg, Feb. 17, 1970, 60362

Int. Cl. A47j 37/08

U.S. Cl. 99—357

14 Claims



A device for heat-treating, such as toasting and/or grilling, foodstuff, has a housing, a foodstuff supporting grid, a heating element, and a metal foil reflector that is supported in an easily exchangeable manner with relation to a reflector support.

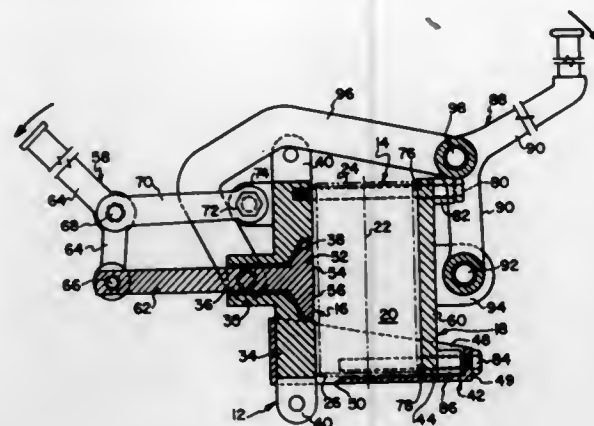
**3,732,804**  
**FLATTENING METAL CANS**  
Bynum W. Moller, P.O. Box 688, Kerrville, Tex.  
Filed Jan. 6, 1971, Ser. No. 104,266  
Int. Cl. B30b 7/04

U.S. Cl. 100—42

8 Claims

A method and apparatus for flattening thin metal cans is disclosed wherein the can is first creased or notched to incline

the can ends with respect to the can axis and each can end is then folded about an axis adjacent the juncture of the respec-

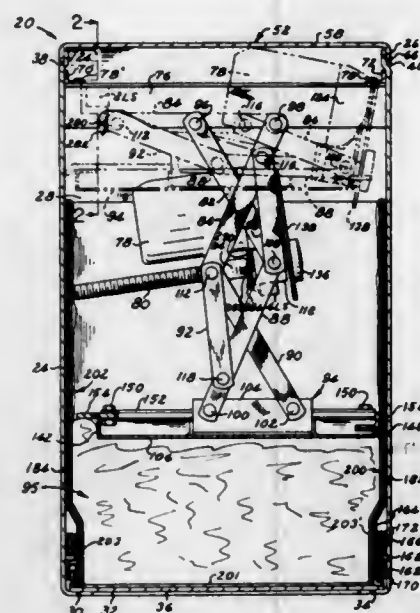


tive can end and the can side into a generally flat configuration.

**3,732,805**  
**REFUSE COMPACTOR**  
Jerry W. Moon, 2735 Alveston, Bloomfield Hills, Mich.  
Division of Ser. No. 148,879, June 1, 1971. This application  
Nov. 24, 1971, Ser. No. 201,928  
Int. Cl. B30b 15/66

U.S. Cl. 100—226

18 Claims

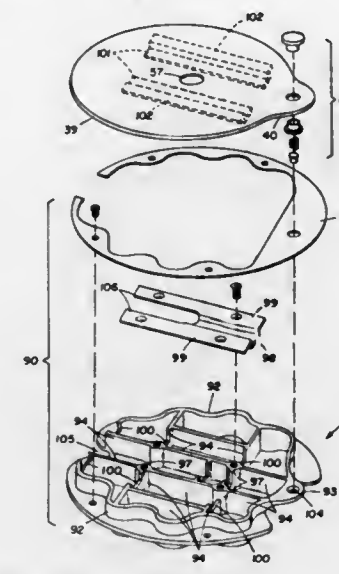


A refuse compactor including a receptacle removably contained within a cabinet wherein refuse is compacted by a ram to a fraction of its normal volume. The refuse is compacted within a specially constructed bag supported by the receptacle and cabinet, permitting the compacted refuse to be removed as a wrapped package for convenient and tidy disposal. The ram includes a refuse-compressing platen actuated through a toggle linkage to which force is applied by a single screw driven by an electric motor coupled to the screw through a reduction drive. The screw and its motor drive train are carried as a unit by the toggle linkage and move bodily therewith to provide a very compact and high ratio force multiplication system of reliable and inexpensive construction. Additional features relating to control circuitry, a safety lock, and bag, receptacle and drawer construction are also disclosed.

**3,732,806**  
**RAM HEAD FOR TRASH COMPACTOR**  
Joseph F. Bourgeois, Cedar Rapids, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa  
Filed July 6, 1971, Ser. No. 159,762  
Int. Cl. B30b 15/06

U.S. Cl. 100—295

4 Claims

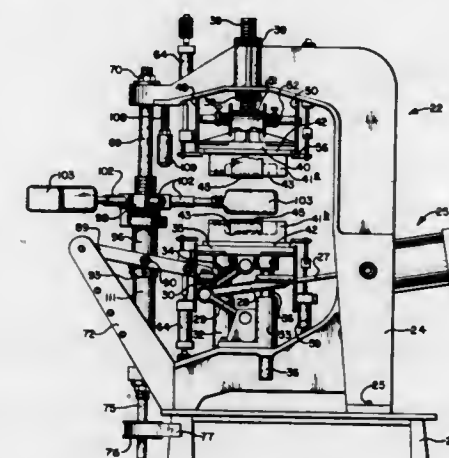


A removable ram head for a trash compactor employs an integral casting having a flat compacting face with an undulating or scalloped periphery of generally overall circular configuration. In trailing relation to the compacting face is a circular, laterally extending flange to which is secured an annular gasket. The undulating periphery of the compacting face and the flange combine to increase the compacting efficiency of the ram head. Structural details of a trash compactor incorporating the ram head are also disclosed.

**3,732,807**  
**METHOD AND APPARATUS FOR PRINTING HOLLOW ARTICLES**  
Elmer L. Robertson, Overland Park, Kans., assignor to Ethyl Development Corporation, Kansas City, Mo.  
Filed June 28, 1971, Ser. No. 157,401  
Int. Cl. B44c 1/14; B41f 17/24

U.S. Cl. 101—11

15 Claims



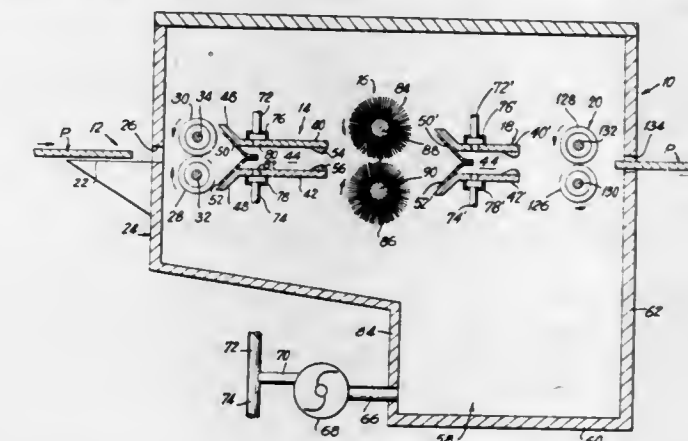
A process and apparatus for hot stamp printing of hollow articles, particularly plastic containers, utilizing pigment coated films or foils. The apparatus uses a split die holder which contains one or more heated elements providing the indicia desired to be printed on the exterior surface of the plastic container. One-half of the die holder is fixedly positioned, and the second half of the die holder is adapted to be raised into position to enclose the hollow plastic container within the die cavity which has the same shape as the container being printed. A mechanical indexing source is utilized to move the bottle into

the split die holder, and a single pneumatic source is utilized to close the split die holder around the bottle.

**3,732,808**  
**APPARATUS FOR DEVELOPING OFFSET PRINTING PLATES**  
Robert C. Graham, Florham Park, N.J., assignor to Polychrome Corporation, Yonkers, N.Y.  
Filed Mar. 18, 1971, Ser. No. 125,612  
Int. Cl. B41m 5/00

U.S. Cl. 101—463

8 Claims

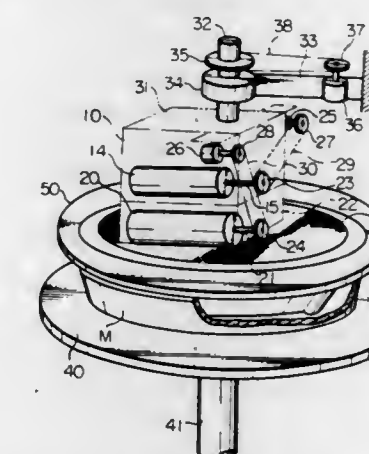


Apparatus for developing offset printing plates wherein means are provided to simultaneously develop both sides of a two surface planographic offset printing plate or one surface of two single surface planographic offset printing plates placed back to back. The apparatus includes means for dispensing developer solution to opposed plate surfaces at the same time, rubbing means to simultaneously rub the opposed surfaces to assist the chemical action of the developer solution, washing means for removing developer solution from the opposed surfaces and propelling means for moving the plate or plates through the apparatus. The developer solution dispenser supplies developer solution at a uniform hydraulic pressure over the full surface area of the offset printing plate without the use of spray nozzles.

**3,732,809**  
**ELECTROSTATIC PRINTING APPARATUS FOR PRINTING ON CURVED SURFACES**  
Hiroomi Sawada, and Shigekazu Shimazawa, both of Tokyo, Japan, assignors to Nippon Denshi Insatsuki Kabushiki Kaisha, Chuo-ky, Tokyo, Japan  
Filed Nov. 10, 1971, Ser. No. 197,211  
Claims priority, application Japan, Nov. 13, 1970, 45/99732; Dec. 2, 1970, 45/105896  
Int. Cl. B41f 17/18

U.S. Cl. 101—35

7 Claims



An apparatus for electrostatically printing on the curved surface of an article, in which the article securely held on a



supporting member is set in such a position that its surface to be printed is located in close proximity of an image forming screen in evenly spaced opposed relation thereto thereby defining a predetermined space therebetween, and a powder feeding box containing a finely divided electroscopic ink powder therein and having a rotatable cylindrical brush mounted therein and further carrying a rubbing member rotated about a vertical shaft with said rubbing member in contact with said screen, while establishing an electrostatic field in said space, whereby the ink powder flows from said feeding box onto the surface of the rubbing member through a slit formed at the bottom of said feeding box by the action of said rotating cylindrical brush is then rubbed through the screen into said space by the action of said rubbing member, is urged electrostatically toward the surface of the article and comes to rest thereon in a pattern defined by the image forming openings of said screen.

3,732,810

### CHARACTER ALIGNING RESTRAINTS FOR HIGH SPEED PRINTERS

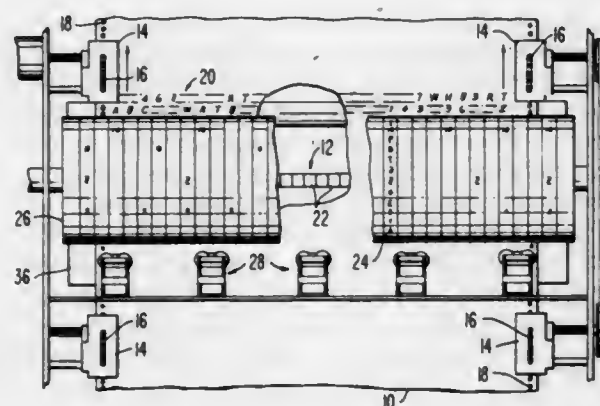
Raymond A. Skiba, Detroit; John W. Funk, Dearborn, and Eugene L. Merlino, Jr., Dearborn Heights, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 31, 1971, Ser. No. 129,853

Int. Cl. B41j 5/00, 1/34

U.S. Cl. 101-93 C

8 Claims



Printing apparatus wherein a webbed medium is intermittently fed from print line to print line between a row of actuable print hammers and a continuously displacing set of print characters. Between intermittent advances the webbed medium is impacted by selected ones of the print hammers to print a line thereupon, such impact being effective to engage the impacted area of the webbed medium with the continuously moving print characters, thus urging the webbed medium out of a predetermined alignment with the print hammers. Restraining means prevents such shiftable movement by immobilizing the webbed medium in opposition to the undesirable influence of the moving print characters.

3,732,811

### RIBBON INKING MEANS IN KEYBOARD CONTROLLED SELECTIVE PRINTING MACHINES

Kenneth F. Oldenburg, Arcadia, Calif., assignor to Litton Business Systems, Inc., New York, N.Y.

Filed Dec. 14, 1970, Ser. No. 97,812

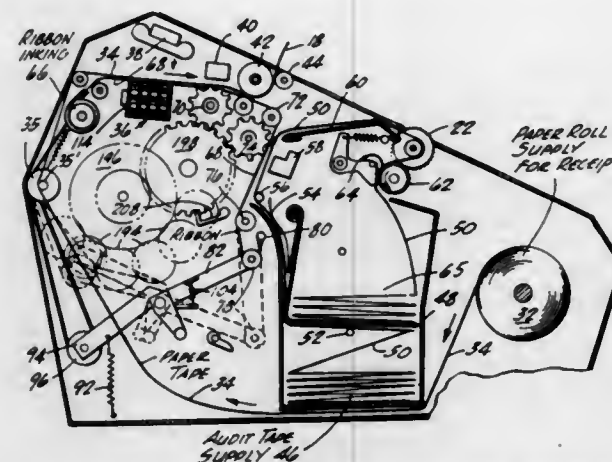
Int. Cl. B41j 33/16, 31/14

U.S. Cl. 101-96

5 Claims

A simple and compact printer for a cash register or the like includes a long self-inking ribbon arrangement for both the receipt tape printer and the audit tape printer. The ribbon extends for a substantial distance in order to extend past the date wheels which have their axes aligned with the path of the ribbon, past the transaction item printing station and also past the audit printing station. The ribbon actuating mechanism is provided with a lost-motion arrangement whereby ribbon ten-

sion is released immediately prior to hammer action to avoid background smudge. Fan fold type paper is employed for the audit tape, and is fed from a supply box to the audit tape printer and then back to storage immediately above the supply box. The alignment of the axes of the date wheels parallel to the ribbon feed and to the side of the machine permits easy changing of dates by the operator without the need for a com-



plex mechanical mechanism. Concerning the physical arrangement of the printer section of the cash register, the supply roll of paper for receipts is located near the keyboard at the end of the cash register toward the clerk. The tape from this roll extends under the fan fold from the ribbon and other print mechanisms, along the bottom and rear of the cash register to the print station located in the upper portion of the cash register.

3,732,812

### DIFFERENTIALLY POSITIONABLE TYPE WHEELS IN REMOTELY CONTROLLED PRINT MODULES

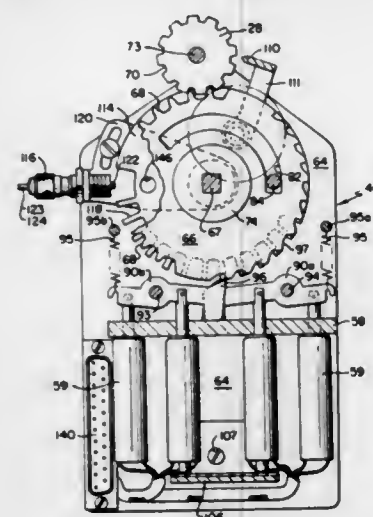
David F. Bremner, Bellbrook, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Mar. 4, 1971, Ser. No. 120,934

Int. Cl. B41j 7/48, 1/46

U.S. Cl. 101-99

8 Claims



A remotely-controlled print module for use in printing labels or the like wherein a plurality of differential gears are aligned on a common drive shaft and oscillatably driven to a predetermined position controllable by selective indexing means, the gears meshing with typewheels carried on a shaft parallel to the drive shaft. The gears are independent of each other and are friction driven by means of spring elements for friction loading thereof, wherein during a cycle of operation, the gears are stopped at predetermined positions by means of indexing pawls which are selectively energized through electromagnetic solenoids, the stopped position of the typewheels

being compatible for striking by print hammers. The differential gear line-up includes an additional gear and read means for sensing positions of the gears and the typewheels and relaying pulses for commutation effect to a remote computer which directs control of the module printing.

3,732,813

### BEARER ARRANGEMENT FOR PRINTING PRESS

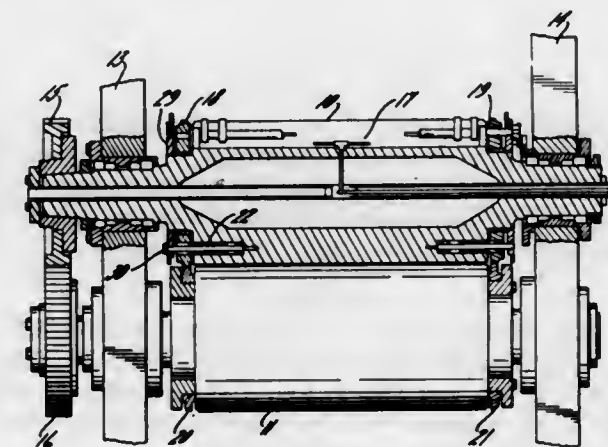
Mahendra Vir Singh, Chicago, and Bruno B. Pasquinelli, Evergreen Park, both of Ill., assignors to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Jan. 3, 1972, Ser. No. 214,945

Int. Cl. B41f 5/00, 13/24

U.S. Cl. 101-216

8 Claims



Cooperating bearers for the printing and impression cylinders in a printing press are provided with oppositely inclined conical surfaces on the peripheries thereof, and the bearers on one of the cylinders are mounted for axial movement so that the conical surfaces of the bearers can be maintained in engagement with each other upon adjustment of the distance between the axes of the two cylinders. Biasing means in the form of hydraulic cylinders continuously urge the movable bearers in an axial direction so as to press the conical surfaces of the cooperating bearers together. Second biasing means in the form of springs urge the movable bearers in the opposite direction for separating the conical surfaces when the hydraulic cylinders are de-actuated. The conical surface of at least one of each pair of cooperating bearers is formed with a curve that is convex relative to the opposed conical surface so that the two surfaces engage each other only along a narrow circumferential area so as to avoid scuffing due to a velocity differential across the width of the conical surfaces. A control system actuates the hydraulic cylinders automatically in response to movement of the printing cylinder toward the impression cylinder, and de-actuates the hydraulic cylinders automatically in the absence of a sheet to be printed, and prior to the printing cylinder tripping away from the impression cylinder.

3,732,814

### BEARER ARRANGEMENT FOR OFFSET PRINTING PRESS

Bruno B. Pasquinelli, Evergreen Park, Ill., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

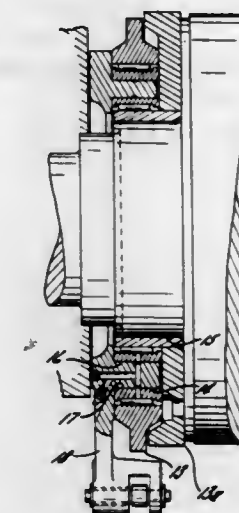
Filed Dec. 15, 1971, Ser. No. 208,229

Int. Cl. B41f 7/02, 13/20

U.S. Cl. 101-218

7 Claims

The blanket cylinder of an offset printing press is provided with a bearer at each end thereof, each of which is mounted on an adjustable eccentric ring for movement radially relative to the blanket cylinder so that positive contact will be maintained with coating bearers on the impression cylinder when the spacing between said cylinders is varied to accommodate changes in the thickness of the stock to be printed. Pneumatic cylinders are provided for adjusting the angular position of the



tivate the pneumatic cylinders in timed relation with the tripping motions of the blanket cylinder between printing and non-printing positions.

3,732,815

### DRIVE ARRANGEMENT FOR PERFECTING LITHOGRAPH PRESS UNIT

Harry M. Greiner, Offenbach/Main, and Hartwig Banfer, Muhlheim/Main, both of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG., Offenbach/Main, Germany

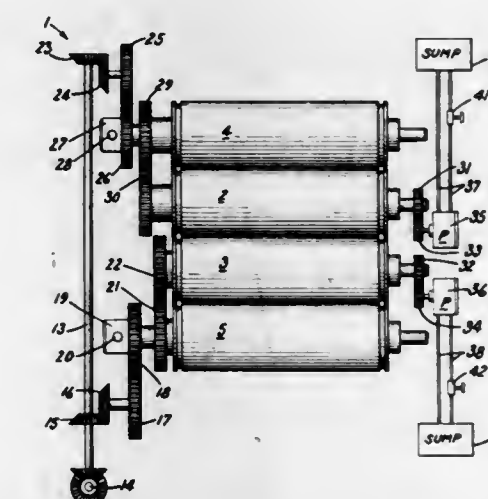
Filed Mar. 19, 1971, Ser. No. 125,935

Claims priority, application Germany, Mar. 26, 1970, P 20 14 753.9

Int. Cl. B41f 5/04

U.S. Cl. 101-220

3 Claims



A lithograph press in which a web is simultaneously printed on both sides by passing the web between a pair of blanket cylinders, the blanket cylinders being gear driven from associated plate cylinders and the plate cylinders being coupled to a common drive shaft. An auxiliary torque loading is applied, by means of brakes, to the blanket cylinders, thereby to minimize the effect of transient changes in loading which tend to occur within the rotative cycle because of the tendency of one blanket cylinder momentarily to over-drive the other. In the disclosed embodiment the braking is accomplished by means of loaded hydraulic pumps coupled to the respective blanket cylinders.



3,732,816

**HOLLOW CHARGE WITH AN INSERT OF PROGRESSIVE OR DEGRESSIVE WALL**

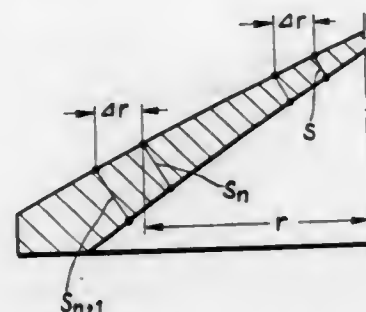
Helmut Muller, Rhynern-Kump, Germany, assignor to Firma Rheinmetall GmbH, Dusseldorf, Germany  
Filed Sept. 10, 1970, Ser. No. 71,091

Claims priority, application Germany, Sept. 17, 1969, P 19 46 959.1

Int. Cl. F42b 3/08

U.S. Cl. 102—24 HC

2 Claims



A hollow charge with an insert of progressive and degressive wall thickness, respectively, wherein the insert has at least partly curved generating lines. The oppositely disposed outer and inner generating lines of the insert have the same line course, yet are rotatably displaced relative to each other for a predetermined angle within a sectional plane.

3,732,817

**EXPLOSIVE BODY CONSTRUCTION**

Franz R. Thomanek, Sandzell 38 1/4, Landkreis Schrobenhausen, Germany

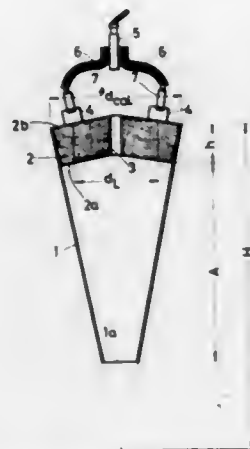
Filed Dec. 20, 1963, Ser. No. 332,995

Claims priority, application Germany, Jan. 24, 1963, B 70 464

Int. Cl. F42b 3/08

U.S. Cl. 102—24 HC

8 Claims



1. An explosive body construction for use with a hollow explosive charge having a cavity in the front in respect to the firing direction, comprising a frustoconically-shaped guiding sleeve having a smaller dimensioned end with an opening in said sleeve being adapted to be arranged before the hollow explosive charge in respect to the firing direction, said guiding sleeve having an apex angle of between 15° and 45°, a secondary charge enclosed by said guiding sleeve having a frontal area at an end thereof, the generatrix of said guiding sleeve forming an angle of between 90° and 100° with the frontal area of said secondary charge, and at least three primer charges arranged on said frontal area at substantially equal distances apart on a pitch circle concentric to the axis of said secondary charge, the diameter of said pitch circle amounting to between 70 and 90 percent of the maximum exterior diameter of said guiding sleeve.

3,732,818

**HOLLOW-EXPLOSIVE CHARGE CONSTRUCTION**

Franz Rudolf Thomanek, Sandzell 38 1/4, Landkreis Schrobenhausen/Upper Bavaria, Germany

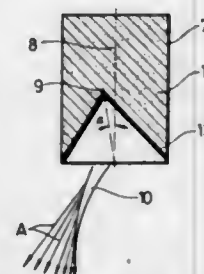
Filed Sept. 7, 1965, Ser. No. 485,626

Claims priority, application Germany, Sept. 7, 1964, B 78 449

Int. Cl. F42b 1/02

U.S. Cl. 102—24 HC

3 Claims



The construction of an explosive charge includes means for causing deviations from the rotational symmetry of the charge. Such means may comprise the eccentric location of the liner for the charge body or the manner in which the charge may be burned or any combination of these.

3,732,819

**SIMULTANEOUS AXIALLY & RADially IGNITED CASELESS TELESCOPIC TUBE AMMUNITION ROUND**

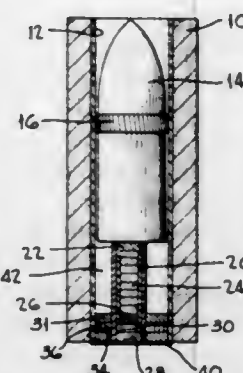
Joseph B. Quinlan, and Earl F. Van Arsdale, both of Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of the Army

Filed Mar. 23, 1971, Ser. No. 127,296

Int. Cl. F42b 5/16

U.S. Cl. 102—40

5 Claims



A caseless cartridge ammunition round occupying a minimum volume while yielding ballistic properties superior to comparable metal case rounds and comprising a completely telescopic projectile within a molded propellant cylinder, the round employing simultaneous radial and axial ignition.

3,732,820

**BALL ANVIL PRIMER**

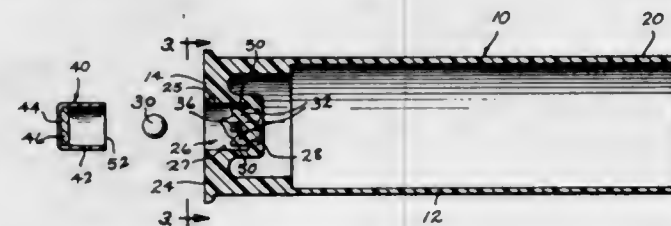
Grover E. Hendricks, 2885 N.E. 19th Street, Pompano Beach, Fla.

Continuation-in-part of Ser. No. 29,787, April 20, 1970, abandoned. This application June 28, 1971, Ser. No. 157,299

Int. Cl. F42b 5/36

U.S. Cl. 102—45

10 Claims



A primer including a support disposed within a cavity. The support carries a ball-like anvil over which is disposed an in-

verted cup-shaped primer cover. A primer powder charge is positioned between the primer cover and anvil and is detonatable upon the application of a percussive force to the primer cover.

3,732,821

**NOSE OGIVE FOR NONLETHAL PROJECTILE**

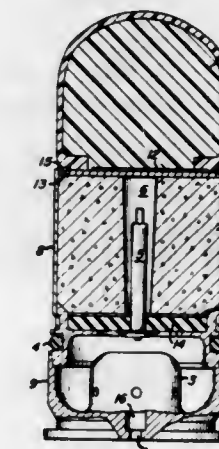
Thurber W. Royer, Arcadia, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 25, 1971, Ser. No. 146,767

Int. Cl. F42b 9/20, 13/20

U.S. Cl. 102—41

9 Claims



A munition assembly comprising a primer, propellant, fuze, chemical agents positioned in a cartridge case and projectile, said projectile fitted with a nondestructable polymeric impact-attenuating nose unit, said nose unit is designed to absorb the kinetic energy in the projectile to reducing the lethal potential of the projectile when fired and physically contacting personnel.

3,732,822

**EXPLOSIVE ENCAPSULATED DEVICE**

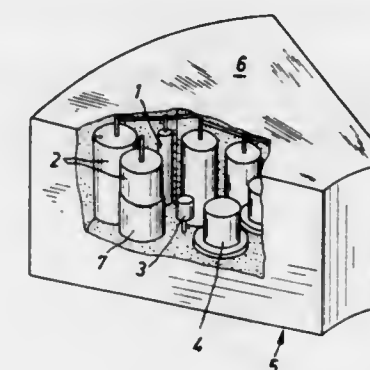
Franz Rudolf Thomanek, Sandzell 38 1/4, Landkreis Schrobenhausen, upper Bavaria, Germany

Filed Jan. 12, 1966, Ser. No. 520,547

Int. Cl. F42b 1/00, 13/48

U.S. Cl. 102—70.2 R

8 Claims



An electrical structural unit comprises a plurality of electrical components which are arranged together in proper circuit orientation within a housing which is packed or filled around the electrical components with an insulating material which comprises an explosive. A synthetic resin material is used to bound the explosive and in one embodiment the explosive is admixed with fillers such as a textile material, synthetic resins and glass fibers.

3,732,823

**ELECTRICAL IGNITER OR FUSE**

Manfred Held, Poettmes, and Johann Spies, Schlitzendorf/Pfahl, both of Germany, assignors to Bolkow Gesellschaft mit beschränkter Haftung, Ottobrunn near Munich, Germany

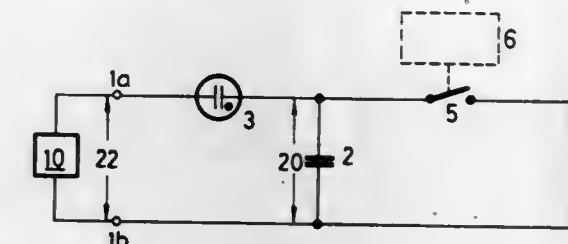
Filed June 28, 1968, Ser. No. 741,142

Claims priority, application Germany, July 6, 1967, P 15 78 447.1

Int. Cl. F42b 11/06

U.S. Cl. 102—70.2 R

8 Claims



An electrical igniter or fuse includes an electrically energized igniting means, an energizing circuit therefore and a condenser connected in the energizing circuit and acting as an electrical energy storage means. Normally open switch means are in series in the energizing circuit and are closed at a preselected time to discharge the condenser through the igniting means. A charging circuit for the condenser includes disengageable contacts for temporary connection to an extraneous source of potential to charge the condenser, and a spark gap switching means is interposed in the charging circuit between the condenser and the disengageable contacts. The extraneous source of potential has a potential higher than the firing potential of the glow tube constituting the spark gap switching means, and the condenser is charged to a potential lower than such firing potential. Thereby, when the contacts are disengaged from the potential source, shorting of the contacts will not effect discharge of the condenser.

3,732,824

**MEANS FOR CONVERTING IMPULSE LINEAR ACCELERATION TO ROTATIONAL INERTIA**

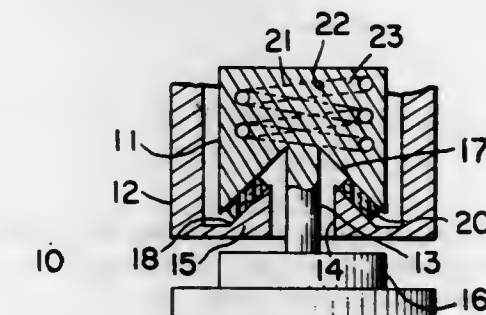
Issai Lefkowitz, Princeton; William J. Ralph, Willingboro; Donald R. Lenton, Haddonfield; Benjamin D. Nabreski, Pennsauken, all of N.J., and David Fox, Rye, N.Y., assignors to The United States of America as represented by the Secretary of the Army

Filed Apr. 28, 1971, Ser. No. 138,052

Int. Cl. F42c 15/24

U.S. Cl. 102—78

6 Claims



A projectile timing fuze arrangement in which a rotatable arming element is driven by a rotor that contains fluid within a forward end of an internal spiral groove thereof, such that upon the rotor being subjected to impulse linear acceleration, rotational motion will be imparted to the rotor.



3,732,825

**IMPACT FUZE FOR A SPIN STABILIZED PROJECTILE**  
Robert Apotheloz, 8304 Wallisellen, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon Bührle AG, Zurich, Switzerland

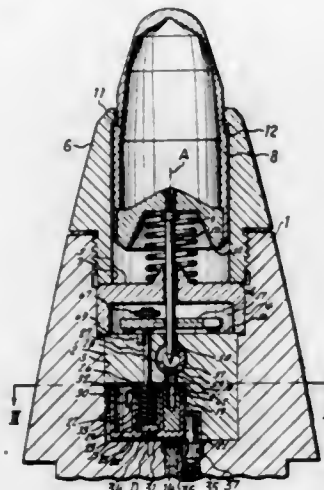
Filed June 22, 1971, Ser. No. 155,480

Claims priority, application Switzerland, June 26, 1970, 9684/70

Int. Cl. F42c 15/26

U.S. Cl. 102—80

4 Claims



An impact fuze for a spin stabilized projectile of the type comprising a carrier for a detonator pellet, rotatable by spring means from a safe into an armed position, and a safety device in the form of an axially movable safety stud. The safety stud in a forward position locks the pellet carried in the safe position. The stud is displaceable by the acceleration on discharge of the projectile into a rear position in which it releases the carrier. The pellet carrier is positioned so that the centrifugal force acting on its center of gravity will oppose the inertial force due to spin acceleration. Thus the frictional forces arising between the pellet carrier and the safety stud is limited to prevent the stud jamming and preventing the fuze from being armed.

3,732,826  
CARTRIDGE

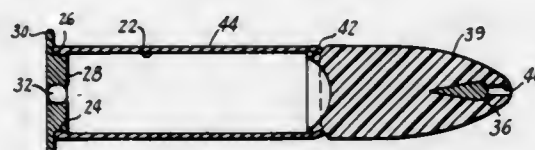
Elmer W. Johnson, 451 E. 9th Avenue, Chico, Calif.

Filed Apr. 9, 1971, Ser. No. 132,694

Int. Cl. F42b 5/22

U.S. Cl. 102—92.7

1 Claim



A tube, cap, head, and weight fabricated to form a bullet.

3,732,827

**RAILROAD TRACK WORKING MACHINE**

James E. Anderson, Ludington, Mich., assignor to Jackson Vibrators, Inc., Ludington, Mich.

Filed Mar. 17, 1971, Ser. No. 125,116

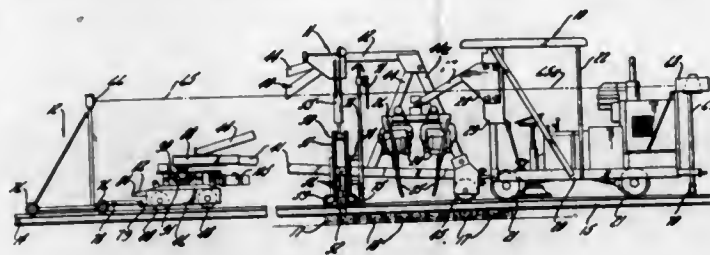
Int. Cl. E01b 33/02, 27/17, 29/04

U.S. Cl. 104—7 R

10 Claims

A track working machine having a unitized construction including a tamper carriage and a track lifting attachment with a truss constructed frame carrying jacks intermediate the ends of the frame. The track lifting attachment includes means for automatically moving the forward end of the truss frame in a lateral direction relative to the track wheels upon which it is

supported so as to maintain the jacks in a vertically centered position over the track rails and thereby enable the machine to



work relatively sharp curved sections of track without the jacks exerting side pull on the rails.

3,732,828

**VARIABLE GAGE RAILWAY TRUCK**

Maurice Paul Wanner, 27 Route de Malagnou, 1268 Geneva, Switzerland

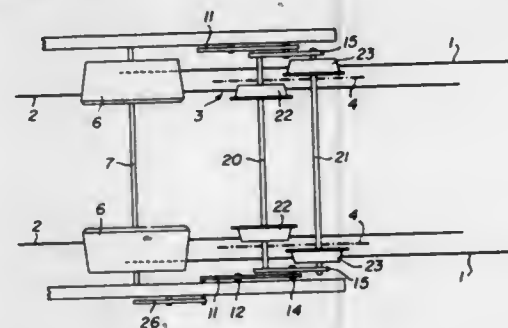
Filed Mar. 12, 1971, Ser. No. 123,572

Claims priority, application Switzerland, Mar. 17, 1970, 4041/70; Nov. 6, 1970, 16889/70

Int. Cl. B61f 7/00, 13/00; B61k 5/00

U.S. Cl. 104—33

12 Claims



To enable a railway vehicle to pass from a narrower track to a wider track and vice versa, the vehicle is provided with carrier, preferably flangeless, wheels which can roll without adaptation on either of the two tracks and with guide means having flanged members, e.g. flanged wheels, which can be made to engage the rails of either track in a change-over section where the two tracks meet, this section being preferably provided with means enabling the flanged members to be adapted automatically from one track to the other.

3,732,829

**DEVICE COMPRISING A NUMBER OF ROTATABLE SHELVES**

Mogens Bech, Bakkevej 2, 2760 Ganløse pr. Malov, Denmark

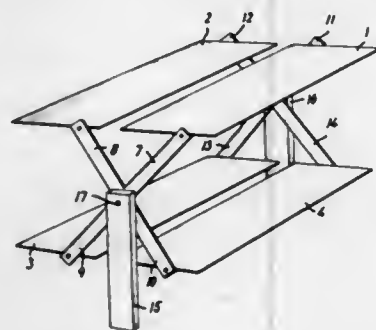
Filed Dec. 7, 1970, Ser. No. 95,827

Claims priority, application Denmark, Dec. 12, 1969, 6599

Int. Cl. A47b 49/00

U.S. Cl. 108—95

11 Claims



A device comprising a number of rotatable shelves which are suspended between two shelf carrying members in a

manner so as to be kept horizontal during rotation, said shelf carrying members being rotatable in parallel, vertical planes around axes extending spaced apart from each other at the same height above a horizontal plane. Each of the shelves are provided at opposite sides thereof with shelf supports, the axes of which are separated by a distance equal to the distance between the rotational axes of said shelf carrying members, said shelf supports being connected with one and the other of said two shelf carrying members, respectively.

3,732,830

**SECURITY METHOD AND DEVICE**

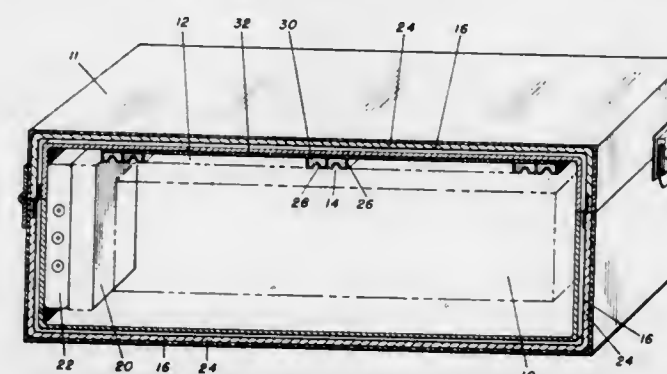
Charles I. Lindstedt, Jr., Morris, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed Nov. 26, 1971, Ser. No. 202,341

Int. Cl. E05g 3/00

U.S. Cl. 109—36

5 Claims



A method for insuring against an unauthorized access to confidential subject matter stowed in a container wherein said method comprises the steps of: juxtaposing sheets of multiple miniature shaped charges proximate to the confidential subject matter; sensing an unauthorized entry into said container; and detonating said shaped charges upon detection of such an unauthorized entry, whereby the confidential subject matter is destroyed by said detonation.

3,732,831

**MODULAR CONCRETE VAULT STRUCTURE**

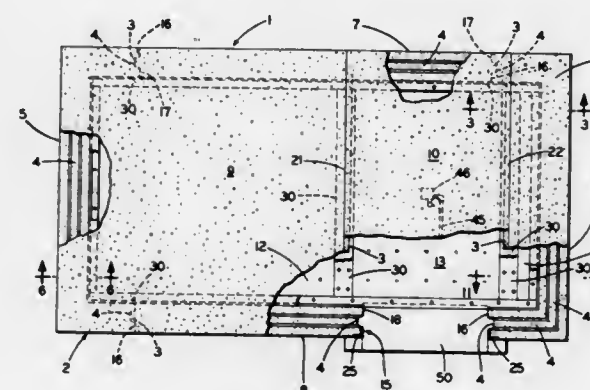
John C. Marcinjak, Canton, and William D. Burkey, Louisville, both of Ohio, assignors to Diebold, Incorporated, Canton, Ohio

Filed July 12, 1971, Ser. No. 161,630

Int. Cl. E04b 2/08

U.S. Cl. 109—83

5 Claims



A modular security vault structure having a plurality of prefabricated concrete panels forming the vault side, ceiling and floor walls. Some of the panels have integral corners. The panels are formed with tongues and grooves for tongue and groove joint connection between adjacent panels. Spaced rows or layers of reinforcing bar grids are embedded within the panels. The ends of the bar grids extend into the tongues

and into the panels on either side of the grooves so as to overlap at each tongue and groove joint. Plates cover the joint lines between panels on the inner vault surfaces. The plates are bolted to sockets embedded within the panels and connected with the bar grids. Vertical panel joints in the vault side walls are offset from horizontal joints in the vault ceiling and floor walls. A usual vault door may be hung in a wall of the modular vault structure. Lighting, alarm and ventilating requirement conduits, offset at least once, may be embedded in the prefabricated panels so that any vault structure can be erected completely and quickly at the bank site.

3,732,832

**ATTACHING BINDING STRIPS TO KNITWEAR ON LINKING MACHINES**

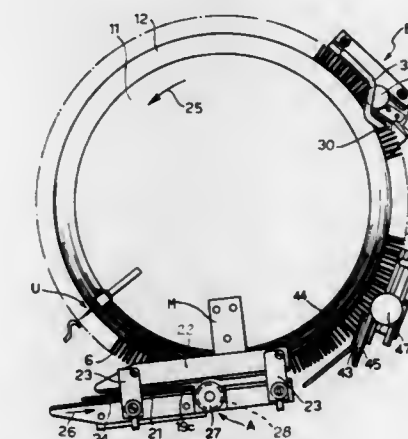
Pietro Rosso, Orbassano, Italy, assignor to Calzificio Fratelli Protasoni Societe di fatto di Mario e Trento Protasoni, Orbassano (Turin) and Calzificio Fratelli Protasoni Societe di fatto di Mario e Trento Protasoni, Gallarate (Varese), Italy

Filed Feb. 11, 1971, Ser. No. 114,450

Int. Cl. D05b 7/00

U.S. Cl. 112—25

19 Claims



In order to allow the so called "casual" impaling of the edges of the binding strip and of the knit-wear article on the points of the rotary dial of a linking machine, the strip is formed at its opposite longitudinal edges with tabs which are superimposed on the inner face of the binding strip before the latter is bent to channel shape. Thicker end portions are formed on the free longitudinal edges of said tabs in order to permit semi-automatic impaling of the binding strip onto the points using guides provided with through slots directed towards the annular path of the points. A further guide allowing a semi-automatic impaling of the article edge to be sewn to the binding strip, may be also provided.

3,732,833

**STITCHING UNITIZER**

Byron B. Brookhyser, Milton, and Harold E. Erickson, Federal Way, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed June 7, 1971, Ser. No. 150,494

Int. Cl. B42b 1/02

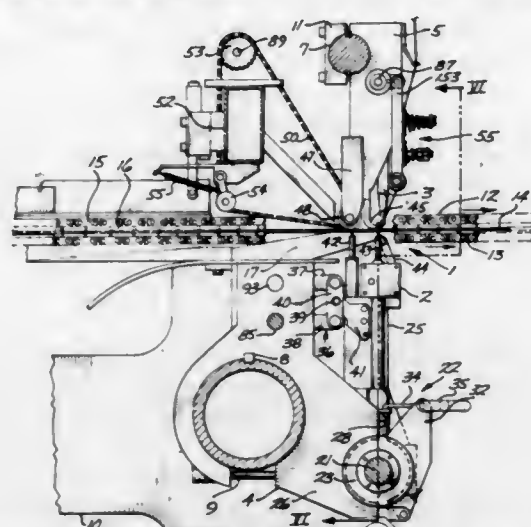
U.S. Cl. 112—203

5 Claims

A sewing machine which has the capability to continuously stitch a traveling relatively hard material with a tight chain stitch utilizes a reciprocating sewing head, and a reciprocating thread thrower, together with appropriate stitching conveyors. Continuously moving material is fed into a sewing station by upper and lower stitching conveyors such that as the material passes through the stitching station, it is generally in a horizontal flat plane. At the stitching station, individual holes are continuously punched and a vertically and axially reciprocating needle then enters the hole and has a thread loop positioned thereon. As the needle travels downwardly while at the same time moving axially carrying the thread loop with it, it will



travel through a previously picked off thread loop which is waiting on a looper mechanism. The stitching cycle is continu-



ously repeated and this action establishes a straight stitched thread line comprised of individual chain stitches.

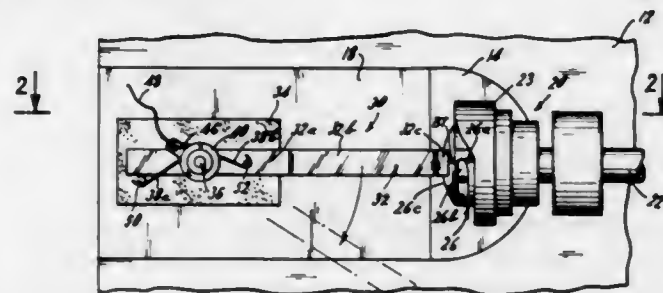
3,732,834

**BOBBIN RUNOUT SIGNALLING DEVICE**

Nathan Mayer, 27 Messer St., East Brunswick, N.J.  
Filed Apr. 23, 1971, Ser. No. 136,706  
Int. Cl. D05b 69/36

U.S. Cl. 112-219 R

7 Claims



A monitoring device for the bobbin mechanism or assembly of a conventional sewing machine which provides a sensing or control signal in response to the imminent runout of the supply of bobbin thread and disrupts stitching with an adequate tail of bobbin thread to avoid loss of the stitch and operation of the sewing machine without a supply of bobbin thread.

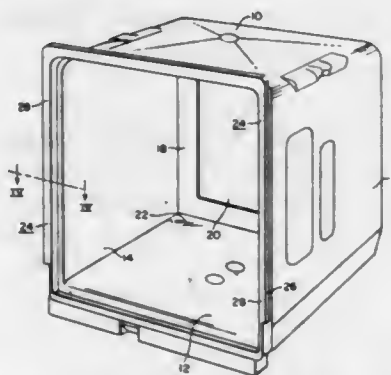
3,732,835

**DISHWASHER TUB GASKET SURFACE AND METHOD OF MAKING SAME**

Olan L. Long, Columbus, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.  
Filed May 10, 1971, Ser. No. 141,685  
Int. Cl. B21d 51/18

U.S. Cl. 113-120 M

2 Claims



A relatively smooth seating surface for a gasket for a dishwasher tube formed by an expanding process is made by dis-

placing the material forming the seating surface sufficiently from its original position established by the expanding step that the wrinkles and irregularities formed during the expanding process are merged into the smooth surface.

3,732,836

**METHOD OF MANUFACTURING DRAWN CUP BEARING RACES WITH CROWNED PATHWAYS**

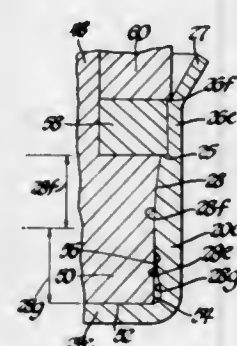
Edward W. Molloy, Port Clinton, Ohio, and Charles K. Williams, Point Pleasant, N.J., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 17, 1971, Ser. No. 181,427

Int. Cl. B21d 53/12

U.S. Cl. 113-117

7 Claims



A method for manufacturing a thick walled, drawn cup bearing race having a crowned pathway and integral radial flanges at opposite ends of the pathway includes the step of drawing an open ended cup in such a manner that the side wall of the cup increases in thickness from the corner of the cup toward its open end. This increasing thickness is taken advantage of to provide the inner half of the crowned pathway. The outer half of the crowned pathway at the open end of the cup is produced by reforming the cup with a punch having a concavely tapered forming surface. The radial flange at the open end of the cup is preferably formed without any internal support to further accentuate the crown on the pathway.

3,732,837

**AUTOMATIC SALVAGE BAG FOR UNDERWATER USE**

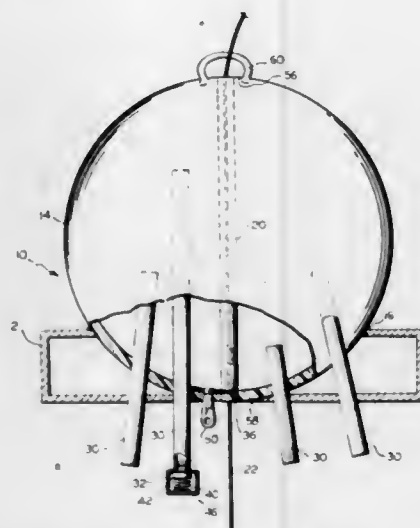
Keith A. Hogan, 2226 Howard Street, Omaha, Nebr.

Filed Aug. 30, 1971, Ser. No. 178,524

Int. Cl. B63b 35/00

U.S. Cl. 114-.5 R

6 Claims



An improved salvage bag for underwater or undersea use, being specially designed to assist scuba divers, deep-sea divers, or sport scuba divers undertaking the salvaging of small items of treasure from the bottom of lakes, rivers or seas.

3,732,838

**SUBMERSIBLE SALVAGE UNIT AND METHOD OF OPERATION**

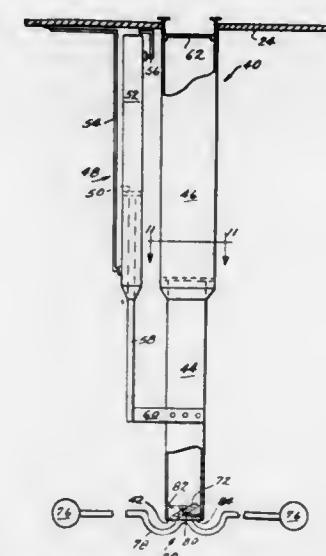
Frederick A. Kriedt, 1722 East West Hwy., Silver Spring, Md.; Thomas H. Sundstrom, 7706 Nicolet Avenue S., Bloomington, Minn., and Richard Walko, 15913 Martin Road, Roseville, Mich.

Division of Ser. No. 765,897, Oct. 8, 1968. This application  
Aug. 26, 1970, Ser. No. 67,263

Int. Cl. B63g 8/22

U.S. Cl. 114-16 E

9 Claims



A submersible salvage unit is provided with a support frame which carries opposed pairs of downwardly depending arms for grasping a sunken vessel or other object. The arms can be actuated from grasping to inoperative positions by relative vertical movements of pontoons which are also carried by the support frame of the unit. The relative movements are effected by movement of either the pontoons or the support frame relative to the other. Buoyancy compensators are provided in the salvage unit to adjust buoyancies to match loads which are to be lifted, and the buoyancy compensators include means for rapidly releasing buoyancy gas from the pontoons, if necessary. Also, buoyancy compensators on opposite sides of the salvage unit may include stabilizers which relate the compensators to each other in their operations to maintain stable attitudes of the salvage unit when it is lifting a load. A method of operation provides for an alignment and sinking of the salvage unit over a sunken vessel, and engagement of the vessel is accomplished by adjusting buoyancies of the entire salvage unit.

3,732,839

**FRICTION REDUCER**

Siegfried Schuster, 1 Berlin 38; Franz Peter Kilian, 1 Berlin 31, and Horst Rachner, 2 Wedel/Holstein, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Germany

Filed June 8, 1970, Ser. No. 44,255

Claims priority, application Germany, June 6, 1969, P 19 28 869.8

Int. Cl. B63b 1/34

U.S. Cl. 114-67 R

1 Claim



The outer skin of a water vehicle such as a boat is provided with openings through which additives can be continuously emitted to reduce boundary layer drag on the vehicle.

3,732,840

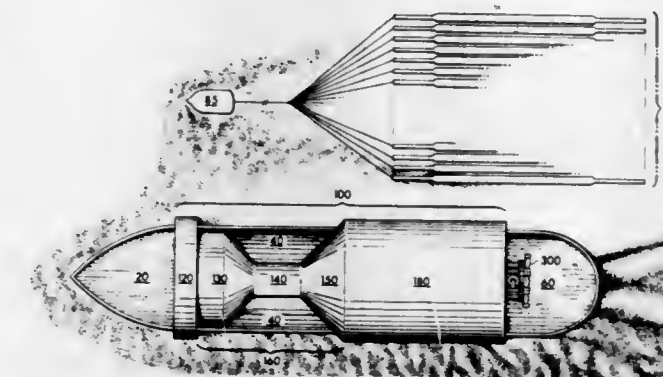
**SHIP SECTIONS ADAPTED FOR DISASSEMBLY AND RE-ASSEMBLY AT SEA**

Ernest B. Dane, Jr., 57 Tyler Road, Belmont, Mass.  
Continuation of Ser. No. 754,191, Aug. 21, 1968, abandoned.  
This application Dec. 14, 1970, Ser. No. 97,484

Int. Cl. B63b 3/02

U.S. Cl. 114-77 R

8 Claims



Streamlining and powered sections for improving the mobility and strength of certain special purpose ships, and adapted for disassembly at sea and re-assembly into a powered auxiliary vessel. Bow, midships and powered stern sections affording streamlining and strength giving features and with internal configurations conforming with those of corresponding portions of the special ship are registered therewith, inflatable tubes being compactly fitted near registering surfaces. At sea, the sections are released upon inflation of the tubes and disengagement of quick release catches thereby freeing the ship to perform its specialized function. The sections are subsequently re-combined into an auxiliary powered vessel by drawing them into alignment with the aid of winch-actuated cables and spring lines, the fending tubes being deflated as the sections are merged for rigid connection.

3,732,841

**EXPLOSIVELY EMBEDDED ANCHOR**

Henry C. Mayo, Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Army  
Filed Mar. 26, 1971, Ser. No. 128,299

Int. Cl. B63b 21/28

U.S. Cl. 114-206 A

2 Claims



The disclosed invention is an explosively embedded anchor assembly for use in all types of ocean bottom and in all water depths. The anchor assembly has a shaped charge explosive for producing a hole in a rock ocean floor, a projectile anchor for embedding in all ocean floors, and a projectile gun for explosively embedding the anchor. The assembly is provided with bottom-contact detonating means which permits automatic firing of the shaped charge and the anchor, and with a buoyant reaction vessel affixed to the projectile gun to permit automatic recovery of the gun.



3,732,842

## ROAD SAFETY DEVICE AND ACCESSORIES

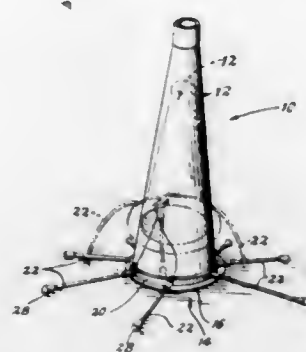
Arthur G. Vara, Sr., 115 Westview Avenue, Hamburg, N.Y.

Filed May 10, 1971, Ser. No. 141,729

Int. Cl. E01f 9/10

U.S. Cl. 116-63 P

23 Claims



A road safety marker featuring an improved marker stabilizing base removably connected thereto and safety accessories.

3,732,843

## INTRUSION ALARM

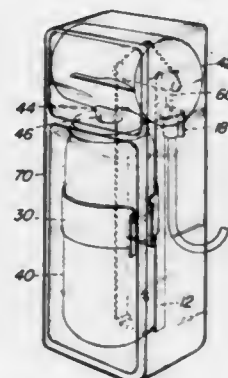
Michael Pappas, Irvington; Paul A. Witte, and Thomas Johnson, both of Hopewell, all of N.J., assignors to Falcon Safety Products, Inc., Mountainside, N.J.

Filed Jan. 20, 1972, Ser. No. 219,251

Int. Cl. G08b 13/08

U.S. Cl. 116-86

9 Claims



Alarm apparatus includes a can which has a valve and contains pressurized gas and is mounted on a support. A horn is mounted on said can. A cover is releasably mounted on the can. Spring means mounted on the support is held in normally stressed condition by the latch. When the latch is released, it actuates the valve and also acts to eject the cover from its position covering the apparatus.

3,732,844

## OMNIDIRECTIONAL SENSOR

Howard A. Heckendorf, Brookfield, Wis., assignor to General Motors Corporation, Detroit, Mich.

Filed June 30, 1971, Ser. No. 158,418

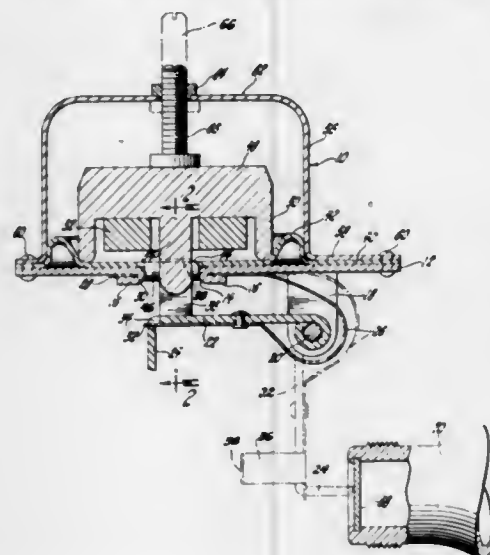
Int. Cl. G01d 21/00

U.S. Cl. 116-114 AH

4 Claims

An omnidirectional sensor includes a base plate having a rectangularly shaped aperture therethrough. An operating arm is swingably mounted on the plate to one side thereof and spring biased to actuated position. A pair of spring arms extend from the operating arm through the aperture and are normally biased together. A retainer plate seats on the base plate to the other side thereof and includes an aperture aligned with the base plate aperture and also receiving the spring arms. A circular embossed rib surrounds the aperture. A cylindrical seismic mass seats on the retainer plate within the rib and is

held against movement by a magnet surrounding a central cylindrical extension which forces the spring arms apart and engages lateral flanges thereof with the retainer plate adjacent the aperture to retain the operating arm against movement to actuated position. Upon tilting movement of the seismic mass



3,732,845

## CUP AND FLAG POSITION INDICATING MEANS

Clovis Istre, 1020 Alamo, Lake Charles, La.

Filed Aug. 3, 1972, Ser. No. 277,505

Int. Cl. G09f 17/00

U.S. Cl. 116-173

10 Claims



For use on a golf ball putting green, a ball sinking cup, a flag and a flagstaff such as is commonly referred to as the pin. The improved cup is interiorly provided with vertically spaced hub-like spiders which stabilize and support the insertable and removable lower end of the flagstaff. As herein shown the lower end is provided with a fiber glass or equivalent member having a head and shank. The essence of the invention pertains to simple, practical and reliable means on the attachable edge of the flag and the flagstaff whereby the flag is capable of being detachably and adjustably mounted by and under the supervision of the greenskeeper precisely and positively in a manner that a golfer teeing off or approaching a given green is

able to not only clearly see the position of the flag but to estimate with reasonable certainty the established locale and placement of the cup, that is, whether the cup has been placed in an area adjacent the rearward segment, the front segment or the medium area relative to the ever varying marginal contour of said green.

3,732,846

## CRYSTAL PLATING MONITORING SYSTEM

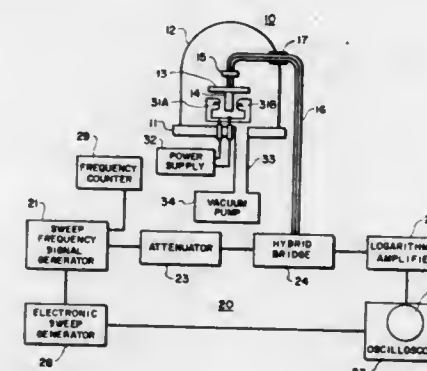
Theodore J. Lukaszek, Ocean, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed Jan. 7, 1972, Ser. No. 216,032

Int. Cl. C23c 13/08

U.S. Cl. 118-8

3 Claims



This disclosure relates to crystals, and particularly to plating techniques for improving the quality of crystals. More particularly, this disclosure relates to the production of crystals having a minimum of unwanted, or inharmonic, modes of oscillation. This disclosure describes an apparatus and a method for taking a mode spectrograph to determine the impedance characteristic of a crystal in the frequency range of a desired harmonic while the crystal is in the process of being plated in a vacuum.

3,732,847

## ANIMAL HOLDER

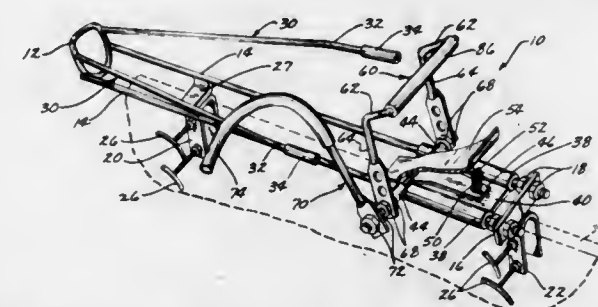
Raymond E. Andersen, Rural Route 3, Audubon, Iowa

Filed Apr. 13, 1971, Ser. No. 133,611

Int. Cl. A01k 29/00; A61d 3/00

U.S. Cl. 119-103

7 Claims



A base element includes a ring at one end for engaging a pig's nose and a sliding member at the opposite end includes an upstanding member for matingly engaging the rear end of an animal and a clamping member is pivotally connected to the slide member for engaging the rear legs of the animal pressing them against the animal's mid-section. A laterally outwardly extending actuating member is provided for the operator to pivot the clamping member and slide the sliding member by the actuating member engaging the operator's hip or leg. The pivoting action of the clamping member is resisted by a spring which yieldably maintains it at a predetermined angle relative to the base member. Side rails are provided on opposite sides of the base member and extend rearwardly from the nose engaging member. The base member includes downwardly extending clamping means for releasably attaching the holder to an upstanding support.

3,732,848

## BOILER

Nils Johan Mauritz Bolin, 27, Nordenskoldsvagen, Handen, Sweden

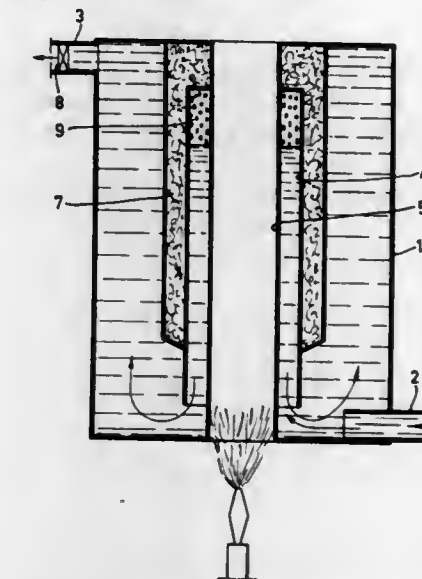
Filed May 4, 1971, Ser. No. 140,226

Claims priority, application Sweden, May 5, 1970, 6140/70

Int. Cl. F22b 5/00

U.S. Cl. 122-14

10 Claims



A circulating liquid heated heating system in which a boiler is connected to a conduit system having an outlet for heated liquid leading to the conduit system and an inlet for liquid returned from the conduit system. A heating space in the boiler has a closed upper end and an open lower end in communication with the return liquid, and a heating means extends into or through the heating space, whereby liquid in the heating space is heated and converted to steam. The steam forces liquid out of the heating space and into the outlet from the boiler to the conduit system. The lowering of the liquid level in the heating space cools and condenses the steam in the heating space, thereby reducing the pressure to a pressure below the pressure of return liquid to the inlet. Liquid from the inlet then raises the level of liquid in the heating space, the liquid volume of the boiler is increased, the sound level of the system is reduced and the risk of overheating is reduced by surrounding the heating space with a liquid containing vessel and interposing an insulating layer between at least the upper portion of the heating space and the body of liquid. Because of the high efficiency of the boiler, the boiler can be combined with tube sets laterally displaced from the boiler and having additional heating units between each unit.

3,732,849

## MINIATURE HEAT EXCHANGER

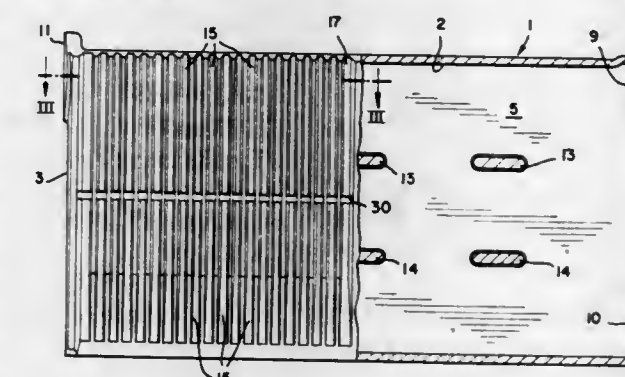
Eric Harry Coley, Skidby, England, and James Duffield, Brussels, Belgium, assignors to American Standard Inc., New York, N.Y.

Filed July 30, 1971, Ser. No. 167,763

Int. Cl. F22b 37/12

U.S. Cl. 122-367 C

7 Claims



Covers a heat exchange element for use in a boiler for central heating systems or the like. The heat exchange element in-



cludes a boiler section having a passage for water or for any other fluid medium, the passage extending longitudinally and horizontally through the section. The water passage section has a plurality of closely arranged laterally protruding fins formed integrally with the walls of the water passage and they are positioned above horizontally disposed burners which may be supplied with gas.

3,732,850

## MINIATURE HEAT EXCHANGERS

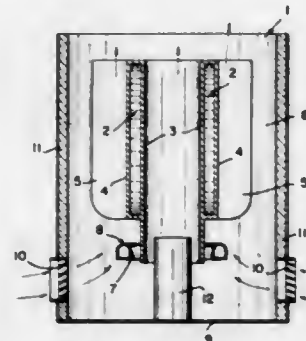
Eric Harry Coley, Skidby, Yorkshire, England, and James Duffield, Brussels, Belgium, assignors to American Standard Inc., New York, N.Y.

Filed Aug. 23, 1971, Ser. No. 173,757

Int. Cl. F22b 5/00

U.S. Cl. 122-367 C

17 Claims



Covers a heat exchanger for use in a boiler or other heating system. The heat exchanger includes one or more boiler sections each having a passage for water or for any other fluid medium, each passage extending vertically throughout the section. One of the walls of each water passage section has a plurality of closely arranged laterally protruding fins formed integrally with the wall of the water passage. The heat exchanger may also be provided with two such sections each equipped with a like plurality of closely arranged laterally protruding fins. The two sections may be arranged opposite each other so that the fins of the two sections extend toward each other. One or more horizontally disposed burners may be positioned below the fins and supplied with gas for heating the fins and the inner walls of the water passages.

3,732,851

## METHOD OF AND DEVICE FOR CONDITIONING STEAM

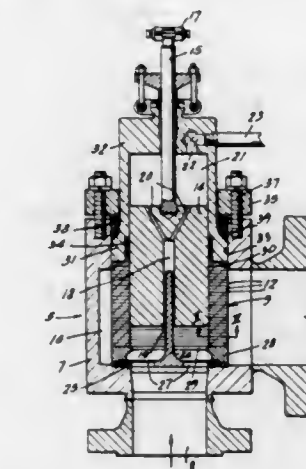
Richard E. Self, 3221 Brimhall Drive, Los Alamitos, Calif.

Filed May 26, 1971, Ser. No. 146,869

Int. Cl. F22g 5/12

U.S. Cl. 122-487

10 Claims



Steam is conditioned, to reduce its temperature and pressure, by introducing cooling water into the steam and thereafter reducing the steam pressure.

### 3,732,852 ELECTRONIC FUEL INJECTION SYSTEM HAVING SPEED ENRICHMENT

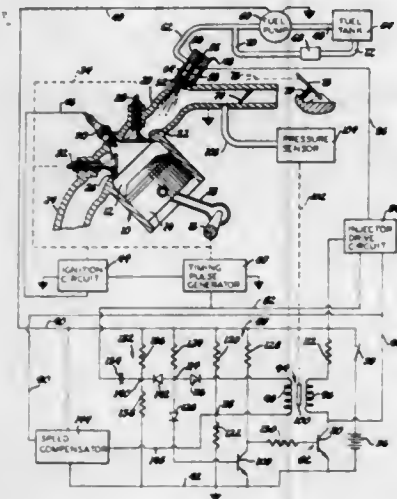
John P. McGavick, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed July 1, 1971, Ser. No. 158,800

Int. Cl. F02b 3/00

U.S. Cl. 123-32 EA

5 Claims



Fuel is applied to an internal combustion engine for the duration of control pulses produced at a frequency proportional to the speed of the engine. The duration of the control pulses is determined as a function of the amplitude of a bias voltage. A speed voltage unidirectionally varies from a base level at the termination of each preceding control pulse to a peak amplitude at the initiation of each succeeding control pulse. A compensation voltage is substantially constant over the duration of each succeeding control pulse at an amplitude proportional to the peak amplitude of the speed voltage during each preceding cycle. The amplitude of the bias voltage is determined in response to the amplitude of the compensation voltage thereby to define the duration of the control pulses as a function of engine speed.

3,732,853

## ELECTRONIC FUEL INJECTION SYSTEM HAVING HIGH SPEED COMPENSATION

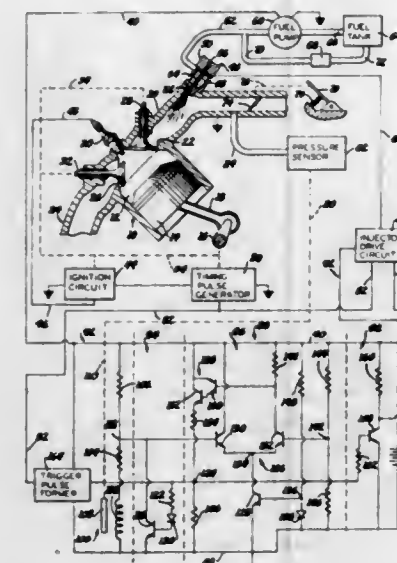
Lester Wilkinson, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 27, 1971, Ser. No. 175,573

Int. Cl. F02d 5/02

U.S. Cl. 123-32 EA

3 Claims



In an internal combustion engine, the inductance of an inductive device is defined in direct relation to the intake pres-

sure of the engine. Further, the inductive device is alternately charged through a first resistive device and discharged through a second resistive device at a trigger frequency which is defined in direct relation to the output speed of the engine. As a result, an action voltage of one polarity is developed as the inductive device is charged and a reaction voltage of opposite polarity is developed as the inductive device is discharged. Fuel is applied to the engine in an amount directly related to the duration of the action voltage as determined in direct relation to the time constant provided by the inductance of the inductive device and the resistance of the first resistive device and as determined in direct relation to the maximum peak of the action voltage. In turn, the maximum peak of the action voltage is inversely related to the minimum peak of the reaction voltage as determined in direct relation to the time constant provided by the inductance of the inductive device and the resistance of the second resistive device and as determined in direct relation to the trigger frequency. The resistances of the first and second resistive devices are selected so that the amount of fuel applied to the engine decreases with increasing output speed and increasing intake pressure after the output speed exceeds a predetermined speed limit.

3,732,854

## INJECTION-CONTROL SYSTEM FOR INTERNAL-COMBUSTION ENGINE

Fernand R. C. Murtin, Paris, France, assignor to Societe Industrielle d'Electronique et d'Informatique, Paris, France

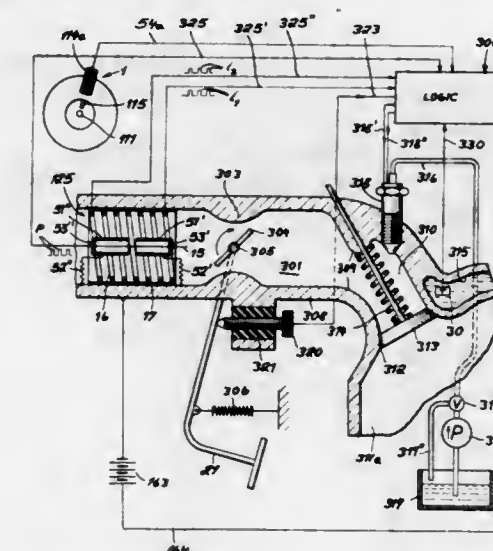
Filed Apr. 2, 1971, Ser. No. 130,615

Claims priority, application France, Apr. 2, 1970, 7011990; June 2, 1970, 7020116

Int. Cl. F02b 3/00; G01F 1/00

U.S. Cl. 123-32 EA

14 Claims



To maintain optimum air-fuel ratio in a cylinder of an internal-combustion engine, the operating time of a fuel injector is controlled by a logic network responding to engine speed, temperature and load as determined by respective sensors. Engine speed is measured by a pulse generator, synchronized with the engine, whose pulses are fed to a spark plug in the cylinder, to a timing circuit in the logic network and to an ionization-type flow meter in the air-intake manifold. The output of the flow meter, integrated over a number of cycles, is applied to one input of a comparator via a circuit including a thermistor which serves as a temperature sensor, the other input of the comparator receiving a progressively rising reference voltage from a timing condenser which is charged from a constant-current source. The timing circuit includes a flip-flop, periodically set by a pulse from the generator, which is reset by the comparator whenever the condenser potential reaches the output voltage of the sensing circuit and which thereupon discharges the condenser, keeping it from recharging until the arrival of the next pulse. The flip-flop, when set, actuates the fuel injector by overlappingly energizing a biasing winding and a working winding thereof.

3,732,855

## CAMSHAFT DRIVE CONVERTER KIT AND METHOD

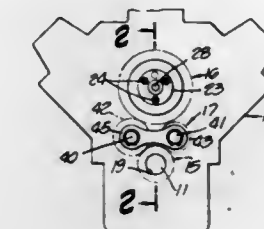
Maurus E. Jackson, 433-A Magnolia Avenue, Los Angeles, Calif.

Filed May 12, 1971, Ser. No. 142,495

Int. Cl. F01I 1/00

U.S. Cl. 123-90.31

30 Claims



A camshaft drive converter kit and method for converting a stock auto engine from chain-driven camshaft operation to precision gear drive operation without need for machining or otherwise altering the engine structure and simply by substituting kit components for certain stock engine components. The kit includes an idler gear subassembly designed for limited floating freedom of movement in the plane of the idler and arranged to seek a precision operating position as an incident to engine starting. This subassembly includes a second idler which serves to limit idler movement in one direction and certain other incidental functions.

3,732,856

## GASOLINE ENGINE CHOKE DELAY DEVICES

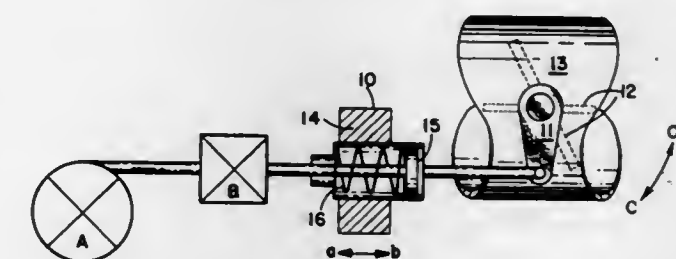
Joseph Carl Firey, 1554 North East 95th Street, Seattle, Wash.

Filed Aug. 27, 1970, Ser. No. 67,388

Int. Cl. F02n 1/00

U.S. Cl. 123-179 A

27 Claims



This invention provides means for reducing the amount of excess gasoline passed through a gasoline engine during starting. In this way the engine contribution of smog forming materials is reduced. This reduction of excess gasoline is achieved by increasing the portion of the work of compression available to evaporate gasoline. To accomplish these results, the carburetor choke on the engine is caused to pass through a cycle of opening and delayed closing, during starting, by the actions of solenoids, spring loaded dashpots, and temperature sensitive elements, acted on by ambient temperatures and current from the battery.

3,732,857

## SELF-CLEANING COOKING OVEN

Victor A. Williamitis, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 21,883, March 23, 1970, Pat. No.

3,700,484. This application June 28, 1972, Ser. No. 267,135

Int. Cl. A21b 1/00; F24c 15/16

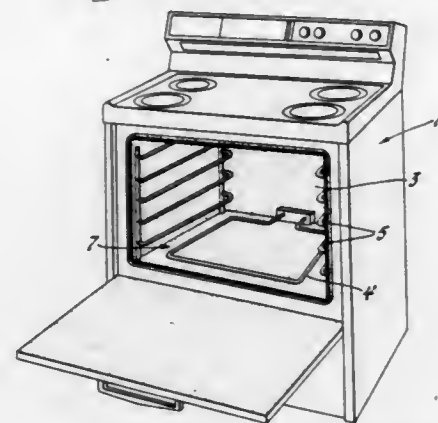
U.S. Cl. 126-19 R

4 Claims

This invention relates to self-cleaning cooking devices wherein the cleaning action results from low temperature, non-catalytic pyrolysis of the staining spatter and condensed vapors resulting from cooking. More particularly, one or more of the metal wall members defining the cooking enclosure are formed with a glazed porcelain enamel undercoating on which



an unglazed porcelain enamel-forming coating is provided by underfiring a porcelain enamel-forming slurry containing an extra loading of pulverized granular materials having sharply angular surfaces selected from the group of non-catalytic



refractory or abrasive materials comprising alumina, silica, emery, tungsten carbide, silicon carbide, kaolin, and feldspar in an amount of from about 20-30 percent by weight of the frit materials in the slurry.

3,732,858

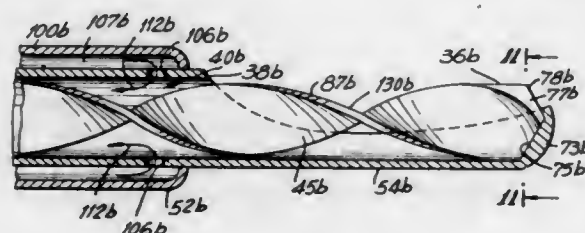
**APPARATUS FOR REMOVING BLOOD CLOTS, CATARACTS AND OTHER OBJECTS FROM THE EYE**  
Anton Banko, Brooklyn, N.Y., assignor to Surgical Design Corp., Long Island City, N.Y.

Continuation-in-part of Ser. No. 762,286, Sept. 16, 1968, Pat. No. 3,528,425. This application Feb. 14, 1969, Ser. No. 799,476

Int. Cl. A61b 10/00, 17/32; A61m 1/00

U.S. Cl. 128-2 B

28 Claims



The invention deals with surgical instrumentation for the removal of generally foreign objects from the eye, including blood clots and the lens of the eye, by inserting a pair of jaws for engaging the object and removing portions thereof as required by movement of the jaws relative to each other.

3,732,859

**BRAIN WAVE MEASURING APPARATUS**  
Keiji Tateno, Nakano-ku, Tokyo, Japan, assignor to Nihon Kohden Kogyo, Ltd., Tokyo, Japan

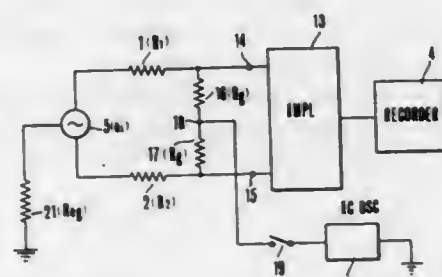
Filed Feb. 1, 1971, Ser. No. 111,540

Claims priority, application Japan, Feb. 2, 1970, 45/8577

Int. Cl. A61b 5/00

U.S. Cl. 128-2.1 B

7 Claims



In brain wave measuring apparatus comprising at least two electrodes adapted to be contacted against the skin of a living

body and an amplifier with its inputs connected to the electrodes, serially connected impedances of equal values are connected across the inputs of the amplifier and a source of check signal is provided to be connectable to the juncture between the impedances.

3,732,860

**VIBRATING MASSAGE DEVICE**

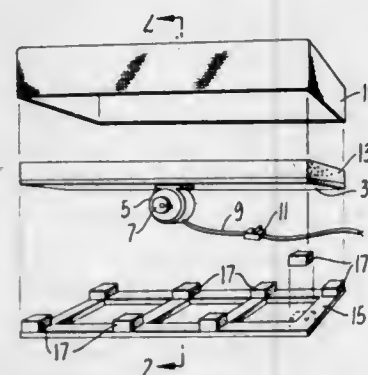
Geraldine H. Thurmer, P.O. Box 987, Yucca Valley, Calif.

Filed July 21, 1971, Ser. No. 164,538

Int. Cl. A61h 1/00

U.S. Cl. 128-33

1 Claim



An improved vibrating bed, sofa or the like is provided wherein the bed element is provided with a motor and eccentric with the moving parts mounted over a frame on spring blocks of a synthetic foam-like material.

3,732,861

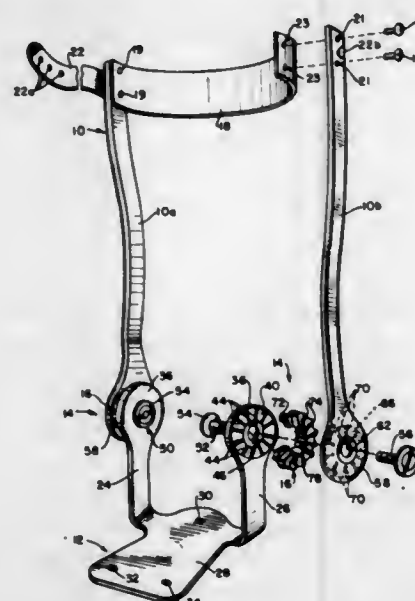
**SERRATED RESILIENT JOINT ORTHOTIC DEVICE**  
Hans Richard Lehneis, Merrick, N.Y., assignor to New York University, New York, N.Y.

Filed Mar. 31, 1971, Ser. No. 129,673

Int. Cl. A61f 3/00

U.S. Cl. 128-80 E

9 Claims



An orthotic device useful in supporting and assisting movement of infirm body limbs is comprised of a pair of support members interconnected for relative resilient motion by a flexure member consisting essentially of elastomeric material. The invention is particularly characterized by a serrated configuration of elements interposed in the mounting of the flexure member in operative relationship with the support members which maintains the parts suitably in place while permitting the intended resilient action.

3,732,862

**LEG BRACE**

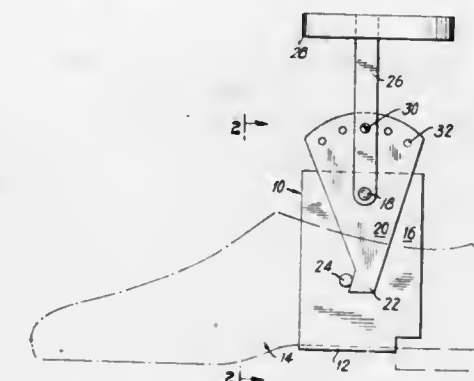
Salvatore Golia, Middle Village, N.Y., assignor to Corona Surgical Appliances Corporation, Corona, N.Y.

Filed May 28, 1971, Ser. No. 147,984

Int. Cl. A61f 5/00

U.S. Cl. 128-80 E

4 Claims



A leg brace which limits turning of the foot with respect to the leg in one direction only. A substantially L-shaped support member has a substantially horizontal wall portion adapted to be fixed to the sole of a shoe and an upright wall portion adapted to extend upwardly along the outer side of a shoe. An elongated bar structure is pivotally connected to the upright wall portion for swinging movement with respect thereto and extends up to an elevation located beneath the knee where a band is carried by the bar structure for attaching the latter to the leg beneath the knee. A stop is provided on the upright wall portion for limiting and swinging of the bar structure in one direction only, and an adjusting structure is provided for adjusting the angle of the bar structure when the latter engages the stop.

3,732,863

**STRETCHER**

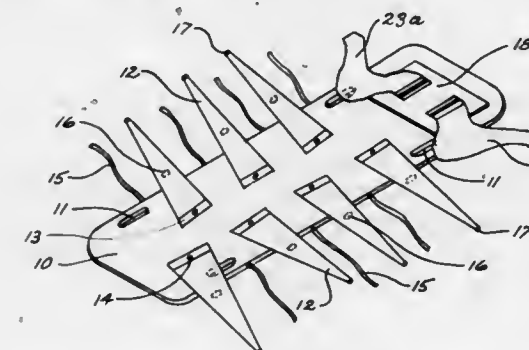
Walter Harrington, Box 494, Battleboro, Vt.

Filed Apr. 14, 1971, Ser. No. 133,848

Int. Cl. A61f 5/04

U.S. Cl. 128-84 C

3 Claims



A stretcher for emergency field work is described, having straps for securing a human body on a rigid plane for safe transport. A special carriage for the head may be biased to provide dynamic traction for the neck vertebrae.

3,732,864

**INHALATION COORDINATED AEROSOL DISPENSING DEVICE**

Robert E. Thompson, Maplewood, and Ernest LeBreton, Lake Hiawatha, both of N.J., assignors to Schering Corporation, Bloomfield, N.J.

Filed June 7, 1971, Ser. No. 150,654

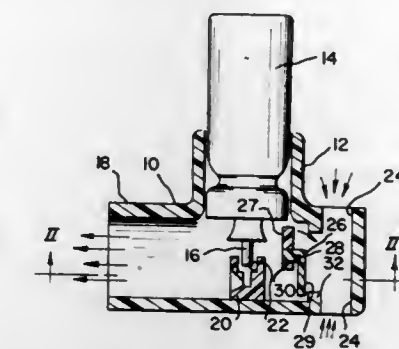
Int. Cl. A61m 11/00, 15/06

U.S. Cl. 128-173 R

9 Claims

An aerosol dispensing device for discharging a metered amount of a medicament-containing aerosol into the mouth of

a patient by manual compression thereof, which can be discharged only during inhalation by the patient or by first tilt-



3,732,865

**OSMOTIC DISPENSER**

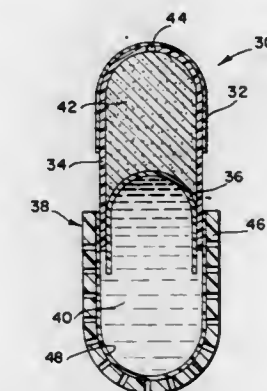
Takeru Higuchi, and Harold M. Leeper, both of Lawrence, Kans., assignors to Alza Corporation, Palo Alto, Calif.

Filed Jan. 13, 1971, Ser. No. 106,130

Int. Cl. A61m 7/00, 31/00

U.S. Cl. 128-260

9 Claims



An osmotic active agent dispenser is comprised of (1) a first compartment of relatively impervious material containing an active agent and provided with an aperture for releasing said active agent to the exterior of the dispenser; (2) a second compartment of controlled permeability to water containing a solution of an osmotically effective solute which exhibits an osmotic pressure gradient against water; and (3) a movable barrier member separating the first from the second compartment. The barrier member is slidably responsive to an increase in volume in the second compartment via absorption of water therein; whereby as water flows by osmosis into the compartment (2) of the dispenser in a tendency towards osmotic equilibrium with its environment, corresponding pressure is exerted behind the barrier (3) driving it into and diminishing the volume of the compartment (1), in turn continuously ejecting active agent thereout at an osmotically controlled rate over a prolonged period of time. In a specific embodiment, the dispenser is comprised of a plurality of capsule half shells one of which compartmentalizing and being free to move within the device, thereby defining a closure for both the active agent compartment and the solution compartment.

3,732,866

**CATAMENIAL DEVICE**

Linda L. Accavallo, 40 Woodstock Avenue, Rutland, Vt.

Filed Feb. 18, 1971, Ser. No. 116,531

Int. Cl. A61f 13/20

U.S. Cl. 128-285

1 Claim

An improvement in a tampon for absorbing menstrual fluids in which a capillary wick of non-absorbing material extends



into the interior body of the tampon. The wick acts as a capil-



lary transport to carry fluids to the core of the tampon body, thus using the absorptive capacity of the unexposed cotton.

3,732,867

**BACTERIOSTATIC SANITARY NAPKIN**

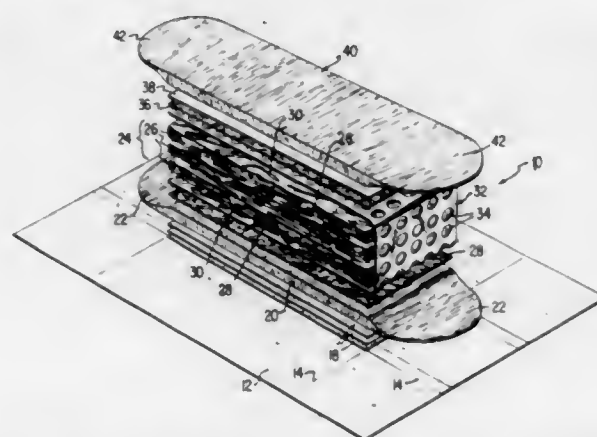
Maxine E. Money, 4187 Patterson Avenue, Winston-Salem, N.C.

Filed Feb. 26, 1968, Ser. No. 708,049

Int. Cl. A61F 13/16

U.S. Cl. 128—290 R

13 Claims



Employment of hexachlorophene incorporated plastic in perforate sheet, impermeate sheet and shredded form as anti-fungal and bacteriostatic means in sanitary napkins or the like.

3,732,868

**DEVICE FOR THE AUDIBLE REPRODUCTION OF A CARDIOGRAM WITH SPEECH-LIKE SOUNDS**

Leonardus Franciscus Willems; Joseph Jacobus Marie Neelen, and Benjamin Lopes Cardozo, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

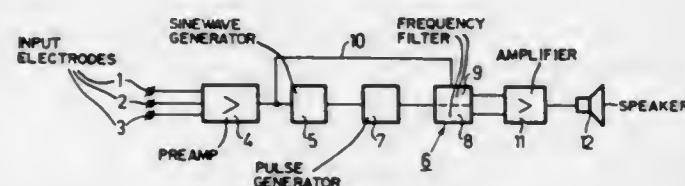
Filed Mar. 3, 1971, Ser. No. 120,629

Claims priority, application Netherlands, Mar. 25, 1970, 7004341

Int. Cl. A61b 5/04

U.S. Cl. 128—2.06 R

7 Claims



A device for the audible reproduction of electrophysiological signals, which includes a serially connected sine wave

generator and pulse shaper in which these signals are reproduced in the form of speech-like sound signals, and a pair of band pass filters of which one is frequency tunable to vary the monotonic signals from the pulse shaper in response to deviations in the electrophysiological signals so that the deviations are reproduced as speech-like deviations in these sound signals.

3,732,869

**CIRCUMCISION METHOD AND PROBE**

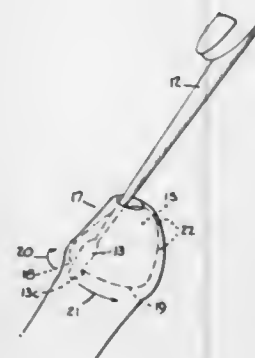
Harry Bronstein, 2311 Avenue J, Brooklyn, N.Y.

Filed Sept. 25, 1970, Ser. No. 75,467

Int. Cl. A61b 17/22

U.S. Cl. 128—304

9 Claims



Probes for use in loosening and extracting smegma from the cervix of the glans penis of an uncircumcised male human being, preliminary to a circumcision operation, are disclosed. The probe construction is characterized by a small, somewhat elongated bulbous head having an oval or rounded tip and undercut at one side to provide a hook structure adapted to be protracted interiorly of the mucosa into the cervix of the glans. The hook structure may be provided with a medial longitudinal channel to define a pair of lateral ears to enhance the smegma-loosening action. When the probe is moved to a limited extent laterally back and forth, i.e., right and left, along the corona of the glans, with the hook structure protracted into the cervix of the glans behind the corona, smegma accumulated in the cervix is loosened and broken free by the hook structure without risk of injury to the frenulum and can then be pulled out with the hook structure when the probe is withdrawn from the prepuce.

This abstract is not to be taken either as a complete exposition or as a limitation of the present invention, however, the full nature and extent of the invention being discernible only by reference to and from the entire disclosure.

3,732,870

**FOUNDATION GARMENTS HAVING RESILIENT CONTROL UNITS**

Henry M. Herbener, 803 N. Dawson St., Thomasville, Ga.

Filed Nov. 3, 1971, Ser. No. 195,210

Int. Cl. A41c 1/00

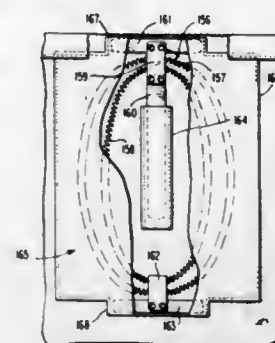
U.S. Cl. 128—533

5 Claims

Foundation garments of the girdle, corselet, panty girdle and bikini types feature resilient abdominal control units and simplified pocket structures for such units, wherein the number of fabric layers is held to a minimum to reduce bulkiness. Each control unit is constructed to allow complete freedom of movement of the body so as to promote comfort while continuing to exert abdominal control and causing the garment to maintain a proper position on the body at all times. Improved means are provided to completely eliminate the possibility of the main vertical rib of the control unit from jabbing into the body during stooping or bending and the con-

trol unit possesses improved means coaxing with the simplified pocket to center the unit laterally, to seat the unit

prevent rearward movement of the plunger after the carriage has been moved forward enough so that the syringe needle has



properly in the pocket and to maintain the upper margin of the garment straight and taut for added neatness.

3,732,871

**METHOD AND APPARATUS FOR MAKING CIGARETTES**

Desmond Walter Molins, London, England, and Francis A. M. Labbe, Neuilly-sur-Seine, France, assignors to Molins Machine Company Limited, London, England

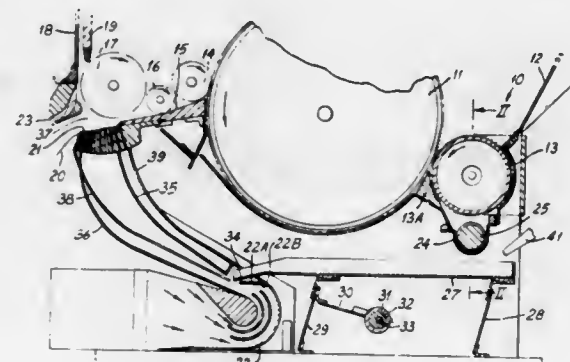
Filed Apr. 20, 1970, Ser. No. 30,070

Claims priority, application Great Britain, May 2, 1969, 22,564/69

Int. Cl. A24c 5/39

U.S. Cl. 131—84 C

9 Claims



In making cigarettes, tobacco shorts are extracted from the tobacco supply after which the remaining tobacco is showered into an air stream onto a moving band to form a filler stream. The shorts are fed into the tobacco shower by means of a vibrating tray which serves to smooth the flow of shorts into the tobacco shower, the width of the stream of shorts in the shower having a predetermined width narrower than the total width of the shower so that the shorts occupy a predetermined level in the filler stream on the band.

3,732,872

**APPARATUS FOR THE UNIFORM ADDITION OF SOLUBLE MATERIALS TO CIGARETTES**

Leon Lakritz, Blackwood, N.J., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 31, 1971, Ser. No. 176,621

Int. Cl. A24b 3/12; A24f 25/00

U.S. Cl. 131—133 R

3 Claims

An apparatus for uniformly distributing an additive solution throughout the length of a cigarette. A hinged block with a recessed cavity or cradle means for holding a cigarette is immovably attached to one end of a track. A carriage provided with clamps for holding a syringe or additive reservoir having a needle and plunger is movably attached to the track in a position facing the hinged block. A stop means is provided to



penetrated the length of the cigarette and its tip is positioned at the end of the cigarette opposite that at which it entered.

3,732,873

**TAMPING TOOL**

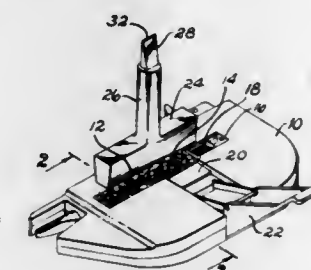
William C. O'Rear, Pico Rivera, Calif., assignor to Max W. Perkins, Whittier, Calif., a part interest

Filed May 20, 1971, Ser. No. 145,367

Int. Cl. A24f 47/00

U.S. Cl. 131—170 R

10 Claims



A tool for tamping and aligning tobacco in a cigarette molding machine comprising in integrated combination a tamp base, an upright finger grip member and a tapered insertion member extending from the vertical end of the finger grip member.

3,732,874

**SMOKING MACHINE**

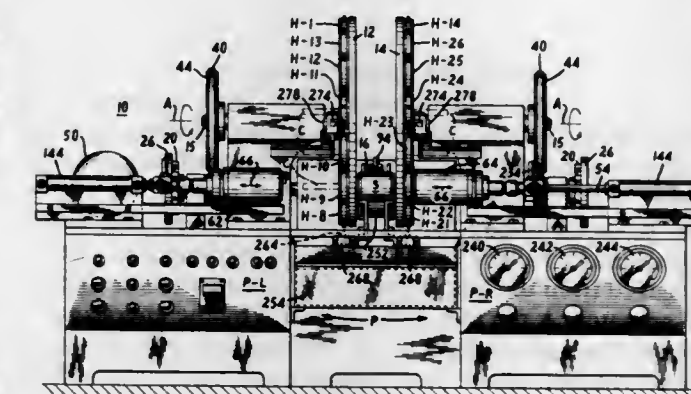
John R. Wagner, and Melvin D. Siddbury, Greensboro, N.C., assignors to Loew's Theatres, Inc., New York, N.Y.

Filed Feb. 25, 1972, Ser. No. 229,268

Int. Cl. A24f 13/00

U.S. Cl. 131—171 R

11 Claims



A smoking machine includes a pair of parallel disks alternately rotatable about a common axis and each provided with a number of holders for cigarettes or other smokable articles. Means is provided for automatically lighting the cigarettes. The holders are spaced apart at equal intervals in circular paths respectively centered on the axis of the disks. A shuttle valve is mounted at a smoking station between the two disks and adjacent to each to receive a continuous stream of smoke from the cigarettes in sequence and channel it to a desired location, at which there may be, for example, a holder



for an experimental animal. The valve shuttles between the two disks to take a puff on each cigarette as it arrives at the smoking station. The cigarettes carried on one disk are thus puffed alternately with those carried on the other. "Reverse puffing" is employed: i.e., chambers are placed over the lighted ends of the cigarettes and pressurized, so that the smoke is delivered at atmospheric pressure. While a puff is being taken on any given cigarette on one of the disks at the smoking station, the other disk is rotated by an indexer to bring the next cigarette to the smoking station, which is puffed in the same way. The process continues for a number of rotations of the disks, until the cigarettes are smoked to the desired extent, whereupon they are automatically ejected.

3,732,875

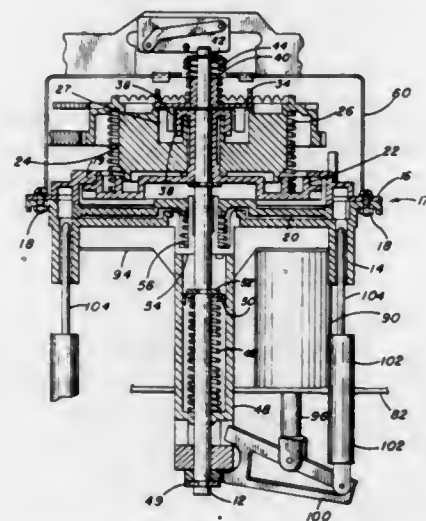
## INCOME TOTALLING DEVICE

Herman G. Jensen, Chicago, and Bernhard O. Williams, Elmhurst, both of Ill., assignors to The Seeburg Corporation of Delaware, Chicago, Ill.

Filed July 26, 1972, Ser. No. 275,368  
Int. Cl. G07d 9/04

U.S. Cl. 133-8

3 Claims



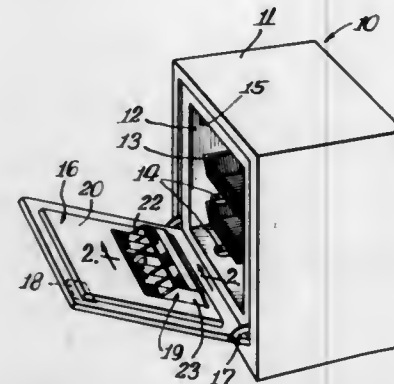
An improved apparatus for totalizing the value of coins deposited in a coin receiving mechanism. Each deposited coin actuates an associated solenoid to produce a longitudinal displacement of the housing of the apparatus and moves a pawl actuator into engagement with a ratchet wheel. The ratchet wheel is spring biased for rotational movement, and as the pawl actuator engages the ratchet wheel the ratchet wheel is disengaged from the housing to rotate in conjunction with the pawl actuator. A pin member controlled by the energized associated solenoid engages the pawl actuator and limits the conjoint rotation of the pawl actuator and the ratchet wheel. The ratchet wheel is then locked in its new position and a motor driven gear member, which is activated by a lever operated switch upon displacement of the ratchet wheel, follows or "tracks" the ratchet wheel until the original relative orientation of the ratchet wheel and gear member is reattained. Simultaneously, a gear arrangement drives a counter to register the new cumulative total. A contact member is mounted on the housing and is positioned so that it engages and delays actuation of the lever operated switch until the associated solenoid is released and the longitudinally displaced housing returns to its original position thereby preventing premature operation of the motor.

3,732,876  
DISHWASHER SILVERWARE BASKET WITH SOAKER MEANS  
Albert T. Braga, Kenneth J. Grall, and Roque D. Marcade, all of Stevensville, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sept. 30, 1971, Ser. No. 185,135  
Int. Cl. B08b 3/02, 13/00

U.S. Cl. 134-58 D

12 Claims



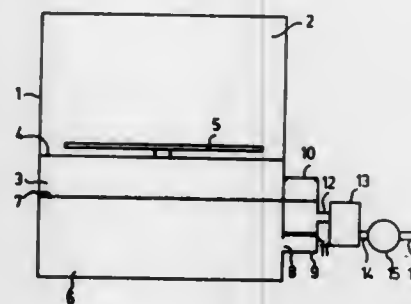
A dishwasher having a silverware basket carried on the door for washing of silverware placed in the basket during the dishwashing operation. The basket includes structure for alternatively arranging the basket for passage of the dishwashing liquid therethrough or for retaining a body of the dishwashing liquid in a lower portion thereof for soaking the silverware disposed in the basket during the first part of a dishwashing operation.

3,732,877  
DEVICES FOR CLEANING OBJECTS  
Hermanus Antonius Marie Kloeg, Nautilusstraat 150, Tilburg, Netherlands

Filed Mar. 29, 1971, Ser. No. 128,776  
Int. Cl. B08b 3/10

U.S. Cl. 134-111

5 Claims



A washing apparatus has a collecting space for a washing liquid. A duct extends through the wall of the collecting space intermediate the level of the liquid therein and the bottom of the space, the duct being connected to an external filter assembly. Washing liquid is circulated from the filter assembly back to the apparatus. The top of the filter assembly has an aperture to permit access to a filter therein.

3,732,878  
VARIABLE TENSIONING STAKE  
James C. Blankemeyer, Route 1, Columbus Grove, and Robert L. Blankemeyer, Route 1, Fort Jennings, both of Ohio

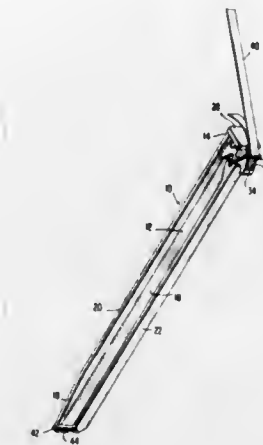
Filed June 28, 1971, Ser. No. 157,210  
Int. Cl. A43f 1/16

U.S. Cl. 135-15 PE

7 Claims

A variable tensioning stake has a camming serrated surface adjacent the impact receiving head portion. The head portion

is supported by three flanges to dissipate impact stress. The central flange member has a pair of inclined camming surfaces for receiving a substantially square ring in a snap engaging fashion. The major portion of the stake has a front and rear

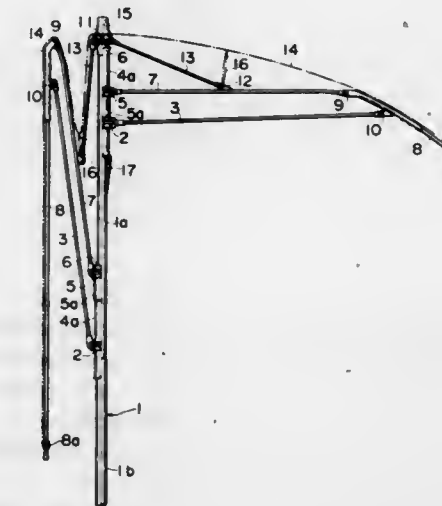


flange connected by a central web with the front flange varying in size to permit a readypenetration of a support surface at the lower portion of the base, while providing a stress resistant structure at the upper portion. The stake can be made of various materials, such as hard plastic.

3,732,879  
UMBRELLA  
Shigekazu Okuda, 307 Minamiue-machi, Kishiwada-shi, Osaka, Japan  
Filed Aug. 23, 1971, Ser. No. 173,968  
Claims priority, application Japan, Nov. 5, 1970, 45/109708  
Int. Cl. A45b 19/00

U.S. Cl. 135-20

13 Claims

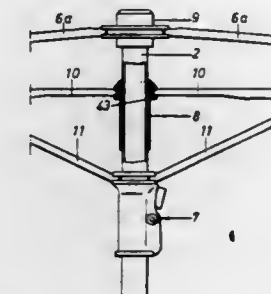


An umbrella construction is disclosed having lower links radiating from a lower ferrule mounted on a shaft and upper links radiating from a middle ferrule mounted on the shaft. The upper and lower links support the main ribs of the umbrella. Auxiliary links connect an upper link with an upper ferrule on the top of the shaft. The lower and middle ferrules are adapted for upward and downward sliding movement on the shaft during opening and closing of the umbrella, thus permitting the ribs, links and umbrella cover to be smoothly collapsed and folded when the umbrella is closed.

3,732,880  
UMBRELLA  
Heinz Weber, 401 Hilden, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec, Canada  
Filed July 22, 1970, Ser. No. 57,175  
Claims priority, application Germany, July 25, 1969, P 19 37 890.6; July 25, 1969, G 69 29 502.9; Oct. 25, 1969, P 19 53 795.2

Int. Cl. A45b 19/00, 25/08  
U.S. Cl. 135-20

6 Claims

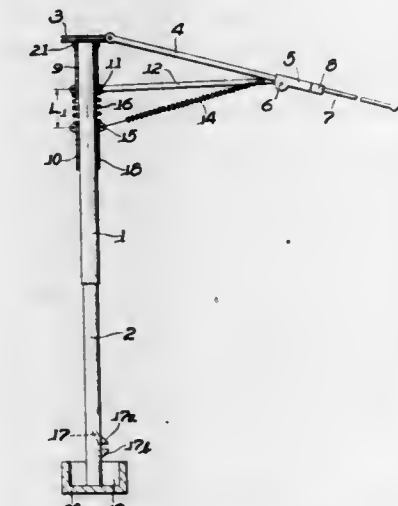


An umbrella wherein the dome ribs and the support structure and a part of the stick define a triangular structure when the umbrella is in an open position. The stretcher is connected to the auxiliary runner while the support structures are connected to the main runner and to the stretcher members. The outer section of the dome ribs extending beyond the triangular structure defined by the dome ribs and the stretcher members is flexible and is bowed concavely when a cover is tightened about the umbrella.

3,732,881  
SELF-OPENING UMBRELLAS  
Masaaki Hirai, Osaka, Japan, assignor to Asahi Kogyo Co., Ltd., Osaka, Japan  
Filed Feb. 16, 1970, Ser. No. 11,743  
Claims priority, application Japan, Aug. 22, 1969, 44/80219  
Int. Cl. A45b 25/16

U.S. Cl. 135-22

3 Claims



A self-opening umbrella utilizing tension springs for self-opening operation is disclosed and comprises a rod or stick with a crown secured on the top thereof, a plurality of roof ribs having their respective base ends thereof pivotally mounted to the periphery of the crown, a slider member roof rib, each slider member being slidable along its associated roof rib, a lower sliding sleeve slidably mounted around the rod or stick and including connection means for connecting the end of an associated tension spring, an upper sliding sleeve slidably mounted around the rod or stick and above the lower sliding sleeve, a brace member associated with each roof rib and



pivotably connected at one end thereof to the slider member and having its otherwise free end pivotably connected to the upper sliding sleeve, and an axial compression spring disposed between the upper sliding sleeve and the connection means of the lower sliding member, the tension spring being connected at its otherwise free end to an associated brace and at a point near the associated slider member, whereby maintaining the umbrella in an open condition is attained utilizing little force and, hence, the force necessary for closing the umbrella is reduced.

3,732,882

## STRUCTURE OF A FOLDING UMBRELLA

Nobutoshi Kida, No. 1-27, Minami Nonin-cho, Osaka; Kazo Saito, No. 9-374, Ohtori Naka-machi, Sakai, and Junichi Furukawa, No. 3-9-10, Sone Higashi-cho, Toyonaka, all of Japan

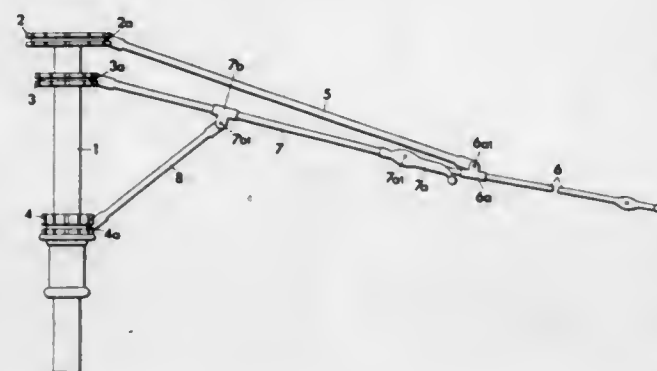
Filed May 27, 1971, Ser. No. 147,349

Claims priority, application Japan, June 1, 1970, 45/47777; Dec. 25, 1970, 45/129646; Dec. 28, 1970, 45/127160

Int. Cl. A45b 19/04

U.S. Cl. 135-25

6 Claims



A novel structure of a folding umbrella comprises a plurality of rib assemblies each comprising a cover rib pivotally connected at its base end to an upper rib-holder, a main rib pivotally connected at its base end to an intermediate rib-holder, a strut pivotally connected at its base end to a lower rib-holder and at its tip end to an intermediate portion of said main rib, an end rib pivotally connected at its base end to a tip end of said main rib and connected at its intermediate portion to a tip end of said cover rib. The structure is capable of automatically expanding an end rib into alignment with a main rib by pushing up a lower rib-holder, for opening the umbrella and automatically folding back said end rib onto a cover rib only by pulling down the lower rib-holder, for closing the umbrella. With such a structure, the umbrella may be closed either in a collapsed form or in an extended form.

3,732,883

## FLUIDIC LINEAR ACCELEROMETER

Otto R. Munch, West Allis, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Jan. 26, 1970, Ser. No. 5,651

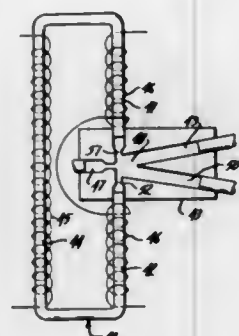
Int. Cl. F15c 1/14

U.S. Cl. 137-824

14 Claims

This disclosure includes a fluidic linear accelerometer in the form of a looped conduit of substantially lineal configuration having a fluid input supply and terminating in a pair of opposed ends. A summing impact modulator is connected to the conduit ends to provide an amplified fluidic signal. The densi-

ty of the fluid flowing in one of the two lineal passageways forming the loop is changed with respect to the other. A pres-



sure differential is established which is dependent upon the linear acceleration in the lineal direction and the difference in densities.

3,732,884

## ARRANGEMENT IN WATER-CLOSETS

Ingmar Strom, Helsinki, Finland, assignor to Oy Wartsila Ab, Helsinki, Finland

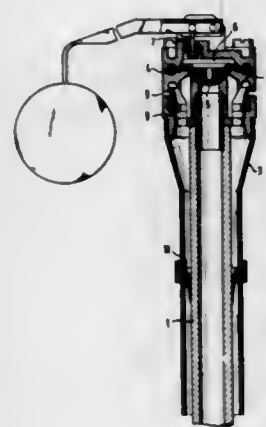
Filed June 26, 1970, Ser. No. 50,036

Claims priority, application Finland, June 26, 1969, 1891/69

Int. Cl. F16k 45/00

U.S. Cl. 137-218

4 Claims



A refilling device for the flush water container of a water-closet. The device comprises an inlet tube, a refilling valve and an outlet tube. In the outlet tube there is a throttling member which also functions as a non-return valve preventing back flow in the outlet tube. This arrangement is especially intended to be used in combination with a so called back suction guard, that is a means usually comprising flap covered air suction openings on the outlet side of the refilling valve. The invention enables the use of relatively stiff flaps or other back flow preventing means at said air openings so that noise producing air suction through the openings can be completely avoided during normal operation of the refilling device.

3,732,885

## VALVE AND METHOD OF ASSEMBLING SAME

Herbert Allen, P.O. Box 1212, Houston, Tex.

Filed Sept. 29, 1971, Ser. No. 184,727

Int. Cl. F16k 27/10

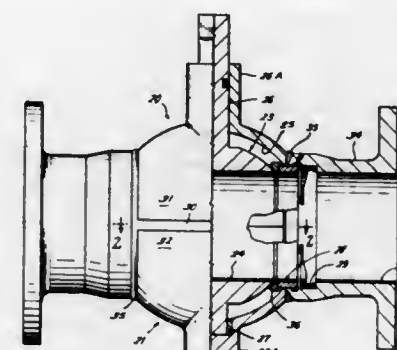
U.S. Cl. 137-315

18 Claims

A valve having seats made of axially separable, inner and

outer parts which may be moved to positions, during assembly of the valve, permitting adjacent parts of the valve body to be

operates to control the main valve to make one condition of the output follow a corresponding input signal closely. Control of the main valve may be transferred from one to the other



welded and the weldments to be stress relieved without damage to seal rings carried by the seats.

3,732,886

## COPPER TUBE SERVICE VALVE

John W. Mullins, c/o J. R. Phillips, 2878 N. 7th Place, Phoenix, Ariz.

Filed Apr. 26, 1971, Ser. No. 137,376

Int. Cl. B23h 41/08; F16e 41/04

U.S. Cl. 137-318

3 Claims



A generally cylindrical centrally bored housing is coaxially secured, at one end portion, within a short length of copper tubing. The other end of the copper tubing is bifurcated for connection with a line to be tapped. A valve equipped tubular core, having a length slightly less than the combined length of the housing and the copper tubing and having a line piercing tip, is freely received by the bore of the housing. A cap threadedly engaged with the free end of the housing, forces the line piercing tip into the line and seals the core with the housing and line.

3,732,887

## FLOW-PRESSURE CONTROL VALVE SYSTEM

Paul F. Hayner, Lexington, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

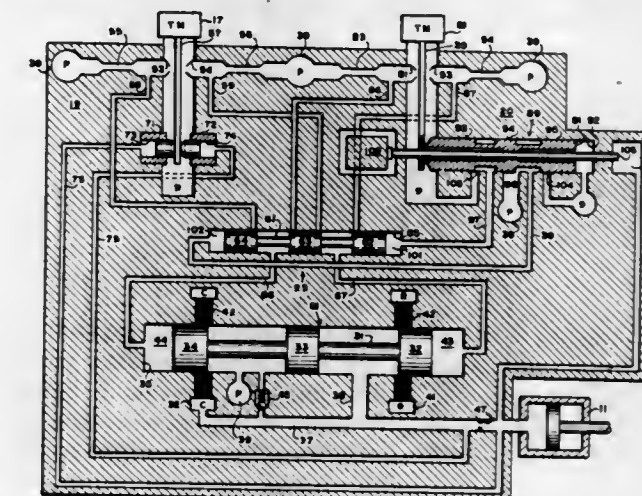
Filed Oct. 12, 1971, Ser. No. 188,283

Int. Cl. G05d 16/06

U.S. Cl. 137-486

16 Claims

A valve system is disclosed in which a main control valve is controlled by either one of two pilot stages. Each stage



pilot stage either manually or automatically. In one embodiment, transfer occurs as the magnitude of one of the conditions reaches a predetermined threshold.

3,732,888

## CLOSING DEVICE FOR A PNEUMATIC SYSTEM

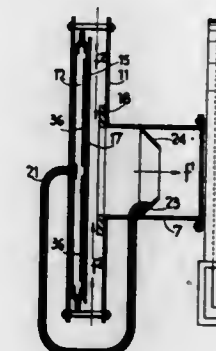
Michel Convain, Marcq-en-Baroeul, and Pascal Meresse, Roubaix, both of France, assignors to Societe Anonyme Pronal, Roubaix, France

Filed Mar. 10, 1972, Ser. No. 233,601

Int. Cl. G05d 7/03

U.S. Cl. 137-489

13 Claims



A closing device for a pneumatic system comprising an inflatable bag having a closing face co-operable with an annular seat defining an aperture which is connected to the pneumatic system by passage means. The bag has an orifice which conduit means puts in communication with the interior of the passage means so that pressure variations in the passage means inflate or deflate the bag so that the closing face closes or unmasks the annular seat. The bag consists of two fluidtight sheets interconnected along their peripheries and means are provided inside the bag to ensure that the two sheets are always spaced apart in the region of the orifice.

The device can be employed in combination with the inlet of fluid-flow generating means to control the fluid flow through the inlet.

3,732,889

## AIR RELIEF VALVE ASSEMBLY

William J. Conery, and Donald A. Kaessen, both of Ashland, Ohio, assignors to Hydr-O-Matic Pump Company, Hayesville, Ohio

Filed Apr. 8, 1971, Ser. No. 132,423

Int. Cl. F16k 31/12

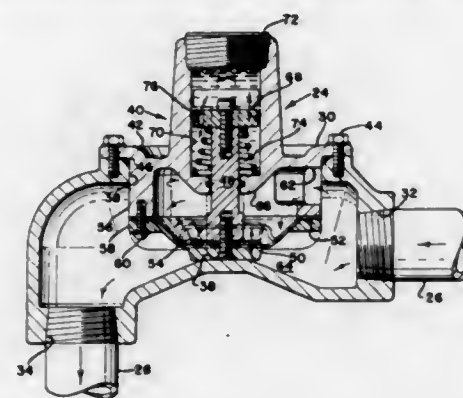
U.S. Cl. 137-498

8 Claims

A valve for venting air from the pumping chamber of a liquid pumping system. A valve plate is normally held in open



position remote from the valve seat by a spring. A flexible diaphragm is attached to the valve plate and divides the valve housing into a through passage and a chamber which communicates with the inlet port of the valve. The valve seat-valve plate arrangement defines a venturi region in the through



passage of the valve. Under low pressure, low volume flow conditions, the valve remains in open position. As the flow rate increases, the decrease in pressure across the venturi together with the increased pressure in the chamber behind the diaphragm overcomes the spring pressure to close the valve.

3,732,890

## UNLOADER VALVE FOR AIR COMPRESSOR

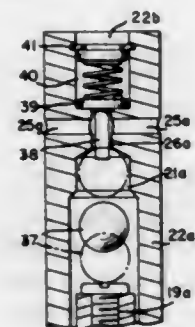
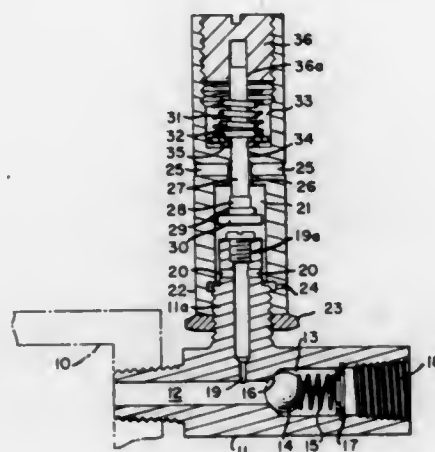
Dresden G. Smith, San Jose, Calif., assignor to Aqua-Mec, Inc., San Jose, Calif.

Filed May 28, 1971, Ser. No. 148,012

Int. Cl. F16k 15/00

U.S. Cl. 137-512.3

2 Claims



A valve device provided to the outlet port of an air compressor for subjecting the compressor to a limited back pressure until the compressor gains enough speed to be able to

pick up the full load. Thereafter the device operates to open the passage to the compressed air tank. This device is provided with a casing having a main passage therethrough in which there is positioned a check valve which controls the passage to the compressed air tank. This device also includes a cylinder which is connected to the casing by a restriction hole and the cavity of this cylinder is normally open to the atmosphere. A valve member is provided in the cylinder cavity responsive to the flow of air into the cavity through said restriction hole and this valve member functions to close an exhaust hole when the air compressor approaches delivery of normal compressed air output. The check valve in the main passage is then opened and compressed air flows into the tank.

3,732,891

## SOLENOID OPERATED, TWO WAY DIVERTER VALVE FOR FLUID LINE WASHING APPARATUS

Lloyd F. Bender, Route 5, Hayward, Wis.

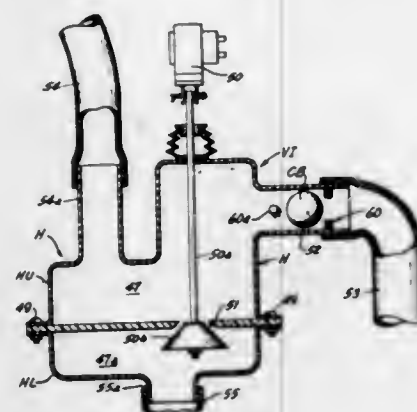
Division of Ser. No. 105,314, Jan. 11, 1971, Pat. No.

3,670,744. This application Apr. 17, 1972, Ser. No. 244,613

Int. Cl. F16k 11/14

U.S. Cl. 137-609

2 Claims



An improved, solenoid operated, two way diverting valve for fluids for a washing apparatus that includes a fluid circuit for conducting a cleansing solution through conveying conduits, and a drying means for blowing heated air through the conduits after they are cleaned. The improved diverting valves selectively divert the washing and drying fluids through the apparatus.

3,732,892

## FLUIDIC MOTION LIMITING SYSTEM FOR MOTOR DRIVEN APPARATUS

Thomas J. Bubula, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 3,734, Jan. 19, 1970, Pat. No. 3,613,505.

This application Jan. 29, 1971, Ser. No. 111,085

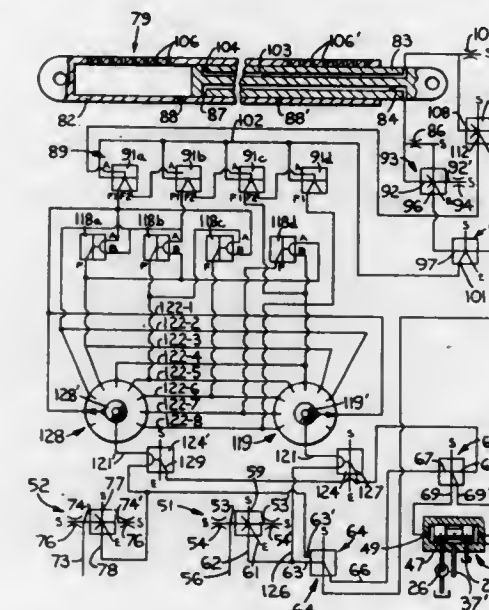
Int. Cl. F15c 3/00

U.S. Cl. 137-609

2 Claims

An operator's control lever which is shifted to actuate a hydraulic motor is returned to the initial position to stop the motor after a preselected amount of travel of a element driven by the motor. A fluidic circuit has means producing digital signals indicative of successive increments of travel of the element and has a counter for storing any preselected number of such signals. When the selected count is reached, a kick-out means manipulates the operator's control lever to stop further

operation of the motor. The count required to stop the motor, and thus the amount of travel of the element, may be changed



by turning of a control knob. The system is applicable, for example, to limiting movement of the lift arms of a loader vehicle.

3,732,893

## SOLENOID VALVE

Kurt Ziesche, 7141 Neckarstrasse; Waldemar Hans; Josef Duffner, both of 8600 Bamberg; Gerhard Brune, 7141 Schwieberdingen, and Alfred Grob, 7141 Oberstenfeld, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

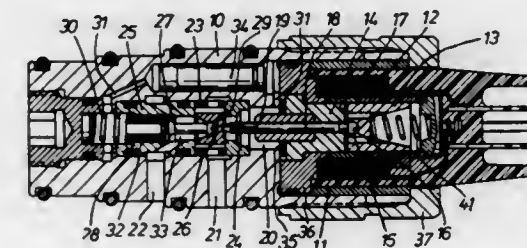
Filed Mar. 6, 1972, Ser. No. 232,082

Claims priority, application Germany, Mar. 5, 1971, P 21 10 596.4

Int. Cl. F16k 31/10, 39/00

U.S. Cl. 137-625.65

11 Claims



In a solenoid valve the axially movable magnet armature (driving piston) is connected through an actuating ram with a valve head which is movable between two valve seats and which is urged against the electromagnet force by a spring-biased counterpiston engaging said valve head at its end remote from said ram.

3,732,894

## PIPEFITTING COVER

Chris J. Botsolas, 56 Woodridge Avenue, Metuchen, N.J.

Filed Jan. 11, 1971, Ser. No. 105,586

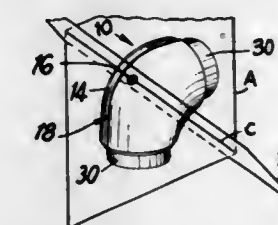
Int. Cl. F16l 9/22

U.S. Cl. 138-178

13 Claims

A pipefitting cover comprised of two half sections pivotally connected together at a single point so that one half section may be revolved into superimposed, nested relationship within the other half section for storage and shipping, and thereafter revolved out of nested relationship to a position of opposed

relationship where the two half sections take the shape of the fitting to be covered. The two half sections preferably are formed from a flexible, resilient material, each having a continuously curved portion overlapping the longitudinal center-



line of the cover and also are each provided with integral, continuously extending end wall portions which may be of restricted diameter to accommodate adjacent reduced-size piping and/or to space the cover from the fitting to allow for insulation between the fitting and the cover.

3,732,895

## REVERSIBLE JACQUARD LOOM AND REVERSING MECHANISM THEREFOR

Walter Keim, Senden, Iller, Germany, assignor to Firma Grosse Webereimaschinen GmbH, Neu-Ulm, Germany

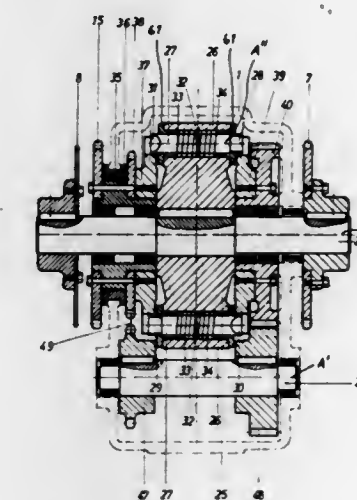
Filed June 28, 1971, Ser. No. 157,089

Claims priority, application Germany, June 26, 1970, P 20 31 807.4

Int. Cl. D03c 3/32

U.S. Cl. 139-1 E

10 Claims



A jacquard loom has a reversing mechanism which, on reversal of the loom drive in case of weft failure, causes the blades controlling the heddle-control rods to orbit backwardly (reverse sense) only until the loom is again in the open-shed or closed-shed position, whereupon the blades are caused to orbit forwardly (forward sense). This apparatus has a single input connected directly with the drive and a pair of outputs, one of which is rigidly (no slip) connected to the input and is operatively connected to the card-reading device and the other of which controls the control-rod blades. The input shaft carries, in addition to the input sprocket and first-output sprocket, a rotatable element flanked by a pair of disks and defining a unidirectional lost-motion indexing clutch therewith. A pair of pins passing through the rotatable element can engage with their ends in either of the flanking disks which are themselves positively coupled (no slip or phase shift) together to rotate in opposite senses. Each disk is formed with notches having one straight and one inclined flank (or only the pins may have such flanks) and these notches only line up in the open-shed and closed-shed positions of the loom, or in at least one of these positions, so that the pins can only slide to change second-output rotation sense when the loom is in either of these positions.



3,732,896

# METHOD OF AND APPARATUS FOR FILLING THE SHUTTLES WITH WEFT IN PROGRESSIVE SHED WEAVING LOOMS

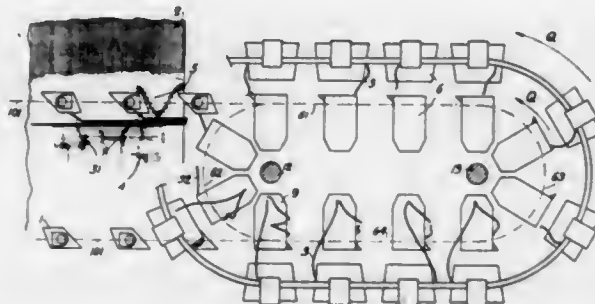
Frantisek Jekl; Vladimir Mateju, both of Usti nad Orlici; Josef Pech, Brno, and Vitezslav Vasek, Usti nad Orlici, all of Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Apr. 26, 1971, Ser. No. 137,250

Int. Cl. D03d 47/26

U.S. Cl. 139-12

11 Claims



Method of and apparatus for filling shuttles with weft in progressive shed weaving looms with continuously travelling shuttles where the filling of shuttles takes place at the common part of the paths of shuttles and filling units moving at the same speed. The excessive part of the end of weft thread is transferred back, in the direction opposite to that of the direction of movement of the thread during the filling of the shuttle, before the end of the weft thread supply is inserted into the shuttle between the bobbin of the shuttle and the driving means of the metering device. At the same time, at the beginning of the winding, the said end of the weft thread supply frees itself from the grip of the braking mechanism and is retained by the windings on the bobbin of the shuttle; the weft is separated and simultaneously gripped by the nipping device, after the rated number of turns have been wound, after the shuttle has entered the shed and the weft has been interlaced by at least two warp threads.

## ERRATUM

For Class 139-370 see:  
Patent No. 3,732,900

3,732,897

APPARATUS FOR DEVELOPING WINDING COILS  
Richard B. Arnold, and Dallas F. Smith, both of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Filed Apr. 1, 1971, Ser. No. 130,399

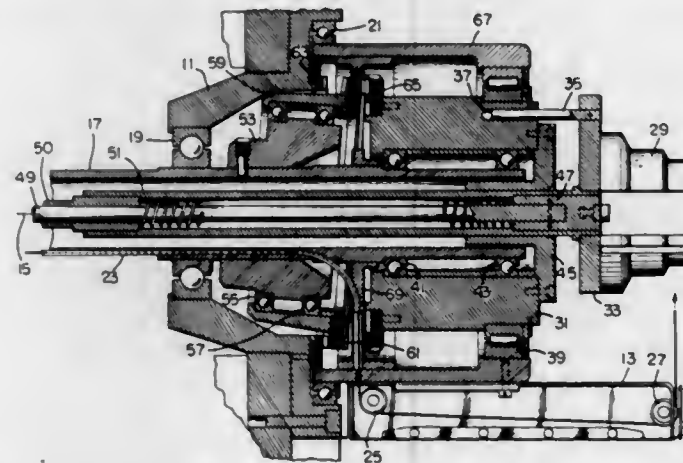
Int. Cl. B21f 3/04

U.S. Cl. 140-92.1

11 Claims

A high speed winding machine for developing or generating coil groups each comprising one or more coils each having one or more turns of winding material. The turns are developed and placed on coil turn receiving means such as coil injection tooling or a coil transfer mechanism with or without auxiliary coil shaping means. The apparatus may be advantageously utilized in the manufacture of wound inductive devices, e.g., dynamoelectric machines such as motors. An illustrated preferred embodiment includes a frame, a coil form support having auxiliary coil shaping means embodied as a coil form mounted thereon for axial movement relative to the frame, and a flyer rotatable about a central axis for developing wire turns on the coil form. In order to prevent rotation of the coil form, located in the vicinity of the central axis, with the rotating flyer and a rotating wire feed tube, a

migrating mechanical linkage is provided between the frame and coil form support to prevent rotation of the coil form with the rotating flyer. The illustrated migrating linkage includes a carriage which supports a wobble face gear and is rotatable relative to the gear. The wobble gear is provided with teeth on opposite faces thereof and the teeth on one face of the wobble gear mesh with the stationary gear teeth on the frame while teeth on the other face of the wobble gear engage the gear on the coil form support. The stationary gear teeth and gear teeth on the coil form support are spaced apart and the wobble gear



3,732,898

# BENDING APPARATUS FOR MULTIPLE WIRE-LIKE ARTICLES

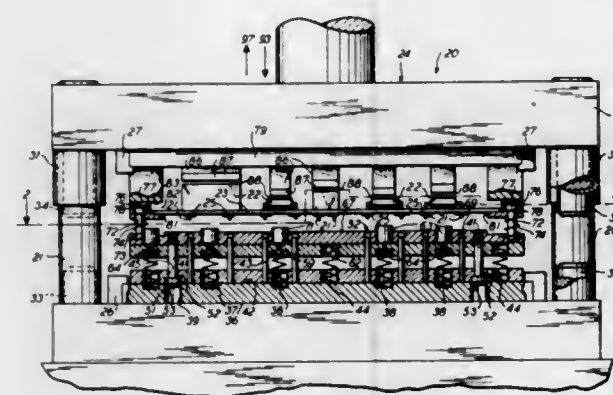
Albert E. Boyer, Peabody, Mass., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 6, 1971, Ser. No. 186,831

Int. Cl. B21f 1/00

U.S. Cl. 140-105

12 Claims



An array of leads extending from diverse electrical components mounted on a printed circuit board are bent simultaneously by an apparatus which advances the board to engage the leads with an array of dies and punches. The dies are formed in a spring biased plate by bores each of which has a bevelled ramp adjacent thereto. As the board advances, the

leads engage the bevelled ramp and are bent partially in predetermined directions. The punches are aligned with the bores and engage the leads to permanently crimp the leads to the board upon movement of the plate over the punches as the board continues to advance.

3,732,899

# APPARATUS FOR DETERMINING THE GAUGE OF WIRE SCREEN OR MESH

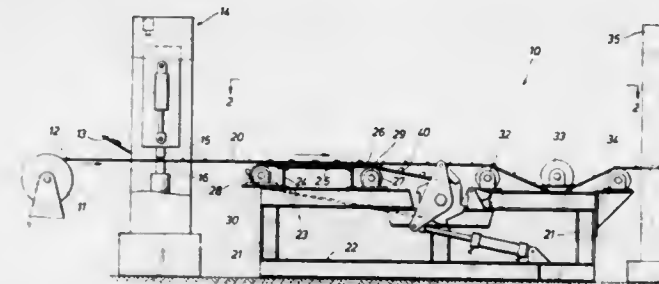
William A. Schindler, 1713 Long Acre, Houston, Tex.

Filed Sept. 3, 1971, Ser. No. 177,704

Int. Cl. B21f 23/00, 27/10

U.S. Cl. 140-112

12 Claims



An apparatus for use in the manufacture of wire screening or mesh which determines the pitch thereof. The apparatus incorporates a means for drawing the completed wire screen or mesh through a welding apparatus. A plurality of flexible chain drives incorporates upwardly extending dogs which selectively engage the wire mesh and the transverse members thereof. The dogs are movable so as to adjust to a different pitch. The chain drives are advanced by means of a ratchet mechanism, the stroke thereof being variable. The stroke can be varied, for example, from two inches to about six inches.

3,732,900

# WEFT FEELER MECHANISM

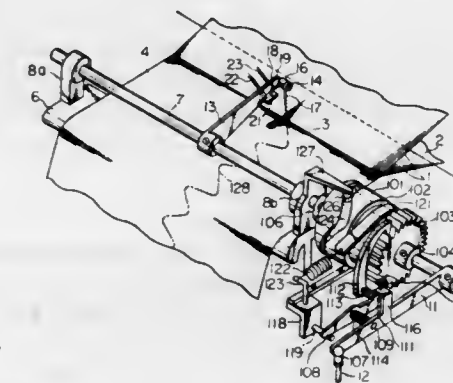
Toemon Sakamoto, Hamamatsu-shi, Shizuoka-ken, Japan, assignor to Enshu Limited, Hamana-gun, Shizuoka-ken, Japan

Filed Dec. 15, 1971, Ser. No. 208,243

Int. Cl. D03d 51/34

U.S. Cl. 139-370

14 Claims



A rocking-type weft feeler mechanism wherein the weft feeler is arranged to reciprocate intermittently and periodically parallel to the cloth-fell from picking to picking.

3,732,901

# APPARATUS FOR WINDING RING-SHAPED ARTICLES

Bryan Kent, Ithaca, and Duane Kent, Beron Center, both of N.Y., assignors to Pulse Engineering Inc., San Diego, Calif.

Filed Mar. 4, 1971, Ser. No. 120,960

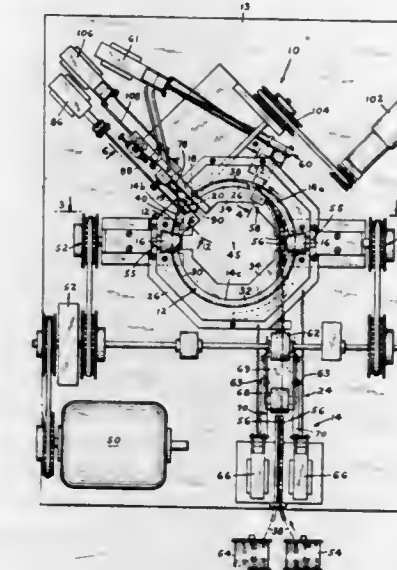
Int. Cl. H01f 41/08

U.S. Cl. 140-92.1

14 Claims

A method and apparatus for winding wire strands onto toroidal cores in which a length of wire is fed along a radially in-

wardly facing channel in an arcular guide to form a loop. As the leading end of the wire completes this loop it hugs the channel's radial boundary to form a second loop inside the first as the wire feeding continues. A gap is provided in the radial boundary of the channel for receiving the core with the core's central aperture in this gap so as each loop is formed the wire in that loop passes through the core. The upper and lower boundaries of the channel are spaced apart so as to



3,732,902

# FILLING DEVICE FOR PREVENTING OVERFLOW OF LIQUID-CONTAINING TANKS

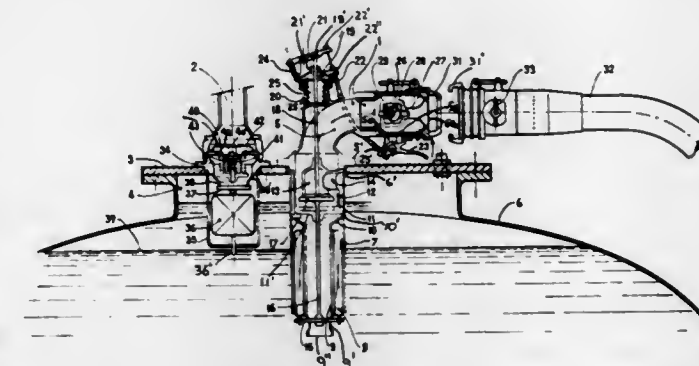
Jacques Muller, 123 Avenue de Genide Gaulle, La Garenne-Colombes, France

Filed Mar. 10, 1971, Ser. No. 122,907

Int. Cl. B67c 3/00

U.S. Cl. 141-198

9 Claims



This invention relates to a filling device for preventing overflow of liquid-containing tanks during the filling thereof and includes a liquid inlet unit having a float controlled valve designed to close to prevent further flow of liquid into the tank when the liquid therein has reached a predetermined level and an air inlet unit having a float controlled valve which prevents venting of air from the tank when the liquid therein has reached a predetermined level, so that the air pressure in the tank would build up quickly to prevent introduction of additional liquid.



3,732,903

## DELIVERY OF LIQUIDS INTO CONTAINERS

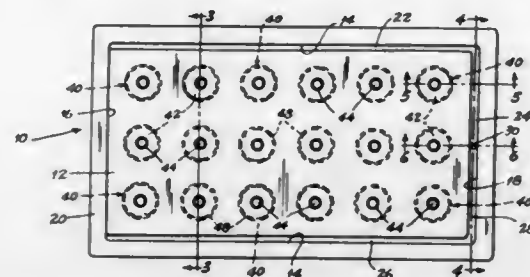
John E. Oates, 6329 Alamo Avenue, Clayton, Mo.

Filed June 3, 1971, Ser. No. 149,702

Int. Cl. B65b 3/06

U.S. Cl. 141—237

1 Claim



The invention provides a simple device for quickly delivering an equal predetermined volume of a liquid simultaneously into each of a plurality of identical containers. The device is particularly adapted for use in schools, hospitals, cafeterias and the like, particularly when numerous servings are required during a relatively short period of time. Use of the invention obviates the tedious and time-consuming manual operations required to fill paper cups and similar containers one at a time, and furthermore automatically insure delivery of an equal amount of a liquid into a plurality of containers simultaneously. Displacement means included in the device provide for a uniform liquid level in each container below the brim.

3,732,904

## MODIFIED PROCESSOR AND COMPONENTS

Douglas D. Hamilton, Mount Royal, Quebec; Joseph J. R. Bolvin, and Domenico Benedetto, both of Montreal, Quebec, all of Canada, assignors to Canadian International Paper Company, Montreal, Quebec; North Shore Paper Company, Montreal, Quebec and Abitibi St. Anne Paper Ltd., Beaufort, Quebec, Canada, part interest to each

Continuation of Ser. No. 794,673, Jan. 28, 1969, abandoned.

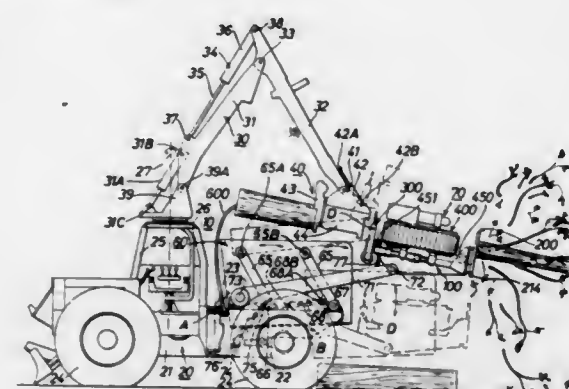
This application Dec. 14, 1971, Ser. No. 207,990

Claims priority, application Canada, Jan. 29, 1968, 11,008

Int. Cl. A01g 23/08

U.S. Cl. 144—3 D

16 Claims



This invention relates to mobile apparatus for handling trees, to mobile apparatus for harvesting and processing trees, to novel components utilized for processing trees, and to a method of logging.

3,732,905

## TREE STUMP REMOVING APPARATUS

James M. Pickel, 6714 Corrington, Kansas City, Mo.

Filed Oct. 26, 1971, Ser. No. 192,517

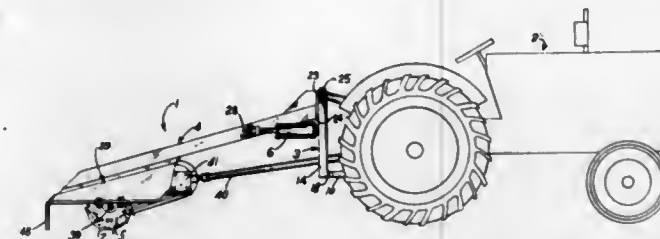
Int. Cl. A01g 23/06

U.S. Cl. 144—2 Z

2 Claims

A tree stump removing apparatus operatively connected to a prime mover includes a support frame and an elongated arm having one end pivotally mounted on the support frame and

extending outwardly therefrom and having a wood cutting blade rotatably mounted adjacent a free end of the arm. A member effects selected movement of the arm and cutting blade thereon in an arc about the one end of the arm during



rotation of the cutting blade. The cutting blade has a plurality of circumferentially spaced cutting elements on opposite faces thereof to cut a tree stump during swinging movement of the arm about the one end thereof.

3,732,906

## TRESTLE TEMPLATE FOR POWER SAWS

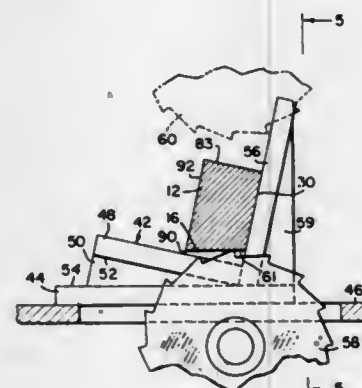
John Welgas, 5819 N. 6th St., Phila., Pa.

Filed Feb. 19, 1971, Ser. No. 116,812

Int. Cl. B27b 5/22, 27/04

U.S. Cl. 144—133 R

1 Claim



A saw template for use in fabricating trestles including a first, angularly inclined work holding surface and a second work holding surface disposed at right angles to the first surface, the first and second surfaces positioning a length of wood which serves as the trestle head in precise angular relationship to a cutting blade to permit the blade to take identical, repeated, angular cuts to receive the trestle legs therein in exact angular relationship.

3,732,907

## DEVICE FOR SEPARATING SMALL PIECES FROM A WORK PIECE OF MATERIAL

Signar Nystrom, and Gosta Larsson, both of Pitea, Sweden, assignors to Pitea Maskin-Industri, Pitea, Sweden

Filed Aug. 24, 1970, Ser. No. 66,547

Int. Cl. B27i 11/02

U.S. Cl. 144—176

14 Claims

The invention relates to a method for separating small pieces from blanks of material by using a device comprising a plurality of cutting elements, with short cutting edges as compared with the blank, said cutting elements being so arranged on the face of a rotating cutting element holding means with their edges pointing essentially in the direction of rotation, that always a plurality of said edges are in holding engagement with the blank during the rotation of said holding means when said blank is moved along a path intersecting said face. The feeding path has a projection, the direction of which is essentially parallel to the direction of the tangents of the orbits of the cutting elements in the place where said path intersects said face.

3,732,909

## THERMOPOLASTIC CONTAINER AND COVER

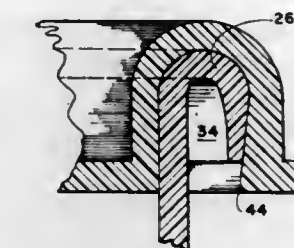
Ralph M. Rooke, Manchester, and James V. Davis, Bloomfield, both of Conn., assignors to The Fuller Brush Company, East Hartford, Conn.

Filed Feb. 16, 1971, Ser. No. 115,342

Int. Cl. B65d 1/00

U.S. Cl. 150—0.5

10 Claims



A container and a hermetically sealable and removable cover therefor each formed of locally deformable thermoplastic material and each having depending skirts. The container skirt forms part of a rim flange with a semi-circular upper portion and the skirt is of decreasing thickness viewed downwardly. The closure skirt forms an outer wall of a downwardly open groove for receiving the container rim flange and which has a complementary semi-circular top groove wall. The cover skirt increases gradually in thickness viewed downwardly and serves to flex the container skirt inwardly on engagement of the cover whereby to provide a resilient gripping engagement of the cover and container.

3,732,910

## ANTI-SKID TRACTION DEVICE

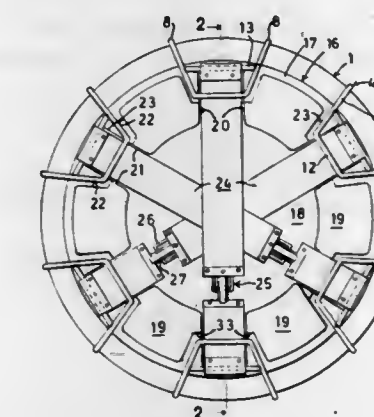
Arthur Cahlan Mathews, 15 Cordova Court, Portola Valley, Calif.

Filed Sept. 2, 1971, Ser. No. 177,290

Int. Cl. B60c 27/12

U.S. Cl. 152—225

10 Claims



the axis of rotation of said holding means and with the edges pointing essentially in a direction of rotation, that always a plurality of said edges are in holding engagement with the blank during the rotation of said holding means when said blank is moved along a path intersecting said face.

The inclination of the back of the cutting element, i.e. the surface of the cutting elements directed towards the blank and the abutting the cutting edge, towards a plane including the rotational path of the cutting element is different between the cutting elements in such a manner that it increases with a reduced spacing between the cutting element and the axis of rotation of the holding means.

In another device for carrying out the method the cutting elements are arranged on a cylinder and the feeding path for the blank to be separated extends at a right angle to the cylinder axis.

3,732,908

## HOT-ROLL EMBOSSED METHOD

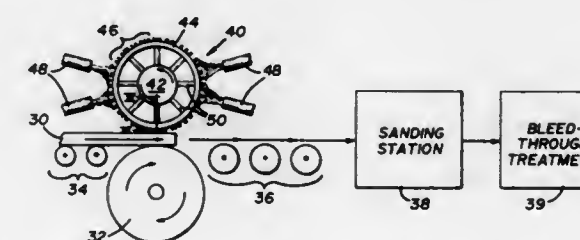
Kendall D. White, Palatine, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Apr. 23, 1971, Ser. No. 136,930

Int. Cl. B27h 1/00

U.S. Cl. 144—328

6 Claims



A method of forming depressions in cellulosic panels by burning patterned holes in only a portion of the surface, preferably using rollers. Thereafter the panel may be treated at the burned areas to prevent bleed-through.

A device providing road-engaging elements adapted to extend transversely across and to be yieldably drawn and held against the road-engaging treads of pneumatic tires on a vehicle. The device is constructed to be readily applied to each tire from the outer side thereof relative to the side adjacent the vehicle body, without fastening it to the wheel. Said road-engaging elements are each generally of U-shape to straddle the tire with the closed end of the U extending across the tread and one of the legs at each opposite side, providing an inner leg at the inner side and an outer leg at the outer side, and the elements are at opposite sides of the tire in pairs spaced around the circumference. The device includes a member engageable with, but not securable to the outer side of the tire, and yieldable tensioning means at the outer side only of a wheel, yieldably hold said member substantially coaxial with the wheel and against said outer side of the tire, and yieldably



hold the elements on the tire, which tensioning means, outer legs, and said member are arranged and formed to coact to hold the road-engaging elements substantially uniformly tight against the road-engaging surface of the tire tread from side-to-side of the tread irrespective of the degree of radially inwardly directed tension applied to said outer legs by said tensioning means. Thus the inner legs on said elements may be quite short.

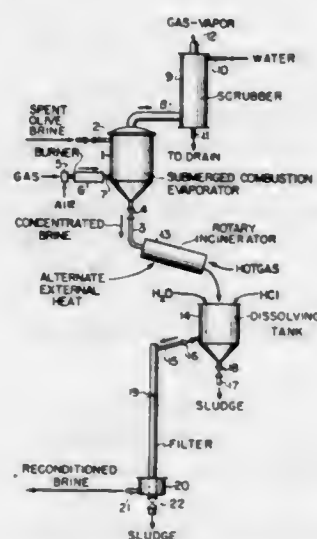
3,732,911

# PROCESS FOR RECONDITIONING SPENT OLIVE-PROCESSING BRINES

Edison Lowe, El Cerrito, and Everett L. Durkee, El Sobrante, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 16, 1971, Ser. No. 124,895

Int. Cl. B01d 1/14, 1/02, A23b 7/00; C10b 47/00  
U.S. Cl. 159—47 WL 2 Claims



Spent brines—for example, those derived from olive processing plants—are reconditioned by applying a series of steps: Concentration of the brine using submerged combustion, incineration of the concentrate, dissolution of the residue in water, and filtration of the resulting solution.

3,732,912

# DEPLOYABLE BLIND

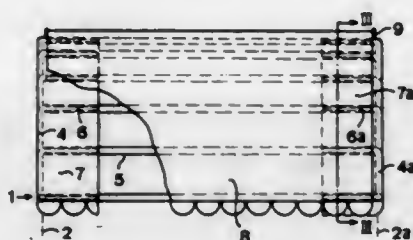
Jean Collet, Annecy, France, assignor to A. Collet & Fils S.A., Annecy, France

Filed June 25, 1971, Ser. No. 156,705

Claims priority, application France, July 9, 1970, 7026562  
Int. Cl. E04f 10/06

U.S. Cl. 160—55

12 Claims



This invention relates to a deployable blind comprising a cloth-supporting frame of adjustable width made up of a series of pivoting ribs joined by the ends of their lateral uprights and the rectilinear part of which, parallel to the pivoting axis of the said ribs, is telescopically adjustable in length; two extendable independent side cloths, fixed on each of the corresponding lateral uprights of the said ribs; and a covering cloth, rolled out from a roller, having a width substantially equal to the minimum length of the telescopically adjustable part of the

ribs and independent of the side cloths which it covers at least partially regardless of the width given to the blind and being fixed only to the first of the ribs.

3,732,913

# ROLL-UP SLATTED SHADE ASSEMBLY

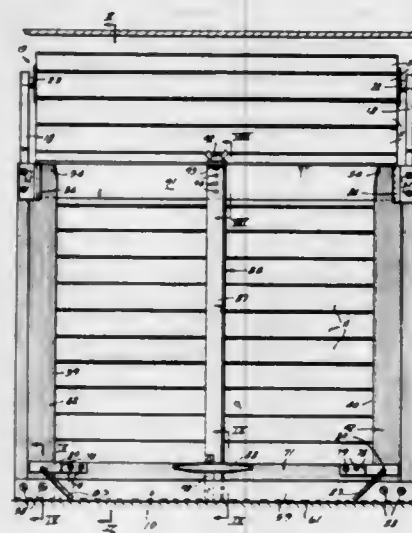
Walter A. Wrono, 3030 Marcus Drive, Building, Apt. 106, North Miami Beach, Fla.

Filed May 27, 1971, Ser. No. 147,431

Int. Cl. E06b 9/08

U.S. Cl. 160—133

24 Claims



A roll-up slatted shade assembly has an articulated slat screen anchored to a wind-up spring head barrel journaled on a shaft carried by arms projecting from the upper ends of vertical guide tracks, with releasable means arranged to lock the pull bar of the screen in the closing position of the screen and comprising pins for coupling members on the pull bar to the lower end portions of the track bars, such members also serving as stops to limit opening movement of the screen by engagement with fixed stops on the upper end portions of the track bars. Silent, rattle-free operation of the screen is assured by soundproofing means. Means are provided for connecting a plurality of assemblies or units in an enclosure orientation. A hurricane brace bar frame structure is provided.

3,732,914

# CURTAIN ROD WITH ELECTRICALLY DRIVEN CARRIAGE

Michel Flagecollet, 19 rue de Verdun, Nancy, France

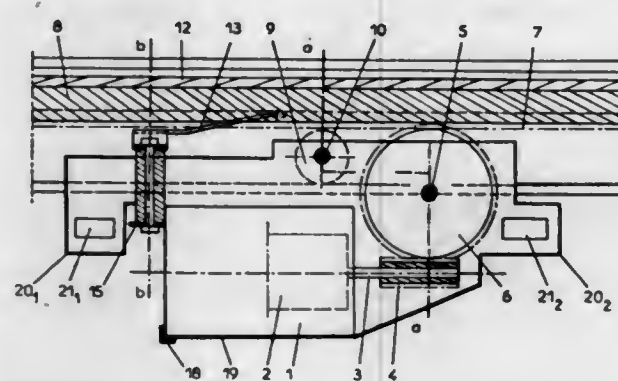
Filed May 6, 1969, Ser. No. 822,268

Claims priority, application France, June 16, 1968, 68151973; Aug. 8, 1968, 68162253

Int. Cl. A47h 1/00

U.S. Cl. 160—331

2 Claims



The disclosure concerns a curtain rod assembly with an electrically driven carriage in which clutching means are provided between the motor and means for driving the carriage along the rod so that the curtain can be manipulated in the case of current failure or breakdown of the motor.

3,732,915

# VACUUM ARC FURNACE

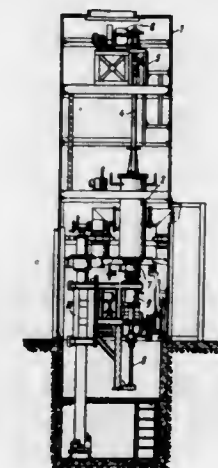
Anatoly Ivanovich Lugovoi, 4 Minaevsky proezd, 6, kv. 1, Moscow; Grigory Alexandrovich Kharatian, Khotkovo, ulitsa Lenina, 4, kv. 13, Moskovskaya oblast; Boris Izidorovich Izraelson, Junykh Lenintsev, 92, kv. 49, and Vera Nikolaevna Kvashnina, Dmitrovskoe shosse, 7/2, kv. 127, both of Moscow, all of U.S.S.R.

Filed Oct. 7, 1971, Ser. No. 187,271

Int. Cl. B22d 27/02

U.S. Cl. 164—252

1 Claim



A furnace for consecutive primary melting and secondary remelting is fitted with a cooler and an ingot withdrawal gear mounted on a supporting swing column and has a changeable mould with a stationary base plate for the secondary remelting of metal; the mould is set up on the said column instead of the cooler and the ingot withdrawal gear.

3,732,916

# HEAT EXCHANGE METHOD AND APPARATUS

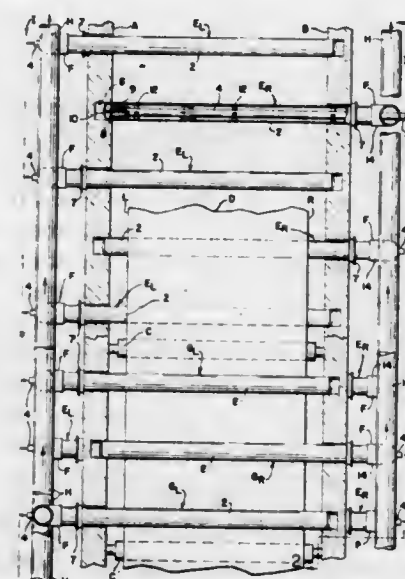
Troy Cope, Salem, Ohio, assignor to The Electric Furnace Company, Salem, Ohio

Filed Jan. 29, 1971, Ser. No. 110,873

Int. Cl. F28f 27/02

U.S. Cl. 165—1

17 Claims



Cooling tubes of the type spaced along the cooling section of a continuous furnace are provided with means for changing the effective cooling length to control cooling of a workpiece passing through the cooling section.

3,732,917

# METHOD OF AND APPARATUS FOR ALTERING THE TEMPERATURE OF CONTAINERS

Hans D. Deubel, Milwaukee, Wis., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed June 25, 1971, Ser. No. 156,617

Int. Cl. F28f 7/00

U.S. Cl. 165—1

16 Claims



A double deck can warmer having spray heads mounted above an upper conveyor for conveying cans in one direction and a lower conveyor for conveying cans in the opposite direction. The arcuate chute communicates with the upper conveyor and the lower conveyor so as to move cans from the upper conveyor to the lower conveyor while effecting an inversion. As the cans move along the upper conveyor, one end of the cans are sprayed with a warming fluid from nozzles located above the conveyor. As the cans are inverted, the liquid contents are agitated. The opposite ends of the cans are now sprayed with warming fluid from the nozzles located above the lower conveyor.

3,732,918

# BOTTOM-FREEZING APPARATUS

Thomas L. Culbertson, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 11, 1971, Ser. No. 123,312

Int. Cl. F28d 15/00

U.S. Cl. 165—106

4 Claims



A bottom-freezing cell which operates on the liquid natural convection principle but contains no internal ducting and no insulating dividers. Additional body sections may be connected to the cell to obtain any desired cell length.



3,732,919

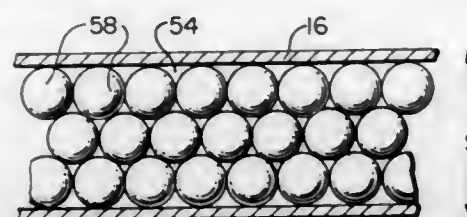
## HEAT EXCHANGER

Joseph R. Wilson, Potzleinsdorferstrass 10/6/5, Vienna, Austria

Filed July 1, 1970, Ser. No. 51,650  
Int. Cl. F28f 3/00

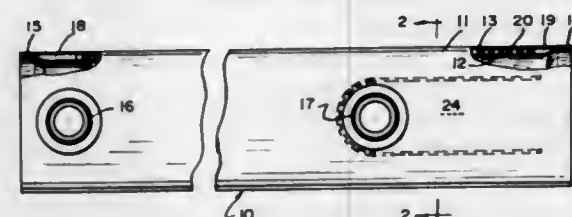
U.S. Cl. 165-110

8 Claims



A heat exchanger has wall means defining an enclosed space, at least one extending surface heat transfer member defining in cooperation with the wall means at least two flow channels in the enclosed space separated by the heat transfer member and contiguous particles packed in at least one of the channels to rigidly support the walls of the channel while permitting fluid flow through said channel.

of fluid into, through and from the passage, a fluid turbulizer in the passage comprising flat stock with laterally projecting integral strips to create turbulence in the fluid flowing through the passage and resulting superior heat transfer with the turbulizer having end portions terminating short of the extremities



of the passage to define a pair of end header spaces and a direct flow path from one fitting means and the nearer header space in collapsed or flattened condition so that the strips in this area provide substantially no impediment to fluid flow from the fitting means to the nearer header space.

3,732,922

## HEAT-EXCHANGER MODULE

Pierre Poudroux, Paris, France, assignor to Stein Industrie, Paris, France

Filed Feb. 26, 1971, Ser. No. 119,124

Claims priority, application France, Mar. 6, 1970, 700821  
Int. Cl. F28f 9/22; F28d 7/08

U.S. Cl. 165-158

5 Claims

3,732,920

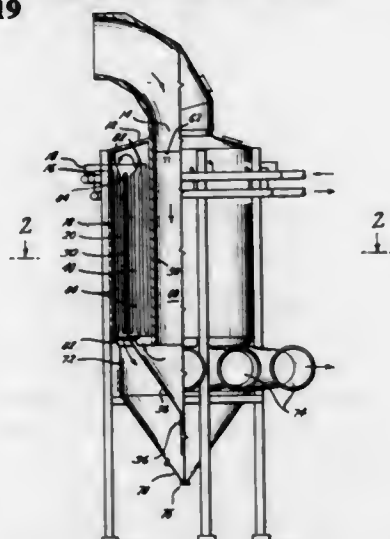
## HEAT EXCHANGER

J. D. Kimmel, Houston, Tex., assignor to Thermotics, Inc., Houston, Tex.

Filed June 21, 1971, Ser. No. 154,732  
Int. Cl. F28b 19/00

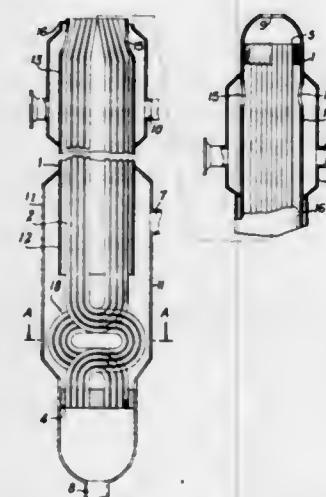
U.S. Cl. 165-119

12 Claims



A heat exchanger including a series of concentric chambers of circular cross-section through which a first fluid is adapted to flow and a plurality of conduits, disposed within the chambers, through which a second fluid is adapted to flow. The conduits having fins such that heat is exchanged between the first fluid and the second fluid by means of convection and conduction through the surfaces of the conduits and fins. The heat exchanger also including hoppers below the chambers to collect the solid particulate impurities as they separate from the first fluid while flowing through the chambers and a water bath which may be added to wash the impurities out of the first fluid.

A tube bundle for the circulation of a first fluid is disposed within a shell for the circulation of a second fluid. At least one end of the tube bundle has a rectilinear portion followed by expansion-bends for compensating differential expansions. The tubes are subdivided in the vicinity of the rectilinear portion into two half-bundles each disposed on a square lattice with an identical pitch on each side of a principal lattice line along which the two lattices are relatively displaced by one half pitch. At the level of the expansion-bends, the two lattices are in interjacent relation, the tubes have substantially the same cross-section and the tubes of one row located at right angles to the principal line retain the same cross-section as in the rectilinear portion, extend into the other lattice in the plane of said row and pass between the parallel rows of the other lattice.



3,732,921

## HEAT EXCHANGER

Edwin J. Hillicki, Racine, Wis., and Harry J. Schroeder, Lake Bluff, Ill., assignors to Modine Manufacturing Company, Racine, Wis.

Filed June 30, 1971, Ser. No. 158,297  
Int. Cl. F28g 13/00

U.S. Cl. 165-154

4 Claims

A heat exchanger in which the exchanger comprises inner and outer tubes spaced apart to define a fluid passage but sealed at the opposite extremities of the passage, a pair of spaced fittings communicating with the fluid passage for flow

3,732,923

## REMOTE UNDERWATER FLOWLINE CONNECTION

John H. Fowler, Houston, Tex., assignor to Rockwell Manufacturing Company, Houston, Tex.

Filed Nov. 1, 1967, Ser. No. 679,858  
Int. Cl. E21b 33/035

U.S. Cl. 166-6

50 Claims

A method and apparatus related thereto for remotely connecting flowlines to an underwater wellhead. A connector

3,732,925

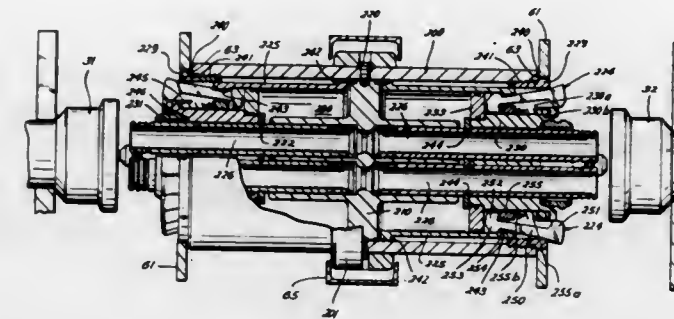
## APPARATUS FOR CONDUCTING OPERATIONS IN A WELL THROUGH A NORMALLY CLOSED VALVE

William E. Kanady, Bellaire, Tex., assignor to Esso Production Research Company, Houston, Tex.

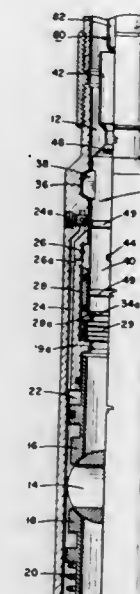
Division of Ser. No. 71,553, Sept. 11, 1970. This application  
Jan. 18, 1972, Ser. No. 218,677  
Int. Cl. E21b 33/00

U.S. Cl. 166-72

6 Claims



lowered with the aid of the guide system into engagement with the opposite end of the support cradle. Finally, a hydraulically operable connector is guided into the cradle between the tree hub and flowline hub. Pressure is supplied to the connector through conduits to cause the connector to sealingly engage the hubs providing flow communication between the tree and flowlines.



An operation is conducted in a well below a normally closed valve therein having a full open bore therethrough which involves running a tubular member having a passageway therethrough into the well from a reel at the earth's surface and releasably connecting the tubular member to the normally closed valve. Fluid pressure introduced through the tubular member from the earth's surface or before the valve is introduced to the well is provided to open the valve and thereafter a well operation is performed through the full open bore and below the valve. The well operation may include a workover operation such as acidizing, cementing, stimulating, sand consolidation, perforating, and the like.

3,732,924

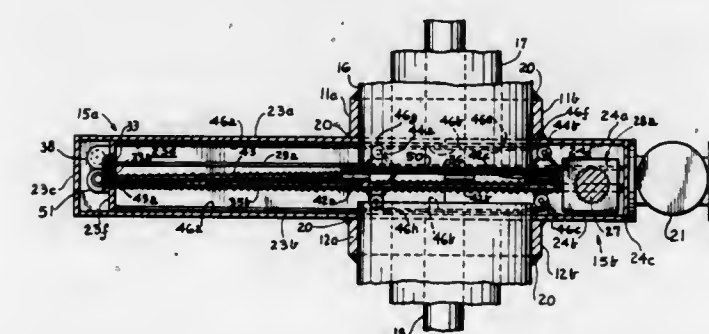
## APPARATUS FOR ATTACHING TO THE OUTER OF A PLURALITY OF TUBULAR MEMBERS AND OF CUTTING THROUGH, VALVING CLOSED, AND DIVERTING MATERIAL FLOW FROM ALL OF THE TUBULAR MEMBERS

Francis M. Chelette, 1910 Crosby Road, Carrollton, Tex., and Charles G. Goodwin, 502 Scott, Baytown, Tex.

Filed Feb. 17, 1971, Ser. No. 115,977  
Int. Cl. E21b 29/00

U.S. Cl. 166-55

19 Claims



The apparatus is employed with a plurality of substantially parallel extending tubular members in the method of diverting the flow matter therefrom, comprising disposing the apparatus in manner to sealably attach the apparatus housing around the outermost of the tubular members, projecting a housing carried severance means to sever the tubular members as a closure plate is moved after the severance means, and at the end of severance is cammed into outer tubular member closing position, thereby closing off the flow of matter from original direction through the tubular members and diverting the flow in a direction sidewardly through the housing from the original direction of flow.

3,732,926

## METHOD FOR RECOVERY OF HYDROCARBONS UTILIZING STEAM INJECTION

Alfred Brown; Joseph T. Carlin; Marc F. Fontaine, and Stewart Haynes, Jr., all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed June 1, 1971, Ser. No. 148,888  
Int. Cl. E21b 43/24

U.S. Cl. 166-272

12 Claims

A method of recovering hydrocarbons from a subterranean hydrocarbon-bearing formation wherein a mixture of steam and a minor amount of an interfacial tension reducer, such as quinoline, etc. is introduced into the formation and oil displaced through the formation is recovered through a production well. Preferably, the formation is heated prior to the introduction of the steam-interfacial tension reducer mixture.

3,732,927

## PLUGGING SOLUTION PRECIPITATION TIME CONTROL BY CHARGE NEUTRALIZATION

Edwin Allen Richardson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed July 29, 1971, Ser. No. 167,460  
Int. Cl. E21b 33/138

U.S. Cl. 166-294

6 Claims

The precipitation time of a precipitate-forming aqueous solution containing a polyvalent metal that precipitates as a gelatinous metal hydroxide and a reactant that raises the pH to cause the precipitation is decreased by dissolving an incompletely dissociated polyvalent acid in the aqueous solution.



3,732,928

**METHOD OF AND APPARATUS FOR REMOVING AND POSITIONING WELL TOOLS IN OFFSET LANDING NIPPLES**

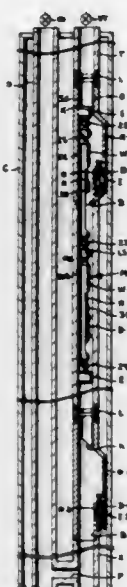
Phillip S. Sizer, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed June 21, 1971, Ser. No. 154,999

Int. Cl. E21b 43/12

U.S. Cl. 166—315

14 Claims



A method and apparatus for use in connection with offset landing nipples connected in a flow conductor of a pumpdown well installation for installing and removing tools therein, including a tandem kick-over running and pulling tool arrangement for removing a well device from and subsequently installing another well device in the side pocket of offset landing nipple housings, and the method of changing the well tool positioned in the side pocket of the offset housings and for installing another well device in the receptacle from which the first device was removed, both operations being effected during a single trip of the pump-down tools into and out of the well flow conductor string. The apparatus and method also contemplates preventing flow of fluids from the producing flow conductor the exterior thereof through the lateral inlet opening of the side pocket landing nipple or receptacle of the housing, through a large differential may exist between the interior and exterior of the flow conductor.

3,732,929

**MOLDED HORSE BOOT**

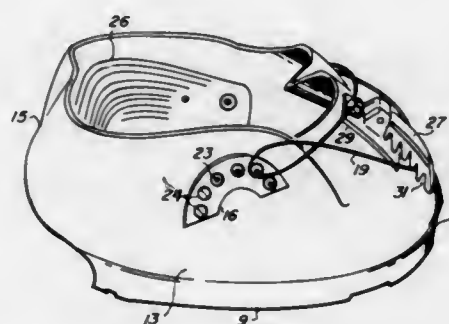
Neel W. Glass, Los Alamos, N. Mex., assignor to Les-Kare, Inc., Los Alamos, N. Mex.

Continuation-in-part of Ser. No. 93,119, Nov. 27, 1970, Pat. No. 3,703,209. This application Dec. 29, 1971, Ser. No. 213,392

Int. Cl. A011 03/00; B68c 05/00

U.S. Cl. 168—18

5 Claims



A horse boot of molded composition having a sole and walls which substantially conform to the shape of a horse's foot and

having reentrant folds in the walls substantially where the side walls meet the front wall to enable the boot to be enlarged at the top to permit slipping the same on a horse's foot, tensioning means for snugly fitting the walls of the boot around the horse's foot and a substantially horizontally disposed strap disposed adjacent the interior side and rear walls of the boot and adjustably attached to the tensioning means at locations on the side walls which are proximate the reentrant folds.

3,732,930

**STORAGE RACK AND SPRINKLER ARRANGEMENT**

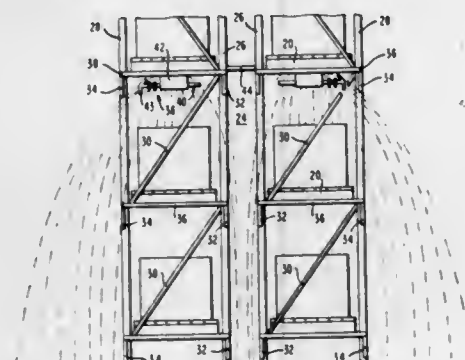
Jerome Frank D'Anneo, Kingston, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 17, 1972, Ser. No. 218,321

Int. Cl. A62c 3/00

U.S. Cl. 169—2 R

9 Claims



A storage rack and sprinkler arrangement wherein two rows of storage racks are arranged in spaced relation so that a narrow flue space exists between the rows. Each rack has a plurality of horizontal shelves arranged in a vertical tier and upright support members supporting the shelves and spaced to separate the tier of shelves into bays. At least one sprinkler head with a heat actuated device which initiates the water flow is mounted on the underside of each alternate shelf in each bay. A heat deflecting means, typically a plate of fire resistant material is associated with the shelf immediately above each sprinkling head which closes the flue space. The sprinkler heads are arranged to provide a spray when actuated over the shelf beneath the head, the aisle and the flue space.

3,732,931

**ELECTRONICALLY CONTROLLED ROW CROP THINNING MACHINE**

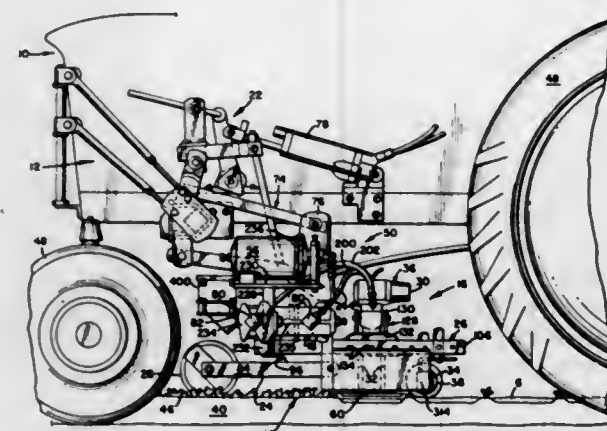
Fred Walker Field, Torrance, and David Walter Cayon, Whittier, both of Calif., assignors to Deere &amp; Company, Moline, Ill.

Division of Ser. No. 601,139, Dec. 12, 1966, Pat. No. 3,543,860. This application Oct. 22, 1970, Ser. No. 83,249

Int. Cl. A01b 63/00

U.S. Cl. 172—6

4 Claims



An electronic control circuit including a sensing circuit for comparing an observed value of electrical resistance to a

3,732,934

**FLUID-DRIVEN TOOL WITH BUILT-IN WORK CONTROL MECHANISM**

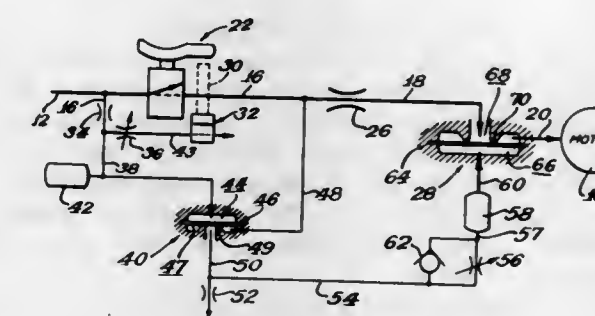
Karl A. Brandenburg, Hayward, Calif., assignor to The Aero Corporation, Bryan, Ohio

Continuation-in-part of Ser. No. 853,632, Aug. 28, 1969, Pat. No. 3,580,285. This application Mar. 29, 1971, Ser. No. 128,899

Int. Cl. B25b 23/14

U.S. Cl. 173—12

24 Claims



A work control mechanism for a pneumatically driven tool such as an impact wrench is incorporated as part of the tool. The motor for the tool commences operation upon movement of a manual trigger mechanism on the tool. As the motor meets increased resistance in its operation, the back pressure in the main fluid supply line to the motor increases. This increase in pressure is sensed and subsequent to the sensing of this increase, a time delayed signal operates a control valve in the main fluid flow line. Operation of this control valve opens the fluid flow circuit to the motor, thereby terminating operation of the motor even though the manual trigger for the tool remains depressed.

3,732,935

**GROUND ROD DRIVER**

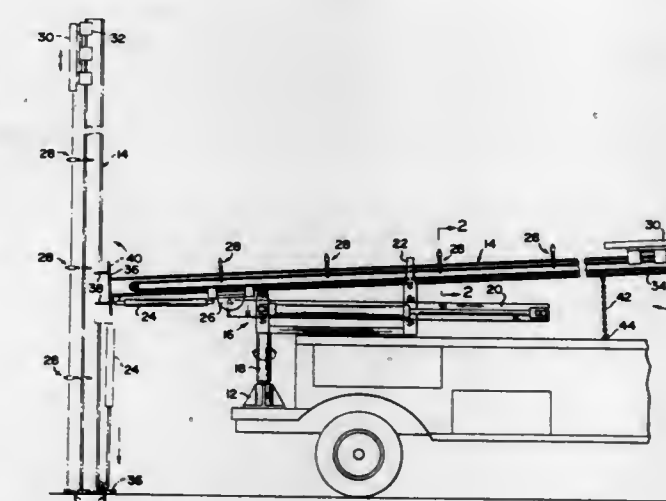
Elvin H. Gibson, Hillsborough, Fla., assignor to Resources, Incorporated, Tampa, Fla.

Filed July 2, 1971, Ser. No. 159,108

Int. Cl. E21c 11/02

U.S. Cl. 173—28

11 Claims



A device for driving ground rods of the type to be mounted on a suitable carriage or vehicle. A boom to engage ground rods as the rods are driven is attached to an adjustable horizontal beam. The adjustable horizontal beam interconnects the boom with a vertical cylinder attached to a base. The base interlocks the entire device to the bed or frame of the carriage. The movement of the horizontal beam and rotation of the vertical cylinder combined as a means of positioning the

3,732,932

**SIDE DRAFT CONTROL SYSTEM FOR A TRACTOR AND EARTH-WORKING IMPLEMENT**

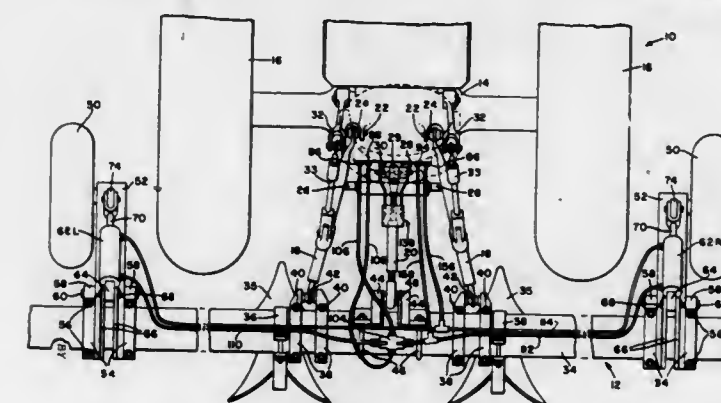
Robert Otto Taube, Moline, Ill., assignor to Deere &amp; Company, Moline, Ill.

Filed May 17, 1971, Ser. No. 143,890

Int. Cl. A01b 63/112

U.S. Cl. 172—7

16 Claims



A side draft control device for wide implements automatically adjusts the implement wheels to raise the high draft side of the implement and lower the low draft side of the implement to maintain a balanced draft load on the tractor and an average working depth of the implement. The system uses lateral movement of the upper link of the tractor hitch to operate switches in the control circuits for a double solenoid valve which selectively and alternately interconnects the cylinders for the implement wheels with the tractor hydraulic pump and reservoir.

3,732,933

**TRACTOR HYDRAULIC LIFT SYSTEM**

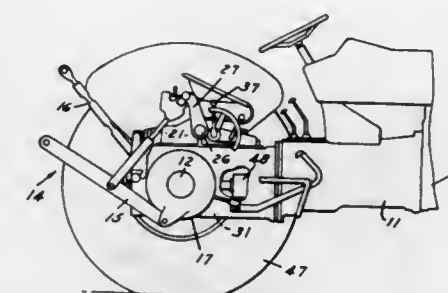
William J. Foxwell, Troy, and James D. Parsons, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 11, 1971, Ser. No. 152,316

Int. Cl. A01b 63/112

U.S. Cl. 172—7

5 Claims



A tractor hydraulic lift system in which the lift system may be controlled by driveline torque, by draft sensed by one of the tractor hitch links or by a position control cam. The mechanism is arranged to permit combinations of position control with draft control and with torque control.



boom relative to the carriage. Attached to the boom is a hydraulically driven impact hammer for power driving the ground rods. The boom is pivotally mounted on the horizontal beam so that the boom may be carried in a substantially horizontal position while in transit and rotated to a vertical position when in use. Also included is a vertical adjustment means mounted on the beam so that the boom may be adjusted vertically to engage with the ground or supporting surface on which the vehicle rests.

3,732,936

## PERCUSSION MECHANISM

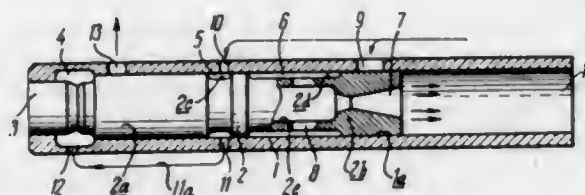
Boris Vasilievich Sudnitsnikov, Krasny prospekt, 56, kv. 59; Alexander Dmitriyevich Kostylev, ulitsa Derzhavina, 19, kv. 44; Anatoly Mikhailovich Petreev, ulitsa Sibirskoy-Gvardeitsy, 8, kv. 59; Konstantin Stepanovich Gurkov, ulitsa Derzhavina, 19, kv. 68; Konstantin Konstantinovich Tupitsyn, ulitsa Krylova, 3, kv. 37, and Vladimir Vasilievich Klimashko, ulitsa Novogodnyaya, 44, kv. 23, all of Novosibirsk, U.S.S.R.

Filed Feb. 10, 1971, Ser. No. 114,115

Int. Cl. B25d 9/14

U.S. Cl. 173-137

1 Claim



A percussion mechanism, for making holes in the ground by compacting the ground, having a housing connected with a working unit and accommodating a striker adapted to deliver impacts upon the working unit while reciprocating inside the housing under the effect of the working fluid; the striker having a tail piece provided with a nozzle through which the working fluid escapes to develop the reactive thrust of the striker, while in the portion of the housing behind the nozzle there is a through opening adapted for the removal of the jet stream, leaving the nozzle.

3,732,937

## WEIGHT SCALE FOR BAG PACKER

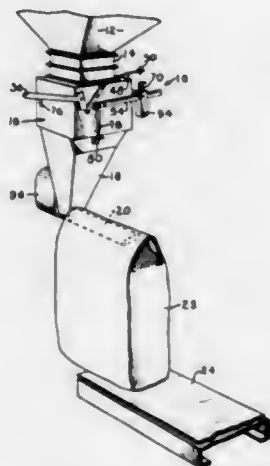
Muriand L. Taylor, 2521 Washington, Parsons, Kans.

Filed Aug. 9, 1971, Ser. No. 170,264

Int. Cl. G01g 13/02

U.S. Cl. 177-68

12 Claims



Apparatus for delivering a predetermined weight of material to a receptacle therefor utilizes a pair of rotatable scale beams with poises disposed on the beams. A scale is included

on the face of each beam thus allowing the effective counterweight of the poises to be divided between the beams and the scales on each beam to be divided into relatively small weight increments for increased accuracy. The beams are rotated about an axis when the weight of the filled receptacle exceeds the effective counterweight of the poises. The major portion of the weight of both the filled receptacle and the poises is always below the axis of rotation of the beams to assure that the center of gravity of the forces acting on the beam is always below this axis. This results in an inherent damping effect on any swinging movement of the beams and eliminates the need for a separate damping mechanism. The material delivered to the receptacle passes through a control opening which is closed by a swingable gate in response to rotation of the beams when the predetermined weight is reached.

3,732,938

## WHEELCHAIR WEIGHING PLATFORM

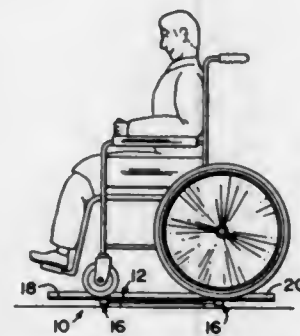
Wayne E. Nelson, 3112 Wulder Avenue, Sarasota, Fla.

Filed June 1, 1971, Ser. No. 148,538

Int. Cl. G10g 19/02, 21/22

U.S. Cl. 177-126

4 Claims



A device for modifying conventional weighing scales so that a person confined to a wheelchair may weigh himself without assistance from others while in the wheelchair. A platform for supporting a wheelchair or like device is fixed to connecting cross members which in combination with a plurality of support beams form a base for mounting the platform on weighing scales. The cross members and support beams are designed so that they may be adjusted to allow mounting the platform on scales of various size and shapes.

3,732,939

## RUNNER SHOE FOR SNOWMOBILE

Jean-Paul Samson, Valcourt, Quebec, Canada, assignor to

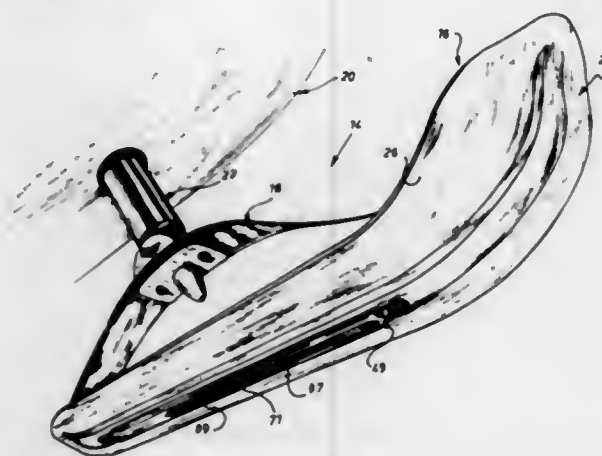
Bombardier Limited, Valcourt, Quebec, Canada

Filed Jan. 27, 1971, Ser. No. 110,053

Int. Cl. B62m 27/02

U.S. Cl. 180-5 R

12 Claims



The disclosure herein describes a runner blade adapted to be secured to the underface of a snowmobile ski; the blade

consists of a longitudinal rigid member with spaced-apart bolts secured on its upper part for fastening the blade to the ski and with a groove longitudinally extending in its lower part and receiving a plurality of adjacent pieces of cemented carbide. Each carbide has its upper faces brazed to corresponding faces in the groove and its lower faces defining a cutting edge extending below the rigid member and adapted to cut into the icy surface over which the snowmobile runs; a preferred carbide is a tungsten carbide known under the trademark 'Carboloy.' In providing increased steering control to the skis, an important safety feature is now added to the snowmobile; furthermore, such a construction greatly simplifies the assembling of the blade to the ski and offers a sturdier assembly to oppose lateral forces exerted on the blade.

3,732,940

## TRACTOR SUBASSEMBLY

Warren H. Price, Sheboygan, Wis., assignor to Gilson Bros. Co., Plymouth, Wis.

Division of Ser. Nos. 880,479, Dec. 10, 1969, Pat. No.

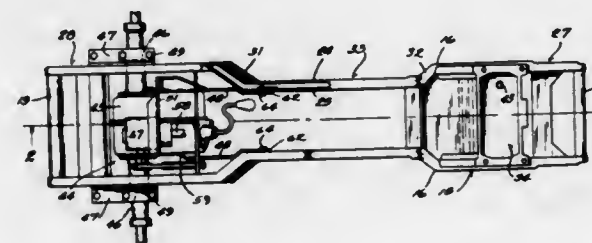
3,604,527, and Ser. No. 672,095, Oct. 2, 1967, abandoned.

This application Feb. 4, 1971, Ser. No. 112,750

Int. Cl. B60k 5/12

U.S. Cl. 180-64 R

3 Claims



The combination of an engine and a wheeled framework in which the wheeled framework has laterally spaced vertical side beams and the engine has a separable base which is integrated with the framework to stiffen and re-enforce the framework. The engine base comprises a hollow, upwardly open box nested between the beams and has vertical end walls fastened in face relation to the vertical frame beams. The hollow interior of the base constitutes an oil pan for the engine.

3,732,941

## VEHICLE CHASSIS RESILIENTLY SUPPORTED ON MAIN FRAME

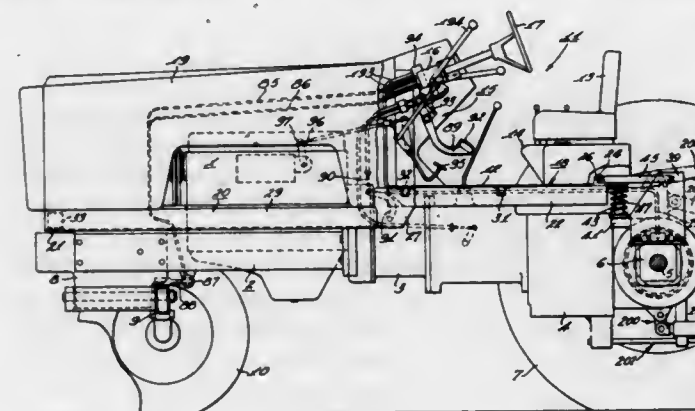
Owen R. Davis, Waukesha; Robert C. Haupt, Milwaukee; Kenneth N. Hansen, Waukesha, and Michael L. Slosirek, Milwaukee, all of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 18, 1971, Ser. No. 144,451

Int. Cl. B62d 33/06

U.S. Cl. 180-89 R

18 Claims



A resiliently mounted chassis including an operator station and a portion of the chassis extending from said operator sta-

3,732,942

## REMOVABLE VEHICLE CHASSIS SUB-FRAME WITH ENGINE

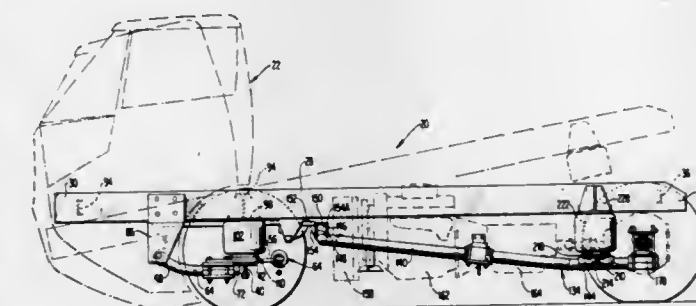
Dean Hobbensiefken, Route 1, Box 241, Lyons, Oreg.

Filed Dec. 16, 1970, Ser. No. 98,625

Int. Cl. B60k 5/00

U.S. Cl. 180-11

8 Claims



A heavy duty motor vehicle has a main frame with a forward axle and steerable ground wheels. A power unit sub-frame carrying a rear axle is releasably secured to the main frame, and includes an engine assembly which is located at an intermediate position between the axles. The unit may also include a fifth wheel assembly whereby it becomes a towing vehicle for a further trailer unit or units.

3,732,943

## AUTOMOBILE VEHICLES DRIVEN BY A ROTARY PISTON ENGINE

Jean Panhard, Paris, France, assignor to Societe de Constructions Mecaniques Panhard & Levassor, Paris, France

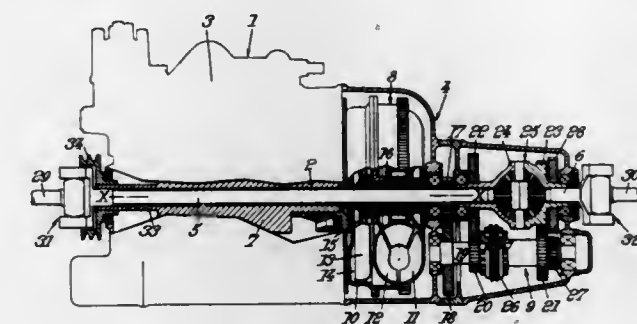
Filed Feb. 23, 1971, Ser. No. 117,949

Claims priority, application France, Feb. 24, 1970, 7006563

Int. Cl. B60k 5/02, 5/04

U.S. Cl. 180-55

9 Claims



An engine has at least one rotary piston and a hollow rectilinear output shaft. The vehicle wheels are driven by two coaxially aligned transmission shafts coupled to the output shaft through a variable ratio transmission mechanism. One transmission shaft is coaxially inside the output shaft which it entirely traverses. Viewed axially, there are seen successively, the projecting portion of the transmission shaft, the engine, the transmission mechanism and the projecting portion of the second transmission shaft. The arrangement reduces the bulk of the propulsion unit group to that of the engine itself. Preferably a differential and a torque converter are included in the transmission mechanism.



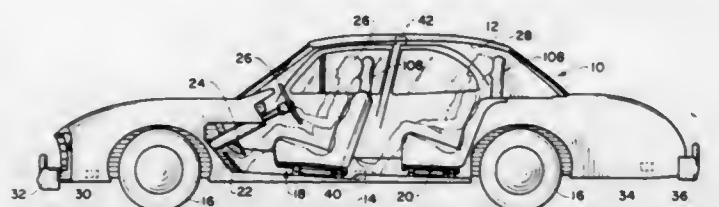
3,732,944

**AUTOMATIC VACUUM RESTRAINT APPARATUS**  
Giles A. Kendall, Burbank, Calif., assignor to Menasco Manufacturing Company, Burbank, Calif.

Filed Apr. 12, 1971, Ser. No. 133,013  
Int. Cl. B60r 21/10

U.S. Cl. 180-103

9 Claims



An automatic vacuum restraint apparatus to restrain the passengers of a vehicle wherein sensors are employed around the periphery of the vehicle structure to be capable of denoting an unstable condition, the sensors effecting actuation of the vacuum system within the vehicle to draw a vacuum between the body of each passenger and its respective passenger seat.

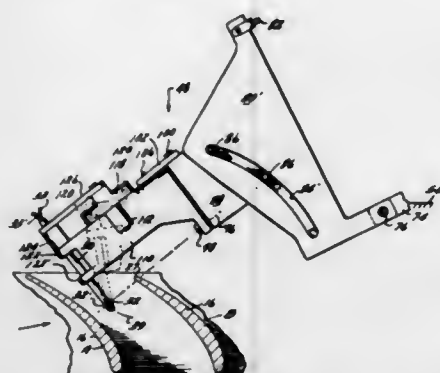
3,732,946

**ULTRASONIC NOZZLE MEASURING SYSTEM**  
Edmund McKnight, Nahant, and Michael Lee Tuttle, Ipswich, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed May 25, 1971, Ser. No. 146,671  
Int. Cl. G01b 17/00

U.S. Cl. 181-5 NP

6 Claims



This is a system for ultrasonically measuring the minimum areas of flow between spaced apart partitions wherein the partitions are cooperatively arranged to define individual nozzles. The system may include an apparatus for inserting and orienting an ultrasonic probe between the spaced apart partitions.

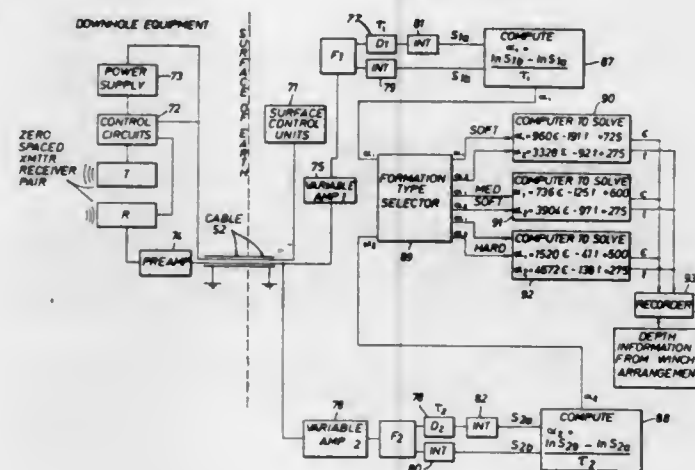
3,732,947

**CEMENT EVALUATION LOGGING**  
James H. Moran, Houston, Tex.; Barkev Y. Bakamjian, Ridgefield, and Thomas Muricchio, Brookfield, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed July 9, 1969, Ser. No. 840,290  
Int. Cl. G01v 1/22

U.S. Cl. 181-5 AC

28 Claims



An illustrative embodiment of the present invention includes methods and apparatus for acoustically logging a cased well borehole to evaluate the condition of cement disposed in the annulus between the casing and the borehole walls. The attenuation constants associated with the radial modes or resonances of the borehole-casing-annulus formation system are determined by periodically exciting the system with acoustic impulses and measuring in a plurality of relatively narrow frequency bands associated with the resonance frequencies or modes, the amplitudes of the reflected sonic waves at two distinct points in time. The attenuation constants so measured may then be used in apparatus designed to calculate cement effectiveness by determining the cement thickness and width of annulus between the casing and the cement.

3,732,945

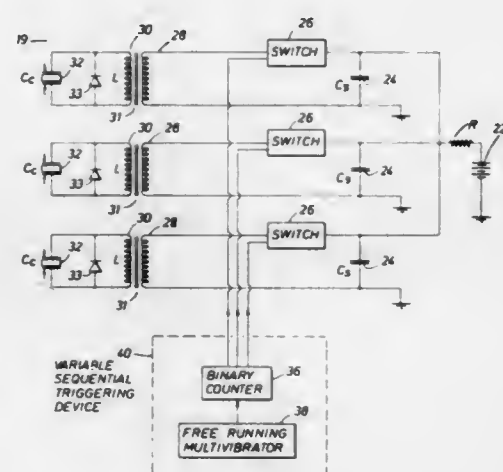
**SWITCHING CIRCUIT CONTROLLED STEERED BEAM TRANSDUCER**

Jean C. Lavigne, Arlington, Mass., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed May 20, 1970, Ser. No. 38,983  
Int. Cl. G01v 1/40

U.S. Cl. 181-5 AG

8 Claims



An improved steered beam transducer which utilizes ceramic elements is described. A relatively low voltage power supply is utilized to excite the ceramic elements through a step-up transformer. The inductance of the secondary of the transformer is chosen to produce resonance with the ceramic elements at the operating frequency. Steering is accomplished by time delayed switching in the low voltage primary where the switches are controlled by variable delay means.

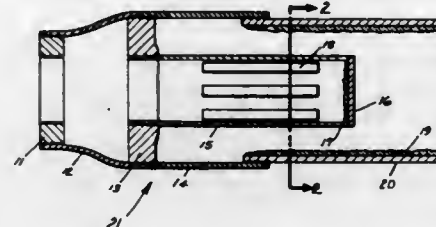
3,732,948

**MUFFLER FOR ALUMINUM CELL TAPPING CRUCIBLE**  
Charles Michael Benton, and Howard E. Niehaus, both of Owensboro, Ky., assignors to National-Southwire Aluminum Company, Carrollton, Ga.

Filed Sept. 20, 1971, Ser. No. 181,777  
Int. Cl. F01n 1/10

U.S. Cl. 181-36 R

7 Claims



An apparatus for reducing the noise level of a stream of air exiting a tapping crucible in aluminum reduction operations. The air is used to create a vacuum in the tapping crucible, thereby promoting siphon removal of molten aluminum from the reduction cell. The apparatus of this invention, commonly referred to as a muffler, comprises an outer conduit having entrance and exit openings, an inner conduit centrally attached within said outer conduit, said inner conduit having an entrance opening, an exit opening enclosed with a cup welded to said inner conduit, and exhaust slots equally spaced around said inner conduit's circumference.

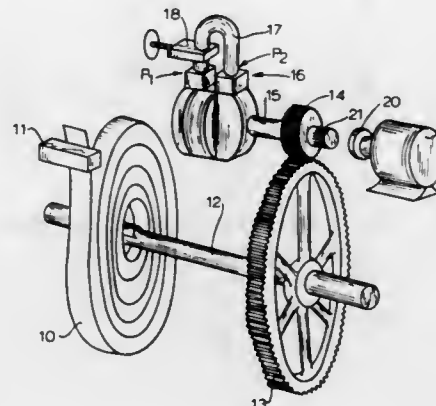
3,732,949

**SPRING DRIVE APPARATUS AND METHOD**  
Clarence O. Williams, 204 Kirkwood Avenue, Rocky Mount, N.C.

Filed June 22, 1971, Ser. No. 155,493  
Int. Cl. F03g 1/00

U.S. Cl. 185-40 R

3 Claims



A wound spiral spring employed as a mechanical power source includes a regulated fluid circulating means to control the energy released as the spring unwinds to drive a power consuming device such as a vehicle, lawn mower and the like.

3,732,950

**ELEVATOR SYSTEMS**  
Henry C. Savino, Hackensack, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

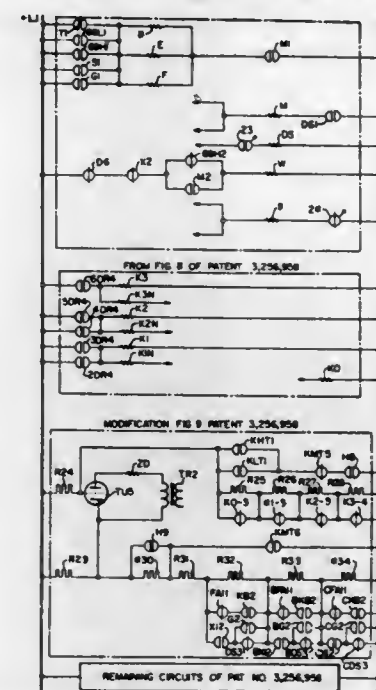
Filed Dec. 6, 1971, Ser. No. 205,191  
Int. Cl. B66b 1/00

U.S. Cl. 187-29

10 Claims

An elevator system having a bank of elevator cars which, under predetermined system conditions, become available for

assignment and dispatching from the landings served thereby. The elevator cars are utilized more beneficially in certain types of structures, by modifying the basis for determining car



availability, and the basis for determining the existence of a predetermined demand for service, upon the occurrence of predetermined traffic conditions and car positions.

3,732,951

**BRAKE MEANS FOR A BICYCLE**  
Kotaro Hata, Nara-shi, and Toshikazu Fujii, Yao-shi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

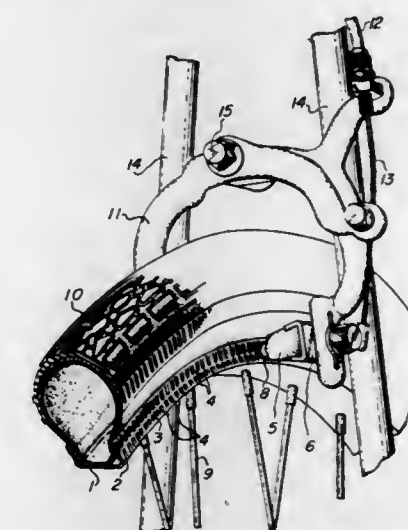
Continuation of Ser. No. 815,671, April 14, 1969, abandoned. This application Feb. 19, 1971, Ser. No. 117,104

Claims priority, application Japan, Oct. 18, 1968, 43/31944; Mar. 26, 1969, 44/23437

Int. Cl. B62i 1/10

U.S. Cl. 188-24

3 Claims



Brake means for a bicycle having a recessed portion provided on either one of the contact portions between a wheel rim and a brake rubber piece and extending in the direction of the periphery of said rim, the other of the contact portions being provided with at least one projection adapted to be brought into engagement with said recess, the arrangement being such that a wedging action is created when the recess and the projection are pressed with each other to produce a strong braking force. Further, the wheel rim may be provided on its recess or projection with unevenness across the recess or projection so as to facilitate draining of water and prevent the braking effect from being reduced in a rainy weather.



3,732,952

**BRAKE ADJUSTERS**

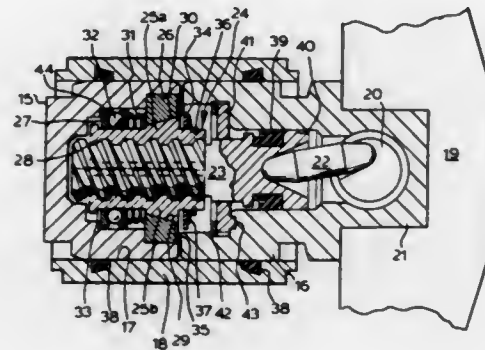
Anthony Asquith, Nuneaton, England, assignor to Girling Limited, Birmingham, England  
Filed Mar. 30, 1971, Ser. No. 129,336

Claims priority, application Great Britain, Apr. 3, 1970, 15,854/70

Int. Cl. F16d 65/56

U.S. Cl. 188—71.9

12 Claims



A slack adjuster for a vehicle braking system including first and second members having a normally reversible screw-thread connections therebetween, the first and second members are supported in first and second pistons respectively of the braking system and excessive displacement of the pistons causes relative displacement between said first and second member to reduce the displacement of the pistons on the succeeding stroke. One of the first and second members may be a split nut and a wedge member can be provided for urging the split nut against the other of the first and second members to prevent relative rotation therebetween under a brake-applying thrust.

3,732,953

**ROTATABLE FRICTION PLATE ASSEMBLY AND METHOD OF MAKING THEREOF**

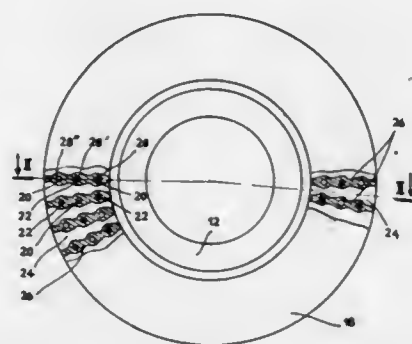
Roger Huet, Grenoble, France, assignor to Merlin Gerin, Societe Anonyme, Grenoble, France

Filed Jan. 29, 1971, Ser. No. 110,881

Claims priority, application France, Feb. 16, 1970, 7005500  
Int. Cl. F16d 65/12, 65/84

U.S. Cl. 188—218 XL

5 Claims



A rotatable friction plate assembly for a clutch or a brake comprising a cast light alloy base plate sandwiched between two facings of friction material, such as cupro-chromium. A plurality of heat conducting studs project from the backside of either facing in radial arrays to permit casting of the flange portion between the positioned facings whereby the flange portion is shaped to form radial ribs embedding said studs and to define radial vent conduits.

3,732,954

**QUICK CHANGE AUTOMATIC TRANSMISSION BAND AND BRACKET ASSEMBLY**

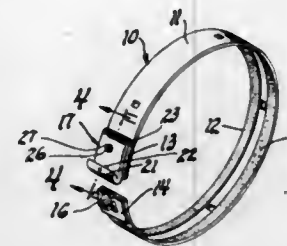
Robert H. Held, 24087 Dartmouth Avenue, Dearborn Heights, Mich.

Filed Sept. 2, 1971, Ser. No. 177,273

Int. Cl. F16d 65/06

U.S. Cl. 188—259

4 Claims



A brake band for an automatic transmission which is provided with a fixed retainer bracket on one end thereof and a detachable retainer bracket on the other end thereof to permit the brake band to be threaded around a brake band assembly in the transmission without removing the brake drum assembly from the transmission.

3,732,955

**TRAVEL CASE FOR INFANT SUPPLIES**

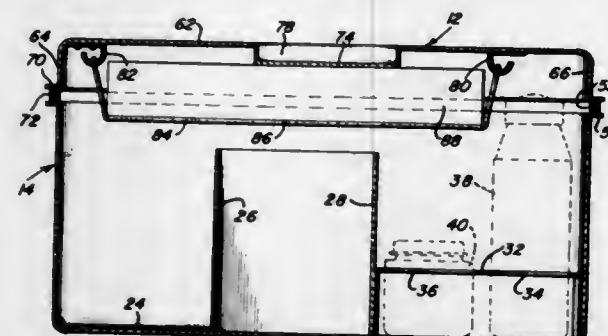
Norman T. Carter, and Margaret A. Carter, both of 65 Country Club Road, Cocoa Beach, Fla.

Filed July 22, 1971, Ser. No. 165,120

Int. Cl. A45c 3/00

U.S. Cl. 190—51

2 Claims



An upwardly opening open-top housing including opposite side and end walls interconnected at their lower marginal edge portions by means of a bottom wall extending therebetween with a top wall being provided and removably positionable over the open upper side of the housing for closing the latter. The inside of the housing includes parallel spaced upstanding partitions dividing the housing interior into three longitudinally spaced compartments and one of the end compartments includes a horizontal partition spaced at least slightly above the bottom wall of the housing and having openings formed therethrough whereby upright containers such as feeding bottles and jars of baby food resting on the bottom wall and projecting upwardly through the horizontal partition may be supported against lateral shifting into engagement with each other. Also, the underside of the top wall of the housing includes means by which an inverted facial tissue box may be removably supported from the top wall for ready dispensing of facial tissues therefrom when the top wall is swung to its open position.

**ERRATUM**

For Class 192—142 see:  
Patent No. 3,732,787

3,732,956

**OVERRUNNING CLUTCH WITH CENTERING MEANS AND UNIT HANDLED SUBASSEMBLY THEREFOR**

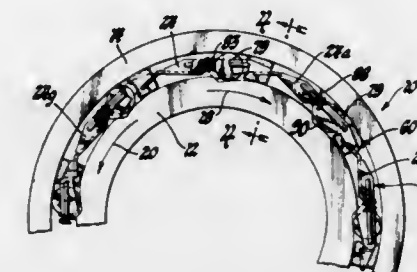
Lawrence P. Johnson, Huron, and Oscar G. Kitchin, Port Clinton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 19, 1972, Ser. No. 219,078

Int. Cl. F16d 15/00, 41/06

U.S. Cl. 192—45

5 Claims



An overrunning clutch is provided with a cage wound from a strip of sheet metal which carries a number of molded bearing blocks within the axial confines of the cage. The bearing blocks center the clutch races with respect to each other and also cooperate in providing a unit handled subassembly of caged rollers for the clutch.

3,732,957

**FREE WHEEL DEVICE**

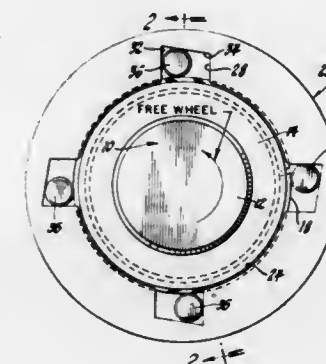
John C. McEwen, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 27, 1971, Ser. No. 175,569

Int. Cl. F16d 15/00, 41/06

U.S. Cl. 192—45

4 Claims



A free wheel unit including a drive unit with an outer surface forming an inner race and having an annular groove in the axial center thereof in which is disposed an expandable split bearing ring, a driven unit or outer race provided with a plurality of circumferentially arranged ramped recesses in each of which is disposed a roller, the rollers being biased radially outward into engagement with the ramped recesses by the expandable split bearing ring, the split bearing ring providing friction contact to rotate the rollers down the ramped recesses into engagement with the inner race to effectively lock the driven unit to the drive unit when the latter is rotated in one direction and to rotate the rollers out of engagement with the inner race when the drive unit is rotated in the opposite direction to place the driven unit in a free wheeling condition relative to the inner drive unit.

3,732,958

**CLUTCH ASSEMBLY**

Helmut Kraus, Kurt Fadler, and Hans-Walter Riese, all of 872 Schweinfurt am Main, Germany, assignors to Fichtel & Sachs AG, Schweinfurt am Main, Germany

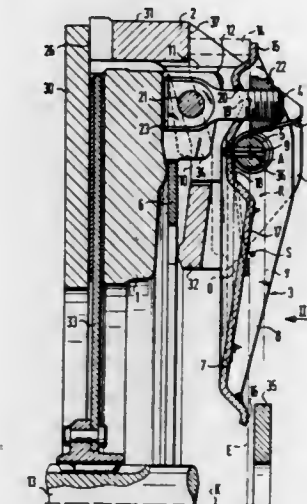
Filed June 1, 1971, Ser. No. 148,351

Claims priority, application Germany, June 5, 1970, P 20 27 687.3

Int. Cl. F16d 11/06

U.S. Cl. 192—70.3

8 Claims



The elements of an automotive friction clutch which are usually installed in a vehicle as a pre-assembled group include a clutch housing, clutch release levers pivoted on the outer or rear face of the radial housing wall, eye bolts pivotally engaged by respective levers, passing through apertures in the radial wall and pivoted to the pressure plate in the housing. The levers are of rearwardly open U-shaped cross section, and their flange portions slidably engage guide faces of the rear wall which bound the afore-mentioned apertures and axially guide bearing blocks on the pressure ring to which the eye bolts are pivoted. The levers are fastened to the radial housing wall by respective pivot pins journaled in ribs of the housing wall and attached to the levers by radial fastening members.

3,732,959

**OVERRUNNING BAND CLUTCH ASSEMBLY WITH SELECTIVE ENGAGEMENT MEANS IN THE DRIVE DIRECTION**

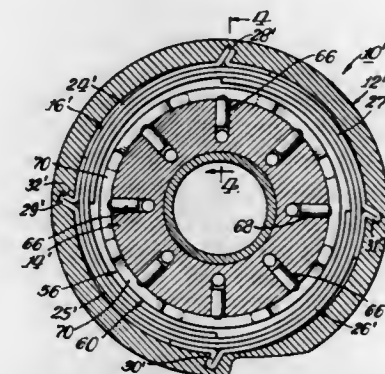
Ernest U. Lang, and Edwin E. Mallory, both of Niles, Mich., assignors to National-Standard Company, Niles, Mich.

Filed Aug. 30, 1971, Ser. No. 176,067

Int. Cl. F16d 25/00

U.S. Cl. 192—91 A

8 Claims



An overrunning clutch comprising drive and driven clutch members, one of which has a V-groove into which the tip ends of a plurality of interfitting and overlapping clutch bands are disposed. Engagement prevention means are used to selectively hold the clutch bands away from engagement with the V-groove as the drive clutch member is turning in the drive direction.



3,732,960

## GRAIN SPOUT FOR TILTING BED TRUCKS

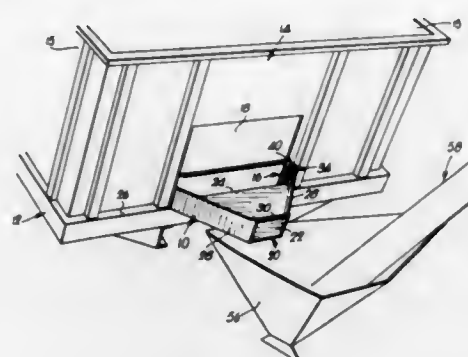
Harvey W. Turner, Rt. 1, Thompson, Md.

Filed June 3, 1971, Ser. No. 149,591

Int. Cl. B65g 11/00

U.S. Cl. 193-5

6 Claims



A discharge spout releasably attached adjacent the opening in the tailgate of a vehicle for hauling granular material. The chute is so designed as to be quickly and easily removed when not in use and of a construction permitting interchangeable mounting thereof on more than one vehicle. The chute also serves as an extension of the bed enabling it to be tilted to a greater angle before interfering with the adjacent hopper of an auxiliary granular material conveying mechanism.

3,732,961

## DEVICE FOR COLLECTING FRUIT

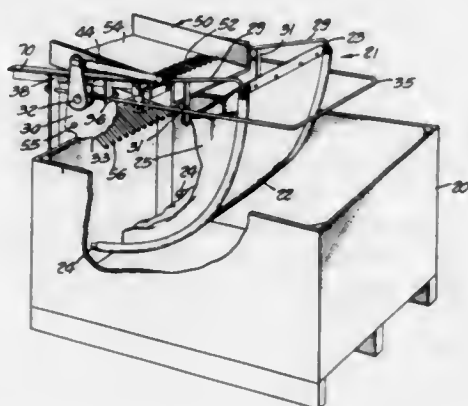
Francis J. Thornton, Ontario, and Welton C. Westfall, Riverside, both of Calif., assignors to Sunkist Growers, Inc., Sherman Oaks, Calif.

Filed Dec. 31, 1970, Ser. No. 103,270

Int. Cl. B65g 11/08, 11/12, 11/18

U.S. Cl. 193-7

3 Claims



A flexible baffle to retard the speed of fruit as they fall into a storage bin or the like to prevent damage to the fruit, the baffle being adjustable upwardly as the fruit collects near its lower extremities. The device includes a gate to block the travel of the fruit in a delivery chute when the adjustable baffle is in its upward-most position to aid in the replacement of a full storage bin with an empty one.

3,732,962

## COIN CHUTE CONSTRUCTION

Mitchell A. Hall, Fort Thomas, Ky., assignor to Monarch Tool &amp; Manufacturing Company, Covington, Ky.

Filed Aug. 10, 1970, Ser. No. 62,384

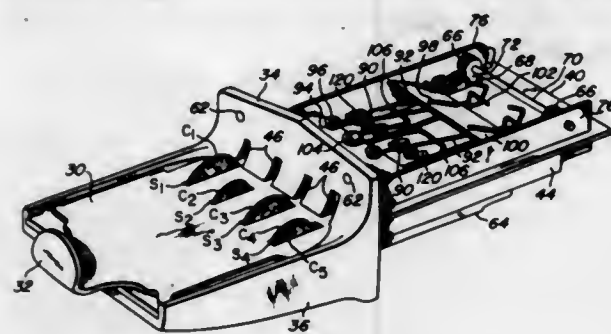
Int. Cl. G07F 5/14

U.S. Cl. 194-92

36 Claims

The coin chute provides effective fool-proof means whereby a substantial number of coins of various denomina-

tions may be inserted and advanced on edge, rather than flatwise with the slider, to initiate or condition for operation the mechanism of a dispenser of goods or services, provided that



all of the coins inserted pass rigid tests for genuineness and for total valuation corresponding to the value of the goods or serves dispensed.

3,732,963

## EMBOSSING TOOL

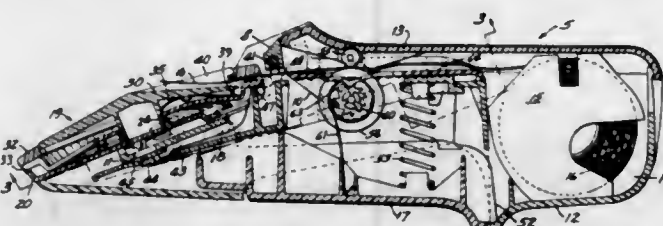
Hans Kraayenhof, Son, Netherlands, and Curt A. Poulton, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 4, 1971, Ser. No. 140,034

Int. Cl. B41j 1/24

U.S. Cl. 197-6.7

6 Claims



An embossing tool which has an elongated body along which is formed a tape path leading from a supply-receiving cavity at one end to the embossing die members at the opposite end. This embossing tool utilizes a tape path which leads to the periphery of the die members and between two apposed die members and then toward the center of the die members. The cut-off member is positioned along the path and adjacent the outer periphery of the die members.

3,732,964

## ELECTRIC TYPEWRITER

Takayasu Inoue, 838 Rokkakubashi-machi, Yokohama, Japan

Filed Aug. 27, 1970, Ser. No. 67,474

Int. Cl. B41j 23/08

U.S. Cl. 197-17

3 Claims



An electric typewriter so constructed that when a key is slightly touched a printing mechanism is electrically actuated to turn upward a corresponding type bar with a character so as to make impressions as desired on the paper wound on a

platen and comprising a carriage having said platen, a spacing mechanism for feeding said carriage, a carriage return mechanism for feeding back said carriage and electric power supplier for operating said mechanisms. Said typewriter being designed so compacted as easier to handle.

3,732,965

## TELEGRAPH TRANSCIVER WITH RETRACTABLE KEYBOARD

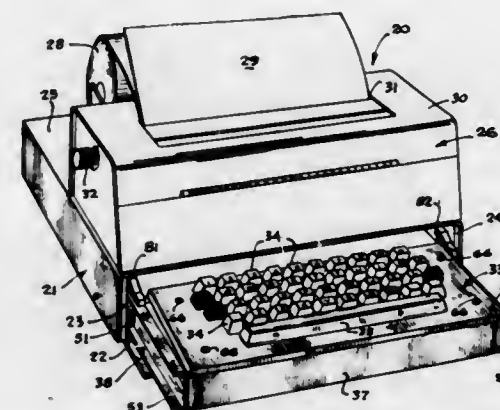
Peter G. S. Mero, Winnetka, Ill., assignor to Extel Corporation, Chicago, Ill.

Filed Mar. 8, 1971, Ser. No. 121,843

Int. Cl. A41j 29/02

U.S. Cl. 197-186 A

2 Claims



A compact, high-speed portable telegraph transceiver having an electrical keyboard movable between an extended operating position projecting outwardly of the front of the base of the telegraph transceiver and tilted at an angle relative to the base, and a retracted storage position in which the keyboard is completely enclosed within the transceiver base and protected against unauthorized use or possible damage.

3,732,966

## PACKAGING APPARATUS

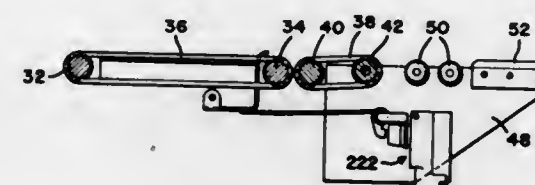
Fritz F. Treiber, Centerville, Ohio, assignor to The Hobart Manufacturing Company, Troy, Ohio

Filed Oct. 19, 1970, Ser. No. 81,716

Int. Cl. B65g 47/00, 37/00

U.S. Cl. 198-21

11 Claims



Packaging apparatus for conveying freshly wrapped packages to a weighing scale, computing the price of the weighed package, printing a label with the computed price and applying the printed label to the weighed package. The main carriage for moving the packages through the apparatus is actuated by a cam and linkage mechanism which imparts a translational movement to the carriage so that indexing through the machine is accomplished by a series of lifting, carrying and depositing movements. The conveyor which loads the packages into the apparatus has a series of package actuated limit switches associated therewith which act in conjunction with a limit switch associated with the drive shaft of the indexing carriage so that the loading conveyor is actuated only when a package is present on the conveyor and the carriage is in position to receive the package from the conveyor. Another limit switch controlled by the drive shaft delays the transfer of

information from the computer associated with the system to the printing mechanism until the package to be labelled is in the proper position for labelling. A main cam mounted on the drive shaft not only provides vertical and horizontal indexing movement to the carriage but also lifts and lowers the labelling head, operates a bellows for alternately applying suction and an air blast to a label carried by the labelling head and operates a pressure roller positioned downstream of the labelling head to apply pressure to the freshly applied label. Normally, all of the three main sections of the apparatus are enclosed in a guard tunnel, including the weighing section, and in this regard the guard tunnel for the weighing section is attached directly to the scale platform so that if an article too large to be conveyed through the tunnel is to be weighed and labelled it may be placed on top of the tunnel and the labelling accomplished semi-automatically. In order to provide positive control of a printed label as it is conveyed from the printer to the labelling head a series of endless belts are provided which not only positively engage the labels and convey them to the labelling head but impart a series of corrugations in a label to stiffen it and facilitate its insertion into the labelling head.

3,732,967

## ORIENTATION APPARATUS

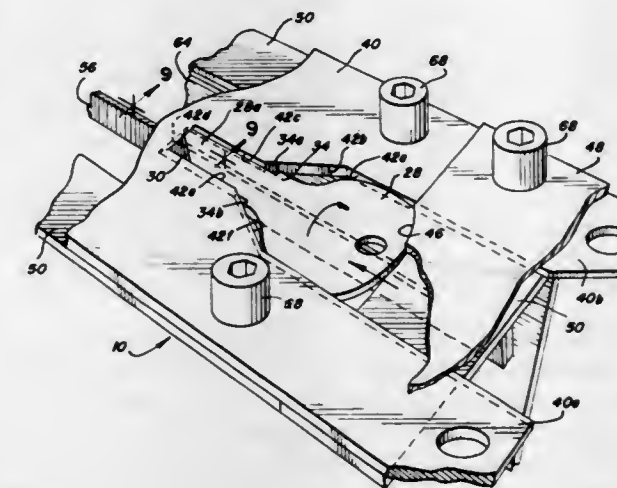
Theodore R. Francis, 855 Richard Street, Aurora, Ill.

Filed Dec. 3, 1971, Ser. No. 204,537

Int. Cl. B65g 47/24

U.S. Cl. 198-33 AC

7 Claims



Apparatus for orienting generally non-cylindrical and non-spherical asymmetrical items, such as keys. The item enters an inlet slot which feeds it to an orientation station having (1) a central support, and (2) means for preventing the item from pivoting until a selected portion of the item engages a beveled portion of the orientation station. When such engagement occurs, the item is cammed to pivot about the central support in a predetermined direction to achieve selected orientation.

3,732,968

## APPARATUS FOR ORIENTING MATERIAL

James R. Fedor, and Christopher E. Christie, both of Akron, Ohio, assignors to The Goodyear Tire &amp; Rubber Company, Akron, Ohio

Filed Aug. 11, 1971, Ser. No. 170,685

Int. Cl. B65g 47/24

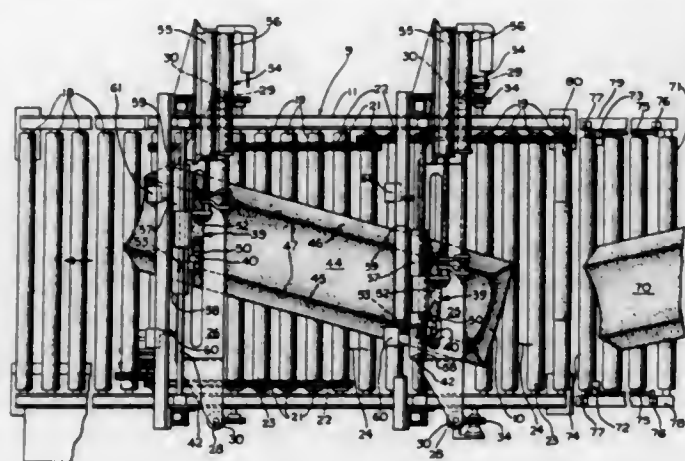
U.S. Cl. 198-33 AB

17 Claims

A machine for properly aligning unoriented pieces of defective tread stock for movement through a tread splitter where



the different tread and sidewall rubber compounds are separated and returned to the extruder for reuse. The machine



includes a pair of pointed awls which act as pivots around which the piece of tread stock is rotated into properly aligned relation for passage through the tread splitter.

3,732,969

**ARTICLE GROUP-SEGREGATING MECHANISM**

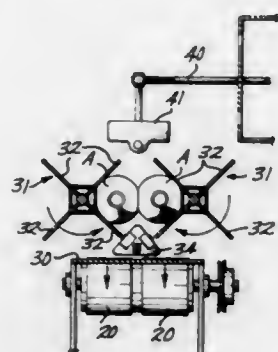
Alvin C. Formo, Seattle, Wash., assignor to Formost Packaging Machines, Inc., Seattle, Wash.

Filed Dec. 14, 1970, Ser. No. 97,784

Int. Cl. B65b 35/30; B65g 47/26

U.S. Cl. 198—34

5 Claims



Articles from which a group is to be segregated are fed in two parallel rows alongside each other until such rows are stopped by clamping means actuated by engagement of the end of the group to be segregated with a stop. Adjacent arms of counterrotating rotors lift the group of articles to be segregated from the infeed path to a parallel discharge path along which a pusher moves to push the segregated article group to a bagging station for bagging. Upon transfer of the segregated article group from the feed path to the discharge path the clamping means are released so that feed of articles from the feed section to the segregating section is resumed.

3,732,970

**LIFT LOADER**

Taro Nakanishi, Nishinomiya, and Nobumitsu Kameo, Mihara-shi, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1972, Ser. No. 229,636

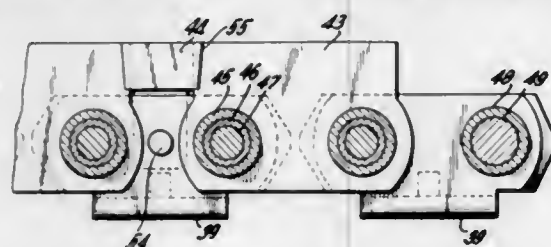
Int. Cl. B65g 17/42

U.S. Cl. 198—154

6 Claims

A lift loader includes a substantially rectangular platform or carrier having each of its four corners connected, by a ball joint, to a respective endless chain, with the chains being trained around sprockets rotatably mounted on a supporting frame including an upper section adjustable vertically relative to a lower section. The chains are in two sets, each including a pair of laterally spaced endless chains, and each set of chains

is trained around a respective set of pairs of laterally spaced sprockets. A motor drives all four endless chains in synchronism with each other along an endless path including a carrier lifting and lowering run, a carrier return run and a pair of vertically spaced horizontal runs. A goods loading station is provided at one end of one horizontal run and a goods discharge station is provided at the opposite end of the other horizontal run. Each carrier is longitudinally flexible and includes a pair of laterally spaced link chains comprising support links articulatedly interconnected by intermediate links, transversely extending juxtaposed support plates each secured on a respective pair of support links, and keeper links insertable between adjacent support links to prevent relative pivoting of the support plates, the keeper links being spring biased to



retracted positions. Adjacent the goods loading and discharge stations, the then flexible carrier is convexly curved about support rollers, "opening" the support links, and guide rails engage the keeper links as the carrier reaches the goods loading station to insert the keeper links between the then "open" support links to prevent the support links from "closing" whereby to maintain the carrier with a horizontally planar orientation during its travel along the lifting and lowering run. As the carrier passes the goods discharge station, the support links again "open" providing for retraction of the spring biased keeper links so that the carrier is again flexible during its passage along the return run. Chain take-up means are provided to compensate the endless chains for any adjustment in the relative height of the supporting frame.

3,732,971

**CONVEYING SYSTEM FOR USE IN SMOKE HOUSES AND THE LIKE**

Knud Simonsen, 25 West Dean Valley Road, Islington, Ontario, Canada

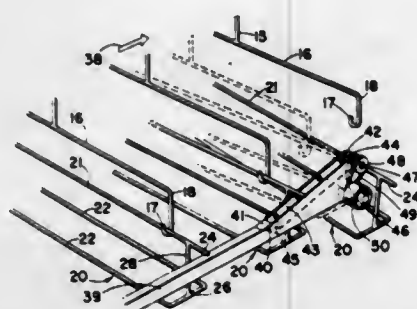
Continuation-in-part of Ser. No. 753,547, Aug. 19, 1968. This

application May 17, 1971, Ser. No. 143,780

Int. Cl. B65g 17/20

U.S. Cl. 198—177 R

11 Claims



An apparatus for use in the processing of sausage products, such as wieners, comprises an overhead conveyor rail having a series of interconnected trolley units travelling thereon. Elongated sausage-supporting structures are releasably suspended on hangers carried by the trolley units for passage through sausage treatment stations with the sausage-supporting structures disposed generally horizontally with a continuous length of linked sausage product festooned thereover. A discharge actuating mechanism at an unloading station is operative to unlatch one end of the supporting structure from its hanger to allow that structure to pivot downwardly in turn to allow the sausage products to slide off.

3,732,972

**WET PALETTE**

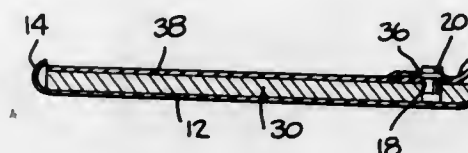
Alfred Israel, New York, N.Y., assignor to Archie F. Burger, New York, N.Y., a part interest

Filed June 26, 1971, Ser. No. 266,064

Int. Cl. B44d 3/02

U.S. Cl. 206—1.7

9 Claims



A wet palette comprising a flat base integral with a peripheral wall, with a portion of the wall extending over a portion of the base to form an overhang in spaced, parallel relationship thereto. A water retentive pad is disposed across the base and beneath the overhang. A plurality of pigment containers are seated in the overhang and fit into openings in the pad. A water-permeable sheet overlies the pad and overhang, surrounding the pigment containers, and providing an area on which selected pigments may be placed and mixed. A flexible sleeve is used to encase the palette when not in use, to prevent dehydration.

3,732,973

**COMBINED DENTURE CASE AND BRUSH**

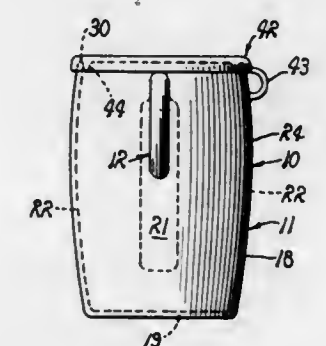
Lois H. Crawford, 2949 North Jackson, Fresno, Calif.

Filed Nov. 22, 1971, Ser. No. 200,894

Int. Cl. A45d 44/18, 44/20; A46b 5/02

U.S. Cl. 206—15.1 E

4 Claims



A combined denture case and brush having a container providing a denture receptacle and a brush receptacle, the brush being positionable in the brush receptacle to provide a handle for the combined case and brush.

3,732,974

**FIBER PACKAGE COMPRISING OVERLYING WRAPS OF A FIBROUS TAPE**

Michael J. Ram, West Orange, and Thomas K. Reynolds, Piscataway, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 15, 1971, Ser. No. 124,077

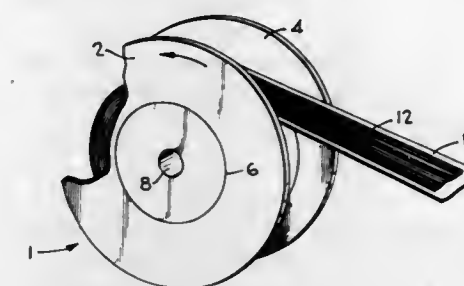
Int. Cl. B65d 85/67; B32b 5/24

U.S. Cl. 206—59 A

13 Claims

An improved fiber package is provided wherein a dry fibrous tape is wound upon a rigid support and each overlying wrap is separated from the previous wrap by an interlay. The interlay employed in the formation of the improved fiber package possesses a stiff inner core and resilient tape contact surfaces. The fibrous tape is preferably composed of a car-

bonaceous fibrous material (e.g. a graphitic carbon fibrous material). The fiber package possesses enhanced stability, and



is resistant to telescoping. The fibrous tape may be conveniently stored within and unreel from the package in the absence of fiber damage.

3,732,975

**STERILE PACKAGE FOR CLINICAL THERMOMETERS AND THE LIKE AND METHOD OF MAKING IT**

George W. Poncy, 59 Dale Drive, Chatham, N.J.

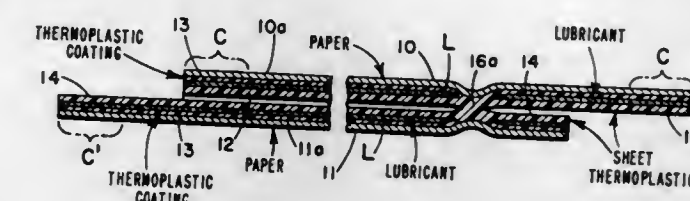
Continuation-in-part of Ser. No. 736,218, June 11, 1968, Pat.

No. 3,552,558. This application Oct. 5, 1970, Ser. No. 77,917

Int. Cl. A61b 19/02

U.S. Cl. 206—63.2

14 Claims



An improved sterile, disposable, sheath and sheath cover for thermometers and the like, and method of making it, packaged so as to preserve the sterility of the sheath during handling and storage, the sheath cover comprising the packaging material being strippable from the sheath along a tear seal to expose the same for clinical use when a thermometer or the like is inserted into the sheath. In some applications the sheath is covered on its outer surface during manufacture with a lubricant, medicated or otherwise, to facilitate insertion into a body cavity. The package is particularly designed for economical mass production.

3,732,976

**PACKAGE FOR FRAGILE ARTICLES**

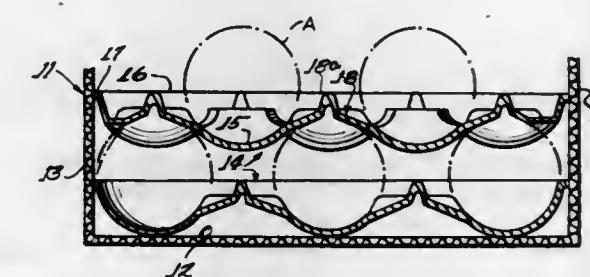
Clifford H. Bennett, South Holland, and Theodore H. Misdorn, Lansing, both of Ill., assignors to Packaging Corporation of America, Evanston, Ill.

Filed Apr. 12, 1971, Ser. No. 133,074

Int. Cl. B65d 71/00

U.S. Cl. 206—65 R

7 Claims



A package for fragile articles is provided which includes a container having a bottom surface delimited by upright walls, and a plurality of article-loaded trays arranged in a compact, stacked, superposed relation and disposed within the con-



tainer. Each tray has a plurality of article accommodating pockets separated by struts. The struts of a tray are in vertical alignment with the pockets of the trays disposed immediately above and below. The peripheries of the stacked trays are adapted to be vertically supported by the adjacent walls of the container thereby preventing sagging of certain of the peripheral pockets during storage or transporting of the loaded container.

3,732,977

# DEVICE FOR THE STORAGE, SELECTION AND LOCATING IN A READING POSITION OF INFORMATION RECORDED ON MICRO-CARDS

Jean-Claude Deprez, Ermont, and Charles Jacques Munier de Montrichard, Sartrouville, both of France, assignors to Societe Industrielle Des Nouvelles Techniques Radioelectriques et de L'Electronique Francaise, Amboise, France

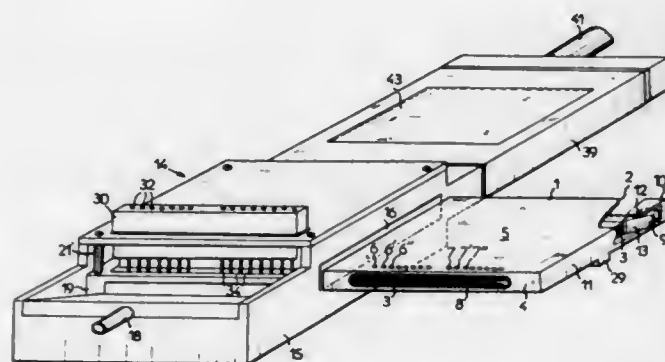
Filed July 27, 1971, Ser. No. 166,410

Claims priority, application France, Aug. 4, 1970, 7028725; Germany, Dec. 23, 1970, P 20 63 552.3; Dec. 23, 1970, G 70 47 541.1; Netherlands, Dec. 10, 1970, 7017998

Int. Cl. B07c

U.S. Cl. 209—110.5

9 Claims



In a device for the storage, selection and locating in a reading position of recorded information on micro-cards it is known to reduce the format of the cards by photographic means. It is also known to mount the standard card on a rigid frame or bar to permit the selective calling up and automatic positioning of the cards in reading means. In the present invention the device comprises cassettes in each of which are stacked micro-cards, each card being provided at one of their edges with coding perforations in the form of open slots or holes forming as many combinations as there are cards in the cassette, the cassette having a row of holes opposite the holes and slots in the micro-cards for the passage of retaining means permitting the locking of the pile of micro-cards and the selective unlocking of each one of them by disengagement of the retaining means passing through the holes of the corresponding card. The cassettes are conveniently constituted by flat rectangular boxes open at a narrow side and having an opposite elongated opening for the introduction of compressed air to expel the selected card from the cassette opening.

3,732,978

# METHOD AND APPARATUS FOR SORTING AND DISTRIBUTING MAIL

Arthur J. Reader, 293 Pepperidge Road, Hewlett Harbor, N.Y.

Filed Mar. 16, 1972, Ser. No. 235,267

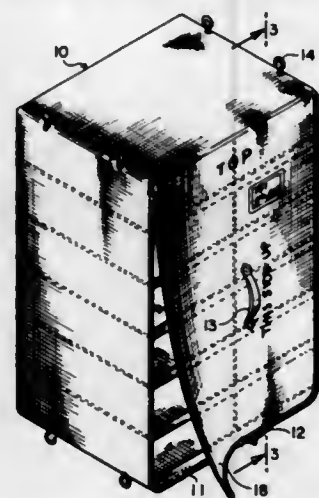
Int. Cl. B07c 7/02

U.S. Cl. 209—122

12 Claims

A method and apparatus for sorting and distributing mail consisting of a multi-compartment mail bag which is collapsible while being transported or returned from a multi-tenant building. The bag is initially retained in a central postal sorting station where mail for each of the tenants is inserted into each of the individual compartments. The multi-compartment bag

is then collapsed and transported to its destination indicated on the outside of the bag. When it is delivered to a multi-tenant building, it is erected and supported within a gang mail box. The gang mail box preferably includes individual mail compartments having inwardly projecting flanges designed to



project into each of the compartments. This physically isolates each compartment from the other in order to prevent compartment-to-compartment pilferage. A slide fastener is also provided on the front cover of the multi-compartment bag so that the bag can be locked while it is transported to the addressee's building.

3,732,979

# MERCURY SCREEN CENTRIFUGAL SEPARATOR

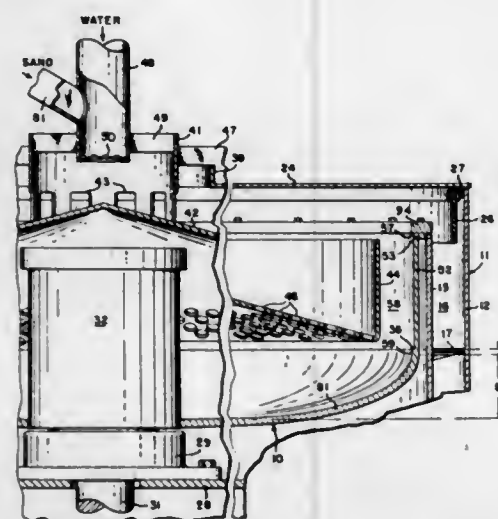
Walter W. Gilkey, P.O. Box 505, Mount Vernon, Wash.

Continuation-in-part of Ser. No. 611,683, Jan. 25, 1967, abandoned. This application Mar. 7, 1969, Ser. No. 805,317

Int. Cl. B04b 3/00

U.S. Cl. 209—199

3 Claims



A centrifugal separator for and a method of recovering highly divided value particles, principally gold and platinum, having a greater specific gravity than mercury. A relatively shallow and large-diameter bowl is provided with a mercury retention channel formed in and extending substantially the entire vertical height of the vertical side wall of the bowl and positioned at a predetermined distance from the point of joiner between the side and bottom walls of the bowl. The retention channel is formed in one embodiment with upper and lower horizontal faces and a vertical bottom face, and in a second embodiment with a sloping bottom face giving the channel greater depth at the bottom. The separator bowl is rotated at a speed sufficient to stabilize the mercury screen within the retention channel forming a smooth substantially vertical face over which the value-containing material is caused to pass in a substantially vertical path. The mercury

wall or film within the channel acts as a screen through which particles of greater specific gravity than mercury are caused to pass by centrifugal force to cover the bottom face of the retention channel thereby displacing the mercury. The value particles thus collected are primarily finely-divided oxide and sulfide-coated gold particles and particles of platinum. The mercury screen does not flow but is stabilized or immobilized and is only removed by erosion as the bottom face of the channel builds up with the separated value particles. The mercury eroded from the channel face is washed off and recovered.

3,732,980

# EARTH MOVING AND SCREENING EQUIPMENT

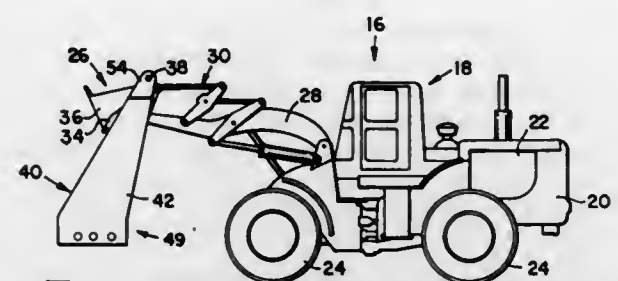
John J. Evers; Ralph E. Jones, and Alvie E. Boyce, all of Tahoe City, Calif., assignors to Robert C. Gibhardt Co., Tahoe City, Calif.

Filed July 9, 1970, Ser. No. 53,603

Int. Cl. B07b 1/28

U.S. Cl. 209—421

12 Claims



A screen for use on buckets of earth moving equipment such as tractors, loaders and the like which is mounted to a generally U-shaped frame that is pivotable independently of the bucket about a horizontal axis between an operative position in which the screen is disposed beneath the bucket into an inoperative position in which the screen is disposed above the bucket. Power means move the screen between its operative positions and the frame fully straddles the bucket so that the bucket can be used for conventional earth moving and loading operations by placing the screen into its inoperative position. To screen the material the screen is placed beneath the bucket so that material dumped from the bucket must fall onto the screen.

3,732,981

# FILTRATION COLUMN

Monroe Mendelsohn, Daly City, Calif., assignor to Bio-Rad Laboratories, Richmond, Calif.

Filed Sept. 1, 1970, Ser. No. 68,710

Int. Cl. B01d 23/20

U.S. Cl. 210—94

2 Claims



A column for use in filtering a fluid wherein a tubular body adapted to contain a filter such as a resin material, has an

upper open end for receiving the fluid to be filtered and a fluid passage extending to its lower end. Means is integral with the body for normally closing the lower end thereof. A line of weakness is disposed at the junction of the lower end of the body and the closing means and such lower end can be opened by grasping the closing means and moving it back and forth to cause fatigue of the material of the body and allow separation of the closing means therefrom, thereby leaving an opening at said lower end.

3,732,982

# APPARATUS FOR USE IN CONTINUOUS LIQUID CHROMATOGRAPHY

Peter Dunnill, London, and Malcolm Douglas Lilly, Orpington, both of England, assignors to National Research Development Corporation, London, England

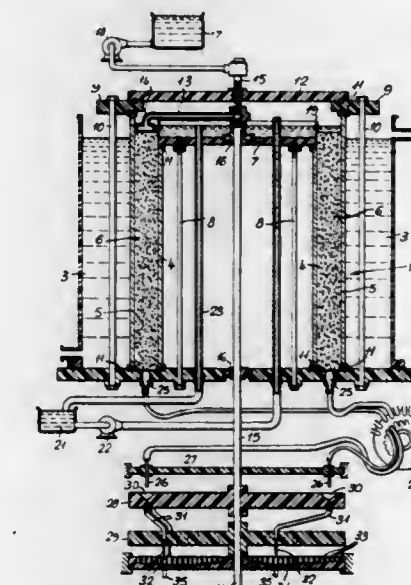
Filed Mar. 31, 1971, Ser. No. 129,666

Claims priority, application Great Britain, Apr. 3, 1970, 16,006/70

Int. Cl. B01d 15/08

U.S. Cl. 210—198 C

2 Claims



A liquid mixture to be separated and an eluting agent are continuously fed to the top of a vertically extending chromatographic column, the former being supplied at a restricted region which is rotated round the column and the latter being supplied uniformly through a buffer reservoir which communicates with the column via a porous barrier. The liquid is pumped through the column and discharges from the base through a series of uniformly distributed output channels, which are scanned by a multi-channel distributor comprising a series of ducts rotated in synchronism with the mixture supply.

3,732,983

# APPARATUS FOR CLEANING LOOSE FILTERING MATERIAL IN SLOW WATER FILLED WATER SUPPLY FILTERS

Boris Fedotovitch Volokh, ulitsa Pasternak, 4, kv. 44, Odessa, U.S.S.R.

Filed Mar. 29, 1971, Ser. No. 128,857

Int. Cl. B01d 23/24

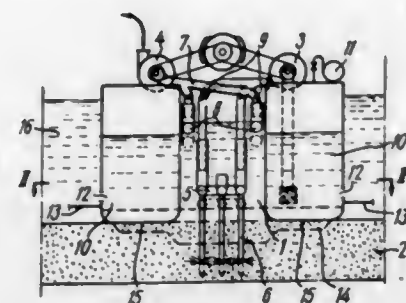
U.S. Cl. 210—273

2 Claims

An apparatus for cleaning loose filtering material in slow water-filled water supply filters, comprising a washing chamber equipped with means for its movement relative to the surface of the loose filtering material being cleaned. Mounted inside the washing chamber are washing tubes to feed clean



water into the layer of filtering material to be washed. The washing chamber communicates with a suction pipe which



evacuates dirty water therefrom. The chamber is provided with means for regulating its pressure upon the filtering material by controlling its degree of buoyancy.

3,732,984

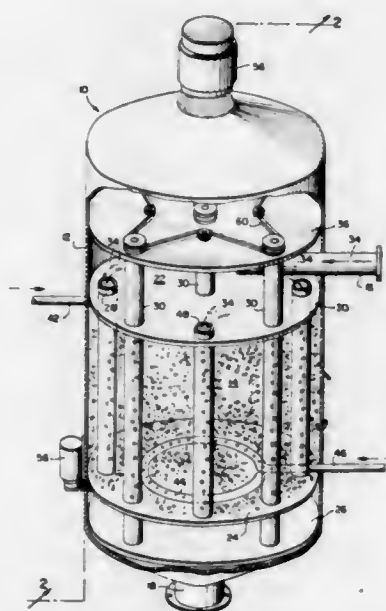
# APPARATUS FOR PRODUCING A CONTINUOUS COUNTER-CURRENT EFFECT

Charles G. Phillippi, 3414 Bonneville Drive, Charlotte, N.C.  
Filed Apr. 24, 1970, Ser. No. 31,481

Int. Cl. B01d 29/08

U.S. Cl. 210-289

6 Claims



Solid-liquid contacting device having means for continuously changing the position of inlet and outlet ports in the solids bed for simulating a continuous counter-current flow of solids and liquid. Method of simulating a continuous counter-current flow of solids and liquid.

3,732,985

# SCREEN RETAINER ASSEMBLY

Donald K. Murrell, La Mirada, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 24, 1971, Ser. No. 146,375

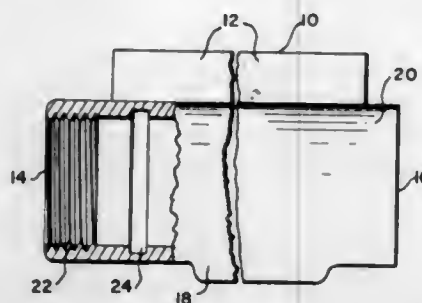
Int. Cl. B01d 35/02

U.S. Cl. 210-446

1 Claim

A method for installing a screen in a conduit includes the steps of draping the screen across a convoluted band of ductile material, positioning the screen-draped band within the conduit in general alignment with a continuous groove provided in the interior surface of the conduit, and expanding the convoluted band so that the band fits snugly in the groove to thereby hold the screen firmly in place with its periphery

pinched between the band and the groove. The resultant screen retainer assembly has the advantages that the screen



retaining means does not impede the flow of fluid through the conduit and that the expanded band cannot become displaced or accidentally removed.

3,732,986

# WELDING ROD HOLDER

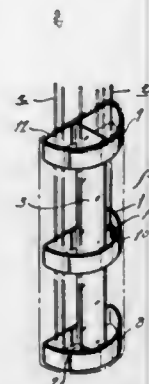
Charles E. Bush, 917 Baden Avenue, St. Louis County, Mo.

Filed Apr. 9, 1971, Ser. No. 132,661

Int. Cl. A471 7/00

U.S. Cl. 211-60

4 Claims



A holder for diverse types of welding rods incorporating at least two rod-receiving compartments which are of different effective longitudinal extent so that rods of different lengths may be accommodated, as well as to permit of a projection of one series of rods beyond another to facilitate manual detection.

3,732,987

# SUPPORT FOR CLOTHES AND THE LIKE

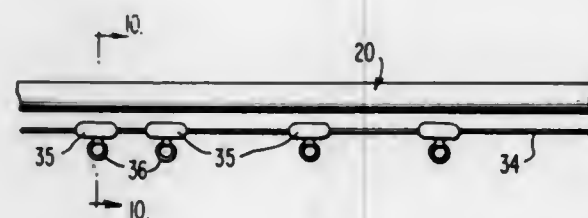
John Q. Adams, IV, 1206 Foxcroft Road, Richmond, Va.

Filed Sept. 22, 1971, Ser. No. 182,635

Int. Cl. D06f 3/14

U.S. Cl. 211-119.13

4 Claims



A support of the "clothesline" type comprises a resilient split tube or channel constituting the body portion of the support and adapted to receive clampingly with the flexible article to be supported a continuous or interrupted clamping bar or lug. Such bar or lug may be integrally hinged to the body portion or may be slidable therealong or may be carried by an independent line extending parallel to the body portion.

3,732,988

# JIB ASSEMBLY FOR TELESCOPING CRANE BOOM

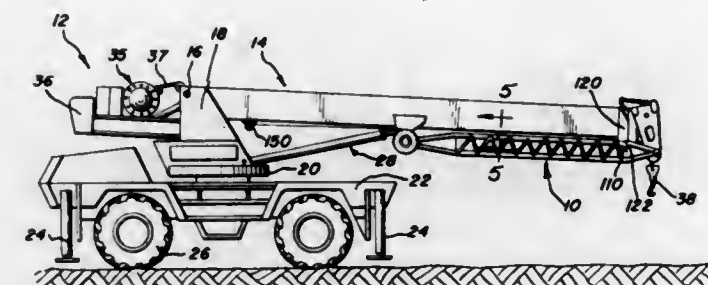
Gerald P. Lamer, Rothschild, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Oct. 12, 1970, Ser. No. 79,767

Int. Cl. B66c 23/62

U.S. Cl. 212-144

3 Claims



An extensible jib assembly for a crane boom of the extensible and retractable type which has a main boom member and at least one outer boom member telescoped within the main boom member. The jib assembly consists of a plurality of rectangular jib sections with a base section telescoping receiving the remainder of the sections. First cooperating means between the base section and the main boom member normally maintain the jib assembly in a stored position on the lower surface of the main boom member. The jib assembly is located in a manner that releasable coupling means carried by one end of the base section may be connected to the outer end of the outer boom section when the boom is fully retracted so as to pivotally connect the jib assembly to the boom while the jib assembly is in the stored position.

The jib assembly is moved to an operative position by connecting one end of a cable forming part of a hand winch to the opposite end of the jib assembly and releasing the cooperating means so that unwinding of the winch will allow the jib assembly to pivot about the crane boom.

The jib assembly is held in any of a plurality of angularly related operative positions on the boom through cable means having one end connected to the jib assembly and a second end connected to a mast structure extending above the free end of the outer boom member. The jib assembly may be used in a fully retracted, a partially extended and a fully extended position of the free end of the boom and may be held in a plurality of angularly related positions on the boom in each extended position.

3,732,989

# LIFT CONTROL SYSTEM FOR PRESS UNLOADER OR THE LIKE

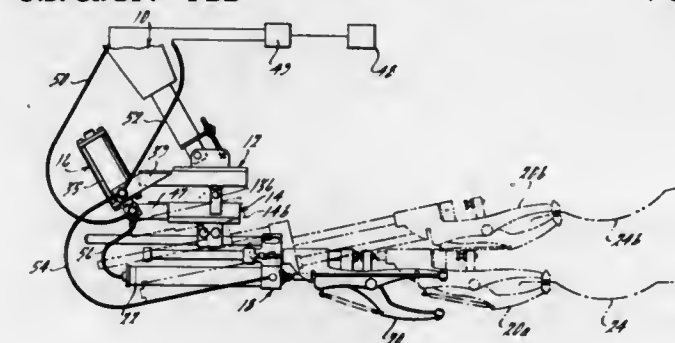
Harlan R. Cagle, Clarkston, Mich., assignor to Sahlin Engineering Company, Inc., Troy, Mich.

Filed May 27, 1971, Ser. No. 147,367

Int. Cl. B66c 23/00

U.S. Cl. 214-1 BD

7 Claims



There is herein disclosed a lift control system for a press unloader having an extendable and retractable jaw means for gripping and removing a part from the die cavity of a press with pivotal frame means supporting the jaw means for pivotal

movement to lift the part from the die cavity and interconnected air operated power cylinder means to sequentially extend the jaw means, grip the part, lift the part, and retract the jaw means.

3,732,990

# TURNOVER DEVICE

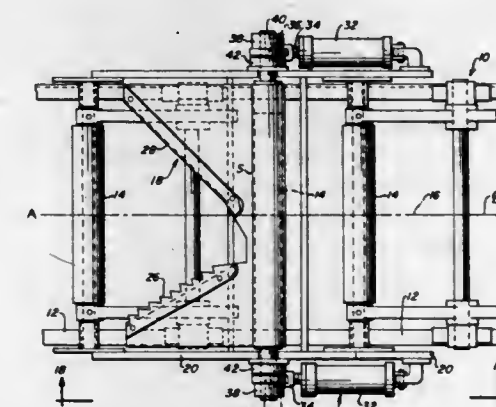
Walter Suter, Willoughby Hills, Ohio, assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 13, 1971, Ser. No. 142,865

Int. Cl. B65q 7/08

U.S. Cl. 214-1 QG

12 Claims



A turnover device for rotating a longitudinal member having a center of gravity and carried by a supporting member having a supporting surface is disclosed. The turnover device has a frame disposed adjacent the supporting member, a tilting member on one side of the frame and a receiving member adjacent the tilting member on the side of the frame. The tilting member and receiving member are movable on the frame. Drive means are connected to the tilting member and the receiving member for moving the tilting member and the receiving member from a normal rest position coincident with or below the supporting surface to a longitudinal member tilting position so that the tilting member engages the longitudinal member and rotates the longitudinal member beyond the center of gravity, thereby causing the longitudinal member to fall back onto the support member during the retracting movement of the tilting member and the receiving member.

3,732,991

# STACKING MACHINE

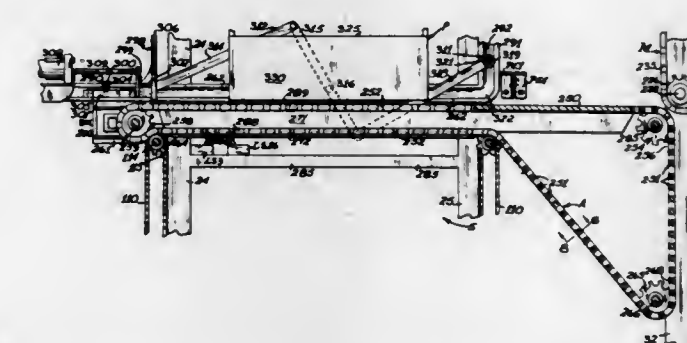
George E. Von Gal, Jr.; Lawrence H. Hutchinson, and Oneal W. Davis, all of Montgomery, Ala., assignors to Litton Industries, Inc., Beverly Hills, Calif.

Division of Ser. No. 775,965, Nov. 14, 1968, Pat. No. 3,521,736, which is a continuation of Ser. No. 557,285, June 13, 1966, abandoned. This application Apr. 24, 1970, Ser. No. 43,294

Int. Cl. B65g 57/24

U.S. Cl. 214-6 P

3 Claims



A stacking machine including an infeed conveyor, a cross-feed conveyor angularly disposed with respect to the infeed

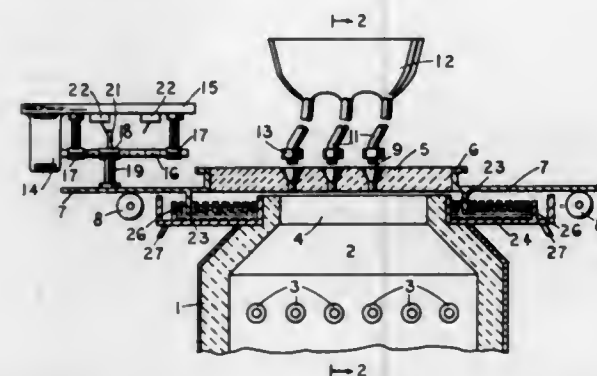


conveyor, and a turning section at the junction of the infeed conveyor and the cross-feed conveyor for selectively turning articles passing from the infeed conveyor to the cross-feed conveyor for sidewise or endwise movement along the cross-feed conveyor. A rake mechanism removes the articles from the cross-feed conveyor onto a selectively extendible apron assembly adjacent the cross-feed conveyor, which selectively moves the articles into an elevator shaft. A compression and release assembly engages and retains the articles on the apron assembly within the elevator shaft while the apron assembly is retracted from under the articles thus held. The compression and release assembly then releases the article in the elevator shaft and allows them to drop onto a pallet held within the elevator shaft by a vertically movable elevator. The elevator lowers the pallet and articles for receipt of more articles from the apron assembly. After a pre-determined number of layers of articles have been placed on the pallet, the elevator lowers and discharges the loaded pallet from the machine, receives an empty pallet thereon and raises the same for the receipt of articles thereon. The operation of the machine is controlled by a punched tape control mechanism. The control mechanism is actuated by a sensing means which electrically counts the number of articles moving into the machine.

**3,732,993**  
**SEAL FOR TOWER FURNACE**  
Michael Csapo, Wyncote, Pa., assignor to Sels Corporation of America, Dresher, Pa.  
Filed Aug. 17, 1971, Ser. No. 172,490  
Int. Cl. F27b 1/00, 9/00

U.S. Cl. 214-18 V

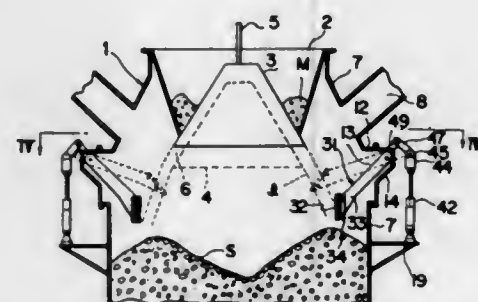
3 Claims



Apparatus forming a seal between the upper end of a tower furnace and a reciprocating feed mechanism that is used to supply feed material to be treated.

**3,732,994**  
**APPARATUS FOR CHANGING THE CHARGE DISTRIBUTION IN A VERTICAL FURNACE**  
Kengo Yoshioka, Naoto Kishikawa, and Hiroyuki Takao, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan  
Filed Apr. 9, 1971, Ser. No. 132,737  
Claims priority, application Japan, April 9, 1970, 45/33654  
Int. Cl. F27b 1/12

U.S. Cl. 214-36 9 Claims

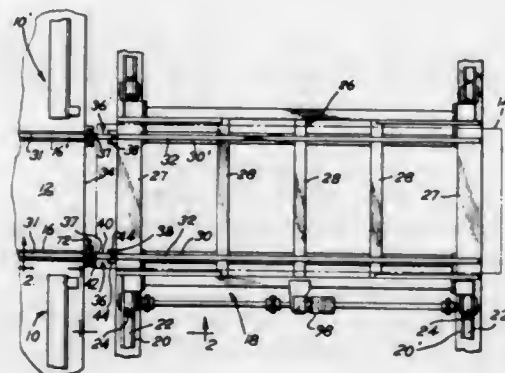


An apparatus for changing the distribution of the charge in a vertical furnace which comprises a multiplicity of projections extending outwardly from the shell of the furnace at the top portion thereof, a pivot shaft rotatably extending through each of said projections and equipped with sealing means, with the shaft ends disposed outside the furnace, repellers secured respectively to the pivot shafts inside the furnace, and a pivot shaft driving system engaged with one-side ends of said pivot shafts.

**3,732,995**  
**EXCAVATING APPARATUS WITH BUCKET CASTING MEANS**  
Willard W. Shepherd, Los Angeles, Calif., assignor to Shepherd Machinery Co., City of Industry, Calif.  
Filed Apr. 30, 1971, Ser. No. 138,980  
Int. Cl. E02f 3/70

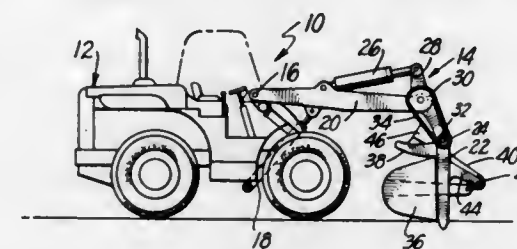
U.S. Cl. 214-92 5 Claims  
An apparatus for excavating areas remote therefrom, comprising a vehicle having a boom carrying a dragline bucket which may be cast horizontally to the desired area by pivoting all or a part of the boom. The bucket is attached to a cable

**3,732,992**  
**SELF ADJUSTING TRACK EXTENSION**  
Donald H. Busam, Hometown, Ill., assignor to Interlake Inc., Chicago, Ill.  
Filed Dec. 30, 1971, Ser. No. 213,981  
Int. Cl. B65g 35/00, 1/06  
U.S. Cl. 214-16.4 B 13 Claims



In a storage and retrieval system of the type having a plurality of aisles in which an article handling load carrier operates and a transfer car for transferring the load carrier between the aisles for operation in several of the aisles, track extensions are pivotally mounted to the transfer vehicle and a plurality of camming and support surfaces are positioned adjacent the rails at the ends of the aisles. A camming surface is also positioned on the end of the track extensions opposite their pivotal attachment to the transfer vehicle and, as the transfer vehicle is moved between the respective aisles, the camming surfaces move into alignment with each other to position the supporting surfaces of the adjustable track extensions in continuous and substantially coplanar relationship with the rails on the transfer vehicle and in the individual aisles.

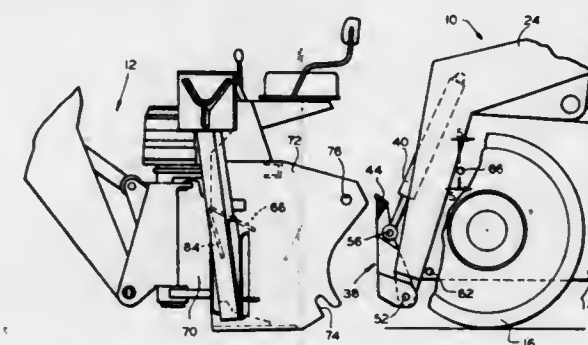
which is reeled in to drag the bucket across the area to be excavated, thereby loading it. Further reeling in of the cable



returns the bucket to its original position on the boom, whereupon the bucket may be tilted to dump it.

**3,732,996**  
**APPARATUS AND METHOD FOR MOUNTING AN ATTACHMENT ON A VEHICLE**  
James J. Bauer, Limon, N. Dak., assignor to Clark Equipment Company, Buchanan, Mich.  
Continuation of Ser. No. 5,541, Jan. 26, 1970, abandoned.  
This application Aug. 30, 1971, Ser. No. 176,268  
Int. Cl. B65g 69/00

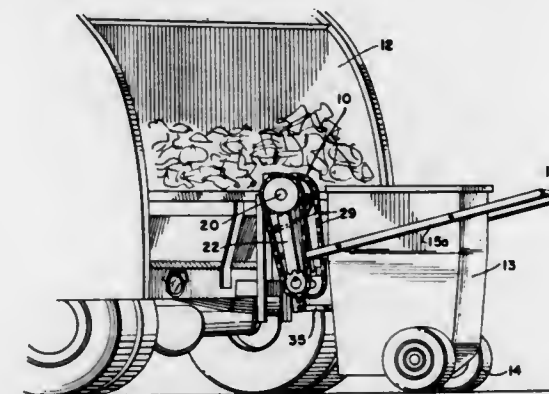
U.S. Cl. 214-152 4 Claims



A vehicle having a body to which a pair of elevatable boom arms are connected. Connected to the boom arms is an attachment carrier. The carrier can engage an attachment so that the attachment can be carried by the boom arms and positioned to bring apparatus on the attachment into cooperation with apparatus on the body of the vehicle for mounting the attachment on the body of the vehicle.

**3,732,997**  
**CONTAINER LIFT AND DUMP APPARATUS**  
Robert P. Reavis; Robert P. Reavis, Jr., both of Box 5229, and Robert P. Reavis, III, Monticello Dr., all of Statesville, N.C.  
Filed Feb. 28, 1972, Ser. No. 229,685  
Int. Cl. B65f 3/02

U.S. Cl. 214-302 12 Claims

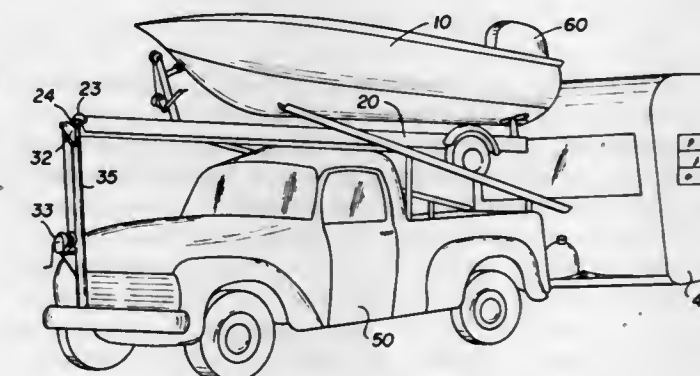


Apparatus is provided for lifting a container and dumping its contents into a receptacle such as a truck body. The ap-

paratus has a horizontal fulcrum mounted on the outside of the receptacle and an elongated frame is swingable about the fulcrum between a lowered and a raised position. Endless chains on the frame have drive sprockets coaxial with the fulcrum and hooks on the chains engage the container to first lift the same while the frame remains in its lowered position. In the lifted position of the container the hooks cooperate with abutments on the frame so that continued movement of the chains swings the frame with the container to a raised position in which contents of the container are dumped into the receptacle.

**3,732,998**  
**BOAT RACK**  
Marion A. Martin, Baton Rouge, La., assignor to The Raymond Lee Organization, Inc., New York, N.Y.  
Filed Sept. 28, 1971, Ser. No. 184,548  
Int. Cl. B60r 9/00

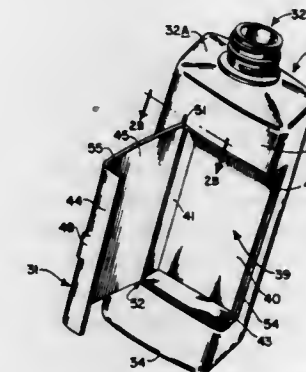
U.S. Cl. 214-450 3 Claims



An improved boat rack capable of carrying a boat which is mounted on a trailer, with provisions for mounting the boat rack on the top of a pick-up truck.

**3,732,999**  
**BOTTLE WITH EXTERNAL COMPARTMENT**  
Rodney G. Rounkles, Excelsior Springs, Mo., assignor to Ethyl Development Corporation, Kansas City, Mo.  
Filed May 3, 1971, Ser. No. 139,650  
Int. Cl. B65d 1/04

U.S. Cl. 215-6 2 Claims



A bottle having an integrally formed, recessed, exterior storage compartment provided in its sidewall. A hinged cover is provided for the storage compartment.



3,733,000

**CHILD PROOF CLOSURE FOR CONTAINERS**

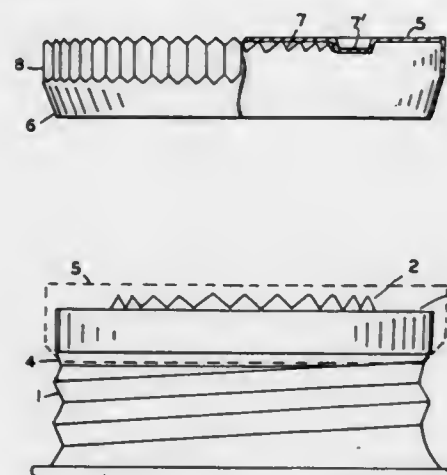
Vincent Scuderi, East Williston, N.Y., assignor to Van Blarcom Closures, Inc., Brooklyn, N.Y.

Filed Jan. 5, 1972, Ser. No. 215,455

Int. Cl. B65d 55/02

U.S. Cl. 215-9

2 Claims



A child proof closure for containers having a threaded neck. A screw type cap has an annular groove in the side of said cap adjacent to the top thereof, and a first circle of teeth on the top of the cap. A drive member fits over said cap and has a second circle of teeth adapted to engage said first circle of teeth when said drive member is firmly pressed down upon said cap. The drive member has a lower lip turned inwardly to engage said groove with a loose fit to permit easy rotation of said drive member when the drive member is not pressed down on the cap. It is necessary to press and turn said drive member simultaneously to unscrew said cap.

3,733,001

**CHILD-PROOF CONTAINER AND CLOSURE UNIT**

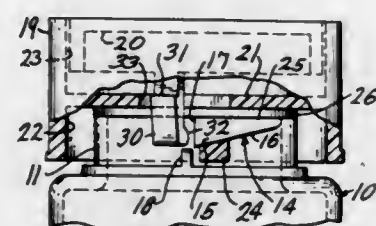
Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Apr. 5, 1972, Ser. No. 241,347

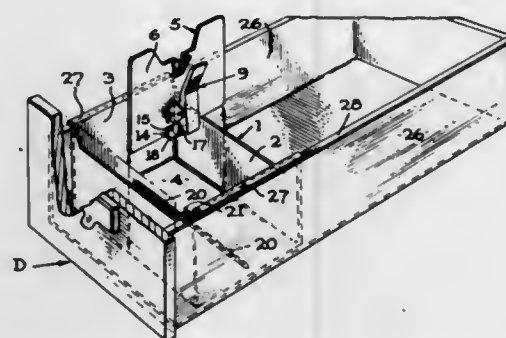
Int. Cl. B65d 55/02

U.S. Cl. 215-9

8 Claims



An improved container and child-proof closure therefor. The container has a neck surrounding an opening. At least two flanges project from the neck. Each flange has a spirally expanding first camming surface and a downwardly directed helical second camming surface which terminates at an inwardly directed end surface. The closure comprises outer and inner members. The outer member includes lugs for engaging the second camming surface as the cap is rotated on the container neck to a locked position for holding the closure on the neck. The inner member includes resilient means which ride over the first camming surfaces and abut the flange end when the closure is rotated to the locked position to prevent removal of the closure. Movement of the inner closure member against spring means within the outer closure member permits the closure to be rotated from the locked position for removal from the container. In one embodiment, means is provided for further tightening the closure on the container after it is in the locked position.



A file tray is provided with a medially disposed longitudinal slot having a centrally located enlarged recess laterally communicating with the slot and by means of which a compressor plate provided with a mounting shoe is attached to the tray.

3,733,002

**SEALED CONTAINER**

Masaaki Fujio, 3-15-8 Aoyamadol, Suita, Japan

Filed Oct. 12, 1970, Ser. No. 80,086

Int. Cl. B65d 11/16

U.S. Cl. 215-12 R

5 Claims



Sealed containers comprising in combination a cylindrical packing member and a container having a closing means. The cylindrical packing member is made from a heat-shrinkable synthetic resin and has printed matter appearing thereon at the required location. The packing member also contains a circumferential tearing line, preferably perforated, at a location above the printed matter. A heat-sensitive adhesive is applied on the inner surface of the packing member at a location below the tearing line and becomes tacky when the packing member is heated to a temperature sufficient to cause the shrinking of said packing member about the container whereby a closely fitting packing member is formed about the container. When the upper portion is removed, and lower portion containing the printed matter remains adhered to the container.

3,733,003

**FILING DEVICE**

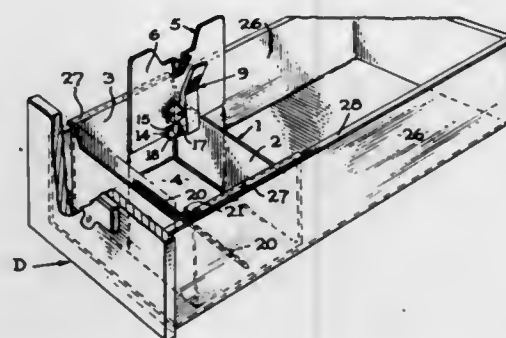
Melvin A. Textoris, Struthers, Ohio, assignor to The General Fireproofing Company, Youngstown, Ohio

Filed June 30, 1971, Ser. No. 121,853

Int. Cl. B65d 25/06

U.S. Cl. 220-22.3

8 Claims



3,733,004

**DEVICE FOR OPENING AND CLOSING RECEPTACLES FOR THE RECEPTION OF INCANDESCENT MATTER**

Jean Pierre Etourneau, 69 Boulevard Carnot, Le Vesinet, France

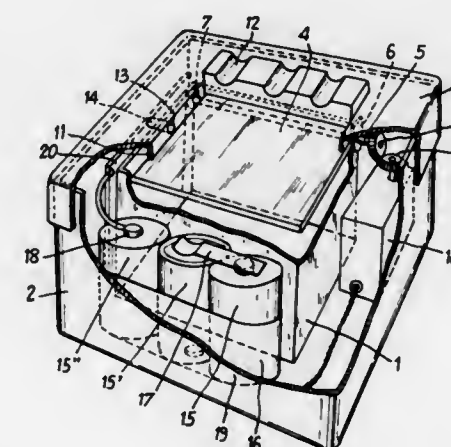
Filed Mar. 23, 1971, Ser. No. 127,155

Claims priority, application France, Mar. 25, 1970, 7010632

Int. Cl. B65d 43/16

U.S. Cl. 220-20.5

5 Claims



A device for opening and closing a receptacle in accordance with the presence or absence of incandescent matter is provided. One or a plurality of infra-red radiation detectors are mounted in the receptacle and in accordance with an electronic amplifier system and an electro-mechanical control system will cause a flap of the receptacle to open in the presence of incandescent matter and to close in the absence thereof.

3,733,005

**DUNNAGE DOOR FOR CARGO BOX**

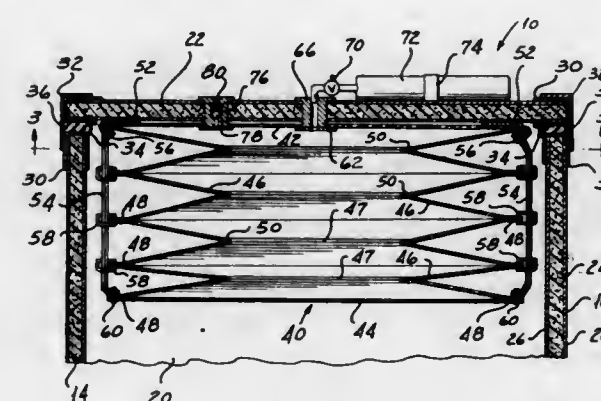
Leonard P. Frieder, Jr., Waverly, Pa., assignor to Gentex Corporation, New York, N.Y.

Filed June 1, 1971, Ser. No. 148,845

Int. Cl. B65h 3/00

U.S. Cl. 220-85 B

3 Cls



A dunnage door for use with a cargo box adapted to be partially filled with cargo from the back or the bottom toward the front or the top on which the door is assembled in which the interior of the door is provided with normally collapsed expandable means adapted to be expanded to fill the space between the door and the cargo to prevent movement of the cargo within the box during shipment.

3,733,006

**WORK PIECE FEEDER FOR MACHINE**

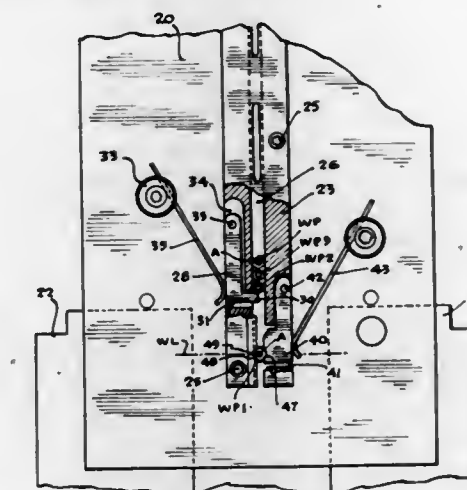
Adolph V. Klancnik, 1020 Glenview Road, Glenview, Ill.

Filed July 12, 1971, Ser. No. 161,777

Int. Cl. B65g 59/00

U.S. Cl. 221-262

9 Claims



Work pieces (nuts, studs, fasteners, etc.) in a magazine are advanced from a temporary holding position to a locating position, there to be worked on by a rotating tool.

The work pieces are apertured, and a positive feed force is applied by a feed finger fitting the aperture in the work piece incidental to moving the work piece from the holding position to the locating position. Means are presented by switching the path of the feed finger into and out of the guideway. Thus, the feed finger is normally in the guideway during its advance stroke; at the end of the advance stroke, which is also the inception of the feed finger return stroke, the switch means is effective to move the feed finger out of the guideway; and at the end of the return stroke, the feed finger is restored or switched back to the guideway in engagement with the next work piece to be advanced.

In one embodiment, the advance stroke of the feed finger moves the work piece in one step from holding position to locating position opposite the tool; in another embodiment, the work piece is advanced incrementally in stages to the holding position opposite the tool.

3,733,007

**ARTICLE DISPENSING APPARATUS**

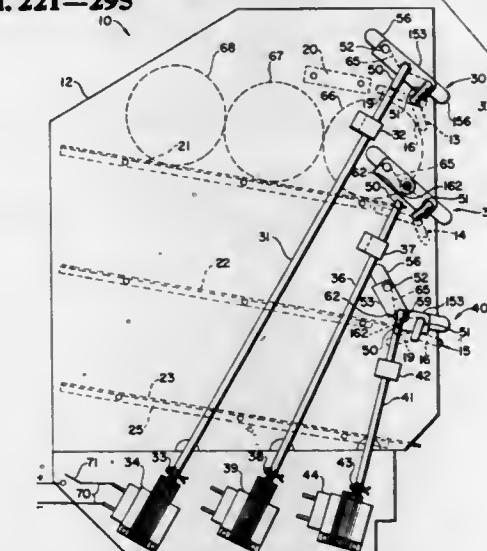
Warren J. Ungerman, Hatboro, Pa., assignor to Captain International Industries, Ltd., Vancouver, British Columbia, Canada

Filed Feb. 17, 1972, Ser. No. 227,694

Int. Cl. B65h 3/32

U.S. Cl. 221-295

10 Claim



An article dispenser having shelves inclined downwardly toward the front for receiving a plurality of articles thereon to



be dispensed, and a gate at the front of each shelf permitting removal of one article at a time. As the gate is swung up to release the front article, a rear part thereof prevents removal of the remaining articles. A control mechanism which moves the gate up and back includes first and second interconnected abutting links, the first link pivotally connected on the axis of a pin passing therethrough and spaced from the turning axis of the gate, such that the first link turns about the pin axis and orbits about the gate turning axis and the second pivotally connected to a fixed pivot axis. The gate is properly opened by applying a force to the links in a certain direction to easily turn the links about their respective axes. However, unauthorized attempts to open the gate manually will only push the abutting surfaces against each other without the turning movement necessary to open the gate.

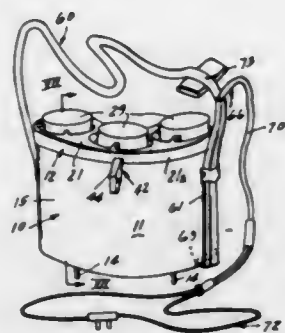
3,733,008

## CARRYING CASE FOR OXYGEN GENERATORS

John P. Churchill, Indianapolis; Tommy Lewis Thompson, Melbourne, and William S. McBride, Melbourne Beach, all of Fla., assignors to Life Support, Inc., Melbourne, Fla.  
Filed May 17, 1971, Ser. No. 143,851  
Int. Cl. A61m 15/00

U.S. Cl. 222—6

18 Claims



Lightweight, compact, attractive, reliable and convenient to use carrying cases for replaceable oxygen generating cells or candles having mechanism for activating or igniting the cells or candles for delivering oxygen through a carrying strap to a canula or breathing mask. The carrying cases of this invention are suspended from a strap also serving as an oxygen conduit and are worn in the manner of a binoculars case to supply instant oxygen when needed by the wearer. These carrying cases with their replaceable oxygen generators or candles release heart and emphysema patients from heretofore required confinement to the vicinity of large heavy oxygen bottles.

3,733,009

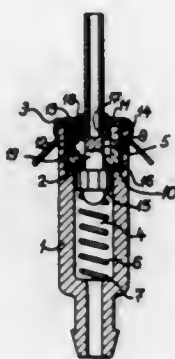
## VALVES FOR PRESSURIZED RECIPIENTS

Philippe Rouzier, Beaurepaire, and Maurice Pelissier, Saint Barthelemy, both of France, assignors to Aluminium Suisse S.A., Chippis, Switzerland  
Filed Mar. 15, 1971, Ser. No. 124,393  
Claims priority, application Switzerland, Mar. 16, 1970, 3863/70

Int. Cl. B67d 1/08, 83/14

U.S. Cl. 222—148

12 Claims



A valve for pressurized recipients comprises two separated chambers, in communication with pressurized liquid and pres-

surized gas respectively. An orifice in a clapper can be moved between the first chamber for distribution of product, the second chamber for purging by the issue of gas, and a closed position. A closure member movably mounted on the clapper can obturate the orifice to prevent purging during opening of the valve, while allowing purging during closing of the valve.

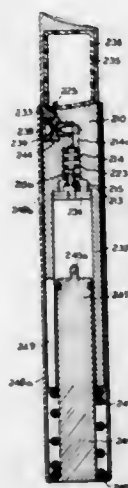
3,733,010

## AIR PRESSURE OPERATED DISPENSER

Pasquale R. Riccio, Suffern, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.  
Filed Apr. 30, 1971, Ser. No. 139,027  
Int. Cl. B67d 5/54

U.S. Cl. 222—193

12 Claims



A dispensing device in which the product to be dispensed is aspirated and sprayed by the discharge of pressurized air. A valve assembly has a product flow path therethrough and a compressed air flow path therethrough. The valve stem of the assembly is actuated to open the compressed air flow path, and a flap valve is actuated to open the product flow path. Aspirating means is provided at the upper end of said stem for bringing one end of each of said flow paths together. A piston-cylinder assembly is provided on the device having a cylinder with one end around the end of the compressed air flow path, a piston slidable in the cylinder, and a piston rod on said piston and rod on said piston and extending out of the other end of said cylinder. A product container means is connected around the end of the product flow path remote from the aspirating means. The end of the valve stem extends into the cylinder and is engaged by the piston rod for moving the valve stem relative to the valve body for opening the compressed air flow path when the piston is moved to the inner end of the cylinder adjacent the valve assembly to provide a predetermined amount of compressed air. The action of the aspirating means opens the flap valve to draw the product to be dispensed from the product container and dispense it.

3,733,011

## FEEDING OF POWDERS

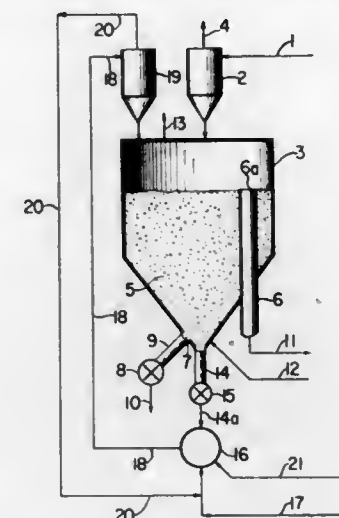
Richard E. Driscoll, Monroe, La., assignor to Cities Service Company, New York, N.Y.  
Division of Ser. No. 758,880, Sept. 10, 1968, Pat. No. 3,627,555. This application Feb. 8, 1971, Ser. No. 113,691  
Int. Cl. B67d 5/54

U.S. Cl. 222—193

3 Claims

Constant mass-rate feeding of powders is improved by supplying the powder to a feeder in fluid form, and at a uniform

bulk density, from a bed of the powder. The depth of the powder bed is maintained essentially constant, thus providing



a more constant head of pressure upon the powder being supplied to the feeder.

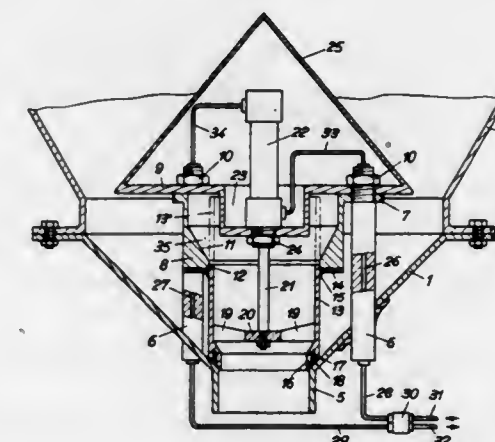
3,733,012

## DISPENSING DEVICE FOR A BULK MATERIAL RECEPTACLE

Gustav Grun, Lissberg/Oberhessen, Germany, assignor to Luco-Technic AG, Zurich, Switzerland  
Filed June 5, 1972, Ser. No. 259,758  
Int. Cl. B65g 65/62

U.S. Cl. 222—193

7 Claims



A dispensing device for the metered discharge of bulk material from a receptacle including a vertically movable cylindrical or tubular slide located in a funnel-shaped dispenser. Actuating means, such as a hydraulic cylinder arrangement, or a winding cable are adapted to raise or lower the slide so as to provide a variable material outlet orifice in the lower end of funnel-shaped dispenser. Pressurized air may be introduced into the device for enhancing pneumatic conveyance of the material and prevent adherence thereof to the interior walls of the device.

3,733,013

## DOUBLE DIP TUBE AEROSOL

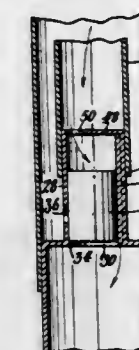
Ross L. Doyle, Ramsey, N.J., assignor to Sterling Drug Inc., New York, N.Y.  
Filed Dec. 22, 1970, Ser. No. 100,620  
Int. Cl. B65d 83/14

U.S. Cl. 222—402.19

10 Claims

In an aerosol valve, a pair of dip tubes located one within the other and attached to the valve body for the valve, the

outer dip tube extending to a point adjacent the bottom of the aerosol container and the inner dip tube extending from the outer tube and being reversed to terminate adjacent the area of the valve at the top of the aerosol container, and a gravity



actuated sliding plug in a housing having two entrances arranged to close the inner dip tube when the aerosol is operated in an upright position, and closing the outer tube when the aerosol is used in inverted position.

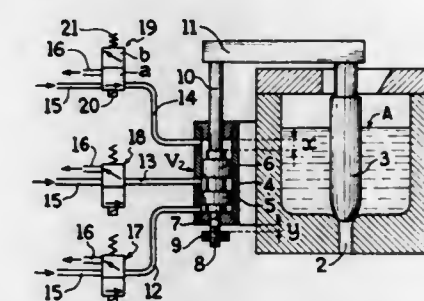
3,733,014

## CONTROL DEVICE FOR THE STOPPER-ROD OF A FOUNDRY POURING VESSEL

Andre Joseph Pflaum, Maidieres, France, assignor to Societe Des Fonderies De Pont-A-Mousson, Nancy, France  
Filed Mar. 30, 1971, Ser. No. 129,459  
Claims priority, application France, Apr. 2, 1970, 7011947  
Int. Cl. B22d 37/00

U.S. Cl. 222—504

4 Claims



A control device for controlling the position of a foundry pouring vessel stopper-rod with respect to a pouring orifice. Long-travel raising means raise the stopper-rod off the pouring orifice when opening the orifice after which short-travel means lower the stopper-rod toward the orifice whereby the flow rate through the orifice is initially higher than the normal flow rate so as to initially heat the region around the orifice and melt any solidified metal adjacent the orifice.

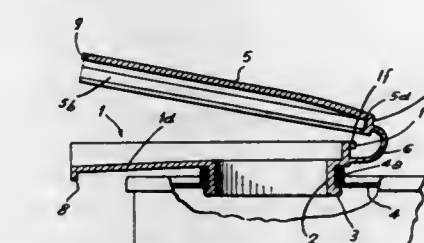
3,733,015

## SINGLE PRICE POURING SPOUT AND LID

Javier Sensat Marques, Paseo Carlos 1, No. 130, Barcelona, Spain  
Filed July 29, 1971, Ser. No. 167,144  
Claims priority, application Spain, Aug. 3, 1970, 161,102  
Int. Cl. B65d 41/18

U.S. Cl. 222—570

1 Claim

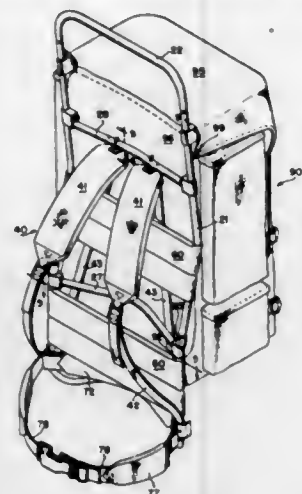


A pouring spout for containers containing liquids formed of a single part of resilient plastic material, comprising a cylindri-



cal rotatable neck which fits the inside of the dispensing opening of the container, and possesses an outer peripheral reinforced rim exerting a grip under the edge of the opening. From this cylindrical neck extends radially a pouring spout provided with a lateral wall which runs along that portion of the cylindrical neck which is opposite the pouring spout and has an outer ledge which also runs along such wall. Furthermore, the pouring spout comprises a lid which completely covers the cylindrical neck and the pouring spout thus protecting them from dust and dirt. Along this lid runs a hanging wall provided with an inner reinforcing rim which in turn grips under the outer ledge of the wall of the pouring spout and of the cylindrical neck. This outer ledge of the cylindrical neck wall possesses a notch the purpose of which is to allow free passage of air into the interior of the container during the dispensing act.

porting belt but carry very little strain themselves. The shoulder straps themselves are adjustable as to length and



3,733,016

## CLOTHES HANGER ATTACHMENT

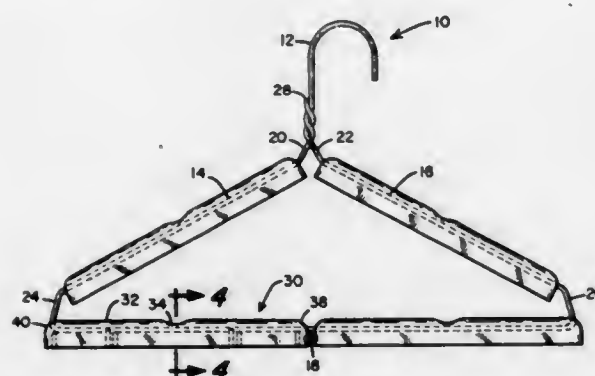
Robert M. Rood, 3325 Victoria Road, St. Paul, Minn.

Filed Feb. 1, 1971, Ser. No. 111,498

Int. Cl. A47J 51/094

U.S. Cl. 223-86

8 Claims



A clothes hanger attachment for use with wire garment hangers is described. A unitary molded wire hanger attachment having end notches for preventing twisting on the wire and having molded wire attachment notches is described, the hanger attachment adapted to fit the sloped shoulder portion of the wire hanger or the cross-member of the hanger. A molded depression in the supporting surface provides shoulder strap restraint, and applies pressure to the wire hanger for mounting. A method for providing a scent in the hanger attachment during the molding process for subsequent release for deodorizing clothing, or providing a perfumed scent is also described.

3,733,017

## ADJUSTABLE PACK FRAME

Murray J. Pletz, Bellevue, Wash., assignor to K2 Corporation, Vashon, Wash.

Filed Mar. 22, 1971, Ser. No. 126,408

Int. Cl. A45F 3/00

U.S. Cl. 224-8 R

5 Claims

A pack frame for hikes which is light and flexes with movement of the wearer's body. The majority of the carried weight is supported by the hips and the pack is adjustably suspended within the frame such that it may be placed in the most comfortable position relative to the frame. Shoulder straps are provided to keep the pack from pivoting about the weight sup-

pivotable about the anchor points thus making the pack extremely versatile and comfortable for wearers of varying stature.

3,733,018

## PRINT INSPECTION AND REPRINT APPARATUS

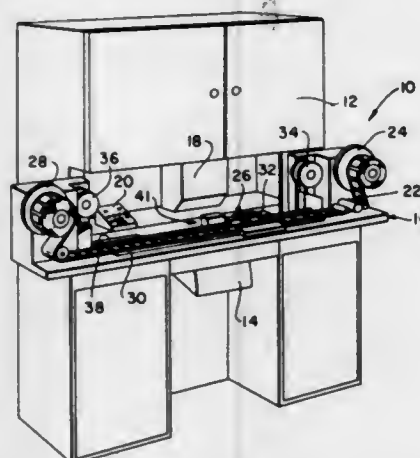
Joseph F. Breilmayer, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 15, 1972, Ser. No. 234,799

Int. Cl. B65h 23/18

U.S. Cl. 226-2

10 Claims



Print inspection and reprint apparatus for cooperation with a photographic printer wherein negatives in a roll of spliced film orders are advanced stepwise into the exposure station of the photographic printer in synchronization with the continuous advancement of finished photographic prints on a print roll through a print inspection station. The operator of the inspection apparatus inspects the prints as they advance continuously through the print inspection station, halts the advancement of unacceptable prints in the print inspection station, marks such unacceptable prints and reprints, with appropriate exposure correction, the corresponding negative located in the exposure station of the photographic printer. The prints continuously move through the inspection station at a variable, operator controlled speed. The stepwise negative advancement synchronized to the continuous advancement of the prints is controlled by a circuit responsive to print marks and order separation marks on the prints and splices attaching ends of successive negative filmstrips. Synchronization is maintained under conditions including: (1) full orders of prints and negatives; (2) two prints per negative; (3) fewer prints than negatives; and (4) fewer negatives than prints. When the photographic print material is exhausted in the printer, it is developed, and the remake prints may be synchronized to the original print orders to complete the customer print orders.

3,733,019

## TAPE CASSETTES

Flavio Bisson, Montalto Dora, Italy, assignor to Ing. C. Olivetti &amp; C., S.P.A., Turin, Italy

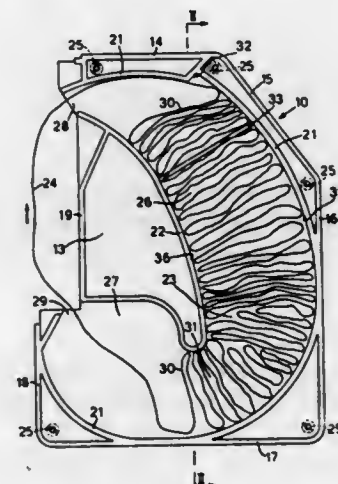
Filed Feb. 17, 1971, Ser. No. 116,043

Claims priority, application Italy, Feb. 17, 1970, 67512 A/70

U.S. Cl. 226-119

Int. Cl. B65h 17/42

6 Claims



A tape cassette is disclosed including a holding chamber substantially in the shape of an upper case G having a downward branch including a tape entrance and an upward branch including a tape exit. The cross-sectional area of the downward branch increases to a maximum and then decreases to a minimum, the minimum occurring at the junction between the upward and downward branches. The walls defining the downward branch are also stepped providing a sudden increase in the cross-sectional area of the branch, allowing the tape to fall easily therethrough.

3,733,020

## APPARATUS FOR AUTOMATIC NAILING OF PREASSEMBLED WOOD STAIRS

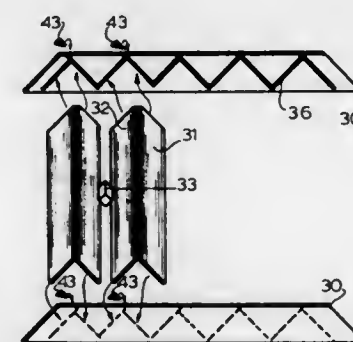
Harry T. Ingram, 1800 Rankin St., Raleigh, N.C.

Filed Dec. 29, 1971, Ser. No. 213,310

Int. Cl. B27I 7/06

U.S. Cl. 227-5

12 Claims



Precut and grooved stringers, precut treads and risers are temporarily secured together in the form of a stair which is then received by an apparatus which automatically indexes the stair step by step past left, right and top banks of nailers which nail the stringers and risers to the treads to produce a permanently secured stair.

3,733,021

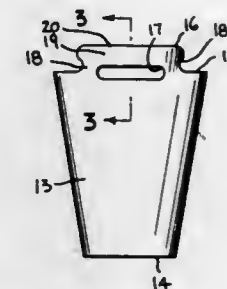
## FLEXIBLE MOUSTACHE CUP

Maxine G. Levin, Westhill Drive, Gates Mills, Ohio

Filed May 28, 1971, Ser. No. 147,897

Int. Cl. B65d 3/28, 3/06

3 Claims



A drinking cup formed of paper stock or other resiliently flexible sheet material and having a movable upper lip protector extending therefrom and integrated therewith for snap action retention in a position of either non-use or use.

3,733,022

## UNITARY HINGED PLASTIC PROTECTOR FOR OPENED SHELF-STORAGE TYPE BOXES

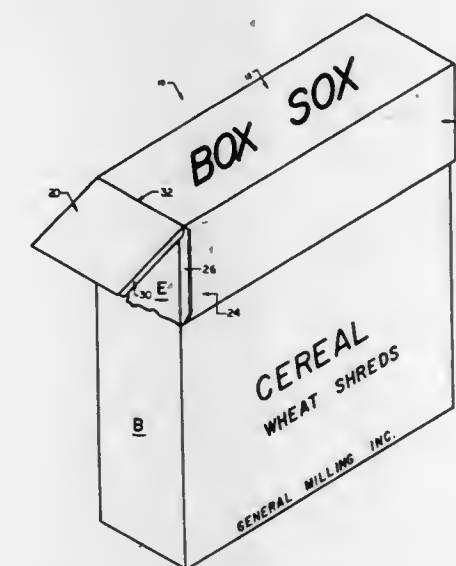
Anita L. Kapiloff, 2845 McGill Terrace, N.W., Washington, D.C.

Filed Apr. 16, 1971, Ser. No. 134,709

Int. Cl. B65d 43/16

U.S. Cl. 229-7 R

2 Claims



A one-piece plastic box top for pantry-type food boxes and the like, comprising top, two sides, and two ends, with one entire end pivoted on a unitary hinge to open downward providing complete clearance for contents of a box to be poured without touching the box top, and with the other end of the box top sealed to the sides to position them, assuring a tight fit; means are provided to hold the hinged door in the open position and in the closed position.

3,733,023

## CUP-SHAPED CARTON WITH GUSSETED SEAMS

Edwin L. Arneson, Hillsdale, N.J., assignor to Federal Paper Board Company, Inc., Montvale, N.J.

Filed Apr. 13, 1971, Ser. No. 133,686

Int. Cl. B65d 5/24, 3/04

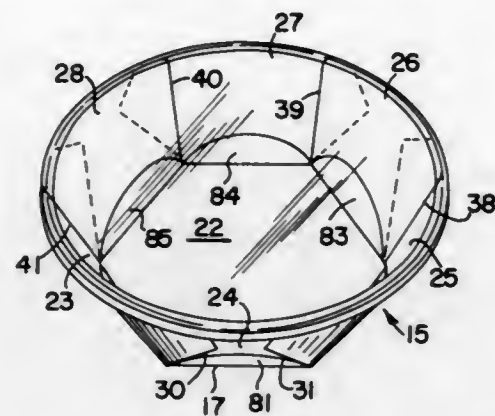
U.S. Cl. 229-31

4 Claims

A container or package which is adapted for use in the packaging of a variety of products where the container is



formed from a single paperboard blank which is cut and scored so that it may be folded into a cup-like or dish-like body shape with gusseted side wall seams and a marginal rim



formation enabling the container to be filled with a liquid product without leakage at the seams and to be readily closed by the application of a cover member secured or seated on the rim formation.

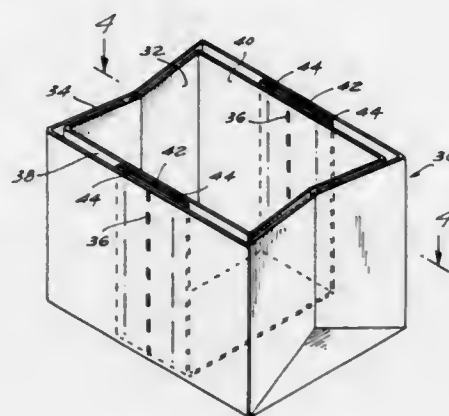
### 3,733,024 CONTAINER

Robert W. Bolling, Jr., Frank S. McCall, and Henry J. Rawl, all of Savannah, Ga., assignors to Union Camp Corporation, Wayne, N.J.

Filed Sept. 18, 1969, Ser. No. 858,947  
Int. Cl. B65d 33/02

U.S. Cl. 229—55

6 Claims



A paper container of the bag type is provided wherein the wall structure incorporates an elastic, longitudinally oriented strip overlying a weakened section of the wall. The elastic strip is bonded to the wall along bonding zones on both sides of the weakened section of the wall, leaving the area of the strip overlying the weakened section free and unattached to the wall. This arrangement concentrates undue dynamic and static stresses at the weakened section of the wall where they are taken up by the elastic strip after rupture of the weakened section.

### 3,733,025 EASY OPENING ENVELOPE

Walter L. Hiersteiner, Shawnee Mission, Kans., assignor to Tension Envelope Corporation, Kansas City, Mo.

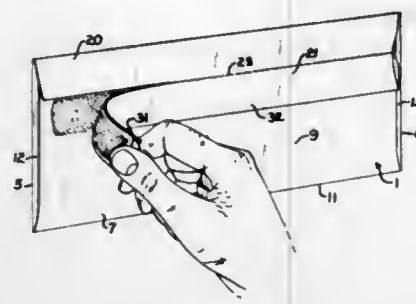
Filed June 10, 1971, Ser. No. 151,691  
Int. Cl. B65d 27/16, 27/34

U.S. Cl. 229—85

3 Claims

The seal flap of an envelope has a portion reinforced by folding and adhesive connection, the reinforced portion being

divided from the remainder of the seal flap by a line of tear perforations. A releaseable adhesive connection is made



between the outside of said portion and the back of the envelope whereby said portion may be peeled across the back of the envelope to open same.

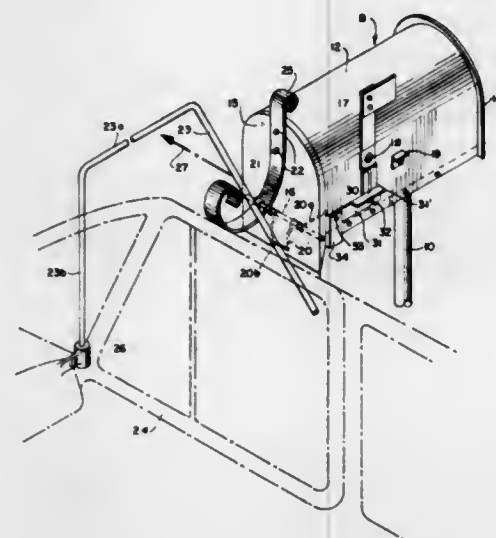
### 3,733,026 MAIL BOX WITH DOOR OPENING MEANS

Lacy A. Rowe, 1851 Skycoe Drive, and John A. Whitley, Rt. No. 1 Box 64, both of Salem, Va.

Filed May 22, 1972, Ser. No. 255,205  
Int. Cl. B65d 91/00

U.S. Cl. 232—35

9 Claims



A roadside mail box is especially adapted to be opened and closed by movement of a mail service vehicle past it. The box has a door provided with an outwardly projecting arm which is engageable by a slanted actuating rod mounted on the vehicle. As the vehicle approaches the box, engagement of the actuating rod with the arm opens the box door. As the vehicle leaves the box, the rod becomes disengaged from the arm and the door is closed by a spring. A signal flag on the box, if raised, is automatically lowered by opening of the door.

### 3,733,027 ELECTRIC FUEL CONTROL FOR GAS GRIDDLE

Clarence H. Napier, 3207 N. 53rd Lane, Phoenix, Ariz.

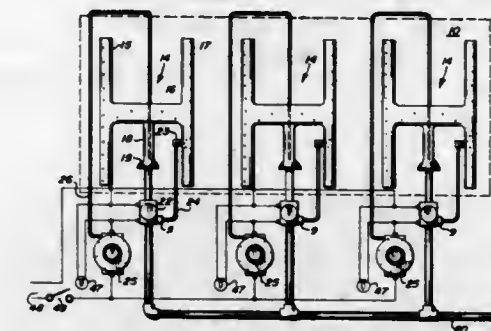
Filed Mar. 31, 1972, Ser. No. 240,196  
Int. Cl. G05d 23/12

U.S. Cl. 236—20

9 Claims

This specification discloses a griddle comprising a thick griddle plate, a plurality of burners positioned below the plate, a gas header line connected to each of the burners by a branch line in which is included a solenoid operated valve, and a thermostat control switch operatively associated with each solenoid valve with the operation of the switch being controlled by a mercury filled capillary tube, the free end of which is in-

serted in the griddle plate in close proximity to the upper surface thereof with the lower portion of the tube being insulated



from the griddle plate. A pilot is associated with each burner and is connected to the input side of the solenoid valve for that burner.

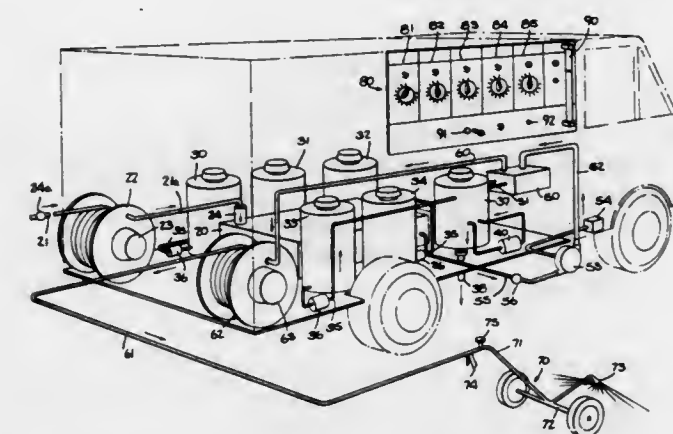
### 3,733,028 METHOD OF SPRAYING TURF AND THE LIKE

James B. McVey, Hill City, S. Dak.

Division of Ser. No. 811,918, April 1, 1969, Pat. No. 3,612,356. This application Mar. 12, 1971, Ser. No. 123,630  
Int. Cl. A62c 1/12

U.S. Cl. 239—10

12 Claims



The disclosure relates to a method and apparatus for spraying a predetermined mixture of liquid chemicals onto turf and the like. A small size panel truck is provided with a plurality of containers for housing liquid chemicals, a means for automatically mixing the chemicals in accordance with a predetermined selection, means for connecting an external water supply to the vehicle, and means for introducing chemicals into the water which is then ultimately applied to the turf or the like.

### 3,733,029 SNOW PRECIPITATOR

William E. C. Eustis, Cambridge, and Wallace E. Howell, Lexington, both of Mass., assignors to Hedco, Inc., Bedford, Mass.

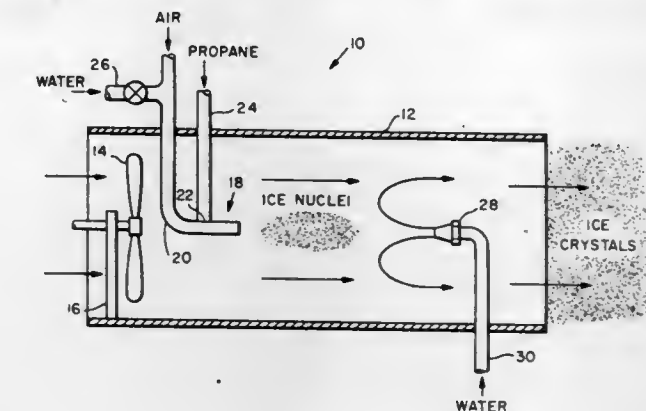
Division of Ser. No. 854,103, Aug. 29, 1969. This application July 23, 1971, Ser. No. 165,689  
Int. Cl. A01g 15/00; E01h 13/00

U.S. Cl. 239—14

12 Claims

A snow-making apparatus wherein ice nuclei are generated by spontaneous nucleation in a separate, distinct nucleation zone. Water, slightly above the freezing temperature, is discharged through a nozzle and broken up into water

droplets. The water droplet formation and ice nucleation formation are separately controlled. A propeller at one end of the housing moves an air mass through the housing to mix the ice nuclei and water droplets. The water droplets are infected



with the ice nuclei, the ice-infected water droplets discharged into the atmosphere, and snow-like particles ultimately fall to the ground. Structure is provided to control separately each of the steps; namely, ice nuclei formation, the water droplet formation, and the flow of the air stream.

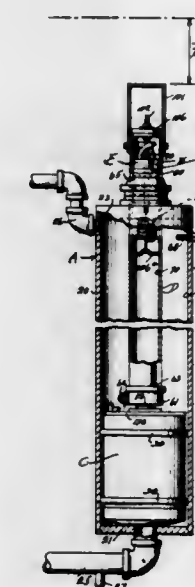
### 3,733,030 UNDERGROUND WATER DISCHARGING AND SPRINKLING DEVICE

Lauren M. Carstenson, P.O. Box 21, Phillips, Nebr.

Filed Mar. 29, 1971, Ser. No. 128,737  
Int. Cl. B05b 3/04

U.S. Cl. 239—205

6 Claims



An underground water discharging and irrigation sprinkler including an elongated housing having a riser tube slidably mounted therein, a water motor being mounted adjacent the lowermost end of the riser tube and a discharge nozzle being provided adjacent the other end thereof, and water inlet means connected with the housing for selectively raising the riser tube within the housing to elevate the nozzle thereof above the ground and lowering the riser tube within the housing to retract the nozzle belowground.

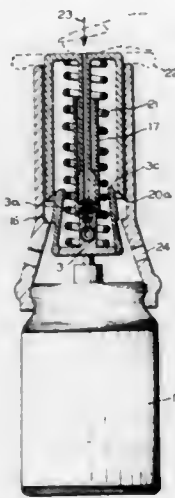


3,733,031

**COMPRESSED AIR OPERATED DISPENSING SYSTEM**  
Jean Marand, Saint-Benoit, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 19, 1970, Ser. No. 90,897  
Int. Cl. B05b 7/30

U.S. Cl. 239—349



A product container having a valve stem is coupled to the first of two flow passages in a coupler-aspirator. The flow passages join at a nozzle. The second flow passage communicates with a first chamber. A guide fits over and extends above the product container and has ridges on the interior thereof. Notched winged portions of the coupler-aspirator are retained on the ridges. A cylinder having a second chamber is coupled to the coupler-aspirator and positioned therebetween is a flexible annular gasket. A hollow valve stem having radial openings is mounted for movement within the chambers. The inner periphery of the gasket obturates the radial openings. A piston slides within the cylinder. Integral with the piston is an actuating member, and integral with the actuating member is a downwardly extending flange concentric around the piston. The bottom of the flange is beveled to mate with the beveled upper edges of the winged portions of the coupler-aspirator.

3,733,032

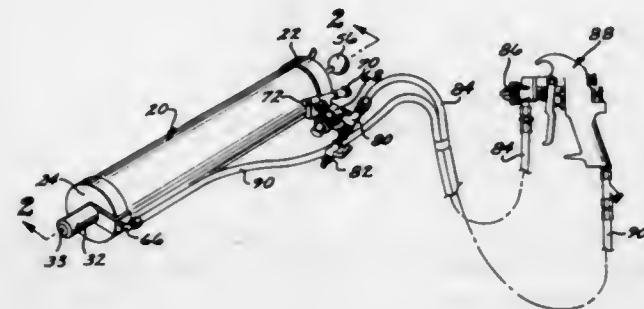
**QUICK LOAD PRESSURE POT**

Harold D. McLeod, 11617 Ryerson Avenue, Downey, Calif.  
Filed Mar. 27, 1972, Ser. No. 238,595

Int. Cl. B05b 9/00

U.S. Cl. 239—373

10 Claims



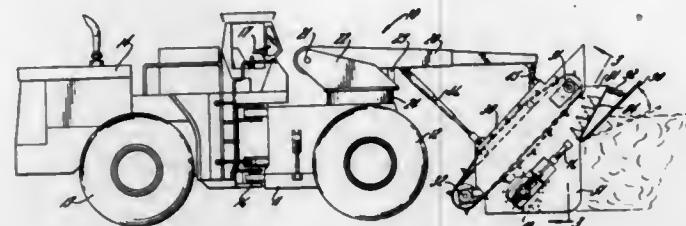
A pressurized cylinder for receiving liquids to be sprayed from connected equipment. The cylinder includes a movable piston that facilitates quick loading and cleaning as it is adjusted to predetermined positions.

**COMPOST AND REFUSE SHREDDING AND SHIFTING APPARATUS**

Herbert T. Cobey, P.O. Box 313, Crestline, Ohio  
Filed Mar. 22, 1971, Ser. No. 126,417  
Int. Cl. B02c 19/00

8 Claims U.S. Cl. 241—30

20 Claims



An improved apparatus for shredding, shifting and aerating organic wastes, refuse and other material that includes an endless web carrying a plurality of outwardly projecting elements which is moved in an upwardly and forwardly extending orbital path as the working face of the web engages the material and also includes a rotatable drum having outwardly extending elements that is positioned forwardly of the web near the lower portion of the orbital path. The plane of the web is adjustable relative to both the longitudinal and vertical axis of the chassis and the drum is vertically adjustable in a direction generally parallel to the plane of the upwardly moving web. In the preferred embodiment, the web and drum are supported from a self-propelled chassis.

3,733,034

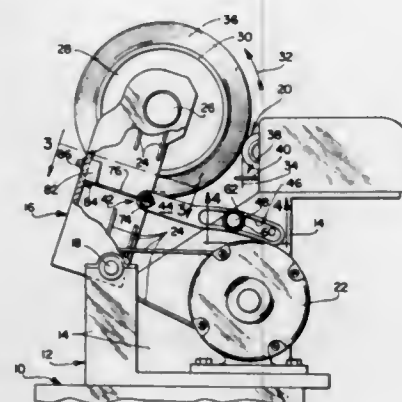
**WINDING APPARATUS**

James N. Allam, Woonsocket; and William M. Bense, Barrington, both of R.I., assignors to Leesona Corporation, Warwick, R.I.

Filed Mar. 1, 1971, Ser. No. 122,601  
Int. Cl. B65h 54/02

U.S. Cl. 242—18 R

8 Claims



Winding apparatus, such as a Model 959 take-up machine, manufactured by Leesona Corporation, Warwick, R.I., has a base on which a spindle frame is pivotally mounted for receiving a yarn package and urging the package against a roller bail mounted on the base. As the package increases in diameter during winding, the spindle frame is progressively moved away from the roller bail which continues to engage the face of the package. The package may tend to bounce or otherwise move away from and toward the roller bail for various reasons, such as an eccentricity in the longitudinal face of the package developing during winding or caused by an eccentric package core. A friction type dampener is provided for dampening such movement of the package on and off of the bail. This dampener has a frictional dampening part fixed to the base and movably secured to the spindle frame by a leaf spring hav-

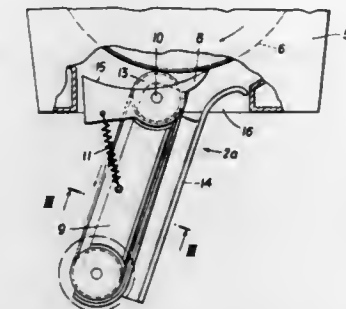
3,733,036

**CASSETTE FEED-OUT DEVICE**

Friedrich Eitzenberger, Neustadt, Austria, assignor to Karl Vockenhuber, and Raimund Hausen, both of Vienna, Austria

Filed Aug. 20, 1971, Ser. No. 173,485  
Claims priority, application Austria, Sept. 28, 1970, 8749  
Int. Cl. G03b 1/04; G11b 15/32  
U.S. Cl. 242—192

11 Claims



A feed-out device for extracting the leading end of a strip wound on a cassetted reel has a stripper hinged to the forward end of a support, which is inserted into the cassette during feed-out. The support is provided with a bearing surface which engages the strip roll periphery, and the stripper is biased resiliently to engage the roll periphery — thus irrespective of the size of the roll, the thrust of the stripper against its surface and its angle of attack remain substantially constant.

3,733,037

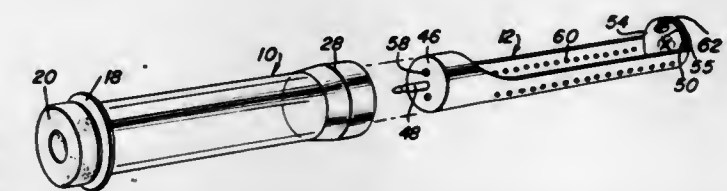
**CLOSURE MEANS FOR PNEUMATIC CARRIER**

John C. Vandiveer, 4205 Benjestown Road, Memphis, Tenn.  
Filed Oct. 14, 1970, Ser. No. 80,753

Int. Cl. B65g 51/06

U.S. Cl. 243—35

7 Claims



A closure assembly for pneumatic tube carriers that enables quick attachment and release of a liner therein for both closing the carrier and permitting easy withdrawal of the contents thereof.

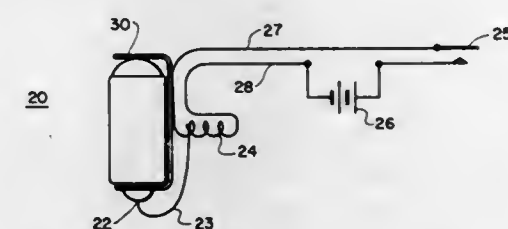
3,733,038

**DISCHARGE DEVICE FOR ELECTROSTATIC CHARGES**  
Kurt Ikrath, Elberon, and Kenneth J. Murphy, Red Bank, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 4, 1971, Ser. No. 140,171  
Int. Cl. H05f 3/06

U.S. Cl. 244—1 A

4 Claims



This disclosure relates to aircraft and particularly to devices for reducing the triboelectric or electrostatic charge on an air-

ing one end fixed to the dampener and the other end secured to the spindle frame to eliminate any play therebetween in the direction of movement of the spindle frame toward and away from the roller bail, while permitting relative movement between the spindle frame and the dampener. Frictional retardation provided by the dampener is adjustable.

3,733,035

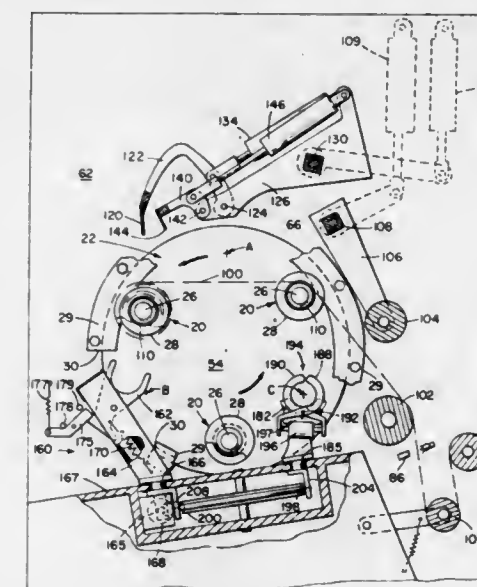
**WINDER**

Charles M. Schott, Jr., Way Road, Gloucester, Mass.  
Filed Mar. 10, 1971, Ser. No. 122,815

Int. Cl. B65h 19/20

U.S. Cl. 242—56 A

30 Claims



Winders capable of production of consumer rolls of an elongated web. A turret assembly has spindles rotatable about respective spindle axes and movable along a path through a series of index stations. A spindle drive is operable to produce spindle rotation at least at the start-up station and a turret drive is operable to move the spindles through the stations. A roll unloader is adjacent the roll unload station, a core loader is adjacent the core load station, and the loader and unloader each have elements movable parallel to the spindle axes to respectively slide fresh cores over and remove wound rolls from the spindles. A roll starting or tucking assembly comprises an enveloping member mounted adjacent the start-up station and movable across the path between a retracted position and an enveloping position adjacent a spindle at the start-up station, and a web tucking member mounted for movement about a tucking axis between a retracted position and a tucking position. The tucking member when in the tucking position extends between the enveloping member and the spindle at the start-up station, whereby the enveloping and tucking members cause the web to envelop the spindle from opposite sides thereof. Also shown are a core loader in the form of a tray and pushers; a core unloader in the form of grooved rings confined to the spindles and engaged by a stripping fork; simultaneous dependent drive of the loader and unloader; a hopper having a wall moving to and fro through a special path; a triggered idler method of controlling belt drive of the spindles and other important features. In another aspect spindle start-up for webs having perforations is accomplished by a blunt-edged blade which by impact breaks the perforations, with the free end carried about the blade edge into tucked relation. For non-perforated webs there is a severing member downstream from the tucking blade.



craft. More particularly, this disclosure relates to a device for penetrating the gaseous dielectric insulation around an aircraft to discharge the accumulated charge on said aircraft. More particularly, this disclosure relates to the projection of a stream of conductive gases, at high velocity, through the air surrounding an aircraft, towards ground or any point of high potential gradient with respect to the aircraft, to provide a conductive discharge path through the air to neutralize any electrostatic charge on the aircraft.

3,733,039

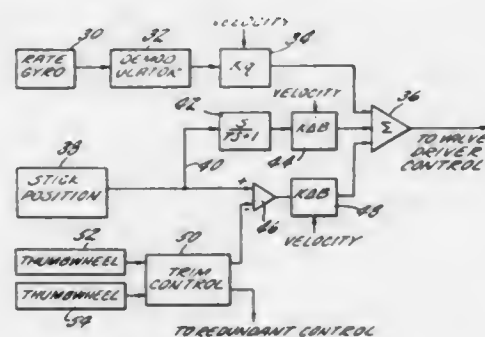
# FEEL AUGMENTATION CONTROL SYSTEM FOR HELICOPTERS

Sean J. O'Connor, Monroe, and Franklin A. Tefft, Killingworth, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed May 20, 1971, Ser. No. 146,572  
Int. Cl. B64c 13/08

U.S. Cl. 244—77 D

7 Claims



The handling capability of helicopters at high speed is enhanced by applying a force to the cyclic stick which is related to the resultant load factor induced on the helicopter by movement of the cyclic stick by the pilot. A feed augmentation system responds to craft pitch rate, cyclic stick deflection and cyclic stick deflection rate signals as a function of airspeed to provide a control force feel on the cyclic stick that does not vary with speed. Both pitch and roll axis controls can be provided.

3,733,040

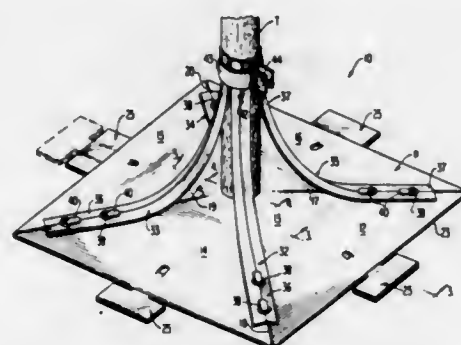
# NO-TILT CHRISTMAS TREE STAND

Camile J. Rocquin, 6011 Airline Highway, Metairie, La.

Filed June 28, 1971, Ser. No. 157,311  
Int. Cl. A47g 33/12

U.S. Cl. 248—48

8 Claims



This disclosure relates to a nontilting Christmas tree stand or the like which includes a base, a plurality of supports carried by an upper surface of the base, each support having terminal upper and lower end portions, first means removably securing the lower end portions of each support to the base, and second means for removably securing the upper end portions of each support to an associated tree. The first means are

preferably in the form of a plurality of tabs formed in the base or in a plate sandwiched between the base and the support lower end portions which engage in slots formed in the support lower end portions. The second means are simply openings in the support upper end portions which receive nails, screws or the like and/or an adjustable clamping band which exteriorly surrounds the support upper end portions. Moreover, to impart stability to the stand the same is provided with outriggers or feet which are likewise interlockingly secured to the base by tabs and slots with the outriggers having arms which pass through openings formed in a peripheral reinforcing bead of the base in one embodiment of the invention.

3,733,041

# DEVICE FOR THE DISPLAY OF BOTTLES

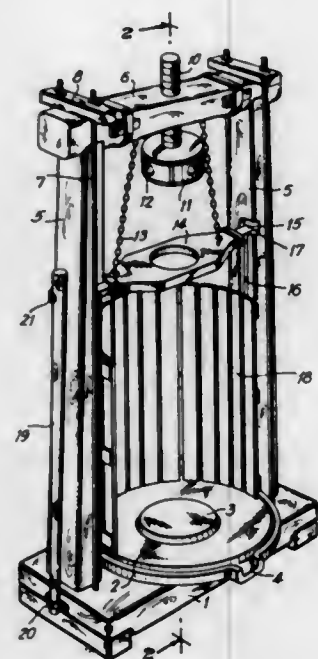
Juan Cusco Clavera, San Sadurn de Noya, Spain, assignor to Segura Viudas, S.A., Barcelona, Spain

Filed Nov. 9, 1971, Ser. No. 197,005

Claims priority, application Spain, Nov. 10, 1970, 163,552  
Int. Cl. A47g 23/02

U.S. Cl. 248—154

6 Claims



A display device for a bottle of wine has features simulating an antique wine press. The device includes a base with means to center the bottle and a structure carrying a clamp that holds the bottle firmly on the base. A collar fits the neck of the bottle to secure the bottle transversely relative to the structure.

3,733,042

# CAMERA STAND

Vernon H. Jungjohann, Rochester, and Ronald E. Lohrman, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

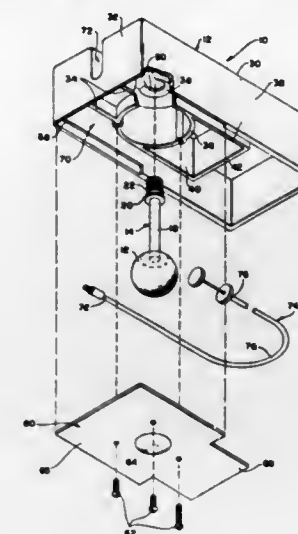
Filed Aug. 2, 1971, Ser. No. 168,254

U.S. Cl. 248—181

4 Claims

A stand for supporting a photographic camera includes a recess for receiving and storing a cable release. The stand has a base and a support arm, with a ball head at one end of the

support arm movably supported within bearing means in the base by a cover spring. The cover spring extends over a por-



tion of the hollow interior of the base and thereby defines the recess for receiving and storing a cable release usable with the camera.

3,733,043

# COAT HOOK ASSEMBLY

Julian R. H. Binns, c/o Harvest Works, Vale Road, and Kenneth H. Grange, 7A Hampstead High St., both of London, England

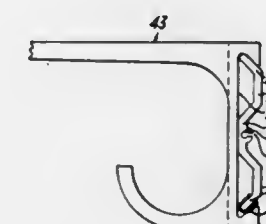
Filed May 25, 1971, Ser. No. 146,721

Claims priority, application Great Britain, May 28, 1970, 25,723/70

Int. Cl. A47f 5/06; A47h 1/02

U.S. Cl. 248—225

2 Claims



A coat hook or hat and coat hook assembly comprising a wall plate, which may be a length of an extruded section, which is secured to a wall or backboard, and one or more coat and/or hat and coat hooks, the rear part of each hook and the front part of the wall plate being so formed that the hook or hooks may be slid laterally into position on the wall plate and then locked into position. End caps may be fitted to the two ends of the assembly.

3,733,044

# TISSUE CONTAINING BOX HOLDER

Walter P. Rabner, 13861 Fresh Meadow, Apt. 1-H, Seal Beach, Calif.

Filed Jan. 11, 1971, Ser. No. 105,358

Int. Cl. A26c 33/00

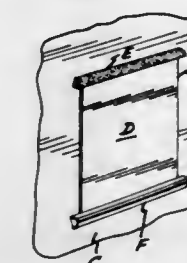
U.S. Cl. 248—313

1 Claim

A tissue containing box holder that includes first and second parallel, spaced, cross pieces that are connected by a backing plate, and fastening means for securing the plate to a vertical wall surface. The first cross piece supports at least one downwardly projecting prong that has the free end extremity thereof spaced from a longitudinally extending apex on the

second cross piece a distance less than the width of a conventional tissue holding cardboard box such as in which Kleenex is retailed.

The edge portions of such a box are rigid and the walls extending between the edges are resilient. When a Kleenex box has a first side wall placed in pressure contact with the prongs



and a second side wall in contact with the apex, the side walls are bowed inwardly towards one another, and any force exerted on the box in removing the tissue therefrom tends to pivot the box towards the prongs to increase the pressure engagement therewith, and prevent the box from being inadvertently displaced from the holder.

3,733,045

# APPARATUS FOR LINING ROTARY KILNS

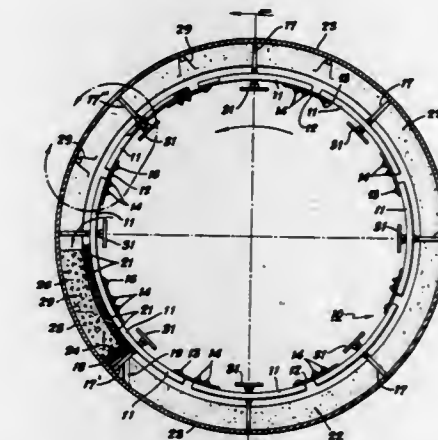
Larry L. Mann, Mexico, Mo., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Feb. 18, 1971, Ser. No. 116,484

Int. Cl. B28b 7/30

U.S. Cl. 249—184

3 Claims



A method and apparatus for lining rotary kilns with monolithic castable refractory comprises rings made of segments preferably adjustably attached to each other so the rings can be adjusted to desired circumference, the rings having removable spacer elements which support the rings on and space them from the kiln shell. Forms are attached to the rings and castable refractory placed between the forms and the kiln shell to form the lining. The lining is cast in sections, the kiln being rotated so that the casting of each section is done in a downward direction. The spacer elements are removed from each section prior to casting refractory material in that section.

3,733,046

# CONSTRUCTIBLE TUBE VALVE

Irving D. Press, West Orange, N.J., assignor to Resistoflex Corporation, Roseland, N.Y.

Filed Mar. 22, 1971, Ser. No. 126,436

Int. Cl. F16k 7/06

U.S. Cl. 251—8

17 Claims

Clamps disposed at opposite sides of a tube of PTFE resin or other crack sensitive material maintain regions at each side of



craft. More particularly, this disclosure relates to a device for penetrating the gaseous dielectric insulation around an aircraft to discharge the accumulated charge on said aircraft. More particularly, this disclosure relates to the projection of a stream of conductive gases, at high velocity, through the air surrounding an aircraft, towards ground or any point of high potential gradient with respect to the aircraft, to provide a conductive discharge path through the air to neutralize any electrostatic charge on the aircraft.

3,733,039

# FEEL AUGMENTATION CONTROL SYSTEM FOR HELICOPTERS

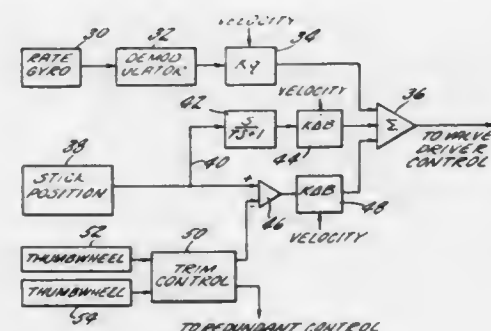
Sean J. O'Connor, Monroe, and Franklin A. Tefft, Killingworth, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed May 20, 1971, Ser. No. 146,572

Int. Cl. B64c 13/08

U.S. Cl. 244—77 D

7 Claims



The handling capability of helicopters at high speed is enhanced by applying a force to the cyclic stick which is related to the resultant load factor induced on the helicopter by movement of the cyclic stick by the pilot. A feed augmentation system responds to craft pitch rate, cyclic stick deflection and cyclic stick deflection rate signals as a function of airspeed to provide a control force feel on the cyclic stick that does not vary with speed. Both pitch and roll axis controls can be provided.

3,733,040

# NO-TILT CHRISTMAS TREE STAND

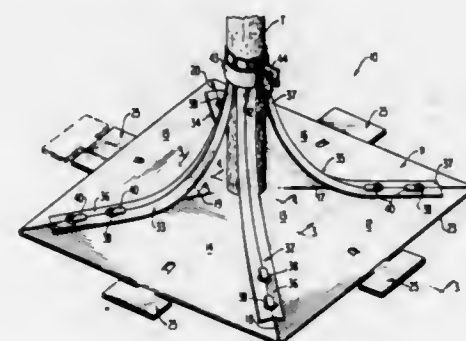
Camile J. Rocquin, 6011 Airline Highway, Metairie, La.

Filed June 28, 1971, Ser. No. 157,311

Int. Cl. A47g 33/12

U.S. Cl. 248—48

8 Claims



This disclosure relates to a nontilting Christmas tree stand or the like which includes a base, a plurality of supports carried by an upper surface of the base, each support having terminal upper and lower end portions, first means removably securing the lower end portions of each support to the base, and second means for removably securing the upper end portions of each support to an associated tree. The first means are

preferably in the form of a plurality of tabs formed in the base or in a plate sandwiched between the base and the support lower end portions which engage in slots formed in the support lower end portions. The second means are simply openings in the support upper end portions which receive nails, screws or the like and/or an adjustable clamping band which exteriorly surrounds the support upper end portions. Moreover, to impart stability to the stand the same is provided with outriggers or feet which are likewise interlockingly secured to the base by tabs and slots with the outriggers having arms which pass through openings formed in a peripheral reinforcing bead of the base in one embodiment of the invention.

3,733,041

# DEVICE FOR THE DISPLAY OF BOTTLES

Juan Cosco Clavera, San Sadurn de Noya, Spain, assignor to Segura Viudas, S.A., Barcelona, Spain

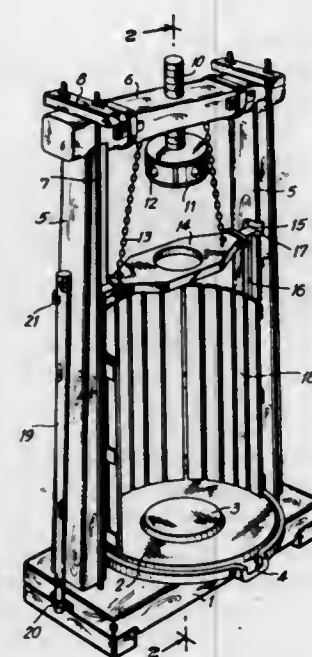
Filed Nov. 9, 1971, Ser. No. 197,005

Claims priority, application Spain, Nov. 10, 1970, 163,552

Int. Cl. A47g 23/02

U.S. Cl. 248—154

6 Claims



A display device for a bottle of wine has features simulating an antique wine press. The device includes a base with means to center the bottle and a structure carrying a clamp that holds the bottle firmly on the base. A collar fits the neck of the bottle to secure the bottle transversely relative to the structure.

3,733,042

# CAMERA STAND

Vernon H. Jungjohann, Rochester, and Ronald E. Lohrman, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 2, 1971, Ser. No. 168,254

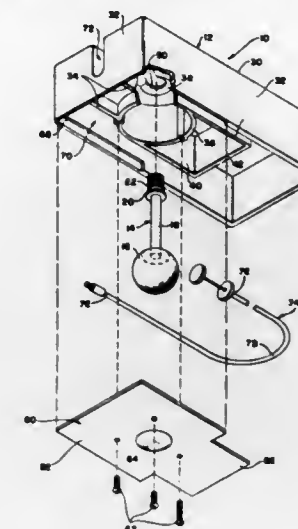
Int. Cl. F16c 11/06

U.S. Cl. 248—181

4 Claims

A stand for supporting a photographic camera includes a recess for receiving and storing a cable release. The stand has a base and a support arm, with a ball head at one end of the

support arm movably supported within bearing means in the base by a cover spring. The cover spring extends over a por-



tion of the hollow interior of the base and thereby defines the recess for receiving and storing a cable release usable with the camera.

3,733,043

# COAT HOOK ASSEMBLY

Julian R. H. Binns, c/o Harvest Works, Vale Road, and Kenneth H. Grange, 7A Hampstead High St., both of London, England

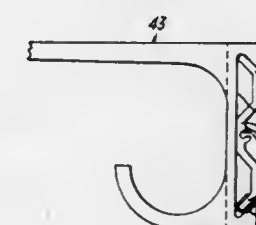
Filed May 25, 1971, Ser. No. 146,721

Claims priority, application Great Britain, May 28, 1970, 25,723/70

Int. Cl. A47h 5/06; A47h 1/02

U.S. Cl. 248—225

2 Claims



A coat hook or hat and coat hook assembly comprising a wall plate, which may be a length of an extruded section, which is secured to a wall or backboard, and one or more coat and/or hat and coat hooks, the rear part of each hook and the front part of the wall plate being so formed that the hook or hooks may be slid laterally into position on the wall plate and then locked into position. End caps may be fitted to the two ends of the assembly.

3,733,044

# TISSUE CONTAINING BOX HOLDER

Walter P. Rabner, 13861 Fresh Meadow, Apt. 1-H, Seal Beach, Calif.

Filed Jan. 11, 1971, Ser. No. 105,358

Int. Cl. A26c 33/00

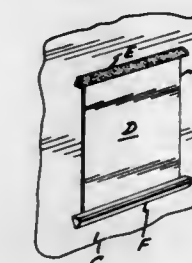
U.S. Cl. 248—313

1 Claim

A tissue containing box holder that includes first and second parallel, spaced, cross pieces that are connected by a backing plate, and fastening means for securing the plate to a vertical wall surface. The first cross piece supports at least one downwardly projecting prong that has the free end extremity thereof spaced from a longitudinally extending apex on the

second cross piece a distance less than the width of a conventional tissue holding cardboard box such as in which Kleenex is retailed.

The edge portions of such a box are rigid and the walls extending between the edges are resilient. When a Kleenex box has a first side wall placed in pressure contact with the prongs



and a second side wall in contact with the apex, the side walls are bowed inwardly towards one another, and any force exerted on the box in removing the tissue therefrom tends to pivot the box towards the prongs to increase the pressure engagement therewith, and prevent the box from being inadvertently displaced from the holder.

3,733,045

# APPARATUS FOR LINING ROTARY KILNS

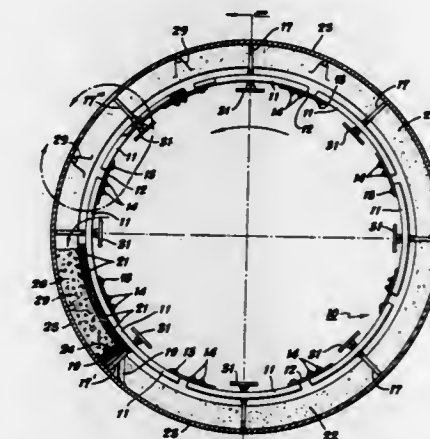
Larry L. Mann, Mexico, Mo., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Feb. 18, 1971, Ser. No. 116,484

Int. Cl. B28b 7/30

U.S. Cl. 249—184

3 Claims



A method and apparatus for lining rotary kilns with monolithic castable refractory comprises rings made of segments preferably adjustably attached to each other so the rings can be adjusted to desired circumference, the rings having removable spacer elements which support the rings on and space them from the kiln shell. Forms are attached to the rings and castable refractory placed between the forms and the kiln shell to form the lining. The lining is cast in sections, the kiln being rotated so that the casting of each section is done in a downward direction. The spacer elements are removed from each section prior to casting refractory material in that section.

3,733,046

# CONSTRICTABLE TUBE VALVE

Irving D. Press, West Orange, N.J., assignor to Resistoflex Corporation, Roseland, N.Y.

Filed Mar. 22, 1971, Ser. No. 126,436

Int. Cl. F16k 7/06

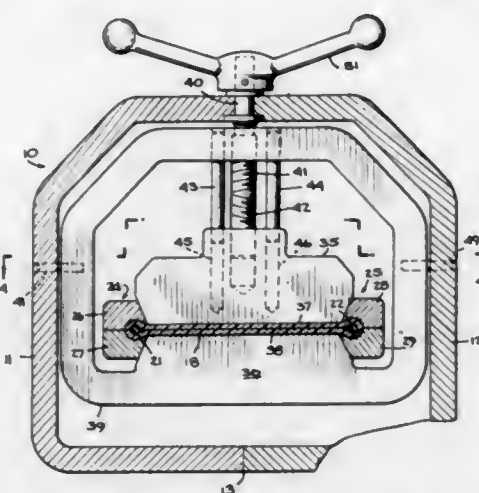
U.S. Cl. 251—8

17 Claims

Clamps disposed at opposite sides of a tube of PTFE resin or other crack sensitive material maintain regions at each side of



the tube in constantly constricted fluid sealing condition free from crack inducing flexure secured in sealing embrace about a smoothly curving filler piece. In combination with a pair of



compressor members there is thus provided a constrictable tube valve having a tube of crack sensitive material which will not crack upon valve manipulation.

3,733,047

#### COMPENSATING PLUNGER FOR SOLENOID VALVE AND METHOD OF MAKING

Walter E. Allen, Prospect, Conn., assignor to Peter Paul Electronics, New Britain, Conn.

Filed June 10, 1971, Ser. No. 151,811

Int. Cl. F16k 31/02

U.S. Cl. 251-141

12 Claims



A fluid control valve for an hydraulic system and having a compensating plunger movable in response to energization of a solenoid to alter the path of hydraulic fluid flow through the valve. The plunger is generally cylindrical and has a bore extending axially therethrough and containing elastomeric inserts at opposite ends thereof. Each insert has a seating surface for sealing engagement with a respectively associated valve seat. One of the inserts is movable relative to the plunger and spring biased to its seating position. The inserts are constructed and arranged so that the portion of each insert which defines the seating surface thereof is substantially free of internal stress.

3,733,048

#### METERING VALVE

Jan A. Hiszpanski, Chicago, Ill., assignor to Imperial-Eastman Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 47,285, June 18, 1970, abandoned. This application Feb. 11, 1971, Ser. No. 114,597

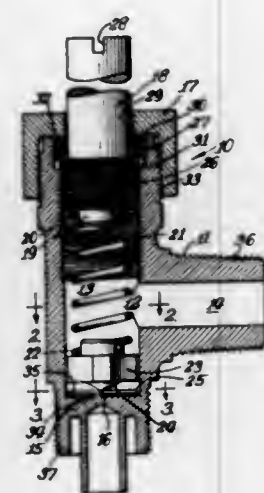
Int. Cl. F16k 15/14

U.S. Cl. 251-205

35 Claims

A fine metering valve having a deflectable beam and means for deflecting the beam adjustably in close spaced juxtaposi-

tion to a valve port thereby to vary the rate of fluid flow therethrough. A displacement reduction means is utilized in providing the deflection of the beam to give high accuracy in



the metering of the fluid flow. The deflecting means may be manually operated or automatically operated, as desired. Means are provided for positively displacing the beam to fully close the valve when desired.

3,733,049

#### DETERMINATION OF YIELD ELONGATION DURING TENSILE TESTING

Christian van den Hove, Bressoux, and Lucien Renard, Liège, both of Belgium, assignors to Centre National De Recherches Metallurgiques, Brussels, Belgium

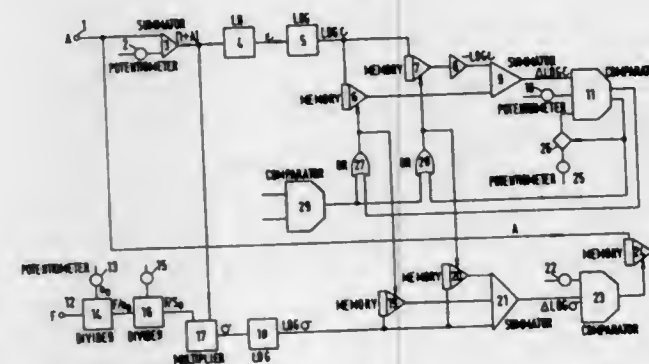
Filed Mar. 4, 1971, Ser. No. 121,104

Claims priority, application Belgium, Mar. 5, 1970, 746930

Int. Cl. G06g 7/24; G01b 7/16

U.S. Cl. 235-151.3

9 Claims



The load, elongation, and width transducers of a tensile test machine are connected to an array of analog calculation elements arranged to calculate the yield elongation.

3,733,050

#### HIGH PRESSURE VALVE

Peter R. Gordon, Los Gatos, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Feb. 16, 1971, Ser. No. 115,607

Int. Cl. F16k 5/00

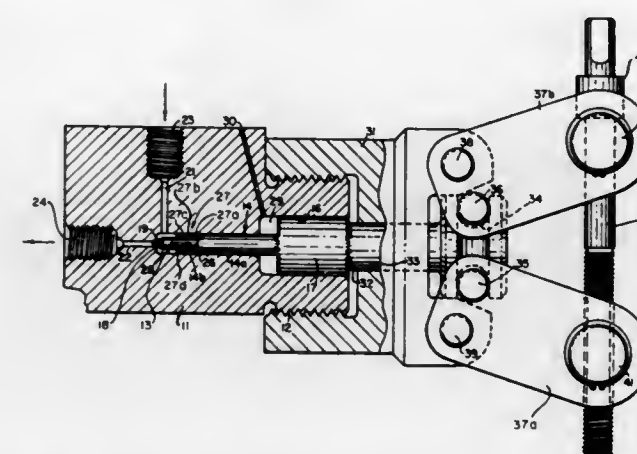
U.S. Cl. 251-214

5 Claims

A high pressure valve in which the valve needle is guided in a well formed in the valve body so that it can be moved to seat one end in a valve seat formed at the bottom of said well. Outlet and inlet passages communicate with the opposite sides of the seat whereby the flow of fluid between said passages can be controlled by axial movement of the valve needle. The

valve needle is arranged and formed whereby the pressure of the fluid being controlled applies a retracting force to retract

tion. The winch operating mechanism can be adapted to existing winch installations of the hand-lever type, as well as being



the valve needle. The valve needle drive means cooperates with said valve needle to overcome the retracting force and advance the needle into seating engagement in the valve seat.

3,733,051

#### TRAILER JACK

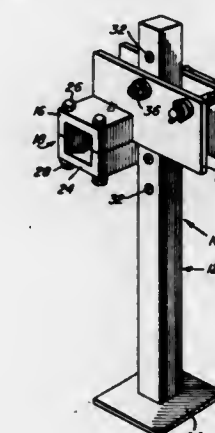
Robert A. Bollinger, 410 West 21st Street, Lumberton, N.C.

Filed Apr. 30, 1971, Ser. No. 138,898

Int. Cl. B66f 7/22

U.S. Cl. 254-94

2 Claims



A trailer jack comprising a two-part axle engaging collar adapted for slidable positioning on the axle and a lifting shaft pivoted between a pair of mounting plates affixed to the collar. The shaft, in its retracted position, is retained by a retaining pin engaged through the shaft and opposed holes within the mounting plates. Upon a release of the retaining pin, the jack pivots downward into engagement with the ground at an angular relation thereto with movement of the vehicle causing an upward riding of the engaged vehicle axle onto the shaft. The shaft engages the collar upon arrival at a vertical position with the axle elevated.

3,733,052

#### SHIPBOARD WINCH WITH RETRACT REEL ACTUATOR

John R. Lovett, 23604 Lake Road, Bay Village, Ohio

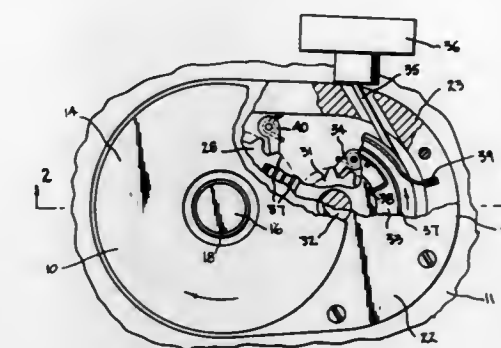
Filed May 24, 1971, Ser. No. 146,080

Int. Cl. B66d 1/30

U.S. Cl. 254-150 R

9 Claims

A manually operated winch intended especially for use in close quarters, such as on board sailing ships or the like, which uses a spring-biased retract reel and pull cord for winch actua-



provided as original equipment. In a modified form of the invention, a two-speed winch mechanism is provided using the same principle of retract reel actuation.

3,733,053

#### PULLEY BLOCKS FOR HOISTING

Georges Haulotte, Rue de la Chambole, 73 Barberaz, France

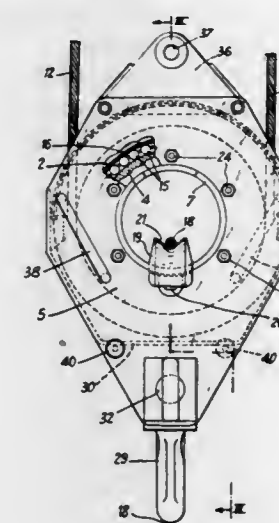
Filed May 13, 1971, Ser. No. 142,925

Claims priority, application France, May 14, 1970, 7017582

Int. Cl. B66d 1/36

U.S. Cl. 254-192

7 Claims



Pulley block comprising at least one rim having a groove for receiving a flexible tie, such as rope, cable or chain, mounted for rotation on an annular part, characterized in that the said annular part is designed and adapted to receive and support a suspension member for a load to be handled.

3,733,054

#### SAFETY FENCE

Bernard Storch, 81-57 259th St., Floral Park, N.Y.

Filed Apr. 28, 1972, Ser. No. 248,561

Int. Cl. E04h 17/02

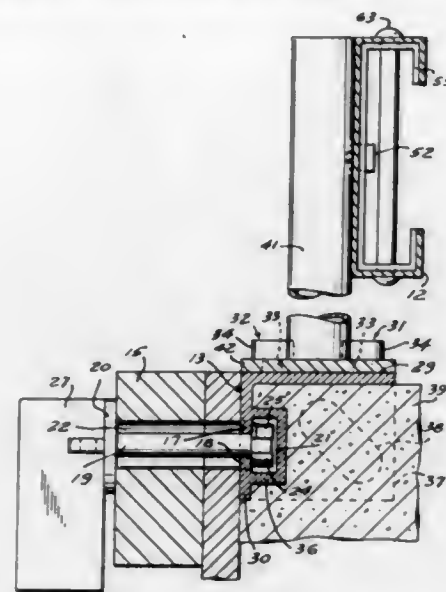
U.S. Cl. 256-59

11 Claims

A safety fence includes a plurality of posts having brackets and telescopic rails which are coupled to and supported by the brackets. The end sections of the rails include holes which are engaged by latches on the brackets to hold the rails in place. Each post is coupled to an anchor which is secured to a form of the type used to contain poured concrete. Each anchor is secured to the form by a rotatable shaft extending through the form and having a head at one end and a cam on the other, the cam being engageable with a follower on the anchor. The head of the shaft includes a handle. If the handle is rotated in a predetermined direction when the cam and follower are engaged, the anchor and the head are caused to securely abut



against the form, thereby securing the anchor. The anchor includes an enclosure which prevents contact between the cam and subsequently poured concrete. When the poured concrete



has set it further secures the anchor, thereby permitting removal of the rotatable shaft and the form while leaving the anchor secure.

3,733,055

# VARIABLE CURVATURE AND/OR PITCH STAIRWAY HANDRAIL

William J. Hughes, Jr., 10201 Mayfair Drive, Baton Rouge, La.  
Filed Feb. 18, 1972, Ser. No. 227,480

Int. Cl. E04b 17/14

U.S. Cl. 256-59

8 Claims



A variable curvature and/or pitch handrail for the balustrade (railing) of a circular, spiral and curved stairway which is capable of being assembled on the site, comprising a plurality of relatively short-length, generally cylindrical handrail sections each having an axial bore therethrough, rotatable washer-form wedges adapted to be interposed between the sections of each pair thereof, an elongate cable adapted to be threaded through the bores of end-to-end related sections and the center openings of the washer-form wedges interposed therebetween, means for tensioning the cable in manner as to secure said sections and washers together to the form of a rigid handrail, said washer-form wedges incorporating readily accessible means whereby they may be individually rotated with respect to one another and to the cylindrical handrail sections between which they are interposed thereby to "set" the curvature and/or pitch of the hand-rail to that desired.

## 3,733,056 FLUIDIZED BED AND METHOD OF TREATING GRANULAR MATERIAL

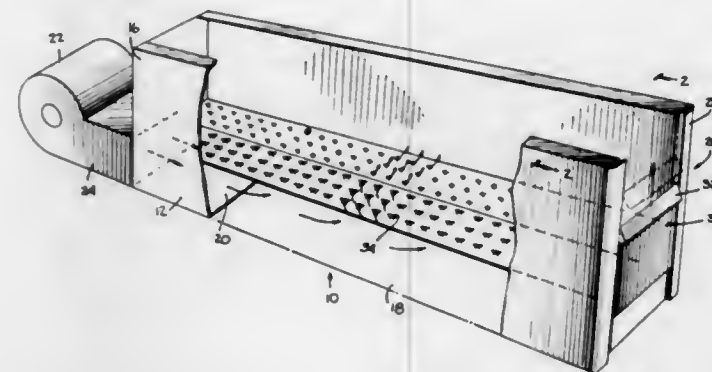
Leong Q. Fong, 5880 Castano Drive, San Jose, Calif.

Filed Jan. 11, 1971, Ser. No. 105,327

Int. Cl. B01f 5/24

U.S. Cl. 259-4

7 Claims



The bed includes a deck having a plurality of openings and side walls defining a trough with the deck. A plenum below the deck supplies air through the openings for fluidizing material in the trough, the openings being arranged to direct air in a manner to establish a predetermined flow pattern for circulating and mixing the material. In one form hereof, the flow direction is transversely of the bed to provide a circular mixing action. In another form, the openings are configured to provide both transverse and horizontal components of flow whereby the material is circulated as it moves downstream through the trough.

3,733,057

# IN-LINE FLUID MIXER

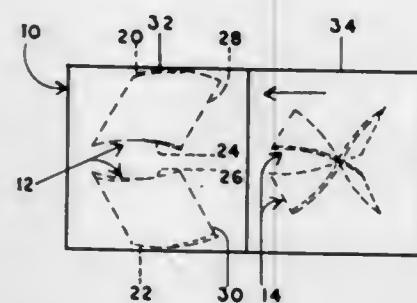
John B. Kahoun, Wisconsin Rapids, Wis., assignor to Consolidated Papers Inc., Wisconsin Rapids, Wis.

Filed Sept. 7, 1971, Ser. No. 178,277

Int. Cl. B01f 5/00

U.S. Cl. 259-4

8 Claims



An in-line spiral mixer characterized by successive left and right hand spaced spiral vanes disposed within a cylindrical tube. Each of the vanes comprises at least two separate parts with a central opening therebetween. The leading edge of each part is tapered from the outer to inner ends in the direction of fluid flow to minimize accumulation of material on the edge and cause self cleaning.

3,733,058

# DOUGH PORTIONING AND KNEADING MACHINE

Helmut König, Ursprungweg 70-72, Graz, Austria

Filed Mar. 8, 1972, Ser. No. 232,756

Claims priority, application Austria, Feb. 26, 1971, A 1698

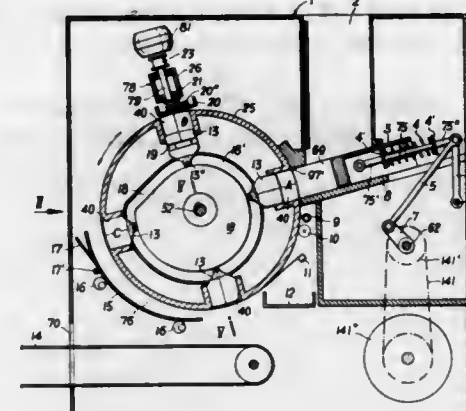
Int. Cl. A21c 7/06

U.S. Cl. 259-185

21 Claims

A dough portioning and kneading machine has a frame on which a drum is rotably mounted around a horizontally

disposed shaft. The drum has pocket openings in its circumference to receive dough supplied from a hopper. The drum is stepwisely rotated and has pistons in each of the pocket openings which are reciprocally moved by a cam means hav-



3,733,059

# PLASTIC EXTRUDER TEMPERATURE CONTROL SYSTEM

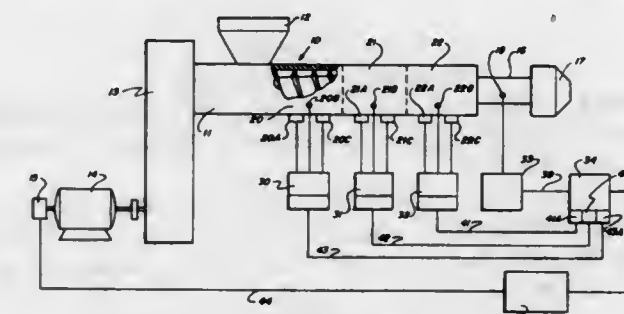
Glenn A. Pettit, Bloomington, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Aug. 10, 1971, Ser. No. 170,585

Int. Cl. B29b 1/10

U.S. Cl. 259-191

7 Claims



A temperature control system for controlling plastic extruders wherein a tachometer generator signal dependent upon motor speed is utilized to compensate for temperature changes in an extruder caused by changes in the speed of the extruder screw.

3,733,060

# MIST GENERATOR

Marvin D. Merritt, Rebel Ranch, Venice Farms, Venice Avenue E., Box 988c, Venice, Fla.

Continuation of Ser. No. 11,943, Feb. 17, 1970, abandoned.

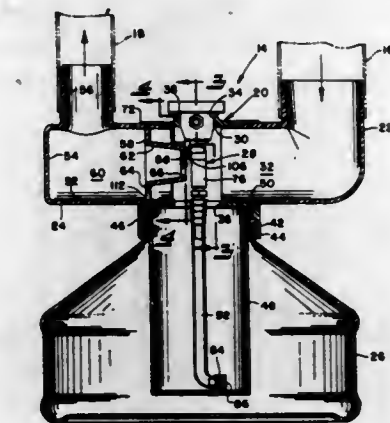
This application Apr. 10, 1972, Ser. No. 242,835

Int. Cl. B01f 3/04

U.S. Cl. 261-1

6 Claims

A generator is provided for producing a liquid aerosol mist of uniform dispersion characteristics that is circulated through an oxygen tent or the like. The generator includes a housing having a primary air passage therethrough which in an intermediate section is formed with an expanding venturi tube. A nebulizer is supported by the housing and functions to entrain a therapeutic liquid within a pressurized gas and subsequently



3,733,061

# GAS-LIQUID CONTACT APPARATUS

Ole Kristian Bockman, Oslo, Norway, assignor to Aktiebolaget Svenska Flaktfabriken, Stockholm, Sweden

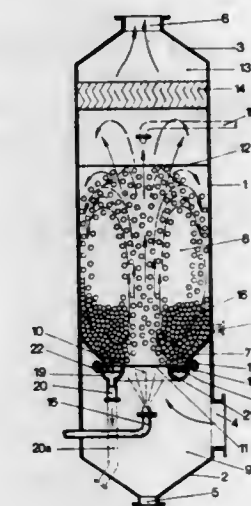
Filed Oct. 26, 1970, Ser. No. 83,809

Claims priority, application Norway, Nov. 13, 1969, 4499

Int. Cl. B01f 3/04

U.S. Cl. 261-21

11 Claims



An apparatus for obtaining interphase contact between fluids, particularly gas and liquid, wherein a gas is caused to flow upwardly through a substantially vertical contact zone providing a so-called fluidized bed of contact bodies. The velocity of the gas entering the contact zone is held at a value at least to prevent discharge of the liquid upwardly from the contact zone and downwardly through the gas entrance. Means is provided to collect the liquid at a location close to the gas entrance and to drain off the liquid from the liquid-collecting means at a controlled rate whereby a portion of the collected liquid may be recirculated into the gas entering the contact zone. The collection means comprises an annular gutter at the bottom of the contact zone and the gas entering the contact zone is injected through the center of the gutter along with a jet of fresh liquid issuing from a nozzle mounted centrally under the gutter.



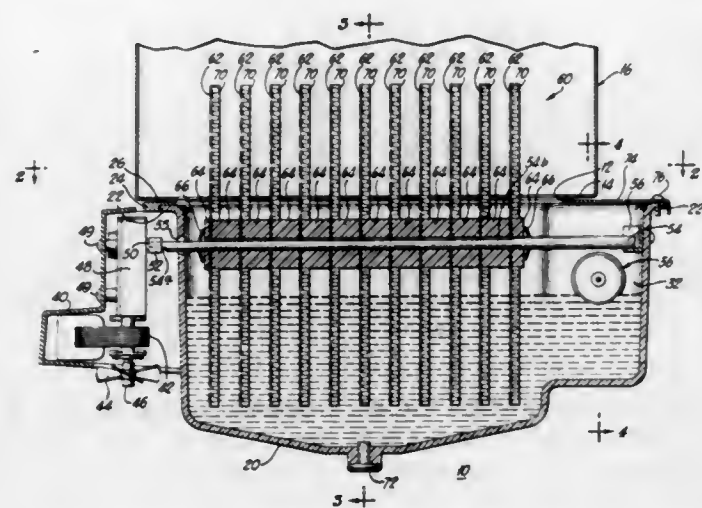
### 3,733,062 HUMIDIFIER

Louis A. Bracich, Cary, Ill., assignor to Nu-Air Humidifier Corporation, Rosemont, Ill.

Filed Aug. 3, 1971, Ser. No. 168,546  
Int. Cl. F24f 3/14; B01d 47/18

U.S. Cl. 261-92

7 Claims



A humidifier for attachment to an air duct or plenum chamber including novel rotor means for introducing water into the air flow in the duct or plenum. The rotor includes a plurality of spaced apart circular disks formed of perforated sheet material which are maintained in axially spaced apart relation on a rotor shaft by a series of annular spacer blocks. Water absorption pads formed of open celled plastic material are secured to one side face of each of the disks for the purpose of picking up of water from a pan-like supply housing for delivery into moving the air flow in the duct.

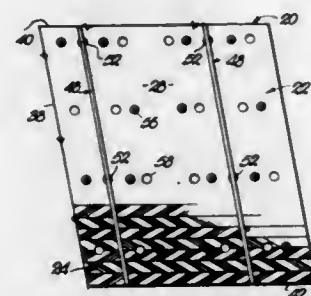
### 3,733,063 CHEVRON RIBBED FILL UNIT FOR WATER COOLING TOWER

Charles E. Loetel; William H. Lebo, and Dougan L. Jones, all of Mission, Kans., assignors to The Marley Company, Kansas, Mo.

Filed Sept. 24, 1971, Ser. No. 183,471  
Int. Cl. B01f 3/04

U.S. Cl. 261-112

19 Claims



A thin, self-sustaining, corrugated plate of polyvinyl chloride is strengthened against bending along its lines of weakness by stiffening structure extending vertically of the plate within the thickness confines of the corrugations to minimize airflow impedance. One embodiment utilizes rovings of fiber glass strands saturated with polyester resin which are placed within troughs cut through the corrugations, the resin then hardening to stiffen the roving and bond it to the plate. A second embodiment has sets of side-by-side stiffening channels integrally formed into the body of the plate. A third embodiment employs a wood brace complementally received within each channel of a series of single stiffening channels to augment the strengthening properties of the channels and to support the plate when the braces are suspended from above

or stood on a flat, underlying surface. A fourth embodiment uses a transversely U-shaped metal brace in place of the rectangular wood brace of the third embodiment.

### 3,733,064 MEANS FOR DIFFUSING GASES INTO LIQUIDS

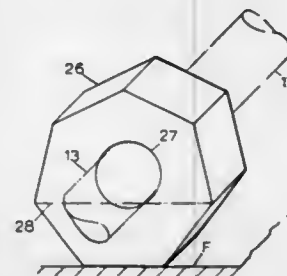
Eric Sidney Branton, 5 Repton Avenue, Gidea Pk., Romford, England

Filed Nov. 10, 1970, Ser. No. 88,291  
Claims priority, application Great Britain, Dec. 24, 1969, 62,972/69

U.S. Cl. 261-122

Int. Cl. B01f 3/04

6 Claims



Means for supporting, levelling and/or retaining a pipe or pipe-work, especially of a gas diffuser system, comprises a block or body adapted to constitute a stand for the pipe or pipe-work and having a hole or recess in or through it for the pipe or pipe-work. The hole or recess is eccentric with respect to the peripheral configuration of the block or body so that, by adjusting or setting the block or body angularly about the axis of the pipe or pipe-work, the effective height of the stand can be varied. In a preferred embodiment of the invention a block, which constitutes the stand for the pipe or pipe-work, is of polygonal form and has five to nine sides. A particularly convenient material for the block or body is concrete.

### 3,733,065 FURNACE APPARATUS

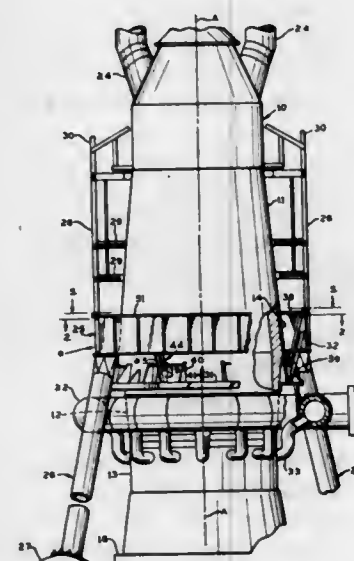
Melvin J. Greaves, Cleveland, and Tage Werner, Rocky River, both of Ohio, assignors to Arthur G. McKee & Company, Cleveland, Ohio

Division of Ser. No. 811,527, March 28, 1969, Pat. No. 3,630,507, which is a continuation-in-part of Ser. No. 778,883, Aug. 29, 1968, Pat. No. 3,559,972, which is a division of Ser. No. 520,945, Jan. 17, 1966, Pat. No. 3,431,691. This application May 5, 1971, Ser. No. 140,577

U.S. Cl. 266-43

Int. Cl. C21b 7/06

8 Claims



Blast furnace apparatus having a shell that is lined with refractory material, and means for reinforcing the shell includ-

ing gussets secured to the outer surface of the shell and companion gussets fixed to the inside of the shell substantially in alignment with the first mentioned gussets. The companion gussets preferably have openings through them to inhibit over-stressing of the companion gussets on expansion and contraction of the shell.

### 3,733,066 FLEXIBLE COUPLING

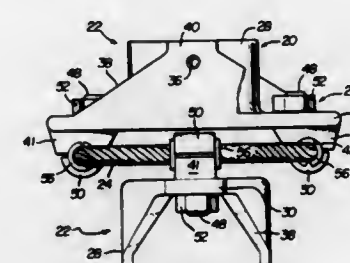
William E. Strain, 503 Shirley Drive, Birmingham, Mich.

Filed Sept. 21, 1971, Ser. No. 182,340

U.S. Cl. 267-148

Int. Cl. F16f 15/10

10 Claims



A flexible coupling including a pair of generally coaxially aligned hub members, each hub secured to a circular cable to transmit radial forces. The hub members each have a pair of opposed radial arms and the cable is secured to the arms by clamps. The radius of the circular cable is preferably less than the length of the arms and the clamps are hook-shaped, with the shank portion of the hook parallel to the axis of the hubs, to secure the cable radially inwardly of the distal ends of the arms.

### 3,733,067 LOG ROTATING AND FEEDING DEVICE WITH CONTINUOUS SUPPORTING DEVICE

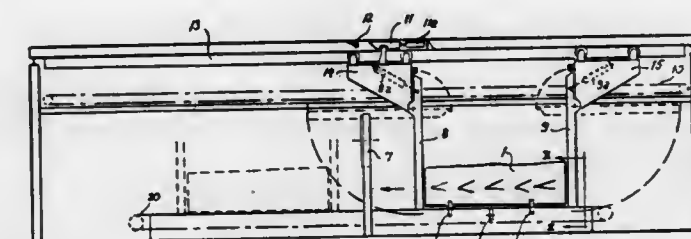
Bo Ingemar Ackerfeldt, 6612 Ascona, Switzerland, assignor to U. S. Natural Resources, Inc., Portland, Oreg.

Filed Nov. 24, 1971, Ser. No. 201,932

U.S. Cl. 269-295

Int. Cl. B27b 29/08

13 Claims



A device for feeding logs through the saws of a sawmill or through other wood-processing machines includes a pair of log-holding arms supported on overhead carriages movable along a track extending parallel to the feeding line of the logs through the saws. A lower portion of each arm has a log end-gripping device that restrains the log against rotation and lateral movement with respect to the arm but permits limited vertical movement of the log while clamped between the two arms. Each such gripping device includes a plate provided with a spiked or other gripping surface. The plates are resiliently mounted on their arms in upwardly biased positions but move downwardly on the arms under the weight of a log to lower a gripped log onto a subjacent elongate support which supports the log as it is fed by the arms through the saws. In one embodiment the subjacent support is driven so as to help feed as well as support the log.

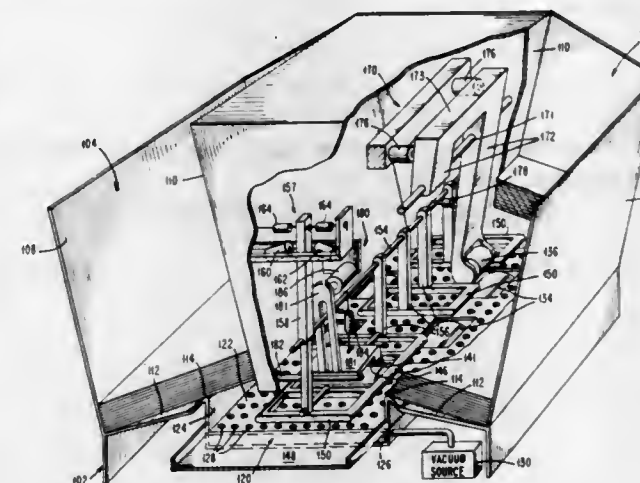
### 3,733,068 DUAL STACK TO COMMON PATH DOCUMENT FEED APPARATUS AND METHOD

George D. Herring, and Kenneth R. Reid, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1971, Ser. No. 157,137  
Int. Cl. B65h 1/06; 3/08

U.S. Cl. 271-9

11 Claims



A compact, dual-hopper document-handling mechanism selectively feeds documents from either hopper into a common path. The width of the system is reduced to less than three times the width of a document because each hopper overhangs one of the sides of a common cornering station so that the bottom document in each hopper overhangs the cornering station. A vacuum attracts the overhanging portion of the bottom document in each hopper towards the cornering station. A document support interposed between the documents and the cornering station bedplate prevents at least one of the document from resting on feed means below the overhanging portion of each hopper. One of the documents is selected by positioning the document support to permit the vacuum to draw the selected document downward to rest on the feed means. The feed means is actuated to feed the selected document into the cornering station from the hopper, while the other feed means is rendered inoperative. A transport means then delivers the document from the cornering station into the common path.

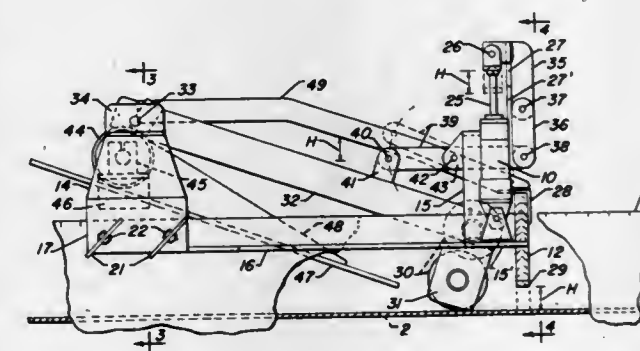
### 3,733,069 AUTOMATIC GATE MEANS FOR HANDLING THIN VENEER-TYPE SHEETS

Royal C. Cady, Melen, Wis., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 20, 1971, Ser. No. 145,353  
Int. Cl. B65g 47/26; B65h 9/14

U.S. Cl. 271-50

8 Claims



An automatic gate means for mounting over a conveyor means provides for the collecting and aligning of the move-



ment of side-by-side pieces of thin veneer-type materials, such as thin wood veneers from a veneer dryer. The lifting and lowering of the gate means over the conveyor belt is operated responsive to the feed means to the conveyor means, or to the dryer, such that the gate lifting awaits the alignment of a full-width charge of a plurality of pieces on the conveyor. A preferred design and operation incorporates a "dead" roller which lifts and lowers opposite to the movement of the gate so as to insure the positive and rapid movement of veneer pieces from the conveyor, particularly from an upwardly sloping conveyor means.

3,733,070

## FLOATING JOGGER

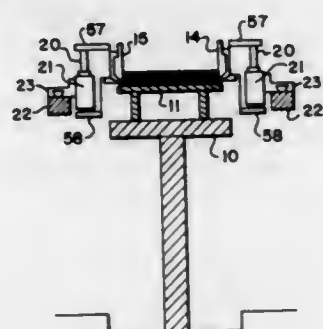
David Noel Obenshain, Swanton, Md., assignor to Westvaco Corporation, New York, N.Y.

Filed Feb. 22, 1972, Ser. No. 228,032

Int. Cl. B65h 31/34

U.S. Cl. 271-89

11 Claims



A paper jogging device is presented for stacking sheets of paper or the like into precise alignment as the sheets are piled directly onto a shipping skid. The device comprises an oscillating paddle, arranged in substantially a vertical plane, that is pivoted at its bottom edge through a flexible hinge element to a more-or-less horizontally disposed hinge plate. The hinge plate rests on and stays in contact with the shipping skid during the initial stages of the stacking operation, and the entire device is mounted so as to float downward with the shipping skid as the stacking operation continues and until the stack reaches a height that is near the top of the oscillating paddle. When the jogging device reaches the level of its lowest downward movement, jogging action continues as the stack increases in height and the shipping skid continues to move downward.

3,733,071

## CUP HAVING ILLUSION OF EMPTYING CONTENTS

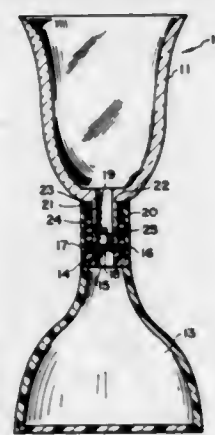
Maxine G. Levin, Westhill Drive, Gates Mills, Ohio

Filed Aug. 17, 1972, Ser. No. 281,468

Int. Cl. A63j 5/00; A47g 33/00

U.S. Cl. 272-8 R

12 Claims



A novelty cup having a transparent upper section for holding liquid contents and an opaque hollow base which is con-

nected to the upper section through a flow passageway normally blocked by a valve. By unobtrusive manipulation of the upper portion relative to the base, the valve is opened to permit gravity flow of the fluid from the transparent section to the reservoir in the base to create the illusion that the upper portion is being emptied of its contents.

3,733,072

## POOL TABLE WITH REMOVABLE POCKET AND RAIL STRUCTURE

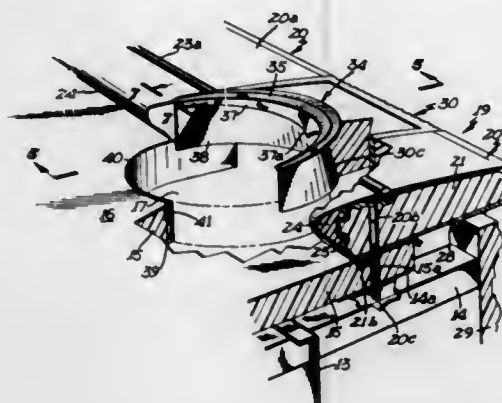
Otto Sevenen Nielsen, 4875 N. Sorell Avenue, North, Minneapolis, Minn.

Filed Aug. 26, 1970, Ser. No. 70,628

Int. Cl. A63d 15/00

U.S. Cl. 273-7

9 Claims



A pool table comprises a table top having a bed provided with side and corner pocket recesses therein. A rail and bumper structure which is secured to the pool table frame is mounted on the bed and includes a plurality of elongate rail and bumper members interconnected together by side and corner connecting members. The side and corner connecting members are provided with male socket elements which are insertable into female sockets in the rail and bumper members. Each side and corner connecting member has a deflector member thereon to facilitate deflection of a pool ball into a pocket. Each concave surface of the bed which defines a pocket recess is provided with an impact member, preferably formed of plastic, to minimize damage to the cover during rebounding of a ball prior to the ball dropping into a pocket.

3,733,073

## TORSION BAR FOR RAISING AND LOWERING A TARGET

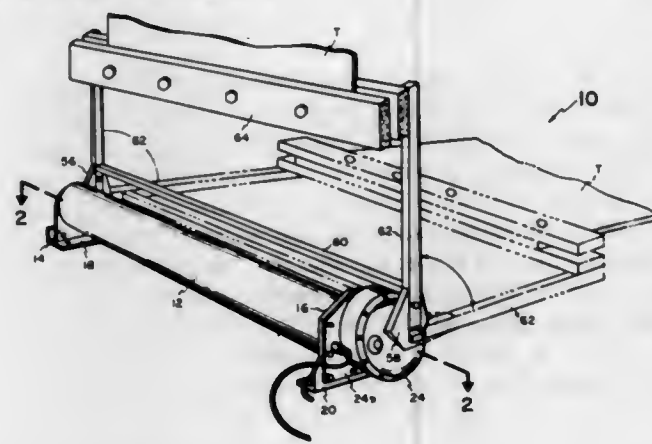
Keith Gutler, Pinellas Park, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 20, 1972, Ser. No. 236,390

Int. Cl. F41j 7/00

U.S. Cl. 273-102.1 E

5 Claims



A target raising and lowering mechanism employs a torque tube and torsion bar combination to provide weatherproof

housing for its electric motor and reduction gear means while also storing energy in the torsion bar during lowering of a target for later use during raising of the target.

3,733,074

## BOARD GAME APPARATUS

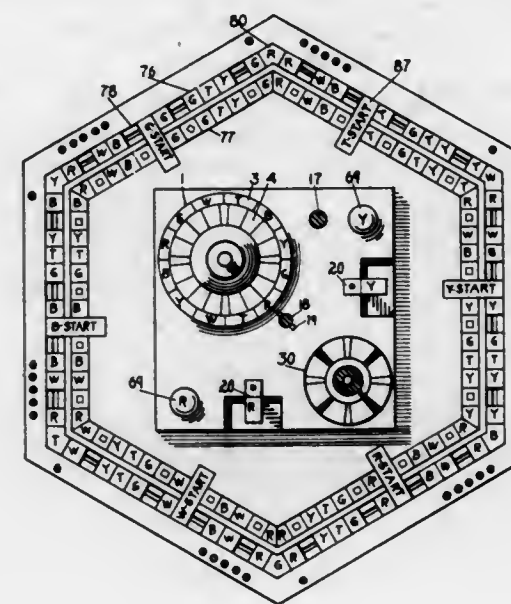
Vincent A. Daley, 189 Second Avenue, Massapequa Park, N.Y.

Filed Feb. 23, 1971, Ser. No. 118,139

Int. Cl. A63f 3/00

U.S. Cl. 273-134 A

3 Claims



A game apparatus comprising an equilateral, hexagonal gameboard having a plurality of insignia, color designated, and power rail exposing aperture spaces, color designated pawns with switching means operable via said apertures, a primary spinner having numeral, insignia, and color indicia thereon, adjustably supporting thereunder a contactor which sequentially engages drycell powered circuit means, conditioning for energization a plunger activated, secondary spinner with related dial indicia and a pawn activated plurality or indicator lamps, which signal use of related instruction cards, providing thereby a plurality of diverse means determining the moves of said pawns with switching means over two continuous courses located inwardly from and parallel to the board edges.

3,733,075

## DEVICE FOR DISPLAYING RANDOMLY SELECTED SYMBOL COMBINATIONS AND RANDOMLY OPERATIVE PLAYER OPERATED SYMBOL CHANGING MEANS THEREFOR

Donald E. Hooker, Wilmette, and Walter M. Burnside, Waukegan, both of Ill., assignors to Waukegan Electronics, Waukegan, Ill.

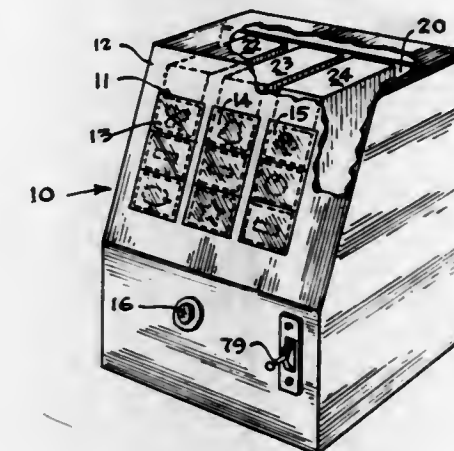
Filed May 7, 1970, Ser. No. 35,533

Int. Cl. A63f 5/04

U.S. Cl. 273-141 A

1 Claim

An amusement game device of the slot machine type comprising rotating drums or electro-optical reels which form a combination of symbols at the end of a play cycle having a specified play value and which includes player activated means for changing at least one of the symbols of the combination to form a new combination which can have increased play value, thereby increasing the player participation in the



during a series of successive plays of the apparatus by having a random selector means operatively associated with the player activated means.

3,733,076

## ELECTRICALLY OPERATED, MANUALLY ACTUATED, MOTOR DRIVEN ROTATABLE DRUM CHANCE DEVICE

Haruo Ohki, Katashika-ku, Tokyo, Japan, assignor to Yoshie Ito, Tokyo, Japan, a part interest

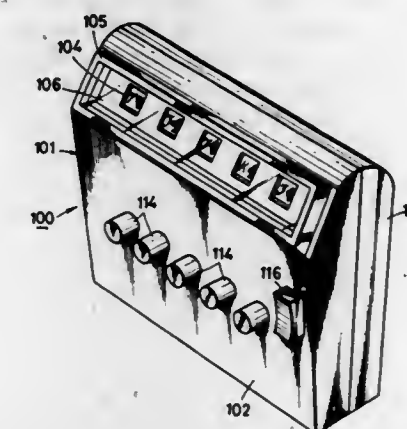
Filed Aug. 12, 1971, Ser. No. 171,194

Claims priority, application Japan, Sept. 18, 1970, 45/92035

Int. Cl. A63f 5/04

U.S. Cl. 273-143 R

6 Claims



A toy amusement machine is disclosed which has rotatably mounted thereon a plurality of display drums each carrying thereon various combinations of symbols at circumferentially spaced positions. These drums are driven by a motor connected to a motor energization circuit including a plurality of parallel switches each consisting of a braking element and a conductor plate. Each drum is stopped independently of the other drums by depressing a control push button operatively associated with the braking element of a respective drum. A release push button is depressed to disengage the braking element from each drum and close the motor circuit to cause all drums to rotate simultaneously.



3,733,077

**GOLF CLUB ATTACHMENT FOR DETERMINING OPTIMUM CLUB HEAD WEIGHT**

Marcus W. Fennell, 10201 Morehart Avenue, Pacoima, Calif.  
 Filed May 26, 1972, Ser. No. 257,288  
 Int. Cl. A63b 69/36  
 U.S. Cl. 273-186 A

6 Claims



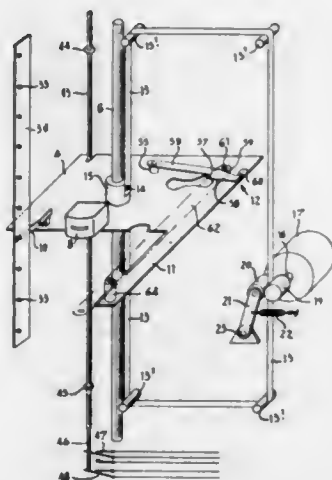
An accelerometer for attachment to the shaft of a conventional-type golf club and which when in use occupies a position adjacent the head of the club. The device includes a spring loaded rod mounted for retractable movement within a housing. The rod has teeth along one longitudinal edge to provide a rack and an indicia speed measuring scale along a diametrically opposite longitudinal edge. A latching and ratcheting pawl is mounted on the housing and is operatively coordinated with the teeth of the rack. The end of the rod which projects outward of the housing is provided with a detachable weight which enables the user to determine the proper weight needed in the head of the club to achieve maximum club head speed.

3,733,078

**APPARATUS FOR PLAYING MULTIPLE TAPE CARTRIDGES**

Marcel Jules Helene Staar, Brussels, Belgium, assignor to Staar Development Company S. A., Brussels, Belgium  
 Filed Aug. 12, 1969, Ser. No. 849,484  
 Claims priority, application Belgium, Aug. 13, 1968, 62195  
 Int. Cl. G11b 21/10, 23/12  
 U.S. Cl. 274-4 F

7 Claims



An apparatus for playing a number of self-contained cartridges of magnetic recording tape in sequence or a selected order. The cartridges are loaded in a stationary frame, and a moving slide is driven in a scanning movement past the stack of cartridges in the frame. The slide bears the playback head

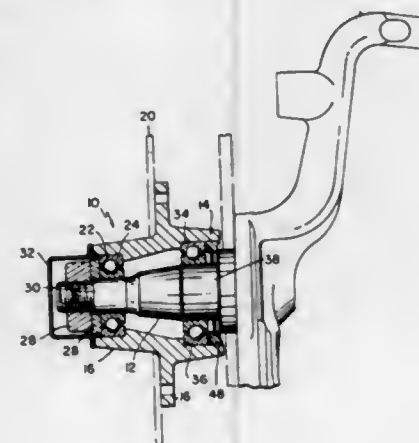
and cartridge moving elements and is adapted to stop adjacent each or a selected cartridge, to engage the cartridge with the moving elements and move it into engagement with the playback head and a tape capstan to play sound recordings on the tape. A full cycle of operation is provided in which the slide is returned to a position adjacent the first cartridge in the stack after all loaded in the frame have been played in sequence.

3,733,079

**SEAL ASSEMBLY**

Henry A. Haigh, Howell, Mich., assignor to Haigh Plastics Products Corporation, Howell, Mich.  
 Filed Mar. 5, 1971, Ser. No. 121,303  
 Int. Cl. F16j 15/32  
 U.S. Cl. 277-184

2 Claims



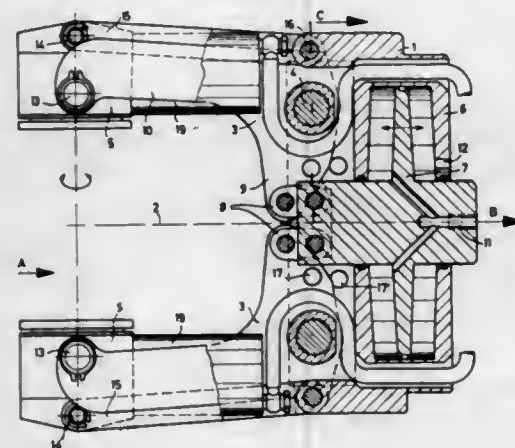
A seal assembly for a front wheel inner bearing comprising a flat ring of elastomeric material and an annular plastic rim or housing molded on the outer edge portion of the ring and adapted to fit within the wheel hub at the inner end thereof.

3,733,080

**SWIVEL CHUCK**

Willy Zeidler, 8729 Hofheim, Germany, assignor to HEWA-HESSISCHER Werkzeug-und Apparatebau Alfred Vogler, Pfaffenwiesbach, Germany  
 Filed Aug. 4, 1971, Ser. No. 169,023  
 Claims priority, application Germany, Aug. 4, 1970, P 20 38 574.4  
 Int. Cl. B23b 31/18, 31/34, 31/30  
 U.S. Cl. 279-4

10 Claims



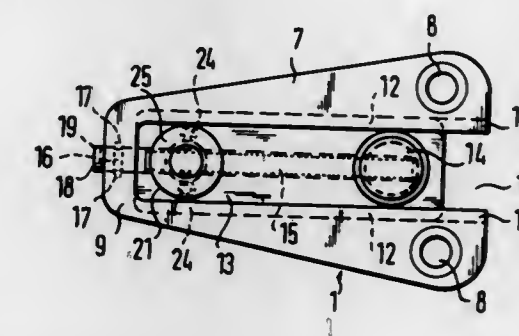
A swivel chuck in which a body is rotatable about a first axis and has two bell cranks pivoted thereto about the second axes perpendicular to the first, shorter arms of the bell cranks being

3,733,083

**SETTING MEANS FOR USE WITH SAFETY SKI BINDINGS**

Ludwig Berchtold, 8033 Krailling, Germany, assignor to Hannes Marker, Garmisch-Partenkirchen, Germany  
 Filed July 7, 1971, Ser. No. 160,355  
 Claims priority, application Germany, July 28, 1970, P 20 37 452.1  
 Int. Cl. A63c 9/00  
 U.S. Cl. 280-11.35 R

7 Claims



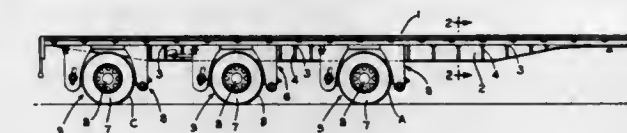
The setting means serve to adjust a binding element on a ski in the longitudinal direction thereof. The binding element comprises a slidable plate, which is guided on a baseplate fixed to the ski and is movable relative to the baseplate by means of a power screw. The nut cooperating with the power screw is provided with a series of half-threads and is held on the screw to be adjustable at least to such an extent in the direction of the mid-perpendicular on the chord which connects the ends of the series of half-threads that the nut can be disengaged from the threads of the power screw.

3,733,084

**TRAILER CONSTRUCTION**

Robert J. Mauck, 2252 Pinconning Road, Pinconning, Mich.  
 Filed Dec. 9, 1971, Ser. No. 206,254  
 Int. Cl. B62d 53/00  
 U.S. Cl. 280-81.5

9 Claims



A trailer construction including three wheel assemblies each comprising two independent sets of wheels. Each independent set of wheels is pivotally connected to the trailer bed and the two independent sets of wheels in each wheel assembly are connected together by links so as to operate in unison. Lock means is provided for optionally locking the individual sets of wheels of the central wheel assembly only, in a straight path, while the trailer is moving forward. Floating wheels are provided at the pivot points of the sets of wheels and lock means is provided for optionally locking certain of said floating wheels to the auxiliary frames of the corresponding wheel sets. Said certain floating wheels are connected together to rotate in unison. Air cylinders are controlled by the tractor operator for simultaneously moving all three wheel assemblies in the same direction for steering the trailer when it is moved in reverse.

acted upon by a hydraulic member movable parallel to the first axis, to pivot the bell cranks, the longer arms of which carry at their free ends jaws which are rotatable about a third axis perpendicular to the first and second axes. Links pivoted to the jaws and the body form a parallelogram linkage to maintain the orientation of the jaws. Three pistons, movable in cylinders carried by the longer arms, have shoes connected thereto which abut rollers, arranged in pairs in grooves in an actuating member connected to each jaw, the rollers of a pair being at 180° to one another, while the rollers in adjacent grooves are at 60° to one another, with respect to the third axis. Movement of a selected one of the pistons will thus rotate the actuating member and associated jaw.

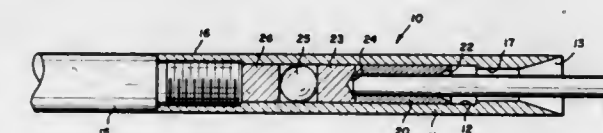
3,733,081

**REMNANT RETRACTOR COLLET**

Robert J. Heslein, 3 Bishop Drive, Fayetteville, and Robert W. Chamberlin, R.D. 1, Woodworth Road, Central Square, both of N.Y.

Filed Mar. 23, 1971, Ser. No. 127,151  
 Int. Cl. B23b 31/00  
 U.S. Cl. 279-46

9 Claims



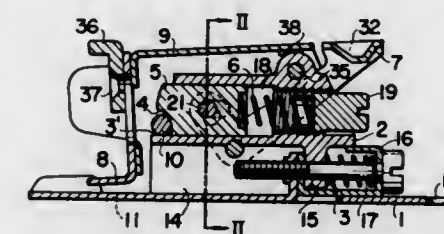
An improved retractor collet fastens to a pusher rod in a bar machine and retracts the remnant end of a consumed bar. The collet includes a fixed sleeve with an axial bore and an open end for receiving the bar, and a rotatable gripper is housed within the sleeve ahead of a thrust bearing. The gripper is sized to receive and grip the bar and is freely rotatable within the sleeve as the bar is machined. The gripper holds the remnant end of the bar when the collet is retracted to remove the remnant from the machine.

3,733,082

**SKI BOOT HEEL BINDING**

Masahiro Murata, Shizuoka, and Michio Iizuka, Tokyo, both of Japan, assignors to Hope Kabushiki Kaisha, Tokyo, Japan  
 Filed May 11, 1971, Ser. No. 142,178  
 Claims priority, application Japan, May 16, 1970, 45/42003  
 Int. Cl. A03c 9/00  
 U.S. Cl. 280-11.35 T

7 Claims



A casing having a boot heel engaging means at its front end is pivoted to a connecting member which is mounted on a base. The connecting member comprises a transverse horizontal plane at its front end and a longitudinal bore which lower end is on the same level as the horizontal plane. Within the longitudinal bore a locking member is provided to be urged forwards which has at its front surface a dented portion to engage with a horizontal pin secured to the casing in the boot heel engaging position.



3,733,085

## SKI BOOT TOE FIXTURE

Tokutaro Iizuka, Sashigaya, Setagaya-ku, Tokyo, and Yoshinari Mochizuki, Itabashi-ku, Tokyo, both of Japan, assignors to Hope Kabushiki Kaisha, Tokyo, Japan

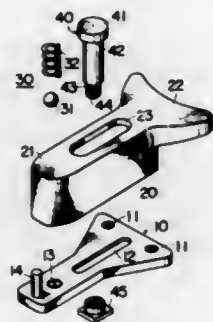
Filed Nov. 27, 1970, Ser. No. 93,232

Claims priority, application Japan, Nov. 28, 1969, 44/95064; Nov. 28, 1969, 44/95065; Feb. 10, 1970, 45/11633

Int. Cl. A63c 9/00

U.S. Cl. 280—11.35 T

3 Claims



A ski boot toe fixture comprises a base adapted to be fixed on the upper surface of a ski, a turntable member holding a ski boot toe, and a press connecting means connecting the base and the turntable member by resilient pressure. The turntable member is arranged on the base to turn relative to the base around a vertical pin. The ratio of the space between the vertical pin and the press connecting means to the space between the boot toe and the vertical pin is adjustable by an adjusting means which adjusts the force by which the boot toe is released.

3,733,086

## GOLF CART BALL DISPENSING HANDLE CONSTRUCTION

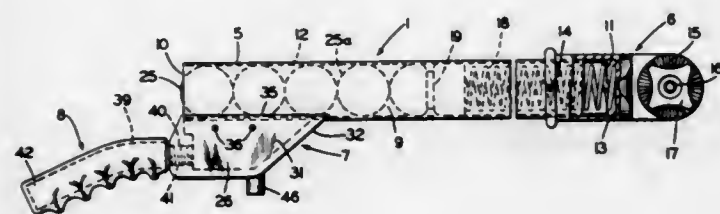
Loy P. Walkerow, P.O. Box 67, Nashville, Ohio

Filed July 26, 1971, Ser. No. 166,026

Int. Cl. B62b 5/06, 11/00

U.S. Cl. 280—47.17

5 Claims



A handle construction for attachment to a usual golf cart having a ball dispensing mechanism mounted thereon. A spring biased plunger is located within a tube and moves golf balls stored within the tube out through an open end of the tube. A stop rod and an actuator button are pivotally mounted, each on opposite ends of a pivotally mounted cam. A spring biased retainer rod engages the cam holding it in an at rest position which extends the stop rod into the open tube end blocking movement of balls through the open end. Depression of the actuator button pivots the cam and simultaneously retracts the stop rod from the open tube end dispensing the outermost stored golf ball, and projects the retainer rod into the tube preventing ejection of the remaining balls until the actuator button is released, whereby the stop rod again blocks the open tube end.

3,733,087

## INDEPENDENT SUSPENSION SYSTEM FOR A MOTOR VEHICLE

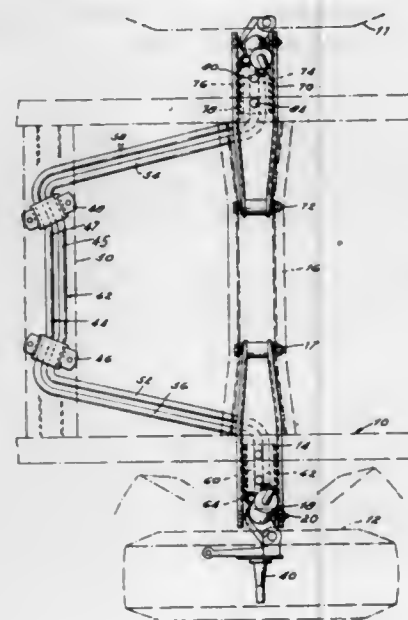
William D. Allison, Grosse Pointe Farms, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 21, 1970, Ser. No. 100,114

Int. Cl. B62d 7/08

U.S. Cl. 280—96.2 R

8 Claims



An independent suspension system for a motor vehicle having left and right wheels each positioned laterally by a suspension arm and guided vertically by a telescopic strut. A plurality of torsion springs interconnects the left and right suspension arms and is constructed to function as the main suspension spring, as an anti-roll stabilizer and as the struts positioning the suspension arms longitudinally in the vehicle.

3,733,088

## VEHICLE PASSENGER RESTRAINT SYSTEM

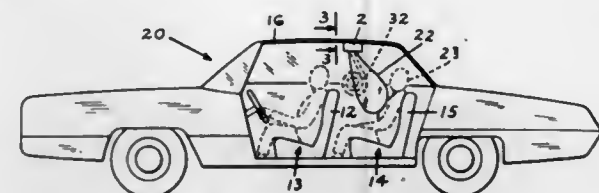
Robert L. Stephenson, Sterling Heights, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Apr. 9, 1971, Ser. No. 132,856

Int. Cl. B60r 21/02

U.S. Cl. 280—150 AB

2 Claims



A vehicle safety assembly for passengers seated in the rear seat assembly of a vehicle passenger compartment. The assembly includes an inflatable bag which is stored in a non-inflated condition above and behind the front seat of the vehicle for limiting forward movement of the rear seat assembly passengers. The assembly includes gas generating means disposed along the roof rail of the vehicle in communication with manifold means disposed across the roof of the vehicle above the rear seat assembly. In turn, the manifold means is in communication with the inflatable bag which is disposed about the manifold in a coil-like fashion. Upon impact or collision of the vehicle the gas generating means is triggered with the resultant inflation of the inflatable gas bag.

3,733,089

## HITCH ATTACHMENT TO CONVERT A TRAILER-VEHICLE HITCH APPARATUS TO A TRAILER-FARM TRACTOR HITCH APPARATUS

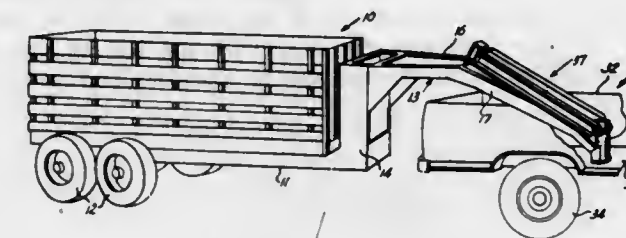
Earl E. Goecke, and Ronald D. Goecke, both of State Center, Iowa

Filed Jan. 17, 1972, Ser. No. 218,172

Int. Cl. E62d 53/00; B62d 53/08

U.S. Cl. 280—415 A

6 Claims



The hitch attachment is adapted for use with a type of hitch apparatus now in general use for connecting the tongue of a stock trailer or the like with the floor of the box of a pickup truck. In this hitch apparatus a hitch ball secured to and projected upwardly from the box floor is received within a ball socket carried at the lower end of a front upright section that forms part of a tongue structure of a gooseneck type. The attachment is of a greater length than the front upright section and is pivoted at one end to the top of the upright section for swinging movement to a first storage position extended rearwardly from the top of the upright section for support on the upper side of the tongue structure and to a second working position projected longitudinally of and downwardly from the upright section. In this second position a hitch ball on the attachment is received in locked engagement within the ball socket on the upright section and a clevis at the lower end of the attachment is connectible with the draw bar of a farm tractor.

3,733,090

## ANTI-JACKKNIFING ASSEMBLY

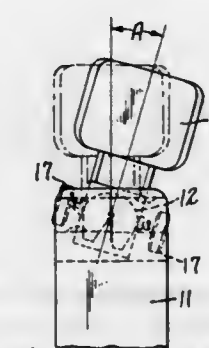
Anthony T. Keller, 10 Hilton Drive, West Haven, Conn.

Filed Apr. 9, 1971, Ser. No. 132,794

Int. Cl. B62d 53/08

U.S. Cl. 280—432

6 Claims



This disclosure relates to apparatus for use in combination with a towing vehicle and a towed vehicle pivotally connected in tandem thereto. Carried on the so-called fifth wheel of the towing or tractor are retractable members which may be extended into a position in which they will engage stopping blocks defined in opposite ends of arcuate paths defined on the towed vehicle or trailer.

3,733,091

## OCCUPANT RESTRAINT CUSHION

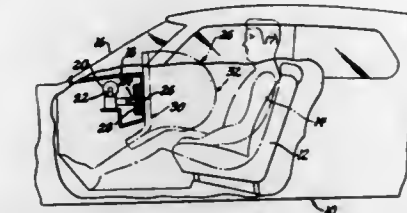
Lawrence L. Fleck, Warren; Robert Hickling, Royal Oak, and Thomas J. Smallidon, Port Huron, all of Mich., assignors to General Electric Corporation, Detroit, Mich.

Filed May 12, 1971, Ser. No. 142,537

Int. Cl. B60r 21/10

U.S. Cl. 280—150 AB

12 Claims



An occupant restraint cushion includes a planar base portion having upper and lower walls secured at the edges thereof. The lower wall has a center inlet which is located at the intersection of inflatable linear passages terminating at an inflatable manifold extending around the periphery of the base portion. The passages and the manifold are formed by triangular portions of the upper and lower walls which are secured to each other in surface-to-surface relationship and provided with apertures. The cushion further includes a frontal portion which extends across the base portion and is secured at opposite edge portions thereof to opposite edges of the base portion. The frontal portion includes a number of adjacent interconnected inflatable tubes. Each tube communicates at the ends thereof with the manifold through openings in the upper wall of the base portion. Apertured intermediate and outer end walls extend between the tubes and the base portion to define ambient air chambers. The apertures of the walls and of the triangular portions are covered by porous material permitting passage of ambient air therethrough. The apertures of the triangular portions and of the base portions and of the outer end walls are further provided with flap-type valves which easily permit the ingress of ambient air into the ambient air chambers but permit only limited egress of the ambient air from the chambers upon pressurization thereof. The base portion is mounted on a vehicle body with the inlet communicating with a source of pressure fluid. In stored position, halves of the base portion and like portions of the frontal portion are respectively rolled upon themselves, or spaced edge portions of the base portion and of the frontal portion are folded upon themselves over a center portion. Upon communication of the inlet with the source of pressure fluid, the fluid inflates the passages and the manifold to move the base portion from stored position to a planar operative position over a backing portion of the vehicle body to preform the frontal portion prior to inflation thereof. Upon inflation of the tubes from the manifold, the frontal portion advances relative to the base portion to operative position. As the frontal portion advances, ambient air is drawn into the cushion through the apertures in the base portion and in the outer end walls.

3,733,092

## CONDUIT RESTRAINING AND SEALING CONNECTOR

Roy E. Yorke, Granada Hills, and Stephen N. Affa, Torrance, both of Calif., assignors to General Connectors Corporation, Burbank, Calif.

Filed Oct. 29, 1970, Ser. No. 84,973

Int. Cl. F16J 27/04

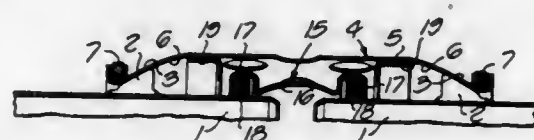
U.S. Cl. 285—166

4 Claims

A restraining means including a pair of journal rings secured to a pair of confronting conduits and having spherical outer surfaces, and a connecting shell having mating end portions to permit limited relative movement of the conduits; the connecting shell being longitudinally split into hinge connected



complementary parts and one hinge being separable. The housing encloses a seal connector also joining the conduits



and permitting limited relative movement. The housing is provided with internal stop flanges which limit axial movement of the seal connector.

3,733,093

# PULL AND PUSH SAFETY DEVICE FOR SCREW SOCKET CONNECTIONS OF PIPES

Georg Siller, Pachmayrplatz 11, Munich, Germany

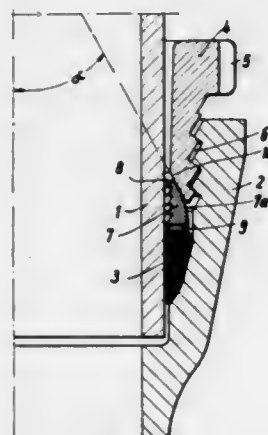
Filed May 20, 1971, Ser. No. 145,327

Claims priority, application Germany, Mar. 10, 1971, P 21 11 568.4

Int. Cl. F16I 21/06

U.S. Cl. 285—342

5 Claims



The invention relates to a pull and push safety for screw socket connections of pipes, in particular malleable iron pipes, plastic pipes and large diameter pipes, such as for supply networks in cities or the like. In such pipes there is disposed in an annular chamber limited by the plane ends of the pipe and the socket equipped with an internal thread a sealing ring which is sealingly preloaded by a pressure ring screwable into the socket.

In such screw socket connections there may occur at the installed pipes extraneously acting pulling forces or pushing forces caused by the internal pressure, tending to loosen the connection between the pipe sections. The sealing rings are able to absorb these forces, which can assume a considerable magnitude, to a limited extent only. Therefore, attempts have already been made to secure such connections against pushing and pulling forces. These known measures are costly, however, because they make necessary special machining operations at the pipe ends, which often can be performed only at the construction site. In addition, the machining of the pipe surfaces, such as cutting in a clamping groove, will weaken the pipe wall which may lead to the premature breakage of the pipe.

3,733,094

# FASTENER DEVICE FOR SAW ARBOR

James J. Emter, 1204 N.W. 53rd Street, Vancouver, Wash.

Filed Mar. 29, 1971, Ser. No. 129,047

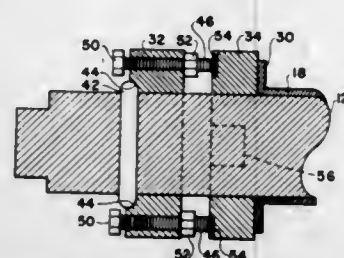
Int. Cl. F16d 1/06; B27b 5/32

U.S. Cl. 287—53 R

8 Claims

A bind-free, bidirectional non-releasing fastener, for an arbor shaft carrying an assembly of circular saw blades and

spacers, for securing the blade and spacer assembly against axial movement in operation yet permitting ready unfastening and refastening for repair, replacement and resetting of the saws on the arbor. The fastener comprises two disc portions, both of annular configuration and fitting loosely over an end of the arbor shaft, cooperating with a pin passing through a diametric hole formed in the arbor shaft. The first of the annular discs contains a pair of aligned radial grooves on the outside face thereof for receiving and locking the projecting ends of the pin. This first member is also provided with a plurality of adjustable threaded bolts extending transversely through the member parallel to the axis of the arbor. In the fastened mode the second disc member bears with one face against the terminal end of the blade and spacer assembly and its other



face is held in spaced rigid relationship to the axially-pinned first disc member by means of the threaded bolts. To release the fastener device, the threaded bolts are loosened by turning in the reverse direction to remove the bearing pressure on the second disc member and permit it to be rotated relative to the first disc member until the bolts are opposed to depressions formed in the face of the second member. This rotational position permits the first disc member to be moved closer inward toward the second disc member, thus freeing the pin from the grooves securing it against movement, and thereby allowing the pin to be withdrawn from the arbor shaft. Thereupon the first and second disc members can then be slid axially off of the arbor, permitting the assembly of saw blades and spacers to be slid off the arbor.

3,733,095

# ELECTRICAL POWER GENERATING PLANT

Harold Sinclair, London, and Herbert Arthur Clements, Weybridge, both of England, assignors to S.S.S. Patents Limited, London, England

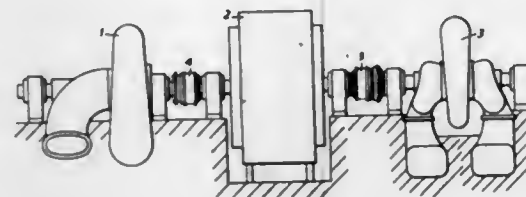
Filed Oct. 1, 1971, Ser. No. 185,558

Claims priority, application Great Britain, Feb. 5, 1971, 4,059/71; Oct. 1, 1970, 46,736/70

Int. Cl. H02k 7/18

U.S. Cl. 290—52

5 Claims



In electrical power generating plant of the pumped storage type comprising a hydraulic turbine, a motor/generator and a storage pump, or of the air storage type comprising a gas turbine, a motor/generator and an air compressor, the times of change-over between the generating mode and the pumping or compressing mode are shortened by providing, between the motor/generator and the pump or compressor a synchronous self-shifting clutch with lock arranged for overrunning when the motor/generator rotates in its normal direction of rotation relative to the pump or air compressor and for engagement when the motor/generator tends to rotate in the reverse direction relative to the pump or the air compressor.

3,733,096

# BUMPER DEVICE

Karl Kassbohrer, Ulm/Donau, Germany, assignor to Karl Kassbohrer Fahrzeugwerke GmbH, Ulm/Donau, Germany

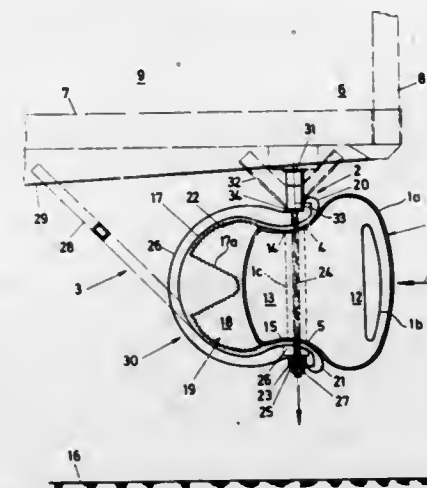
Filed Mar. 15, 1971, Ser. No. 124,408

Claims priority, application Germany, Mar. 13, 1970, P 20 12 033.6

Int. Cl. B60r 19/10

U.S. Cl. 293—63

19 Claims



An energy absorbing, or bumper, device, particularly for vehicles and especially to resist under-running by smaller vehicles of larger vehicles, as trucks, having a substantial overhang. An impact member has an impact receiving surface and an oppositely facing angular surface. A support holds the impact member in a suitable position and so bears against the angular surface in such a manner as to resist with a progressively increasing force movement of the impact member in response to impact. Springs, compression resistant materials and other means, including progressively collapsible structural means, can be added to the support device for further progressively resisting movement of the impact member.

3,733,097

# DEVICE FOR ATTACHING A HOOK TO A SPACED OBJECT

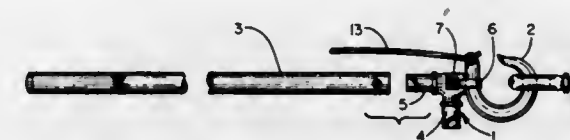
Aaron J. Hank, Jr., 3743 Devon Drive, SE, Warren, Ohio

Filed Apr. 21, 1971, Ser. No. 135,899

Int. Cl. A47I 13/06

U.S. Cl. 294—19 R

5 Claims



A device for attaching a hook to a spaced object, such as a crane, electrical transmission means, or industrial equipment. The device, however, is primarily used for mooring a boat into a dock or loading it on a trailer and consists of a head, a hook secured to the head, and a handle. The head has a pair of arms spaced at an angle to each other, each having an arcuate-shaped groove therein and a long tubular handle is provided having a projection thereon which may be inserted in the groove in either arm and when the handle is rotated it is secured to that arm. Two arms are provided which enables the hook to engage the object to be moved when the hook is in the correct position. If desired two grooves may be formed in each arm which are inclined in different directions relative to each other so that the handle may be attached to either arm, irrespective of its direction or rotation. The hook has a pointed

end to engage the object to be moved and a shank portion to which a rope or cable is attached. When the hook portion engages the object to be moved, such as the eye of a boat, the handle is then removed by rotating it in a direction opposite to that to which it was applied, and the object to be displaced is moved to the desired position by a rope or cable attached to the shank of the hook. When the object is a boat, it may be moored into a dock or it may be mounted on a trailer having a winch upon which the rope or cable may be wound.

3,733,098

# SANITATION APPARATUS

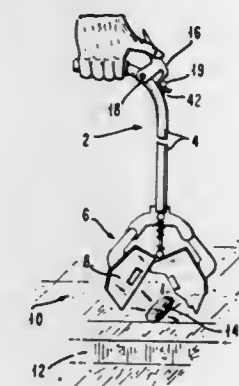
Emil A. Tobias, 362 Saw Mill River Road, Yonkers, N.Y.

Filed Nov. 12, 1971, Ser. No. 198,125

Int. Cl. A47I 13/06

U.S. Cl. 294—19 R

11 Claims



Apparatus for the collection and disposal of solid animal excrement is disclosed. The apparatus consists of a cane-like handle at the bottom of which a pair of jaws which are biased to the open position are located. A hand-operated actuator at the top of the handle is connected to the jaws by a rod or cable for closing the jaws. A disposable cardboard container is releasably held open in the open jaws by magnetic means on the jaws in cooperation with metal strips on the walls of the container. When the jaws close, the container is closed and locked in the closed position by a tab latching mechanism. When the jaws are subsequently opened, the closed container is released from the jaws.

Solid animal excrement can be collected and disposed of without the user having to touch the disposable container containing the excrement.

3,733,099

# HOLDER AND MANIPULATOR FOR REFUSE BAGS

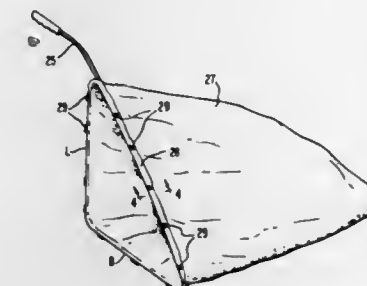
Frank Szita, 12919 Grenoble Drive, Rockville, Md.

Filed Apr. 27, 1971, Ser. No. 137,786

Int. Cl. A47I 13/06

U.S. Cl. 294—55

20 Claims



A holder and manipulator for flexible refuse bags features an adjustable triangular frame and convenient means for attaching the frame to the mouth of a bag to support the mouth wide open. The frame carries a handle extension for manipu-



lating the holder and for supporting the same on the ground when desirable. The triangular frame enables the user of the bag holder to manipulate the same without stooping and a wide straight edge portion of the frame may be held on the ground to greatly facilitate sweeping debris into the bag.

3,733,100

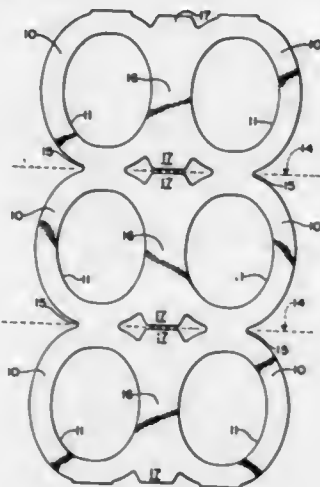
## CONTAINER CARRIER STOCK

John Tanzer, Brookfield, Wis., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed May 5, 1971, Ser. No. 140,405  
Int. Cl. B65d 71/00

U.S. Cl. 294—87.2

2 Claims



Strip stock of container carriers primarily for machine application to a selected number of pairs of containers wherein the stock is capable of being severed at any longitudinal position between container encircling bands to provide unitary packages of different selected numbers of pairs of containers.

3,733,101

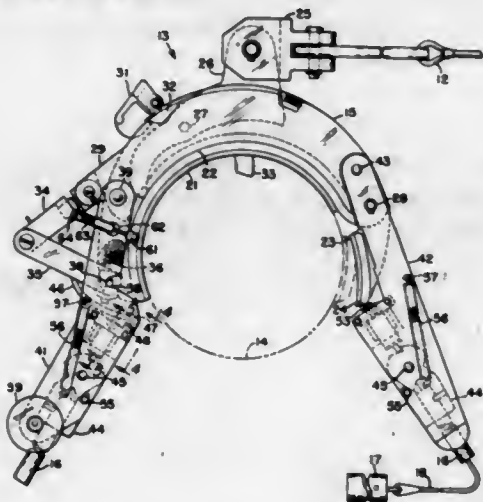
## HELO RECOVERY SYSTEM TONGS

Jack L. Sayre, Jr., Glendora, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 15, 1972, Ser. No. 234,762  
Int. Cl. B66c 1/62

U.S. Cl. 294—104

10 Claims



An aerial recovery system to retrieve cylindrical objects floating on the surface of the water includes a spring biased tong assembly which grips the cylindrical body when lowered from an aircraft. The tong assembly is characterized by guide legs which center the tong assembly over the object to be recovered. A retraction mechanism is also provided to retract the guide legs once the object has been gripped. Additionally, automatic release means are incorporated in the tongs to release the recovered object when it is lowered to a deck of a ship.

3,733,102

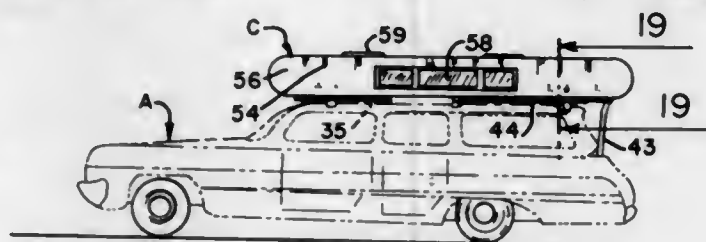
## AUTOMOBILE CAMPERS

Andrew Serino, Denver, and Joseph A. Cwik, Arvada, both of Colo., assignors to Andrew Serino, Denver and Joseph A. Cwik, Arvada, both of Colo.

Filed Jan. 15, 1971, Ser. No. 106,789  
Int. Cl. B60p 3/32

U.S. Cl. 296—23 MC

7 Claims



A collapsible camper room adapted to be mounted upon the top of an automobile. The camper is carried upon a deck adapted to extend upwardly to expand into a room. The construction is of a lightweight, honeycomb core paneling with improved modes of fabricating and joining the paneling to produce a rigid, lightweight unit. The raising and lowering of the nested wall sections is effected by corner posts operatively interlocked to raise and lower in unison.

3,733,103

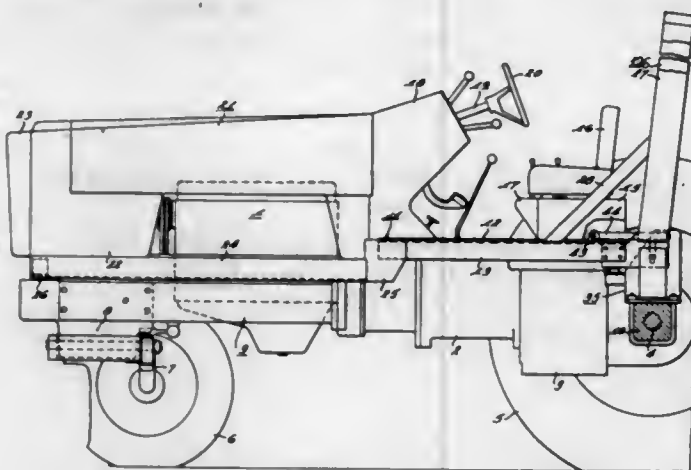
## MOUNTING OF PROTECTIVE BARS ON MAIN FRAME

Kenneth N. Hansen, Waukesha, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed May 18, 1971, Ser. No. 144,419  
Int. Cl. B62d 27/04

U.S. Cl. 296—35 R

12 Claims



A means of mounting protective bars on a chassis resiliently supported by a suspension system on the vehicle main frame and a lost motion device which permits limited movement between the protective bars and the main frame until the protective bars firmly engage the main frame to provide a protective device in event of vehicle upset.

3,733,104

## MULTIPLE USE BODY SUPPORT

Michael N. Carstensen, 3766 Pin Oak Circle, Doraville, Ga. Continuation-in-part of Ser. No. 733,500, May 31, 1968. This application July 6, 1971, Ser. No. 159,932

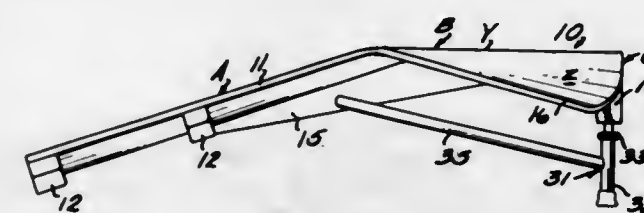
Int. Cl. B47c 4/02; A61g 7/10

U.S. Cl. 297—377

9 Claims

A contoured body support defining a first support surface for supporting the trunk of a person, a second support surface for supporting the head of the person extending from one end

of the first support surface at an angle thereto; and a pair of third support surfaces on each side of the second support surface and extending from one end of the first support surface at a greater angle with respect to the first support surface than the angle of the second support surface with respect to the first support surface for supporting the arms of the person and leaving a sufficient area to support a substantial portion of the person's forearms. A support platform is adjustably mounted on the body support at the first support surface and is selec-



tively movable therealong to support a person in the seated or prone position. A support stand is provided for selectively supporting the body support at a convenient angle. A swing support is provided for mounting the body support as a swing. A support frame for utilizing the body support as a walker is provided and includes caster wheels and a means for maintaining the person in a position so that his trunk rests on the first support surface while allowing his feet to contact the floor for propulsion.

3,733,105

## ROAD SURFACING APPARATUS

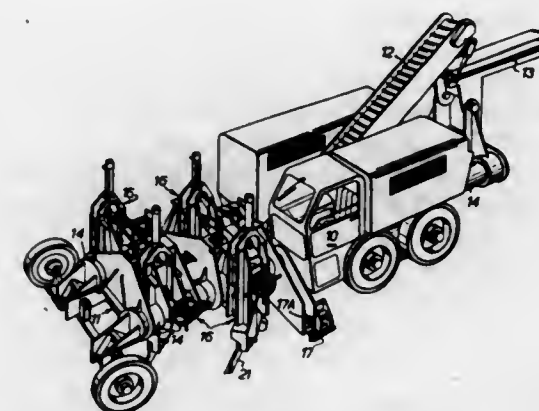
Leonard J. Housego, 134, Craddocks Avenue, Ashtead, Surrey, England

Continuation of Ser. No. 11,146, Feb. 13, 1970. This application Nov. 16, 1971, Ser. No. 199,324

Int. Cl. E01c 23/09

U.S. Cl. 299—37

8 Claims



The obliquely disposed cutters of a road surface planing machine are caused to vibrate during the planing operation, so that the cutting edge of the blade is alternately advanced and retracted, to provide a percussive stone-splitting action and thereby produce a more accurate and smoother planed surface.

Camber changes are effected by mounting each cutter on a support structure which is mounted on a rigid frame member of the machine chassis for adjustment about a pivot axis extending obliquely to the cutting edge, and preferably longitudinally of the vehicle.

3,733,106

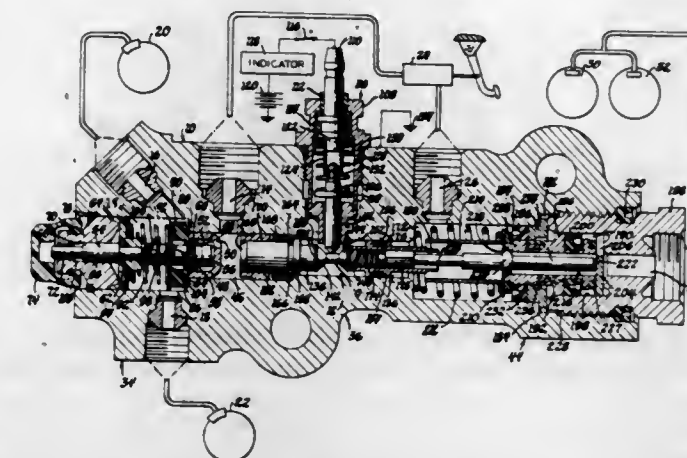
## COMBINATION VALVE ASSEMBLY WITH PROPORTIONER OVERRIDE

Richard C. Rike, Dayton, and Ronald L. Shellhouse, Vandalia, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 17, 1970, Ser. No. 72,992  
Int. Cl. B60t 13/00

U.S. Cl. 303—6 C

9 Claims



A combination valve assembly for a dual circuit brake system in which a metering valve is in one circuit, a proportioning valve is in the other circuit, and a hydraulically reset pressure loss warning indicator unit is sensitive to both circuits. Actuation of the warning unit because of pressure loss in the metering valve circuit causes the proportioning valve to be overridden by removing one of the valve elements from a proportioning position so that pressure through the valve is not proportioned.

3,733,107

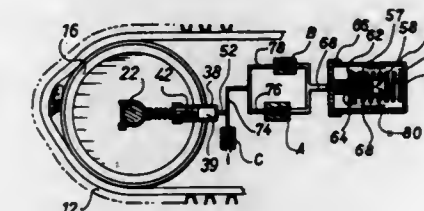
## ENDLESS TRACK TENSION RELEASE MECHANISM

Gilles Yvon Cote, and Jacques Bombardier, both of Valcourt, Quebec, Canada, assignors to Bombardier Limited, Valcourt, Quebec, Canada

Filed July 19, 1971, Ser. No. 163,823  
Int. Cl. B62d 55/30

U.S. Cl. 305—10

4 Claims



The disclosure herein describes a mechanism adapted to take up the overload exerted on the track of a crawler-type vehicle when an obstruction is lodged between the track and the wheel. The mechanism consists of a first cylinder filled with a fluid, such as oil or grease, and which receives a piston with one end connected to a wheel axle of the vehicle; the cylinder is hydraulically connected to a second fluid-filled cylinder by means of hydraulic conduits and valves. When the inward force on the wheel axle exceeds a predetermined value, the grease or oil in the first cylinder is transferred to the second cylinder; when the obstruction is removed, a prestressed spring in the second cylinder causes the return of the grease or oil into the first cylinder which, in turn, actuates its piston to return the wheel to its original position. A safety check valve is provided to allow the grease to be discharged outside the mechanism if the inward force on the wheel axle exceeds a second predetermined value greater than the first predetermined value.



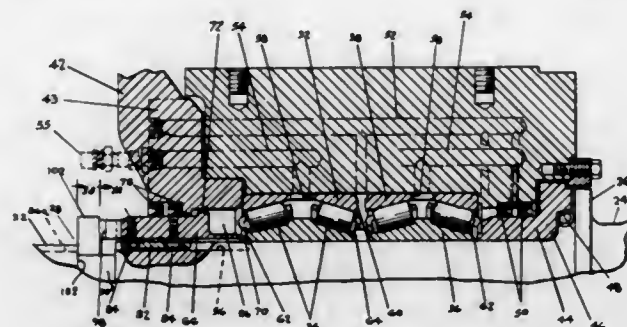
3,733,108

**THRUST MECHANISM FOR A MILL ROLL BEARING ASSEMBLY AND THE LIKE**

Andrew J. Petros, and James M. Minter, both of Pittsburgh, Pa., assignors to Mesta Machine Company, Pittsburgh, Pa.  
Filed Mar. 31, 1971, Ser. No. 129,898  
Int. Cl. F16c 35/06

U.S. Cl. 308—236

16 Claims



A thrust mechanism on a shaft structure comprises a member slidably mounted on the structure for movement longitudinally thereof, stop means positioned on the structure at the terminus of such movement, and first and second thrust members. The first thrust member is slidably mounted on the structure for movement longitudinally thereof into bearing contact with the slidable member. Means are provided for slidably mounting the first thrust member against turning movement thereof relative to the structure. Second stop means are provided on the shaft structure, together with means for mounting the second thrust member against the second stop means for turning movement thereof relative to the shaft structure. Means are provided for securing the second thrust member to the structure against further turning movement thereof following a predetermined limited angular displacement of the second thrust member, together with means on at least one of the thrust members and engageable with the other of the thrust members for urging the first thrust member and the slidable member against the first stop means and for urging the second thrust member against the second stop means.

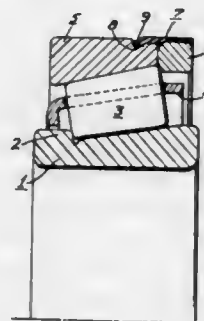
3,733,109

**ROLLING BEARING, E.G. TAPER ROLLER BEARING**

Stig Lennart Hallerback, Vastra Forlunda, Sweden, assignor to SKF Industrial Trading and Development Company, Amsterdam, Holland  
Filed May 3, 1971, Ser. No. 139,351  
Claims priority, application Sweden, May 8, 1970, 6318/70  
Int. Cl. F16c 33/58

U.S. Cl. 308—216

4 Claims



Rolling bearing, for example a taper roller bearing of a unitized type, showing at least one separately arranged supporting flange ring for the rolling bodies, characterized thereby that a resilient element is fixed to the periphery of the supporting flange ring and that a part of the resilient element is projecting axially outside the supporting element and is at its outer part formed as a hook-shaped part projecting radially inwardly or outwardly, which part is intended to cooperate with

a groove in the inner or outer periphery of the bearing race ring which groove has a section essentially corresponding to the hook part of the resilient element.

3,733,110

**MULTI-MATERIAL FILAMENT WOVEN CAGE**

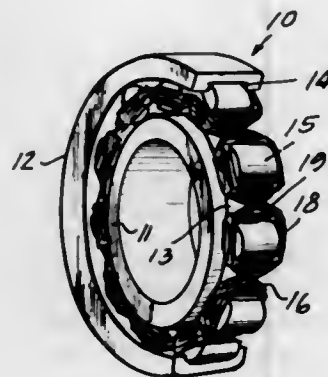
Paul B. Davis, Sinclairville, N.Y., assignor to TRW Inc., Cleveland, Ohio

Filed Apr. 17, 1972, Ser. No. 244,535

Int. Cl. F16c 33/46

U.S. Cl. 308—217

11 Claims



A bearing cage and a method for manufacturing a cage wherein the cage consists of a plurality of circumferentially spaced radially directed cylindrical or rectangular pockets for receipt of roller elements, each pocket having at least a portion of its walls defined by a wound filament of a first material and the cage being defined by a wound filament of a second material.

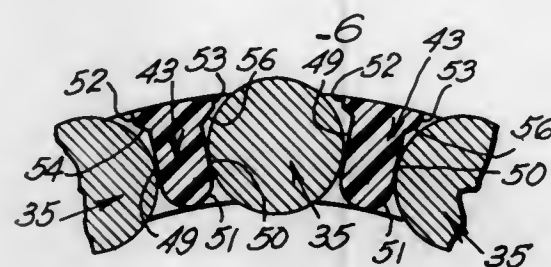
3,733,111

**TAPERED ROLLER BEARING ASSEMBLY WITH ANTIFRICTION MOLDED CAGE**

Jerry C. Harlan, Madison, and William A. Angus, Lebanon, both of Tenn., assignors to TRW Inc., Cleveland, Ohio  
Filed June 29, 1971, Ser. No. 157,931  
Int. Cl. F16c 33/46

U.S. Cl. 308—218

1 Claim



A tapered roller bearing cage assembly in which the retainer cage is formed of a one-piece molded plastic ring having a series of circumferentially spaced slots for receiving the roller elements of the assembly and ribs between the slots for maintaining the roller elements within the slots.

3,733,112

**BOOK MATCH DISPENSER**

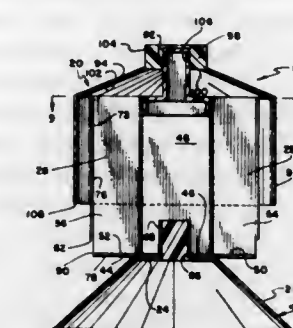
Delbert C. Marquardt, 1506 Laura, Wichita, Kans.  
Filed Mar. 1, 1972, Ser. No. 230,657  
Int. Cl. A47I 1/00

U.S. Cl. 312—97.1

8 Claims

A Lazy Susan type dispenser wherein book matches are top loaded in vertical dispensing magazines spaced about the

center of a rotary body. A dispensing slot at the bottom of each magazine limits withdrawal to a single book of matches



at a time, while a removable cover nonrotatably carried by the body discourages unauthorized removal of books of matches from the top of the magazines.

3,733,113

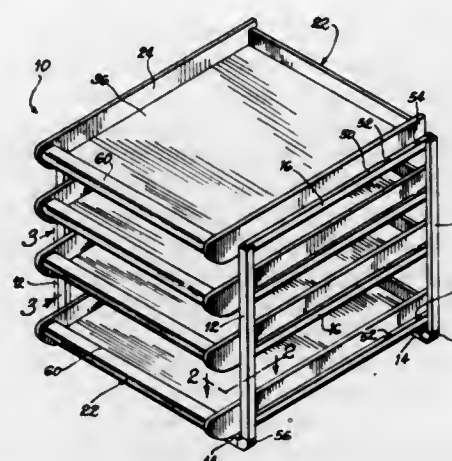
**DRAWER ASSEMBLY**

Joseph B. Glassford, 613 North Lindberg, Griffith, Ind., and John Daniel Lazar, 8940 White Oak, Munster, Ind.

Continuation-in-part of Ser. No. 776,070, Nov. 15, 1968, abandoned. This application Jan. 15, 1971, Ser. No. 106,655  
Int. Cl. A47b 88/04

U.S. Cl. 312—330

20 Claims



An assembly consisting of a frame comprising upright corner posts and horizontally extending connecting members. One set of connecting members extends longitudinally of the assembly and tracks are integrally formed with these members for receiving the lower edges of drawers included in the assembly. Tracks may also be attached to existing walls adjacent a space where drawers are desired. All track designs include passages which cooperate with pins on the sides of drawers to facilitate removal of the drawers, the pins otherwise serving as stop means for the drawers. The side walls of the drawers define the lower edges, and a bed portion extends between these side walls. The bed portion may be formed of a fiberboard material which can be bent at its leading and trailing edges for forming front and back walls for the drawer. The side walls define grooves for receiving the side edges of the bed, and additional groove portions are provided for receiving an over-hanging portion connected to the front wall of the bed and defining a handle for the drawer.

3,733,114

**DIELECTRIC FRAME BEAM WAVEGUIDE**

Pier Francesco Checcacci, and Annamaria Scheggi, both of Firenze, Italy, assignors to Consiglio Nazionale Delle Ricerche, Roma, Italy

Filed Sept. 23, 1971, Ser. No. 183,046

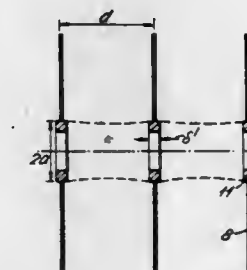
Int. Cl. G02b 5/14

U.S. Cl. 350—96 WG

5 Claims

An iterative or beam waveguide consisting of several guide elements which are identical, parallel, inter-equidistant and

coaxial to the beam's axis, characterized by the fact that it is made up of several identical cross sections realized in dielectric material, with each pair of cross sections having a function equivalent to that of a resonator formed by a pair of flat parallel reflectors symmetrically placed, with each reflector having a stepped edge and with the dimensions of said cross sections having outside measurements little greater than the beam's, the beam being in said cross sections, which are placed at equal distances from each other, the distances being equal to



those separating the cross sections' equivalent resonators' reflectors, every cross section, which carries out a function equivalent to that of the resonators' reflectors' peripheral step corresponding to the cross section, creating a phase jump having a transverse area width large enough to allow reconstructing the original size of the beam modified, as it were, during passage from one cross section to the next, and having a thickness computed in a way to correspond to minimum loss or attenuation, which can be suffered by a beam-type wave.

3,733,115

**SYMMETRICAL OPTICAL LENS SYSTEM**

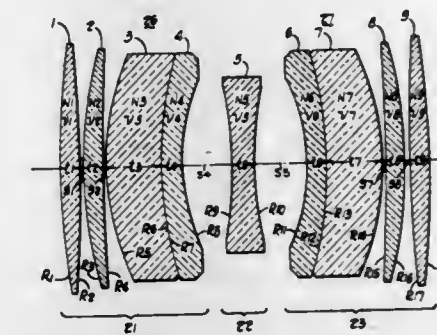
Arthur Cox, Park Ridge, Ill., assignor to The Austin Company, Cleveland, Ohio

Filed May 17, 1971, Ser. No. 143,954

Int. Cl. G02b 9/64

U.S. Cl. 350—214

19 Claims



An optical lens system is disclosed comprising nine elements having a reduced Petzval sum, a wide field and low secondary spectrum Spherical aberrations, coma, astigmatism and distortion are similarly reduced resulting in a diffraction limited superachromat.

3,733,116

**MIRRORS HAVING STRETCHED REFLECTIVE SHEET MATERIALS**

Mark Earle Hutchinson, Goffstown, N.H., assignor to American Velcro, Inc., Manchester, N.H.

Filed Apr. 20, 1972, Ser. No. 245,720

Int. Cl. G02b 5/08

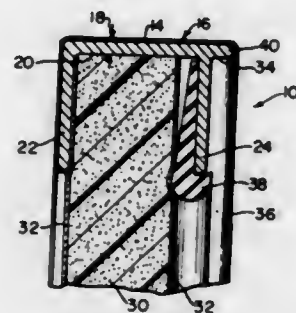
U.S. Cl. 350—288

8 Claims

A planar mirror having a reflective surface including a metallized thin film reflective sheet material in a stretched condition over a raised ridge on one side of the supporting



frame, with means for securing the film in the stretched condition over the frame. A resilient wedge-like member is positioned and gripped between an upper flange member of each frame member and a supporting substrate member such that



compressive reaction forces of the resilient members are in balanced equilibrium with compressive and bending forces of the film thus creating a continuous and optically correct reflecting mirror surface.

3,733,117

**FILM-TAPE SYNCHRONIZATION SYSTEM**

Mitsutoshi Ogino, Kawasaki-shi, Kanagawa-ken; Takashi Itami, Ota-ku, Tokyo, and Kiyoshi Takahashi, Kunitachi-shi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Shimonoseki, Ota-ku, Tokyo, Japan

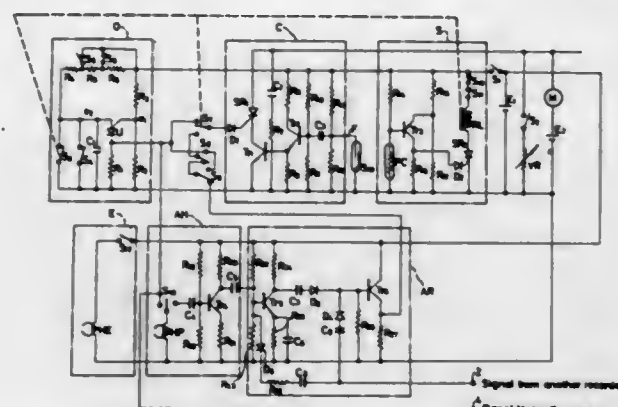
Filed July 26, 1971, Ser. No. 165,999

Claims priority, application Japan, July 24, 1970, 45/64859

Int. Cl. G03b 31/04

U.S. Cl. 352—22

14 Claims



In the disclosed system, a control circuit drives a projector by comparing the speed of the projector with the rate of clock signals from a pulse generator. When the projector reaches a start index on the film a detector disables the pulse generator so that the control circuit stops the projector. At the same time the detector connects the control circuit to the tape which has clock signals recorded along with the sound. As soon as the tape reaches the point where the sound and clock signals begin the control circuit restarts the projector and keeps it running in synchronism with the tape.

3,733,118

**FILM TRAINING PROJECTOR**

Richard P. Gundlach, Belleville, Ill., assignor to Gamco Industries, Inc., Big Spring, Tex.

Division of Ser. No. 814,127, April 7, 1969, Pat. No.

3,623,801. This application June 28, 1971, Ser. No. 157,198

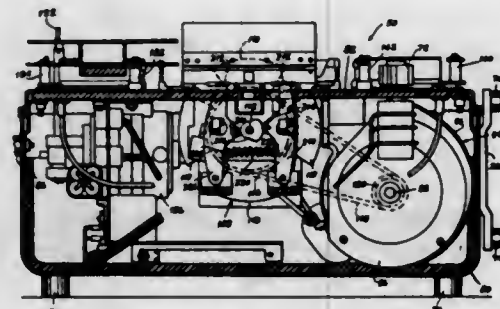
Int. Cl. G03b 21/02

U.S. Cl. 352—97

4 Claims

A visual training projector for projecting intelligible matter from one or two films. The projector may be used to project

stationary pictures or motion pictures, as desired, by control from a remote control unit such as a remote operator's handle. Provision is made through a specially designed blower to provide for cooling the projector lamp bulb to accommodate projection from either a horizontal or vertical plane. Special loading means are provided for the film in pressure plates at the projector through solenoid operated gates to provide ready accessibility for loading and unloading. Advancement of the film, past the film aperture, is effected through solenoid and cam operated vibrated shuttles, which are mounted on a ball



pivot for two directions of freedom to hold and actuate the film. In order to reduce wear on the film, the film is taken from a supply reel and fed to a take-up reel by sensing arms which sense the tension in guided film loops and control supply and take-up motors to control the play out and take up of the film reels. Where, in addition to the front film, a rear film is used for fixation upon the front film, provision is made for feeding the films in the same direction to facilitate timing. The construction of the film reels and spindles is so designed that the film reels may be wound in either clockwise or counter-clockwise direction.

3,733,119

**AUDIO-VISUAL SYSTEM**

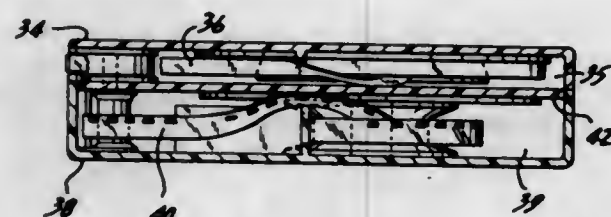
Paul D. Catalano, Manhattan; Norman Buten, Douglaston, both of N.Y.; George H. Ensh, Encino, Calif., and Frank V. Emanuel, Cherry Hill, N.J., assignors to Retention Communication Systems, Inc., New York, N.Y.

Filed Dec. 14, 1970, Ser. No. 97,794

Int. Cl. G03b 21/00

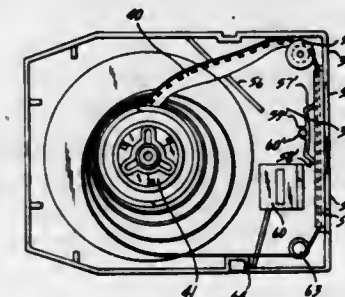
U.S. Cl. 352—78 R

1 Claim



An audio-visual system including a cartridge and an audio-visual housing. The cartridge contains an endless tape on one reel and an endless filmstrip in a loop. Means are also provided on the cartridge to bring the continuous tape and continuous filmstrip into communication with openings to the exterior of the cartridge. The audio-visual housing is adapted to

receive the cartridge and start means on the housing are provided responsive to reception of a portion of the cartridge within the housing to activate a tape drive motor, a lamp and a power source. Tape engaging and audio pick-up means are in the housing to engage the exposed portion of the tape when the cartridge is received in the housing and is responsive to the tape drive motor to drive the continuous tape. Audio means are in the housing in communication with the pick-up head means to transmit the sound tracks from the tape. Discriminator means are positioned in the housing in communication with the pick-up head to receive and respond to a signal received from the tape. Film transport means are also in the housing to engage the exposed portion of the filmstrip when



the cartridge is received in the housing and is adapted to transport the film. Film advance means is positioned in the housing and is in communication with the discriminator means and the film transport means so that when a signal is received by the discriminator means it will respond by causing the film advance means to drive the film transport means and transport the film to thereby permit the tape and film to be advanced in a predetermined sequence. A projector lens is located in the housing and is aligned with the exposed portion of the film and the cartridge positioned in the housing. Condenser and director means are in the housing and the cartridge positioned in the housing and is in association with the lamp to condense and direct light from the lamp onto the rear of the film and to pass through the film and aligned lens and thereby project an image of the exposed frame of film. Finally, cooling means is positioned in the housing to assist in preventing excessive heating of the exposed filmstrip and the interior of the housing.

3,733,120

**FILM DRIVE, AND CINEMATOGRAPHIC APPARATUS INCORPORATING THE SAME**

Lloyd M. Adams, Santa Ana, Calif., assignor to Geotek, Inc., Amityville, Long Island, N.Y.

Division of Ser. No. 843,892, June 16, 1969, Pat. No.

3,586,224, which is a continuation-in-part of Ser. No. 528,718,

Feb. 21, 1966, abandoned. This application June 11, 1971,

Ser. No. 152,359

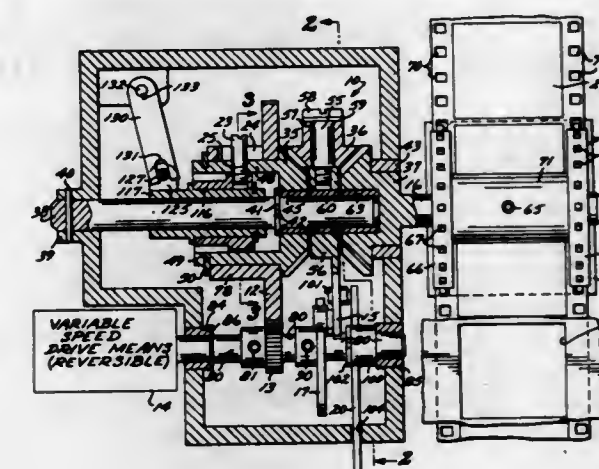
Int. Cl. G03b 21/48

U.S. Cl. 352—187

33 Claims

A cinematographic apparatus which incorporates, as the film-drive mechanism therein, a differential gear having two inputs and one output, the latter being connected to the sprocket which drives the film. One of the inputs is driven at a constant speed, and the other is driven alternately in opposite directions by a cam, the cam being so shaped that the film will alternately advance and dwell in intermittent manner. Locking apparatus is provided to insure that the film remains absolutely stationary during each dwell period, despite varia-

tions of or wear in the drive components. A mechanism is provided to disengage the cam from such other input, so that the film may be driven rapidly in a nonintermittent manner and



still maintain precise framing. A framing mechanism is provided to achieve correct framing, in a manner which is not subject to creep, without destroying the proper phase relationship with the shutter.

3,733,121

**MICROFICHE READER**

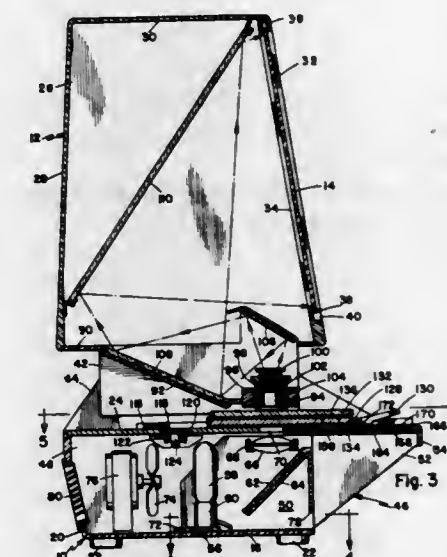
Louis A. Smitzer, San Diego, Calif., assignor to Seaco Computer-Display Incorporated, Garland, Tex.

Filed Dec. 15, 1969, Ser. No. 885,203

Int. Cl. G03b 23/08, 1/48, 21/20

U.S. Cl. 353—27

6 Claims



A reader for viewing enlarged images of selected portions of a flat film microfiche. The film is sandwiched between flat transparent plates of a holder, which is easily slidable in a carriage to bring a selected micro image into the optical projection path, positioning being facilitated by a guide in the table on which the carriage moves. To ensure precise focussing, the lens unit rides on and is supported by the upper plate of the film holder. When the holder is pulled forward the upper plate automatically rises to allow removal or replacement of the film. The illumination source and a portion of the optics are disposed within a removable drawer translatable positioned in the reader housing.



3,733,122

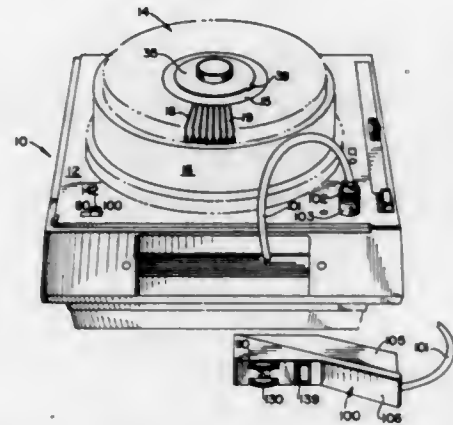
## RANDOM SELECTION SYSTEM FOR SLIDE PROJECTORS AND THE LIKE

Oleg Szymber, Elk Grove, Ill., assignor to GAF Corp., New York, N.Y.

Filed June 17, 1969, Ser. No. 834,040  
Int. Cl. G03b 23/00, 23/02, 23/06

U.S. Cl. 353-103

11 Claims



A handpiece connected to a slide projector includes two thumb actuated selector wheels for dialing any number from "01" to "100". These thumb wheels operate a pair of variable resistors in the handpiece for establishing a predetermined electrical resistance for each selected number. The slide projector has a circular slide tray with 100 slide receiving spaces. An electric motor drives this tray and also movable contacts of a pair of variable resistors in the projector. A balancing resistance circuit connects the motor with the variable resistors in the projector and in the handpiece. When the resistance selected by the thumb wheels is unequal to the resistance of the variable resistors in the projector, the circuit is energized for advancing the tray. When the resistance established by the variable resistors in the projector is equal to the resistance established by the variable resistors in the handpiece, the circuit is de-energized thereby positioning the selected tray space adjacent the projection gate of the slide projector.

3,733,123

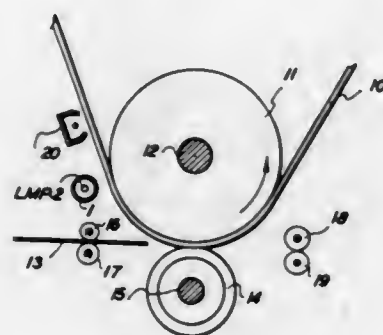
## METHOD AND APPARATUS FOR ENCLOSING A LAMP

Charles F. Roth, Jr., Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 16, 1971, Ser. No. 171,827  
Int. Cl. G03g 15/00

U.S. Cl. 355-3

4 Claims



Method and apparatus for keeping a light source in an electrophotographic machine free from contaminating deposits of electroscopic toner material in which the light source is enclosed within an electrically chargeable closure member to physically isolate the light source from the toner material, and the closure member is charged to a polarity. The transparent portion of the closure member may be either a dielectric material or glass coated with a transparent conductive layer to form an electric field to repel the toner material away from the closure member and the light source.

3,733,124

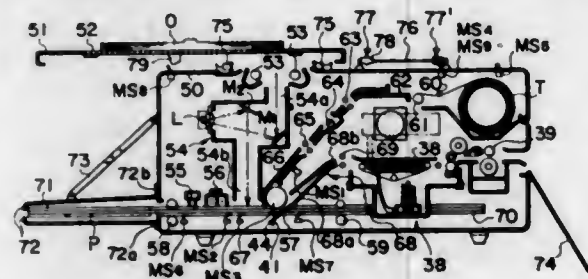
## TRANSFER TYPE ELECTRONIC PHOTOGRAPH DUPLICATOR

Susumu Tanaka; Masayoshi Inoue, both of Sakai; Yuji Enoguchi, Higashiosaka; Kenichi Wada, Toyokawa, and Takao Fujiwara, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka-shi, Osaka-fu, Japan

Filed May 17, 1972, Ser. No. 254,082  
Int. Cl. G03g 15/10, 15/00

U.S. Cl. 355-10

11 Claims



In an electronically controlled electrostatic latent image transfer type photographic duplicator, an original document receiver having a transparent plate for supporting an original document thereon is movable along the top surface of the duplicator case. An optical exposure projection system is mounted within the case and includes exposure and image slit openings. The original document receiver is reciprocated along the top surface of the duplicator case to completely expose the original document as it moves in one direction traversing the slit opening. A photosensitive plate reciprocates along a path parallel to and spaced from the original document receiver and is reciprocated at the same speed and in the same direction as the document receiver so that an image of the original document is projected onto the photosensitive plate as it moves in the same direction as the document receiver to completely traverse the image slit opening.

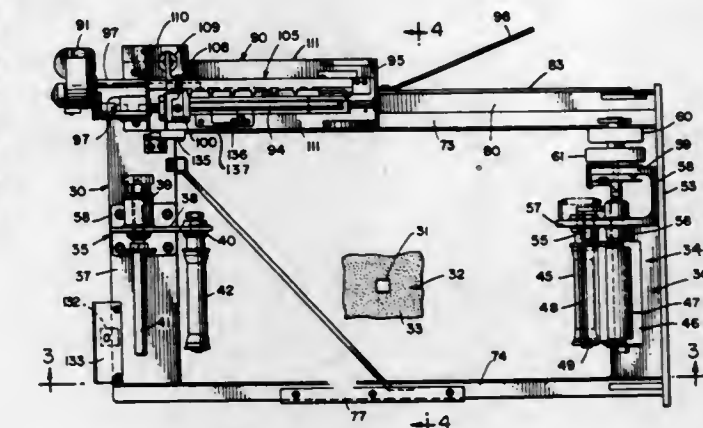
The electrostatic latent image formed on the photosensitive plate is transferred to a transfer paper having a conductive base and an image transfer surface by contacting the transfer surface with the electrostatic latent image on the photosensitive plate as both the contacting portions of the transfer surface and the photosensitive plate move at the same speed and in the same direction.

The transfer paper is deposited on the photosensitive plate so that its leading edge overlaps the leading edge of the photosensitive plate and is separated therefrom by a separating mechanism which includes a guide plate having a surface extending into the plane of the path of the photosensitive plate and including thereon comb-like projections. A member rotatable to a first and second position also includes comb-like projections and is biased into a first position wherein the comb-like projections are upstanding in the path of the transfer paper and the member is rotated to a second position by contact with the leading edge of the photosensitive plate having comb-like projections on the leading edge thereof; with the rotating member in the second position, its comb-like projections, as well as the comb-like projections on the photosensitive guide plates, are in interleaving relationship to form a continuous surface for guiding the transfer paper to a developing means.

The image on the transfer paper is developed by contacting the transfer surface thereof with a developer. In one embodiment, the transfer paper is transported across a developing tank in close proximity to an electrode plate by an endless belt. In another embodiment, the developing tank is divided into two compartments separated by a weir and developer is pumped into one compartment and flows to the other compartment whereupon it flows over an electrode plate having wires on the surface thereof which have a height slightly less than the flow of developer. The transfer surface is carried across the electrode plate at a greater speed than the flow of the developer stream.

The developed image is fixed by removing excess developer from the transfer paper by squeezing it between one or more squeeze rollers, respective ones of which may be in contact with a hygroscopic roller and a cleaning roller. The transfer paper is then dried by guiding it in close proximity to a heater and a blower. In a modification of the fixing mechanism, the squeeze rollers are caused to be separated in the absence of transfer paper therebetween. Additional developer may also be removed from the transfer paper by a rotating wiper roller the surface speed of which is greater than the speed of the transfer paper passing from the electrode plate, or a doctor blade which scrapes the transfer surface.

and a step-by-step drive for each carriage including a ball screw, a traveler on the screw, a latch member on the traveler



3,733,125

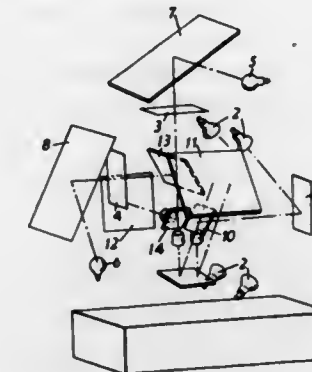
## PHOTO-COMPOSING MACHINES

Daniel Camille Cornelius Dewaele, Beelare, Belgium, assignor to Lamson Paragon Limited, London, England

Filed Oct. 15, 1971, Ser. No. 189,504  
Int. Cl. G03b 27/52, 27/70

U.S. Cl. 355-43

7 Claims



This invention is concerned with a photocomposing machine and is more particularly concerned with a photocomposing machine for use in preparing printing plates for use in a machine for printing business forms. In such a machine text matter is prepared on a master sheet which is mounted on a carrier which moves through the machine in such a way that the matter to be projected is correctly positioned in the photocomposing machine Mask mechanisms and also provided in the photocomposing machine and these Mask mechanisms have to be moved at the same time as the carrier. The present invention provides a memory system to record a predetermined position of the carrier and masks and hence record a position of reproduction of the representation on the sensitized material.

and a pivotable catch member bearing a plurality of projecting teeth with spacings between the teeth corresponding to a dimension of the fiche frames.

3,733,127

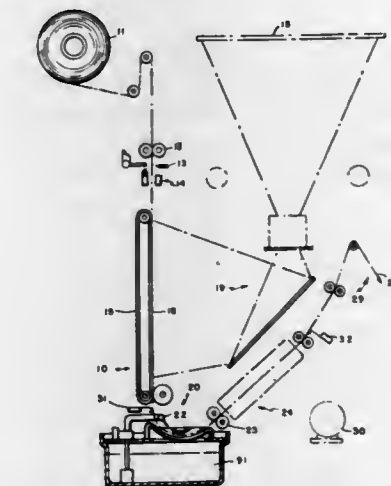
## CONTINUOUS TONE PHOTOCOPIER

Barry R. Perlis, Lexington, and Alfred K. MacKenzie, Wayland, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Aug. 14, 1970, Ser. No. 63,758  
Int. Cl. G03g 13/10

U.S. Cl. 355-10

4 Claims



An electrostatic copier apparatus for reproducing continuous tone images which utilizes the effect of saturation, or near saturation, development of the latent electrostatic image by using in a preferred embodiment a two-speed motor which feeds the paper to the developer station at a first relatively fast rate of travel, feeds the paper through the developer station at a second relatively slow rate of travel to achieve such saturation, or near saturation, development, and thereupon feeds the paper from the developer station to the apparatus outlet at the first relatively high rate of travel to minimize the overall time spent in the reproduction process.

3,733,126

## STEP-BY-STEP DRIVE USEFUL IN MICROFICHE CAMERAS

Philip J. Browncombe, Millington, N.J., assignor to Eugene Dietzgen Co., Chicago, Ill.

Filed Aug. 4, 1971, Ser. No. 169,025  
Int. Cl. G03b 27/44

U.S. Cl. 355-54

10 Claims

A microfiche camera embodying a film-indexing mechanism for frame-by-frame and row-by-row exposure of the film in a grid-like fiche pattern, the drive embodying a first carriage mounted for linear movement on a frame, a second carriage mounted for linear cross-motion on the first carriage,

## ELECTROPHOTOGRAPHIC MICROFILM RE-ENLARGING APPARATUS

Gerhard Naumann, Wiesbaden-Biebrich; Gerhard Marx, Hahn, and Erich Blume, Wiesbaden-Biebrich, all of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Apr. 21, 1971, Ser. No. 135,870

Claims priority, application Germany, Dec. 11, 1970, P 20 50 012.3

Int. Cl. G03b 13/28

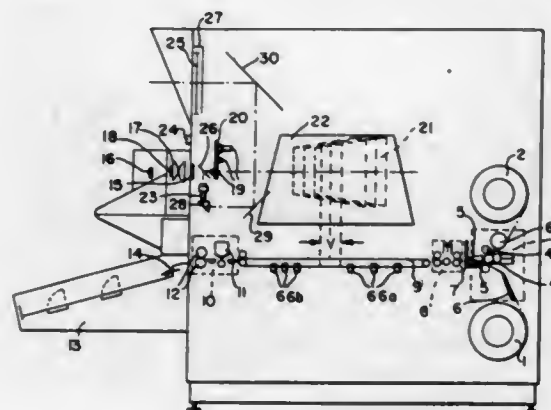
U.S. Cl. 355-45

12 Claims

This invention relates to an electrophotographic microfilm re-enlargement apparatus comprising, for optical projection



of a negative, an optical system including a plurality of lens means individually insertable into a projection beam and so selected that, with an at least approximately constant projection path, the negative can be projected, at a different enlargement factor for each lens, onto a fixed image plane, and pre-selectable drive means for moving optical elements of the optical system into positions corresponding to each available enlargement factor.



ment factor for each lens, onto a fixed image plane, and pre-selectable drive means for moving optical elements of the optical system into positions corresponding to each available enlargement factor.

3,733,129

## LASER DISTANCE DETECTOR

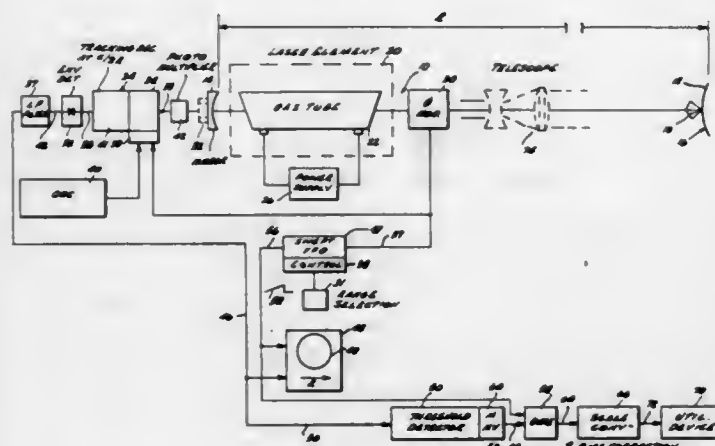
William B. Bridges, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 1, 1971, Ser. No. 111,636

Int. Cl. G01c 3/08

U.S. Cl. 356-5

13 Claims



A system utilizing a laser for accurately measuring range from a first position to a second position by providing a laser cavity having a reflective mirror at the first position and a target as the reflective mirror at the second position, and by detecting the occurrence of an induced optical mode locking condition in the laser cavity. The system phase modulates the energy in the cavity at a swept modulation frequency with the amplitude of the intermode beats or differences being detected to determine the effective length of the cavity. At phase modulation frequencies near  $c/2l$  ( $c$  is the velocity of light in the medium and  $l$  is the length of the cavity) mode locking occurs in such phase relations that the beat signal appears to be a pure FM signal with a relatively small amplitude and at phase modulation frequencies at  $c/2l$  a different type of mode locking produces a large amplitude signal, either of which conditions may be utilized to provide a scaled value of  $l$  or range.

3,733,130  
SLOTTED PROBE FOR SPECTROSCOPIC MEASUREMENTS

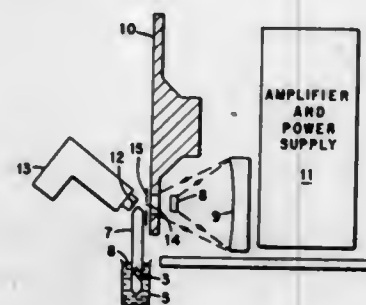
Jack P. Young, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Mar. 7, 1972, Ser. No. 232,488

Int. Cl. G01j 3/42, 3/50

U.S. Cl. 356-74

2 Claims



A device is provided for conducting colorimetric or absorption spectral measurements which consists of a transparent material of proper index of refraction and having a geometrical design such that an entering beam of light into the material is totally reflected internally so as to proceed from an entering point into and through a sample system of known dimensions whereupon said beam emerges from said material through a single sealable opening and is transmitted to a conventional detector where spectral measurements are carried out in a normal manner.

3,733,131

## OPTICAL BEAM SWITCHING DEVICES UTILIZING A PAIR OF PLANE MIRRORS

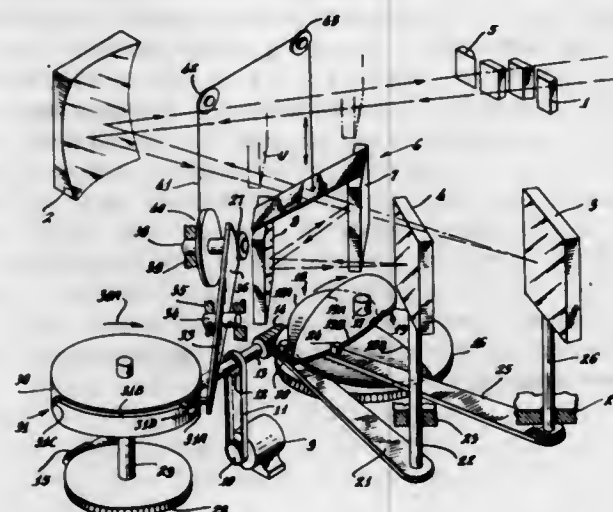
Henry Manifold Mould, Penn, England, assignor to Perkin-Elmer Limited, Beaconsfield, Buckinghamshire, England

Filed Aug. 5, 1971, Ser. No. 169,343

Int. Cl. G01j 3/12, 3/42

U.S. Cl. 356-100

6 Claims



Where it is desired to "switch" a beam of radiant energy from a first to a second receiving element, it is proposed to introduce into the beam a pair of parallel facing plane mirrors rigidly attached to each other, along a line parallel to the reflective surfaces. This eliminates undesired change in the direction of the reflected beam caused by unintentional rotation of the two-mirror assembly about the line of introduction. The device may be used in a two-grating scanning monochromator to cause gradual change-over of the beam from one grating to the other. The two-mirror assembly movement is preferably interconnected to the grating drive to cause movement of the assembly at the appropriate time, and preferably in such manner as to allow reversing of the monochromator.

3,733,132

## COLLIMATOR FOR BINOCULAR INSTRUMENTS

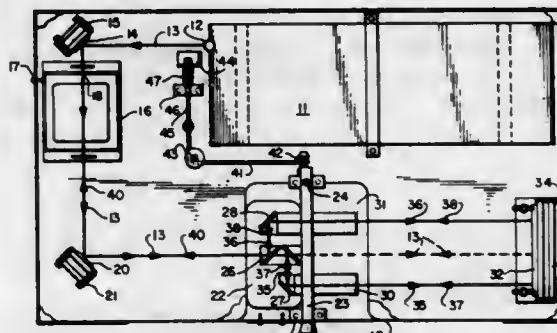
Stephen Beecher Leighton, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Oct. 26, 1971, Ser. No. 192,267

Int. Cl. G01b 11/26

U.S. Cl. 356-138

8 Claims



A precise system for aligning the beam splitting system such as the prisms of a binocular instrument. A beam of collimated light passes through a hole in a screen to a flat mirror and returns coincident with itself to the screen. When the beam splitter to be checked is placed in the path of the light, two rays are formed. These rays travel to the flat mirror and return to the screen through the beam splitter. Any non-parallelism of the rays is indicated by light spots not centered on the screen.

3,733,133

## BALANCED TILTABLE, ROTATING MIRROR WITH ITS OPTICAL AXIS ANGULARLY OFFSET FROM ITS AXIS OF ROTATION

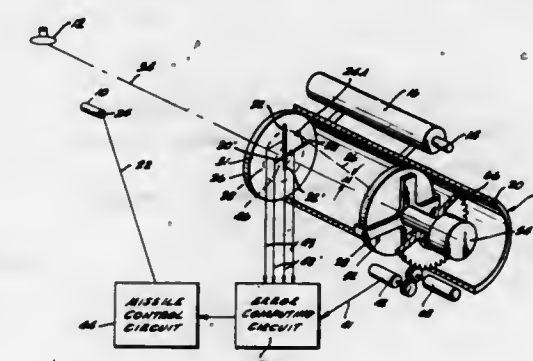
Arthur S. Chapman, Rolling Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 13, 1970, Ser. No. 19,374

Int. Cl. F41g 7/00; G02b 17/00

U.S. Cl. 356-152

14 Claims



The mirror, such as a mangin-mirror, is useful in a system which automatically detects a deviation between a target and an object moving towards the target by comparing the line of sight to the target and the line of sight to the object. The mirror has a first axis about which it rotates and an optical axis which is displaced at an angle from the rotational axis. The rotational axis is kept coaxial with the target line of sight. The mirror is selectively tilttable to one of two discrete positions about its optical axis so that, as the mirror rotates, the reflection from the object forms two images, corresponding to the two mirror positions which conically scan a detector plane. Two pairs of right-angled light detectors, one for each position, are located on the plane. By comparing the time intervals for each pair of detectors when the reflection crosses the detectors, the deviation can be calculated, and by other equipment corrections in the path of the object can be made.

3,733,134

## DEVICE FOR MEASURING MECHANICAL DEVIATION AT REMOTE LOCATION

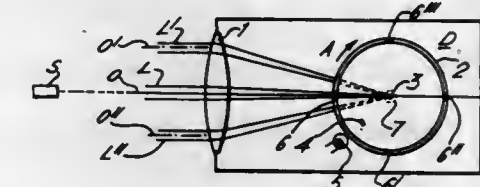
Yoshiki Kadoya, Mure, Mitaka City, Tokyo, Japan, assignor to Kyowa Electronic Instruments Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1970, Ser. No. 101,498

Int. Cl. G01b 11/26

U.S. Cl. 356-152

8 Claims



A measuring device for mechanical deviation or vibration at remote location comprising a first light source projecting a light beam onto the device, a condenser lens for collecting the projected light, a photoelectric element positioned at the focus of said condenser lens, a rotating drum rotating in constant speed and having its axis passing through the focus in a direction normal to a plane including axis of the light beam and the direction of the deviation to be measured and being arranged to interrupt the path of the projected light beam between the condenser lens and the photoelectric element, and further comprising a local light source and a second photoelectric element being placed on both sides of the rotating drum. The rotating drum is provided with a plurality of slits spaced equidistantly on the periphery, parallel to the drum axis, so that to interrupt the path of projected light beam periodically to produce a first series of electric output pulses and to interrupt the path of the local light source impinging onto the second photoelectric element to produce second series of electric output pulses which consists of a reference pulse train. The device is fixed onto a body to be measured for the mechanical deviation or the vibration. The body is located at a remote place from the first light source. The mechanical deviation or vibration of the body will cause phase variation of the first series of electric output pulses and the deviation is detected by comparing the phase of the first electric pulse series with that of the second electric pulse series constituting reference pulse series.

3,733,135

## METHOD AND APPARATUS FOR MEASURING IMAGE FORMING PROPERTIES OF AN IMAGE DISPLAY PANEL

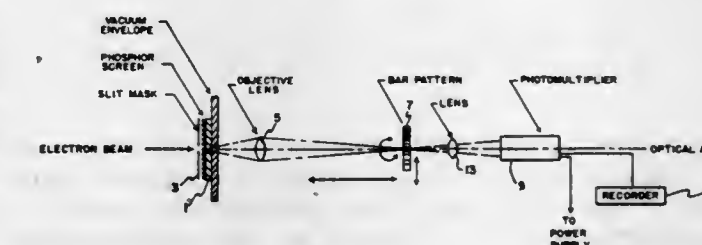
Nicholas A. Diakides, Alexandria, and Richard L. Sormberger, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 23, 1971, Ser. No. 155,698

Int. Cl. G01b 11/00, 9/08, 9/00

U.S. Cl. 356-156

8 Claims



Method and apparatus for measuring image forming properties of optical and electro-optical systems in terms of modulation transfer function wherein the apparatus comprises a sim-



ple lens focussing system, a filar eye piece with a desired pattern, a photomultiplier and associated mechanisms for aligning the pattern with an optical image, and a variable speed reversible motor for scanning the pattern over the image; and wherein the method provides objective electronic focusing and alignment of the image.

3,733,136

# METHOD AND APPARATUS FOR MEASURING THE DEGREE OF ASSYMMETRY OF NON-SPHERICAL PARTICLES

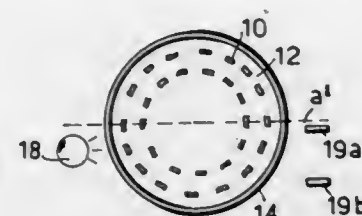
Asher Porath-Furedi, Batel Even 64/9 Kiriat Yovel, Jerusalem, Israel

Filed July 12, 1971, Ser. No. 161,798

Int. Cl. G01n 21/24, 33/16

U.S. Cl. 356-197

9 Claims



Method and apparatus for measuring the degree of asymmetry of non-spherical particles (e.g., erythrocytes, i.e., red blood cells) wherein the particles are suspended in a light-transparent medium, the medium is mixed to cause the particles to rotate while light is projected through the medium, and the differences in the profiles of the particles to the light when the particles move at different angles to the path of the light through the medium are detected to provide an indication of the degree of asymmetry of the particles.

3,733,137

# LOG RATIO TRANSMITTANCE SIGNAL PROCESSOR FOR PHOTOMETRIC APPARATUS

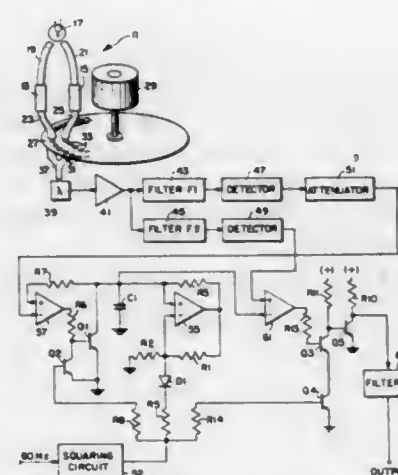
Rosario S. Badessa, c/o Damon Corp. 115 Fourth Ave., Needham Heights, Mass.

Filed Jan. 12, 1971, Ser. No. 105,802

Int. Cl. G01n 21/22; G01j 3/42

U.S. Cl. 356-204

4 Claims



The processor described herein operates to provide an output signal which varies as a function of the logarithm of the ratio of two input signals. In the processor, the charge on a capacitor is controlled to provide an exponential waveform which starts at a level proportional to one of the input signals. Preferably, the exponential is positive, i.e., regenerative rather than degenerative. A squarewave pulse is initiated simultaneously with the starting of the exponential waveform. When the exponential waveform reaches a level proportional to the other of the input signals, this squarewave pulse is terminated.

By repetitively generating squarewave pulses in this manner, a pulse train output signal is obtained having an average amplitude or d.c. component which is proportional to the logarithm of the ratio between the two input signals.

3,733,138

# OPTICAL SYSTEM FOR INSPECTION OF A CAVITY

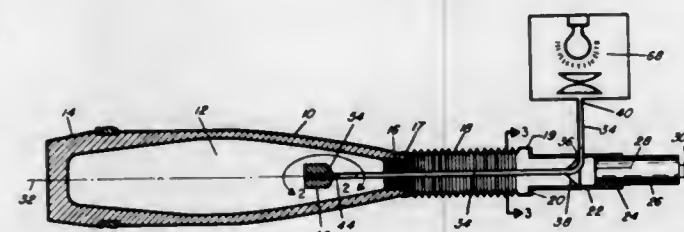
Mark H. Weinberg, Short Hills, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 14, 1972, Ser. No. 262,900

Int. Cl. G01n 21/16

U.S. Cl. 356-241

4 Claims



An optical system for inspecting a 360° annular section of a housing interior. The optical system includes a telescope whose objective lens end is axially aligned and slidably affixed to a hollow cylindrical extension tube, a hollow cylindrical bellows has one end fixedly attached to the objective lens end and the other end slidably attached to the housing so that it is axially aligned with the extension tube and the housing, a light transmitting means extends longitudinally through said extension tube and bellows so that its output end protrudes into the housing interior, a 360° reflecting means is axially disposed adjacent to the light means output end, a 360° viewing means is axially positioned adjacent to the reflecting means so that the viewing means field of view coincides with the reflecting means field of illumination, a light source is directed into the input end of a fiber optic light pipe for illuminating a 360° area of the housing interior so that the latter may be viewed by focusing the telescope on an image formed by the viewing means reflecting surface, and the entire interior surface visually scanned by longitudinally moving the housing relative to the viewing means.

3,733,139

# DUAL WRITING INSTRUMENT

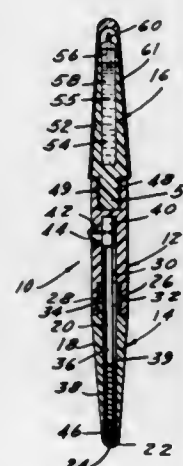
John G. Neidhardt, and Joyce D. Neidhardt, both of 1232 Superior, Ventura, Calif.

Filed Nov. 5, 1971, Ser. No. 196,142

Int. Cl. B43k 27/12

U.S. Cl. 401-17

5 Claims



There is herein disclosed a dual-purpose writing device having a main, central body with opened ends therein, adapted to

removably receive end bodies, one of the end bodies being provided with a bore in which is disposed a retractable ink cartridge, the second end body being provided with a cavity adapted to become a chamber for storing of writing fluid when a felt writing tip is disposed within the opened end thereof. The device is also provided with a cap member designed to fit as a cover over either end body.

3,733,140

# CURB FORMING MACHINE

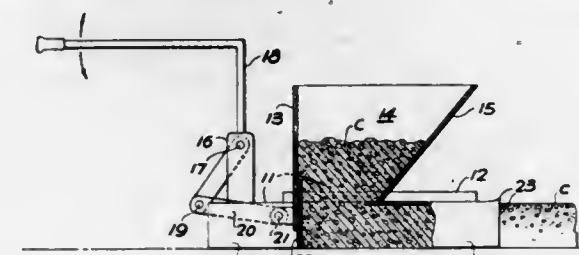
William T. James, III, Canfield, Ohio, assignor to The Renner Company, Youngstown, Ohio

Filed Dec. 20, 1971, Ser. No. 209,638

Int. Cl. E01c 19/48

U.S. Cl. 404-98

4 Claims



A curb forming machine comprises a manually operable steerable device for forming asphaltic concrete or portland cement mixes having no slump characteristics into a uniform curb. The device carries a curb forming shoe with a hopper thereabove slidable in relation to the shoe and communicating therewith in one position and closed with respect thereto in another. A ram is attached to a wall of the hopper and is movable toward and away from the shoe. Movement of the ram and the hopper permits asphaltic or portland cement mix to fall by gravity into the shoe and the compaction of the same in the shoe when the ram moves toward the same. The reaction force moves the curb forming machine away from the newly extruded curbing.

3,733,141

# MACHINE FOR FORMING CURBING

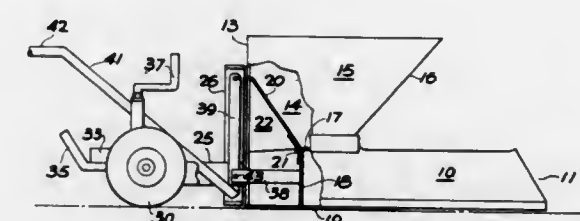
William T. James, III, Canfield, Ohio, assignor to The Renner Company, Youngstown, Ohio

Filed Dec. 20, 1971, Ser. No. 209,796

Int. Cl. E01c 19/48

U.S. Cl. 404-98

5 Claims



A machine for forming curbing consisting of a manually operable steerable device which compacts and shapes asphaltic concrete or portland cement mixes having no slump characteristics into uniform curbing. The machine has a curb forming shoe with a hopper thereabove and communicating therewith and a manually controlled ram to which a closure plate is hinged. Operation of the ram and the closure plate permits the asphaltic or portland cement mix to fall by gravity into the shoe where operation of the ram compacts the mix in the shoe to form the curbing. The reaction force moves the machine away from the newly extruded curbing.

3,733,142

# APPARATUS FOR SIMULTANEOUSLY DRILLING AND TAPPING A PLURALITY OF WORK PIECES AT EACH OF A PLURALITY OF POSITIONS

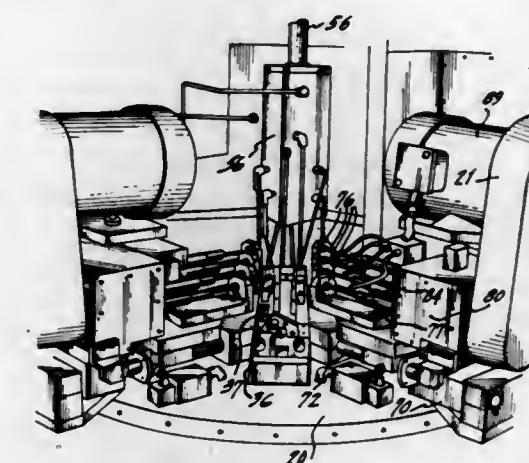
Nils Hoglund, Short Hills, N.J., assignor to Tri-Ordinate Corporation, Berkeley Heights, N.J.

Division of Ser. No. 763,043, Aug. 9, 1968, abandoned. This application Feb. 24, 1971, Ser. No. 118,218

Int. Cl. B23b 39/16, 39/20

U.S. Cl. 408-42

5 Claims



The apparatus, intended primarily for simultaneously drilling and tapping a plurality of work pieces at each of a plurality of working positions includes an annular table supporting a plurality of tapping and drilling assemblies at a plurality of spaced working positions. Rotatably mounted within the annular table support is a turret having a plurality of radial arms on which are supported retractable work supporting shuttles movable toward and from working positions adjacent the tapping and drilling assemblies mounted on the annular table. Means are provided for rotating the turret to successive working positions. A novel clamp and positioning means are mounted on the shuttles for holding and accurately positioning a work supporting cartridge. Novel multiple spindle tapping and drilling assemblies permit tapping and drilling from different angles, simultaneously of a plurality of rigidly held work pieces mounted on the shuttles.

3,733,143

# SPEED GOVERNED ROTARY DEVICE

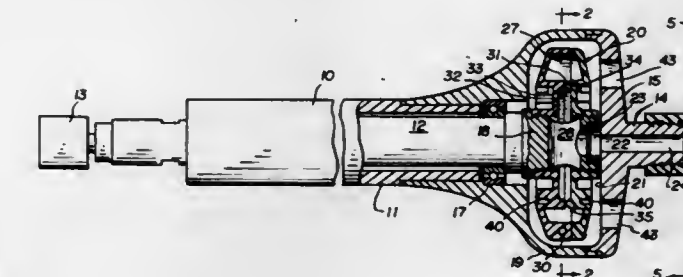
James V. Theis, Jr., Park Forest, Ill., assignor to Hollymatic Corporation, Park Forest, Ill.

Filed Sept. 8, 1971, Ser. No. 178,648

Int. Cl. F01d 1/18

U.S. Cl. 415-80

17 Claims



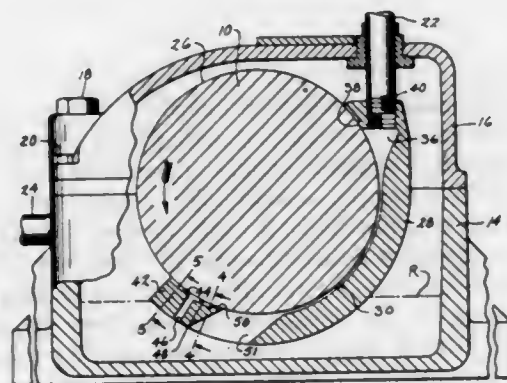
A rotary device with a speed governor and having a centrifugally radially expandable rotor with a drive surface acted upon by pressurized fluid, either gas or liquid, for this rotating the rotor and a fluid passage in the rotor to this surface including an inlet for the fluid and valve means in the rotor fluid passage movable to restrict flow of the fluid to the surface



upon centrifugal expansion of the rotor in order to govern the speed of rotation. The disclosure is also directed to a rotor having such a drive surface and centrifugally operated valve means for restricting flow of the fluid in the rotor to the surface to govern the speed of rotation. The disclosure is further directed to a hollow flexible rotor expandable radially under centrifugal forces to move the sides of the rotor toward each other during this centrifugal expansion and a fluid valve in the rotor that is moved toward closed position by the centrifugal expansion to govern the speed of the rotor.

### 3,733,144 VISCOSITY PUMP

Willis W. Gardner, Waukesha, Wis., assignor to Waukesha Bearings Corporation, Waukesha, Wis.  
Filed Sept. 8, 1971, Ser. No. 178,627  
Int. Cl. F01d 1/36  
U.S. Cl. 415-90 8 Claims



The inlet of a relatively large viscosity pump for high speed applications is sealed by a small viscosity pump which directs a stream of oil onto the rotor of the large viscosity pump to produce an air seal that increases the inlet suction of the large viscosity pump. The small viscosity pump includes (1) an air scraper in close proximity to the rotor of the large viscosity pump immediately before the rotor enters an oil chamber, and (2) a small oil conduit which extends adjacent the air scraper to the oil chamber of the large viscosity pump. The suction produced by the air scraper draws oil up through the small oil conduit and onto the periphery of the rotor to produce an air seal at the point where the rotor enters the inlet of the larger pump.

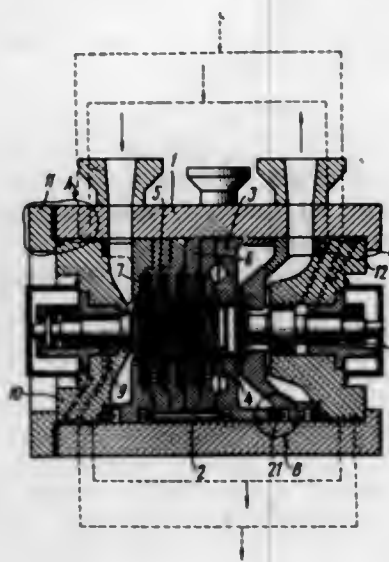
### 3,733,145 VAND-TYPE CENTRIFUGAL MACHINE, MAINLY, HIGH-PRESSURE COMPRESSOR

Arkady Fridmanovich Kaplansky; Izya Yakovlevich Korenblit; Andrei Filippovich Frenkel, and Alexandr Ivanovich Zakhariev, all of Leningrad, U.S.S.R., assignors to Nevsky Mashinostroitelny Zavod imeni V. I. Lenina, Leningrad, U.S.S.R.

Filed Mar. 4, 1971, Ser. No. 120,956  
Int. Cl. F01d 11/00, 1/02; F16j 15/00  
U.S. Cl. 415-112 3 Claims

A vane-type centrifugal machine is provided which is characterized in that rotor bearings and end seals are arranged

directly in a set composed of the working compressor stages while, where this set mates with a cylinder encasing the set,

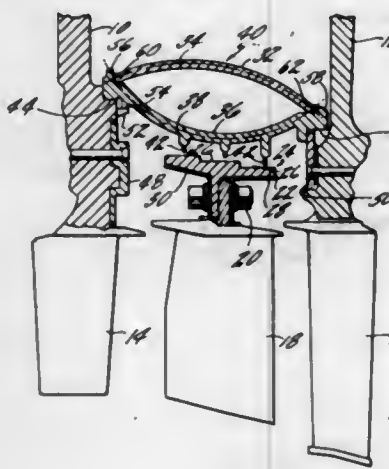


seals are mounted for the purpose of hermetically sealing in the medium being compressed.

### 3,733,146 GAS SEAL ROTATABLE SUPPORT STRUCTURE

Stephen Lester Smith, South Windsor, and Peter Edward Voyer, Tolland, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Apr. 7, 1971, Ser. No. 131,973  
Int. Cl. F01d 11/08, 1/04  
U.S. Cl. 415-172 4 Claims

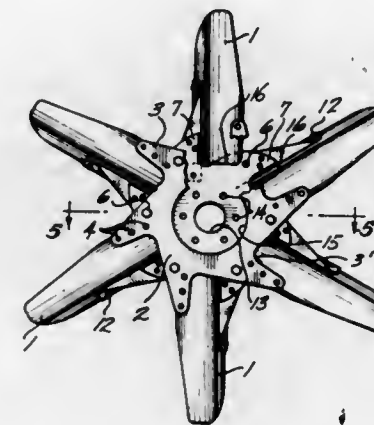


A toroidal structure which is lenticular in cross section and rotatable in a gas turbine environment is disclosed. The structure is described as a support member for the rotating component of a seal assembly in a high temperature application, such as a turbine rotor.

The structure is radially supported by a pair of adjacent turbine disks and comprises a pair of curved plates which cooperate during rotation to cause a low net stress in the plates. The outer plate has a raised ridge along each of its circumferential edges and correspondingly the inner plate has a butt face along each of its circumferential edges. During rotation of the lenticular structure, the ridge edges tend to draw closer together and the butt face edges tend to spread apart and since the inner plate edges are restrained by the outer plate ridges, a transfer of axial loads between the plates occurs, resulting in a reduction in the net stress in the structure.

### 3,733,147 RADIAL AND AXIAL AIRFLOW FAN

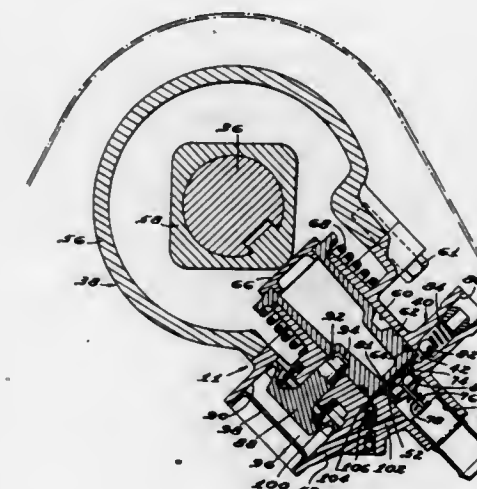
Samuel A. Felker, 10233 Green Lane S.W., Tacoma, Wash.  
Filed Dec. 7, 1970, Ser. No. 95,768  
Int. Cl. F04d 29/34  
U.S. Cl. 416-214 8 Claims



The open forward unobstructed root portions of radially extending fan blades are secured to the arms of front and rear portions spaced apart axially. A large aperture in the central portion of the front spider enables air to flow axially into a chamber between the front and rear spiders which opens radially outwardly between the root portions of the blades. Trailing edge margins of the blades are connected to the rear spider by angles riveted to such blade portions and to the rear spider and leading edge margins of the blades are riveted to arms of the front spider.

### 3,733,148 PUMP SUITABLE FOR A HYDRAULIC STEERING POWER SYSTEM HAVING AN AUXILIARY POWER SOURCE

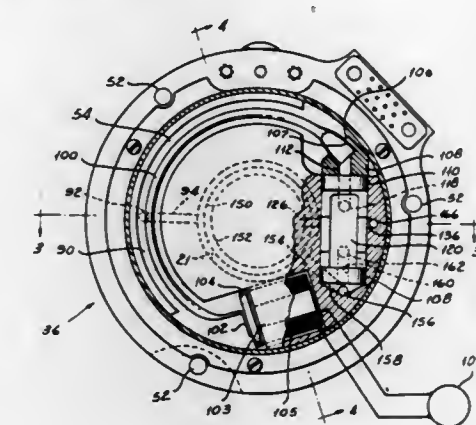
William B. Goodale, Orchard Lake, Mich., assignor to Ford Motor Company, Dearborn, Mich.  
Division of Ser. No. 763,228, Sept. 27, 1968, abandoned. This application June 2, 1970, Ser. No. 54,080  
Int. Cl. F04b 49/00  
U.S. Cl. 417-214 1 Claim



A hydraulic steering system for a motor vehicle having a primary fluid pressure source and a secondary pressure source. The secondary source comprises a pump driven by the vehicle's transmission upon demand and which is inoperative when the primary pressure source is functioning properly.

### 3,733,149 FLEXIBLE TUBE PUMP

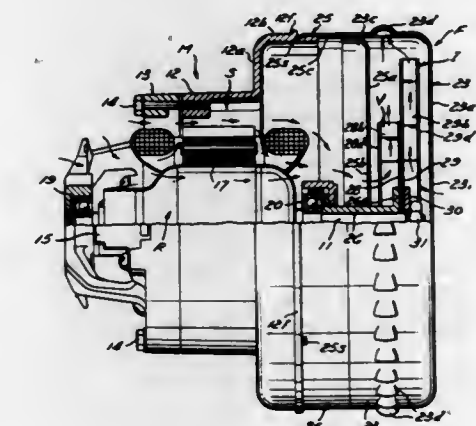
Oscar D. Jacobson, New York, N.Y., assignor to The Bendix Corporation, Teterboro, N.J.  
Division of Ser. No. 822,524, May 7, 1969, Pat. No. 3,653,267.  
This application Sept. 18, 1970, Ser. No. 73,274  
Int. Cl. F04b 43/00  
U.S. Cl. 417-412 5 Claims



A flexible tube pump of a Bourdon tube type in an assembly including a motor means or electrically controlled solenoid to actuate the flexible tube in an arrangement in which the tube functions as a low power input pump which may be utilized to supply a liquid pressure medium to hydrostatically support bearings of a gyroscope.

### 3,733,150 MOTOR-FAN UNIT FOR MOVING WET WORKING AIR

John H. Porter, Talmadge, Ohio, and Robert O. Swift, Stow, both of Ohio, assignors to Ametek, Inc., New York, N.Y.  
Filed Mar. 15, 1971, Ser. No. 124,026  
Int. Cl. F04b 35/04  
U.S. Cl. 417-424 14 Claims



In an electric motor fan unit for environments such as washing machines, vacuum cleaners, air samplers, a motor section frame enclosing an internal motor cooling air path includes an end bracket with an enlarged rim for mounting fan shell and interior partition structures defining a fan section housing for a smaller motor ventilating impeller and a larger working air centrifugal impeller commonly mounted on the motor shaft outboard of the motor section frame and drawing respective air streams into housing axial inlets for discharge at the housing circumference. Back-to-back and axially spaced impeller dispositions and corresponding housing structures and also resultant direction of ventilating air from the motor to the air discharge region ensure both adequate motor and adjacent bearing ventilation and bearing protection from working air borne moisture, contaminants, and high temperature and humidity, by simple, low cost, durable structure.



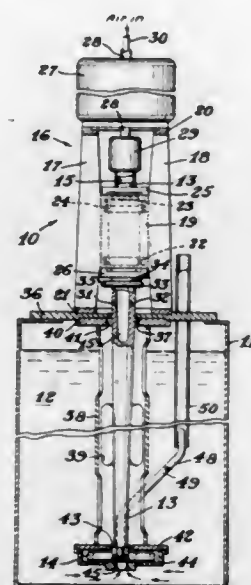
3,733,151

**PUMP ASSEMBLY FOR HANDLING LIQUID MATERIALS**  
Harold L. Timmons, and Henry C. Deitsch, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 1, 1972, Ser. No. 230,791  
Int. Cl. F04b 17/00

U.S. Cl. 417-424

3 Claims



Disclosed is a pump assembly of the vertical submerged type, which has a rotatable shaft with a hollow upper portion and a solid, tapered lower portion. The pump is mounted on a tank containing liquid to be pumped by supporting the upper part of the shaft in a bearing pedestal mounted on top of the tank. A housing encloses the lower part of the pump shaft and an impeller is connected to the tip of the shaft. The impeller is enclosed by a head casing which has an inlet port and two outlet ports therein. Liquid drawn into the head casing is discharged through two separate discharge lines which converge into a single discharge line. The pump shaft is rotated by a motor having a hollow drive shaft, which is coupled to the hollow upper part of the pump shaft. During operation, the pump shaft is cooled by passing air through the hollow motor shaft and into the hollow part of the pump shaft. The pump assembly is particularly suitable for handling corrosive liquids at high temperatures, such as molten caustic.

3,733,152

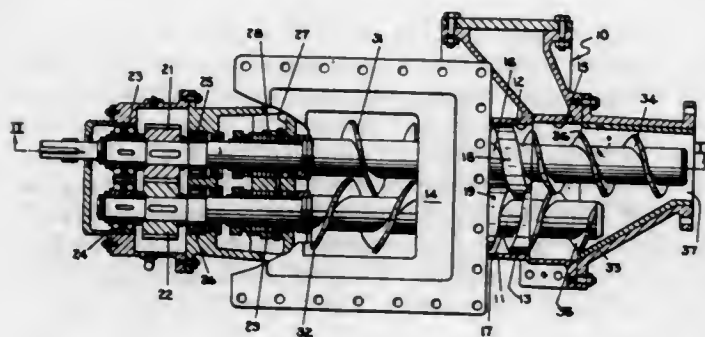
ROTARY PUMP

Elliott H. Blackwell, Warren, Mass., assignor to Warren Pumps, Inc., Warren, Mass.

Filed Oct. 29, 1971, Ser. No. 193,734  
Int. Cl. F01c 1/16

U.S. Cl. 418-201

5 Claims



A rotary pump of the twin-screw type having a lateral inlet port at one end and an axial outlet port at the other end, the outlet port being provided with a transition member containing feed screws.

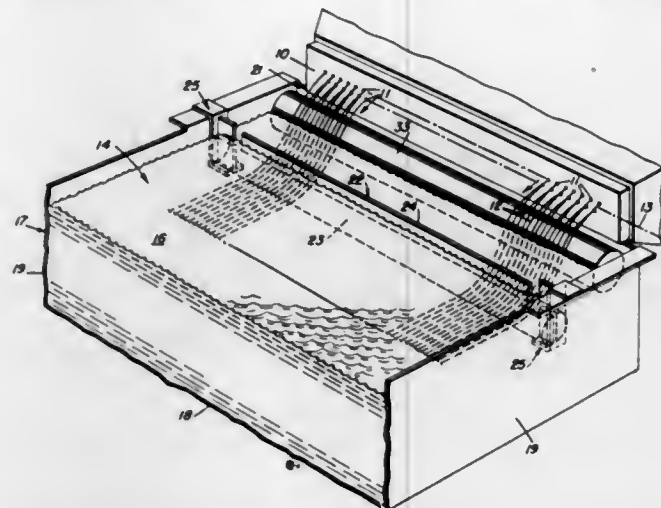
3,733,153

**APPARATUS FOR MINIMIZING STRAND DROP-OFF**  
John Mozlek, South Hadley, Mass., assignor to Monsanto Company, Saint Louis, Mo.

Filed May 14, 1971, Ser. No. 143,574  
Int. Cl. B29c 25/00; B29d 7/20

U.S. Cl. 425-71

4 Claims



A system for controlling strand drop off at an extrusion die in a plastic stranding operation is provided. A plurality of hot polymer strands generally uniformly spaced from one another in a horizontal direction from the extrusion die pass downwardly into a cooling bath beneath a hold down bar assembly. The continuously moving strands slidably engage circumferential surface portions of a cylindrical member positioned in the surface of the cooling bath which is revolvably driven by the strands passing thereover. When a strand breaks, it almost immediately contacts an adjacent strand and is immediately bonded thereto, all strands still being in a thermoplastic condition, so that all strands continue to move forward down into the cooling bath without loss of the broken strand.

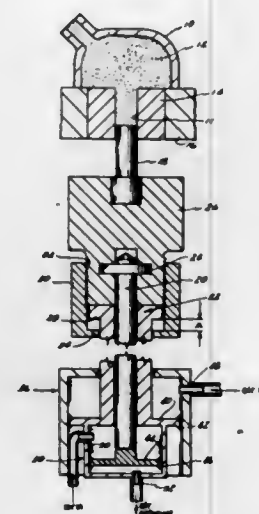
3,733,154

**DEFLECTION COMPENSATION SYSTEM FOR PRESS**  
Joseph E. Smith, Birmingham; Georges D. DeTroyer, Grosse Ile, and Raymond P. DeSantis, Royal Oak, all of Mich., assignors to Wolverine-Pentronix, Inc., Lincoln Park, Mich.

Filed Aug. 17, 1971, Ser. No. 172,510  
Int. Cl. B30b 11/04

U.S. Cl. 425-78

5 Claims



A system for providing for compensation for deflection during a compacting press operation. The system is operable in conjunction with a separate inner and outer ram arrangement so that immediately after press operation and throughout the press eject operation there is provided a preloading of the

3,733,156

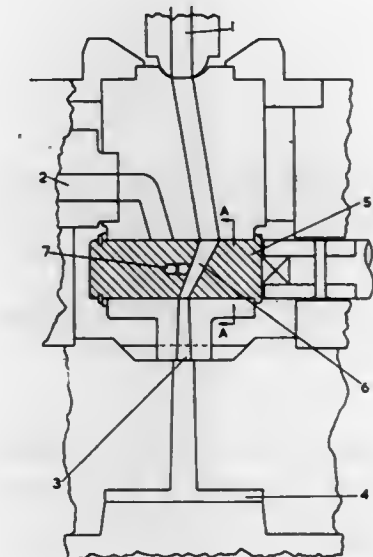
INJECTION MOULDING MACHINES

Paul Johnson Garner, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, Millbank, London, England

Division of Ser. No. 781,763, Dec. 6, 1968, Pat. No. 3,599,290.  
This application Apr. 12, 1971, Ser. No. 132,971  
Int. Cl. B29f 1/022

U.S. Cl. 425-132

8 Claims



There is provided apparatus for moulding laminar articles. Two screw-injection barrels are arranged to sequentially pass resinous materials through a valve, in the fixed platen of an injection moulding machine or in the walls of the mould cavity, in a single sprue into the mould cavity. Control means are provided to control the valve so that material from one screw-injection barrel does not pass while material flows from the other screw-injection barrel. The control means is synchronized so that the desired quantities of materials from two injection barrels are placed in the mould cavity.

3,733,157

APPARATUS FOR MOLDING PLASTIC SHEET

James W. Hendry, Helena, Ohio, assignor to Sund-Borg Machines Corporation, Fremont, Ohio

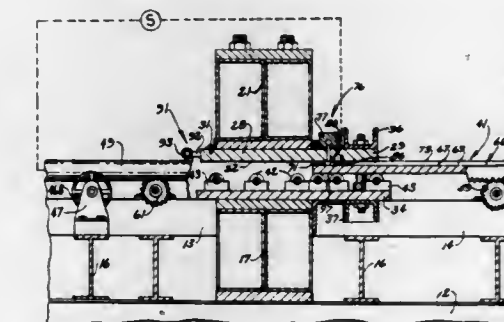
Continuation of Ser. No. 708,965, Feb. 28, 1968, abandoned.

This application Aug. 3, 1970, Ser. No. 64,143

Int. Cl. B29d 7/02

U.S. Cl. 425-149

12 Claims



An apparatus for forming large surface area plastic sheets inside of a mold by introducing plastic from an injection molding machine, an extruder or other source of moldable plastic material, through a feed member positioned adjacent the mold. The feed member and the mold are relatively movable with respect to each other to progressively fill the mold cavity through a selected length thereof.

inner ram upwardly in supporting relationship to the part. A predetermined space is provided between the inner and outer rams. The particular space adjustment means provided for deflection compensation also permits adjustment where it is necessary to provide overflow or underfill where these conditions are required.

3,733,155

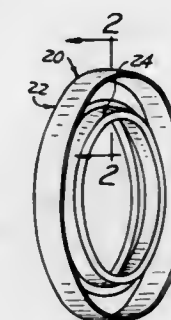
**APPARATUS FOR MAKING AN ELASTOMERIC ANNULAR SEAL WITH ENCLOSED GARTER SPRING**  
Michael J. Burke, Southfield, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Division of Ser. No. 982, Jan. 6, 1970, Pat. No. 3,666,852. This application Apr. 1, 1971, Ser. No. 130,223

Int. Cl. B29c 27/30

U.S. Cl. 425-128

3 Claims



A mold assembly including an externally-tapered lower core member with an annular garter-spring-holding groove near its smaller-diameter top and an annular shoulder and seat near its larger-diameter bottom and an internally-tapered upper cavity mold member cooperatively form an annular die cavity having the shape desired for the elastomeric annular seal to be formed therein. Prior to molding the seal, the upper cavity mold member is retracted and moved out of alignment with the core member and replaced temporarily by a cylindrical loading device having an annular groove for receiving a pre-tensioned annular hollow helical tension spring and below it a cylindrical end portion adapted to receive an annular charge of elastomer. In carrying out the method of this invention, an annular mounting case is placed on the seat and a collar on the loading device is moved downward so as to push the spring and the annular elastomeric charge from the loading device onto the core member until the spring snaps into the annular groove of the core-member. The loading device is then retracted and moved out of alignment with the core member and the mold cavity member moved into alignment therewith and then moved downward into telescoping relationship with the core member, moving the spring downward out of the annular core groove and at the same time expanding it by circumferentially stretching it to open up spaces between its convolutions.

As the spring is pushed downward, it pushes the elastomeric charge ahead of it into the mold chamber which shapes the seal and totally encloses the spring therein. Excess elastomer is ejected upward through the clearance between the mold and core members. Simultaneously therewith, the elastomer is pushed between the now-spaced convolutions of the expanded spring into the hollow of the spring, completely and uniformly filling it with elastomer. The upper mold cavity is then moved downward to the end of its stroke and an annular nose portion thereof cooperates with the shoulder as a fulcrum to bend the periphery of the case upward into a frusto-conical flange which enters the mold chamber and becomes bonded to elastomer flowing against its opposite sides. The end of the stroke ordinarily cuts off any flash adhering to the upper end of the seal, forming a sharp sealing lip thereon. The elastomer of the seal is then cured in the mold cavity by heating the mold assembly, after which the completed seal is ejected from the core member by a conventional stripper as the mold cavity member is retracted upward.

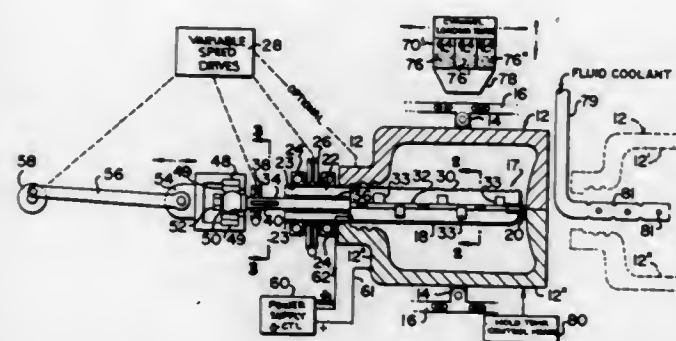


3,733,158

**ELECTROSTATIC MOLDING APPARATUS FOR PREPARING THERMOPLASTIC ARTICLES**  
Herbert S. Rueckberg, Highland Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.  
3,478,387. This application June 2, 1969, Ser. No. 855,790  
Int. Cl. B29c 5/04

U.S. Cl. 425-174

3 Claims



A molding apparatus for producing thermoplastic articles from finely divided comminuted thermoplastic materials which may optionally be reinforced with fibers wherein the comminuted material and fibers are electrostatically deposited on the surface of a mold.

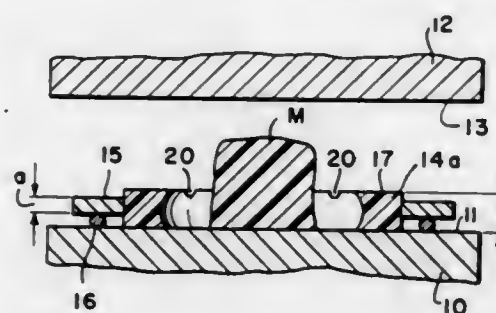
3,733,159

**APPARATUS FOR MANUFACTURE OF VOID-FREE AND WARP-FREE SLAB STOCK**

Paul M. Coffman, Cherry Hill, N.J., assignor to Shell Oil Company, New York, N.Y.  
Continuation-in-part of Ser. No. 857,176, Sept. 11, 1969, Pat. No. 3,608,508, which is a continuation-in-part of Ser. No. 633,673, April 19, 1967, abandoned, which is a continuation-in-part of Ser. No. 524,743, Feb. 3, 1966, abandoned. This application Aug. 5, 1971, Ser. No. 169,422  
Int. Cl. B29c 3/00

U.S. Cl. 425-186

4 Claims



Void-free slabs or billets of thermoplastic polymer are produced by cooling polymer melt in a mold under pressure while keeping part of the melt in contact with a heat-insulating deformable surface of the mold cavity. Apparatus of this invention comprises a mold having two parallel rigid planar surfaces, a deformable heat-insulating ring placed between said planar surfaces, stiffening or backing means to maintain the shape of the outer wall of the ring, and pressure means for controllable changing the distance between said surfaces.

3,733,160

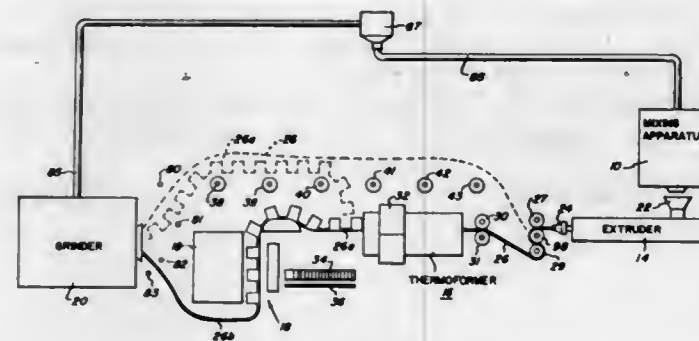
**MATERIAL HANDLING SYSTEM FOR PLASTIC FILM MOLDING APPARATUS**  
Peter C. Neil, Fullerton, Calif., assignor to Standard Oil Company, Chicago, Ill.

Filed Mar. 18, 1971, Ser. No. 125,471

Int. Cl. B29c 29/00

U.S. Cl. 425-217

7 Claims



The system includes mixing apparatus, extruder, thermoformer, trimmer and grinder. Ground plastic from the mixing apparatus is fed directly to the extruder which provides a thin, continuous film of plastic. In the direct feed mode this film moves from the extruder directly into the thermoformer and then to the trimmer. Articles are formed in the film by the thermoformer and are cut from the film by the trimmer to leave a skeletal film which is fed directly into the grinder. In the bypass feed mode, film from the extruder or from the thermoformer is fed directly into the grinder. Novel mixing apparatus is disclosed for mixing plastics of different bulk densities, such as ground film from the thermoformer, extruder and trimmer. Also, novel cutting apparatus is disclosed which reduces noise and overloading problems.

3,733,161

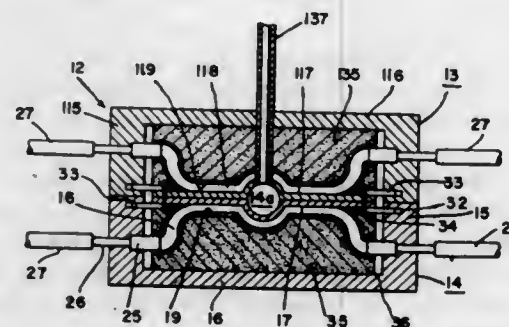
**STRUCTURIZER MOLD**

Frank J. Nussbaum, New York, N.Y., assignor to Bischoff Chemical Corporation, Hicksville, N.Y.

Continuation-in-part of Ser. No. 884,956, Dec. 15, 1969, abandoned, which is a continuation-in-part of Ser. No. 752,518, Aug. 14, 1968, Pat. No. 3,671,168. This application Sept. 15, 1972, Ser. No. 289,655  
Int. Cl. B29f 1/00; B22d 27/04

U.S. Cl. 425-243

3 Claims



Each of the two sections of a separable mold for a giant plastic article includes a box having a contoured wall as one end face. The giant article is molded in the cavity defined by the pair of contoured walls. Each contoured wall is thin, heat conductive, and of low specific heat. A plurality of conduits on the rear face of each contoured wall direct the flow of heat transfer fluid to regulate the temperature of a zone of the contoured wall. A relatively high density cellular polyurethane serves as an insulating foundation between the rear face of a contoured wall and the plate of the box and also provides support for the contoured wall. A relatively thin layer of silicone

rubber or like material is provided between the cellular polyurethane and each contoured wall. The contoured wall can undergo thermal expansion or contraction throughout or in selected zones without losing its bond to such cellular foundation. Floating connectors associate the contoured walls with frame members of the box, whereby relative thermal expansion of the box independently of the contoured wall is possible.

3,733,162

**INJECTION MOULDING TOOL**

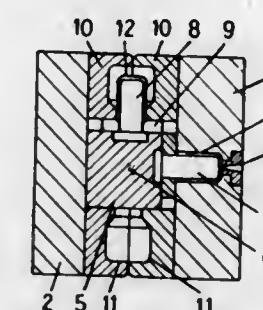
Francis Farkas, c/o Clearplex Containers Ltd., P.O. Box 241, Phelps, N.Y.

Filed June 19, 1970, Ser. No. 47,841

Int. Cl. B29d 23/03

U.S. Cl. 425-249

8 Claims



A plastic moulding apparatus in which a core-carrier head is arranged between the counter-moulding plate and the nozzle moulding plate, the said carrier-head being pivotable through 90° about an axis perpendicular to the direction of closing of the moulding plates; in the blowing-mould halves adapted to each other are seated on the moulding plates, the mould halves accepting the core in the pivoted position and swinging out of the injection-moulding position when the moulding plates are in the closed position, the core being equipped with a blowing nozzle.

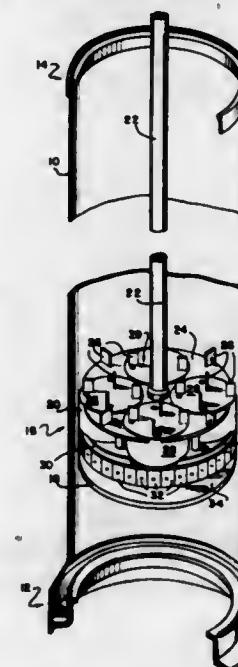
3,733,163

**WEAR SURFACE FOR CONCRETE PIPE MACHINE LONG BOTTOMS**

Lorin E. Hermann, Sioux City, Iowa, assignor to Concrete Pipe Machinery Company, Sioux City, Iowa  
Filed Sept. 1, 1970, Ser. No. 68,703  
Int. Cl. B28b 21/26

U.S. Cl. 425-262

9 Claims



An improved wear surface for long bottoms employed in concrete pipe making machines utilizing the packerhead

method of pipe formation wherein the base, or long bottom, of the packerhead includes a plurality of wear segments about the upper circumferential outer surface thereof, each easily removable for replacement after wear. Each segment may be 3.1416 inches wide so that if the diameter of the long bottom is a whole number, measured in inches, an easily determinable number of segments may be used to completely skirt the long bottom for wear purposes. Since the circumference of a circle equals  $\pi$  times the diameter, and  $\pi$  equals 3.1416, each 1 inch increase in diameter of the long bottom calls for one additional segment. Each segment is secured to the long bottom by a single bolt, countersunk through the segment wear surface. Preferably, the segments are made of cast Nihard steel, or some other hard, long wearing material.

3,733,164

**POROUS MEDIA TUNNEL BURNER**

Donald Westlake, Fleet, and Kenneth F. Coles, Farnborough, both of England, assignors to Shell Oil Company, New York, N.Y.

Filed July 9, 1971, Ser. No. 161,109

Claims priority, application Great Britain, July 13, 1970, 33,835/70

Int. Cl. F23d 13/12

U.S. Cl. 431-328

8 Claims



A porous media burner comprises an outer casing of impermeable material separated by a gas distributing space from an inner hollow core, open at one end, of a porous medium. The fuel mixture enters the gas distributing space between the casing and the core and then passes through the core to the hollow space of the core.

3,733,165

**LIQUID FUEL COMBUSTION DEVICE**

Masayoshi Nakagawa, Nishinomiya; Toshihiro Hirai, Sakai; Yuji Suzuki, Amagasaki-shi; Ryozauro Kimura, and Masamichi Okahara, both of Takarazuka, all of Japan, assignors to Daido Sans Kabushiki Kaisha, Osaka-shi, Minami-ku, Unagidani-Nakano-cho, Banchi, Japan

Division of Ser. No. 794,221, Jan. 27, 1969, Pat. No. 3,610,537. This application Mar. 29, 1971, Ser. No. 128,937  
Claims priority, application Japan, Jan. 25, 1968, 43/4712; Feb. 23, 1968, 43/11674; Aug. 27, 1968, 43/74096  
Int. Cl. F23f 7/00

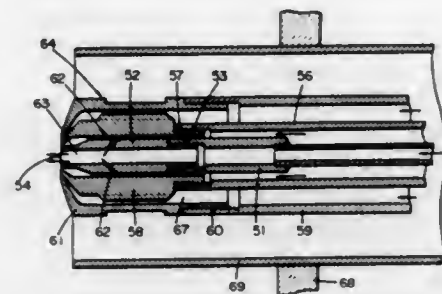
U.S. Cl. 431-10

4 Claims

Through a combination of  
a. the supply of oxygen substantially in the form of pure oxygen in an amount far less than that theoretically required for combustion of liquid fuel to be burned in such a manner as to attain a very rapid combustion temperature rise,  
b. with the strong activation of the liquid fuel by mixing and atomization of a part of the fuel liquid sufficiently with



the oxygen, limited in quantity, closely adjacent to a liquid fuel nozzle thereby to form a high-temperature center flame very close to the nozzle.



c. a high-temperature flame having a large potential heat per unit volume thereof, that is, a flame of extremely high intensity, is obtained efficiently with a small supply of oxygen.

### 3,733,166 CONTROL OF BURNERS

Joshua Swithenbank, Hathersage, near Sheffield, and David Shaw Taylor, Sheffield, S11 9AU, both of England, assignors to Land Pyrometers Limited, England

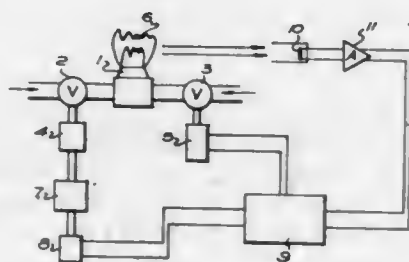
Filed Apr. 27, 1971, Ser. No. 137,864

Claims priority, application Great Britain, May 6, 1970, 21,761/70

Int. Cl. F23n 1/02

U.S. Cl. 431-76

9 Claims



The control of the reactant flow ratio to a burner is effected by applying determined fluctuations to the flow of one reactant to the burner, detecting radiation from the flame from the burner, correlating the fluctuations in the radiation with the applied fluctuations, and utilizing the polarity of the correlation to effect the appropriate adjustment of the reactant flow ratio to the burner.

### 3,733,167 GAS-FUELED LIGHTERS

Robert Raymond Hocq, Boulogne-Billancourt, France, assignor to Societe Franco-Hispano-Americaine (Francispam), Saint Gratin (Val d'Oise), France

Filed Feb. 21, 1971, Ser. No. 136,091

Claims priority, application France, Apr. 24, 1970, 7014982

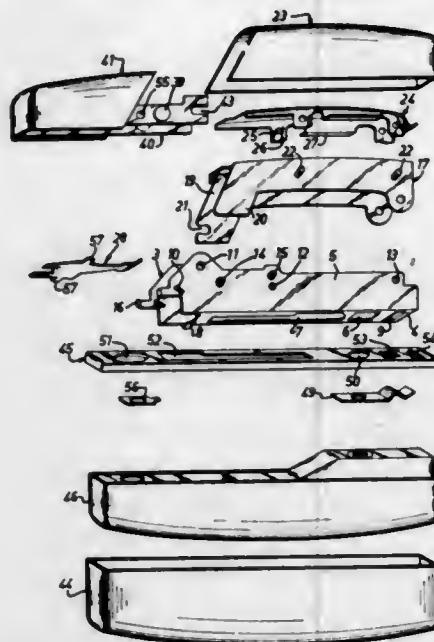
Int. Cl. F23q 2/00

U.S. Cl. 431-143

16 Claims

The invention relates to a gas-fueled lighter in which the

outer covering or sheath is segregated from any mechanical functions, so that after the lighter has been assembled, no



mechanical part of the gas release, ignition mechanism, and filling mechanism can be seen by the user.

### 3,733,168 SMOKE DISSIPATING ASHTRAY LAMP

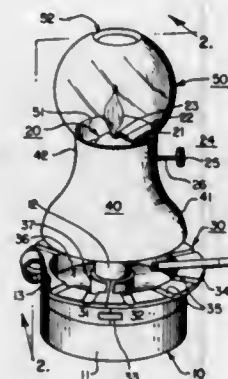
Milton M. Marsh, 11130 South Parnell, Chicago, Ill., and Robert A. Marsh, 4948 W. 78th Street, Oak Lawn, Ill.

Continuation-in-part of Ser. No. 795,927, Feb. 3, 1969, abandoned. This application Mar. 24, 1970, Ser. No. 22,335

Int. Cl. F23d 3/02

U.S. Cl. 431-253

2 Claims



A lamp assembly includes a fuel tank with a lower portion for enclosing liquid fuel and an upper wick guide portion, with a burner affixed to the top of the wick. A globe extends above the burner. An ashtray rests on the fuel tank, or individual cigarette-supporting clips can be attached to a smoke hood just below apertures in the hood, with the ashtray positioned on the table within the hood. The smoke hood directs smoke rising from the ashtray unit to a location adjacent the flame for virtual dissipation of the smoke.

### 3,733,169 FLAME RETENTION HEAD ASSEMBLY

Denis Lefebvre, 150-441eme Avenue, St. Eustache, Quebec, Canada

Filed Feb. 22, 1972, Ser. No. 227,843

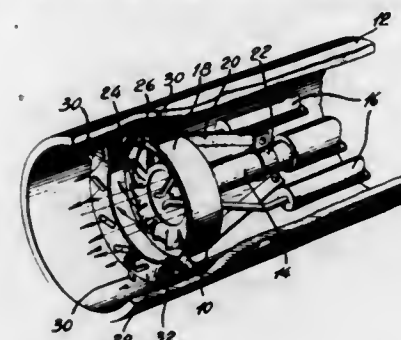
Int. Cl. F23q 3/00

U.S. Cl. 431-265

5 Claims

A flame retention head assembly for use in the air tube of a fuel burner having a fuel nozzle and ignition means for igniting

the burner. The head assembly comprises a cylindrical ring positioned coaxially in the air tube and secured to the fuel nozzle. A spinner plate is secured inside the cylindrical ring adjacent the rear end of the ring and such plate is provided with a central opening facing the fuel nozzle. Vanes are formed in the spinner plate around the opening therein so as to impart a swinging motion to the air stream passing through the cylindrical ring thus causing a turbulence in the air stream



to improve combustion of the flame produced by ignition of the fuel emitted by the nozzle. A cone-shaped flange is secured to the front part of the cylindrical ring and has openings therein for creating additional turbulence in the air stream at the outlet of the cylindrical ring to improve fuel combustion. Finally, a gap is provided between the cone-shaped flange and the air tube to permit flow of air at high velocity creating an overlapping air stream permitting to control the flame pattern.

### 3,733,170 GAS BURNER

Ikuo Kobayashi, Nara; Takao Tomizawa, Yamatokoriyama, and Shigeo Murase, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Osaka, Japan

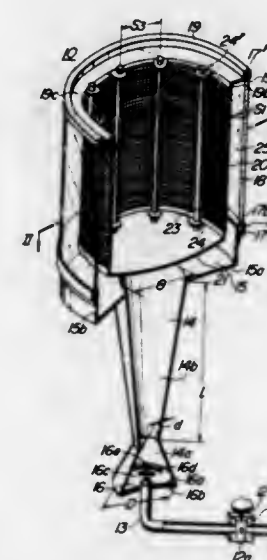
Filed May 21, 1971, Ser. No. 145,863

Claims priority, application Japan, May 27, 1970, 45/52609

Int. Cl. F23d 13/14

U.S. Cl. 431-329

13 Claims



A gas burner having a cylindrical glass member and a cylindrical screen of metal wires having closed bottom end and disposed and spaced inwardly from the glass member to define therebetween an annular gas passage space which is closed at the top thereof by an annular cap. The space enclosed by the glass member is substantially closed at the lower end by an annular bottom wall which cooperates with the closed bottom end of the screen and a part of the glass member to define a mixing chamber which is in communication with air-fuel mixture supply source and the annular gas passage space whereby the mixture is fed from the supply source through the mixing

chamber to the cylindrical screen through which the mixture is passed inwardly and burnt to form combustion flames on the inner surface of the screen. Heat catalytic members are disposed inwardly of the cylindrical screen to facilitate complete combustion of the fuel.

### 3,733,171 APPARATUS AND METHOD FOR FIRING MAGNETIC CORES

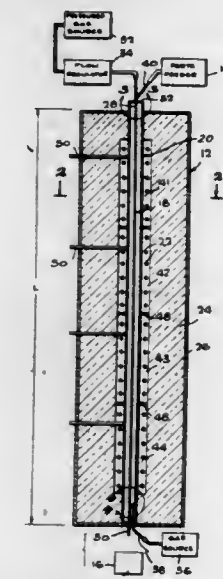
Robert J. Skolak, Edison, N.J., and Jack R. Bryant, Palos Verdes Peninsula, Calif., assignors to Electronic Memories & Magnetics, Los Angeles, Calif.

Filed Apr. 21, 1971, Ser. No. 135,980

Int. Cl. F27b 5/00

U.S. Cl. 432-17

11 Claims



A kiln for sintering small magnetic cores or other parts, which includes a vertically extending tube that is heated along a center section. Magnetic cores of a diameter much smaller than the inside diameter of the tube, drop in free fall through the tube and emerge fully heat treated at the lower end. An additional inlet at the upper end is connected to a pressurized gas source to pump air, oxygen, or other gas at a controlled rate through the tube to control the speed at which the cores move through the tube. An additional gas inlet is connected immediately above the lower end of the tube for receiving cooling gases to cool the cores in a controlled atmosphere prior to emergence at the lower end of the tube.

### 3,733,172 METHOD AND APPARATUS FOR AUTOMATIC CLEANING OF COFFEE ROASTERS

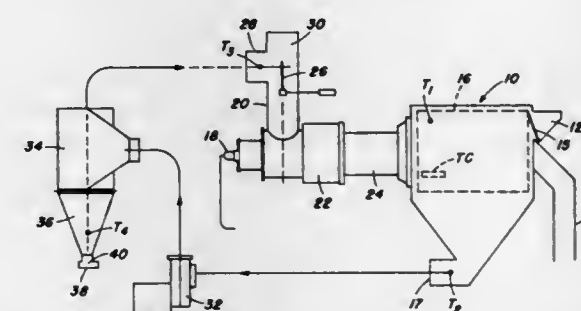
John W. Angstadt, Williamsville, N.Y., assignor to Blaw-Knox Food and Chemical Equipment, Inc., Buffalo, N.Y.

Filed Nov. 9, 1970, Ser. No. 87,790

Int. Cl. F27b 3/10

U.S. Cl. 432-41

3 Claims



The presence of oils, tars, steam and chaff in the recirculating gases of high-velocity, low-temperature coffee roasters



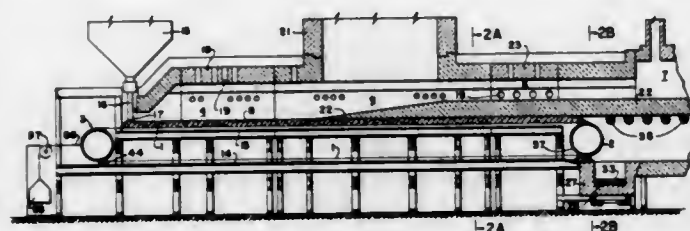
requires frequent shut-downs for mechanical cleaning purposes. With associated cooling-off and heating-up periods, the production loss is significant. The present invention provides means for periodically cutting off the flow of beans to the roaster and heating the gas recirculation portions to the ignition temperature of the deposited by-products (a temperature of from about 500° to 800°F., depending on whether the by-products are light and fluffy or baked on like varnish). After combustion is complete, proper roasting temperatures and atmospheres are restored, and roasting is recommenced. In addition to minimizing down time, the invention more effectively cleans the roaster and prolongs equipment life by reducing metal fatigue resulting from thermal cycling.

3,733,173

**TOWER FURNACE COLLECTING MECHANISM**  
Michael Caspo, Wyncote, Pa.; Nathan Waldman, Midland, Mich., and William E. Micho, Ironton, Ohio, assignors to The Dow Chemical Company, Midland, Mich. and Sels Corporation of America, Dresher, Pa.  
Filed Dec. 22, 1971, Ser. No. 210,706  
Int. Cl. F27b 19/00

U.S. Cl. 432-87

7 Claims



There is disclosed an endless conveyor belt for moving hot material from under a tower furnace, with the drive from the belt having provisions to compensate for changes in the length and the width of the belt due to expansion and contraction.

### 3,733,174 COVERED TYPE HEAT TREATMENT COMBUSTION FURNACE

Hiromu Yoshimoto, Aichi, Japan, assignor to Daido Steel Co., Ltd., Azu-Kuridashi, Hoshizaki-cho, Minami-ku, Nagoya-shi, Aichi-ken, Japan

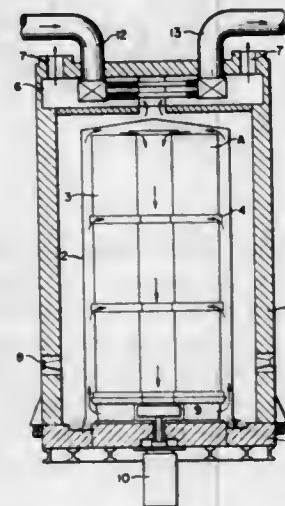
Filed Mar. 10, 1971, Ser. No. 122,962

Claims priority, application Japan, Mar. 13, 1970, 45/20810

Int. Cl. F23i 15/04

U.S. Cl. 432-199

2 Claims



A covered type heat treatment combustion furnace having a recuperative heat exchanger constructed as the roof of the furnace for preheating the combustion air.

## CHEMICAL

3,733,175

### HAIR DYE BLEND OF A YELLOW COMPONENT AND RED COMPONENTS AND/OR BLUE COMPONENTS

George Alperin, Stamford, and Socrates Vaniotis, Huntington, Conn., assignors to Clairol Incorporated, New York, N.Y.

No Drawing. Continuation of application Ser. No. 517,987, Jan. 3, 1966. This application May 23, 1969, Ser. No. 827,137

Int. Cl. A61k 7/12

U.S. Cl. 8-10.1

16 Claims

A hair dyeing composition containing a yellow dye component and/or a blue component and/or a red component in which the yellow component is changed, destroyed, leached or otherwise removed from hair to which said dyeing composition has been applied at the same rate as said red and/or blue components.

3,733,176

### METHOD FOR CLEANING CARPETS AND LIKE MATERIALS

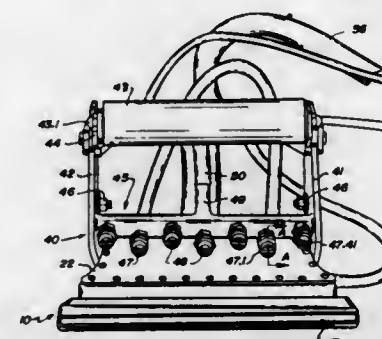
William H. Wisdom, 9806 Van Dyke Drive, Dallas, Tex. 75218

Continuation of abandoned application Ser. No. 795,767, Dec. 20, 1968, which is a division of application Ser. No. 638,890, May 16, 1967, now Patent No. 3,436,787. This application Dec. 28, 1970, Ser. No. 102,221

Int. Cl. A47i 7/00

U.S. Cl. 8-149.1

7 Claims



A carpet and rug cleaning method involving successive rolling, spraying, and nearly simultaneous exposure to vacuum and to heat. Method achieves faster drying than heretofore was common, with minimal wicking. Pre-rolling, spraying under pressure with the spray impinging the carpet at an acute angle so as to loosen rather than to imbed soil together with application of the vacuum, pressure, and heat, used to achieve the foregoing.

3,733,177

### METHODS AND COMPOSITIONS FOR THE DETERMINATION OF URIC ACID IN BLOOD

Bernard Klein, New Hyde Park, N.Y., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 3, 1972, Ser. No. 214,770

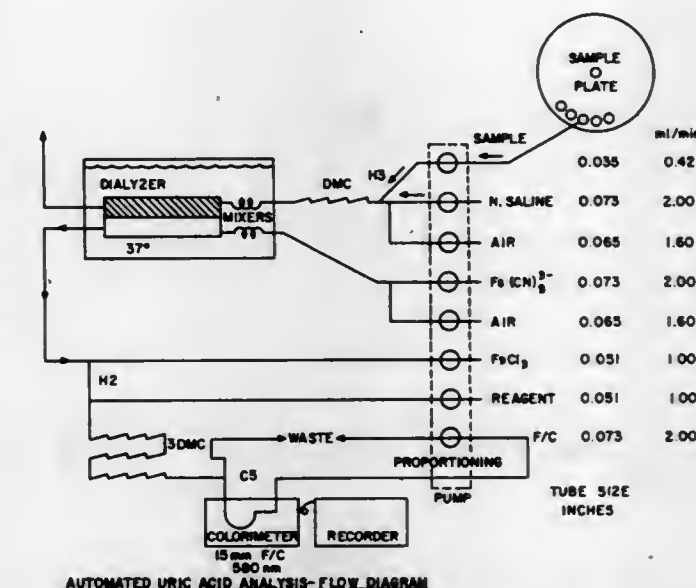
Int. Cl. G01n 31/22

U.S. Cl. 23-230 B

11 Claims

Colorimetric methods and compositions for the quantitative determination of the uric acid content of blood

by treating blood serum at ambient temperatures with an alkaline ferricyanide solution, followed by the addition of ferric ions and a 5-(2-pyridyl)-2H-1,4-benzodi-



azepine or water soluble salt thereof to produce a brilliant purple colored solution which is then quantitatively measured by standard colorimetric means.

3,733,178

### CHEMICAL CODING METHOD

Stuart P. Eriksen, Santa Ana, Calif., assignor to Allergan Pharmaceuticals, Irvine, Calif.

No Drawing. Filed Apr. 2, 1970, Ser. No. 25,248

Int. Cl. G01n 31/22, 33/16

U.S. Cl. 23-230 B

4 Claims

An internal labelling system for clinical laboratory specimens based upon the addition of known amounts of salts of the lanthanide and actinide series to specimen containers with subsequent analysis and simultaneous digital print-out of a code number uniquely associated with the sample.

3,733,179

### METHOD AND APPARATUS FOR THE QUANTITATIVE DETERMINATION OF BLOOD CHEMICALS IN BLOOD DERIVATIVES

Paul F. Guehler, White Bear Lake Township, Ramsey County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 29, 1968, Ser. No. 756,098

Int. Cl. B65d 79/00; G01n 31/02, 33/16

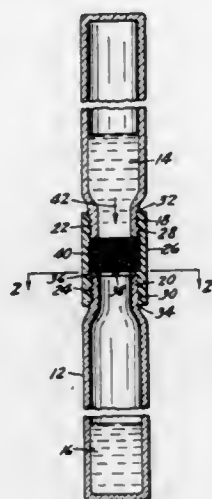
U.S. Cl. 23-230 B

4 Claims

A method for the quantitative determination of a blood chemical in a blood derivative wherein a first container containing a blood derivative sample and a solution capable of forming therewith a reactive component is joined by filter means to a second container of test material capable of reacting with the reactive component to form a colored solution having an optical density dependent upon the concentration of the blood chemical. The contents of the compartments are combined by centri-



fusing the assembly. The optical density of the colored fluid is measured and is correlated with the concentration



of the blood chemical. Apparatus for practicing this method.

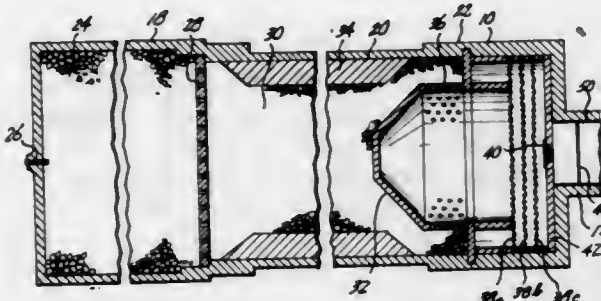
3,733,180

**SOLID STATE COOL GAS GENERATOR**

Joseph B. Heineck, Everett, and James J. Schwab, Kent, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 8, 1971, Ser. No. 104,889

Int. Cl. B01j 7/00; B05b 1/00; B60r 21/00  
U.S. Cl. 23—281 1 Claim



An emergency system which generates cool gases for pneumatic or pressurization systems, and for inflating inflatable objects. Hot gases are generated by a solid propellant. The hot gases flow through a dissociated bed of solid endothermic material which is decomposed to generate cool gases mixing with and cooling the hot gases. The flow of gases within the dissociated bed is directed by a baffle located at the outlet to the bed. The cooled gases flow via a variable area nozzle and into a gas receiver if used for pneumatic, pressurization or similar systems, or through an aspirator and into an inflatable device to be inflated.

3,733,181

**CATALYTIC EXHAUST GAS TREATMENT APPARATUS**

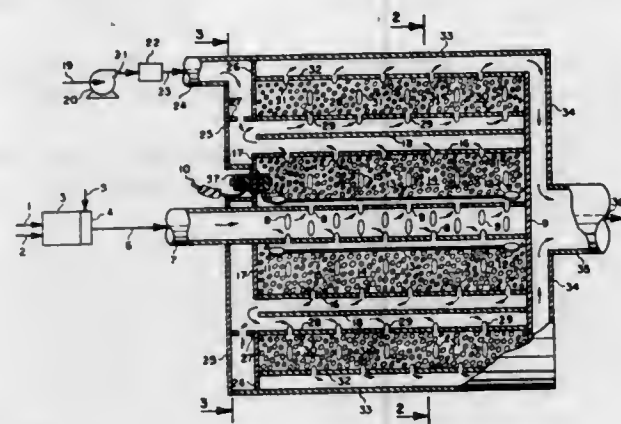
John F. Tourtellotte, Westfield, and John F. Villiers-Fisher, Kendall Park, N.J., assignors to Chemical Construction Corporation, New York, N.Y.

Filed May 14, 1971, Ser. No. 143,401

Int. Cl. F01n 3/14; B01j 9/04  
U.S. Cl. 23—288 F 25 Claims

An apparatus for catalytically treating the exhaust gas from an engine, so as to eliminate noxious components in the exhaust gas. The apparatus features concentric

cylindrical inner and outer catalyst beds, means to pass the engine exhaust gas radially outwards through the beds, and means to inject air into the exhaust gas between the inner and the outer bed, so that catalytic reduction of



nitrogen oxides to nitrogen takes place in the inner bed and catalytic oxidation of hydrocarbons and carbon monoxide to water vapor and carbon dioxide takes place in the outer bed.

3,733,182

**THICK FILM CIRCUITS**

William Alden Crossland and Colin Andrew Marr, Harlow, and Laurence Halles, Ware, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 21, 1971, Ser. No. 108,660

Claims priority, application Great Britain, Feb. 6, 1970, 5,824/70

Int. Cl. B32b 15/04

U.S. Cl. 29—195

2 Claims



A tin-free lead cadmium solder (75% Pb, 25% Cd) is used to attach electrical devices to thick film palladium conductors. The use of this tin-free solder results in smaller loss of adhesion of the palladium to a substrate upon aging and at elevated temperatures.

3,733,183

**LOW SULPHUR FUEL SYSTEM UTILIZING COAL CHAR, AND COPRODUCTS THEREOF**

Alamjit D. Singh, 4015 N. Whipple St., Chicago, Ill. 60618

Continuation-in-part of application Ser. No. 801,460, Feb. 24, 1969, which is a continuation-in-part of application Ser. No. 415,603, Dec. 3, 1964. This application Aug. 24, 1970, Ser. No. 66,337

Int. Cl. C101 5/00; C10g 1/00

U.S. Cl. 44—1 R

15 Claims

In accordance with the disclosure of the present invention in one embodiment, coal in granular form is heated and introduced under pressure into a coal devolatilizer forming a reaction chamber for the coal and from which reaction by-products are separately withdrawn. Preheated oil is introduced under pressure into an oil fluid coker forming a reaction chamber for the oil, and from which oil reaction products are separately withdrawn. Granular residue from the coal devolatilizer and oil fluid coker are introduced under pressure into a heat generator in which further reaction takes place, there being means for effecting an interchange of material between the coal devolat-

ilizer and the heat generator, and between the oil fluid coker and the generator. The by-products from the oil fluid coker and from the coal devolatilizer are separately processed, and the desulphurized fuel components thereof are used with the carbonaceous product, which is a combined coal char and oil fluid coke, produced by the system; whereby to provide a low sulphur fuel system, and also elemental sulphur and other useful by-products which may be separately utilized. The use of the oil fluid coker is optional; and in one form of the invention the oil fluid coker vessel is used as a further processing vessel for desulphurizing the coal, into which hydrogen is introduced to further the desulphurization process.

3,733,184

**COMPOSITION FOR IMPROVING AIR-FUEL RATIO DISTRIBUTION IN INTERNAL COMBUSTION ENGINES**

Abraham A. Zimmerman, New Providence, Louis E. Furlong, Westfield, and Hugh F. Shannon, Scotch Plains, N.J., assignors to Esso Research and Engineering Company

No Drawing. Filed Feb. 9, 1971, Ser. No. 114,039

Int. Cl. C101 1/16

U.S. Cl. 44—80

3 Claims

The distribution of the air-fuel mixture in the intake manifold of a multicylinder gasoline engine is improved by adding to the gasoline that is used as the fuel for that engine, a hydrocarbon wax that has at least 20 weight percent of normal paraffin hydrocarbons of at least 23 carbon atoms and not more than 10 weight percent of paraffinic hydrocarbons of more than about 36 carbon atoms. The concentration of the added wax in the gasoline is from about 2 to about 100 pounds per thousand barrels of gasoline, one barrel equalling 42 U.S. gallons.

3,733,185

**APPARATUS AND METHOD FOR PRODUCING OXYGENATED GASEOUS FUELS**

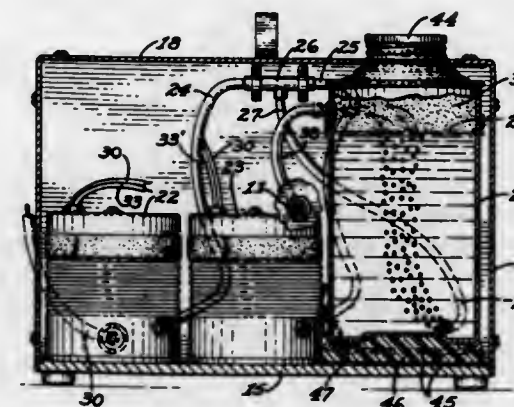
Richard W. Henes, 5901 E. Calle Del Sud, Phoenix, Ariz. 85018

Filed Apr. 19, 1971, Ser. No. 135,067

Int. Cl. C10j 1/08

U.S. Cl. 48—144

4 Claims



Apparatus and method for producing oxygenated gaseous fuel wherein ambient air or oxygen is bubbled through a volatile liquid fuel entraining the fuel and conveying it to a combustor where it burns the vaporized fuel.

3,733,186

**TWO-STEP CONTROLLED FLOW GASIFICATION PROCESS**

Joseph F. Zemaitis, Jr., Morristown, N.J., assignor to Esso Research and Engineering Company

Filed Apr. 6, 1971, Ser. No. 131,728

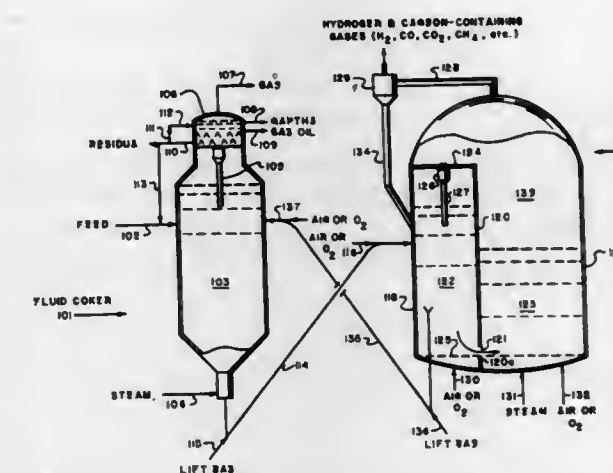
Int. Cl. C10b 49/10; C10j 3/00

U.S. Cl. 48—202

7 Claims

In a single vessel reactor a heavy hydrocarbon fuel is stripped of valuable light hydrocarbons and heated to a

temperature between 1100° and 1300° F. in a heating zone before a portion is transferred to a gasification zone to be substantially completely converted to a hydrogen



and carbon oxide-containing gaseous stream, the rate of transfer being controlled by the pressure differential between the two zones.

3,733,187

**PROCESS FOR CONVERTING SOLID WASTES TO PIPELINE GAS**

Herman F. Feldmann, Bethel Park, Pa., assignor to the United States of America as represented by the Secretary of the Interior

No Drawing. Filed June 7, 1971, Ser. No. 150,754

Int. Cl. C10j 3/00

U.S. Cl. 48—209

20 Claims

Solid wastes are heated to 500° C.—675° C. at 1000–3000 p.s.i.g. in presence of gas containing at least 90 mole percent hydrogen to convert said wastes to a methane- and ethane-containing gas having no condensable oils and tars. The carbonaceous residue is also free of tars and oils.

3,733,188

**METHOD AND APPARATUS FOR FORMING GLASS FIBERS**

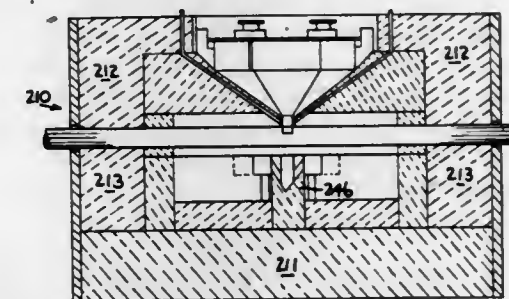
Thomas H. Jensen, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of applications Ser. No. 779,684, Ser. No. 779,940, and Ser. No. 779,941, all Nov. 29, 1968, all now abandoned. This application May 4, 1971, Ser. No. 140,220

Int. Cl. C03b 37/02

U.S. Cl. 65—2

15 Claims



In the manufacture of glass fibers, molten glass is delivered from a melter-refiner to a two-stage continuous, non-pulsing pumping device which drags a high volume of bubble-containing viscous glass through a first stage at a relatively low shear rate supplying an excess of glass at a modest pressure increase to a second stage which drags a part of the viscous glass through it at substantially higher shear rates thus delivering substantially bubble-free molten glass at higher pressure to a working chamber, while the excess bubble-containing glass, unable to support shear, is



rejected from the pump and delivered to a refining chamber with the bubbles concentrated to assist their removal by heating.

3,733,189

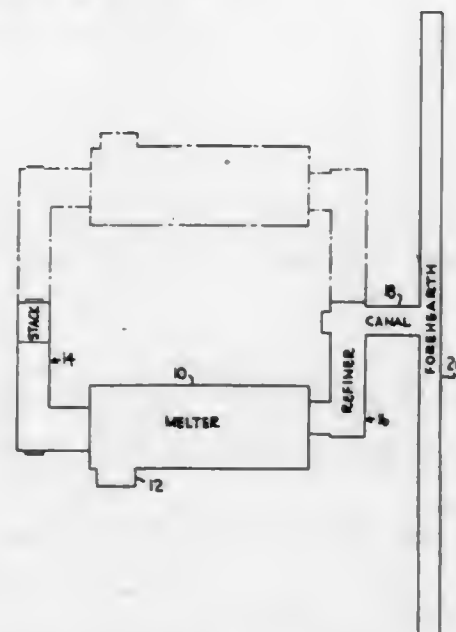
# METHOD AND APPARATUS FOR FORMING GLASS FIBERS

George B. Zurhede, Upper St. Clair, Pa., and Robert G. Shealy, Shelby, N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.  
Continuation of abandoned application Ser. No. 729,044, May 14, 1968. This application Mar. 10, 1971, Ser. No. 123,022

Int. Cl. C03b 37/02, 5/16

U.S. Cl. 65—11 R

9 Claims



Apparatus for manufacturing fiber glass includes a recuperator glass melter, a refiner and a forehearth. The stack for discharge of hot gases is spaced from the melter, providing a relatively long path for the hot gases. The refiner is separate from the melter and is relatively long and narrow, insuring substantially plug-flow therethrough. Molten glass from the melter is fed as a relatively thin stream over an inclined trough, so that it is exposed to the atmosphere thereabove and into a container with an opening therein through which the glass falls, as a spiraling stream onto any glass in the refiner. The refiner may be perpendicular to the center line of the melter. The glass flows from the refiner into a canal and then into a T-shaped forehearth which tapers in width from the canal to the ends to insure substantially uniform velocity of the glass from entry to terminal end thereof. The depth of the forehearth, which is well insulated to reduce heat loss therefrom is substantially uniform along its length. The forehearth contains, in its bottom walls, a plurality of fiber forming bushings having orifices through which streams of glass flow to be attenuated into fibers.

3,733,190

# MANUFACTURE OF FLOAT GLASS BY APPLYING LATERAL ELECTROMAGNETIC FORCES TO THE EDGES

Jack Lawrence, St. Helens, and Frederick William Silverwood, Appleby Bridge, England, assignors to Pilkington Brothers Limited, Liverpool, Lancashire, England  
Filed Feb. 2, 1971, Ser. No. 111,905

Claims priority, application Great Britain, Mar. 9, 1970, 11,235/70

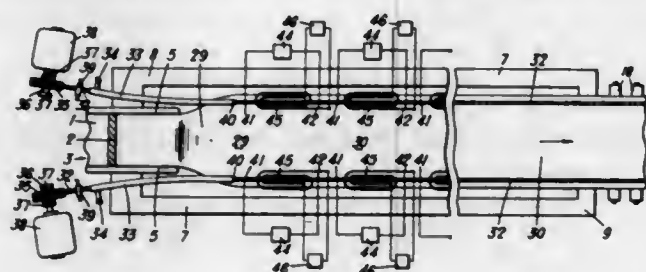
Int. Cl. C03b 18/02

U.S. Cl. 65—91

20 Claims

The thickness of a float glass ribbon is regulated by electromagnetically applying transversely-directed forces to molten glass in ribbon form as it is advancing along a

molten metal bath. The margins of the glass are provided with electrically conductive regions along which current



flow takes place, and each region is subjected to a magnetic field acting through the glass to produce said transversely-directed forces.

3,733,191

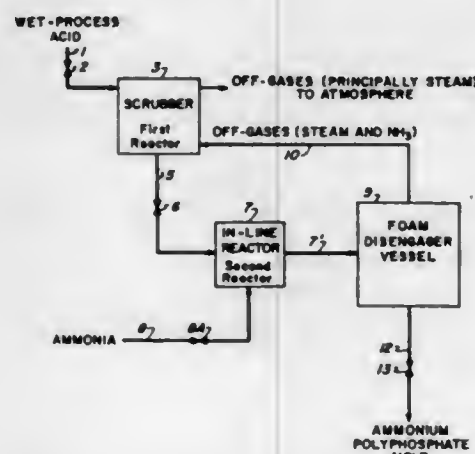
# PROCESS FOR THE PRODUCTION OF AMMONIUM POLYPHOSPHATE

Robert S. Meline and Robert G. Lee, Florence, Ala., assignors to Tennessee Valley Authority  
Continuation-in-part of application Ser. No. 833,936, June 17, 1969, which is a continuation-in-part of application Ser. No. 715,786, Mar. 25, 1968, both now abandoned. This application Feb. 13, 1970, Ser. No. 11,060

Int. Cl. C05b 7/00

U.S. Cl. 71—34

5 Claims



AMMONIATION PROCESS WITH IN-LINE REACTOR FOR PRODUCTION OF SOLID AMMONIUM POLYPHOSPHATE

Process for the production of high-analysis solid and liquid (solutions and suspensions) ammonium polyphosphate fertilizers of high P<sub>2</sub>O<sub>5</sub> polyphosphate and availability levels from wet-process phosphoric acid and ammonia. The acid is ammoniated so that fixation of ammonia, dehydration of the acid, and formation of polyphosphate occur simultaneously. The polyphosphate content is maintained at a high level by dispersal of the polyphosphate foam in a disengaging vessel of design to allow escape of free water entrapped in the foam prior to reduction in temperature and thereby preventing hydrolysis of the phosphate with the entrapped water.

3,733,192

# PLANT FOODS

Frederick John Harris and John Stewart Raitt, Edinburgh, Scotland, assignors to Scottish Agricultural Industries Limited, Edinburgh, Scotland  
No Drawing. Filed Mar. 17, 1969, Ser. No. 807,908  
Claims priority, application Great Britain, Mar. 28, 1968, 14,966/68; Mar. 14, 1969, 20,217/69

Int. Cl. A01n 21/02

U.S. Cl. 71—77

20 Claims

A method of regulating the growth of plants in agriculture and horticulture is described which comprises treat-

ing the plants, seeds or the medium in which they are grown with hydrocarbon and substituted hydrocarbon phosphonic and phosphinic acids, amides, esters and salts, and analogous thio compounds, phosphine oxides and sulphides, and compositions containing the same. By selecting the appropriate application rate an increase in the yield can be obtained, e.g. grain yield of cereals and/or an increase in the protein content of the plant. The compounds can be applied in admixture with a diluent, surfactant, fertilizer or weedkiller.

3,733,193

# RECOVERY OF VANADIUM FROM TITANIFEROUS IRON ORES

Joseph S. Fox, Lewiston, N.Y., and William H. Dresher, Upper Saddle River, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed July 22, 1970, Ser. No. 57,091

Int. Cl. C22b 55/00

U.S. Cl. 75—1

4 Claims

A process for salt roasting a vanadium-containing titaniferous iron ore having at least a few percent of a silicious material calculated as SiO<sub>2</sub>, comprising the addition of an aluminum bearing material to the ore, prior to roasting, in an amount ranging between about 2% and about 15% based on the weight of the ore, and wherein the roasting is carried out at a temperature not in excess of about 1350° C. for a time period between about ½ and about 2 hours so as to extract at least 70% of the vanadium values contained in said ore.

3,733,194

# MERCURY GENERATION

Paolo Della Porta and Mauro Rebaudo, Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy  
Original application Oct. 7, 1970, Ser. No. 78,839, now Patent No. 3,657,589. Divided and this application Jan. 18, 1972, Ser. No. 218,684

Claims priority, application Italy, Oct. 20, 1969, 23,582/69

Int. Cl. H01j 7/10, 7/18

U.S. Cl. 75—5 R

4 Claims

Mercury releasing compositions employing intermetallic compounds of mercury with zirconium and/or titanium such as Zr<sub>3</sub>Hg and Ti<sub>3</sub>Hg useful to charge electron tubes with mercury.

3,733,195

# CORROSION RESISTANT STEELS HAVING IMPROVED WELDABILITY

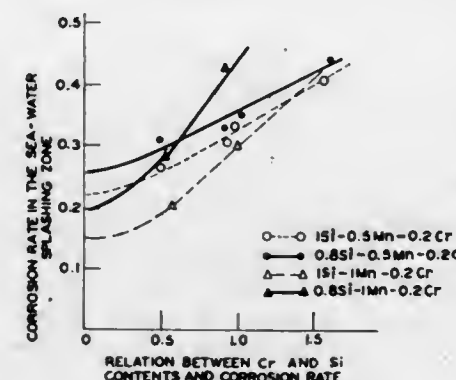
Tadashi Nishi, Tuneyasu Watanabe, Haruo Shimada, Hiroki Masumoto, Takeshi Fujimoto, Kazuhiro Mida, and Takashi Okazaki, Kitakyushushi, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan  
Filed Jan. 14, 1970, Ser. No. 2,695

Claims priority, application Japan, Jan. 16, 1969, 44/3,003; Feb. 28, 1969, 44/15,630

Int. Cl. C22c 39/54

U.S. Cl. 75—125

2 Claims



A corrosion resistant steel having improved weldability consists of 0.001–0.30 percent carbon, 0.1–2.0

percent silicon, 0.3–2.0 percent manganese, 0.01–0.50 percent chromium, 0.1–0.29 percent copper, 0.0001–0.040 percent phosphorus, two or more elements selected from the group consisting of arsenic, beryllium, bismuth, lead, germanium, antimony, selenium and tellurium in an amount of 0.02–0.20 percent each, balance being iron and unavoidable impurities. The steel may also include one or more elements selected from the group consisting of titanium, zirconium, niobium, vanadium, molybdenum, tungsten and nickel in an amount of 0.01–0.50 percent in respect to titanium, zirconium, niobium and vanadium, 0.1–1.5 percent in respect to molybdenum and tungsten and 0.1–3.5 percent in respect to nickel, balance being iron and unavoidable impurities.

3,733,196

# CHEMICALLY HARDENED SILVER HALIDE EMULSIONS CONTAINING TEMPERING CONCENTRATIONS OF SIMPLE ORGANIC POLYOLS

Edward Peter Abel, Robert Stanley Darlak, and Louis Morton Minsk, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

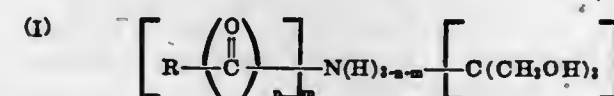
No Drawing. Filed Feb. 4, 1971, Ser. No. 112,768

Int. Cl. G03c 1/30

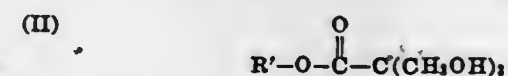
U.S. Cl. 96—111

12 Claims

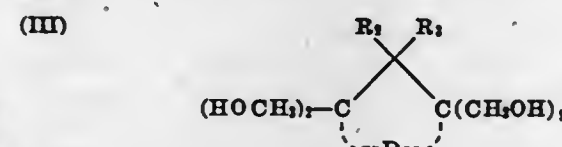
Photographic silver halide elements containing hydrophilic colloids are tempered by simple organic polyols having the formulae:



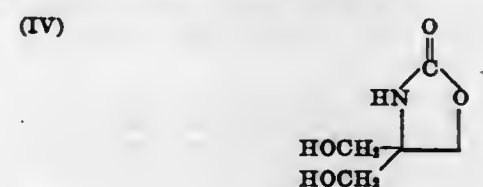
wherein R is phenyl or substituted phenyl, alkyl, substituted alkyl or alkenyl; p is 0 or 1; m is 0, 1 or 2; and n is 1 or 2; the sum of m and n being at most 3; or



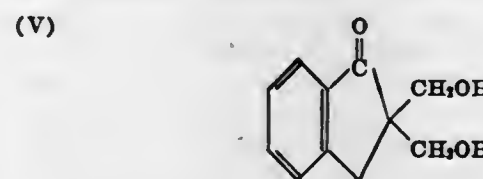
wherein R' is alkyl, a hydrogen atom, an alkali metal or the atoms necessary to complete an ammonium salt group; or



wherein D is the atoms needed to complete a 5 or 6 membered carbocyclic ring; and taken separately, R<sub>2</sub> is hydrogen and R<sub>3</sub> is hydroxy, or taken together R<sub>2</sub> with R<sub>3</sub> represents an oxo-group or



or



Also disclosed are processes for effecting tempering of various layers comprising these polyols and polymeric latex dispersions.



3,733,197

**PHOTOSENSITIVE COMPOSITION CONTAINING A HALOGENATED HYDROCARBON PHOTOACTIVATOR AND A SPIROTHIONAPHTHOPYRAN, A SPIROCYCLOHEPTATRIENE, OR A SPIROTHIOBENZOPYRAN**

Cajetan Schiele, Beihingen (Neckar), Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm (Danube), Germany  
No Drawing. Continuation-in-part of application Ser. No. 881,340, Dec. 1, 1969. This application Sept. 16, 1970, Ser. No. 72,848  
Claims priority, application Germany, Nov. 29, 1968, P 18 11 620.6

Int. Cl. G03c 1/52, 5/24

U.S. Cl. 96—48 R 13 Claims

A composition of matter comprising spiro compounds held in a matrix substance and exhibiting stable color changes upon exposure to radiation of characteristic wavelength. The composition of matter is exposed to data-modulated light of such wavelength to provide permanent records of the data.

3,733,198

**DIRECT POSITIVE PROCESSES UTILIZING SILVER HALIDE INTERNAL LATENT IMAGE EMULSIONS CONTAINING HIGH CONCENTRATION OF HETEROCYCLIC THIONE ANTIFOGGANTS**

Gerard Laurens Vanreusel, Hove, Paul Desire Van Pee, Edegem, and Jules Maria De Laet, Mortsel, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium  
No Drawing. Continuation-in-part of abandoned application Ser. No. 546,528, May 22, 1966. This application Feb. 1, 1971, Ser. No. 111,706

Claims priority, application Great Britain, Apr. 30, 1965, 18,335/65

Int. Cl. G03c 5/24

U.S. Cl. 96—64 21 Claims

In a known method of photographically producing direct positive images by exposing a light-sensitive material carrying a silver halide emulsion layer of the type forming a latent image predominantly in the inner part of the silver halide grains, i.e. a so-called internal image emulsion, treating the exposed material with a surface developer and overall exposing the material during this treatment to actinic light of low intensity, an image having minimum density and contrast is obtained by incorporating within the emulsion layer a fog-inhibiting compound of the class of the heterocyclic thione compounds in an amount of at least about 0.1 mole per 100 mole of silver halide and which is substantially larger than normal fog-inhibiting amounts. The concept can be applied to the formation of black and white images as well as to colored images.

3,733,199

**PHOTOGRAPHIC COMPOSITION OF SODIUM AND POTASSIUM IONS FOR TREATING DIRECT POSITIVE EMULSIONS**

Paul E. Crough and Henry J. Snyder, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
No Drawing. Filed June 14, 1971, Ser. No. 152,978

Int. Cl. G03c 5/24

U.S. Cl. 96—64 13 Claims

A diffusion transfer process comprises developing an exposed direct positive emulsion in the presence of a silver halide solvent, a silver halide developing agent, a development restrainer such as benzotriazole and sodium and potassium as ions or in combined form e.g. as compounds, including complexes. The sodium and potassium are present in a concentration of about 8 to about 27 mole percent potassium and about 92 to about 73 mole percent sodium, based on the total moles of sodium and potassium of about 5 to about 30%, by weight, dry basis of total developing composition.

3,733,200

**PRINTING PLATE**

Shunji Takashi, Tokyo, and Akira Kato, Yokohama, Japan, assignors to Hydron Chemical Co., Ltd., Tokyo, and Kansai Paint Co., Osaka, Japan

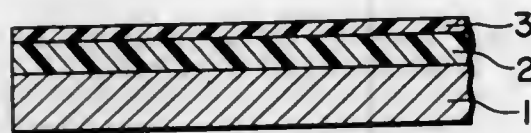
Filed Feb. 12, 1971, Ser. No. 114,887

Claims priority, application Japan, Feb. 19, 1970, 45/13,759

Int. Cl. G03c 1/94

U.S. Cl. 96—86 R

12 Claims



A printing plate is constituted a basic plate, a layer of water insoluble hydrophilic acrylate or methacrylate polymers over the plate and a photo-sensitive layer over the layer.

3,733,201

**PHOTOGRAPHIC COMPOSITIONS AND ELEMENTS COMPRISING COUPLING COMPOUNDS WHICH ON DEVELOPMENT RELEASE SILVER HALIDE-COMPLEXING MATERIALS AND DYES**

Charles Robert Barr, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 1, 1971, Ser. No. 185,870

Int. Cl. G03c 1/40, 5/54, 7/00

U.S. Cl. 96—100

40 Claims

A novel class of selenium and tellurium organic ether photographic coupler compounds having utility in the color photographic area, such compounds containing a releasably linked organic radical attached at a coupling site by a divalent selenium or tellurium atom, photographic emulsions, developing compositions and photographic elements containing such compounds as well as a process for developing the exposed photographic elements.

3,733,202

**DEEP FAT FRYING PROCESS**

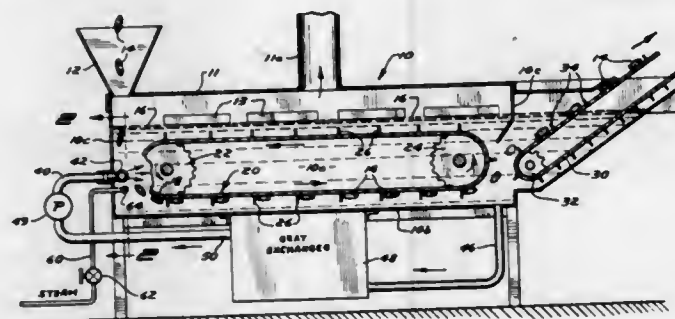
Ralph A. Marmor, Minneapolis, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Continuation-in-part of abandoned application Ser. No. 820,113, Apr. 29, 1969. This application Nov. 18, 1970, Ser. No. 90,772

Int. Cl. A23l 1/00; C09f 5/12

U.S. Cl. 99—1

6 Claims



A deep fat fryer composed of a frying vessel having side and bottom walls and a hood. An external heat exchanger and pump are connected to the vessel for heating the fat and passing it through the vessel. A provision is made for introducing a small amount of moisture into the fat at the point where the fat enters the vessel to distill off undesired fat breakdown products. The moisture is preferably introduced as steam through a manifold located at the inlet end of the frying vessel. As the steam

escapes, it carries away the products of fat degradation and at the same time fills the hood thus lessening oxidation that would otherwise occur on the surface of the fat.

3,733,203

**AMMONIATED PHOSPHORIC ACID, MOLASSES, SULFATE FEED SUPPLEMENT FOR RUMINANTS**

Donald M. Steen, Morrill, Nebr., assignor to Allied Chemical Corporation, Morris Township, N.J.  
No Drawing. Continuation-in-part of application Ser. No. 484,460, Sept. 1, 1965. This application Mar. 5, 1970, Ser. No. 16,988

Int. Cl. A23k 1/22; C05f 5/00; C05c 9/00

U.S. Cl. 99—2 ND

2 Claims

A feed supplement for ruminant animals comprising a supply of non-protein nitrogen, such as urea, a water-soluble sulfate and ammoniated phosphoric acid, providing a sulfur-nitrogen ratio of not more than 15 parts of nitrogen to 1 part of sulfur by weight. Pyrophosphate included in the feed acts as a sequestering agent upon the trace minerals therein. The feed may also contain vitamins, antibiotics, hormones and/or salt as desired. The described feed supplement provides a desired nutrition for animals, increasing their growth rate, health and digestive efficiency.

3,733,204

**METHOD OF FEEDING CHITINOUS MEAL TO CRUSTACEA**

Keir Charles Campbell, Carlton, near Goole, England, assignor to Ranks Hovis McDougall Limited, London, England

No Drawing. Filed Mar. 2, 1970, Ser. No. 15,940  
Claims priority, application Great Britain, Mar. 7, 1969, 12,272/69

Int. Cl. A23k 1/18

U.S. Cl. 99—2 R

8 Claims

A method for the intensive farming of crustacea, e.g. prawns, in which, to increase survival rate, the growing crustacea are fed a prepared food composition comprising a chitinous meal. The chitinous meal may be a meal from the waste parts of crustacea, e.g. of crustacea previously reared by the same method, and is preferably provided in pellets containing also the other components of a balanced feed for the crustacea.

3,733,205

**ENZYMATIC REMOVAL OF DIACETYL FROM FERMENTED BEVERAGES**

John Shovers, Shorewood, Wis., and William E. Sandline, Corvallis, Oreg., assignors to Pfizer Inc., New York, N.Y.

No Drawing. Filed Aug. 7, 1970, Ser. No. 62,193

Int. Cl. C12h 1/12; C07g 7/02

U.S. Cl. 99—48

6 Claims

A process for the enzymatic removal of diacetyl from beer and ale by the addition of diacetyl reductase and reduced nicotinamide adenine dinucleotide or combinations of whole bakers' or brewer's yeast with diacetyl reductase and reduced nicotinamide adenine dinucleotide which have been micro-encapsulated with gelatin or calcium alginate.

3,733,206

**CONTINUOUS PROCESS FOR THE MANUFACTURE OF CEREAL FOOD PRODUCTS**

Philip Jansen, Jr., Westport, Conn., assignor to National Biscuit Company

Filed July 13, 1970, Ser. No. 54,098

Int. Cl. A23l 1/10

U.S. Cl. 99—80 R

13 Claims

Cooked cereal grain is rolled to form thin flakes which are compressed under heavy pressure to provide a continuous flowing sheet or sheet-like form of compressed cereal laminations. As the sheet advances on a continuously moving conveyor band it is first cut by a transversely reciprocating assembly of rotating disc cutters and

subsequently cut into longitudinal strips by a second assembly of rotating disc cutters to form a continuously advancing sheet of rectangular shaped biscuits. The product is then baked and toasted to form a crunchy flaked biscuit which will maintain its crispness upon contact with aqueous liquids such as milk or cream.

3,733,207

**PREPARATION OF A SOY PROTEIN FRACTION**

Edward M. McCabe, Marysville, Ohio, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

No Drawing. Filed July 14, 1971, Ser. No. 162,654

Int. Cl. A23j 1/14; A23l 1/00, 1/20

U.S. Cl. 99—17

6 Claims

A protein fraction particularly suitable for incorporation in carbonated beverages is recovered from soy protein, by reaction of the soy with phytase, removal of matter insoluble at a pH of about 4.6 and recovery of the fraction insoluble at pH of about 5.0 to 5.4.

3,733,208

**PRODUCTION OF BAKERY PRODUCTS**

Shigehiko Sato, Osaka, and Saburo Yamatodani, Minoo, Japan, assignors to Takeda Chemical Industries, Ltd., Higashi-ku, Osaka, Japan

No Drawing. Filed Feb. 5, 1970, Ser. No. 9,039

Claims priority, application Japan, Feb. 5, 1969, 44/8,514

Int. Cl. A21d 2/18

U.S. Cl. 99—90 R

24 Claims

Uniform incorporation of microbial heteropolysaccharides comprising hexose and succinic acid produced by e.g. *Archromobacter lactolyticus* into doughs for bakery products enhances the stability of the doughs, makes the doughs susceptible to mechanical treatment with less trouble, significantly increases weight and specific volume of bakery products and also considerably prevents the bakery products from staling and retrogradation on storage.

3,733,209

**CULINARY MIX FOR THE PREPARATION OF BAKED GOODS WITH IMPROVED MILK CHOCOLATE FLAVOR**

Monoj K. Gupta, Cincinnati, and William M. James, Symmes Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Oct. 6, 1970, Ser. No. 78,616

Int. Cl. A21d 2/00; A23l 1/10

U.S. Cl. 99—94

6 Claims

A prepared culinary mix for the preparation of milk chocolate flavored baked goods which includes sugar, flour, shortening, and other minor ingredients, and to which is added small amounts of non-fat dry milk solids or whey solids, cocoa, and either lactose, maltose, raffinose or galactose. The baked goods made from the above-mentioned culinary mix exhibit a desirable milk chocolate type flavor.

3,733,210

**METHOD FOR MAKING LIQUID SHORTENING-CONTAINING CULINARY MIXES**

Paul Seiden, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Mar. 24, 1971, Ser. No. 127,765

Int. Cl. A21d 2/00

U.S. Cl. 99—94

15 Claims

Flour is premixed with emulsifier and the premix which is free of shortening is passed between rollers to smear emulsifier on the flour. The emulsifier-coated flour is added to additional cake mix ingredients, including a liquid shortening, to provide a liquid shortening-containing culinary mix which does not have the usual disadvantages of liquid shortening-containing culinary mixes.



## ERRATUM

For Class 106—178 see:  
Patent No. 3,733,297

3,733,211

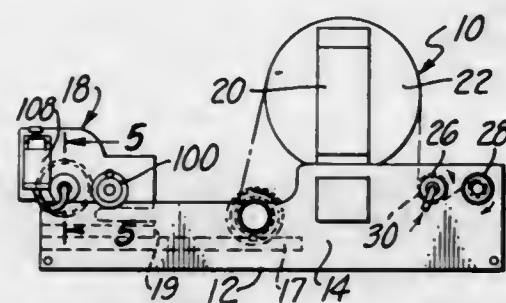
## RIBBON-INKING METHOD

Frank R. Anderson and Albert J. Castro, Montebello, Calif., assignors to Westates Space-Era Products, Inc., El Monte, Calif.  
Original application Oct. 27, 1969, Ser. No. 869,461.  
Divided and this application June 28, 1971, Ser. No. 157,769

Int. Cl. B23p 7/00

U.S. Cl. 117—2 R

2 Claims



A used previously inked ribbon for which ink has been removed as a result of use can be effectively reinked so as to be capable of reuse by applying ink to a surface of the ribbon from a roller and then by subsequently ironing the ribbon. Such ironing involves applying heat to the ribbon while holding the ribbon under tension; preferably the ironing is followed by cooling the ribbon.

3,733,212

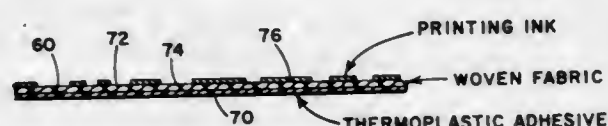
## HEAT SEALABLE LABEL CARRYING AN INDELIBLE INK

Edward A. McCafferty, Cincinnati, Ohio, assignor to Natmar, Inc., Cincinnati, Ohio  
Filed Sept. 3, 1970, Ser. No. 69,420

Int. Cl. C09j 7/04

U.S. Cl. 117—14

9 Claims



This disclosure includes a method and combination of apparatus for the manufacture of inked labels and the attachment of such labels to selected goods and an inked label as well as an ink composition particularly useful for the printing of inked labels. The aforesaid label, ink composition, method and combination of apparatus making possible the efficient manufacture of labels directly at the point of attachment of such labels to respective goods.

3,733,213

## ELECTROLESS PLATING OF PLASTICS AND FIBERS

George Jacob, Flouertown, Pa., assignor to Coppertech Inc., Flouertown, Pa.  
No Drawing. Filed Dec. 31, 1970, Ser. No. 103,296

Int. Cl. C23c 3/02

U.S. Cl. 117—47 A

9 Claims

Nylon, Dacron or other fibers or fabric is plated by first degreasing the fabric with an organic solvent such as

methyl ethyl ketone, the fabric is then immersed in a novel non-aqueous solution which simultaneously further degreases, cleans and wets, etches and initiates sensitization of the surface of the fabric fibers, the fabric is then rinsed after which it is deglazed by immersion in an oxidizing solution, rinsed, immersed in ammonia solution, treated in a novel sensitizing solution, activated in a novel activating solution, rinsed and plated in a novel nickel or copper plating solution. The fabric may be further plated by electroplating techniques.

3,733,214

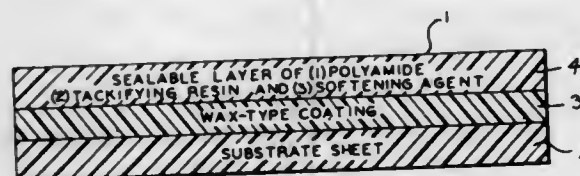
## PRESSURE SEALABLE PACKAGING FILM

Frank H. Stockhausen, Wauwatosa, Wis., assignor to Milprint, Inc., Milwaukee, Wis.  
Filed July 19, 1971, Ser. No. 163,817

Int. Cl. B32b 23/08, 27/08

U.S. Cl. 117—76 F

2 Claims



A packaging film formed of (1) a substrate sheet of flexible packaging material, (2) a tacky wax-type coating on a surface of the substrate sheet, and (3) a sealable layer covering the wax-type coating which comprises a mixture of a polyamide, a tackifying resin and a softener. The sealable layer of the foregoing composition is capable of forming seals for the production of packages from the film by the use of pressure alone at room temperature conditions.

3,733,215

## SURFACE TREATMENT OF POLYESTER MATERIAL

August Jean Van Paesschen, Antwerp, and Lucien Janbaptist Van Gossom, Kontich, Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium  
No Drawing. Filed June 8, 1971, Ser. No. 151,131  
Claims priority, application Great Britain, June 9, 1970, 27,979/70

Int. Cl. B32b 37/14; B44d 5/04

U.S. Cl. 117—138.8 F

4 Claims

To improve the adhesion to polyester surfaces of layers which are subsequently to be applied thereto, there is previously applied to the polyester surface a uniform layer of finely divided silica from an aqueous dispersion of silica particles containing chloral hydrate.

3,733,216

## METHOD FOR IMPREGNATING STRANDED CABLE WITH WATERPROOFING COMPOUND

Ira Bernard Goldman, Levittown, Pa., and Charles Bean Heard, Jr., Lawrenceville, Ga., assignors to Western Electric Company, Incorporated, New York, N.Y.  
Filed Apr. 19, 1971, Ser. No. 135,105

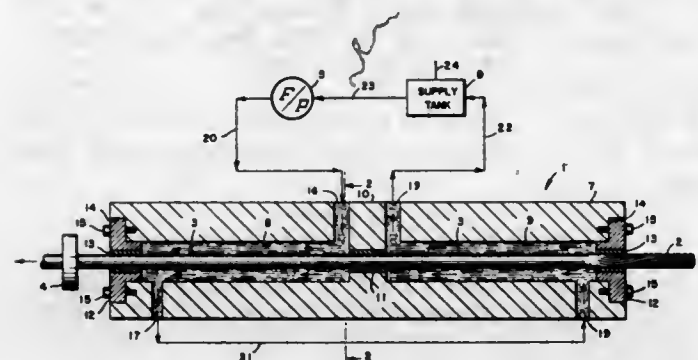
Int. Cl. B44d 1/16

U.S. Cl. 117—231

6 Claims

Waterproofing compound at ambient or substantially ambient temperature, in the preferred embodiment, is continuously forced under pressure to flow through staged conduit surrounding stranded cable. Compound fills interstitial spaces between adjacent conductors in cable

and simultaneously exerts viscous drag force along the surface of the cable to propel, or otherwise control the



movement of the cable. Wiping die subsequently removes excess compound from surface of cable.

3,733,217

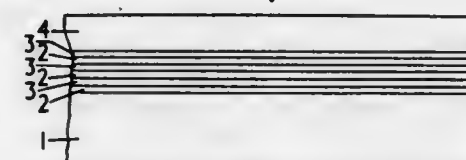
## METHOD OF MAKING INTERFERENCE FILTERS

John Scott Seeley and Stanley Desmond Smith, Berkshire, and Frederick Stafford Ritchie, Newcastle-upon-Tyne, England, assignors to Sir Howard Grubb Parsons & Company Limited, Walkergate, Newcastle-upon-Tyne, England  
Original application Sept. 16, 1969, Ser. No. 858,302, now Patent No. 3,614,188. Divided and this application July 28, 1971, Ser. No. 166,689

Int. Cl. G02b 5/28

U.S. Cl. 117—33.3

2 Claims



A method of making an interference multi-layer filter for use with infra-red radiation, which includes the steps of depositing in vacuo on a substrate, selected from the group comprising germanium, silicon and crystal quartz, alternate layers of caesium iodide and a material of different refractive index selected from the group comprising germanium, silicon, tellurium and lead telluride. The substrate is heated to a temperature in the range of 130–230° C. and after deposition of the alternate layers the substrate is allowed to cool down to a temperature of 20° C. at a rate not exceeding 1° C. per minute before admitting air at ambient temperature into the vacuum chamber.

3,733,218

## REMOVAL OF SOLDER FLUX WITH AZEOTROPIC SOLVENT MIXTURES

Cary A. Begun, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio  
No Drawing. Filed Nov. 15, 1971, Ser. No. 198,776

Int. Cl. B08b 7/00; B01f 1/00

U.S. Cl. 134—38

9 Claims

Azeotropic mixtures of trichloroethylene/isobutanol, perchlorethylene/cyclopentanol, perchlorethylene/ethylene glycol monoethyl ether or perchlorethylene/n-amyl alcohol are used to remove the residual rosin-based solder flux from soldered printed circuit boards.

3,733,219

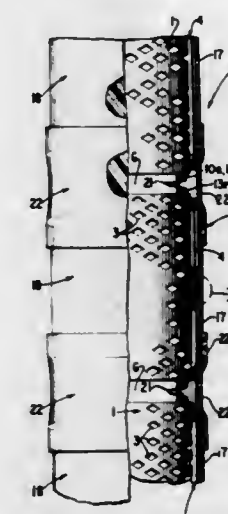
## LOW IMPACT ENERGY ELECTROCHEMICAL CELLS AND BATTERIES

Jean-Pierre Courtot, Pantin, France, assignor to Societe des Accumulateurs Fixes et de Traction (Societe Anonyme), Romainville, France  
Filed Feb. 22, 1971, Ser. No. 117,433  
Claims priority, application France, Feb. 27, 1970, 7007205

Int. Cl. H01m 35/16, 5/00

U.S. Cl. 136—13

3 Claims



Electrochemical cells and batteries of low collision impact energy for use in high altitude testing equipment such as sounding balloons to reduce to the negligible the danger of impact damage to aircraft colliding therewith. Individual cells include flexible bands of opposite polarity electrodes, interposed separators and electrolyte all enclosed in a flexible sealed envelope with leads from the respective opposite polarity electrodes projecting in sealed relationship from the envelope. Each envelope with its contents is wrapped around a rigid tubular grid structure of small mass and having small meshes. The envelope is secured in place on the grid structure by flexible reinforced tape. Groups of such individual cells are positioned in axial spaced-apart alignment with appropriate long lead interconnection of cell terminals to form a battery. Adjacent cells are maintained together in assembled relationship with gaps between adjacent cells by reinforced flexible tape bindings.

3,733,220

## WATER ACTIVATED LEAD-ACID BATTERY HAVING DRIED, DISCHARGED ELECTRODES

Nicholas J. Cortese, Racine, Wis., and James E. Bell, Fairview Park, Ohio, assignors to ESB Incorporated  
Filed Mar. 3, 1971, Ser. No. 120,426

Int. Cl. H01m 39/00

U.S. Cl. 136—26

4 Claims

A lead-acid battery is produced by: charging the electrodes to a state of substantially full charge in a formation tank; discharging the electrodes to a state of substantially complete discharge in the formation tank; drying the electrodes; assembling the dried, discharged electrodes into elements; coating the exposed areas of elemental lead in the element, particularly the surfaces of the positive connective strap, with a non-oxidizing material or, alternatively, oxidizing those exposed areas of elemental lead with an oxidizing agent; and, placing the element into a battery container. Enough PbSO<sub>4</sub> may be contained in the dry, discharged electrodes so that the battery can be activated by the addition of water.



3,733,221

**GAS DIFFUSION ELECTRODE**

Yehuda L. Sandler, Pittsburgh, and Docile D. Durigon, Irwin, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.  
Continuation-in-part of application Ser. No. 776,636, Nov. 18, 1968. This application Jan. 27, 1971, Ser. No. 110,126

Int. Cl. H01m 13/00

U.S. Cl. 136—120 FC

4 Claims



A gas diffusion electrode for use with a liquid electrolyte in an electrochemical cell, which electrode includes a porous electrical conductor between two porous layers. The first porous layer on the liquid electrolyte side is composed of a conducting material and a binder. The second layer of a thickness of from 3 to 7 mils is on the gas side and contains a conducting material, a binder, and a catalyst; and it is less than about one-half as thick as the first layer and more hydrophobic, whereby gas diffusion rates are optimized and the catalyst is employed in a highly efficient manner.

3,733,222

**METHOD OF REMOVING INVERSION LAYERS FROM SEMICONDUCTOR BODIES OF P-TYPE CONDUCTIVITY**

Hans-Peter Schiller, Hellbronn, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Sept. 22, 1970, Ser. No. 74,261

Claims priority, application Germany, Sept. 27, 1969, P 19 48 884.7

Int. Cl. H01l 7/00

U.S. Cl. 148—1.5

5 Claims

A method of removing inversion layers from the surface of high resistance semiconductor regions of p-type conductivity which border, in a semiconductor body, on a semiconductor region of n-type conductivity and are covered with an oxide masking layer. The method essentially comprises irradiating the semiconductor body with neutrons.

3,733,223

**NEAR INFRARED ILLUMINATING COMPOSITION**

Carl W. Lohkamp, Bloomfield, Ind., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed May 22, 1972, Ser. No. 255,333

Int. Cl. C06d 1/10

U.S. Cl. 149—19

4 Claims

An illuminating composition which, upon burning, produces infrared radiation in the 0.74–1.2 micron region of the spectrum. The produced radiation can be utilized to produce irradiance upon a target to improve the range and resolution of a night viewing device. The composition is comprised of silicon, hexamethylenetetramine, an epoxy binder, and an alkali metal nitrate selected from the group consisting of potassium nitrate, cesium nitrate and rubidium nitrate.

3,733,224

**EXPLOSIVE COMPOSITION CONTAINING PHOSPHORUS AND PARTICULATE COFFEE**

G. Farlan Floyd, Rte. 1, Temple, Ga. 30179

No Drawing. Filed Aug. 24, 1972, Ser. No. 283,539

Int. Cl. C06b 1/04

U.S. Cl. 149—30

2 Claims

A cap sensitive explosive composition consisting of ammonium nitrate, soybean oil, red phosphorus, and dried coffee.

3,733,225

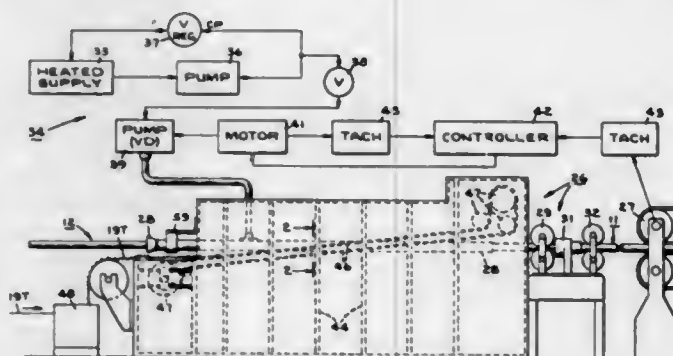
**METHOD OF APPLYING A WATERPROOFING JELLY-LIKE COMPOUND TO AN ELONGATED STRAND AND FORMING A SHEATH ABOUT THE STRAND**

Larry D. Moody, Ralston, Nebr., assignor to Western Electric Company, Incorporated, New York, N.Y.  
Filed Sept. 4, 1970, Ser. No. 69,837

Int. Cl. H01b 13/16, 13/26

U.S. Cl. 156—48

2 Claims



An elongated strand, such as cable core assembly, is advanced longitudinally through a forming tube of apparatus for forming a sheath about the strand with edge portions of the sheath overlapped to form a longitudinally extending seam. As the strand passes through the forming tube a waterproofing jelly-like compound is introduced into the forming tube at a point spaced from its entrance end and under relatively high pressure such that the compound completely fills a circumferentially extending portion of the space between the strand and the forming tube to produce a waterproof layer of the compound which encircles the strand and which provides a smooth cylindrical support surface about which the sheath can be formed in tight-fitting relationship and with a tight seam as the strand exits from the forming tube. The pressure at which the waterproofing jelly-like compound is introduced into the forming tube also is such that the waterproofing compound flows between the overlapped edge portions of the sheath to seal and waterproof the seam formed by the edge portions.

3,733,226

**LAMINATE STRUCTURE SUITABLE FOR CARPET USE AND METHOD OF MAKING**

Frederick L. Stoller, Greenville, S.C., assignor to Phillips Petroleum Company

Filed Dec. 22, 1970, Ser. No. 100,702

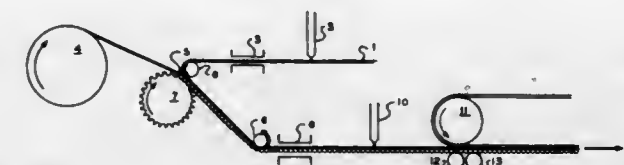
Int. Cl. B32b 5/00; D04h 11/00

U.S. Cl. 156—72

3 Claims

A laminate structure, as in a carpet, in one form comprises a non-woven heat sealable fabric, heat sealed on one side, laminated with an adhesive to a facing layer of heat sealable fibers, applied as by an embossing roll which can be heated. The non-woven fabric can be a needle-punched assemblage of a scrim and fibers and the assemblage heat sealed on that side of the scrim from which the needles have emerged thus to lock the fibers into the scrim when heat sealing to provide a fibrous, non-heat sealed pad side of the assemblage. The adhesive can be

a thermally responsive, i.e., a thermoplastic or thermosetting, film, powder or melt. The adhesive in tacky, fiber receiving condition, as after being passed through a heating zone, is passed together with a face yarn web through an embossing zone, the embossing member of which can be heated. In a modification a further backing can be



applied to the non-heat sealed pad side. When the non-woven fabric can be readily heat sealed it can be passed directly together with the face yarn to a heated embossing roll or press and the two heat sealed there together without use of adhesive. Likewise, the second backing can be so applied.

3,733,227

**METHOD OF MAKING A DRAPERY SWAG**

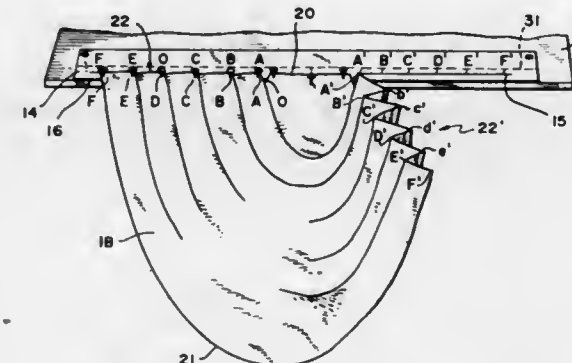
Albert E. Collins, Jr., 3030 Mount Diablo St., Concord, Calif. 94520

Filed Feb. 19, 1971, Ser. No. 116,818

Int. Cl. A47k 23/00

U.S. Cl. 156—196

12 Claims



A method of making a drapery swag or the like from a backing strip having an alignment pattern therealong and a swag blank cut from a drapery fabric. The backing strip is buckram having a heat-sensitive adhesive along one surface thereof upon which the alignment pattern is printed, and the alignment pattern has an essentially straight line running from end-to-end thereof and a plurality of longitudinally spaced alignment positions located along the line. The swag blank has a straight upper edge, an arcuate lower edge, and side edges with a generally saw-toothed configuration therealong providing spaced apart roots or alignment points. The backing strip is secured along a flat surface, and the upper edge of the swag blank is temporarily attached to the backing strip in a centered and aligned disposition with the longitudinal line of the pattern thereon, and the side edges of the blank are then folded and placed along the backing strip with the roots of the saw-toothed edges in respective juxtaposition with the alignment positions on the backing strip and with the side edge portions of the blank aligned with the longitudinally extending line of the alignment pattern. Thereafter, the backing strip is folded over the side edges of the swag blank and is heated to permanently secure the same to the swag blank.

3,733,228

**METHOD OF MANUFACTURE OF GLASS FIBER REINFORCED EPOXY RESIN TUBES**

Ludwig Wesch, Heidelberg, Germany, assignor to Manufacture de Machines du Haut-Rhin S.A., Mulhouse-Bourtzwiller, France

No Drawing. Filed Feb. 27, 1970, Ser. No. 15,195

Claims priority, application France, Mar. 7, 1969, 6906540

Int. Cl. B65h 81/06

U.S. Cl. 156—172

8 Claims

Glass fiber reinforced epoxy resin tubes can be mass produced by winding glass fibers or filaments upon a mandrel at a high linear speed, preparing an epoxy resin which has a controlled viscosity of 400 to 900 cp. with an epoxy equivalent of 120 to 180 by mixing a more viscous epoxy resin with additives including reactive diluents which have a viscosity of 3.5 to 200 cp., an ebullition temperature of 120–30° C., and an epoxy equivalent of 70 to 180, and applying such prepared mixture to the filaments being wound. The additives may include hardeners, accelerators, and silanes. A layer of soft, uncured epoxy resin may be applied to the winding as the winding operation continues, or a layer of roving may be applied to the winding during the winding operation.

3,733,229

**METHOD OF FILLING HONEYCOMB CORES WITH FIBERS**

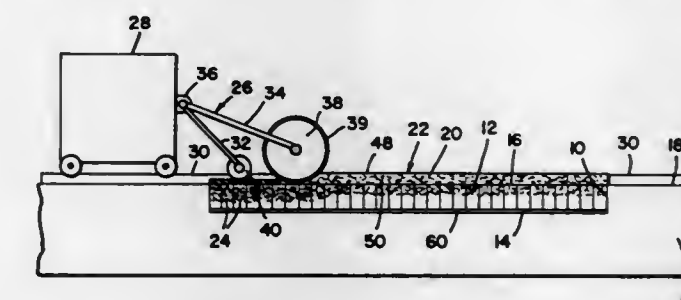
Donald E. Scheer, San Ramon, and Robert G. Noble, Castro Valley, Calif., assignors to Hexcel Corporation, Dublin, Calif.

Filed Sept. 16, 1970, Ser. No. 72,781

Int. Cl. B31d 3/02

U.S. Cl. 156—197

16 Claims



A method of filling honeycomb cores with thin fibers by placing the expanded core in a holding fixture, placing a mat of relatively brittle fibers on top of the core and reciprocating at least one roller across the mat until the fibers are severed along core cell walls and have been moved into the cells. Adhesive or resinous materials are applied to the core and/or the fibers to retain the fibers in the cells during handling of the filled core.

3,733,230

**LABEL INSPECTION SLITTER/REWINDER**

Allan R. Prittle, 12 Blackdown Cr., Islington, Ontario, Canada

Filed Feb. 8, 1972, Ser. No. 224,427

Int. Cl. B65h 17/34

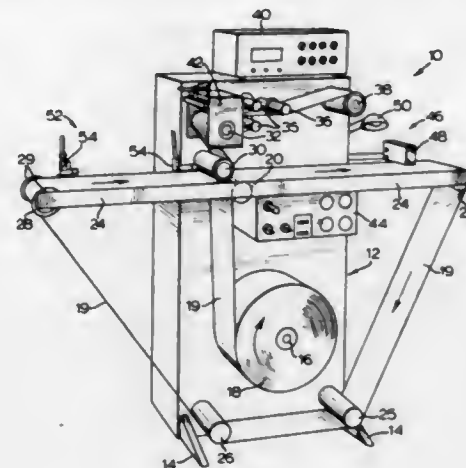
U.S. Cl. 156—64

8 Claims

This invention provides a web processing device which has an unwinding mandrel and a rewinding mandrel, and is adapted to receive rolls of web on the former and rewind the web on the latter. Between the mandrels, the unwinding web is made to follow a path which brings it sequentially to a web inspection location and a splicing location. Braking means are provided for halting the movement of the web along the path. The distance along the path between the web inspection location and the splicing location is long enough to permit the braking means to halt the movement of the web before a given



point on the web can move the full distance from the web inspection location to the splicing location. In this way, there is no need to provide reverse drive facility



on the unwinding mandrel for the purpose of moving the web backwards should a faulty section detected at the inspection location over-shoot the splicing location.

3,733,231

## WALLBOARD ATTACHMENT

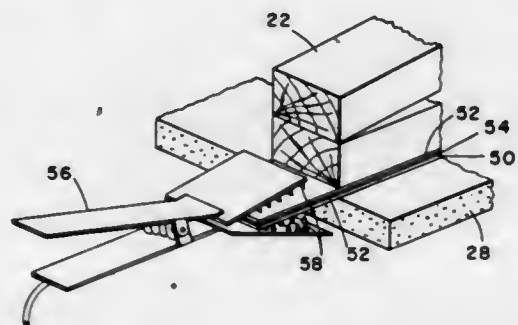
Edward J. Rutkowski, Kenmore, and Joseph W. Schneller, Williamsville, N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed June 16, 1971, Ser. No. 153,611

Int. Cl. E04b 2/00

U.S. Cl. 156-71

3 Claims



Wallboard affixed to studs or trusses by a strip of metal foil with hot melt adhesive on both surfaces, disposed between the board and the framing member and held there firmly while heating the foil with an electric current.

3,733,232

## METHOD FOR MAKING BUILDING SHEATHING ELEMENTS

Harold J. W. Payne, Raby Mere, England, assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Oct. 10, 1967, Ser. No. 674,317

Claims priority, application Great Britain, Feb. 2, 1967, 5,074/67

Int. Cl. B32b 5/18; E04b 2/28; E04c 1/00

U.S. Cl. 156-79

1 Claim



A prefabricated, insulated building panel formed from an inner liner sheet and a fluted outer facing sheet with

side edges of both sheets engaged to allow overlapping connection of the assembled panels in side-by-side relation on a building outer surface. The panels contain foamed-in-situ insulation which serves as thermal and sound insulation and serves to rigidify the panel. The foamed-in-situ insulation may fill less than all of the volume of the fluted outer facing sheet.

3,733,233

## METHOD OF MAKING A ROLLER

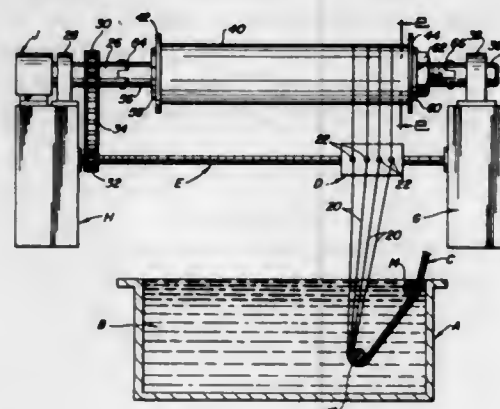
Wilfred Griffiths, Bardwell Park, New South Wales, Australia, assignor to Abrasive Aids Pty. Limited, Bankstown, New South Wales, Australia

Original application May 16, 1969, Ser. No. 825,174, now Patent No. 3,639,958. Divided and this application Jan. 29, 1971, Ser. No. 111,099

Int. Cl. B32b 31/22; B65h 81/06

U.S. Cl. 156-153

9 Claims



A roller comprises a rigid cylindrical sleeve formed of fiberglass which is coated with resin. The outer surface of the sleeve is machined to remove substantially all visible resin therefrom and to expose the fiberglass. The fibers of fiberglass provide substantially fuzzy surface characteristics on the outer surface of the sleeve. An elastomeric sleeve is molded around the outer surface of the rigid sleeve. Fibers of the fiberglass extend into the elastomeric sleeve and define a zone having an elasticity modulus which is between that of the rigid sleeve and the elastomeric sleeve. The roller is formed by coating fiberglass filaments with resin and winding them upon a rotating mandrel. When a desired thickness of resin coated filaments are on the mandrel, the filaments are cut and the assembly is heated to partially cure the resin while the mandrel is rotated. Following the final curing of the rigid sleeve, it is placed in a lathe where its outer surface is machined to remove free visible resin on its exterior surface and to expose the fiberglass fibers. The exterior of the rigid sleeve is then coated with a bonding agent and an elastomeric sleeve is bonded to its exterior surface.

3,733,234

## METHOD FOR FORMING AN AIRLAID WEB

Charles E. Dunning, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of abandoned application Ser. No. 882,257, Dec. 4, 1969, which is a continuation-in-part of application Ser. No. 783,877, Dec. 16, 1968. This application May 20, 1971, Ser. No. 145,451

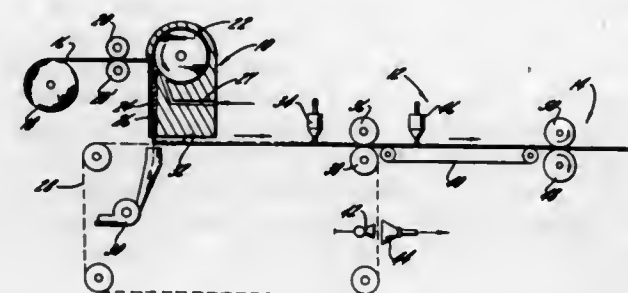
Int. Cl. B31f 1/36

U.S. Cl. 156-209

9 Claims

A method for forming lightweight cellulosic webs useful for tissue and toweling applications comprises air laying a continuum of wood fibers on a foraminous carrier, moisturizing the wood fiber continuum and bonding the continuum with a pair of rolls, at least one having a series of land areas thereon, the rolls forming a nip through

which the continuum is passed and adapted to compress or automatically. The printer is mounted for bodily movement to facilitate manual operation whether the continuum into a pattern of thin, localized bonded



fiber zones with zones of substantially unbonded fibers therebetween.

3,733,235

## FABRICATION OF LAMINATED STRUCTURAL PANELS

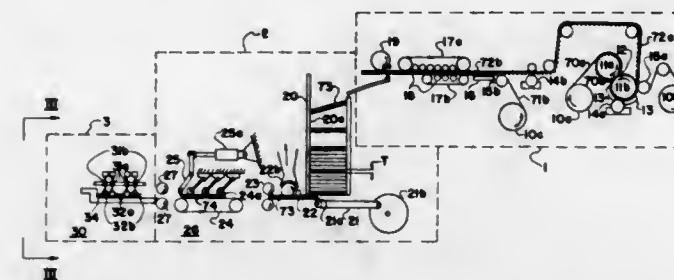
John De Light and Clifford D. Shelor, Covington, Va., assignors to Westvaco Corporation, New York, N.Y.

Filed July 22, 1971, Ser. No. 165,017

Int. Cl. B32b 31/00

U.S. Cl. 156-260

19 Claims



Method and apparatus for fabricating high strength to weight ratio structural panels from sheet stock such as corrugated paper board having a major strength plane and direction by slicing strips of said sheet stock along a cutting plane transverse of said major strength plane and direction, applying adhesive to one face of said strips conveying said strips in edge-to-edge alignment to a collimating device, re-aligning said strips in face-to-face contact with each other and with planar parallel alignment of strip edges and applying adhesive setting pressure between adjacent faces.

3,733,236

## REVERSIBLE MANUAL AND AUTOMATIC LABELING MACHINE

John T. Young, Lake Bluff, Ill., and Charles E. Michels, Racine, and Thomas C. Zimmerman and Gilbert M. Hagemann, Franksville, Wis., assignors to Reliance Electric Company, Toledo, Ohio

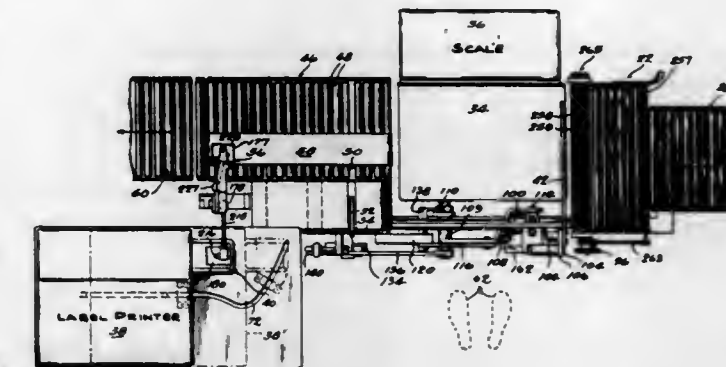
Continuation of abandoned application Ser. No. 732,750, May 28, 1968. This application July 22, 1970, Ser. No. 64,041

Int. Cl. B65g 47/26, 69/00; G01g 13/00

U.S. Cl. 156-360

4 Claims

Between input and output conveyors is an opening in which a computer scale may be reversed to face toward either side of the machine, parts required for propelling the workpiece across the scale table being interchangeable from one side to the other. Regardless of scale position, mechanism associated with the output conveyor rectifies successive workpieces on the conveyor rather than the scale platform to align them with the labeler for automatic operation irrespective of the side toward which the scale faces. The label printer remains at one side of the output conveyor and is operable either manually



operator stands at one side or the other side of the machine.

3,733,237

## APPARATUS FOR MAKING HERMETICALLY SEALED GLAZING UNITS

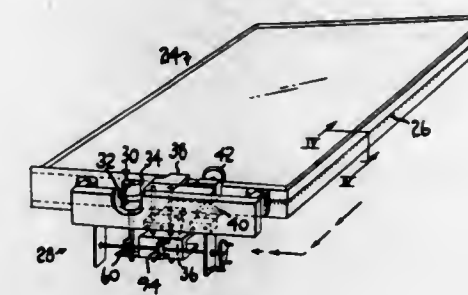
Bernhard B. Wolff, Tarentum, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Original application Aug. 19, 1970, Ser. No. 65,126, now abandoned. Divided and this application Oct. 20, 1971, Ser. No. 190,858

Int. Cl. B31f 1/00; C03c 27/00; E06b 3/24

U.S. Cl. 156-468

7 Claims



Disclosed is an improved multiple glazed window unit and an improved method and apparatus for fabricating hermetically sealed glazing units comprised of a pair of spaced glass sheets separated at their marginal edges by a flexible spacer and surrounded about the perimeter by a deformable sealant covered with a flexible or non-rigid tape. In accordance with use of the preferred process and apparatus of this invention, the portions of the flexible cover tape and sealant overlying the spacer are longitudinally recessed or indented relative to lateral portions of the tape and sealant overlying the glass sheet edges.

3,733,238

## APPARATUS FOR VIBRATION WELDING OF SHEET MATERIALS

Delmar D. Long, Southbridge, and Edgar C. Rust, Jr., Williamstown, Mass., and Stanley L. Lawrence, Stamford, Vt., assignors to Crompton & Knowles Corporation, Worcester, Mass.

Filed Dec. 13, 1971, Ser. No. 207,322

Int. Cl. B06b 3/00; B23k 1/06

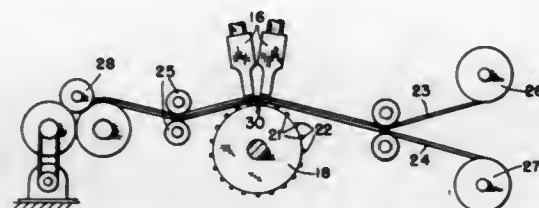
U.S. Cl. 156-580

7 Claims

Ultrasonic apparatus for welding thermoplastic sheet-like elements wherein a plurality of spaced ultrasonic vibration transmitting members having working surfaces in contact with one side of the sheet-like elements. The working surfaces cooperate with opposing spaced anvil surfaces located on the opposite side of the sheet-like elements for producing welds in the material there-



between. Means are provided to advance the sheet-like elements between the members and the anvil surfaces,



said members being arranged so that every point across the width of one of the sheet-like elements comes into contact with at least one of said working surfaces.

3,733,239

**GLASS-ORGANIC FIBER SCRIM FOR FLOORING**  
Jay R. George, Manheim, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.  
Filed Nov. 19, 1971, Ser. No. 200,561  
Int. Cl. D03d 13/00; 15/00; B32b 3/26  
U.S. Cl. 161—89 1 Claim

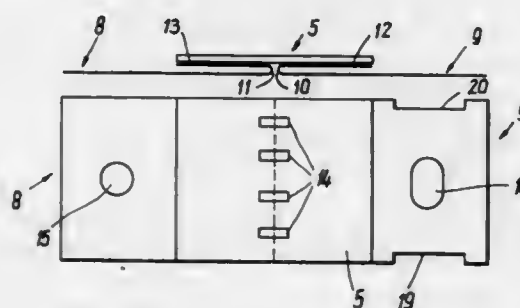


A glass scrim is often placed as the middle layer of a laminated hard surface flooring structure. The scrim is normally in a plain open weave. Herein the strands of glass fiber are alternated with strands of an organic thermoplastic material so that certain glass fiber strands are not placed in an overlying relationship in a certain direction of the weave.

3,733,240

# ADHESIVE SPLICING ELEMENT AND METHOD OF SPLICING

Rudolf Hanke, Monheim, Schwaben, Germany, assignor to Hama Hamaphot, K.G., Hanke & Thomas, Monheim, Schwaben, Germany  
Filed Apr. 12, 1971, Ser. No. 133,263  
Claims priority, application Germany, May 19, 1970, P 20 24 303.2  
Int. Cl. B32b 3/10; G03d 15/04  
U.S. Cl. 161—102 3 Claims



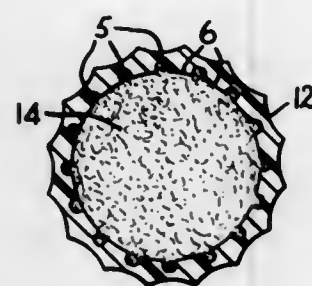
An adhesive splicing element for use in splicing together the ends of two strips (such as tape-recorder tapes)

comprises a substantially rectangular pliable tab adhesive coated on one side and having perforations in a row along its centre line; folded strippable handling strips overlie the adhesive layer each to cover a respective half thereof with their folds abutting or confronting one another along the said centre line, each such handling strip being divided, by its fold, into an adherent panel contacting the adhesive and a handling panel extending outwards of the tab from the centre line and overhanging the respective edge of the tab. Such a splicing element lends itself readily to being handled mechanically, the tab being capable of being peeled from the handling strips and applied to the strips to be joined, by means of an applicator.

3,733,241

# EXTRUDING TOW FILLED MOUTHPIECE ROD HAVING SERRATED INNER SURFACES CLENCHING THE TOW

George L. Mathe, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.  
Original application Jan. 3, 1969, Ser. No. 788,903, now Patent No. 3,607,512. Divided and this application Mar. 24, 1971, Ser. No. 127,799  
Int. Cl. B32b 5/00  
U.S. Cl. 161—116 2 Claims



A method with which a continuous length, tubular article filled with a tow of a fibrous material and having serrated or grooved inner surfaces clenching the tow is disclosed. The article is formed by extruding thermoplastic material as a tubular sheath having a smooth inner surface at extrusion around an advancing tow of fibers, the serrations or grooves being formed by spraying a cooling fluid against the inner wall surface of the plastic sheath at circularly spaced locations therein as it leaves the extrusion aperture. The cooling fluid functions to chill and set the inner wall surface sufficiently so that when the tubular sheath is thereafter pulled down from an initial to a final size, the sheath will pull down to a lesser extent at said spaced locations than at the still more plastic surfaces intervening said spaced locations thereby forming longitudinal grooves in the sheath inner wall surface.

3,733,242

# DECORATIVE LAMINATE COATED ON ITS BACKMOST SURFACE WITH A CARBOXYLATED STYRENE-BUTADIENE POLYMERIC RUBBER BASED ADHESIVE AND PROCESS FOR INSTALLING THE SAME

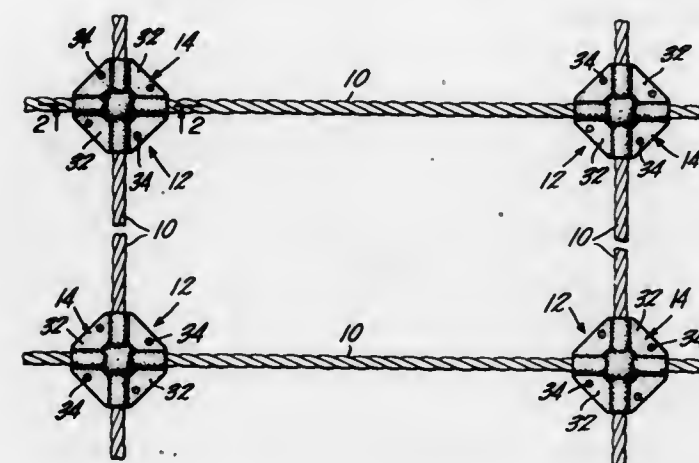
Walter Thomas Davis, Cincinnati, Ohio, assignor to Formica Corporation, Cincinnati, Ohio  
No Drawing. Filed Sept. 7, 1971, Ser. No. 178,495  
Int. Cl. B32b 3/26; E04b 2/00  
U.S. Cl. 161—160 10 Claims

A process which bonds a decorative laminate to a substrate comprising coating the backmost flat surface of the laminate with certain quantities of a carboxylated styrene-butadiene polymeric rubber, drying the adhesive, reactivating the adhesive and installing the laminate by pressing against the substrate to which the laminate is to be attached.

3,733,243

NET

James H. Crawford, Anniston, Ala., assignor to Indian Head, Inc., New York, N.Y.  
Filed Nov. 24, 1971, Ser. No. 201,713  
Int. Cl. B32b 3/06  
U.S. Cl. 161—48 14 Claims

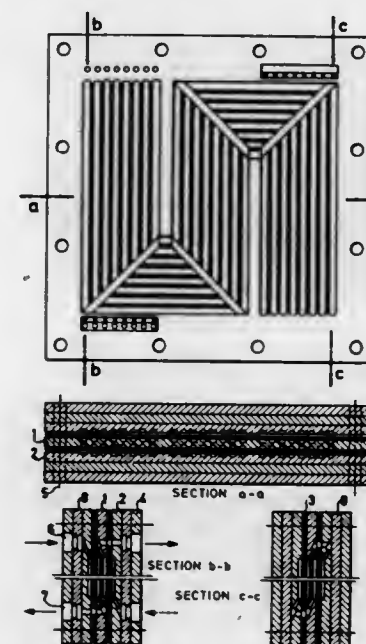


A net comprising mutually crossing lines interconnected at the intersections to form meshes by two-piece thermoplastic connectors, the parts of which are ultrasonically fused together in situ. The two parts of each connector have grooves and recesses that match to define holes that receive and capture segments of the lines adjacent the intersections and a cavity that receives and captures the segments of the lines at the crossing points.

3,733,244

# PLATE HEAT EXCHANGER FROM POLYTETRAFLUOROETHYLENE

Ludwig Sanberger and Gottfried Burgstaller, Burgkirchen (Alz), Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany  
Filed Feb. 16, 1971, Ser. No. 115,493  
Claims priority, application Germany, Feb. 17, 1970, P 20 07 033.1  
Int. Cl. F28f 3/00  
U.S. Cl. 161—166 6 Claims

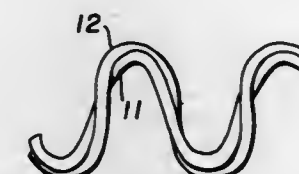


A plate heat exchanger which consists of plates and separating sheets made from polytetrafluoroethylene, the plates being provided with channels on one or both sides. The channels of adjacent plates are separated by sheets made from polytetrafluoroethylene.

3,733,245

# COMPOSITE TEXTILE FIBERS HAVING NON-WATER REVERSIBLE CRIMP

Thomas M. Veazey, Decatur, Ala., and Wayne R. Eberhardt, Manchester, Mo., assignors to Monsanto Company, St. Louis, Mo.  
Continuation-in-part of application Ser. No. 796,064, Feb. 3, 1969, which is a continuation-in-part of application Ser. No. 314,781, Oct. 8, 1963. This application Nov. 21, 1969, Ser. No. 882,750  
Int. Cl. D01d 5/28; D02g 1/00  
U.S. Cl. 161—173 6 Claims

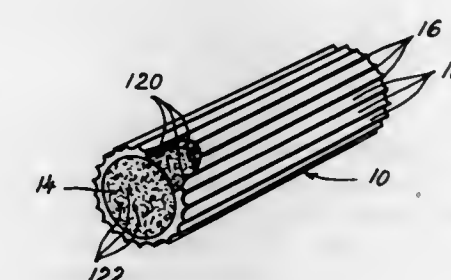


A composite acrylonitrile filament having non-water reversible crimp, stability of the crimp being achieved by controlling the ionizable groups in each component of the filament. The filament is also useful as a stuffing material.

3,733,246

# FORMING FILLED CONTINUOUS PLASTIC ROD SUCH AS PLASTIC CIGARETTE FILTER ROD FILLED WITH A TOW OF CELLULOSE ACETATE

Richard N. Thomson, Jerome S. Osmalov, and George L. Mathe, Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.  
Original application July 24, 1968, Ser. No. 747,279. Divided and this application July 23, 1970, Ser. No. 63,996  
Int. Cl. A24c 5/50; B01d 27/00  
U.S. Cl. 161—176 1 Claim



A method with which a continuous length, tubular article filled with a gas or liquid pervious filler material such as a tow filled plastic cigarette filter rod is formed by extruding plastic as a sheath around an advancing bloomed tow of fibrous filter material, heat from the plastic extrudate being utilized in the course of the forming operations to accelerate curing of a plasticizer impregnating the tow. A crosshead type extrusion die is utilized for the forming operation and is provided with a central tube extending longitudinally therein for receiving the advancing tow and isolating it from the molten plastic with which the extrudate is formed, the latter entering the die laterally and issuing from the mouth thereof as a continuous tubular sheath which makes first contact with the tow at a distance downstream of the die mouth. The extrudate on leaving the crosshead die is then sized by passing it through a cooling chamber wherein the external dimension of the plastic sheath is accurately controlled within predetermined limits.



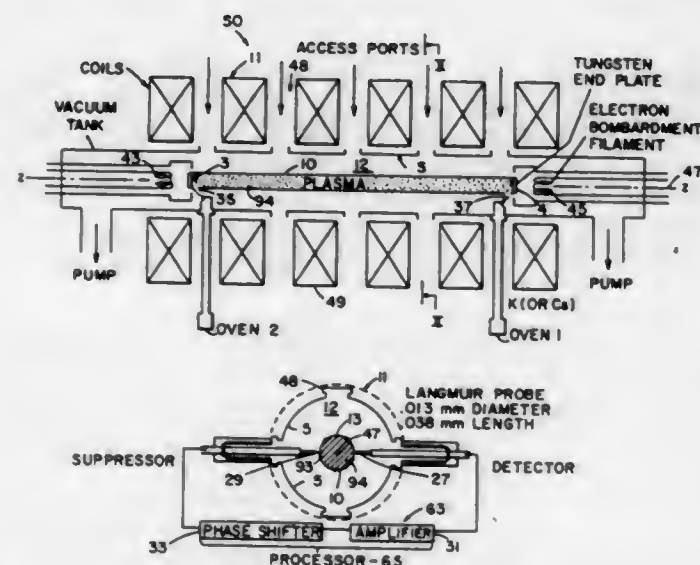
### 3,733,247 BLEACHING OF CELLULOSE FIBERS WITH AN AQUEOUS SOLUTION OF A WATER-SOLUBLE HYDROPEROXYPENTACYANOCOBALTATE SALT

John Allan Fetchin, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.  
No Drawing. Filed Nov. 18, 1971, Ser. No. 200,163  
Int. Cl. D21c 9/16

U.S. Cl. 162-78 10 Claims  
Cellulose fibers are bleached by contact with an aqueous solution of a water-soluble hydroperoxypentacyanocobaltate salt. The spent cobaltate salt is regenerated and recycled.

3,733,248  
**PLASMA CONTROL BY FEEDBACK**  
Hans W. Hendel, Princeton, N.J., Francis F. Chen, Los Angeles, Calif., and Tzu-Kai Chu, Harold P. Furth, Francis W. Perkins, Thomas C. Simonen, and John B. Taylor, Princeton, N.J., assignors to the United States of America as represented by the United States Atomic Energy Commission  
Continuation of abandoned application Ser. No. 12,309, Feb. 18, 1970. This application Feb. 15, 1972, Ser. No. 226,556  
Int. Cl. G21b 1/00

U.S. Cl. 176-3 9 Claims

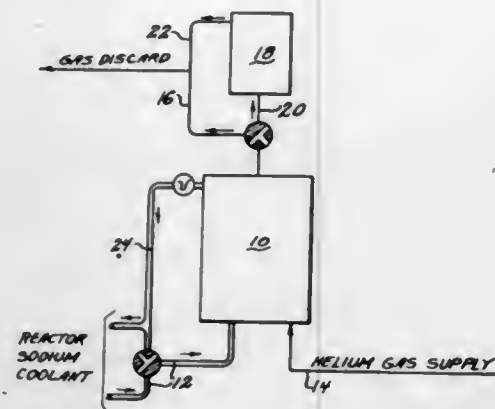


Method and apparatus for controlling instabilities in a magnetically confined plasma by applying feedback to the particle density, momentum, energy, and/or potential of the plasma, for maximizing the density of the same and/or for providing means for confining the plasma for long periods of time and/or at high temperatures. More particularly, this invention contemplates feedback control of the plasma by selectively injecting particles, momentum or energy into the plasma. In another aspect, this invention contemplates feedback control of the magnetic confining field.

3,733,249  
**METHOD FOR DETECTING AND MONITORING A FUEL ELEMENT FAILURE IN A NUCLEAR REACTOR**  
William E. Miller, Naperville, and William J. Mechem, Hickory Hills, Ill., assignors to the United States of America as represented by the United States Atomic Energy Commission  
Filed Nov. 2, 1971, Ser. No. 194,963  
Int. Cl. G21c 17/04

U.S. Cl. 176-19 LD 6 Claims  
A method for detecting a fuel element failure in a liquid-sodium-cooled fast breeder reactor and for monitoring the progression thereof, wherein the failure causes sodium coolant to contact the fuel oxide, which com-

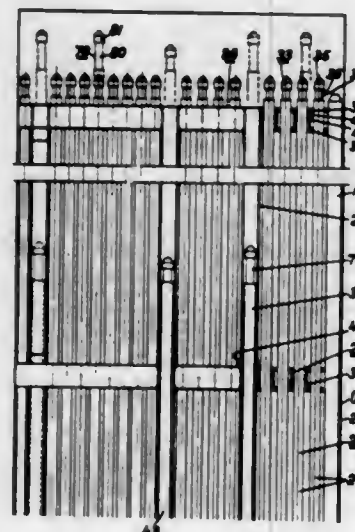
prises determining the level of  $^{135}\text{I}$  activity in the liquid sodium resulting from the failed fuel element by separat-



ing and counting its daughter  $^{135m}\text{Xe}$  utilizing an inert gas sparge.

3,733,250  
**METHOD AND MEANS FOR FUEL EXCHANGE IN A NUCLEAR REACTOR**  
Aart van Santen, Vasteras, and Kjell Eklöfson, Handen, Sweden, assignors to Allmänna Svenska Elektriska Aktiebolaget, Vasteras, Sweden  
Filed Dec. 1, 1969, Ser. No. 881,111  
Claims priority, application Sweden, Dec. 2, 1968, 16,408/68  
Int. Cl. G21c 19/20

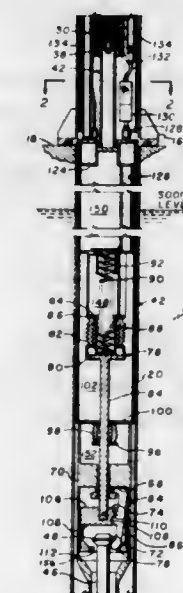
U.S. Cl. 176-30 9 Claims



A nuclear reactor formed of fuel assemblies each including a plurality of parallel fuel rods arranged in a predetermined fuel rod lattice, which rods are freely extractable and insertable at one end of the fuel assembly, is refueled by extracting from one of the fuel assemblies a number of fuel rods substantially less than the total number of fuel rods and replacing these by inserting new fuel rods into the vacated positions. This is done for a majority of fuel assemblies of the reactor. At the next refueling operation different fuel rods from those previously replaced are removed and replaced. The removal and return of the rods is produced by a tool having a plurality of gripping members capable of engaging shoulders beneath heads formed on the upper ends of the fuel rods. This may be accomplished by providing a tool having a

number of gripping members attached to the tool body corresponding to the lattice positions of the fuel rods to be extracted, having gripping members which can be pushed together to grip beneath shoulders on the upper ends of the fuel rods.

3,733,251  
**CONTROL ROD RELEASE MECHANISM**  
Jon C. Gilbertson, Hartford, and Raymond A. Gorsky, Bolton, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.  
Filed June 22, 1971, Ser. No. 155,461  
Int. Cl. G21c 7/08  
U.S. Cl. 176-36 R 25 Claims



A control rod release mechanism utilizing a pneumatically actuated mechanical gripper device located immediately above the reactor core region and remotely connected to the control rod drive mechanism. The pneumatic system includes a pressure source which exerts a force on a gripper actuating member in a direction to initiate positive gripping action of a control rod extension shaft by the gripper device. The actuating member is spring biased towards a positive grip release initiating position so that release of the pressure of the pneumatic system will always serve to disconnect the control rod extension shaft from the gripper device.

3,733,252  
**NUCLEAR FUEL ASSEMBLY**  
Nicholas J. Georges, Pittsburgh, and William E. Pennell, Irwin, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.  
Filed Nov. 26, 1968, Ser. No. 779,054  
Int. Cl. G21c 3/34

U.S. Cl. 176-78 8 Claims

A fuel assembly for nuclear reactors wherein grid members having openings in which a plurality of fuel rods are laterally supported are structurally integrated by temperature compensated longitudinal members of an elongated framing means so as to minimize thermal bowing of the fuel rods. In one embodiment, the longitudinal members of the elongated framing means comprises a number of insulated tubes, each provided with an internal coolant flow channel and joined proximate their ends by the grid members. The grid members on each end are in turn joined by a shear resisting web structure to form a shear-grid such that a transverse temperature gradient produces end moments on the fuel assembly which balance each other. In another embodiment, the insulated tubes are replaced by struts constructed of several materials of selected lengths and thermal expansion properties

so joined that the expansion of the various materials produces no overall elongation of the strut between selected points. In still another embodiment, the shear-grid structures are formed as and connected by a temperature compensated enclosure to form a "canned" fuel assembly



having essentially zero expansion between a plurality of lateral planes at which the grids may be located. Optionally, groups of fuel rods may be joined by shear webs so as to produce an integral structure which may be inserted in the grid openings and thereby produce increased stability due to an increased moment of inertia.

3,733,253  
**METHOD OF PRODUCING CITRIC ACID**  
Takashi Suzuki and Yasuhiro Sumino, Hyogo, Shunichi Akiyama, Kyoto, and Hideo Fukuda, Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan  
No Drawing. Filed July 15, 1970, Ser. No. 55,229  
Claims priority, application Japan, July 15, 1969, 44/56,272  
Int. Cl. C12d 1/04

U.S. Cl. 195-30 7 Claims

Citric acid is produced by a process which comprises contacting (+)-isocitric acid with a fermentation broth of a yeast capable of accumulating (+)-isocitric acid belonging to the genus *Saccharomyces*, *Candida*, *Brettanomyces*, *Debaryomyces*, *Hansenula*, *Kloeckera*, *Trichosporon*, *Torulopsis* or *Pichia*, the cells of said yeast, or a processed matter derived from the broth or the yeast cells, at pH 7.0 to 9.5, thereby converting (+)-isocitric acid to citric acid and subsequently recovering the citric acid so accumulated.

3,733,254  
**METHOD OF PREPARING d-13 $\beta$ -ETHYLGONA-1,3,5(10)-TRIENE-2,16 $\alpha$ ,17 $\beta$ -TRIOL**  
George C. Buzby, Jr., Philadelphia, and George Greenspan, Narberth, Pa., assignors to American Home Products Corporation, New York, N.Y.  
No Drawing. Filed Feb. 22, 1971, Ser. No. 117,783  
Int. Cl. C07c 167/00

U.S. Cl. 195-51 C 1 Claim  
The preparation of d-13 $\beta$ -ethylgona-1,3,5(10)-triene-3,16 $\alpha$ ,17 $\beta$ -triol by contacting d-13 $\beta$ -ethylgona-1,3,5(10)-triene-3,17 $\beta$ -diol with *Bacillus megaterium* under aerobic fermentation conditions is reported. This compound is useful as an impeded estrogen in treating infertility due to anovulation.



3,733,255

**CONVERSION OF MUNICIPAL REFUSE, SEWAGE SLUDGE AND OTHER WASTES TO HEAVY OIL OR BITUMEN**

Herbert R. Appell, Monroeville, Pa., and John S. Tosh, Alexandria, Va., assignors to the United States of America as represented by the Secretary of Interior  
No Drawing. Filed Oct. 30, 1970, Ser. No. 85,704  
Int. Cl. C10b 57/00

U.S. Cl. 201-25

7 Claims

Municipal sewage sludge, refuse and other wastes are converted to heavy oil or bitumen by heating under pressure, in the absence of air, in the presence of carbon monoxide and water.

3,733,256

**PROCESS FOR EXTRACTING SILVER FROM SILVER BEARING MATERIALS**

Ralph Anderson, Saratoga, Calif., assignor to Future Systems, Inc., Los Gatos, Calif.  
No Drawing. Filed Oct. 12, 1970, Ser. No. 80,213  
Int. Cl. C22d 1/12, 11/06

U.S. Cl. 204-109

5 Claims

A process for extracting and recovering silver from the gelatin layer of photographic or other solid base materials including the steps of treating the material with an aqueous solution of oxidizing salt to oxidize the metallic silver in the gelatin layer of the material; washing the material with a complexing agent; solution to form silver thiosulfate ions and recovering the silver from the complexing agent solution.

3,733,257

**RADIATION INITIATED PROCESS FOR THE GRAFT COPOLYMERIZATION OF BINARY MONOMER MIXTURES AND CELLULOSE**

Jett C. Arthur, Jr., Metairie, and James A. Harris, Pearl River, La., assignors to the United States of America as represented by the Secretary of Agriculture  
No Drawing. Filed Nov. 19, 1971, Ser. No. 200,618  
Int. Cl. B01j 1/10, 1/12; C08d 9/06

U.S. Cl. 204-159.12

9 Claims

Industrial textiles and rigid construction cellulose-copolymer products are produced by processes of this disclosure. The fibrous cellulosic material is dried in the absence of oxygen to a moisture content of about 2%, irradiated with a radioactive source, then reacted with one of several binary monomer mixtures which are in certain preferred solvent mixtures and washed.

3,733,258

**SPUTTER-ETCHING TECHNIQUE FOR RECORDING HOLOGRAMS OR OTHER FINE-DETAIL RELIEF PATTERNS IN HARD DURABLE MATERIALS**

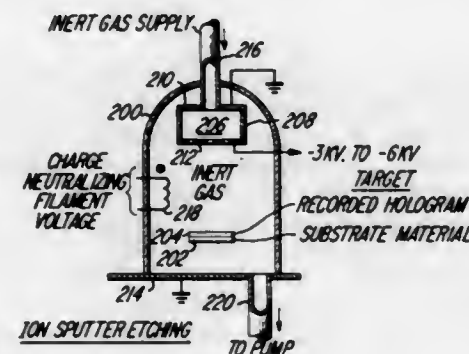
Joseph John Hanak, Trenton, N.J., and John Patrick Russell, Thalwil, Switzerland, assignors to RCA corporation, New York, N.Y.

Filed Feb. 3, 1971, Ser. No. 112,273

Int. Cl. C23c 15/00

U.S. Cl. 204-192

10 Claims



Sputter etching has been found to be capable of transferring holograms recorded on a photosensitive surface

layer covering an underlying substrate material from the layer to the substrate material itself. The transferred hologram is in the form of a relief pattern. This technique provides both high fidelity and high resolution capabilities in both the depth dimension and in the surface dimensions of the transferred relief-pattern hologram, which are in the order of one micron or less, and is applicable to other fine-detail relief patterns.

3,733,259

**TREATMENT OF HEAVY PETROLEUM OILS**

Raymond F. Wilson, Edward L. Cole, and Reese A. Peck, Fishkill, N.Y., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed Nov. 10, 1971, Ser. No. 197,364

Int. Cl. C10g 31/08

U.S. Cl. 208-86

10 Claims

Asphaltenes and metals are removed from heavy petroleum oils by dispersing the oil in steam at a temperature of at least 750° F. then cooling to form a stable water-asphaltene emulsion. After separation from the emulsion, the treated oil may be used as a fuel or subjected to hydroconversion.

3,733,260

**HYDRODESULFURIZATION PROCESS**

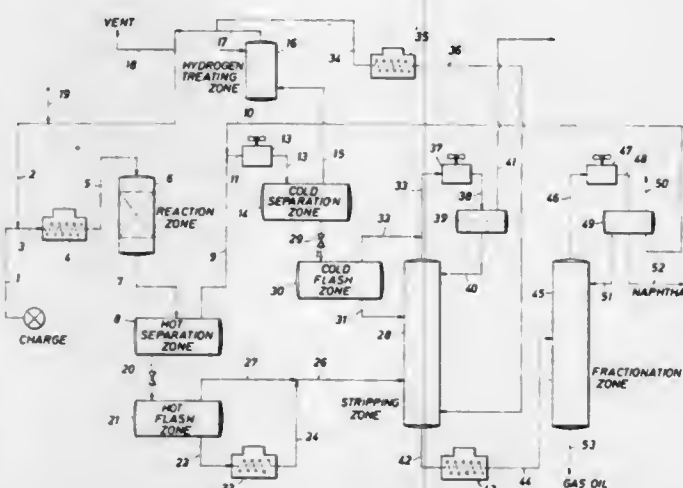
James A. Davies and Dale Williams, Houston, and Thomas L. Hill, Stafford, Tex., assignors to Texaco, Inc., New York, N.Y.

Filed Feb. 4, 1972, Ser. No. 223,549

Int. Cl. C10g 23/00

U.S. Cl. 208-212

3 Claims



A hydrodesulfurization process for treating a sulfur containing gas-oil hydrocarbon charge to yield a low-sulfur gas-oil product and a naphtha product wherein effluent from a hydrodesulfurization process comprising gas-oil, naphtha, hydrogen and hydrogen sulfide is separated into a liquid fraction and a vapor fraction, wherein the vapor fraction is treated to yield a treated hydrogen stream substantially free of hydrogen sulfide, wherein recycle, naphtha is combined with the liquid fraction to form a mixture having a bubble point temperature below about 650° F. at a pressure of about 130 p.s.i.g., wherein the liquid mixture is stripped in a stripping zone to remove hydrogen sulfide employing treated hydrogen as stripping vapor at a pressure of about 100-130 p.s.i.g. at the bubble point temperature of the liquid mixture, wherein stripped liquid substantially free of hydrogen sulfide is fractionated into a naphtha fraction and a gas-oil fraction, and wherein a portion of the naphtha fraction is recycled for mixture with additional liquid fraction from the hydrodesulfurization reaction.

3,733,261

**PROCESS FOR SEPARATING OLEFINS FROM SATURATED HYDROCARBONS**

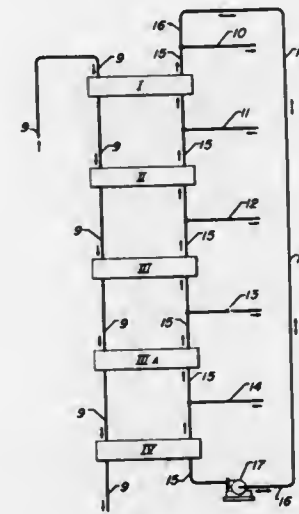
Frank H. Adams, La Grange Park, and Joe M. Pharis, Lockport, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of application Ser. No. 100,105, Dec. 21, 1970. This application Apr. 10, 1972, Ser. No. 242,456

Int. Cl. C07c 7/12

U.S. Cl. 208-310

7 Claims



An improved process for separating olefinic hydrocarbons in high purity from a feed stream containing a mixture of olefinic and paraffinic type hydrocarbons along with contaminants including aromatic and non-normal type hydrocarbons. The general process operations include a contacting operation wherein an olefinic hydrocarbon is preferentially adsorbed by a selective adsorbent in an adsorption zone and subsequently contacted with a desorbent material in a desorption zone to effect the removal of preferentially adsorbed olefins from the adsorbent. The improvement resides in effecting the removal of product olefins from the adsorbent prior to contacting the adsorbent in the desorption zone with an increased concentration of desorbent to effect a second desorption of the more tenaciously held contaminant hydrocarbons. The improvement allows the process to rid the adsorbent of contaminants (aromatic and non-normal hydrocarbons) present on the adsorbent when attempting to separate olefinic hydrocarbons. This results in increased adsorbent capacity for olefinic hydrocarbons and improved olefinic extract purity relative to contaminants.

3,733,262

**AROMATICS EXTRACTION PROCESS**

Michael R. Basila, Munster, Ind., and Alfred R. Pate, Jr., Tyler, Tex., assignors to Howe-Baker Engineers, Inc., Tyler, Tex.

No Drawing. Continuation-in-part of application Ser. No. 752,740, Aug. 15, 1968, now Patent No. 3,583,906.

This application Feb. 16, 1971, Ser. No. 115,864

The portion of the term of the patent subsequent to June 8, 1988, has been disclaimed

Int. Cl. C10g 21/16

U.S. Cl. 208-331

10 Claims

Aromatics are extracted from aromatics-containing hydrocarbon mixtures by contacting said mixtures with a solvent comprising 2-(2-aminoethoxy) ethanol containing water in amounts from about 0.7-10 percent, by volume.

3,733,263

**WASTE TREATMENT SYSTEM**

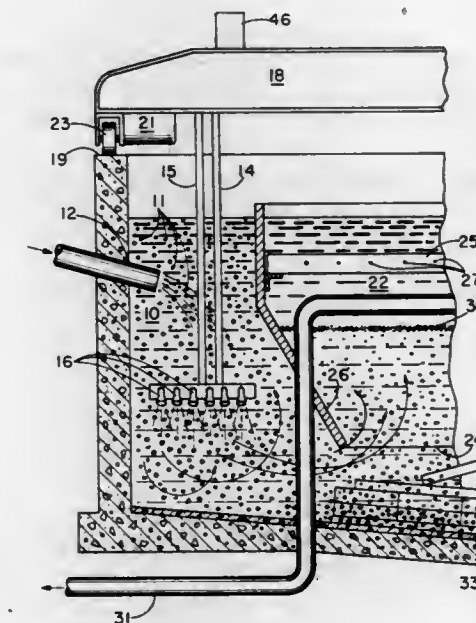
Mikkel G. Mandt, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 1, 1971, Ser. No. 119,463

Int. Cl. C02c 1/06

U.S. Cl. 210-7

10 Claims



Compact waste treatment unit utilizing annular flow, positive mixing aeration with inclusive sludge blanket clarification and internal sludge recycle.

3,733,264

**ACTIVATED SLUDGE SEWAGE TREATMENT PROCESS AND SYSTEM**

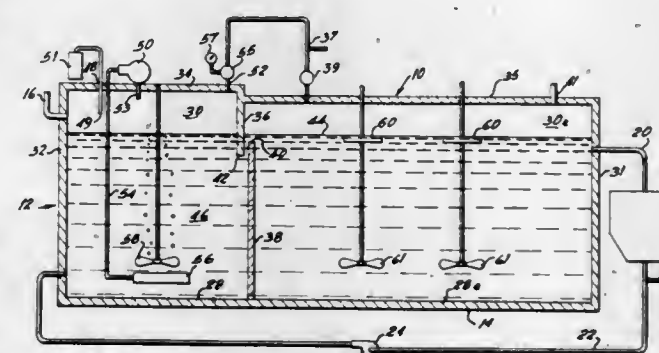
Marshall L. Spector, Belle Mead, N.J., and Robert D. Jones, Allentown, and Curtis S. McDowell, Macungie, Pa., assignors to Air Products & Chemicals, Inc., Allentown, Pa.

Filed Mar. 18, 1971, Ser. No. 125,603

Int. Cl. C02c 1/10

U.S. Cl. 210-7

4 Claims



An activated sludge sewage treatment process and system which includes an initial enclosed aeration chamber providing a vessel for a mixed liquor formed from a liquid biologically degradable waste and recirculated sludge where the liquor is aerated in an oxygen enriched environment and a subsequent aeration chamber where



the liquor, after being treated in the initial chamber, is aerated in the subsequent chamber in the presence of atmospheric air or a gas which has a slightly higher percentage of oxygen enrichment than atmospheric air. The system is designed so that between 15 to 95% of the oxygen utilized by the mixed liquor, to effect biological degradation, is utilized by the liquor in the initial chamber and the remainder of the oxygen utilized by the liquor for biological degradation is utilized in the liquor when the liquor is in the subsequent aeration chamber.

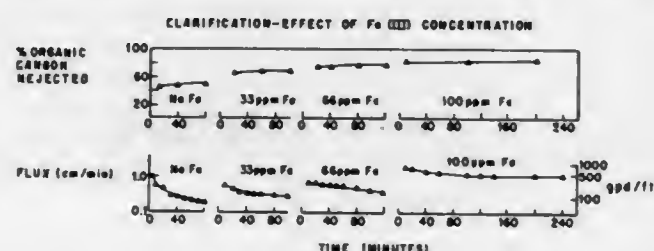
**3,733,265**  
**CROSS-FLOW FILTRATION PROCESS FOR REMOVAL OF TOTAL ORGANIC CARBON AND PHOSPHATES FROM AQUEOUS SEWAGE EFFLUENTS**

Kurt A. Kraus, Oak Ridge, and Harvey A. Mahlman, Knoxville, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 22, 1971, Ser. No. 200,840  
Int. Cl. C02c 5/06

U.S. Cl. 210-23

7 Claims



An improved method is provided for removing the organic and phosphate content of an aqueous feed which comprises adding an effective amount of a salt which hydrolyzes to a hydrous oxide to said feed and then passing the thus-treated feed tangentially past one face of a porous substrate at a pressure sufficient to produce a clarified filtrate on an opposite face of said substrate.

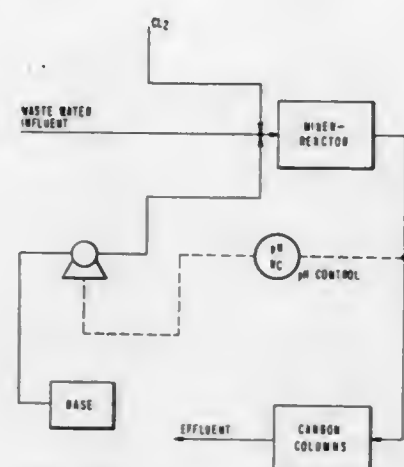
**3,733,266**  
**WASTE WATER PURIFICATION BY BREAKPOINT CHLORINATION AND CARBON ADSORPTION**

Doloff F. Bishop, Camp Springs, Md., and Alan F. Cassel and Thomas A. Pressley, Springfield, Va., assignors to the United States of America as represented by the Administrator of the Environmental Protection Agency

Filed Sept. 7, 1971, Ser. No. 178,310  
Int. Cl. C02b 1/36; C02c 5/02

U.S. Cl. 210-26

7 Claims



Sodium hypochlorite or chlorine is used to oxidize the ammonia in raw, secondary and lime clarified municipal wastewaters using breakpoint chlorination. Carbon adsorption columns are located downstream from the break-

point chlorinator. In wastewater, the breakpoint requires a minimum chlorine dose of approximately an 8:1 weight ratio of Cl:NH<sub>3</sub>-N in lime clarified secondary effluent. A slight chlorine excess is used which is adsorbed by the carbon thereby inhibiting slime buildup.

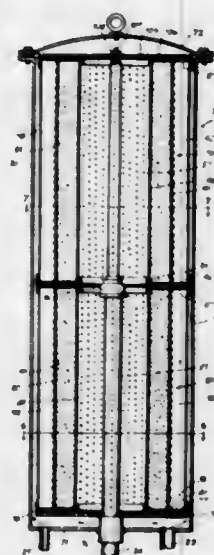
**3,733,267**  
**PROCESS OF FILTRATION OF DRY CLEANING FLUID**

Gordon W. Haase, Madison, Wis., assignor to Frederick Tausig, St. Louis, Mo.

Filed Apr. 17, 1970, Ser. No. 29,558  
Int. Cl. B01d 15/00

U.S. Cl. 210-27

4 Claims



A method and apparatus, particularly adapted to filtering liquid, consisting of, preferably, a deep-walled fiber-bag or similar pre-filter, following by a cross flow filter cartridge comprising a primary filter, surrounding a coarse clay or clay-carbon adsorber unit containing heat-treated attapulgite particles of about 6-25 mesh size. A post-filter can filter out microparticles of clay or carbon.

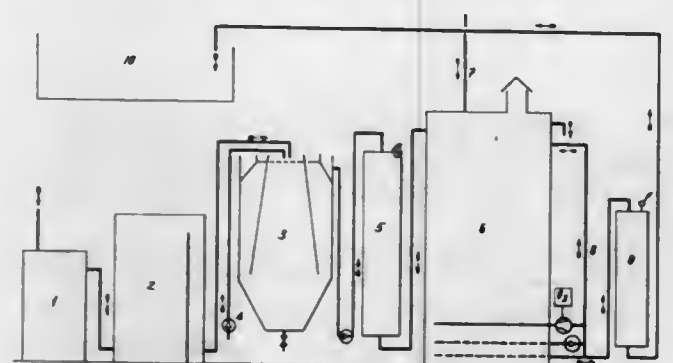
**3,733,268**  
**PROCESS OF TREATING AND PURIFYING SEWAGE, PARTICULARLY OF SEWAGE CONTAMINATED WITH DETERGENTS**

Karl Marschall, 3/7 Zenogasse, A-112 Vienna, Austria

Filed Dec. 8, 1970, Ser. No. 96,246  
Claims priority, application Austria, Dec. 11, 1969, 11,559/69

U.S. Cl. 210-27

1 Claim



A sewage purification process wherein sewage is contacted with ozone and other gases after an optional pre-purification in a recirculation system under substantially atmospheric pressure.

**3,733,269**  
**PROCESS FOR COAGULATING AND AGGLOMERATING PARTICULATE MATERIAL WITHIN A LIQUID MEDIA**

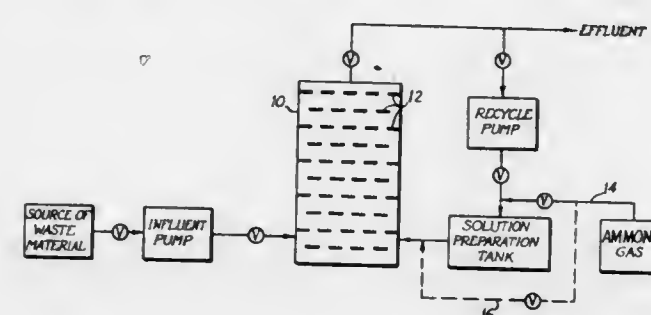
Jan W. Gooch, Russellville, Ark., assignor to Paul Paladino and John H. Haley, Russellville, Ark., fractional part interest to each

Continuation-in-part of application Ser. No. 781,840, Dec. 6, 1968, now Patent No. 3,586,627, which is a continuation-in-part of application Ser. No. 757,224, Aug. 30, 1968, which in turn is a continuation-in-part of application Ser. No. 696,537, Jan. 9, 1968. This application Aug. 31, 1970, Ser. No. 68,399

Int. Cl. B01d 21/01

U.S. Cl. 210-47

10 Claims



A waste extraction process for agglomerating, coagulating and extracting suspended solids and organic waste materials such as found in the waste effluent streams of packing and rendering plants, paper and pulp mills, food processing plants, wood preserving plants, rice processing plants, and similar facilities. In one embodiment of the invention, the process comprises introducing a reagent solution into the waste stream in such a manner that the reagent is released and dispersed within the waste stream in the form of a microscopically gaseous phase which is adsorbed on the surfaces of the suspended solids and organic waste materials to react with the surfaces of the solids and materials and produce surface characteristics which induce agglomeration and coagulation of the solids and materials.

**3,733,270**  
**METHODS OF SCALE INHIBITION**

Al F. Kerst, Littleton, Colo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 27,984, Apr. 13, 1970. This application Mar. 8, 1971, Ser. No. 122,124

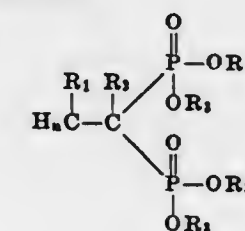
The portion of the term of the patent subsequent to Nov. 2, 1988, has been disclaimed

Int. Cl. C02b 5/06

U.S. Cl. 210-58

3 Claims

The precipitation of scale-forming salts in an aqueous system is inhibited by adding either stoichiometric or sub-stoichiometric amounts to said system of an organo-phosphorus compound which is a substituted ethane di-phosphonic acid or its salt, said organo-phosphorus compound having the formula



wherein R<sub>1</sub> and R<sub>2</sub> are hereinafter defined and R<sub>3</sub> is hydrogen or a metal ion and n is an integer having a value of 1 or 2.

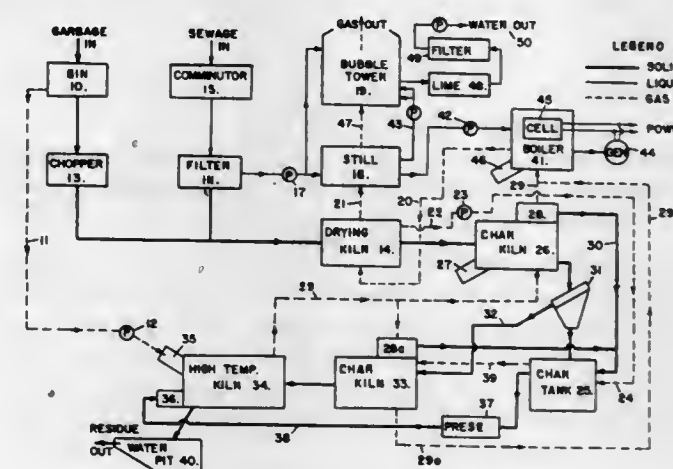
**3,733,271**  
**WASTE DISPOSAL APPARATUS AND METHOD**

Horace W. Olsen, 2038 North Blvd., Houston, Tex. 17006

Filed Jan. 12, 1971, Ser. No. 105,812  
Int. Cl. C02c 3/00

U.S. Cl. 210-63

3 Claims



Solid waste in garbage, trash and sewage is subjected to progressive incineration and reduced to inert residue capable of reclamation. Combustion gases are utilized for generation of steam and electricity, and are freed of sulphur and other atmospheric pollutants. Liquid sewage effluent is made potable by chemical treatment.

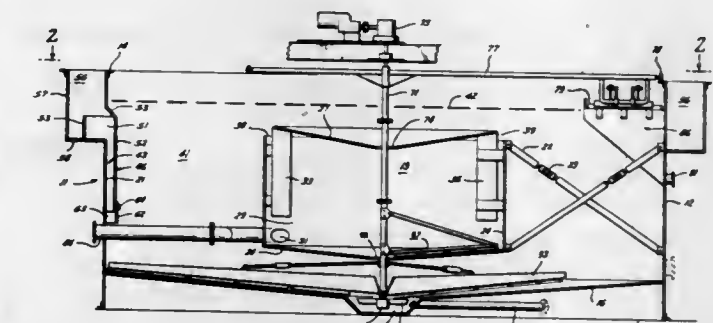
**3,733,272**  
**CIRCULAR FLotation SYSTEM**

William F. Burns, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed July 16, 1971, Ser. No. 163,193  
Int. Cl. B01d 19/00; B03b 1/00

U.S. Cl. 210-221

12 Claims



A flotation system for removing suspended material from a liquid in a circular vessel with a vertical axis. An upright cylindrical inlet chamber resides centrally on the vessel and receives in a mixing zone in its lower portion the liquid containing dissolved flotation gas through a horizontal tangential inlet. Vertical vanes above the mixing zone direct the circulation liquid into a radial and linear flow rising upwardly in the inlet chamber. An inverted conical cover supported by the vanes provides an unbroken annular nozzle to direct liquid flow from the inlet chamber in a path forming an acute angle with the top of the vessel. Circumferential liquid outlets on the vessel remove the clarified liquid adjacent the sidewall at a certain selected horizon. Accumulated floating deposits and settled solids are removed through suitable outlets from the vessel.



### 3,733,273 AZEOTROPIC COMPOSITION OF FLUOROCARBONS

Bradley L. Munro, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.  
No Drawing. Filed Jan. 3, 1972, Ser. No. 215,087  
Int. Cl. C09k 3/06

U.S. Cl. 252—1 5 Claims  
An azeotropic composition is formed by 1,2-dichloro-1,1,2,2-tetrafluoroethane and 1-chloro-1,2,2-trifluoroethane.

### 3,733,274 FLUID LOSS CONTROL AGENT

Mao H. Yueh and Wesley A. Jordan, Minneapolis, Minn., assignors to General Mills, Inc., Minneapolis, Minn.  
No Drawing. Filed Dec. 11, 1970, Ser. No. 97,345  
Int. Cl. C10m 3/08

U.S. Cl. 252—8.5 C 12 Claims  
A fluid loss control agent is disclosed including solubilized nucleoprotein such as from fish milt, or avian blood. The fluid loss control agent may be included in aqueous fluids used in oil and gas wells. Such aqueous fluids include drilling muds, completion fluids and hydraulic fracturing fluids.

### 3,733,275 N-SUBSTITUTED FATTY ACID AMIDE LUBRICANTS

Frank C. Hagne, Robert E. Mod, and Gene Sumrell, New Orleans, La., and Winfred E. Parker, Philadelphia, Pa., assignors to the United States of America as represented by the Secretary of Agriculture  
No Drawing. Filed Dec. 21, 1971, Ser. No. 210,591  
Int. Cl. C10m 1/20, 1/36, 1/38

U.S. Cl. 252—46.3 7 Claims  
This invention relates to N-acylmorpholines and N-mono and N,N-disubstituted fatty acid amides and to similar derivatives of epithioamides which are useful as base and extreme pressure lubricants and additives.

### 3,733,276 FUNCTIONAL FLUIDS HAVING INCREASED FIRE RESISTANCE

Robert S. McCord, Pacific Palisades, Donald H. Nail, Los Angeles, and Martin B. Sheratte, Reseda, Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.  
No Drawing. Filed May 3, 1971, Ser. No. 139,870  
Int. Cl. C09k 3/00

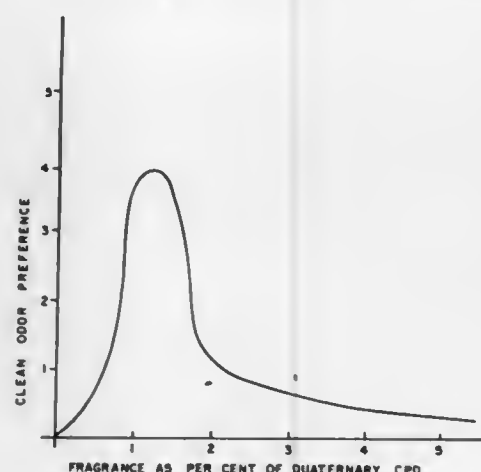
U.S. Cl. 252—78 26 Claims  
Production of functional fluids, particularly aircraft hydraulic fluids, of improved fire resistance, comprising a functional fluid base stock, such as a phosphate ester, e.g., tri-n-butyl phosphate, or mixtures of such base stocks, and a small amount of a selenium or tellurium dialkyl dithiocarbamate, e.g., selenium tetra (diethyl dithiocarbamate) or its tellurium analogue.

### 3,733,277 CLEANING AND SANITIZING CONCENTRATE CONTAINING LEMON-LIME FRAGRANCE

Robert P. Wooden, St. Louis Park, and William G. Page, Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.  
Continuation-in-part of abandoned application Ser. No. 887,529, Dec. 23, 1969. This application Dec. 6, 1971, Ser. No. 205,157  
Int. Cl. C11d 3/04, 3/48, 7/08

U.S. Cl. 252—106 8 Claims  
This invention is based upon the discovery that a subliminal quantity of a lemon-lime fragrance can be employed effectively without degradation in a liquid, low pH, sanitizing and cleaning solution containing quaternary ammonium halides to produce a fresh, clean fragrance sensation without producing an awareness of the specific lemon-lime odor. A cleaning and sanitizing concentrate

is disclosed consisting essentially of (a) phosphoric or hydroxyacetic acid, (b) a nonionic synthetic detergent,



(c) a quaternary ammonium halide, (d) water, and (e) lemon-lime fragrance.

### 3,733,278 DETERGENT SLURRY PROCESS

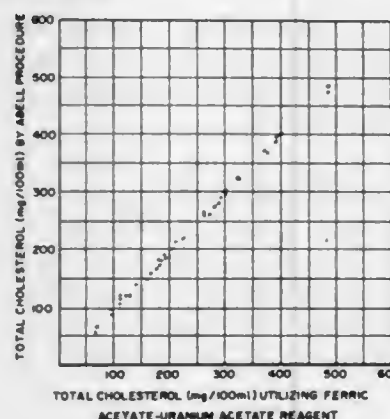
Eric W. Vessey, Springfield, Pa., assignor to Philadelphia Quartz Company, Philadelphia, Pa.  
No Drawing. Filed Mar. 22, 1971, Ser. No. 127,057  
Int. Cl. C11d 3/065, 11/00, 11/02

U.S. Cl. 252—135 4 Claims  
A method has been found for increasing the alkali metal silicate content of spray dried detergents without decreasing the spray dryer production and without changing the solubility characteristics of the detergent. The method involves the preparation of detergent slurries in a crutcher with high alkali metal silicate content by adding alkali metal silicate glass to the slurries in such a manner that it readily dissolves. The glass is added through a jet nozzle with steam pressure. Thus, the amount of water that must be removed by spray drying can be reduced or remain unchanged while the silicate solids of the slurry and subsequently the detergent can be increased substantially.

### 3,733,279 REAGENT FOR THE SOLUBILIZATION OF CHOLESTEROL

Amritlal C. Parekh and David H. Jung, Indianapolis, Ind., assignors to Research Corporation, New York, N.Y.  
Original application Feb. 5, 1970, Ser. No. 8,954, now Patent No. 3,615,232. Divided and this application May 13, 1971, Ser. No. 143,190  
Int. Cl. B01f 1/00, 3/12

U.S. Cl. 252—363.5 3 Claims



A reagent for the solubilization of cholesterol comprising a mixture of ferric acetate and uranium acetate, preferably dissolved in a lower aliphatic carboxylic acid.

### 3,733,280 POLYMERS DERIVED FROM CHLOROMALEIC ANHYDRIDE AS DETERGENT BUILDERS

Paritosh M. Chakrabarti, Hightstown, and Gert P. Volpp, Princeton, N.J., assignors to FMC Corporation, New York, N.Y.  
No Drawing. Filed Nov. 18, 1970, Ser. No. 90,782  
Int. Cl. C11d 3/066, 3/065

U.S. Cl. 252—539 6 Claims  
Detergent compositions are described comprising a detergent surfactant and a water-soluble salt of a polymeric builder of the formula



wherein  $m$  and  $n$  are positive numbers whose sum is less than unity;  $p$  is an integer the lower limit of which is 3 and the upper limit of which is determined by the solubility of the salt in an aqueous system;  $X$  is derived from the monomer monochloromaleic acid;  $Y$  is derived from the monomer maleic acid and  $Z$  is derived from a monoethylenically unsaturated monomer containing 1 to 3 substituents selected from the class consisting of carboxy, lower carboxyalkyl, lower alkyl, lower chloroalkyl, hydroxy, non-gem. dihydroxy, lower aliphatic acyloxy, chloro and lower alkoxy, it being provided that some of the carboxy groups in the polymer can be esterified with a lower aliphatic radical.

### 3,733,281 METHOD OF CLEANING CARPETS AND FABRICS

La Mar E. Durfey, 165 North 3rd West, Provo, Utah, and Wells B. Johnson, North Las Vegas, Nev.; said Johnson assignor to said Durfey  
No Drawing. Continuation-in-part of application Ser. No. 761,804, Sept. 23, 1968. This application Apr. 6, 1971, Ser. No. 131,772  
Int. Cl. C11d 1/18

U.S. Cl. 252—544 2 Claims  
Disclosed is a method of cleaning carpets and fabrics comprising combining at room temperature a fluorocarbon such as, for example, a fluoromethane, with an aqueous medium, then adding to and mixing with said combination a fatty acid such as, for example, lauric or stearic acid, and an amine such as triethanolamine or triethylamine, which forms an amine soap, and immediately thereafter contacting the fabric material with the cleaning composition so prepared.

### 3,733,282 EPOXY RESIN MIXTURES CONTAINING HETEROCYCLIC SYSTEMS

Juergen Habermeler, Allschwil, Hans Batzer, Arlesheim, and Daniel Porret, Binningen, Switzerland, assignors to Ciba-Geigy AG., Basel, Switzerland  
No Drawing. Filed Mar. 24, 1971, Ser. No. 127,766  
Claims priority, application Switzerland, Apr. 1, 1970, 4,792/70  
Int. Cl. C08g 45/06

U.S. Cl. 260—830 TW 5 Claims  
Epoxide resin mixtures, which at room temperature are stable to storage and do not crystallize, of (a) diglycidyl ethers of binuclear 5-membered or 6-membered, unsubstituted or substituted, oxyalkylated N-heterocyclic compounds which contain two NH groups in the molecule for example 1,6-bis(1'-glycidyoxyethyl-5',5'-dimethylhydantoinyl)-hexane, and (b) polyglycidyl compounds of the N-heterocyclic series which contain at least one heterocyclic ring, which possesses the —NH—CO— grouping at least once, with at least two glycidyl groups or  $\beta$ -methylglycidyl groups in the polyglycidyl compounds being linked directly to endocyclic nitrogen atoms (for example 1,3-diglycidyl-5,5-dimethylhydantoin).

### 3,733,283 FLAMEPROOF POLYLACTAM COMPOSITION AND PROCESS FOR ITS MANUFACTURE

Ray B. Duggins, Chadds Ford, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.  
No Drawing. Filed May 10, 1971, Ser. No. 141,953  
Int. Cl. C08j 1/24

U.S. Cl. 260—2.5 N 24 Claims  
A flameproof polylactam composition containing 20 to 80% by weight of hydrated alumina or hydrated calcium sulfate is manufactured by first heating the filler to a temperature of 100–300° C., mixing the filler with lactam monomer, polymerization catalysts and initiators, and finally heating the mixture under anhydrous conditions to a temperature of 135 to 170° C. for a time sufficient to cause polymerization.

### 3,733,284 CELLULAR RUBBER OF 1,2-POLYBUTADIENE

Eiichiro Shiratsuchi, Yokkaichi, Satoshi Terashima, Matsugae-machi, and Mitsuo Ichikawa, Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan  
No Drawing. Filed June 10, 1970, Ser. No. 45,224  
Claims priority, application Japan, June 25, 1968, 43/43,623  
Int. Cl. C08d 13/10, 5/00

U.S. Cl. 260—2.5 H 2 Claims  
As a new matter composition of, a cellular rubber based on 1,2-polybutadiene and a process for preparing same. A very valuable cellular rubber having a fine and uniform cellular structure can be obtained by a single vulcanizing and foaming step when polybutadiene containing a large number of 1,2-configuration units is used as the starting elastomer.

### 3,733,285 LIGHTWEIGHT STRUCTURAL COMPOSITIONS USING POLYESTER RESINS

George A. Steffy, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.  
No Drawing. Filed Mar. 2, 1972, Ser. No. 231,408  
Int. Cl. C08j 1/30

U.S. Cl. 260—2.5 B 6 Claims  
There is disclosed a composition comprised of expanded polystyrene particles, a copolymerizable mixture of a polyester resin and monovinyl ether monomer, and a hydraulic binder. Other conventional aggregates, such as sand and the like, may be added to the composition.

### 3,733,286 COMPOSITIONS FOR PIGMENTED PAPER COATINGS WHICH CONTAIN STYRENE-ACROLEIN POLYMERS

David W. Holly, Naperville, and George T. Kekish, Chicago, Ill., assignors to Nalco Chemical Company, Chicago, Ill.  
No Drawing. Filed Oct. 19, 1970, Ser. No. 82,065  
Int. Cl. C08g 51/04, 51/06, 51/34

U.S. Cl. 260—17.4 ST 12 Claims  
Acrolein-styrene polymers have been found effective as coatings in imparting water resistance to pigmented paper.

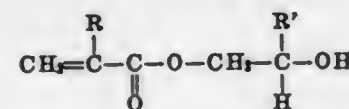
### 3,733,287 PAINT COMPOSITIONS CAPABLE OF BEING CURED BY IRRADIATION OF ELECTRON RAY

Hiromasa Masuda, Osaka, Yukio Nomura, Nishinomiya, and Toru Fuyuki and Junichi Matsuzaka, Yokohama, Japan, assignors to Nippon Oils and Fats Company Limited, Tokyo, Japan  
No Drawing. Filed June 30, 1971, Ser. No. 158,612  
Claims priority, application Japan, June 29, 1970, 45/56,786  
Int. Cl. C09d 3/26, 5/32

U.S. Cl. 260—21 5 Claims  
A paint composition capable of being cured by irradiation of electron ray in a low absorbed dose comprises a



component (I) obtained by reacting triepoxypropyl isocyanurate with a sufficient amount of acrylic acid or methacrylic acid to esterify two or more epoxy groups in said isocyanurate or a resinous component (II) obtained by reacting (A) a reaction product of 1 mole of urea, melamine, benzoguanamine or acetoguanamine with at least 2 moles of formaldehyde, or (B) hexamethoxymethylmelamine with 2 to 6 moles of an  $\alpha,\beta$ -unsaturated ester having the general formula



wherein R and R' are hydrogen or methyl group alone or in admixture with a saturated alcohol, and a resinous component (III) obtained by reacting a reaction product of 1 mole of a natural drying oil or semi-drying oil with 2 to 5 moles of maleic anhydride with 2 to 5 moles of the above described  $\alpha,\beta$ -unsaturated ester based on 1 mole of the drying oil or semi-drying oil.

3,733,288

#### ALKALINE EARTH METAL PHENOXIDE ESTERS AND POLYVINYL CHLORIDE RESIN COMPOSITIONS CONTAINING THE SAME AS STABILIZERS

Motonobu Minagawa, Koshigaya, Tetsuo Sekiguchi, Hasuda-machi, and Naohiro Kubota, Tokyo, Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

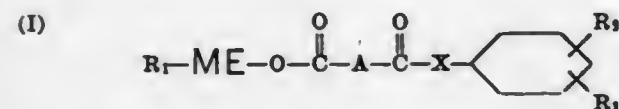
No Drawing. Filed July 30, 1970, Ser. No. 59,670  
Claims priority, application Japan, Aug. 23, 1969,  
44/66,770

Int. Cl. C08f 45/32, 45/62

U.S. Cl. 260—23 XA

21 Claims

Alkaline earth metal phenoxide esters are prepared having the following formula:



wherein R<sub>1</sub> is an organic radical linked to the alkaline earth metal atom ME through oxygen or sulfur, or a carboxylic or thiocarboxylic acid group, A is a bivalent linking group, X is oxygen or sulfur, and R<sub>2</sub> and R<sub>3</sub> are organic radicals or hydrogen.

Polyvinyl chloride resin compositions having improved resistance to weathering, and a reduced tendency to plate out, and to develop bloom, are also provided, containing these compounds as stabilizers, alone or with other polyvinyl chloride resin stabilizers.

3,733,289

#### FIRE RETARDANT COATING COMPOSITION

Arnold J. Burns, Collinsville, Ill., and Glen F. Snow, St. Ann, and Howard L. Vandersall, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 48,813, June 8, 1970, which is a continuation of application Ser. No. 739,149, June 24, 1968, now abandoned. This application Aug. 24, 1971, Ser. No. 174,514

Int. Cl. C08c 11/70

U.S. Cl. 260—28.5 R

4 Claims

An improved fire retardant intumescent coating composition for metallic substrates is disclosed; the composition comprises (a) an organic resin, (b) an organic solvent, (c) a carbonific, (d) an ammonium phosphate, (e) asbestos and (f) diatomaceous earth.

#### 3,733,290 POLYAMIDE-POLYAMINE-EPICHLOROHYDRIN WET STRENGTH RESIN

Laurence Lyman Williams, Stamford, and Anthony Thomas Coscia, South Norwalk, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Oct. 12, 1970, Ser. No. 80,181

Int. Cl. C08g 20/38

U.S. Cl. 260—29.2 N

9 Claims

Water-soluble cationic thermosetting polyamidepolyamine-epichlorohydrin resins containing phenylene linkages are prepared by reacting  $\frac{1}{2}$  to  $\frac{3}{4}$  mol of a non-orthophthalic acid with 1 mol of a water-soluble polyalkylene-polyamine, reacting the resulting monomeric phthalamide with  $\frac{3}{4}$  to  $\frac{1}{4}$  mol of a C<sub>2</sub>-C<sub>10</sub> saturated aliphatic dicarboxylic acid to form a chain polymer (the total amount of the acids being  $\frac{3}{4}$  to  $\frac{1}{4}$  mol per mol of the polyamine), and rendering the chain polymer thermosetting by reaction with epichlorohydrin.

3,733,291

#### FORMATION PROCESS FOR PRODUCING DIELECTRIC ALUMINUM OXIDE FILMS

Robert S. Alwitt, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

No Drawing. Filed July 23, 1971, Ser. No. 165,580

Int. Cl. C23b 9/02

U.S. Cl. 204—29

7 Claims

A process for forming dielectric aluminum oxide films produces a foil system that will not lose capacitance in a working electrolyte for formations of 50 v. or more. An aluminum foil surface has a hydrous oxide formed thereon, and a barrier oxide layer anodically formed through this hydrous film. Any excess hydrous oxide remaining is stripped away with a solution made up of H<sub>3</sub>PO<sub>4</sub> and CrO<sub>3</sub>; and on this surface the barrier oxide layer is anodically reformed in the same manner as in the original formation. Such a formation process can be used to produce a unit having a much lower equivalent series resistance than prior art units.

3,733,292

#### HYDROLYSIS OF MALEIC ANHYDRIDE COPOLYMERS

Julius Sirota, South Plainfield, and Irwin J. Davis, Somerville, N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 728,758, May 13, 1968. This application Nov. 18, 1971, Ser. No. 200,241

Int. Cl. C08f 27/14, 39/00, 37/14

U.S. Cl. 260—29.6 H

7 Claims

Pressure sensitive adhesive composition and substrates coated therewith, said pressure sensitive adhesive compositions comprising lacquers of maleic anhydride containing copolymers wherein at least part of the maleic anhydride moieties have been hydrolyzed to the acid state. A method for effecting said hydrolysis which involves the use of a mixture of water and a water miscible organic solvent as the hydrolyzing reagent is described, said method enabling the production of novel hydrolyzed maleic anhydride copolymers.

3,733,293

#### WATER AND ABRASION RESISTANT COATINGS HAVING LOW GLOSS FROM AQUEOUS SYSTEMS

John F. Gallagher and Martin Salo, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Mar. 10, 1971, Ser. No. 123,019

Int. Cl. C08f 37/18

U.S. Cl. 260—29.6 RW

8 Claims

It has been discovered that certain blends of polymers can be applied from an aqueous system to glossy surfaces and dried to yield coated surfaces that have a pleasing

degree of roughness or "matte" and that are water and abrasion resistant, anti-blocking, and essentially completely transparent to visible light.

The coatings are applied to the glossy surface in the form of an aqueous lacquer composition comprising

- (a) water;
- (b) dissolved in the water, an effective amount of ammonium salt or a copolymer of ethyl methacrylate and methacrylic acid; and
- (c) dispersed in the form of a latex through the solution of (b) in (a), an effective amount of a higher molecular weight poly(vinyl acetate).

3,733,294

#### MANUFACTURE OF SOLUTIONS AND DISPERSIONS OF POLYMERS IN ORGANIC LIQUIDS FROM A POLYMER LATEX

Robert W. Keown, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 30,270, Apr. 20, 1970. This application Nov. 25, 1970, Ser. No. 92,950

Int. Cl. C08f 45/28, 47/20

U.S. Cl. 260—33.6 A

9 Claims

Solutions and dispersions of polymers in organic liquids can be manufactured by (A) providing a polymer latex containing an anionic or cationic emulsifier, (B) providing a solution in a water-immiscible organic liquid of a transfer agent which is able to undergo an ion-exchange reaction with said emulsifier as defined in C below, (C) bringing the latex of A and the solution of B into contact with each other so that an ion-exchange reaction occurs between the transfer agent and the emulsifier to form a reaction product whose solubility is such that in a mixture of equal parts by weight of said organic liquid and water, about 90–100% by weight of the reaction product is dissolved in the organic liquid and about 0–10% by weight is dissolved in the water, and (D) removing the water from the composition. When the organic liquid used in (B) is a solvent for the polymer at ordinary temperatures, a polymer solution is obtained by the process.

3,733,295

#### FLUOROCARBON FILLED CARBOXYNITROSO-POLYBUTADIENE VULCANIZATE

Jon W. Martin, Los Alamitos, Eugene A. Burns, Palos Verdes Peninsula, and Robert A. Meyers, Encino, Calif., assignors to TRW Inc., Redondo Beach, Calif.

No Drawing. Filed Dec. 28, 1970, Ser. No. 102,268

Int. Cl. C08f 9/08, 45/04, 45/14

U.S. Cl. 260—41.5 R

10 Claims

A decrease in permeability and an increase in chemical resistance of carboxynitroso rubbers can be effected by the addition of small amounts of polybutadiene resins and powdered tetrafluoroethylene polymer filler. Liquid functionally terminated polybutadiene and powdered polytetrafluoroethylene are mixed into a terpolymer containing trifluoronitrosomethane, tetrafluoroethylene, and a small amount of nitrosoperfluorobutyric acid. The mixture is cured in the presence of a peroxide free radical initiator.

3,733,296

#### STABILIZED POLYCARBONATES

Thomas H. Cleveland and John V. Bailey, New Martinsville, W. Va., assignors to Baychem Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 342, Jan. 2, 1970. This application July 22, 1971, Ser. No. 165,300

Int. Cl. C08g 51/56, 51/58; C09k 3/28

U.S. Cl. 260—45.7 P

3 Claims

A halogenated polycarbonate polymer composition containing an effective amount of a metal carbonate selected from the group consisting of barium carbonate, strontium

carbonate, and calcium carbonate, or an effective amount of a combination of the metal carbonates and an organic phosphite to stabilize the polymer.

3,733,297

#### ORGANIC ESTERS AND THEIR USE AS ULTRAVIOLET LIGHT ABSORBERS AND AS HEAT STABILIZERS

Stanley J. Buckman, Kenneth J. Flanagan, John D. Pera, and Lester A. Wienert, Memphis, Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

No Drawing. Continuation-in-part of application Ser. No. 800,007, Feb. 17, 1969, now Patent No. 3,629,322, dated Dec. 21, 1971. This application May 7, 1971, Ser. No. 141,442

Int. Cl. C08f 45/58; C08g 51/58; C08b 27/66

U.S. Cl. 106—178

23 Claims

The preparation and use of betabenzoyloxy - 2' - hydroxychalcones as ultraviolet light absorbers and heat stabilizers are described.

3,733,298

#### METHOD FOR PREPARING POLYCARBORANYL-ENESILOXANE POLYMERS

Karl O. Knollmüller, Hamden, Conn., assignor to Olin Corporation

No Drawing. Filed Apr. 28, 1972, Ser. No. 248,589

Int. Cl. C08f 11/04

U.S. Cl. 260—46.5 E

9 Claims

Method for the preparation of linear polycarboranylene-siloxane polymers by the condensation of selected hydroxy terminated, silicon-containing carboranes with selected anilinosilanes.

3,733,299

#### PROCESS FOR THE PREPARATION OF POLYPHENYLENE ETHERS WITH ACTIVATED COPPER-AMINE CATALYSTS

Glenn D. Cooper, Delmar, and James G. Bennett, Menands, N.Y., assignors to General Electric Company

No Drawing. Filed June 10, 1971, Ser. No. 151,933

Int. Cl. C08g 23/18

U.S. Cl. 260—47 ET

15 Claims

There is disclosed an improved process for the preparation of high molecular weight polyphenylene ethers by oxidatively coupling a di-ortho-substituted phenolic precursor in a reaction system containing oxygen and a complex catalyst formed from a copper salt and either a primary, secondary or tertiary amine and an alkali metal bromide or alkaline earth metal bromide as an activator for the catalyst. Use of the activator results in the formation of higher molecular weight polymer in a given reaction time or polymer of comparable molecular weight in substantially decreased reaction time.

3,733,300

#### PROCESS FOR PRODUCING GLASS FIBER-REINFORCED POLYPROPYLENE MOLDED ARTICLE

Toshihito Fujita, Nobuyuki Takao, and Atsuki Kodama, Fukushima, Japan, assignors to Nito Boseki Co., Ltd., Gonome, Fukushima-shi, Japan

No Drawing. Filed Aug. 12, 1971, Ser. No. 171,361

Claims priority, application Japan, Aug. 15, 1970,  
45/71,493

Int. Cl. C08f 45/10

U.S. Cl. 260—41 AG

10 Claims

When a stereoregular polypropylene and a silane-treated glass fiber are subjected to heat-molding under pressure in the presence of an organic peroxide and a vinyl compound having at least two carbon to carbon double bonds, the glass fiber is strongly bonded to the polypropylene, whereby a glass fiber-reinforced polypropylene molded article improved in both dry and wet bending strengths is produced.



3,733,301

## SEPARATION AND RECOVERY OF CATALYST RESIDUE

Michael M. Modan, 24 Buckingham Drive, Albany, N.Y. 12208

Original application Feb. 16, 1970, Ser. No. 11,747. Divided and this application May 4, 1971, Ser. No. 140,272

Int. Cl. C07c 85/16; C08g 23/18

U.S. Cl. 260—47 ET

5 Claims

The invention relates to separation and recovery of copper-amine complex catalyst residues from a reaction stream in a process for the formation of polyphenylene ethers by an oxidative coupling polymerization reaction. The process comprises simultaneously terminating the reaction and extracting catalyst residue by contact of the reaction solution with an aqueous acid solution in a counter-current, liquid-liquid extraction column. The polymer is then recovered from the reaction solution substantially free of catalyst residue. The amine is recovered from the aqueous acid solution by pH adjustment with alkali and may be re-used if desired. The process of the invention is less expensive than prior art procedures and provides more effective catalyst removal than other commercially acceptable methods.

3,733,302

## TRIMELLITIMIDO ALKYL SUBSTITUTED AROMATIC CARBOCYCLIC ORGANIC POLYMERS AND A METHOD FOR MAKING SAME

Johann F. Klebe, Henry A. Wroblewski, and Alfred R. Gilbert, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Filed Sept. 1, 1971, Ser. No. 177,176

Int. Cl. C08g 23/20

U.S. Cl. 260—47 ET

2 Claims

A variety of aromatic carbocyclic polymers substituted with trimellitimido alkyl radicals can be made by effecting reaction between an aromatic carbocyclic organic polymer, for example, polyphenylene oxide, and a hydroxy alkyl trimellitimide, or derivative thereof, in the presence of a Friedel Crafts catalyst, such as boron trifluoride. The trimellitimido alkyl substituted aromatic carbocyclic organic polymers can be electrodeposited onto various substrates to impart improved surface characteristics thereto.

3,733,303

## HIGH POLYMER HAVING THE STRUCTURE OF POLY-[IMINO(2,5-DIALKOXYCARBONYL-1,4-PHENYLENE)IMINOALKYLENE]

Kazuo Adachi, Akira Tai, and Fukuji Higashi, Tokyo, Japan, assignors to Tekkosha Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1971, Ser. No. 189,876

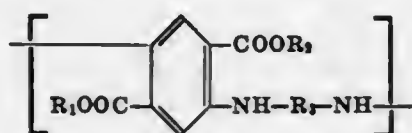
Claims priority, application Japan, Oct. 20, 1970, 45/91,668

Int. Cl. C08 33/02

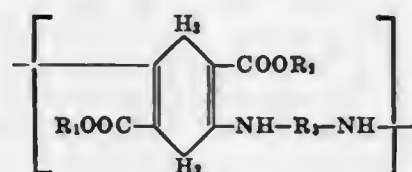
U.S. Cl. 260—47 CP

7 Claims

A new high polymer comprising recurring structural units of the formula



is obtained by the oxidation of high polymer comprising recurring structural units of the formula



which may be derived from a reaction between dialkylsuccinyl succinates and aliphatic diamines, and said new high polymer compound is a thermo plastic resin being characterized by spectroscopic absorption IR spectra at the vicinities of 2.80, 5.80, 6.49, 11.5 and 12.7μ, which is conveniently employed as a coating for metals, films, sheets and as various shaped moldings.

3,733,304

## ARYL SULFATE POLYMERS AND METHODS FOR THEIR PRODUCTION

William Charles Firth, Jr., Wilton, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Apr. 1, 1971, Ser. No. 130,528

Int. Cl. C08g 33/14

U.S. Cl. 260—49

10 Claims

A method for the production of compounds having the formula



wherein A is an aromatic radical, polymers produced from said compounds and methods for the production of said polymers, are disclosed.

3,733,305

## CURABLE LOW SOFTENING EPOXY RESINS CONTAINING BISPHENOL S

Peter Loewrighelt, Wyckoff, and James C. Spitsbergen, Franklin Lakes, N.J., assignors to Witco Chemical Corporation, New York, N.Y.

No Drawing. Filed Feb. 3, 1971, Ser. No. 113,700

Int. Cl. C08g 30/00, 30/08

U.S. Cl. 260—49

7 Claims

Catalyst-free, curable, substantially linear thermosetting epoxy resins having low softening points and good melt viscosity stability, are made available by the reaction of a bis(hydroxyphenyl)sulfone (bisphenol S) with a bis(glycidyloxyphenyl)sulfone (diepoxy bisphenol S) in the hot molten state, without catalyst.

3,733,306

## PREPARATION OF POLYARYL ESTERS

Wolfgang Wolfes, Mondorf, and Erich Behr, Troisdorf, Germany, assignors to Dynamit Nobel AG, Troisdorf, Postfach, Germany

No Drawing. Filed July 14, 1971, Ser. No. 162,714

Claims priority, application Germany, July 18, 1970, P 20 35 846.7

Int. Cl. G08g 17/003

U.S. Cl. 260—61

7 Claims

In the preparation of a polyaryl ester by condensing at least one aromatic dicarboxylic acid chloride with at least one dihydric phenol in the presence of metallic magnesium as catalyst to produce HCl and a polyaryl ester, the improvement which comprises dissolving said acid chloride and phenol in an inert organic solvent and contacting said solution with the metallic magnesium in subdivided form at a temperature between about 170 and 280° C. Advantageously the preheated solution is trickled through a bed of magnesium chips in a heated pipe with a contact time of less than about 10 minutes. The conversion in the pipe exceeds 80%, based on HCl formed, and the product may be further condensed in known manner to viscosities in excess of 1.

3,733,307

## COPOLYMERS OF POLYPHENYLENE ETHERS

Glenn D. Cooper, Delmar, N.Y., assignor to General Electric Company

No Drawing. Filed Oct. 14, 1971, Ser. No. 189,193

Int. Cl. C08g 23/16

U.S. Cl. 260—61

5 Claims

Copolymers with repeating units of (a) 2,6-diaryl-1,4-phenylene ethers and (b) 2,6-dihalo-1,4- or 3,5-dihalo-1,2-phenylene ether units are provided by free radical initiated polymerization of the corresponding 2,6-disubstituted-4-halophenolates. The novel copolymers are melt

3,733,311

## THERMOSET RESIN FROM GLYCIDOL AND A CYCLIC ANHYDRIDE

Richard A. Hickner, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 721,076, Apr. 12, 1968, which is a continuation-in-part of application Ser. No. 320,833, Nov. 1, 1963, both now abandoned. This application Oct. 16, 1970, Ser. No. 81,602

Int. Cl. C08g 17/04, 51/10

U.S. Cl. 260—78.4 EP

12 Claims

The reaction of glycidol with a cyclic polycarboxylic acid anhydride produces a thermoset polyester type resin which does not yield water as a by-product of the reaction.

3,733,312

## POLYMER COMPOSITIONS

Gerbrand Deetman, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Aug. 12, 1971, Ser. No. 171,322

Int. Cl. C08f 27/08

U.S. Cl. 260—78.5 T

10 Claims

Novel quaternary salt modified esters of maleic anhydride copolymers are film forming resins useful, for example, as holding agents in hair sprays.

3,733,313

## HALOHYDRIN SYNTHESIS

Arnold N. Johnson, Wayne, and Walter Nudenberg, West Caldwell, N.J., assignors to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed Mar. 4, 1970, Ser. No. 16,607

Int. Cl. C07c 29/00; C08f 15/40

U.S. Cl. 260—80.78

12 Claims

Halohydrins (especially chloro- and bromo-hydrins) are prepared from olefins having a double bond not activated by an adjacent aromatic radical, by reaction with a dilute solution of hydrogen peroxide and the corresponding aqueous hydrogen halide. Examples of starting olefins are cyclohexene, butadiene, and polybutadiene, to make, respectively, 2-halocyclohexanol, the three isomeric dihalobutanediols, and poly (3-halo-2-hydroxytetramethylene). Halohydrin of EPDM rubber may be prepared by the process. The EPDM halohydrin can be cured by the action of diisocyanates or other reagents.

3,733,314

## PURIFICATION OF AMORPHOUS POLYOLEFINS

Stanley J. Marwil and Roy C. Harrison, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Feb. 3, 1971, Ser. No. 112,434

Int. Cl. C08f 3/02, 3/08

U.S. Cl. 260—93.7

13 Claims

Crude amorphous polyolefins are purified in a sequential treatment process with a reducing type inorganic compound, a polyphosphate, and an alcohol. The amorphous polyolefin is recovered as a safe-to-handle, essentially color-free and catalyst residue-free, useful material.

3,733,315

## UNSATURATED CARBOXYLIC ESTERS

Fred Smeets, Tienen, Belgium, assignor to N.V. La Citrique Belge, Pastoorijstraat, Tienen, Belgium

Original application July 8, 1966, Ser. No. 563,816, now Patent No. 3,586,715, dated June 22, 1971. Divided and this application Nov. 24, 1969, Ser. No. 877,598. Claims priority, application Great Britain, July 19, 1965, 30,640/65

Int. Cl. C07c 69/52

U.S. Cl. 260—234 R

8 Claims

Unsaturated ester materials prepared by heating an alkaline-earth metal salt of citric acid, hydrolysing the reaction product to form the corresponding organic acid

processable into articles having extended high temperature resistance and those containing at least 15 mole percent of the 2,6- or 3,5-dihalo-component (b) are flame resistant.

3,733,308

## HIGHLY ORDERED AZO-AROMATIC POLYIMIDES

Hartwig C. Bach, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of abandoned application Ser. No. 196,704, Nov. 10, 1971, which is a division of application Ser. No. 46,454, June 15, 1970, which in turn is a continuation-in-part of abandoned application Ser. No. 792,823, Jan. 21, 1969. This application Aug. 14, 1972, Ser. No. 280,607

Int. Cl. C08g 20/32

U.S. Cl. 260—65

5 Claims

A class of ordered fiber and film forming aromatic polyamide acids and corresponding polyimides derived from certain symmetrical aromatic azo diamines have been found to possess excellent thermal and mechanical properties useful in fibers, films and other shaped articles.

3,733,309

## BIAXIALLY ORIENTED POLY(ETHYLENE TEREPHTHALATE) BOTTLE

Nathaniel Convers Wyeth, Mendenhall, Pa., and Ronald Newman Roseveare, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of abandoned application Ser. No. 885,853, Dec. 17, 1969. This application Nov. 30, 1970, Ser. No. 93,571

Int. Cl. B29c 5/06

U.S. Cl. 260—75 T

14 Claims

A hollow, biaxially oriented, thermoplastic article, particularly a bottle, prepared from polyethylene terephthalate wherein said article has an inherent viscosity of at least 0.55, a density of about 1.331 to 1.402 and a ratio of article weight in grams to volume in cubic centimeters of about 0.2 to 0.005:1. Such articles have excellent strength properties, are impact resistant, and are capable of holding liquids under pressures as high as about 100 p.s.i.g. at a temperature of about 50° C. without significant deformation making such articles useful in bottling liquids under pressure such as beer, carbonated beverages, or aerosols.

3,733,310

## PROCESS FOR THE MANUFACTURE OF POLYURETHANE SPINNING AND COATING SOLUTIONS

Roxburgh Richmond Aitken, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Continuation-in-part of application Ser. No. 52,762, July 6, 1970. This application Feb. 22, 1972, Ser. No. 228,259

Claims priority, application Great Britain, July 24, 1969, 37,281/69

Int. Cl. C08g 22/14, 22/16

U.S. Cl. 260—77.5 AQ

3 Claims

A process for the manufacture of a solution of a polyurethane containing isocyanate-reactive groups which comprises reacting together in an inert solvent an essentially linear hydroxyl-ended polymer, an at least trifunctional polyol and an excess of an organic diisocyanate to form an isocyanate-ended prepolymer, then adding a dihydric alcohol or a mixture thereof with water and allowing reaction to proceed until the solution has attained a viscosity within a predetermined range, and finally adding a polyfunctional isocyanate-reactive compound in which the isocyanate-reactive groups are of different reactivity in amount such that there is one molecule of such compound for each isocyanate group still present.



material, and esterifying the acid. The compounds are sulfonated to produce surface active agents, ion exchange materials and detergents.

3,733,316

# NOVEL 17 $\beta$ -(TETRAHYDROPYRAN-4-YLOXY)STEROIDS

John A. Edwards, Los Altos, Calif., assignor to Syntex Corporation, Panama, Panama

No Drawing. Filed Apr. 20, 1971, Ser. No. 135,757

Int. Cl. C07c 173/00

U.S. Cl. 260—239.55 R

17 Claims

Novel 17 $\beta$ -(tetrahydropyran-4-yloxy) steroid ethers are disclosed. Specifically, 17 $\beta$ -(tetrahydropyran-4-yloxy) ethers of androstane and estrane series are disclosed together with a method for their preparation and a discussion of their unexpected biological activity, inter alia, as anabolic/androgenic agents.

3,733,317

# METHOD FOR THE PREPARATION OF OMEGA-LACTAMS AND THEIR LACTAMIZABLE PRECURSORS

Luigi Giffre, Milan, and Giancarlo Stoli, Como, Italy, assignor to Sna Viscosa Società Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

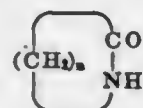
Filed June 30, 1970, Ser. No. 51,268

Int. Cl. C07d 41/06

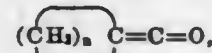
U.S. Cl. 260—239.3 A

12 Claims

There is described a process for the preparation of omega-lactams having the general formula:



wherein  $n$  = from 2 to 13, and/or of their lactamizable precursors, which may be cycloaliphatic oximes or cycloaliphatic nitroso derivatives, monomers or dimers characterized by the fact that the corresponding cyclomethylene ketene, having the general formula



where  $n$  has the aforementioned value, is subjected to nitrosation with a nitrosating agent of the formula NOX, where X can be  $-\text{HSO}_4$ ,  $-\text{Cl}$ ,  $-\text{NO}_2$ ,  $-\text{OR}$  (in which R indicates an alkyl or aryl organic substituent), at a temperature comprised between  $-60^\circ \text{C}$ . and  $+100^\circ \text{C}$ .

3,733,318

# 21-ORTHOESTERS OF CORTICAL STEROIDS AND METHODS OF PREPARING SAME

Michael Marx, Sunnyvale, Calif., assignor to Syntex Corporation, Panama, Panama

No Drawing. Filed Mar. 23, 1972, Ser. No. 237,506

Int. Cl. C07c 173/00

U.S. Cl. 260—239.55 D

19 Claims

21-orthoesters of 16 $\alpha$ - and 16 $\beta$ -hydro or methyl cortical steroids and 21-orthoesters of 16 $\alpha$ ,17 $\alpha$ -cyclic acetal cortical steroids. The method of preparing such orthoesters comprises reacting the corresponding 21-hydroxy cortical steroid with an excess of an alkyl orthoester in

the presence of a catalytic amount of a strong acid. These 21-orthoesters of cortical steroids have utility as anti-inflammatory agents in the treatment of mammals.

3,733,319

# NITROTHIOPHENES

David W. Henry and William T. Colwell, Jr., Menlo Park, Calif., assignors to the United States of America as represented by the Secretary of the Army

No Drawing. Filed Jan. 7, 1970, Ser. No. 1,301

Int. Cl. C07d 63/12; A61k 27/00

U.S. Cl. 260—240 A

2 Claims

The disclosure describes eighteen analogs of 5-nitrothiophene 2-carboxaldehyde. The compounds are useful in the prevention and treatment of malaria.

3,733,320

# ANTIBIOTIC PURIFICATION PROCESSES

Seemon H. Pines, Murray Hill, Norman C. Jamieson, Rahway, and Matthew A. Kozlowski, South River, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Mar. 3, 1971, Ser. No. 120,706

Int. Cl. C07d 99/24

U.S. Cl. 260—243 C

7 Claims

Fermentation broths or impure solutions containing 7- $\beta$  - (D-5-amino-5-carboxyvaleramido)-3-(carbamoyloxy-methyl) - 7-methoxy-3-cephem-4-carboxylic acid, a substance having antibiotic activity against gram-negative and gram-positive microorganisms, are purified using (a) passage through a cationic exchange resin, (b) elution with a weak base, (c) passage through a weakly basic anionic exchange resin, (d) washing the column resin of stage c with a solution of dilute lower alkanolic acid, and (e) elution with a weak base or a phosphate buffer solution. The yield of product is greatly increased over prior purification processes.

3,733,321

# 1,4-BENZOTHAZIN-3-ONES

John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

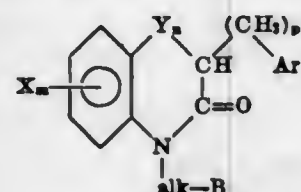
No Drawing. Filed July 6, 1971, Ser. No. 160,066

Int. Cl. C07d 93/12, 87/00, 27/00

U.S. Cl. 260—243 R

2 Claims

Anti-inflammatory agents of the formula



(I)

wherein X may be hydrogen, halogen, alkyl, haloalkyl, alkoxy, haloalkoxy, hydroxy, alkylthio, haloalkylthio, nitro, alkylsulfonyl, amino, alkanoylamino, or mono- or dialkylamino wherein any of the foregoing alkyl or substituted alkyl radicals may contain up to 8 carbon atoms; m may be 0, 1, 2, 3 or 4; Y may be  $-\text{O}-$ ,  $-\text{S}-$ ,  $-\text{SO}-$ ,  $-\text{SO}_2-$ ,  $-\text{CH}_2-$ , or  $-\text{CH}_2\text{CH}_2-$ ; n may be 0 or 1; alk may be a straight or branched alkyl radical of up to 6 carbon atoms; B may be a basic nitrogen containing radical; p may be 1, 2 or 3; and Ar may be phenyl, X-substituted phenyl, pyridyl, thienyl, furyl, naphthyl, or alkylendioxyphenyl; and pharmaceutically acceptable

acid-addition or quaternary ammonium salts thereof and N-oxides and pharmaceutically acceptable acid-addition salts thereof.

3,733,322

# N - (AMINODIALKYL)THIENYL[3,2-b]THIOPHENE-2-CARBOXAMIDES AND METHODS OF PREPARATION

William Blythe Wright, Jr., Woodcliff Lake, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed June 16, 1971, Ser. No. 153,864

Int. Cl. C07d 87/46

U.S. Cl. 260—247.1

6 Claims

The preparation of N-(aminoalkyl)-thieno[3,2-b]thiophene-2-carboxamides by the reaction of a thieno[3,2-b]thiophene-2-carbonyl chloride with an alkylendiamine derivative is described. Other methods of preparing N-(aminoalkyl)thieno[3,2-b]thiophene-2-carboxamides are described. The latter products are useful for their antidepressant, anti-inflammatory and analgesic properties.

3,733,323

# 2-MERCAPTOQUINOXALINE-1-OXIDES, SALTS THEREOF AND 2 - (1-OXOQUINOXALINYL) DISULFIDES

Miriam Lois Douglass, Bound Brook, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed Nov. 26, 1969, Ser. No. 880,413

Int. Cl. C07d 51/78

U.S. Cl. 260—250 R

19 Claims

2-mercaptoquinoxaline-1-oxides, salts thereof and 2-(1-oxoquinoxalyl) disulfides are useful antimicrobial agents, active against gram-negative and gram-positive bacteria and fungi, e.g., *Escherichia coli*, *Bacillus subtilis*, *Micrococcus pyogenes* var. *aureus*, *Trichophyton mentagrophytes*, and *Pityrosporum ovale*.

The antimicrobial compounds are useful alone, usually in aqueous solution, as microbicides or microbistats. They may also be included as constituents of hairdressings or shampoos because they are effective microbicides, even in the presence of oily materials, such as the sebum normally secreted by the human scalp.

3,733,324

# PYRROLIDINOCARBONYLMETHYL PIPERAZINO METHYL INDOLE

Claude P. Fauran, Michel J. Turin, and Guy M. Raynaud, Paris, and Bernard M. Pourrias, Meudon-La-Forêt, France, assignors to Delalande S.A., Courbevoie, Hauts-de-Seine, France

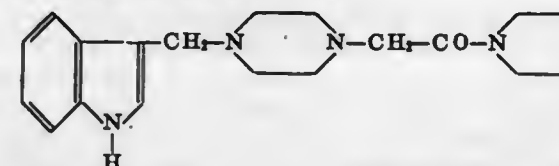
No Drawing. Filed June 4, 1971, Ser. No. 150,224

Claims priority, application France, June 10, 1970, 7021223

Int. Cl. C07d 51/70

U.S. Cl. 260—268 BC

A compound of the formula



The compound is prepared by reacting indole with N-(pyrrolidinocarbonylmethyl) piperazine and trioxymethylene (paraformaldehyde).

The compound possesses anti-hypertensive properties.

3,733,325

# PREPARATION OF AMINOETHYLPIPERAZINE

Ernest Leon Yeakey, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

No Drawing. Filed Dec. 16, 1970, Ser. No. 98,920

Int. Cl. C07d 51/70

U.S. Cl. 260—268 ST

6 Claims

A novel continuous process for producing 1-(2-aminoethyl)piperazine is provided by catalytic hydrogenation of nitrilotriacetonitrile.

3,733,326

# INHIBITION OF THE POLYMERIZATION OF VINYL MONOMERS

Kelsuke Murayama, Toshimasa Toda, and Elko Mori, Tokyo, Japan, assignors to Sankyo Company Limited

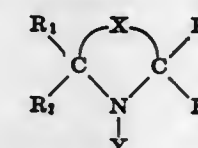
No Drawing. Filed Mar. 10, 1971, Ser. No. 123,077

Int. Cl. C07d 31/20

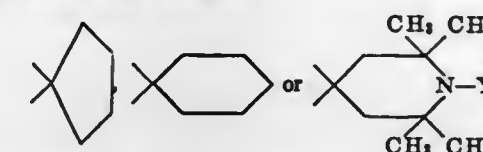
U.S. Cl. 260—290 V

4 Claims

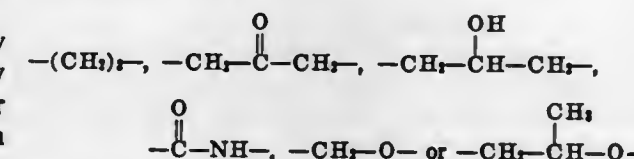
Vinyl monomer compositions inhibited against the polymerization thereof by having incorporated therein a sufficient amount to effectively inhibit said polymerization of a compound having the formula



wherein R<sub>1</sub> and R<sub>2</sub> may be the same or different and each represents an alkyl group of 1-11 carbon atoms, phenyl group or hydrogen atom, provided that, where one of the R<sub>1</sub> and R<sub>2</sub> is hydrogen atom, another is an alkyl group of 1-11 carbon atoms or phenyl group or they may, together with the carbon atom to which they are attached, form the group



R<sub>3</sub> and R<sub>4</sub> have the same meanings as the R<sub>1</sub> and R<sub>2</sub>; X represents the group



and Y represents hydrogen atom or hydroxyl group.

3,733,327

# CATALYTIC OXYDEHYDROGENATION OF ALKYL AROMATICS AND ALKYL PYRIDINES

G. Edwin Vrieland, Midland, Mich., and Henry Nelson Beck, Walnut Creek, Calif., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed June 28, 1971, Ser. No. 157,722

Int. Cl. C07c 51/18; C07d 31/20

U.S. Cl. 260—290 V

17 Claims

Oxydehydrogenation of alkyl aromatic compounds including nitrogen heterocyclics having at least one C<sub>2</sub>-C<sub>6</sub> alkyl side chain having at least one hydrogen atom on the carbon atom of the alkyl group attached to the aromatic ring and 1-2 rings, by passing a mixture of the alkyl aromatic compound and an oxygen containing gas over a cerium phosphate or cerium-zirconium phosphate catalyst at 400-650° C. converts said C<sub>2</sub>-C<sub>6</sub> alkyl groups to alkene derivatives, with good selectivity and conversion.

3,733,328

# PYRAZOLO[3,4-b]PYRIDINE-5-CARBOXAMIDES

Hans Hoeft, Tegerheim, Germany, and Jack Bernstein, New Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

No Drawing. Continuation-in-part of application Ser. No. 62,674, Aug. 10, 1970. This application Nov. 4, 1971, Ser. No. 195,808

Int. Cl. C07d 57/04

U.S. Cl. 260—293.6

5 Claims

New 5-carboxamides of pyrazolo[3,4-b]pyridines and salts thereof are useful as ataractic, analgesic and anti-inflammatory agents.



3,733,329

**PROCESS FOR THE PREPARATION OF 2- AND 3-AZA-CHOLESTANE-DERIVATIVES**

Zoltan Tuba and Maria Bor, nee Szabo, Budapest, Hungary, assigns to Richter Gedeon Vegyeszeti Gyar R. T., Budapest, Hungary

No Drawing. Filed June 14, 1971, Ser. No. 152,973

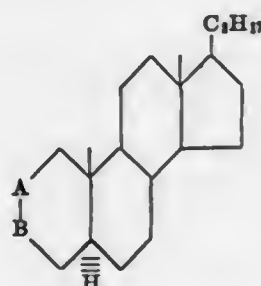
Claims priority, application Hungary, June 18, 1970, 395

Int. Cl. C07d 39/00

U.S. Cl. 260—293.54

7 Claims

The invention relates to a process for the preparation of cholestane derivatives with a nitrogen atom in 2 or 3 position, having the general formula



wherein A and B stand for a carbonyl, methylene or imino or N-methylimino group, with the restriction, that within one compound A and B are different, but either A or B stands for an imino or N-methylimino group in each case.

3,733,330

**BENZOMORPHAN DERIVATIVES**

Hans-Werner Schubert and Friedrich Hoffmeister, Wuppertal-Elberfeld, Germany, assigns to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 14, 1970, Ser. No. 37,331

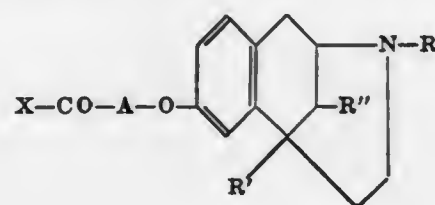
Claims priority, application Germany, May 17, 1969, P 19 25 296.1

Int. Cl. C07d 39/00

U.S. Cl. 260—293.54

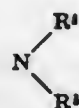
9 Claims

Benzomorphanes of the formula:



wherein

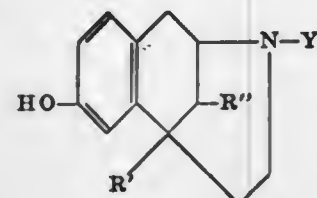
R is methyl, cyclopropylmethyl or cyclobutylmethyl; R' and R'' are the same or different, and are straight or branched chain hydrocarbons of 1 to 5 carbon atoms; X is OH, OR''' or



wherein

R''' is a straight or branched chain, saturated or unsaturated hydrocarbon of 11 to 11 carbon atoms; R4 and R5 are the same or different, and are hydrogen, a straight or branched chain, saturated hydrocarbon of 1 to 4 carbon atoms, or R4 and R5 together with the nitrogen atom form a 5- or 6-membered heterocyclic ring which may have oxygen as a second heteroatom; and

A is a bivalent, straight or branched chain, saturated or unsaturated hydrocarbon of 1 to 10 carbon atoms, said hydrocarbon substituted by 1 or more phenyl moieties, or said hydrocarbon substituted by 1 or more alkyl, alkoxy, halogen, nitro or acylamino substituted phenyl moieties, and pharmaceutically acceptable non-toxic salts thereof are produced by reacting a benzomorphan of the formula:



wherein

R' and R'' are as above defined, and Y is hydrogen, methyl, cyclopropylmethyl, cyclobutylmethyl, or the moiety —CO—R4,

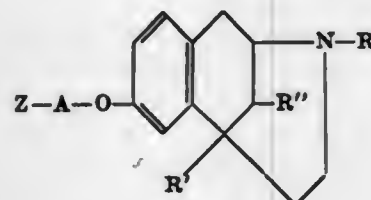
wherein

R4 is cyclopropyl or cyclobutyl, in the presence of an acid-binding agent, or by reacting said benzomorphan in the form of a metal or ammonium salt with a reactive ester of a hydroxy compound of the formula:



wherein

A is as above defined, and Z is CO—X or CN to give a compound of the formula.



wherein

R, R', R'', A and Z are as above defined, and in the case where Z is CN, converting this group into the corresponding CO—H group and if Y is hydrogen or —CO—R4, converting said hydrogen or said moiety into a methyl, cyclopropylmethyl or cyclobutylmethyl moiety.

The benzomorphanes are useful as analgesics.

3,733,331

**ACYLATED N-(ALKYLAMINOALKYL)-AMINOPYRIDINES**

Rudolf Hiltmann, Hartmund Wollweber, and Friedrich Hoffmeister, Wuppertal-Elberfeld, and Hans-Gunther Kroneberg, Wuppertal-Vohwinkel, Germany, assigns to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation-in-part of abandoned application Ser. No. 761,794, Sept. 23, 1968. This application Nov. 30, 1970, Ser. No. 93,844

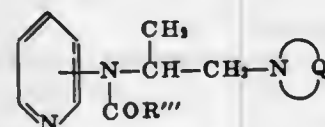
Claims priority, application Germany, Sept. 25, 1967, P 19 70 929.8

Int. Cl. C07d 39/00

U.S. Cl. 260—293.54

12 Claims

Novel and improved analgetics are provided of the formula:



in which R''' is hydrogen or alkyl or alkenyl of 1-4 carbon atoms, and



is azabicyclo substituted or not by one or more alkyl groups or such having a double bond, and unacylated intermediates for said analgetics.

3,733,332

**HALOGENATED CYANOACETIC ACID PIPERIDIDE**

Werner Toepfl, Basel, and Hans-Rudolf Hitz, Muttentz, Switzerland, assigns to Ciba-Geigy AG

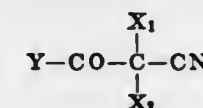
No Drawing. Original application July 30, 1965, Ser. No. 476,192, now Patent No. 3,557,184. Divided and this application Sept. 8, 1970, Ser. No. 70,139

Int. Cl. C07d 29/32

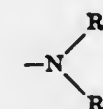
U.S. Cl. 260—293.86

2 Claims

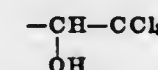
New pesticidal preparations are provided which contain as the active component a compound represented by the formula:



wherein X1 and X2 represent hydrogen or halogen, and Y represents the radical —OR where R stands for an alkyl or chloralkyl radical containing up to 18 carbon atoms or the radical.



in which R1 and R2 are identical or different and each represents hydrogen or alkyl, alkoxyalkyl, dialkylaminoalkyl, cyclohexyl, or for a phenyl radical or for the radical of the formula



or, together with the nitrogen atom, form a morpholine, piperidine or piperazine ring which latter is substituted by the radical —CO—CCl2—CN together with a suitable carrier. The preparation may contain one or several of the following additives: solvents, diluents, dispersants, wetting agents, adhesives and other pesticides.

3,733,333

**SUBSTITUTED 1-AMINO 4,9-DIHYDRO-3H-PYRIDO[3,4-b]INDOLES AND PROCESS FOR THEIR PREPARATION**

Otto Behner and Walter Puls, Wuppertal-Elberfeld, Germany, assigns to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Apr. 27, 1971, Ser. No. 137,991 Claims priority, application Germany, May 2, 1970, P 20 21 519.4

Int. Cl. C07d 31/42

U.S. Cl. 260—296 A

15 Claims

4,9-dihydro-3H-pyrido[3,4-b]indoles bearing a substituted amino group in the 1-position and their salts possess antihyperglycemic properties. The compounds are prepared through treatment of certain reactive derivatives of 1-oxo-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indoles with an amine or through cyclization of an appropriately substituted 3-(2-ureidoethyl)-indole or the corresponding thioureido compound. A typical embodiment is 1-(3,5-dimethylpyrazol-4-ylamino)-4,9-dihydro-3H-pyrido[3,4-b]indole.

3,733,334

**1,3,2-OXAZABORINIDES AND METHOD FOR PREPARING THE SAME**

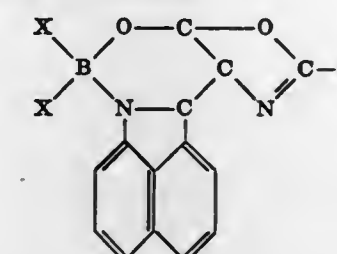
Thuralrajah Padmanathan, Highland Park, N.J., assignor to American Cyanamid Company, Stamford, Conn. No Drawing. Continuation-in-part of application Ser. No. 732,045, May 27, 1968, now Patent No. 3,621,023, dated Nov. 16, 1971. This application Apr. 19, 1971, Ser. No. 135,361

Int. Cl. C07d 85/36

U.S. Cl. 260—307 F

2 Claims

Compounds of the formula



wherein both X's are the same and represent either fluoro or acetoxy and R represents methyl, phenyl or acetylaminophenyl. These compounds are characterized by affinity for polyesters, nylon and acetate when applied by disperse dyeing methods and fluoresce on the fiber.

3,733,335

**INDAZOLONE MAGENTA COUPLERS**

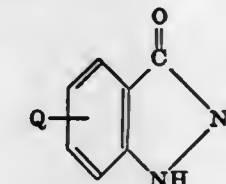
Brian Anderson, Bury, England, assignor to Ilford Limited, Ilford, Essex, England No Drawing. Filed Jan. 6, 1971, Ser. No. 104,510 Claims priority, application Great Britain, Jan. 7, 1970, 823/70

Int. Cl. C07d 49/04

U.S. Cl. 260—310 A

1 Claim

This application describes an indazolone magenta coupler of the formula:



where Q is either a group —NH—R wherein R is an acyl group containing a nitrogen atom to which there is attached either directly or via a phenyl group an alkyl residue of at least 10 carbon atoms, together with a free carboxylic acid group or a group which can liberate a free carboxylic acid group or Q is a group —N<(T) wherein T is an acyl group which is attached to the nitrogen atom by a cyclic imide linkage, the group T containing an alkyl residue of at least 10 carbon atoms, the ring to which Q is attached optionally containing other substituents.

3,733,336

**PROCESS FOR THE PRODUCTION OF 5,6-DIHYDRO-2H-THIOPYRAN-3-CARBOXALDEHYDE**

Hans Wagner and Klaus W. Udluft, Konstanz, Germany, assigns to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany No Drawing. Filed Apr. 6, 1970, Ser. No. 26,160 Claims priority, application Germany, Apr. 17, 1969, P 19 19 504.1

Int. Cl. C07d 65/08

U.S. Cl. 260—327 TH

13 Claims

5,6-dihydro-2H-thiopyran-3-carboxaldehyde is produced by reacting acrolein with hydrogen sulfide in the presence of a small amount of a basic or acidic catalyst followed by treating the reaction product with a large amount of an acid.



3,733,337

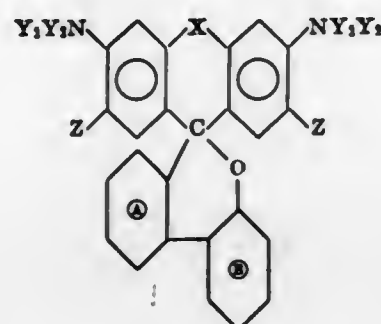
**DIAMINO-XANTHENE (OR THIOXANTHENE)-SPIRODIBENZOPYRANES**

Heinz Balli, Riehen, and Ulf Krueger, Binningen, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Dec. 16, 1970, Ser. No. 98,879  
Claims priority, application Switzerland, Dec. 23, 1969, 19,172/69; Nov. 3, 1970, 16,229/70

Int. Cl. C07d 7/42, 65/16

U.S. Cl. 260—328 7 Claims  
A 3',6'-diamino-xanthene (or thioxanthene)-9'-spiro-6-dibenzo-[b,d]-pyrane compound of General Formula I



wherein X represents an oxygen atom or a sulphur atom, Y<sub>1</sub> and Y<sub>2</sub>, which may be the same or different, each represents an alkyl or aryl radical and Z represents a hydrogen atom or an alkyl group, and wherein the benzene rings A and B may contain alkyl groups, halogen atoms and sulphonic acid groups as substituents.

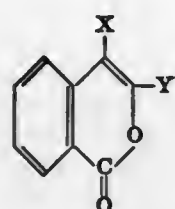
3,733,338

**1-OXO-ISOCHROMENES**

Masayasu Kimura and Masaya Kokubo, Toyama-ken, Japan, assignors to Ikeda Pharmaceutical Industry Co., Ltd.

No Drawing. Filed July 29, 1971, Ser. No. 167,473  
Int. Cl. C07d 7/18

U.S. Cl. 260—343.2 R 4 Claims  
Compounds of the formula



wherein X is a phenyl group having a substituent selected from alkoxy, halogen, hydroxy or amino groups, and Y is a hydrogen atom or a carboxyl group, are useful as medicines for humans and animals because of their high anti-allergic properties.

3,733,339

**DISUBSTITUTED PROPIONAMIDES**

Bruce Wayne Horrom, Wankegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.  
No Drawing. Continuation-in-part of application Ser. No. 684,492, Nov. 20, 1967. This application Oct. 5, 1970, Ser. No. 78,283

Int. Cl. C07d 13/10

U.S. Cl. 260—340.5 1 Claim  
A novel series of N-substituted 3-halo-2,2-dimethylpropionamides. The compounds are useful as intermediates for preparing substituted 1-(phenylisopropyl)-3,3-dimethyl azetidines. These azetidine compounds exhibit marked activity as anorectic agents.

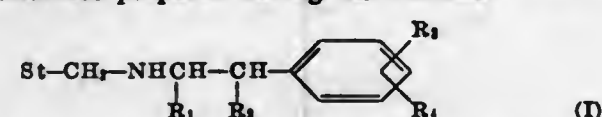
3,733,340

**BASIC SUBSTITUTED KETOSTEROIDS**

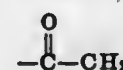
Kurt Thiele, Frankfurt am Main, and Klaus Posselt, Bergen-Enkheim, Germany, assignors to Deutsche Gold- und Silber-Schmelzanstalt vormals Roessler, Frankfurt am Main, Germany

No Drawing. Filed Aug. 10, 1970, Ser. No. 62,619  
Int. Cl. C07c 169/20, 169/32

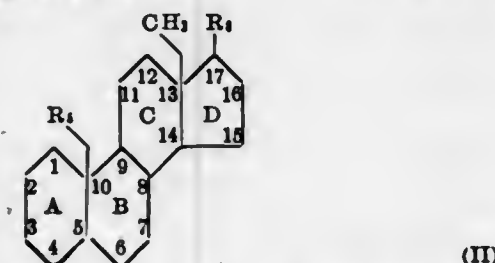
U.S. Cl. 260—397.4 12 Claims  
Compounds are prepared having the formula



where R<sub>1</sub> is hydrogen or lower alkyl, R<sub>2</sub> is hydrogen or hydroxyl, R<sub>3</sub> and R<sub>4</sub> are hydrogen, halogen, hydroxy, lower alkyl or lower alkoxy and St is a steroid radical which is connected to the methylene group by the grouping



of the ring A, B, C or D or by a side chain R<sub>4</sub>, said steroid having the general formula



which is derived from etiocholanone or etioallocholanone series, the connection with the basic portion of the molecule being either a ring carbon atom or the C-17 side chain, the steroid being either unsubstituted or containing one or more hydroxy, lower alkoxy, lower alkyl, or acyloxy groups, e.g. lower alkanoyloxy or benzoyloxy and containing either no double bonds or containing one or more double bonds, ring A or both rings A and B can be aromatic, R<sub>5</sub> is methyl or a double bond, and R<sub>6</sub> either forms a keto group with the No. 17 ring carbon atom or is hydrogen or an alkyl group of 1 to 12 carbon atoms, or alkenyl or alkynyl of 2 to 12 carbon atoms. The compounds can be prepared as optically active or diastereometric forms or as salts. They are useful primarily in the pharmaceutical field, e.g. to increase coronary blood flow.

3,733,341

**STABILIZING THE COLOR OF NEO-CARBOXYLIC ACIDS**

Robert Drogan, Linden, N.J., assignor to Esso Research and Engineering Company  
Filed Nov. 19, 1968, Ser. No. 776,929

Int. Cl. C11b 5/00

U.S. Cl. 260—398.5 8 Claims  
The color stability of C<sub>8</sub> to C<sub>13</sub> neo-acids in storage is achieved by the addition of small amounts of a material selected from the group consisting of 2,6-di-tertiary butyl p-cresol, hydroquinone monomethyl ether, 2,6-di-octadecyl p-cresol and p,p'-di-octyl diphenylamine.

3,733,342

**SEPARATION OF ACIDS**

Bertram Yeomans, Hesse, England, assignor to BP Chemicals Limited, London, England  
No Drawing. Filed Dec. 14, 1970, Ser. No. 98,006  
Claims priority, application Great Britain, Dec. 17, 1969, 61,393/69

Int. Cl. C09f 5/10

U.S. Cl. 260—419 11 Claims  
Di-neo acids and mono-neo acids are separated by treating a solution containing mono- and di-neo acids in

a water-immiscible organic solvent with an aqueous alkaline solution to extract the di-neo acid.

3,733,343

**CONTINUOUS PROCESS FOR THE SEPARATION OF MIXTURES OF FATTY ACID ESTERS OF DIFFERENT MELTING POINTS**

Helmut Hartmann, Langenfeld, and Werner Stein, Erkrath-Unterbach, Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed Dec. 30, 1970, Ser. No. 102,712

Claims priority, application Germany, Oct. 30, 1970, P 20 53 257.4

Int. Cl. C09f 5/10

U.S. Cl. 260—428 8 Claims  
The invention relates to an improvement of the known continuous process for the separation of solid and liquid fatty acid esters, in which the starting mixture by treating with an aqueous wetting agent solution is converted to a dispersion of liquid fatty acid esters and solid fatty ester particles, the formed dispersion is separated by centrifuging into two phases of different specific weights, the lighter phase consists substantially of the liquid fatty acid esters and the heavier phase of a dispersion of the solid fatty ester particles in the aqueous wetting agent solution. After separation of this suspension the wetting agent solution is returned to the process. The improvement consists in withdrawing a part of the recycling wetting agent solution from the cycle and replacing it with fresh wetting agent solution.

3,733,344

WITHDRAWN

3,733,345

**ORGANO-MOLYBDENUM PHOSPHORODITHIOATES AND METHOD FOR PRODUCING SAME**

Vincent Chiola, Towanda, Phyllis R. Dodds, Wysox, and Tai K. Kim, North Towanda, Pa., assignors to GTE Sylvania Incorporated

No Drawing. Continuation-in-part of application Ser. No. 757,786, Sept. 5, 1968. This application Aug. 10, 1970, Ser. No. 62,667

Int. Cl. C07f 11/00

U.S. Cl. 260—429 K 4 Claims

Organo-molybdenum phosphorodithioates which contain the desired organic, molybdenum, phosphorus and sulfur groups useful as additives to an oil of lubricating viscosity, are disclosed and a process for preparing same, which process comprises contacting an aqueous solution containing the phosphorodithioic acid and an organic solvent, thereby extracting the molybdenum into the organic solution and thereafter removing the organic solvent to thereby recover the molybdenum phosphorodithioates.

3,733,346

**WERNER CHROMIUM COMPLEXES AND METHOD FOR THEIR PREPARATION**

John Edwin Bride, Mentor, Ohio, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Feb. 19, 1971, Ser. No. 117,044

Int. Cl. C07f 11/00

U.S. Cl. 260—438.5 C 13 Claims

A Werner complex composition has trivalent chromium atoms coordinated with acido groups and fluorine atoms. The acido groups are from saturated aliphatic dicarboxylic acids having less than six carbon atoms and that may contain hydroxyl groups, but not more than three hydroxy groups. The complexes are characterized by a specific range for the ratio of both the chromium atoms to acido groups as well as chromium atoms to fluorine atoms. The complex composition is useful in prepar-

3,733,347

**WERNER CHROMIUM COMPLEXES AND METHODS FOR THEIR PREPARATION**

John Edwin Bride, Mentor, Ohio, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Feb. 19, 1971, Ser. No. 117,046

Int. Cl. C07f 11/00

U.S. Cl. 260—438.5 C 13 Claims

A Werner complex composition has trivalent chromium atoms coordinated with acido groups and fluorine atoms. The acido groups are from aliphatic, hydroxy-containing, monocarboxylic acids having less than six carbon atoms and not more than three hydroxyl groups. The complexes are characterized by a specific range for the ratio of both the chromium atoms to acido groups as well as chromium atoms to fluorine atoms. The complex composition is useful in preparing chromium plating baths that have a bright plating range that is unique in the history of decorative chromium plating.

3,733,348

**NICKEL COMPLEXES FROM AROMATIC OXIMES CONTAINING PHENOLIC GROUPS**

Peter James Briggs and Ronald James Hurlock, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Original application Oct. 17, 1966, Ser. No. 586,947. Divided and this application Jan. 27, 1969, Ser. No. 807,168

Claims priority, application Great Britain, Oct. 21, 1965, 44,655/65

Int. Cl. C07f 15/04; C08f 45/62

U.S. Cl. 260—439 3 Claims

Nickel chelate compounds of substituted orthohydroxy phenyl, substituted orthohydroxy- $\alpha$ -naphthyl and substituted orthohydroxy- $\beta$ -naphthyl ketoximes are prepared from the ketoxime in which the oxime group is in the syn-position with respect to the group other than the substituted orthohydroxy-phenyl or -naphthyl group by reaction with nickel salts.

3,733,349

**FLUOROCARBON CYANATES**

Basil L. Loudas, St. Paul, and Herward A. Vogel, Oakdale, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Original application July 1, 1968, Ser. No. 741,308, now abandoned. Divided and this application Mar. 30, 1971, Ser. No. 129,559

Int. Cl. C07c 119/04

U.S. Cl. 260—453 AL 7 Claims

Methylol-terminated fluorocarbons are reacted with cyanogen halides to produce fluorocarbon cyanates which can be polymerized to produce polyfluorocyanurates having chemical resistance and thermal stability and useful in making shaped plastic or elastomeric articles.

3,733,350

**LOW OUTGASSING POLYDIMETHYLSILOXANE MATERIAL AND PREPARATION THEREOF**

Benjamin Seidenberg, Baltimore, Md., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

No Drawing. Filed Feb. 15, 1972, Ser. No. 226,551

Int. Cl. C08f 11/04

U.S. Cl. 260—46.5 R 7 Claims

A fluid polydimethylsiloxane resin having improved outgassing properties in cured state consisting essentially



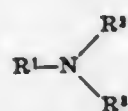
of: a first polydimethylsiloxane oligomer having a weight average molecular weight,  $\bar{M}_w$ , of about 1800 to 2900 and a number average molecular weight,  $\bar{M}_n$ , of about 1500 to 2500; a second polydimethylsiloxane oligomer having a weight average molecular weight,  $\bar{M}_w$ , of about 10,000 to 12,000 and a number average molecular weight  $\bar{M}_n$  of 19,500 to 21,500; and a third polydimethylsiloxane oligomer having a weight average molecular weight,  $\bar{M}_w$ , of about 1,780,000 to 1,800,000 and a number average molecular weight,  $\bar{M}_n$ , of about 850,000 to 870,000.

The fluid polydimethylsiloxane resin of the invention is obtained by pouring to a height of up to about 2 inches a starting polydimethylsiloxane resin such as General Electric Company's RTV-602 silicone resin and devolatilizing the starting resin at a temperature of about 125 to 150° C. under a vacuum of at least  $10^{-5}$  torr.

### 3,733,351 PRODUCTION OF 2-METHYLENE-GLUTARONITRILE

Yoshihisa Watanabe and Makoto Takeda, Inashiki-gun, Ibaraki-ken, Japan, assignors to Mitsubishi Petrochemical Company, Limited, Tokyo-to, Japan  
No Drawing. Filed Apr. 25, 1969, Ser. No. 819,472  
Claims priority, application Japan, Apr. 30, 1968, 43/28,989; Sept. 21, 1968, 43/68,513  
Int. Cl. C07c 121/20, 121/30

U.S. Cl. 260—465.8 D 7 Claims  
Catalytic dimerization of acrylonitrile is carried out with the use, as the catalyst, of a combination of one or more metal halogenides or metal halides, e.g., a metal chloride, and one or more trialkylamines. The metal halogenides are each representable by the general formula  $MeX_n$  (where Me is zinc, aluminum, titanium, vanadium, iron, or cobalt, X is a halogen, and n is equal to the valence of the metal Me), and the trialkylamines are each representable by the general formula



(where  $R^1$ ,  $R^2$ , and  $R^3$  are respectively alkyl groups).

### 3,733,352 PREPARATION OF D-THREO-1-p-METHYLSULFONYLPHENYL-2-DICHLORO-ACETAMIDOPROPANE-1,3-DIOL

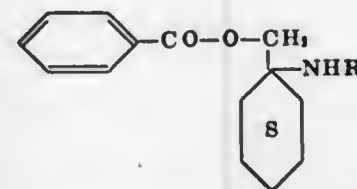
Hisao Akiyama, Nishinomiyashi, Hisao Tobiki, Toyonaki-shi, Toru Mitani, Nishinomiyashi, Yasuharu Miura, Ikeda-shi, and Hiroyuki Suzuki, Takarazuka-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Higashi-ku, Osaka, Japan  
No Drawing. Filed July 23, 1969, Ser. No. 844,206  
Int. Cl. C07c 147/10

U.S. Cl. 260—470 5 Claims  
p-Methylsulfonylbenzaldehyde (2 moles) is reacted with an alkali metal salt of glycine (1 mole) in an alcohol in the presence of an alkali metal carbonate, and the thus obtained  $\beta$ -p-methylsulfonylphenylserine is reacted with an alcohol in the presence of an acid to give an ester of optically inactive threo- $\beta$ -p-methylsulfonylphenylserine. This optically inactive ester is optically resolved with d-tartaric acid. D-form ester thereof is reduced by calcium chloride and sodium borohydride, and the thus obtained calcium salt of D-threo-1-p-methylsulfonylphenyl-2-amino-1,3-propane-diol boron complex is contacted with an alkali metal cyanide and chloral in water to obtain thiamphenicol. Further, the L-form threo ester obtained by the optical resolution can easily be racemized when hydrolyzed and then heated at 30°–150° C. at pH 8–11.

### 3,733,353 1-AMINOCYCLOHEXANEMETHYL BENZOATES

Julian R. Reasenberg, Brooklyn, and Rubin Drucker, Rosedale, N.Y., assignors to Mizzy Inc., New York, N.Y.  
No Drawing. Application Apr. 22, 1970, Ser. No. 28,295, which is a continuation of application Ser. No. 848,394, July 23, 1969, which in turn is a continuation of application Ser. No. 379,375, June 30, 1964. Divided and this application Jan. 27, 1971, Ser. No. 110,303  
Int. Cl. C07c 93/24

U.S. Cl. 260—477 5 Claims  
Compounds useful as local anesthetics having the formula:



wherein R is a member selected from the group consisting of hydrogen and alkyl wherein said alkyl is a member selected from the group consisting of straight and branched chain saturated aliphatic hydrocarbon groups.

### 3,733,354 PROCESS FOR THE PREPARATION OF CARBOXYLATED AROMATIC COMPOUNDS

Luigi Cassar and Marco Foa, Novara, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy  
No Drawing. Filed Oct. 16, 1970, Ser. No. 81,624  
Claims priority, application Italy, Oct. 20, 1969, 23,584/69  
Int. Cl. C07c 63/00

U.S. Cl. 260—515 R 8 Claims  
A process is disclosed for the preparation of carboxylated aromatic compounds by the reaction of simple or substituted aromatic chlorides, bromides and iodides, with carbon monoxide and a compound containing activated hydrogen selected from the class consisting of water, alcohols and amines, and in the presence of nickel-tetracarbonyl, wherein the reaction is carried out in an organic solvent medium having a high dielectric constant, in the presence of a basic compound, under substantially ambient pressure, and at a temperature between 20° and 130° C.

### 3,733,355 PRODUCTION OF NITRILOTRIACETIC ACID AND THE ANALOGS THEREFOR

Edward E. Harris, Niagara Falls, and James J. Hodan, Williamsville, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.  
No Drawing. Continuation of application Ser. No. 587,970, Oct. 20, 1966. This application July 28, 1970, Ser. No. 64,097  
Int. Cl. C07c 101/20

U.S. Cl. 260—534 E 11 Claims  
An improved process for the production of nitrilotriacetic acid is provided. In this process e.g., metal cyanide and formaldehyde are premixed for from about 0.1 to about 100 seconds, and this premixture is then reacted with ammonia. A substantial increase in the yield of the desired product is obtained via this process.

### 3,733,356 PROCESS FOR THE PREPARATION OF CIS-1-PROPENYLPHOSPHONIC ACID

Edward J. Glamkowski, Plainfield, Carlos B. Rosas, Rahway, Meyer Slettinger, North Plainfield, and Joseph A. Wantuck, Woodbridge, N.J., assignors to Merck & Co., Rahway, N.J.  
No Drawing. Filed Dec. 29, 1969, Ser. No. 888,864  
Int. Cl. C07f 9/38, 9/42

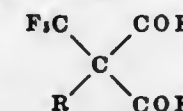
U.S. Cl. 260—543 P 3 Claims  
Cis-1-propenylphosphonic acid is prepared by reacting propargyl alcohol with an excess of phosphorus trichloride

ride at elevated temperature to form 2-propynylphosphorodichloridite which is thermally rearranged to propadienylphosphonic dichloride. The latter compound is catalytically hydrogenated and then hydrolyzed to cis-1-propenylphosphonic acid, which is useful in preparing antibacterial materials.

### 3,733,357 PERFLUOROMALONYL FLUORIDES

David Charles England, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.  
No Drawing. Filed Feb. 18, 1972, Ser. No. 227,614  
Int. Cl. C07c 55/08

U.S. Cl. 260—544 F 7 Claims  
Disclosed herein are compounds of the formula

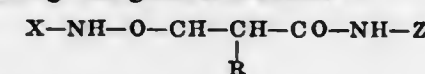


wherein R is F or  $\text{CF}_3$ ; and a process therefor comprising reacting carbonyl fluoride with a perfluoro compound selected from perfluoroacrylyl fluoride, perfluoromethacrylyl fluoride and perfluorodimethylketene, in the presence of an alkali metal fluoride catalyst; and their use as waterproofing agents.

### 3,733,358 ALFA-AMINOXY-CARBOXYLIC AMIDE DERIVATIVES

Lajos Kisfaludy, Agnes Patthy, nee Lukats, Lajos Dancsi, Gyorgy Fekete, and Istvan Szabo, Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyan Rt., Budapest, Hungary  
No Drawing. Filed Dec. 28, 1970, Ser. No. 102,228  
Int. Cl. C07c 103/38, 103/30

U.S. Cl. 260—558 A 4 Claims  
 $\alpha$ -Aminoxy-carboxylic acid amides of tuberculostatic activity, having the general formula



wherein

X represents hydrogen atom or an acyl group,  
R represents hydrogen atom or an unsubstituted or substituted alkyl, aralkyl or aryl group,  
Z represents an unsubstituted or substituted alkyl group of 1 to 15 carbon atoms, a cycloalkyl, aryl or aralkyl group, an unsubstituted or substituted aryl group or a heterocyclic radical

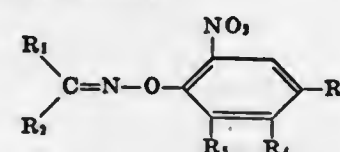
and their pharmaceutically acceptable acid addition salts.

### 3,733,359 OXIME ETHERS AND PESTICIDAL PREPARATIONS CONTAINING THEM

Adolf Hubele, Riehen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland  
No Drawing. Continuation-in-part of application Ser. No. 521,413, Jan. 18, 1966. This application June 16, 1970, Ser. No. 46,832

Claims priority, application Switzerland, Jan. 22, 1965, 915/65; July 9, 1965, 9,630/65  
Int. Cl. C07c 131/00

U.S. Cl. 260—566 AE 3 Claims  
New oxime ethers and pesticidal and herbicidal preparations containing them are disclosed. The oxime ethers correspond to the formula



wherein  $R_1$  is a hydrogen atom or a lower alkyl radical;  $R_2$  is aliphatic, cycloaliphatic, araliphatic, aromatic or heterocyclic radical; or wherein  $R_1$  and  $R_2$  form part of a saturated or unsaturated carbocycle or a 5-, 6- or 7-

membered heterocycle;  $R_3$  is a nitro, trifluoromethyl, formyl, lower carbalkoxy, sulfamyl or mono- or di-lower alkylsulfamyl radical;  $R_4$  and  $R_5$  each is a hydrogen or halogen atom, an amino, mono- or di-lower alkyl-amino, lower alkoxy, cycloalkoxy, lower alkylthio, nitro, lower carbalkoxy, arylthio, lower aralkylthio group or 5-, 6- or 7-membered heterocycle.

### 3,733,360 PROCESS FOR PREPARING TETRAKIS (DIFLUORAMINO) METHANE

William Charles Firth, Jr., 192 Cheese Spring Road, Wilton, Conn. 06897, and Simon Frank, 34 Hazelwood Lane, Stamford, Conn. 06905  
No Drawing. Original application May 9, 1963, Ser. No. 280,492. Divided and this application Oct. 22, 1965, Ser. No. 505,307  
Int. Cl. C07c 87/22

U.S. Cl. 260—583 NH 1 Claim  
The invention is to a process for preparing tetrakis-(difluoramino)methane, useful as a fuel for rocket propulsion, which comprises reacting bis(difluoramino)fluoraminomethyl isocyanate with fluorine.

### 3,733,361 OXO PROCESS

John F. Deffner, Glenshaw, Edmond R. Fucci, Pittsburgh, and John V. Ward, Oakmont, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.  
No Drawing. Filed Aug. 23, 1966, Ser. No. 574,302  
Int. Cl. C07c 45/08

U.S. Cl. 260—604 F 8 Claims  
An oxo process wherein an olefin is reacted with hydrogen and carbon monoxide in the presence of a cobalt carbonyl and a trioxaphosphinebicyclooctane, preferably in the presence of a trialkyl amine.

### 3,733,362 VAPOR PHASE CARBONYLATION

Giovanni Biale, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.  
No Drawing. Filed Mar. 19, 1968, Ser. No. 714,348  
Int. Cl. C07c 45/08

U.S. Cl. 260—604 HF 8 Claims  
A gas phase carbonylation reaction is provided wherein a gas mixture of a low molecular weight olefin, carbon monoxide, and a coreactant such as an alcohol, amine, water or hydrogen is contacted in the vapor phase with a heterogeneous catalyst comprising a Group VIII metal and a biphilic ligand which is supported in the reaction zone on a suitable inert solid support such as silica or alumina. In a typical application, propylene is hydroformylated to butyraldehyde by the contacting of a gas mixture of propylene, carbon monoxide and hydrogen with a tris (triphenylphosphine)rhodiumhydridecarbonyl catalyst impregnated on silica pellets. The reaction is performed at 400 p.s.i.g. and about 280° F. to produce an excellent yield of butyraldehyde having a high normal to iso ratio.

### 3,733,363 PROCESS FOR PREPARING A PHOSPHORYLATED ALPHA-OLEFIN POLYMER

Thomas J. Clough, Webster Grove, Mo., assignor to Atlantic Richfield Company, New York, N.Y.  
No Drawing. Original application Apr. 11, 1967, Ser. No. 629,929, now Patent No. 3,650,953. Divided and this application Aug. 5, 1971, Ser. No. 169,527  
Int. Cl. C07f 9/28

U.S. Cl. 260—606.5 P 11 Claims  
A phosphorus halide (e.g.  $\text{PCl}_3$ ) is present during the Friedel-Crafts polymerization in a monochloroalkane solvent (e.g. ethylchloride) of an alpha-monoalkene, resulting in the in situ formation of a phosphorylated polymer. Further reaction of the polymer with a polymaine converts phosphoryl groups to phosphonamide groups, yielding a product which is useful as a lube oil detergent.



3,733,364

**5-CHLORO-2-ETHYNYLBENZYL METHYL SULFOXIDE AND ITS PREPARATION**

Joseph Albert Meschino, Doylestown, and James Nelson Plampin, Roslyn, Pa., assignors to McNeil Laboratories, Inc.

No Drawing. Filed Feb. 25, 1971, Ser. No. 118,977  
Int. Cl. C07c 147/02

U.S. Cl. 260—607 A

3 Claims

Preparation of (i) 5-chloro-2-ethynylbenzyl methyl sulfoxide, useful for its muscle relaxant activity, by the reaction of methylsulfinyl carbanion with p-chlorobenzotri-fluoride, and (ii) 2-methyl-sulfonylmethyl-4-chloroben-zoic acid by the oxidation of (i).

3,733,365

**PROCESS FOR ORTHO-ALKYLATION**

Ernest Leon Yeakey and Clarence Edward Keller, Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

No Drawing. Filed May 5, 1969, Ser. No. 821,971  
Int. Cl. C07c 39/06

U.S. Cl. 260—624 C

9 Claims

Aromatic compounds such as hydroxyaromatics and aromatic amines are selectively ortho-alkylated with an olefin in the presence of a catalyst of a polymeric alumin-um alcoholate, aluminum hydroxide condensed with an aluminum alcoholate, or active alumina activated with an aluminum alcoholate. The ortho-alkylated products of our invention are used industrially as antidegradants for materials subject to degradation caused by oxygen or ozone.

3,733,366

**PREPARATION OF WHITE BROMINATED BIPHENYL**

George A. Burk, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Dec. 21, 1970, Ser. No. 100,349  
Int. Cl. C07c 25/18

U.S. Cl. 260—649 D

7 Claims

It has been found that discolored brominated biphenyl which is prepared by brominating biphenyl with bromine or bromine chloride in the presence of a Friedel-Crafts catalyst is decolorized by heating at a temperature between about 100° and the temperature at which the product discolors.

3,733,367

**PROCESS FOR THE SEPARATION OF STYRENE FROM ETHYL BENZENE**

Eli Perry, St. Louis, and William F. Strazik, St. Ann, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Mar. 8, 1972, Ser. No. 232,967  
Int. Cl. C07c 7/02, 15/10

U.S. Cl. 260—669 A

5 Claims

Styrene is separated from organic mixtures comprising styrene and ethylbenzene by contacting the mixture against one side of a cyanoethyl cellulose membrane withdrawing at the other side a vaporous mixture having increased styrene concentration. The cyanoethyl cellulose employed preferably has a degree of substitution (D.S.) of from about 0.5 to 3.0.

3,733,368

**PROCESS FOR THE SEPARATION OF POLYMERS FROM A RECYCLE STREAM THAT CONTAINS ETHYLENE**

Delwin E. Dodd, San Ramon, Kuel-Jung Li, Oakland, and Robert A. Golding, San Rafael, Calif., assignors to Shell Oil Company, New York, N.Y.

Filed July 2, 1971, Ser. No. 159,326

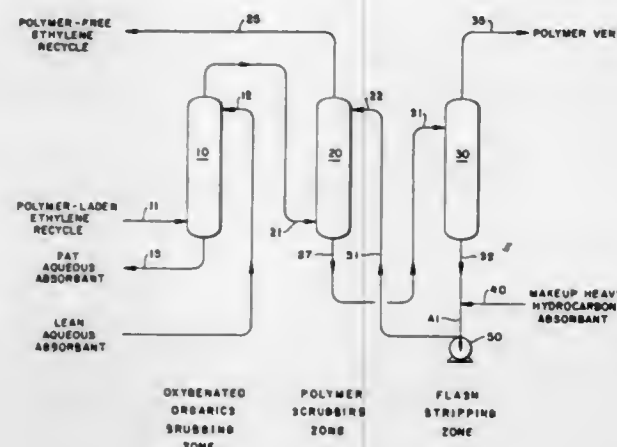
Int. Cl. C07c 11/12

U.S. Cl. 260—677 A

10 Claims

Contaminating quantities of C<sub>4</sub>+ hydrocarbon poly-mers are removed from recycle ethylene in the process for catalytic hydration of ethylene by

(a) washing at least a portion of the total gaseous recycle stream with an aqueous absorbant in a first scrubbing zone to produce a polymer-rich ethylene overhead; and



(b) scrubbing the polymer-rich ethylene with a lean, heavy hydrocarbon absorbant in a second scrubbing zone to produce an ethylene overhead substantially free of polymers.

3,733,369

**PRODUCTION OF 2-METHYL-6-ETHYL-HEPTA-2,6-DIENE**

Lawrence H. Shepherd, Jr., Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

No Drawing. Original application May 5, 1969, Ser. No. 822,046, now Patent No. 3,634,482. Divided and this application July 26, 1971, Ser. No. 164,852  
Int. Cl. C07c 1/00, 11/12

U.S. Cl. 260—680 R

2 Claims

Nonionic organoaluminum compounds possessing an aluminacycloalkene moiety are prepared by causing interaction among aluminum, a conjugated diene (e.g., butadiene), an alkali metal aluminum tetrahydrocarbyl (e.g., sodium aluminum tetraethyl), and hydrogen, the reaction being conducted in the presence of a Lewis base (e.g., 1,4-dioxane) which is not excessively cleaved under the reaction conditions selected.

3,733,370

**UNSATURATED ESTER GROUP TERMINATED POLYDIENES AS UNSATURATED POLYESTER MODIFIERS**

Ronald E. Thompson, Park Forest, Ill., and Patrick W. Ryan, Glen Mills, Pa., assignors to Atlantic Richfield Company, Philadelphia, Pa.

No Drawing. Filed May 6, 1971, Ser. No. 140,938  
Int. Cl. C08f 43/02, 43/08, 29/12

U.S. Cl. 260—862

14 Claims

Polyester resins of increased flexibility and strength are obtained by mixing usually liquid, unsaturated polyesters with certain, usually liquid, polymerizable polydiene ethylenically-unsaturated esters having terminal, allylic, acyloxy groups, such as acryloxy, which are terminally ethylenically-unsaturated, thereby forming usually liquid polymerizable compositions which are polymerizable to solid polymers. Commercial unsaturated polyester resins containing 0 to about 75% by weight of styrene can be used. From about 5 to 95% of the polymerizable polydiene ethylenically-unsaturated ester can be used in the

composition, although usually about 10 to 50% by weight is preferred.

3,733,371

**IRIDESCENT COMPOSITION AND METHOD OF ITS PREPARATION**

Akira Kose, Koganei, and Yoko Kobayashi, Fujisawa, Japan, assignors to Zaidan-Hojin Oyo Kogaku Kenkyujo, Tokyo, Japan

No Drawing. Filed Feb. 5, 1971, Ser. No. 113,039

Claims priority, application Japan, Mar. 31, 1970, 45/26,845

Int. Cl. C08f 19/08, 15/00, 19/00

U.S. Cl. 260—880 R

10 Claims

A stabilized light reflecting iridescent polymeric material is provided. The new material comprises a three dimensional closely packed regularly arranged structure of uniform polymeric microspheres. The microspheres are obtained from a film forming polymeric latex and have a particle diameter in the range from 1,000 to 4,500 Å. The polymeric structure is stabilized by surrounding the microspheres with a polymeric material having no measurable solubilizing effect on the microspheres and having a refractive index differing from that of the microspheres in absolute value to the extent of up to 0.1 to provide optical discontinuity.

3,733,372

**IRIDESCENT MATERIAL AND METHOD MAKING THE SAME**

Akira Kose, Koganei, and Yoko Kobayashi, Fujisawa, Japan, assignors to Zaidan-Hojin Oyo Kogaku Kenkyujo, Tokyo, Japan

No Drawing. Filed Feb. 5, 1971, Ser. No. 113,054

Int. Cl. C08f 19/02, 19/20

U.S. Cl. 260—886

11 Claims

A stabilized light reflecting iridescent polymeric material is provided. The new material comprises a three dimensional, closely packed regularly arranged structure of uniform polymeric microspheres. The microspheres are obtained from a non-film-forming polymeric latex and have a particle diameter in the range from 1,500 to 4,500 Å. The polymeric structure is semi-stabilized by sintering the particles by heat treatment in a liquid having no measurable solubilizing effect on the microspheres. The semi-stabilized polymeric structure is then completely stabilized by surrounding the microspheres with a polymeric material having no measurable solubilizing effect on the microspheres and having a refractive index differing from that of the microspheres in absolute value to the extent of up to 0.1 to provide optical discontinuity.

3,733,373

**POLY-1-BUTENE RESINS**

Richard L. McConnell and Doyle A. Weemes, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Apr. 1, 1971, Ser. No. 130,518

Int. Cl. C08f 29/12

U.S. Cl. 260—897 A

12 Claims

Improved molding resins comprising a blend of (A) about 70 to 99.9% by weight of a substantially crystallizable polymer of 1-butene selected from homopolymers of 1-butene and copolymers of 1-butene and a dissimilar α-olefin of 2 to 12 carbon atoms, said α-olefin being present in said copolymer in a concentration of up to about 20% by weight and (B) about 0.1 to 30% by weight of

a polymer of ethylene selected from homopolymer of ethylene and copolymer of ethylene and a higher α-olefin, said higher α-olefin being present in said copolymer in a concentration of up to about 10% by weight, said polymer of ethylene having a density of at least 0.93.

3,733,374

**THIOPHOSPHATE ACETYL HYDRAZINES**

James Zielinski, Kenilworth, N.J., assignor to Esso Research and Engineering Company

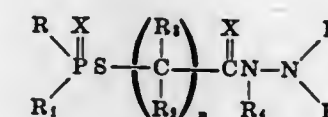
No Drawing. Filed Apr. 24, 1970, Ser. No. 31,762

Int. Cl. C07f 9/16; A01n 9/36

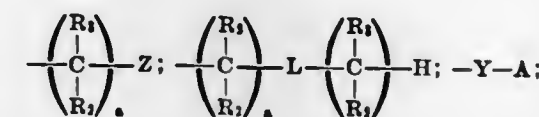
U.S. Cl. 260—923

12 Claims

Organophosphorus compounds represented by the following structure:



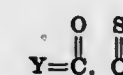
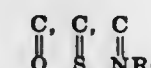
wherein R and R<sub>1</sub> may or may not be the same and are selected from the group consisting of C<sub>1</sub>-C<sub>6</sub> alkoxy or alkyl; C<sub>1</sub>-C<sub>6</sub> alkoxyalkyl; phenoxy optionally substituted by halogen, nitro or C<sub>1</sub>-C<sub>6</sub> alkyl; phenylthio optionally substituted by halogen, nitro or C<sub>1</sub>-C<sub>6</sub> alkyl; C<sub>1</sub>-C<sub>6</sub> alkylthio, branched and unbranched; phenyl optionally substituted by halogen, nitro or C<sub>1</sub>-C<sub>6</sub> alkyl; R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> may or may not be the same and are selected from the group consisting of hydrogen; C<sub>1</sub>-C<sub>6</sub> alkyl, unsubstituted, branched or unbranched or optionally substituted by halogen, C<sub>1</sub>-C<sub>6</sub> alkoxy, C<sub>1</sub>-C<sub>6</sub> alkylthio, C<sub>1</sub>-C<sub>6</sub> alkylthioalkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy alkyl or mono and dialkylaminoalkyl; phenyl optionally substituted by halogen, nitro or C<sub>1</sub>-C<sub>6</sub> alkyl; X is either O or S and n is an integer ranging from 1-3; R<sub>5</sub> and R<sub>6</sub> may be the same or different and are selected from the group consisting of



substituted or unsubstituted aryl and heteroaryl; wherein Z=CN, COOR<sub>2</sub>, CON(R<sub>2</sub>)<sub>2</sub>, NO<sub>2</sub>, SO<sub>2</sub>N(R<sub>2</sub>)<sub>2</sub>, COOH, trihaloalkyl,



wherein L=O, S, SO, SO<sub>2</sub>, NH, NR<sub>2</sub>,



SO, SO<sub>2</sub>, A=OR<sub>2</sub>, SR<sub>2</sub>, NHR<sub>2</sub>, N(R<sub>2</sub>)<sub>2</sub> and a is an integer ranging from 1 to 6; with the proviso that when R<sub>5</sub> is the same as R<sub>2</sub>, then R<sub>6</sub> cannot be R<sub>2</sub> except when R<sub>5</sub> or R<sub>6</sub> is aryl or heteroaryl.



3,733,375

**OXIME CARBAMATE PHOSPHATE, PHOSPHONATE, PHOSPHINATE AND PHOSPHORAMIDATES**

Arnold D. Gutman, Pinole, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

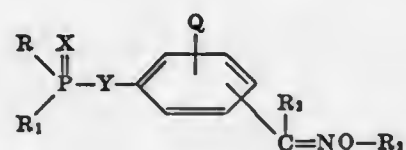
No Drawing. Continuation of application Ser. No. 730,588, May 20, 1968, which is a continuation-in-part of application Ser. No. 646,467, June 16, 1967. This application July 9, 1970, Ser. No. 53,703

Int. Cl. C07f 9/12, 9/18; A01n 9/36

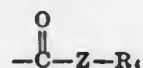
U.S. Cl. 260-938

44 Claims

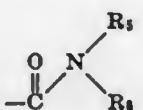
Oxime carbamate phosphates, phosphonates, phosphinates and phosphoramidates having the general formula:



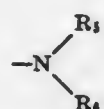
in which X and Y are independently selected from the group consisting of oxygen and sulfur; R is selected from the group lower alkyl or lower alkoxy, having from 1 to 6 carbon atoms inclusive; R<sub>1</sub> is selected from the group consisting of lower alkyl or lower alkoxy having from 1 to 6 carbon atoms, inclusive, amino, lower alkyl-substituted amino and phenyl; Q is selected from the group consisting of divalent tetramethylenediene-1,3, lower alkoxy or lower alkyl having from 1 to 4 carbon atoms inclusive, each, nitro, halogen and combinations thereof, and lower dialkyl substituted thionophosphoryloxy; R<sub>2</sub> is selected from the group consisting of hydrogen, lower alkyl having from 1 to 4 carbon atoms, and phenyl; and R<sub>3</sub> is selected from the group consisting of hydrogen; substituted carbonate and thiocarbonates of the type



in which Z is oxygen or sulfur, R<sub>4</sub> is lower alkyl having from 1 to 4 carbon atoms, inclusive, and  $\beta$ -chloro-lower-alkyl having from 2 to 4 carbon atoms; carbamates of the type



in which R<sub>5</sub> and R<sub>6</sub> are independently selected from the group consisting of hydrogen, alkyl having from 1 to 10 carbons, inclusive, substituted alkyl having from 1 to 6 carbon atoms inclusive, said substituents selected from the group consisting of hydroxy, halogen, amino, di-lower-alkyl amino, lower alkoxy, and tetrahydrofuryl; lower alkenyl having from 2 to 4 carbons, inclusive, carboalkoxy alkyl having a total of from 3 to 8 carbon atoms, inclusive, cycloalkyl having from 3 to 6 carbon atoms, inclusive, piperazino, 2-thiazolyl, phenyl, naphthyl, substituted phenyl wherein said substituents are selected from the group consisting of halogen, lower alkyl, lower alkoxy, lower thioalkyl, lower dialkylamino in which said lower alkyl and lower alkoxy moieties have from 1 to 4 carbon atoms, inclusive, nitro, cyano, trifluoromethyl, and combinations thereof; and in which



is an N-containing heterocyclic member selected from the group consisting of morpholino, piperazino, pyrrol-

idino, piperadino, hexamethylenamino, pyrrol, indolyl, imidazolyl, benzimidazolyl, pyrazolyl, 1,3-oxazolidino, and 1,3-thiazolidino; esters of the type



wherein R<sub>7</sub> is selected from the group consisting of alkyl having from 1 to 8 carbons inclusive, trichloromethyl and lower alkenyl having from 2 to 4 carbon atoms, inclusive, and the radical  $-(\text{CH}_2)_m-\text{SR}$  in which m is 1 or 2, R is alkyl having 1 to 6 carbon atoms, alkenyl having 2 to 4 carbon atoms, phenyl, substituted phenyl in which said substituents are selected from the group halogen, lower alkyl having 1 to 4 carbon atoms, inclusive, and lower alkoxy having 1 to 4 carbon atoms, inclusive; lower alkyl sulfonate having from 1 to 6 carbon atoms, inclusive; lower alkyl substituted thiophosphoryl wherein the lower alkyl groups independently contain from 1 to 4 carbon atoms, inclusive, and 2,2,2-trichloro-1-hydroxyethyl-4-cyanophenyl, 2,4,5-trichlorophenyl and 4-methylthiophenyl.

3,733,376

**PHOSPHORIC ACID ESTERS**

Odd Kristiansen, Reinach, Basel-Land, and Kurt Gubler, Riehen, Basel-Stadt, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

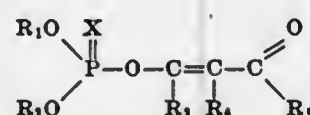
No Drawing. Filed Sept. 4, 1970, Ser. No. 69,893 Claims priority, application Switzerland, Sept. 10, 1969, 13,751/69

Int. Cl. A01n 9/36; C07f 9/08

U.S. Cl. 260-941

7 Claims

Phosphoric acid esters of the formula



wherein

X represents oxygen or sulphur, R<sub>1</sub> and R<sub>2</sub> each independently represent a lower alkyl radical, R<sub>3</sub> represents hydrogen, an alkoxycarbonyl or halogenomethyl radical, R<sub>4</sub> represents a lower alkoxy, alkylthio or dialkylamino radical and R<sub>5</sub> represents a lower alkoxy radical, or R<sub>4</sub> represents a lower alkylthio radical and R<sub>5</sub> represents a dialkylamino radical, are disclosed. Pesticidal compositions and a method for controlling pests are further disclosed.

3,733,377

**METHYLACETYLENE DIADDUCTS OF DIALKYL DITHIOPHOSPHORIC ACIDS**

Alexis A. Oswald, Mountainside, N.J., assignor to Esso Research and Engineering Company

No Drawing. Continuation-in-part of abandoned application Ser. No. 518,028, Jan. 3, 1966. This application Mar. 15, 1971, Ser. No. 124,564

Int. Cl. A01n 9/36; C07f 9/16; C10m 1/48

U.S. Cl. 260-948

5 Claims

Methylacetylene diadducts of dialkyl dithiophosphoric acids are prepared via selective free radical and electrophilic reactions. The free radical reactions can be carried out to yield the corresponding vinylic dithiophosphate monoadducts. These in turn are reacted with thiols to yield sequential diadducts. Some of the novel sequential diadduct dithiophosphate esters are unexpectedly suitable for animal insecticide applications, due to the detoxifying effect of their  $\beta$ -alkyl substituents on the hydrocarbylthioethyl moiety.

3,733,378

**AMIDO-O-LOWER ALKYL-S-ALLYLMERCAPTO-METHYLTHIOLPHOSPHORIC ACID ESTERS**

Gerhard Schrader, Wuppertal-Cronenberg, Ingeborg Hammann, Cologne, and Gunter Unterstenhofer, Opladen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

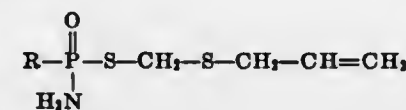
No Drawing. Filed Dec. 2, 1970, Ser. No. 94,533 Claims priority, application Germany, Dec. 24, 1969, P 19 64 835.2

Int. Cl. A01n 9/36; C07f 9/24

U.S. Cl. 260-948

4 Claims

Amidothiophosphoric acid esters, i.e. amido-O-lower alkyl-S-allylmercaptomethylthiophosphoric acid esters of the general formula



in which

R denotes an alkoxy radical having 1 to 4 carbon atoms, which possess insecticidal and acaricidal properties.

3,733,379

**ALKOXYALKYL PHOSPHONATES**

Karoly Szabo, Syracuse, N.Y., assignor to Esso Research and Engineering Company

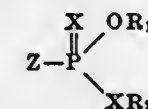
No Drawing. Filed Aug. 3, 1970, Ser. No. 60,773

Int. Cl. A01n 9/36; C07f 9/40

U.S. Cl. 260-950

5 Claims

Organophosphorus compounds, characterized by the following structural formula:



wherein Z is a C<sub>1</sub> to C<sub>8</sub> alkyl-O-CH<sub>2</sub> group; X is either O or S; R<sub>1</sub> is a C<sub>1</sub> to C<sub>8</sub> alkyl group; R<sub>2</sub> is one selected from the group consisting of C<sub>1</sub> to C<sub>20</sub> aliphatic, C<sub>6</sub> to C<sub>10</sub> aromatic and heterocyclic moiety containing 3 to 8 carbon atoms, have been shown to possess insecticidal properties.

3,733,380

**PRODUCTION PROCESS FOR A CORE BODY OF SKI**

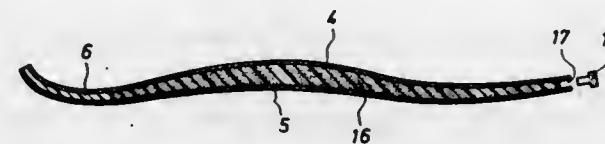
Yoshikatsu Ishida, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Mar. 10, 1971, Ser. No. 122,727 Claims priority, application Japan, Mar. 18, 1970, 45/22,480; Dec. 30, 1970, 46/123,007

Int. Cl. B29d 27/00

U.S. Cl. 264-45

12 Claims



A process for producing a core body of ski comprising the steps of preparing a combined mold consisting of an upper mold and a lower mold and forming a molding cavity therebetween in such a manner that the vertical measurement of the cavity conforms to the thickness distribution of the desired core body of ski, disposing the combined mold obliquely so that an end thereof is located at a lowermost position, providing an opening in one part of the upper mold extending from the center to the upper end of the obliquely disposed mold, pouring a hard type

foamable resin into the molding cavity, closing the opening, foaming and solidifying the resin thus poured inside of the molding cavity, and taking out the core body thus formed inside of the molding cavity.

3,733,381

**CONTINUOUS PROCESS FOR MAKING THERMOFORMED ARTICLES OF MANUFACTURE**

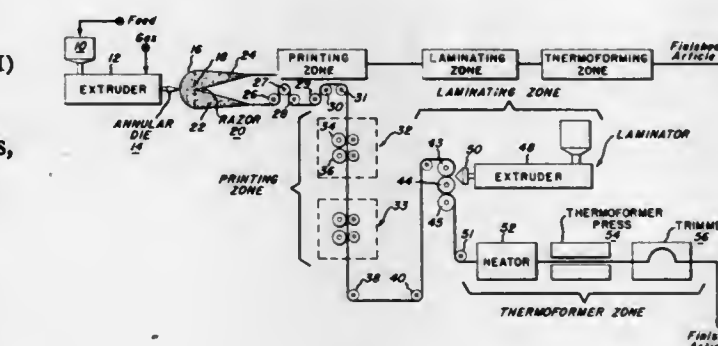
Edward D. Willette, Winnetka, Ill., and Conrad F. Mazur, Chippewa Falls, Wis., assignors to Standard Oil Company, Chicago, Ill.

Filed Dec. 31, 1970, Ser. No. 103,019

Int. Cl. B29d 27/00

U.S. Cl. 264-47

1 Claim



Polymeric material, with gas injection, is continuously extruded to form a continuous web of foam. The web is then directly laminated and the article of manufacture is directly thermoformed from the laminated web. Optionally, the web surface can be printed upon before lamination. This provides an article having a cellular-structure polymeric substrate having an imprinted surface protected by a laminar-like coating.

3,733,382

**METHOD OF CENTRIFUGALLY APPLYING FOAM INSULATION TO A PIPE**

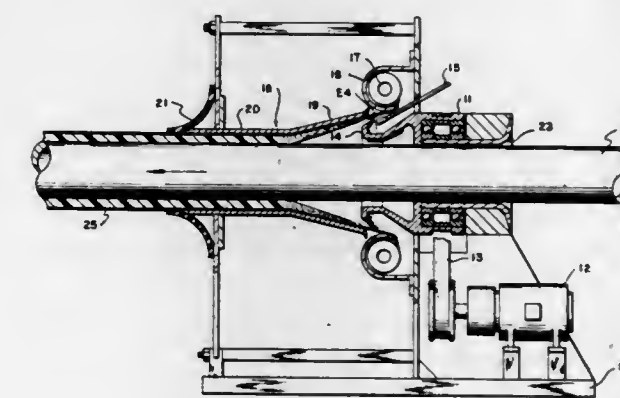
Jan C. van Dijk, Delft, Netherlands, assignor to Shell Oil Company, New York, N.Y.

Filed Apr. 10, 1969, Ser. No. 815,129

Int. Cl. B29d 27/04

U.S. Cl. 264-47

7 Claims



A method for continuously producing tubular foamed polyurethane insulation in which a liquid foamable polyurethane composition is supplied to a rotary ring dispenser which centrifugally sprays the liquid onto a flexible sleeve positioned around and spaced from a pipe. The sleeve and dispensed liquid are moved axially relative to the dispenser and the outer surface of the sleeve is supported while the liquid foams and expands radially to fill the space between the pipe and the sleeve.



3,733,383

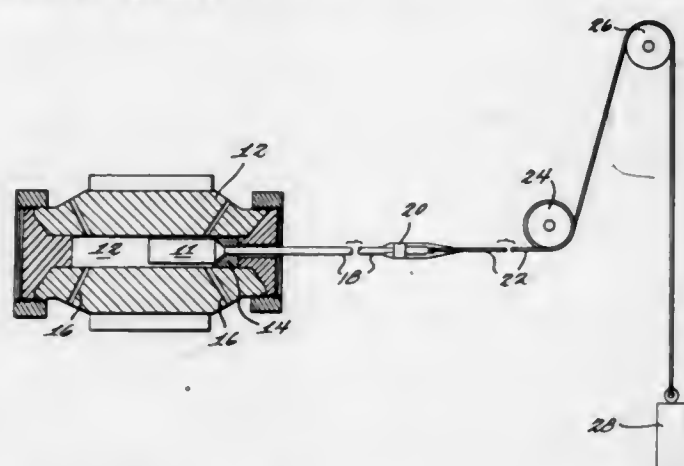
**DEFORMATION OF POLYMERIC MATERIALS**  
John Brian Bunney and Christopher Cassin, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed July 9, 1970, Ser. No. 53,585

Int. Cl. B29c 23/00, 17/00

U.S. Cl. 264—88

14 Claims



A process for the reduction of the cross-sectional area of an article of thermoplastic polymeric material by drawing it through a well-lubricated die, at least that part of the article to which the draw-stress is applied being pre-strengthened by molecular orientation. A preferred form of the process involves applying a substantial draw-stress to the extrudate from a hydrostatic extrusion process. Extruded and/or drawn articles of thermoplastic polymers may be produced having a hitherto, unattainable degree of molecular orientation, and, hence, physical properties, e.g., modulus. It is also possible to overcome the excessive relaxation of the product hitherto associated with the application of hydrostatic extrusion to such materials.

3,733,384

**PROCESS FOR PREVENTING FLUID LEAKAGE IN EXTRUSION BLOW MOLDING**

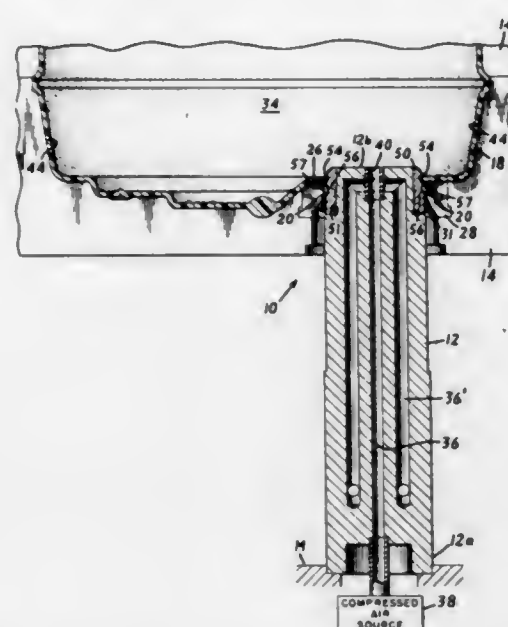
Albert F. Gerlovich, Fanwood, and George H. Dunbaker, Old Bridge, N.J., assignors to Rheem Manufacturing Company, New York, N.Y.

Continuation of abandoned application Ser. No. 866,665, Oct. 15, 1969. This application Jan. 19, 1972, Ser. No. 219,170

Int. Cl. B29c 17/07

U.S. Cl. 264—98

1 Claim



A blow pin on the one hand and outer partible mold sections on the other are complementally shaped substan-

tially to engage each other along a circular cutting edge when the mold sections are closed about the blow pin. The portion of the blow pin that engages the outer partible mold sections is provided with a removable sleeve formed with a pair of annular grooves extending circumferentially of the blow pin. The sleeve cooperates with removable inserts in the outer mold sections. A container is fabricated the neck of which is fully formed by the initial cooperation between the blow pin and mold sections and the remainder of which is formed by a subsequent blowing operation.

3,733,385

**METHOD OF MAKING CONDUCTING PLASTIC ARTICLES**

Wilson Reddish, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Dec. 2, 1968, Ser. No. 780,581

Claims priority, application Great Britain, Dec. 4, 1967, 55,063/67

Int. Cl. B01f 3/18

U.S. Cl. 264—105

7 Claims

A method for making conducting articles from thermoplastics materials containing no more than 2% by weight of a conducting filler comprises rotationally moulding a dry mixture of powdered thermoplastic with from 0.1 to 2% by weight of a powdered conducting filler such as carbon black and in particular furnace black. Also conducting articles made from a thermoplastic material such as low density polythene containing no more than 2% by weight of a conducting filler and having a volume resistivity of less than  $1 \times 10^8$  ohms.

3,733,386

**PROCESS FOR PRODUCING ACRYLIC SYNTHETIC FIBERS IMPROVED IN THE HYDROPHILICITY**

Keitaro Shimoda, Takehiko Sumi, and Yoshiharu Mochida, Okayama, Japan, assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Apr. 13, 1971, Ser. No. 133,709

Int. Cl. D01f 7/00

U.S. Cl. 264—182

9 Claims

A process for making acrylic fibers more hydrophilic by wet-spinning an acrylonitrile polymer solution to form a wet-gel fiber, stretching the wet-gel fiber, crosslinking the wet-gel fiber, hydrolyzing the crosslinked wet-gel fiber, optionally treating the hydrolyzed crosslinked wet-gel fiber with an aqueous solution of an ammonium or metal salt to improve anti-static properties, and thereafter drying the fiber.

3,733,387

**PREPARATION OF FINELY PARTICULATE SILICON DIOXIDE**

Tibor Kugler, Sins, and Jakob Silbiger, Basel, Switzerland, assignors to Lonza Ltd., Gampel, Valais, Switzerland

Original application Mar. 12, 1970, Ser. No. 18,902.

Divided and this application Dec. 6, 1971, Ser. No. 205,166

Claims priority, application Switzerland, Mar. 31, 1969, 4,826/69

Int. Cl. C01b 33/18, 33/00

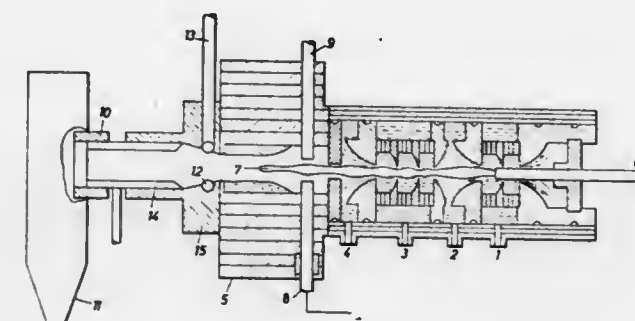
U.S. Cl. 423—33 C

6 Claims

Finely particulate silicon oxides are produced from coarse particulate silicon dioxide using a liquid stabilised plasma burner. Hydrocarbons are used as the stabilising liquid, and the coarse particulate silicon dioxide is reduced by the hydrocarbon plasma jet leaving the plasma burner, and a part of the hydrocarbon which is evaporated and decomposed in the arc zone is withdrawn together with the liquid hydrocarbon stabilising medium, which is recycled, separated from the liquid, and used as carrier gas

for feeding the coarse particulate silicon dioxide. Finely particulate silicon monoxide is initially formed, and may

an oxygen containing gas against the said material in the direction opposite to the flow of the said material in the oxidizing zone of the kiln so as to scatter a part of the said material coming down thereto, resulting in the promotion of the oxidizing roasting, etc.



3,733,390

**PROMOTION OF CRYSTALLINE ZEOLITE SYNTHESIS**

Harry E. Robson, Baton Rouge, La., assignor to Esso Research and Engineering Company

No Drawing. Continuation-in-part of application Ser. No. 104,745, Jan. 7, 1971. This application July 1, 1971, Ser. No. 159,053

Int. Cl. C01b 33/28

U.S. Cl. 423—118

13 Claims

A process for promoting the conversion of certain crystalline aluminosilicate zeolites into crystalline aluminosilicate zeolites having an entirely different crystal structure and a lower  $\text{SiO}_2/\text{Al}_2\text{O}_3$  mole ratio is described. Addition of certain soluble salts to the caustic treatment is the essential feature, and in a most preferred embodiment the conversion of clinoptilolite into faujasite is promoted by the addition of certain soluble halides to the reaction mixture.

3,733,391

**PROCESS OF PREPARING HIGH SILICA FAUJASITE**

George W. Hoffman, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 784,230, Dec. 16, 1968. This application Nov. 1, 1971, Ser. No. 194,489

Int. Cl. C01b 33/28

U.S. Cl. 423—118

12 Claims

Synthetic faujasite having a  $\text{SiO}_2/\text{Al}_2\text{O}_3$  mol ratio of at least 3.5 is produced by acid leaching calcined kaolin clay to a  $\text{SiO}_2/\text{Al}_2\text{O}_3$  mol ratio within the range of about 4 to 10, washing the acid leached clay until substantially free of acid, commingling the clay with sodium hydroxide and water in specified mole ratios of  $\text{Na}_2\text{O}$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{SiO}_2$ , and  $\text{H}_2\text{O}$ , optionally aging the reaction mixture at a temperature in the range of about  $20^\circ\text{C}$ . to  $35^\circ\text{C}$ ., and thereafter heating the reaction mixture to a temperature in the range of about  $95^\circ\text{C}$ . to  $105^\circ\text{C}$ . until the desired degree of formation of faujasite has taken place. Delaminated kaolin clay is preferred. Optionally, fluoride ions are added to the reaction mixture to increase the  $\text{SiO}_2/\text{Al}_2\text{O}_3$  mol ratio of the faujasite product. Also, optionally, the calcined kaolin clay is acid leached to a  $\text{SiO}_2/\text{Al}_2\text{O}_3$  mol ratio in the range of about 10 to 50 and sodium hydroxide added to the clay-acid leach mixture to raise the pH thereof so as to reprecipitate some of the alumina to produce a clay having a  $\text{SiO}_2/\text{Al}_2\text{O}_3$  mol ratio in the range of about 4 to 10 prior to washing the acid-leached clay.

3,733,392

**OXYCHLORINE TRIFLUORIDE AND ALKALI FLUORIDE- $\text{Cl}_2\text{O}$  COMPLEX**

Donald Pilipovich and Richard D. Wilson, Canoga Park, and H. Fred Bauer, Thousand Oaks, Calif., assignors to North American Rockwell Corporation

No Drawing. Filed Apr. 13, 1966, Ser. No. 543,493

Int. Cl. C01b 11/02; C01d 3/02

U.S. Cl. 423—179 R

4 Claims

The new compounds,  $\text{OClF}_3$  and  $\text{MF} \cdot \text{Cl}_2\text{O}$  where M is an alkali metal, are prepared by reacting  $\text{Cl}_2\text{O}$  with an

be recovered as such, or oxidised at the anode of the plasma burner to silicon dioxide.

3,733,388

**PURIFICATION PROCESS FOR SOLUTIONS CONTAINING RHENIUM**

Max Ziegler, Hohe Linde, Germany, assignor to W. C. Heraeus G.m.b.H., Hanau (Main), Germany

No Drawing. Filed Apr. 27, 1971, Ser. No. 137,951

Claims priority, application Germany, May 2, 1970, P 20 21 631.3

Int. Cl. C01g 47/00

U.S. Cl. 423—49

2 Claims

Metal impurities are quantitatively removed from aqueous rhenium solution or an ammonium perrhenate solution with an ion exchange material comprising a support to which is bound polyethyleneimine as the active exchange material.

3,733,389

**METHOD FOR THE MANUFACTURE OF ALKALI CHROMATE FROM A CHROME ORE**

Keizo Honbo, Anan, Japan, assignor to Nippon Denko Kabushiki Kaisha, Tokyo, Japan

Filed July 14, 1971, Ser. No. 162,436

Claims priority, application Japan, Aug. 31, 1970, 45/75,905

Int. Cl. C01g 37/14

U.S. Cl. 423—53

2 Claims

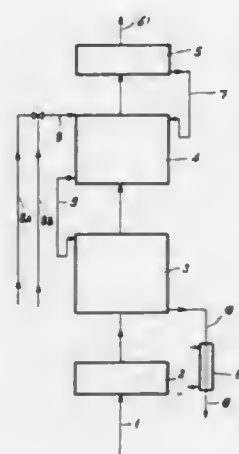


A method for manufacturing alkali chromate in a rotary kiln by roasting the material which includes chrome ore, caustic alkali, alkali carbonate and slaked lime, etc. In a process for roasting the said material wherein the said material is passed through a horizontally inclined rotary kiln from its raised end, while passing into the low end the improvement comprises blowing



alkali metalfluoride to form  $\text{MFCl}_2\text{O}$  and then fluorinating to form  $\text{OClF}_3$ , which is useful as an oxidizer in rocket engines.

**3,733,393**  
**PURIFICATION OF COMBUSTION PRODUCTS BEFORE DISCHARGE INTO THE ATMOSPHERE**  
Jean-Pierre Couillaud, Antony, and Jean Louise, Villejuif, France, assignors to l'Air Liquide, Societe Anonyme Pour l'Etude et l'Exploitation des Procédés Georges Claude, Paris, France  
Filed Sept. 30, 1971, Ser. No. 185,113  
Claims priority, application France, Sept. 30, 1970, 7035347; Aug. 17, 1971, 7129931  
Int. Cl. B01d 47/00  
U.S. Cl. 423—215



The invention relates to a process for purifying combustion fumes and other residual gases before being discharged into the atmosphere. The process comprises at least two stages, consisting in a first dust-extraction phase and then a second chemical purification phase of the fumes, in which is achieved an intimate contact of the said smokes with a solution containing hydrogen peroxide.

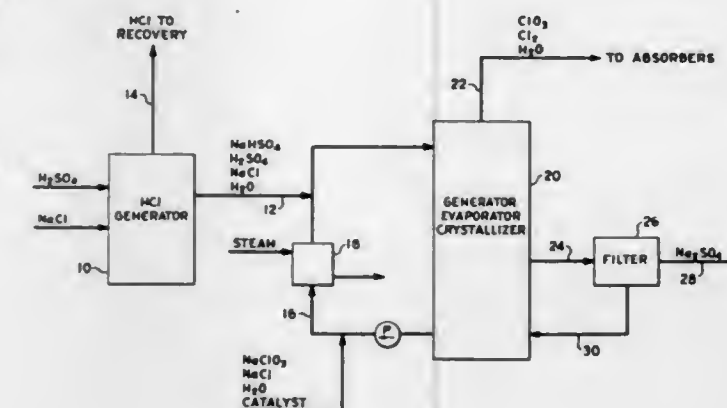
**3,733,394**  
**PROCESS FOR MAKING CHAOITE**  
Arthur G. Whittaker, Woodland Hills, Calif., assignor to The Aerospace Corporation, Los Angeles, Calif.  
No Drawing. Filed Aug. 3, 1970, Ser. No. 60,705  
Int. Cl. C01b 31/02

U.S. Cl. 423—460 4 Claims  
An allotropic form of carbon, "chaoite," having a white appearance, a hardness greater than 9 on the Moh scale, a density in excess of 3.33 g./c.c., is produced on the surface of graphite heated to above 2550° K. in an inert atmosphere.

**3,733,395**  
**PROCESS FOR PRODUCING CHLORINE DIOXIDE, CHLORINE AND A NEUTRAL SULFATE SALT IN THE SULFATE OR KRAFT PROCESS OF PREPARING WOOD PULP**  
Willard A. Fuller, Grand Island, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.  
Filed Apr. 7, 1971, Ser. No. 132,037  
Int. Cl. C01b 11/02; C01d 7/02, 5/02

U.S. Cl. 423—478 10 Claims  
A continuous process is provided for the production of chlorine dioxide, chlorine and a neutral sulfate salt which comprises feeding a chlorate, a reducing agent, a bisulfate and sulfuric acid to a chlorine dioxide generator to form an aqueous reaction solution which is maintained at a temperature of from about 50 to about 100 degrees centigrade, at a pressure from about 50 millimeters mercury

absolute to about atmospheric pressure, while maintaining the concentration of said chlorate from about 0.2 to about 2.5 moles per liter; maintaining the concentration of said reducing agent from about 0.2 to about 2.5 moles per liter; maintaining the acidity of said reaction solution between about 2 to about 6 normal in sulfuric acid and coordinating the bisulfate feed rate with the sulfuric



acid feed rate to provide an acid hydrogen radical to sulfate radical ratio from about 1.05–1.95. The bisulfate feed material as well as a portion of the reducing agent, in the form of an alkali metal chloride, is advantageously supplied from the by-product of the reaction of sodium chloride with concentrated sulfuric acid to produce hydrochloric acid.

**3,733,396**  
**PREPARATION OF ALKALI METAL HEXAFLUOROCHLORATES**  
John P. Faust, Hamden, Albert W. Jache, North Haven, and Andrew J. Klanica, Cheshire, Conn., assignors to Olin Mathieson Chemical Corporation  
No Drawing. Filed Aug. 20, 1965, Ser. No. 482,330  
Int. Cl. C01c 7/24; C01d 11/00

U.S. Cl. 423—466 2 Claims  
1. Process for preparing alkali metal hexafluorochlorates having the formula  $\text{MClF}_6$  where M is potassium, rubidium or cesium which comprises reacting MF with chlorine pentafluoride in a reaction zone defined by surfaces of polymeric tetrafluoroethylene at about 0° to 150° C. and at autogenous pressure.

**3,733,397**  
**METHOD FOR THE X-RAY VISUALIZATION OF BODY CAVITIES AND A PREPARATION FOR CARRYING OUT THE METHOD**  
Lars Björk, Uno Eugen Erikson, Kirsti Annikki Granath, Björn Gustav-Adolf Ingelman, and Bernt Jabes Lindberg, Uppsala, Sweden, assignors to Pharmacia AB, Uppsala, Sweden  
No Drawing. Continuation-in-part of applications Ser. No. 686,340, Nov. 28, 1967, and Ser. No. 775,920, Nov. 14, 1968, both now abandoned. This application Oct. 27, 1969, Ser. No. 869,926  
Claims priority, application Sweden, Dec. 2, 1966, 16,513/66; Nov. 16, 1967, 15,725/67  
Int. Cl. A61k 27/08

U.S. Cl. 424—5 23 Claims  
Method for the X-ray visualization of body cavities which comprises administering to the body of the test object a preparation which contains a member selected from the group of polymers being built up of alternating 2,4,6-triiodobenzoic acid derivative groups and intermediate aliphatic hydroxyl group-containing bridges, and physiological acceptable salts thereof; and the preparations suitable for carrying out the method.

**3,733,398**  
**DETERMINING AND REVERSING ANTICOMPLEMENTARY ACTIVITY IN COMPLEMENT FIXATION TEST FOR AUSTRALIA ANTIGEN**  
Nahum Raphael Shulman, Kensington, Md., assignor to the United States of America as represented by the Secretary of the Department of Health, Education, and Welfare

Filed July 17, 1970, Ser. No. 55,725  
Int. Cl. C12k 1/00; G01n 31/00, 33/16  
U.S. Cl. 424—12 4 Claims

Antigen or antibody is added to an appropriate biologic material to react with hepatitis associated antibody or antigen, respectively, if present. The reaction mixture is incubated with complement to fix the latter. Titration of non-fixed complement with standardized cells reveals presence or absence and amount of hepatitis associated antibodies or antigens in the substance tested, thereby revealing the presence of disease or immunity to the disease if substances from an individual are tested, or the presence of virus than can transmit disease or antibody that may neutralize virus in biological materials that are tested. In such test procedure, anticomplementary activity may be detected. It can be reversed by adding to the anti-complementary biologic material a large excess of the antigen or the antibody.

**3,733,399**  
**ORAL COMPOSITIONS CONTAINING AN ENZYME**  
Joseph Gerald Becker, Martinsville, Robert Lee Mitchell, Somerset, and William Grant Pierson, Irvington, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.  
No Drawing. Continuation-in-part of application Ser. No. 23,467, Mar. 27, 1970, which is a continuation-in-part of application Ser. No. 864,212, Oct. 6, 1969, now abandoned. This application Jan. 14, 1972, Ser. No. 217,940

U.S. Cl. 424—50 13 Claims  
Toothpaste compositions which contain as the active ingredient, the enzyme invertase.

**3,733,400**  
**DIGESTIVE TRACT PROTECTING COMPOSITIONS**  
André Queuille, Nolsy le Sec, and Robert Fournex, Paris, France, assignors to Roussel-UCLAF, Paris, France  
No Drawing. Filed Jan. 26, 1971, Ser. No. 109,989  
Claims priority, application France, Feb. 5, 1970, 7004075  
Int. Cl. A61k 27/00

U.S. Cl. 424—81 4 Claims  
Digestive tract protecting compositions containing as the active ingredient at least one polymer selected from the group consisting of homopolymers of acrylamide and methacrylamide, copolymers of acrylamide and acrylic acid and copolymers of methacrylamide and methacrylic acid and to methods of treating or preventing ulcers or inflammation of large intestine in warm-blooded animals.

**3,733,401**  
**HIGHLY ATTENUATED NEWCASTLE DISEASE VIRUS VACCINE AND PRODUCTION THEREOF**  
Homu Ito, Suita, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan  
No Drawing. Filed Nov. 30, 1970, Ser. No. 93,875  
Int. Cl. C12k 7/00

U.S. Cl. 424—89 5 Claims  
Highly attenuated Newcastle disease virus vaccine is provided, as well as method for production thereof by (1) either subjecting Newcastle disease virus (NDV) to at least 20 serial passages of cultivation in a porcine tissue

culture, or cultivating the virus in porcine stable cell lines for at least 2 months, (2) inoculating the resultant porcine cells containing attenuated NDV onto a chorioallantoic membrane of a chick embryo and cultivating the inoculated chick embryo, and (3) subjecting the NDV recovered from the resultant complex of the chorioallantoic membrane and porcine cells to at least 2 serial passages of cultivation in the allantoic cavity of a chick embryo.

**3,733,402**  
**AMNIOTIC LIQUID FOR CONDITIONING THE HAIR**  
Gregoire Kalopissis and Georges Manoussos, Paris, France, assignors to Societe Anonyme dite: L'Oreal, Paris, France  
No Drawing. Continuation-in-part of application Ser. No. 475,876, July 29, 1965. This application June 11, 1970, Ser. No. 45,584

U.S. Cl. 424—70 2 Claims  
A hair conditioning composition comprising a lyophilized sterile amniotic liquid free of natural amniotic solids that has been taken from bovines that have been pregnant for more than 60 days and less than 90 days.

**3,733,403**  
**GELLED MINERAL OIL**  
James Ling Chen, East Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.  
No Drawing. Filed Jan. 26, 1970, Ser. No. 5,931  
Int. Cl. A61k 9/06; C10m 5/26, 5/10  
U.S. Cl. 424—83 7 Claims  
Mineral oil gelled with a gellant selected from polyethylene and polymethylpentene and contains 0.1–5% by weight of powdered porous magnesium silicate as an anti-syneresis agent.

**3,733,404**  
**ANTIBACTERIAL COMPOSITION CONTAINING α-AMINO BENZYL PENICILLINS**  
Gilman N. Cyr, Piscataway, Charles Riffkin, Highland Park, and Carl B. Rifino, Lakewood, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.  
No Drawing. Filed Sept. 4, 1970, Ser. No. 69,967  
Int. Cl. A61k 21/00

U.S. Cl. 424—114 5 Claims  
Antibacterial compositions are provided comprising a mixture of ampicillin trihydrate and sodium ampicillin which is absorbed at a faster rate than ampicillin trihydrate alone and which does not have disadvantages associated with the use of sodium ampicillin alone. Further, antibacterial compositions are provided comprising a mixture of ampicillin and sodium ampicillin which does not have disadvantages associated with the use of sodium ampicillin alone.

**3,733,405**  
**STABILIZER FOR ETHYLENE DIAMINE DIHYDRIODIDE**  
Donald J. Derrig, Watkins Glen, N.Y., assignor to Watkins Salt Company  
No Drawing. Continuation-in-part of abandoned application Ser. No. 753,740, Aug. 19, 1968. This application May 10, 1971, Ser. No. 142,005  
Int. Cl. A01k 27/00

U.S. Cl. 424—171 13 Claims  
This invention relates to a method of stabilizing ethylene diamine dihydriodide (EDDI) so as to prevent the release of iodide or iodine, particularly in the presence of moisture. This stabilized product may be used by itself or blended with various animal feeds so as to provide medicaments and nutrients therein. The stabilizer is selected from the group consisting of hemicellulose extract, lignosulfonate, caramel, wood sugar and molasses.





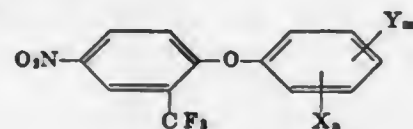


**3,733,421**  
**MICROBIOCIDAL NITROGEN DERIVATIVES OF HALOGENATED BIPHENYLS**  
 John J. Merianos, Jersey City, Edward Griffin Shay, Belle Mead, Phillip Adams, Murray Hill, and Alfonso N. Petrocci, Glen Rock, N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.  
 No Drawing. Continuation-in-part of application Ser. No. 883,636, Dec. 9, 1969, now Patent No. 3,663,620. This application May 18, 1970, Ser. No. 38,513  
 Int. Cl. A01n 9/20

U.S. Cl. 424—330 1 Claim  
 Microbiocidal bis-amino substituted halogenated biphenyls, as well as the nitrogen derivatives thereof such as quaternary ammonium compounds, amine oxides, imidazolines, amides, enamines, ampholytes, and the like.

**3,733,422**  
**MOLLUSCICIDAL TRIFLUOROMETHYL p-NITRO DIPHENYL ETHERS**  
 Otto Rohr, Therwil, and Marcus von Orelli, Munchenstein, Switzerland, assignors to Ciba Limited, Basel, Switzerland  
 No Drawing. Application Apr. 1, 1970, Ser. No. 24,851, now Patent No. 3,647,888, which is a continuation-in-part of abandoned application Ser. No. 680,334, Nov. 3, 1967. Divided and this application Nov. 19, 1971, Ser. No. 200,608  
 Int. Cl. A01n 9/24

U.S. Cl. 424—340 6 Claims  
 The present invention relates to compounds of the general formula



wherein X is a member selected from the group consisting of a halogen atom, an alkyl group having 1 to 4 carbon atoms, the group —OCH<sub>3</sub>, —SCH<sub>3</sub>, —NO<sub>2</sub> and —CF<sub>3</sub>, Y is a member selected from the class consisting of a halogen atom and an alkyl group having 1 to 4 carbon atoms, and n and m denote integers from 0 to 3, whose sum is at most 5, as well as to molluscicidal preparation containing such compounds.

**3,733,423**  
**HYDROGENATED ERGOT ALKALOID COMPOSITIONS AND METHODS OF USING SAME**  
 Botond Berde, Basel, Switzerland, assignor to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland  
 No Drawing. Continuation-in-part of abandoned application Ser. No. 691,142, Dec. 18, 1967. This application Nov. 23, 1970, Ser. No. 92,206  
 Claims priority, application Switzerland, Dec. 22, 1966, 18,385/66  
 Int. Cl. A61k 27/00

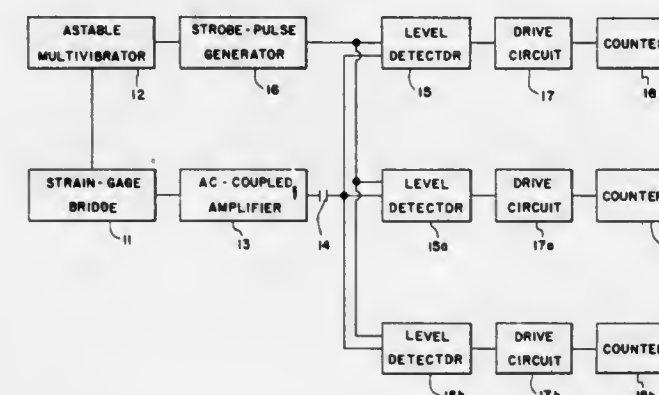
U.S. Cl. 424—253 15 Claims  
 The invention concerns a novel hydrogenated ergot alkaloid composition comprising one part by weight of a hydrogenated ergot alkaloid constituent selected from the group consisting of dihydroergocornine, dihydroergocristine, dihydroergocryptine, and their pharmaceutically acceptable acid addition salts, and between 10 and 150 parts by weight of 7-(2-hydroxypropyl)-theophylline.

The 7-(2-hydroxypropyl)theophylline not only significantly enhances the enteral effect of oral effectiveness of the hydrogenated ergot alkaloid constituent, but various properties of the composition are superior to its individual components. The composition is particularly suitable for improvement of cerebral and peripheral blood flow.

## ELECTRICAL

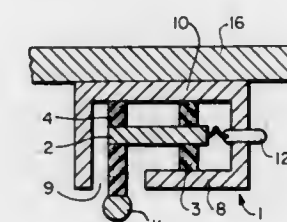
**3,733,424**  
**ELECTRONIC STRAIN-LEVEL COUNTER**  
 Felix L. Pitts, Newport News, and John L. Spencer, Hampton, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.  
 Filed July 8, 1971, Ser. No. 160,859  
 Int. Cl. G01b 7/16

U.S. Cl. 73—88.5 R 2 Claims



An electronic strain level counter for obtaining structural strain data on in-flight aircraft. The device counts the number of times the strain at a point on a structural member of the aircraft exceeds each of several preset levels. A dead band is provided at each level to prohibit the counting of small strain variations around a given preset level.

**3,733,425**  
**PICK UP DEVICE FOR STRINGED INSTRUMENT**  
 Kouin Chaki, Inami 274 Edosakuchō, Inashikigun, Japan  
 Continuation of Ser. No. 776,547, Nov. 18, 1968, abandoned.  
 This application Nov. 8, 1971, Ser. No. 196,826  
 Int. Cl. G10h 3/00  
 U.S. Cl. 84—1.14 5 Claims



A piezoelectric pickup for stringed musical instruments comprising a piezoelectric element, a synthetic rubber vibration transmitting material attached to one end of the element, a support for the element at the other end thereof, and a weight attached to the vibration transmitting end of the element, the pickup being mounted in the resonance box of the instrument.

**3,733,426**  
**METHOD AND MATERIAL FOR RECLAIMING WATERLOGGED TELEPHONE CABLE AND THE LIKE**  
 Stanley Kaufman, Flanders, and Raffaele Antonio Sabla, Lincoln, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
 Filed Dec. 15, 1971, Ser. No. 208,420  
 Int. Cl. H01b 11/02, 3/30

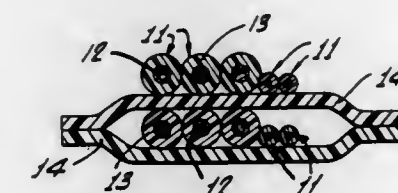
U.S. Cl. 174—23 C 3 Claims  
 In-service PIC telephone cable that has become waterlogged in places is reclaimed dielectrically by pumping in an

aromatic solvent oil containing cross-linking agents that will gel the oil in a predetermined period preferably of the order 24 hours. A nongelling prepurgent miscible with both water and aromatic solvent oil may be pumped in before the gelling compound is introduced, to more completely purge the water.

**3,733,427**  
**WATERPROOF ELECTRICAL CABLE**  
 Michael Gordon Clark, and Saleem Sabir Bhatti, both of Toronto 12, Ontario, Canada, assignors to Union Carbide Canada Limited, Toronto, Ontario, Canada  
 Filed May 11, 1972, Ser. No. 252,496  
 Int. Cl. H01b 7/30

U.S. Cl. 174—23 C 11 Claims  
 A cable filling composition comprising polybutene, microcrystalline wax, polyethylene and an antioxidant is disclosed which exhibits desirable electrical performance while having good handling characteristics and compatibility with polyethylene cable insulation. The composition prevents water ingress in a telephone cable.

**3,733,428**  
**WIRING HARNESSES AND METHOD OF MAKING SAME**  
 William Lawrence Fry, Haughton, England, assignor to Rists Wires Cables Limited, Newcastle, England  
 Filed July 8, 1971, Ser. No. 160,803  
 Claims priority, application Great Britain, July 11, 1970, 33786/70  
 Int. Cl. H02g 3/02  
 U.S. Cl. 174—72 A 6 Claims



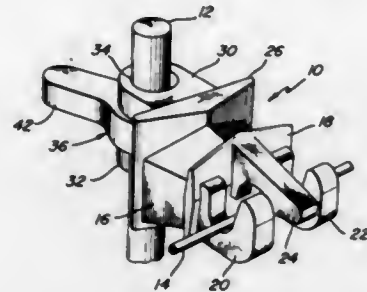
A wiring harness for a road vehicle includes a plurality of conductive leads each of which includes a conductive core in a synthetic resin sheath. The individual leads of the harness extend side by side wherever possible, and are secured together by means of a synthetic resin backing member which is fused to the sheaths of the leads. The leads are positioned in a predetermined pattern, and the synthetic resin backing member is engaged with the leads. A fusing tool is engaged with the backing member and is operated to fuse the backing member to the sheaths of the leads. The backing member can be a preform in the shape of the harness pattern, or alternatively can be in a number of separate parts individually fused to the leads.

**3,733,429**  
**FENCE INSULATOR WITH ECCENTRIC POST-ATTACHING MEANS**  
 Albert T. Berg, Jr., and Howard Langlie, both of Ellendale, Minn.  
 Filed Aug. 2, 1972, Ser. No. 277,294  
 Int. Cl. H01b 17/16; A01k 3/00

U.S. Cl. 174—161 F 10 Claims  
 An all plastic insulator has a body provided with two upwardly facing jaws and an intermediate resilient tongue pro-



jecting from one side thereof so as to grip and hold an electric fence wire. Projecting from the other side of the body are two vertically spaced ears having aligned holes therein. Between the two ears is placed an eccentric member which also has a hole therein as well as a cam surface that pressurally bears against the body when the eccentric member is rotated suffi-



ciently by a handle or lever thereon. The camming action forcibly displaces the hole in the eccentric member with respect to the holes in the two ears, thereby forcing one wall portion of the hole in the eccentric member against the fence post and reactively forcing wall portions of the holes in the ears against the fence post to thus securely clamp the insulator at a desired elevation on the post.

3,733,430

## CHANNEL MONITORING SYSTEM

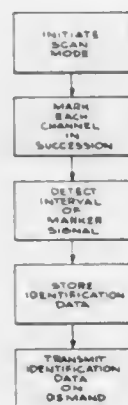
John R. Thompson, Los Angeles, and Robert L. Schoenbeck, Santa Monica, both of Calif., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,818

Int. Cl. H04n 1/44

U.S. Cl. 178-5.1

38 Claims



A novel remote monitoring system, described in the context of a cable antenna television system, which includes a control monitoring station for interrogating and monitoring various devices in a subscriber's remote site. The interrogation signals are transmitted by means of high frequency FM transmission via a trunk cable to a multitude of remote sites. Each remote site is addressed by a unique code and each remote site stores information indicative of the status of its respective monitored devices. Upon request from the control monitor station, such information is transmitted to the control monitor station by means of low frequency FM transmission via the aforementioned trunk cable.

For tv channel identification, as for pay tv billing, each individual channel is marked with an identification signal which may be stored in the respective subscriber's remote unit until the control monitor station requests such information by interrogating the remote unit. The stored information is transmitted to the control monitor station and transferred to storage means, such as a computer, for billing or for other purposes.

### 3,733,431 ELECTRONIC COMMUNICATION APPARATUS EMPLOYING ENCRYPTED SIGNAL DISTRIBUTION

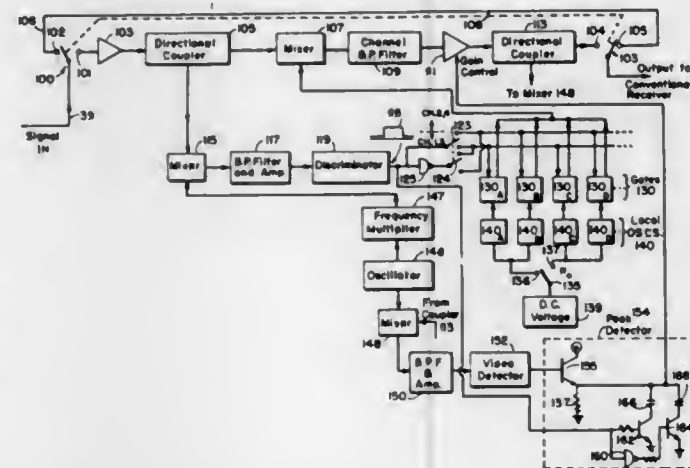
Donald Kirk, Jr., St. Petersburg, and Austin S. Coryell, Winter Haven, both of Fla., assignors to Television Communications Corporation, New York, N.Y.

Filed Mar. 10, 1971, Ser. No. 122,660

Int. Cl. H04n 1/44

U.S. Cl. 178-5.1

2 Claims



Private programming information, e.g., television programs provided for a community antenna television signal distribution system (CATV) to supplement those programs received from local commercial television stations, are encrypted by switching the private program signals between predetermined transmission channels at a low, preferably nonperiodic rate. A modulated pilot carrier is provided to communicate synchronizing information.

A special signal recovery apparatus at the station of a private service subscriber recovers the special programming by effecting a switching procedure inverse to that performed upon signal generation under control of the demodulated pilot signal. The video and sound programs presented by a conventional television receiver tuned to a private service channel comprises offensive interrupted bursts of two intermittently alternating programs which, moreover, may vary in intensity.

3,733,432

### SYSTEM FOR PRODUCING A CONTINUOUS SIGNAL IN SYNCHRONOUS PHASE WITH A REFERENCE SIGNAL

Ichiro Arimura, Kyoto, and Hiroshi Taniguchi, Hirakata-shi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

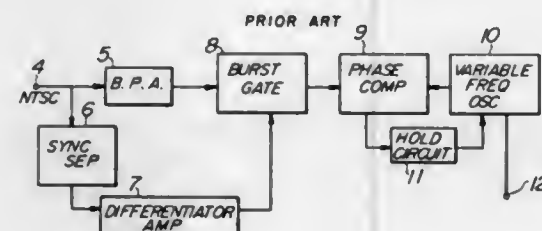
Filed Oct. 8, 1969, Ser. No. 864,683

Claims priority, application Japan, Oct. 12, 1968, 43/74753; Nov. 11, 1968, 43/83112; Nov. 11, 1968, 43/83113; Mar. 5, 1969, 44/17295; Aug. 5, 1969, 44/75467

Int. Cl. H04n 9/46

U.S. Cl. 178-5.4 CD

6 Claims



A system for producing a continuous signal in synchronous phase with the color-burst signal of a composite color television signal which is received through a transmission system subject to comparatively large time-base variations such as a VTR, said system including means for comparing in phase said

burst signal with the output of an oscillator whose oscillation frequency is nearly equal to that of the burst signal, the phase of oscillation of said oscillator being adjusted according to the detected difference of the phase; characterized in that said system also includes means for detecting variation in the frequency of the synchronizing signal contained in the television signal, the frequency of said oscillator also being adjusted according to the amount of the detected variation, thereby to extend the frequency range in which said oscillator can be pulled into the synchronization; and a method for demodulating the coded color signals utilizing the above-described system.

3,733,433

## IMAGE ANALYSIS

Colin Fisher, Hertfordshire, Royston, England, assignor to Image Analysing Computers Limited, Melburn, Royston, England

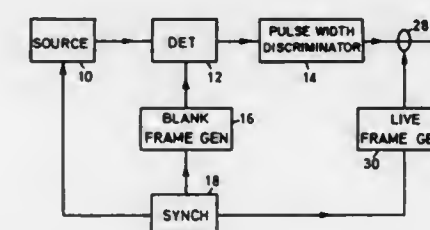
Filed Nov. 19, 1970, Ser. No. 90,932

Claims priority, application Great Britain, Nov. 24, 1969, 57,320/69

Int. Cl. H04n 7/18

U.S. Cl. 178-6.8

15 Claims



The invention provides a method of analyzing the features in a field of view in which information arising from features which are truncated by one or more edges of the field of view, is inhibited. Methods and apparatus for performing a chord size distribution on scanned video signal are described together with methods and apparatus for correcting associated parameter information derived from scanned video signal.

Two types of solution are envisaged. According to one solution, all information signals arising during a selected distance within the scanning raster are inhibited. Thus, chord count pulses or associated parameters which appear within a certain time interval from the edges of the scan raster are either not generated or inhibited. According to a second solution, an information signal is only inhibited if, when dealing with line scan intersects of features, the line scan intersect from which the information signal arises begins or ends on an edge of the scan raster or in the case of associated parameters, the feature or area of the image for which the associated parameter is computed touches or intersects one or more edges of the scan raster.

The correction is applied in both line and frame scan directions.

3,733,434

### TIME DISCRIMINATOR CIRCUIT FOR EDGE TRACKING TARGET CONTOURS

Myron Weinstein, Munroe Falls, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed June 1, 1970, Ser. No. 42,185

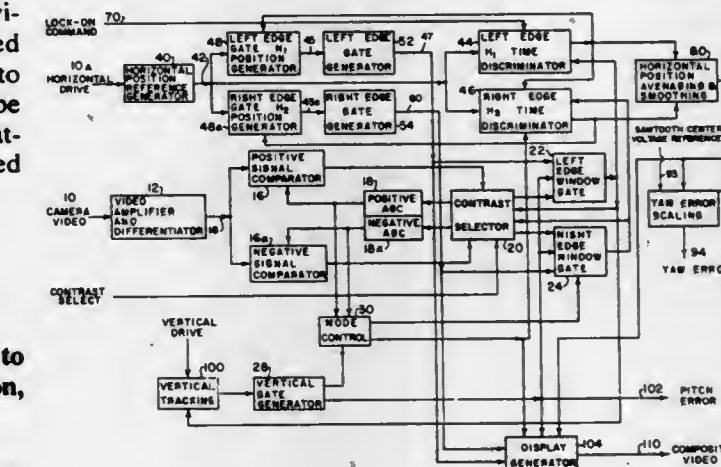
Int. Cl. H04n 1/38

U.S. Cl. 178-6.8

4 Claims

The invention relates to a circuit utilizing a television signal to track the edges of an object, (hereinafter called the target)

to provide position and guidance information. The object may be standing still or moving and the television camera with tracking circuitry may be standing still or moving. The unique feature is in the ability to track a contour to one or both sides



3,733,435

### INTEGRAL MEMORY IMAGE DISPLAY OR INFORMATION STORAGE SYSTEM

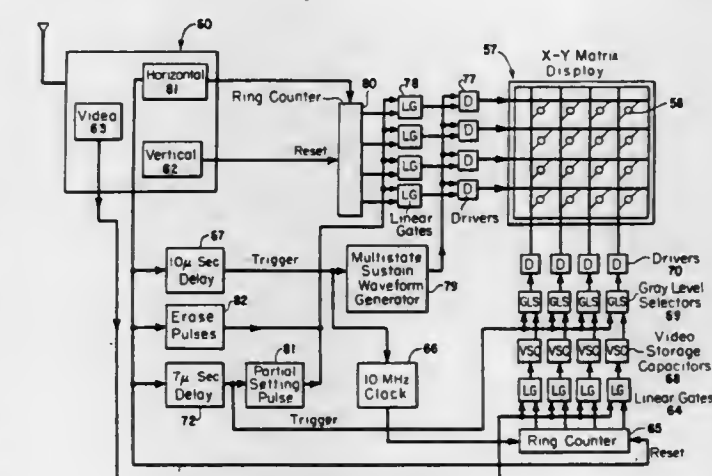
Gerald J. Chodil, Harwood Heights, and Michael C. DeJule, Chicago, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Feb. 26, 1971, Ser. No. 119,319

Int. Cl. H04n 5/66

U.S. Cl. 178-7.3 D

14 Claims





sociated with each memory state. A complete television image display incorporating a matrixed array panel of memory-display elements is described in which gray scale with storage is achieved by controlling the memory states, and thus the duty factors, of the respective elements of each row of the panel in accordance with respective samples of a line of video signal quantized to one of a fixed number of discrete intensity levels each of which is associated with a memory state.

3,733,436

## VIEWING SHIELD FOR DISPLAY DEVICE

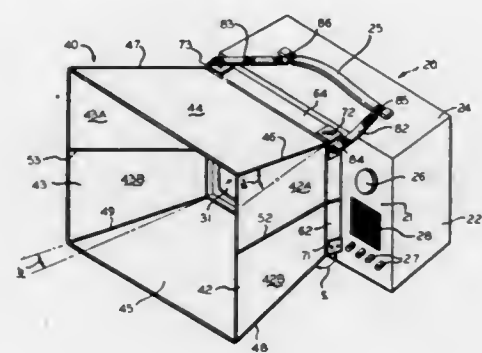
Joseph K. Rose, 1958 Linden Avenue, Highland Park, Ill.

Filed Mar. 24, 1972, Ser. No. 237,652

Int. Cl. H04n 5/64

U.S. Cl. 178—7.82

10 Claims



A four-sided light shield assembly for a television receiver or other image-exhibiting apparatus, in which the side panels have a hinged construction allowing the assembly to be folded to flat, compact form without detachment or separation of any of the components, when the shield assembly is removed from the image-exhibiting apparatus, but with the side panels locked against folding when the shield assembly is opened up for use.

3,733,437

## TELEPHONE HANDSET COUPLER

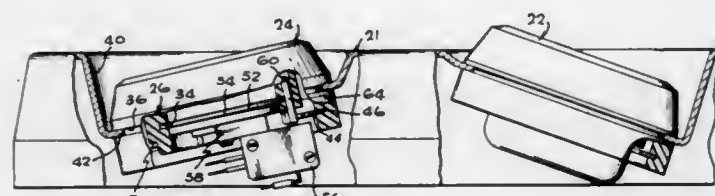
Craig L. Kelth, San Jose, Calif., assignor to Anderson Jacobson, Inc., Sunnyvale, Calif.

Filed May 20, 1970, Ser. No. 39,048

Int. Cl. H04m 1/14

U.S. Cl. 179—1 C

12 Claims



Apparatus for acoustically coupling a telephone handset to transducers of a data terminal, comprising a pair of cup-like coupling members of rubber or other elastomeric material for holding the mouthpiece and earpiece ends of the handset. Each elastomeric coupling member has an inner wall for snugly receiving a handset end and for holding a data transducer below it, an outer wall that encircles the inner wall and that can be mounted on the data terminal, and a thin membrane that connects the upper ends of the inner and outer walls to support the inner wall while largely isolating it from vibrations.

### 3,733,438 CARRIER SUPPLY FOR FREQUENCY DIVISION MULTIPLEXED SYSTEMS

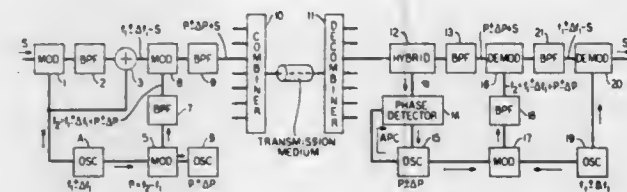
Thomas John Haley, Summit, N.J.; Thomas Bennett Merrick, Plaistow, N.H., and James Sayre Ronne, Groveland, Mass., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 1, 1971, Ser. No. 119,750

Int. Cl. H04j 1/06

U.S. Cl. 179—15 FD

12 Claims



The terminals in the frequency division multiplexed systems of the prior art employ many steps of modulation whose frequency variations, due to changes in the frequencies generated by the carrier oscillators, add to produce a frequency offset which is unacceptable in modern wideband systems. The terminals of the present invention use additional modulators connected to the carrier oscillators to reduce the frequency offset of the transmitted signal to the frequency variations of only a single oscillator.

3,733,439

## AUTOMATIC TELECOMMUNICATION SWITCHING SYSTEM

Henri Albert Julia Verhille, B-2200 Borgerhout, and Oswald Pieter Maria Donkers, B-2100 Deurne, both of Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

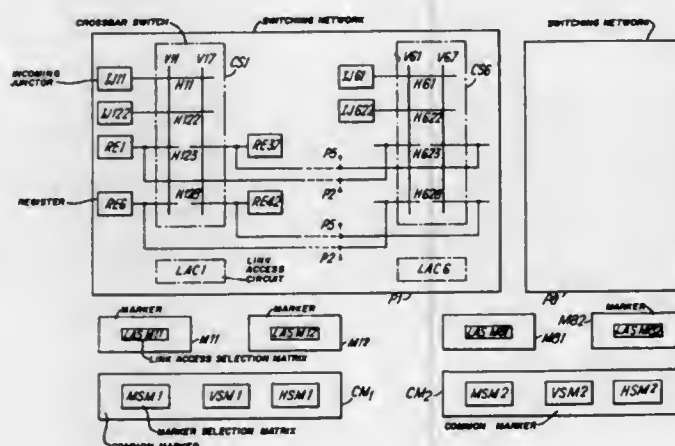
Filed Dec. 14, 1970, Ser. No. 97,681

Claims priority, application Netherlands, Dec. 31, 1969, 6919631

Int. Cl. H04q 3/42

U.S. Cl. 179—18 E

13 Claims



In a crossbar switching system, the functions of marker circuits are broken down such that there are two common marker circuits for the entire system and two regular marker circuits for each group of crossbar switches. Each marker circuit of each type has a selection matrix, the common marker being used to select the regular marker circuit to be used. The use of common markers reduces the possibility of double testing, reduces the equipment necessary and speeds switching.

### 3,733,440 SEMIAUTOMATIC CALL PLACEMENT AND MESSAGE DELIVERY ARRANGEMENT

James David Sipes, Columbus, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed July 19, 1971, Ser. No. 163,743

Int. Cl. H04m 3/42

U.S. Cl. 179—18 B

### 3,733,442 HOLD CIRCUIT FOR MULTI-LINE KEY TELEPHONE SYSTEM

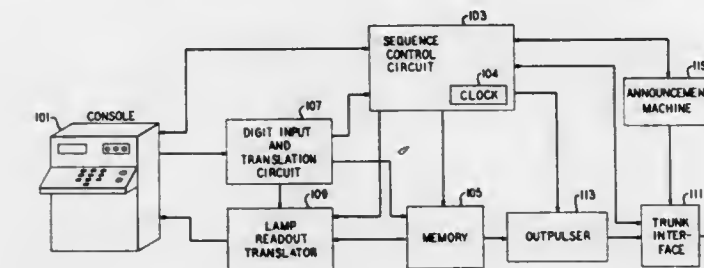
Allan Yook Foo Lee, London, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Jan. 18, 1971, Ser. No. 107,352

Int. Cl. H01m 1/72

16 Claims U.S. Cl. 179—99

3 Claims



An arrangement is disclosed as an applique to a PBX to allow a PBX attendant to originate a series of message delivery calls. The attendant dials in PBX station numbers to which the message is to be delivered. These numbers are temporarily stored in a memory and sequentially outpulsed to the PBX in the order in which they were dialed by the attendant. The PBX then establishes a connection from the arrangement to a station identified by an outpulsed number. When the party at that station answers, a recorded message is connected to the established connection. After the message is delivered, the next station number in the memory is outpulsed to the PBX. Circuitry is provided to notify the PBX attendant when there is a failure to complete call if there is no answer or if the called station is busy.

3,733,441

## AMBIPOLAR MICROPHONE UNIT

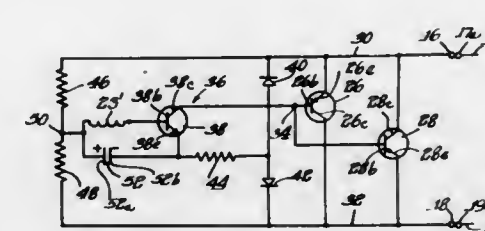
David P. McCorkle, South Bend, Ind., and Lee P. Hagey, Buchanan, Mich., assignors to Electro-Voice Inc., Buchanan, Mich.

Continuation-in-part of Ser. No. 881,648, Dec. 3, 1969, abandoned. This application June 14, 1971, Ser. No. 152,614

Int. Cl. H04q 1/00

U.S. Cl. 179—81 B

16 Claims



A microphone unit for incorporation in a telephone headset or the like including a low signal output transducer, and a polarity independent current control amplifier circuit for amplifying the transducer signals and having a pair of substantially identical parallel oppositely connected main current control devices, such as transistors, each having their load terminals arranged for controlling current flowing in a normal forward direction which is opposite to that of the other so that there will always be one fully conductive and one partially conductive or nonconductive path across the microphone unit terminals independently of the polarity of the D.C. current to be modulated by the microphone unit. Drive circuit means energized by the voltage on the telephone lines applied to the microphone unit terminals are provided to receive the transducer signals and amplify the same before being applied to the control terminals of the current control devices regardless of the polarity of the energizing voltage.

3,733,443

### SPEED CONTROL SYSTEM WITH CONTROL SIGNALS ON ONE TAPE USED TO CONTROL SPEED OF SECOND ENDLESS TAPE

Yasutaka Iwawaki, Ohta-ku, Tokyo; Minoru Yoshikawa, Kawasaki-shi, Kanagawa, and Yukio Usui, Asahi-ku, Yokohama-shi, Kanagawa-ken, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1971, Ser. No. 140,355

Claims priority, application Japan, May 8, 1970, 45/39423

Int. Cl. G11b 15/52

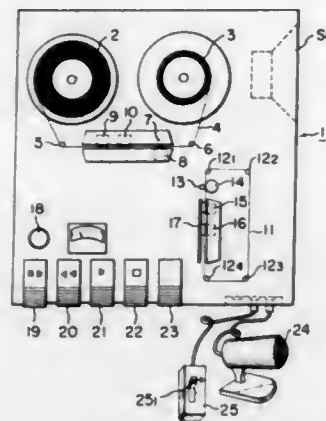
U.S. Cl. 179—100.2 S

9 Claims

The audio signals are recorded on the two tracks of the tape in phase and the control signals for automatically stopping the main tape and for varying the tapespeed of the endless tape are recorded on the respective tracks so as to be out of phase by 180°, so that the audio signals and the control signals may



be derived independently as the summation and difference signals. Therefore the recording capacity of a magnetic tape



may be much improved and the speed of the endless or auxiliary tape may be varied in response to the control signals.

3,733,444

# EDIT CONTROL APPARATUS FOR RECORDING EQUIPMENT

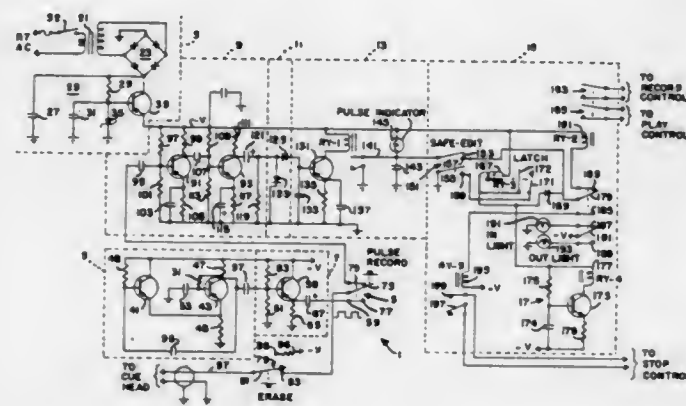
James French, Jr., Fort Collins, Colo., assignor to Video Aid Corporation of Colorado, Loveland, Colo.

Filed Nov. 12, 1970, Ser. No. 88,615

Int. Cl. G11b 27/08

U.S. Cl. 179—100.2 B

1 Claim



Edit control apparatus for recording equipment comprising, a signal generator for developing first and second cue signals for input to the recording equipment; a signal selector for enabling the first and second cue signals to be recorded by the recording equipment; a signal detector responsive to the recorded cue signal and operative to develop a first output signal, and responsive to the second recorded cue signal and operative to develop a second output signal; and a control network responsive to the first output signal and operative to develop an edit-in signal for actuating the edit-in control of the recording equipment, and responsive to the second output signal and operative to develop an edit-out signal for actuating the edit-out control of the recording equipment.

3,733,445

# INERTIAL REACTION TRANSDUCERS

George J. Sebesta, and Richard W. Carlisle, Hicksville, N.Y., assignors to Dyna Magnetic Devices, Inc., Hicksville, N.Y.

Continuation of Ser. No. 650,776, July 3, 1967, abandoned.

This application Feb. 17, 1971, Ser. No. 116,260

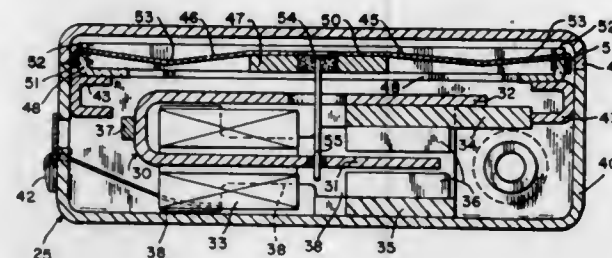
Int. Cl. H04r 11/04

U.S. Cl. 179—115 A

5 Claims

An acoustic transducer having good speech intelligibility with inherent significant suppression of ambient noise. Incorporates inertial mass reaction in efficient, compact and lightweight arrangement. In one form includes a predetermined weight or block suspended by a vibratory diaphragm and linked to the electro-mechanical or motor section, to impart a specific upper resonant frequency. In another, the

weight is mounted directly upon the armature. Effective over a relatively wide speech band. Has a single resonant frequency that is readily controlled and manufactured. Provides inherent roll-off beyond this frequency to extend response, yet substantially reduce noise. Applications include: contact head microphone; in-mask microphone; in-ear receiver.



weight is mounted directly upon the armature. Effective over a relatively wide speech band. Has a single resonant frequency that is readily controlled and manufactured. Provides inherent roll-off beyond this frequency to extend response, yet substantially reduce noise. Applications include: contact head microphone; in-mask microphone; in-ear receiver.

3,733,446

# GUIDED VEHICLE POWER SUPPLY SYSTEM

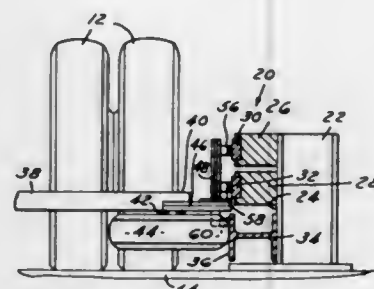
Denny D. Colovas; John S. Logan, and Richard R. Skrch, all of Dearborn, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 14, 1971, Ser. No. 152,641

Int. Cl. B60i 5/08

U.S. Cl. 191—49

3 Claims



A power supply system for a vehicle which is guided along a predetermined path is disclosed. The power supply system has the following makeup. A power supply structure for supplying power to the guided vehicle is located along the side of the predetermined vehicle path. An aligning structure, associated with the power supply structure, provides a guide surface. An aligning wheel is rotatably secured by first support structure to the vehicle in such a position that the wheel contacts the guide surface of the aligning structure to guide the vehicle as it passes along the predetermined path. A plurality of current collectors, for engaging the power supply structure, are secured by second support structure to the first support structure in a position adjacent the aligning wheel. This second support structure resiliently supports the plurality of current collectors in engagement with the power supply structure.

3,733,447

# TILT RESPONSIVE INERTIA SWITCH WITH PRINTED CIRCUIT AND MOVABLE BALL CONTACT

Clayton J. Schneider, Jr., E. Aurora, N.Y., assignor to The United States of America as represented by the Secretary of the Army

Filed Dec. 2, 1971, Ser. No. 204,105

Int. Cl. H01h 35/02, 35/14

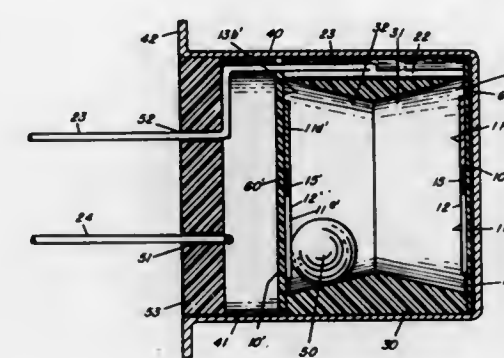
U.S. Cl. 200—61.52

5 Claims

This invention relates to a printed circuit, intermittent, normally open, single pole electric switch designed to become

operative upon the receipt of a tilt motion. The device uses a housing means, a printed circuit contact terminal means supported in the housing, a conducting ball having a first radius of curvature, operatively positioned adjacent to the contact terminal means which responsively moves when the switch is

tilted, and momentarily closes the contact terminal means; an insulated track means is positioned intermediate to the printed circuit contact terminal means, insulating the housing from the contact terminal means while maintaining the conducting ball operatively adjacent to the contact terminal means.



tilted, and momentarily closes the contact terminal means; an insulated track means is positioned intermediate to the printed circuit contact terminal means, insulating the housing from the contact terminal means while maintaining the conducting ball operatively adjacent to the contact terminal means.

3,733,448

# INERTIA TYPE SWITCH WITH ADJUSTABLE SELECTIVE SEATING SURFACE FOR MOVABLE CONTACT

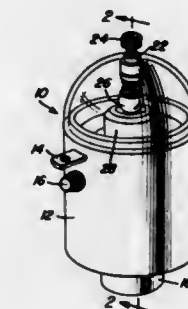
Clifford H. Brady, P.O. Box 812, Sulphur Springs, Tex.

Filed Jan. 11, 1972, Ser. No. 217,053

Int. Cl. H01h 35/02

U.S. Cl. 200—61.45 R

11 Claims



A movement responsive switch assembly comprising a housing, a vertical conductive post reciprocally mounted in the housing and including inner and outer elements threaded together to define a seat of adjustable depth for supporting a conductive ball, and an adjustable stabilizing spring depending from the housing to apply stabilizing forces to the top of the ball, which together with the seat depth determines the directions and magnitude of the forces under which the ball is dislodged to effect switching.

3,733,449

# PUMP PROTECTION SYSTEM WITH PRESSURE RESPONSIVE SWITCH AND FLOAT VALVE

Laurence J. Parker, Guthrie, Okla., assignor to George C. Chiga, Guthrie, Okla., a part interest

Filed Sept. 22, 1971, Ser. No. 182,727

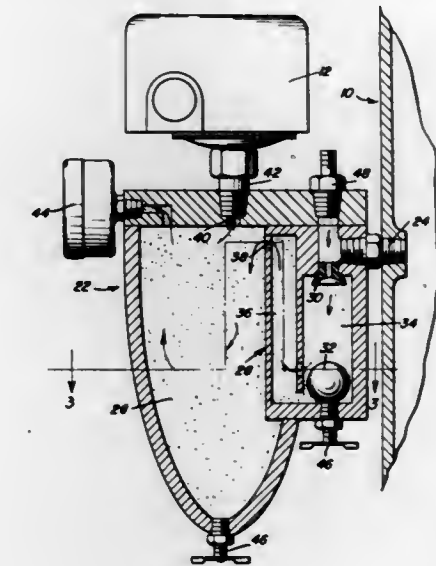
Int. Cl. H01h 35/24

U.S. Cl. 200—81 R

6 Claims

A safety cutoff device mounted on a pressure tank between the tank and the pressure activated pump switch for automati-

ally locking the switch open upon the reduction of air in the tank to the point at which damage could result to the pump electrical system should the pump be allowed to continue to operate. The safety cutoff includes a float valve which is activated to segregate a pressure accommodating auxiliary tank



3,733,450

# OVERLOAD SAFETY SWITCH APPARATUS

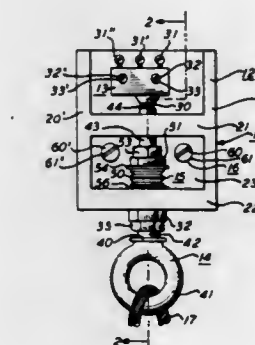
Charles K. Ridge, 71 Norwood Avenue, Upper Montclair, and Jack R. Allen, 16 Oak Tree Lane, Bloomfield, both of N.J.

Filed Oct. 18, 1971, Ser. No. 190,123

Int. Cl. H01h 3/14

U.S. Cl. 200—85 R

2 Claims



An overload safety switch apparatus. Direct switch-to-load movable connection-contact means are provided for supervision of the load hoisting operation, and resilient load-sensing means are provided for use in the safety switch apparatus, to thereby provide an overload safety switch device which supervises load-lifting electrically-operable hoist operation to interrupt the electrical hoist circuit in the event that the lift load exceeds the programmed maximum safe load weight, to safely shut down the hoist operation thereby.



3,733,451

# **ELECTRIC SWITCH ASSEMBLY FOR CONTROL STATIONS HAVING RECTILINEARLY OR ROTATABLY MOVABLE SWITCH OPERATORS LOCATED AT DIFFERENT CENTERS**

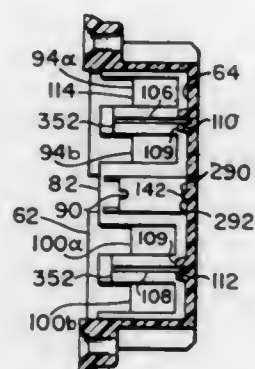
Rudolf H. Kiessling, Milwaukee, Wis., assignor to Square D Company, Park Ridge, Ill.

Filed Mar. 23, 1972, Ser. No. 237,382

Int. Cl. H01h 9/02

U.S. Cl. 200-168 R

18 Claims



An electrical switch assembly having its component parts arranged so a maximum number of the common parts can be used in a flush mounted control station or a surface mounted control station with either of the control stations having rectilinearly moving or rotatable switch operators. The assembly includes components which operate on selected centers so the components may be selectively arranged to be used with two different switch covers, two different type switch actuators and with or without a pilot light. The components also are arranged so the rectilinearly movable operators may be interlocked or made to operate alternately and the rotary operator to be programmed to operate in a two or three position mode of operation.

3,733,452

# **PRESSURE EQUALIZATION MEANS BETWEEN COMPARTMENTS IN A PUFFER CIRCUIT INTERRUPTER**

Francois Strippoli, and Guy Combet, both of Grenoble, France, assignors to Merling Gerin, Societe Anonyme, Grenoble, France

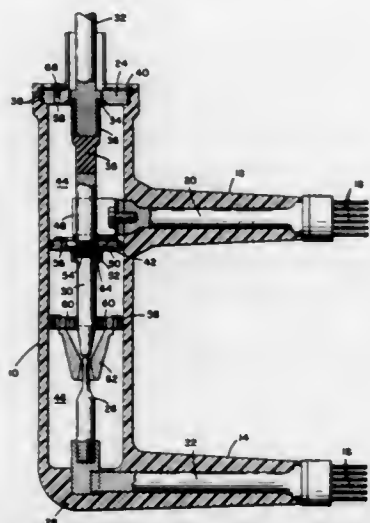
Filed Feb. 5, 1971, Ser. No. 112,887

Claims priority, application France, Feb. 16, 1970, 7005501

Int. Cl. H01h 33/70

U.S. Cl. 200-148 A

9 Claims



A puffer type fluid blast circuit interrupter having a gas tight casing subdivided into two compartments. In the opened position of the interrupter the two compartments communicate freely to permit a rapid equalization of the pressures in the whole casing. An escape valve opens in the case of an excess of pressure in one compartment to allow escape of pressure into the other compartment.

3,733,453

# **HIGH FREQUENCY WELD BOX**

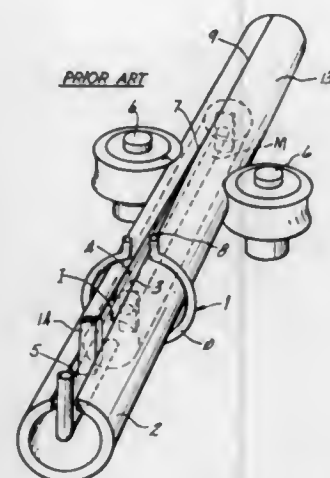
Charles D. McLain, Alton, Ill., assignor to Olin Corporation, New Haven, Conn.

Filed Feb. 18, 1972, Ser. No. 227,472

Int. Cl. H05b 5/02

U.S. Cl. 219-8.5

16 Claims



A weld box and an apparatus for welding metal strip into tubing having improved electrical efficiency. The improvements in electrical efficiency are obtained by shielding magnetic components of the weld box from the induction field of the induction coil which is employed. Alternatively, and preferably, those magnetic parts which are exposed to the induction field have been formed of non-magnetic materials such as copper and copper base alloys. Further, short circuit paths within the weld box have been substantially eliminated by interposing insulating means between components of the weld box in the short circuit path which do not move with respect to one another.

3,733,454

# **OSCILLATOR TUBE FILAMENT CIRCUIT FOR HIGH FREQUENCY WELDING GENERATOR**

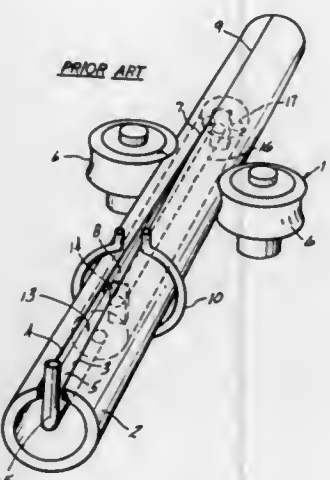
William R. Schwartz, Granite City, Ill., assignor to Olin Corporation, New Haven, Conn.

Filed Feb. 17, 1972, Ser. No. 227,179

Int. Cl. H05b 5/02

U.S. Cl. 219-8.5

7 Claims



A high frequency welding apparatus for obtaining consistently high quality welds in metals, particularly those having low magnetic permeabilities and high thermal conductivities. The filament supply to the oscillator tube or tubes of the current generator has been changed from an A-C supply to a D-C supply having a low ripple or no ripple at all. The output stability of the current generator is thereby improved by decreasing the ripple on the output current to less than 6 percent.

3,733,455

# **POSITIVE LOCKING MECHANICAL COUPLING ARRANGEMENT**

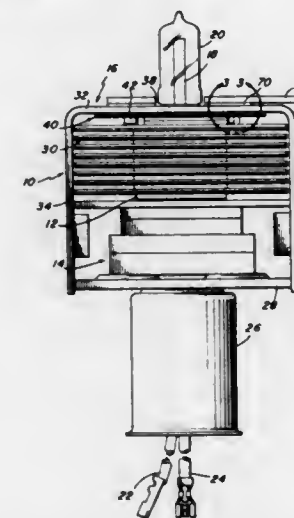
Richard A. Foerstner, Iowa City, Iowa, and James R. Mims, Acton, Mass., assignors to Amana Refrigeration, Inc., Amana, Iowa

Filed June 11, 1971, Ser. No. 152,309

Int. Cl. H05b 9/06

U.S. Cl. 219-10.55

6 Claims



A positive locking arrangement is disclosed for coupling with the wall portion of the first component carrying the locking means sandwiched in between. A rotatably actuated locking ring member having a spaced clearance hole and connected slot arrangement together with ramp bearing and spring force exerting means is adapted to receive and retain in the hole portion stud members positioned in a second component. The components are interlocked by a rotational movement of the ring member. Rotation in a reverse direction unlocks the components. In an illustrative embodiment a magnetron energy generator having an external magnetic field producing means and incorporating the mechanical arrangement is supported by appendages in the launching waveguide section of a high frequency heating apparatus.

3,733,456

# **MICROWAVE OVEN DOOR LATCH**

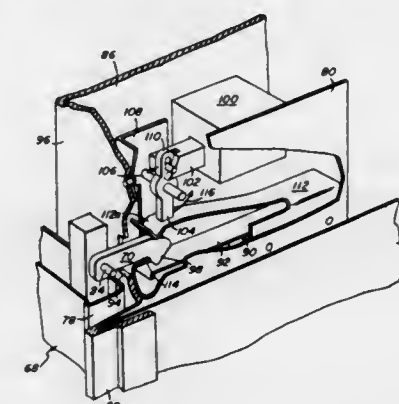
Louis W. Blackburn, Norway, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Filed Sept. 7, 1971, Ser. No. 178,044

Int. Cl. H05b 9/06

U.S. Cl. 219-10.55

5 Claims



An electrically actuated arrangement for securing the door of a microwave oven apparatus while the energy is radiating within the enclosure. The door can only be opened by the user after the heating source has been de-energized. Mechanical latching structures are eliminated and the novel door latch is adaptable to either the side-mounted swinging oven door as well as the drop down model.

3,733,457

# **STUD WELDING TOOL CONSTRUCTION**

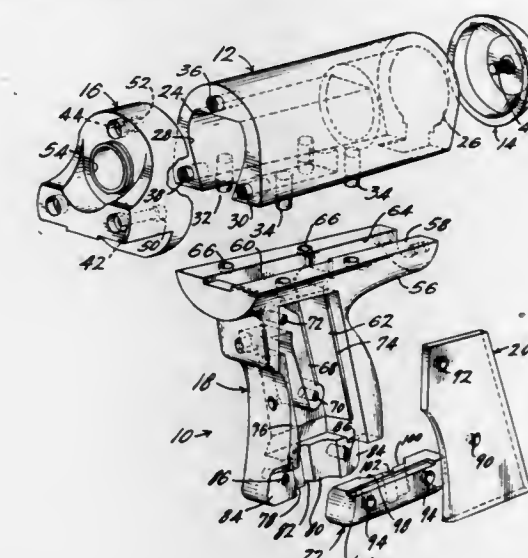
Howard N. Wieland, Amherst, Ohio, assignor to TRW Inc., Cleveland, Ohio

Division of Ser. No. 722,607, April 19, 1968, abandoned. This application May 20, 1970, Ser. No. 51,030

Int. Cl. B23k 9/20

U.S. Cl. 219-98

1 Claim



The body of a stud welding tool is made of a plurality of separate parts. The main housing of the tool thereby can be employed for different applications without the necessity of designing and molding a different housing for each application. The handle of the welding tool body is made of several portions which enable an operator to have access to the interior or more readily and more easily. The welding tool also has an internal component through which current is supplied to a chuck of the tool, and which causes fasteners to be transferred from a point behind the chuck into the work. The component is compact and relatively maintenance free. In particular, the welding tool can be substantially shorter and lighter than those of a like nature heretofore employed.

3,733,458

# **FLUX CORED ELECTRODE**

Igor Konstantinovich Pokhodnya, Pereulok Mechnikova, 3, kv. 21; Vladimir Nikolaevich Golovko, Pechersky spusk, 18, kv. 77, and Alexandr Mikhailovich Suptel, ulitsa Vladimirskaia, 95, kv. 29, all of Kiev, U.S.S.R.

Filed July 8, 1971, Ser. No. 160,920

Int. Cl. B23k 35/22

U.S. Cl. 219-146

1 Claim

A continuous welding electrode for shielded-gas welding and building-up of steels consisting of 25 to 35 percent by weight of a powdery core in a steel envelope, the core consisting of the following components taken in per cent by weight:

|                     |         |
|---------------------|---------|
| rutile concentrate  | 20-40   |
| ferromanganese      | 10-13   |
| feldspar            | 0.6-6.0 |
| sodium fluosilicate | 0.6-4.6 |
| ferrosilicon        | 0.6-2.0 |

the balance being iron powder.

3,733,459

# **INTERNAL HEATING DEVICE FOR AIR VALVES**

Clifford M. Lengstorf, Route No. 1, Whitefish, Mont.

Filed Feb. 9, 1971, Ser. No. 113,947

Int. Cl. H05b 1/00; F16k 49/00

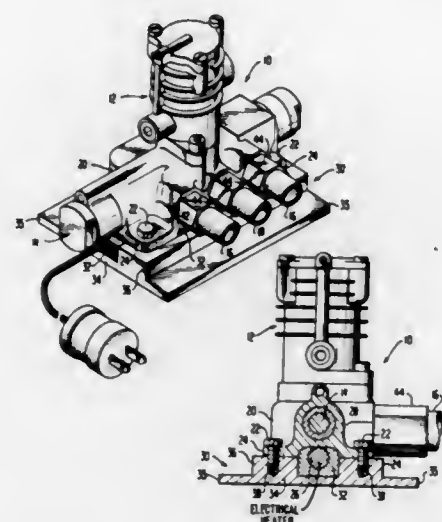
U.S. Cl. 219-201

5 Claims

An electrical heating device for valves is presented. The device prevents freezing of water vapor normally present in



the compressed air used in pneumatic systems, and thereby allows the use of the compressed air machinery under prolonged low temperature conditions. The device consists of an insulated, electrical heating element which is mounted under any conventional pilot valve, abutting the lower surface valve base. A metal mounting plate having a recess for receiving the heating element is affixed to the valve base and holds the ele-



passageway through which the material to be heated flows. Enclosed inside the heat exchanger is an electric heating element and a thermal switch assembly for controlling the heating element. The switch assembly has first and second electric current conducting contact blades resiliently biased in the same direction and supported by insulators at one end in spaced relationship. The switch assembly has a pivotal cam element that cooperatively acts on both blades and there is a stop member movable to prevent the cam element against pivoting in one direction and is released from its stop position by a temperature responsive element set at a predetermined temperature. Operation of the switch is initiated by a two-position actuator.

3,733,461

## RADIANT HEATER

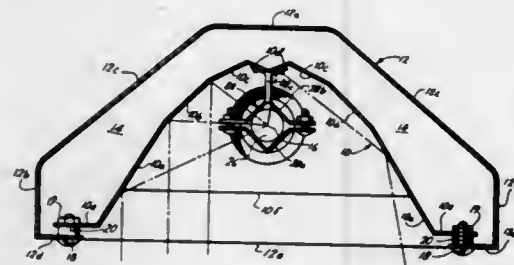
Frank J. Rohats, Kansas City, Mo., assignor to Robert L. Powell, Kansas City, Mo.

Filed May 26, 1971, Ser. No. 146,877

Int. Cl. H05b 1/00; F21v 7/12, 29/00

U.S. Cl. 219-343

2 Claims



ment against the base. Insulating material having a central depression is placed in the recess with the material substantially surrounding the element. The insulating material also extends between the base and the plate to channel heat from the element into the base. The element may be coupled to any conventional power source and is designed to heat the entire valve body.

3,733,460

## APPARATUS FOR HEATING DISPENSED FLOWABLE MATERIAL

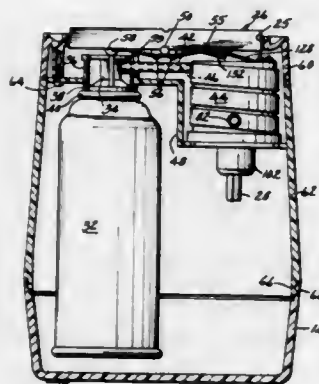
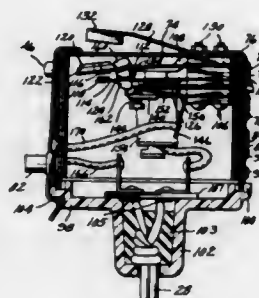
William D. Ryckman, Jr., Asheboro, N.C., assignor to General Electric Company, Bridgeport, Conn.

Filed Sept. 15, 1971, Ser. No. 180,582

Int. Cl. H05b 1/02; B67d 5/62

U.S. Cl. 219-308

10 Claims



Apparatus for heating flowable material dispensed from a pressurized container includes a housing to receive the pressurized container and a heat exchanger assembly having a

A radiant heater having a trough-shaped reflector comprising a plurality of elongated planar sections joined edge to edge in such angular relationship that the trough has a substantially parabolic contour in transverse cross section. The sections immediately adjacent to and on either side of the vertex of the parabola are bent to form an inwardly directed V-shaped rib which reflects heat rays away from an elongated heat generating element positioned at the focus of the parabola. The reflector is housed within an outer shell in spaced relationship thereto, the space between the two being open to the atmosphere along the lateral edges of the reflector and via apertures located in the central section of the shell.

3,733,462

## HEATING ELEMENT FOR FLUSH TOP RANGES

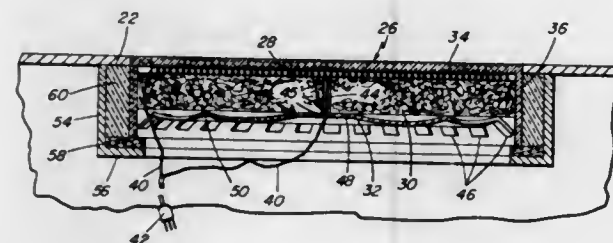
Kenneth G. Bouchard, Brighton, and Wesley W. Teich, Wayland, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 11, 1972, Ser. No. 217,012

Int. Cl. H05b 3/68

U.S. Cl. 219-464

10 Claims



A flush top range having replaceable heating units comprising a sandwich structure which includes a coiled heater element and heat conducting or infrared transmitting disc having a substantially planar surface, and cable means for easily connecting the unit into range circuitry with the planar surface of the disc being adapted to lie substantially in the plane of the adjoining surfaces of the range cooktop.

3,733,463

## TEMPERATURE CONTROL SYSTEM WITH A PULSE WIDTH MODULATED BRIDGE

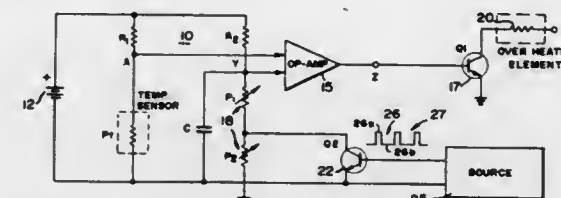
George M. Low, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Richard C. Heyser, Tujunga, Calif.

Filed Dec. 24, 1970, Ser. No. 101,214

Int. Cl. H05b 1/02

U.S. Cl. 219-499

8 Claims



A temperature control system is disclosed which includes a modified wheatstone bridge with a resistive-capacitive (RC) circuit in one leg of the bridge. The RC circuit includes a resistor which provides an effective resistance as a function of its absolute resistance and the on-time to off-time ratio of pulses supplied to a switch connected thereacross. A sawtooth voltage is produced across the RC circuit, the voltage being compared with the voltage across a temperature sensor, with heat being applied during each pulse period portion when the sawtooth voltage exceeds the voltage across the temperature sensor.

3,733,464

## BUSINESS MACHINE

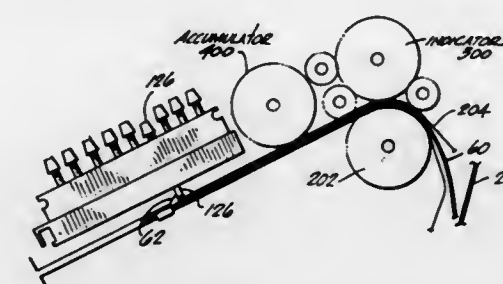
Kenneth F. Oldenburg, Arcadia, Calif., assignor to Litton Business Systems, Inc., New York, N.Y.

Filed June 26, 1970, Ser. No. 50,064

Int. Cl. G07g 1/00

U.S. Cl. 235-23 RC

21 Claims



A cash register is provided with a flexible plastic digit tape to interconnect the cash register display with the selected depressed digit keys. The plastic digit tapes are very flexible and lightweight, and are operated to transmit force under tension to avoid binding and frictional forces. The digit tape is deflected down at the rear of the register to save space. The accumulator is moved down to engage the tape and to the rear to transfer to the display. Both the accumulator and the display assemblies have interleaved indicator wheels having different indications, with the wheel spacing and movement being unitarily related to the keyboard spacing. Light duty components and simple controls, compatible with the low inertia of the digit tapes are used throughout the cash register.

3,733,465

## LOG-BASE ANALOG BALLISTICS COMPUTER

Paul M. Marasco, Cherry Hill, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 16, 1971, Ser. No. 153,681

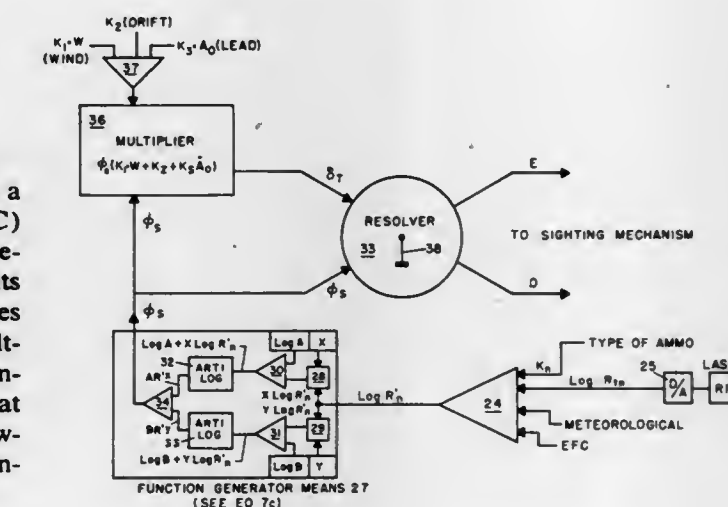
Int. Cl. G06g 7/80

U.S. Cl. 235-61.5 E

3 Claims

An electronic analog ballistics computer wherein various ballistics correction analog signals as well as the log of the

range from a range finder, either optical or one employing the laser principle are applied to a summing amplifier whose output is effectively the log of the adjusted range ( $R_a$ ). Since the superelevation  $\phi_s$  is a function of range for any specific ammunition and constitutes a family of graphic functions for the various ammunitions, an intermediate selected  $\phi_s$  function is generated such that when the log  $R'$  signal is provided as an input the output will be the superelevation therefor. The superelevation  $\phi_s$  is then applied to a multiplier into which is also fed the output of an operational amplifier which receives



the lateral correction factors and effectively sums them. Thus, the multiplier output constitutes the total horizontal correction and when applied with the superelevation  $\phi_s$  to a resolver whose other input which may be internal is the cant angle, the resultant output provides the total elevation above the line of sight and the total lateral deflection from the line of sight in the gun axis with only the necessity of a single function generator. These output signals can then be applied to the sighting mechanism to correct the reticle for the total of all ballistic factors.

3,733,466

## PERFORATING DEVICE

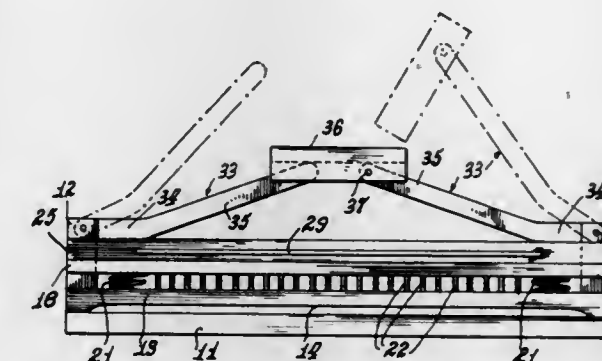
Raymond D. Krumrey, 31 South Clifton, Elgin, Ill.

Filed Aug. 2, 1971, Ser. No. 167,971

Int. Cl. G06k 21/06, 1/02; B26f 1/04; B44b 5/02

U.S. Cl. 235-61.6 E

7 Claims



A multiple perforator for grading examination papers or score sheets of a type including a multitude of punches all or some of which are actuated upon manipulation of a hand actuated lever system to perforate such papers or sheets.



3,733,467

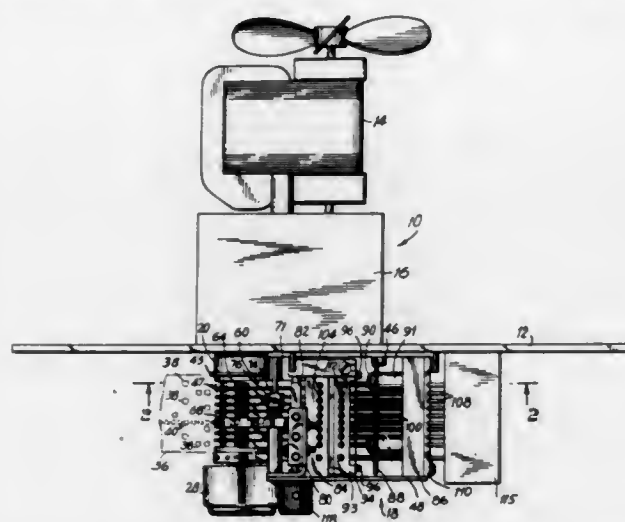
## PERFORATED TAPE READER

Carl Bayer, Jr., Hackensack, and Robert Kelly, Old Tappan, both of N.J., assignors to Data Peripheral Inc., Hackensack, N.J.

Filed Sept. 13, 1971, Ser. No. 179,879  
Int. Cl. G06k 7/04

U.S. Cl. 235-61.11 C

10 Claims



A perforated tape reader having a rotatable capstan engaging the tape for advancing same. Perforation in said tape are detected along an axis substantially transverse thereto by an array of pivotally mounted star wheels and a data signal is produced in response to such detection. A plurality of apertures are circumferentially spaced in the surface of said capstan out of registration with said tape, and a timing signal is produced in response to the detection of said apertures by a further pivotally mounted star wheel.

3,733,468

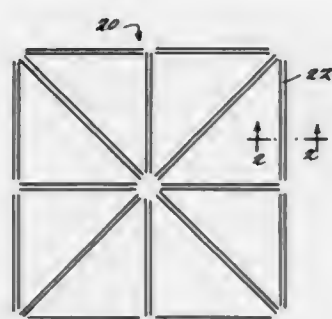
## TWO TRACK EMBOSSED PRODUCT

David H. Eberly, Jr., Fairfield, Conn., assignor to United States Banknote Corporation, New York, N.Y.

Filed Mar. 18, 1970, Ser. No. 20,783  
Int. Cl. G06k 19/00, 19/02; G09b 11/04

U.S. Cl. 235-61.12 R

8 Claims



A method of producing a matrix or similar structure adapted for being used to manually produce alpha-numerical characters in a form suitable for quick and accurate reading by a relatively simple optical scanner or similar device whereby each character is formed by manually tracing over a combination of traceways in the matrix and whereby each traceway is bounded by two rails or tracks, raised with respect to the traceway so as to guide the writer in manually following each traceway with a marker to form the alpha-numerical characters so that the characters can be manually produced quickly, accurately and easily. The tracks or rails can be themselves elevated or the traceway can be formed as a groove in paper or other medium. The two raised tracks or the groove can be formed on paper or other medium by thermographic processes, reverse intaglio, blind embossing, intaglio printing,

dye stamping, impressing hot or cold rolling die against a paper or foil printing as discussed below.

3,733,469

## COUNTING DEVICE FOR PUNCH TYPE BALLOT CARD

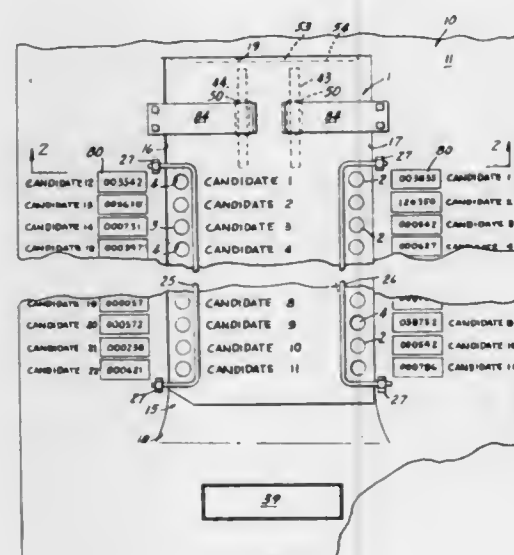
Peter C. Meyer, 3030 Bridgeway, San Rafael, Calif.  
Continuation of Ser. No. 849,827, Aug. 13, 1969, abandoned.

This application Sept. 15, 1971, Ser. No. 180,854

Int. Cl. G06k 7/04; G07c 13/00

U.S. Cl. 235-61.6 R

6 Claims



A counting device especially adapted for counting votes made on a punch type ballot card wherein selections are made by the voter by punching holes at predetermined index point areas. The device provides means for counting all selections on the card simultaneously and permits interruption of the counting cycle to enable viewers to visually inspect the count. Means is provided for ejecting the card from the device.

3,733,470

## SLIDE RULE OF GENERAL USE OF POCKET SIZE

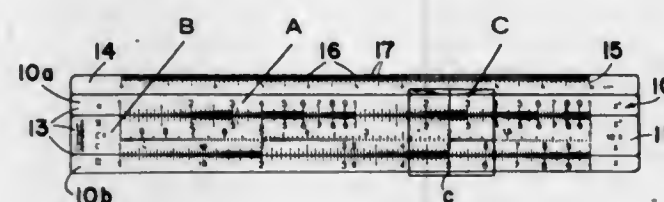
Iosif Hondrea, Timisoara, Romania, assignor to Iprofil-Tennolemn-Industria Produselor Finite Din Lemn, Timisoara, Romania

Filed June 21, 1971, Ser. No. 154,744

Int. Cl. G06g 1/06

U.S. Cl. 235-70 R

5 Claims



A slide rule has a rule face provided with a number of scales, a reglet whose face is provided with compartment scales for normal slide rule operation, and a cursor or slide is shiftable over the body of the rule and carries an index line for cooperation with the scales of the face. Along one longitudinal side of the body of the rule, a beveled face or trapezoidal flange carries a decimally divided scale which indicates units of length and simultaneously serves, by co-operation with the cursor, to indicate the mantissa of the logarithm of a number indicated on a logarithmically divided scale of the face of the slide rule.

3,733,471

## RECIRCULATING COUNTER

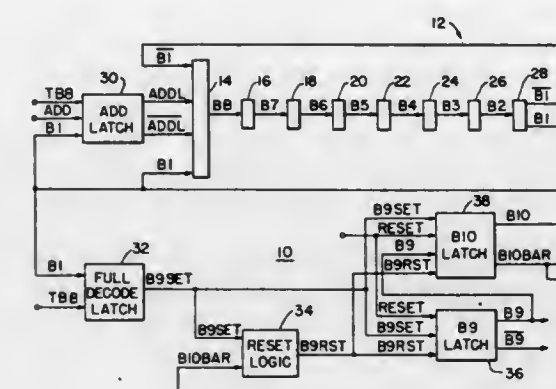
Robert C. Gilberg, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Dec. 7, 1971, Ser. No. 205,546

Int. Cl. H03k 21/36, 23/02

U.S. Cl. 235-92 NG

7 Claims



A four phase MOS-LSI dynamic recirculating binary counter which operates in an N bit time cycle and which counts in excess of  $2^N-1$  counts is disclosed. The counter includes an N stage shift register counter and output logic. The output logic includes a latch which is set once each time cycle during a given bit time and reset by the first logic 0 signal from the shift register counter. If during the given bit time of the next cycle the latch is still set and the least significant shift register stage signal is logic 1, a signal is provided to set additional latch circuits which act as additional stages of the binary counter.

3,733,472

## APPARATUS FOR THE AUTOMATIC DETECTION OF COUNTING ERRORS IN A DISPLACEMENT MEASURING SYSTEM BY ENCODING AND COUNTING

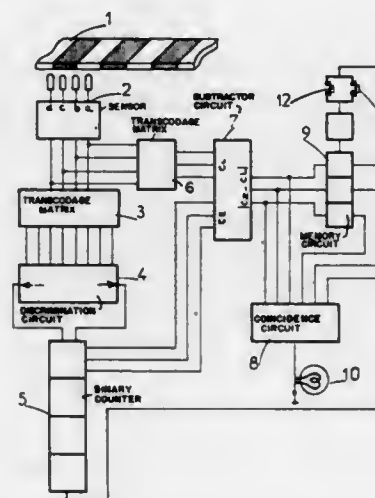
Jean Taisne, Fontenay sous Bois, France, assignor to Societe D'Optique Precision, Electronique Et Mecanique Sapelem, Paris, France

Filed Jan. 28, 1972, Ser. No. 221,710

Int. Cl. H03k 21/30

U.S. Cl. 235-92 DN

9 Claims



Counting errors are automatically detected in a displacement measuring system using encoding and counting by sensing a value  $C_L$  and subtracting it from a value  $C_R$  registered by a counter. The difference of the values is memorized at the beginning of measurement and is then continuously compared with the memorized difference. Non-coincidence between the instantaneous difference and the memorized difference actuates an alarm.

3,733,473

## MEANS AND METHOD FOR CONTROLLING THE STRENGTH OF ACID IN AN ALKYLATION UNIT

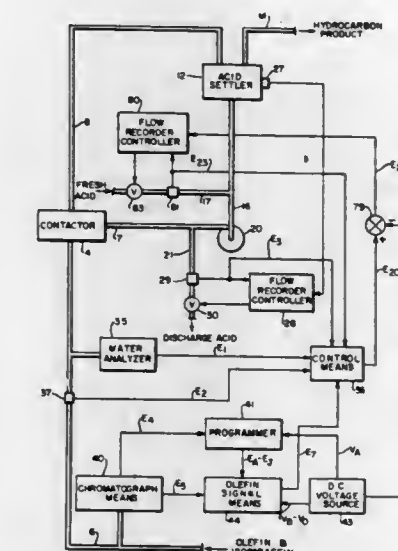
Edward T. Child, Montebello, Calif.; John E. May, Port Arthur, Tex., and William D. Stepanek, Beacon, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Aug. 5, 1971, Ser. No. 169,385

Int. Cl. C07c 3/14

U.S. Cl. 235-151.12

4 Claims



The strength of acid in an alkylation unit is controlled by a system using a signal corresponding to the anticipated demand on the acid by the reaction of olefin and isoparaffin in the presence of the acid. The reaction weakens the acid so that it is necessary to replace some of the weakened acid with fresh acid to maintain a desired acid strength. The control system includes apparatus sampling the olefin and isoparaffin entering the alkylation unit which provides a signal corresponding to the percent volume of acid degrading constituents formed during alkylation. A water analyzer samples the olefin and isoparaffin and provides a signal corresponding to their water content. Signals corresponding to sensed flow rates of fresh and discharged acid entering and leaving, respectively, the alkylation unit and of the olefin and isoparaffin are provided by sensors. A control circuit using analog computers develop the control signal in accordance with the signals from the sensors, the volume signal and the signal from the analyzer and equations hereinafter disclosed. The control signal is applied to a flow recorder controller which controls the flow rate of the fresh acid entering the alkylation unit so as to maintain the desired acid strength.

3,733,474

## APPARATUS AND METHOD FOR PROVIDING CORRECTED NORMALIZED SIGNALS CORRESPONDING TO THE COMPOSITION OF A MATERIAL

Richard R. Edwards, Groves; Walker L. Hopkins, Houston; Leland A. Chvatal, Port Arthur, and Thomas R. Cooper, Groves, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Sept. 1, 1971, Ser. No. 177,028

Int. Cl. G01n 31/08; G06g 7/48

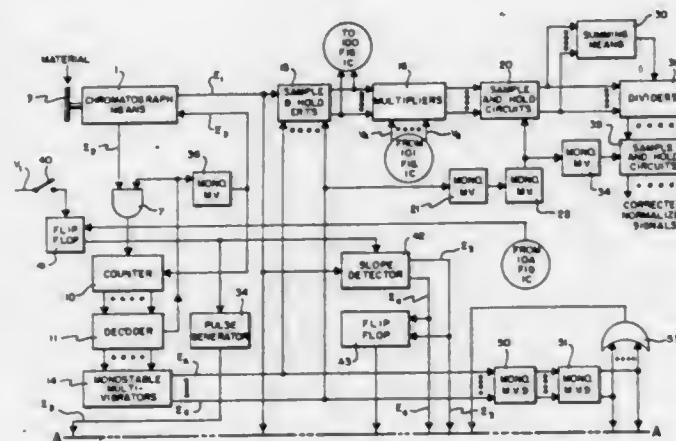
U.S. Cl. 235-154.35

8 Claims

The apparatus includes a chromatograph which samples material and provides a first signal, having peaks corresponding to different constituents of the material, and a pulse signal. Each pulse in the pulse signal coincides with a different peak amplitude occurring in the first signal. In accordance with the signals from the chromatograph, one circuit determines the area under the curve, the curve being the first signal, for each peak in the first signal. Another circuit determines a different baseline for each peak and the area under each baseline. A



third circuit receiving signals from the first two circuits effectively subtracts each baseline area from a peak from the area under the curve associated with the peak to determine a peak area for each peak. The peak area signals are multiplied by thermal conductivity factors to provide signals corresponding to the concentration of the components of the material. A programmer responsive to the pulse signal from the chromatograph controls sample and hold circuits receiving the first



signal from the chromatograph to provide peak height voltages. The peak height voltage for each peak is divided into a corresponding percent concentration signal to provide a correction signal. The correction signals are multiplied with the peak height voltages to provide corrected signals corresponding to the concentrations of the components of the material. The corrected signals are normalized by summing the corrected signals and dividing each corrected signal by the resulting sum signal.

3,733,475

## DIGITAL PULSE SEQUENCE DIVIDER

Jochen Haessler, Nurnberg-Laufamholz, and Wolfgang Wagnerberger, Nurnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

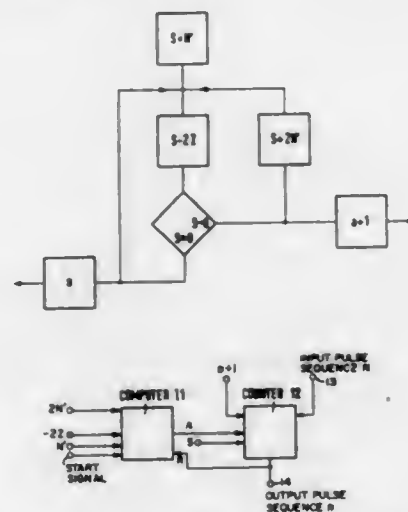
Filed Nov. 10, 1970, Ser. No. 88,351

Claims priority, application Germany, Nov. 22, 1969, P 19 58 622.0

Int. Cl. G06f 7/52; H03k 29/00

U.S. Cl. 235-156

6 Claims



A computer determines the pulse intervals of an output pulse sequence which lead to optimization between two pulses of the output pulse sequence. The computer adds, subtracts and compares integral numbers and determines the pulse intervals in order to prepare the next pulse of the output pulse sequence. The computer avoids division, so that it provides a

result which is free of round-off errors. A counter responds to the pulses of the input pulse sequence and releases pulses of the output pulse sequence under the control of the computer, in accordance with a or a + 1 pulses of the input pulse sequence.

3,733,476

## MEANS AND METHOD FOR AUTOMATICALLY CONTROLLING THE HYDROGEN TO HYDROCARBON MOLE RATIO DURING THE CONVERSION OF A HYDROCARBON

Walker L. Hopkins, Houston; William D. White, Nederland, both of Tex., and Luther F. Champion, Cherry Hill, N.J., assignors to Texaco Development Corporation, New York, N.Y.

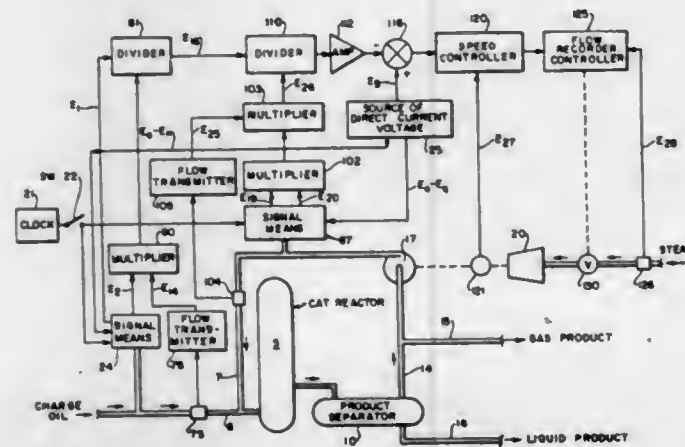
Continuation of Ser. No. 97,571, Dec. 14, 1970, abandoned.

This application May 30, 1972, Ser. No. 257,644

Int. Cl. C10g 35/04; G06g 7/58

U.S. Cl. 235-151.12

8 Claims



In a hydrocarbon converting unit in a petroleum refinery, the hydrogen to hydrocarbon mole ratio is controlled in accordance with the following equation:

$$H_2/HC = \frac{V_H G_R F_c}{13261.21 \times \frac{G_c F_c}{M_c}}$$

where  $V_H$  is the volume percent hydrogen in recycle gas,  $G_R$  is the specific gravity of the recycle gas,  $F_c$  is the flow rate of the recycle gas,  $G_c$  is the specific gravity of the charge oil,  $F_c$  is the charge oil flow rate,  $M_c$  is the average molecular weight of the charge oil and the term 13261.21 is a conversion factor. Signal means sample the charge oil and the recycle gas and provide signals corresponding to the specific gravity of the charge oil  $G_c$  and of the recycle gas  $G_R$ , the average molecular weight  $M_c$  of the charge oil and the quantity of hydrogen  $V_H$  in the recycle gas. Flow transmitters sense the flow rates  $F_c$  and  $F_R$  of the charge oil and the recycle gas, respectively, and provide corresponding signals. An analog computer computes the hydrogen to hydrocarbon mole ratio in accordance with the aforementioned equation and the signals from the signal means and the flow transmitters and provides an output corresponding thereto. An error signal is developed using an output from the analog computer and a reference signal corresponding to a desired value for the hydrogen to hydrocarbon mole ratio. The error signal is used to control the hydrogen entering the hydrocarbon converting unit so as to maintain the hydrogen to hydrocarbon mole ratio at the desired value.

3,733,477  
ITERATIVE BINARY DIVIDER UTILIZING MULTIPLES OF THE DIVISOR

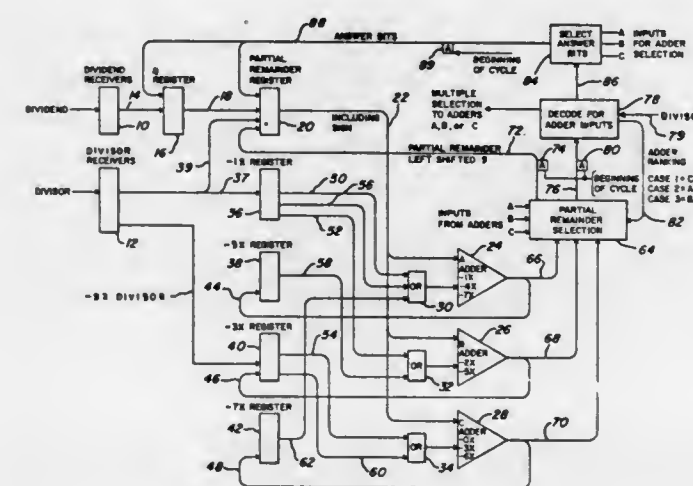
Donald P. Tate, St. Paul, and Louis Kent Steiner, Minneapolis, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Feb. 4, 1972, Ser. No. 223,559

Int. Cl. G06f 7/52

U.S. Cl. 235-164

6 Claims



A high speed divider is provided for a digital computer for generating a predetermined number of partial quotient bits per iteration by initially using a decode table implemented by a logic network to examine a predetermined number of high order bits of the divisor and another predetermined number of high order bits of the dividend, on the first iteration, and on successive iterations, of the partial remainder. The decode table is generated using the principle that for a given range of the divisor and dividend, as established by fixing the high order digits thereof, a limited range of possible partial quotients exists. The number of difference networks required to form partial remainders is limited to the number of decoded possible values for the partial quotient to be generated. A number of trial possible partial remainders are generated by the difference networks using the multiples of the divisor equal to the decoded possible partial quotient values. A second decode table, implemented by a logic network, determines, from the multiples of the divisor gated to the difference networks, and the results determined therein, which has produced the new partial remainder for the next iteration. The bits of the partial quotient are determined by a selector which examines the multiples of the divisor gated to the difference networks and the network from which the new partial remainder was derived. The process of iteration continues until the entire quotient is generated.

3,733,478

## TRANSPORTABLE CONTAINER FOR ELECTRIC CORDS AND CONNECTORS

James D. Barker, R. D. No. 1, Kittanning, Pa.

Filed June 14, 1971, Ser. No. 152,567

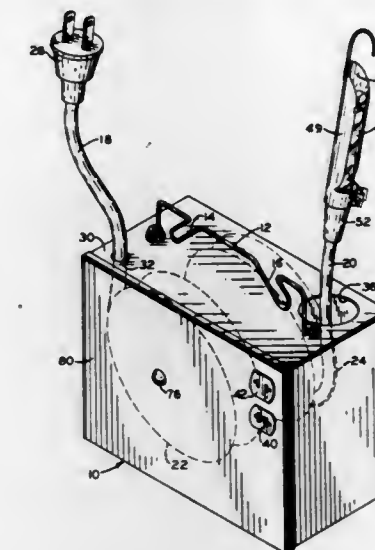
Int. Cl. F21v 15/22

U.S. Cl. 240-2 R

5 Claims

A portable power box has a handle and internal oppositely wound reels, with extension cords one on each of a respective reel, the box also includes an outlet receptacle. The two reels are electrically connected by means of a plurality of sets of copper points and the reels are proportioned to accommodate the desired size and length of electrical cord. The portable box includes a trouble light on one cord and a plug on the other

cord and means are provided on the handle to receive and clamp the respective cords at the desired pulled out lengths.



The power box may also include an attachment clip whereby it can be easily mounted as a whole for convenient carrying.

3,733,479

## END LAMP ACCESSORY

James A. Carley, Rolling Hills, Calif., assignor to Los Angeles Miniature Products, Inc., Torrance, Calif.

Filed Sept. 23, 1971, Ser. No. 182,951

Int. Cl. F21v 33/00

U.S. Cl. 240-2 R

10 Claims



An accessory for use with an electrically operated end lamp, with the accessory when so used acting as a heat sink, a protective housing for the lamp, and as a means for reflecting a beam from the lamp at a desired angle, as well as varying the optical characteristics of the reflected beam from those of the beam initially emitted by the lamp.

3,733,480

## STUDIO LIGHTING APPARATUS

William E. Glenn, Jr., Stamford, Conn., assignor to Columbia Broadcasting System, Inc., New York, N.Y.

Filed June 24, 1971, Ser. No. 156,436

Int. Cl. F21v 9/00

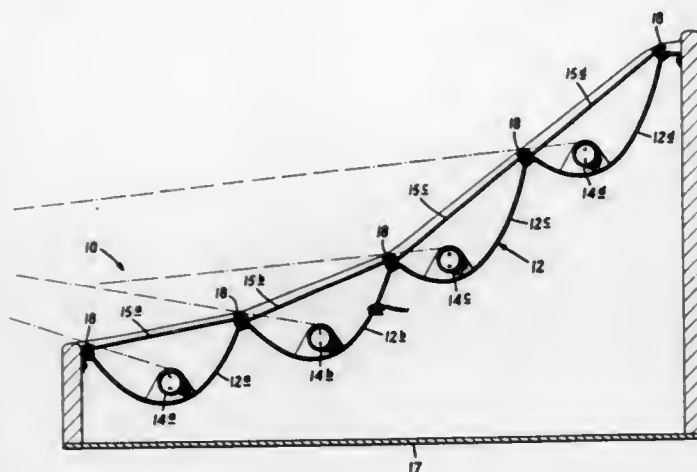
U.S. Cl. 240-20

6 Claims

Apparatus for illuminating a background surface of a television studio or stage with white light comprising red, blue and green color components that are matched with the corresponding primary color sensitivity curves in a color televi-



sion or film camera. The apparatus comprises an assembly of reflectors of elliptical shape supported in contiguous side-by-side relationship with successive reflectors positioned slightly higher than the last and having their major axes departing



from the vertical to a greater extent than the last. Each reflector is illuminated by an elongated fluorescent lamp mounted at the focus of the reflector and having a primary color-emitting phosphor.

3,733,481

## FIBER OPTICS LIGHT SOURCE

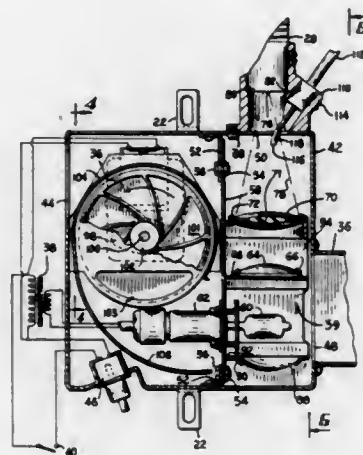
Frits Kuyt, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed June 11, 1970, Ser. No. 45,367

Int. Cl. F21v 29/00

U.S. Cl. 240—47

1 Claim



A fiber optics light source of compact, flat configuration comprises a narrow lamphouse including lamp, reflector and condenser aligned for focusing into the receiving end of a fiber optics bundle, and an air impeller mounted laterally of the lamphouse to direct air over the lamp for dissipating heat buildup. The light source may be built into a dental chair or the like, or it may be a separate module.

3,733,482

## FLUORESCENT LUMINAIRE WITH VERTICALLY ORIENTED U-SHAPED LAMP

Jack V. Miller, Sierra Madre, and Ernest Monte, Pasadena, both of Calif., assignors to Sunbeam Lighting Co., Los Angeles, Calif.

Filed July 22, 1971, Ser. No. 165,256

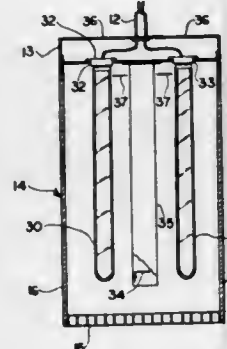
Int. Cl. F21s 3/00

U.S. Cl. 240—51.12

17 Claims

Disclosed is a novel luminaire structure employing a U-shaped fluorescent lamp mounted in a rectangular or cylindrical

cal light diffuser in either an upstanding or depending position. The diffuser constitutes the radiating surface of the luminaire. The diffuser and lamp or lamps are supported from a base member which contains the electrical connections of the luminaire. The electrical ballast associated with the lamp or lamps is secured to the base in an elongated upstanding housing parallel to the leg portions of the lamp or lamps and positioned therebetween. The ballast housing has a reflective sur-



face whereby the light output of the lamp structure is enhanced and has a portion of its metal surfaces in contact with the ballast whereby heat is conducted away from the ballast and is dissipated by radiation from the housing.

Also disclosed is a combination of a vertically oriented U-shaped lamp plus enclosing diffusers of particular orientation which minimizes glare by limiting light distribution at the angle of 25° with respect to the nadir.

3,733,483

## ELECTRON SPECTROSCOPY

Brian Noel Green, Sale, and John Merza Watson, Manchester, both of England, assignors to Associated Electrical Industries Limited, London, England

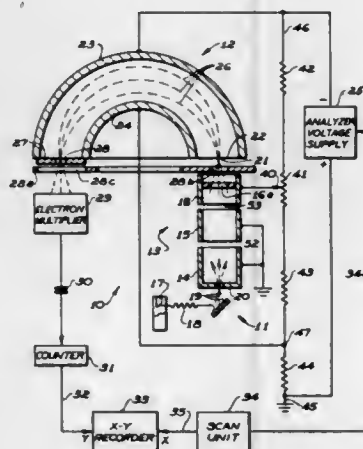
Filed Feb. 26, 1971, Ser. No. 119,327

Claims priority, application Great Britain, Feb. 27, 1970, 9,638/70

Int. Cl. G01t 1/36

U.S. Cl. 250—49.5 AE

8 Claims



An electron spectroscopy apparatus has an analyzer and a retardation lens system. In a first mode of operation, no retardation is applied, and the analyzer scans a low-energy range of the energy spectrum. In a second mode, retardation is applied, and the analyzer scans a high-energy range. The retardation is varied in synchronism with the scanning of the analyzer, so as to maintain a constant retardation factor.

3,733,484

## CONTROL FOR ELECTRON MICROPROBE

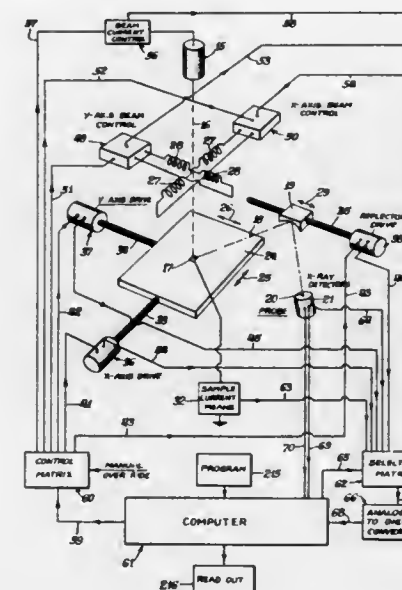
Michael A. Bayard, Chicago, Ill., assignor to Walter C. McCrone Associates, Inc., Chicago, Ill.

Filed Oct. 29, 1969, Ser. No. 872,061

Int. Cl. G01n 23/22

U.S. Cl. 250—49.5 PE

7 Claims



An electron microprobe has a holder for a sample to be analyzed. The holder is movable along an X-axis and a Y-axis, each at right angles to the electron beam directed at the sample. Drives, each including an electric motor, are operatively connected to the holder to adjust the position of the holder along the respective axis. There are also electron beam position controls for positioning the beam in a path oriented as desired with respect to the X and Y axes. An electron beam current control enables the quantity of electrons in the beam to be adjusted. A third drive includes an electric motor, and is connected to a reflector to position the reflector with respect to the X-rays emitted from the sample, and with respect to X-ray detectors. The controls and drives are connected to a control matrix through which signals are supplied to the respective controls and drives, as dictated by a computer. Each of the controls and drives produces an analogue feedback signal indicative of the setting thereof. These feedback signals are sent to a selector matrix from which a specific signal is selected, as dictated by the computer, with the selected signal being delivered to the computer through an analogue to digital converter. The X-ray detectors also produce signals which are ultimately delivered to the computer either directly or through the analogue to digital converter. By appropriately programming the computer, the apparatus automatically analyzes the sample for constituents as desired.

3,733,485

## EXPOSURE METER FOR THERMAL IMAGING DEVICES

Joseph Gaynor, Arcadia, and Terry G. Anderson, Pasadena, both of Calif., assignors to Bell & Howell Company, Pasadena, Calif.

Filed Mar. 18, 1971, Ser. No. 125,684

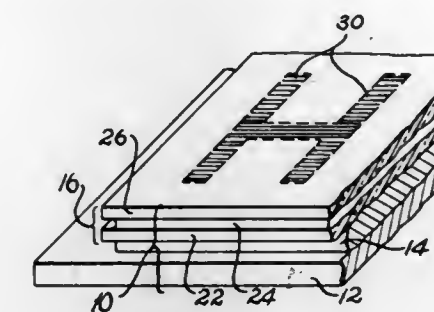
Int. Cl. B41m 5/00

U.S. Cl. 250—65 T

12 Claims

An exposure meter to permit the determination of optimum thermal exposure of a document to be thermographically reproduced. A sheet of thermotropic material is assembled with the document and exposed to thermal radiation until a change in form is discerned corresponding to the document

information. Exemplary thermotropic materials include cholesteric liquid crystalline material, thermochromic com-



pounds, heat-fusible materials and materials having electrical resistance which is sharply temperature dependent.

3,733,486

## RADIOLOGICAL WELL LOGGING METHODS AND APPARATUS FOR REDUCING THE EFFECT OF ACTIVATION FROM THE DETECTOR CRYSTAL

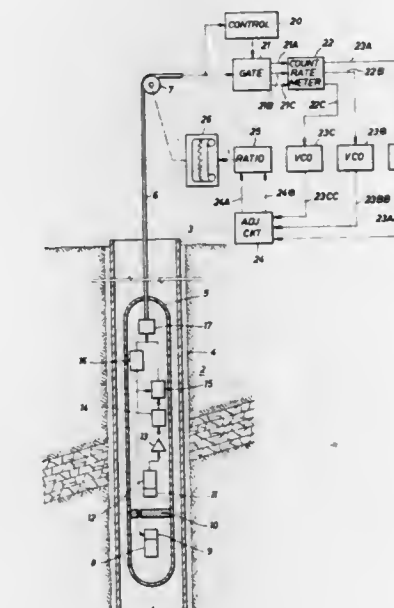
Dan McCay Arnold, and Robert William Pitts, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 30, 1970, Ser. No. 102,743

Int. Cl. G01t 1/20

U.S. Cl. 250—71.5 R

27 Claims



Improved radioactivity well logging methods and apparatus are provided for determining the macroscopic thermal neutron capture cross section of subsurface earth materials, wherein a correction is made to reduce or eliminate the effects of the portion of the measurement which is due to activation of the crystal in the detector. The high energy neutron source is pulsed at a preselected rate during the first portion of the operating cycle, and the resulting capture-induced radiation is measured within the first portion of the operating cycle during two preselected time intervals following the termination of each neutron burst. Thereafter, the source is inactivated during the balance of the operating cycle, and a measurement is made of the radiations registering in the activated crystal. This latter measurement is then utilized to correct the measurements obtained during the first portion of the operating cycle to a predetermined relationship.



3,733,487

**X-RAY DIAGNOSTIC APPARATUS**

Jean Claude Paul Louche, and Rene Loucheur, both of Paris, France, assignors to Compagnie Generale De Radiologie, France

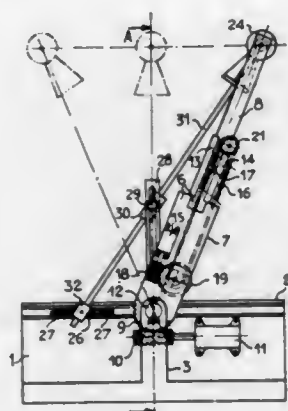
Filed Apr. 13, 1971, Ser. No. 133,660

Claims priority, application France, Apr. 30, 1970, 7016007

Int. Cl. H01J 37/00

U.S. Cl. 250-61.5

4 Claims



X-ray diagnostic apparatus, particularly adapted for rectilinear tomography, comprising a column carrying the X-ray source pivoting about a horizontal axis, said column being composed of a lower and an upper parts, the latter one longitudinally displaceable relatively the former one by means of an electric motor controlled by a signal, which is a function of the angle of inclination of the column.

3,733,488

**DEVICE FOR INDICATING RAPID RADIOACTIVE CONTAMINATION**

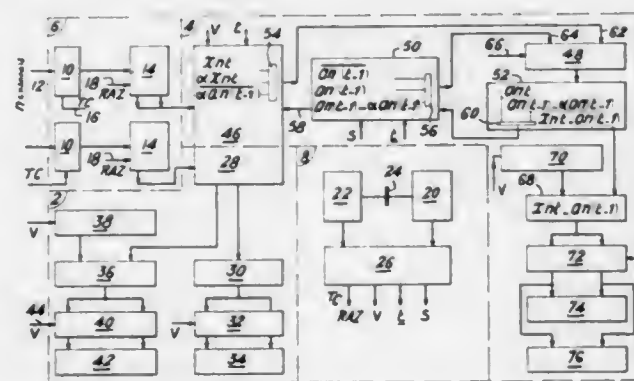
Andre Chaud, Manosque; David Da Costa Vieira; Georges Friedling, both of Aix en Provence; Henri Suzan, Saint Paul les Durance, and Claude Vieuxmaire, Meyrargues, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed May 20, 1971, Ser. No. 145,404

Int. Cl. G01t 1/16

U.S. Cl. 250-83.3 R

5 Claims



The difference in rates of variation in time of useful and spurious signals is employed in order to select the useful signals by means of  $n$  detection channels each comprising successively a radioactivity detector, a matching circuit and a scaler, at least one clock signal generator for delivering periodic pulses and a circuit for the distribution of clock signals, a direct measurement channel for recording and comparing the content of each scaler with a threshold value  $A'$  in order to provide information when the content exceeds the threshold value, and a "difference" measurement channel

which follows the progressive variation of radioactive contamination and comprises a scaler-selection circuit, means for providing a "filtered" value  $a$  of the content of each scaler, means for comparing the difference between each content and the corresponding "filtered" value with a threshold value  $A$  and threshold-overshoot information means.

3,733,489

**RADIATION TIMING DEVICE**

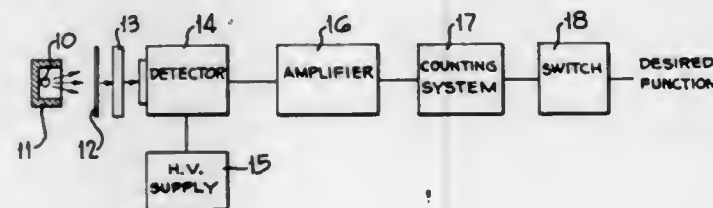
Sigmund Berk, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 7, 1971, Ser. No. 160,287

Int. Cl. G01t 1/16

U.S. Cl. 250-83.3 R

9 Claims



Radiation timing device for use in fuzes for bombs, shells, mines and the like. The constant emission of radioactive emanations from a radioactive source is used to measure time. The device consists of a source, a shutter or absorber placed between the source and a radiation detector and counter. When a predetermined number of emanations is counted a switch activates the device.

3,733,490

**ROTARY TARGET FOR ELECTROSTATIC ACCELERATOR WHICH OPERATES AS A NEUTRON GENERATOR**

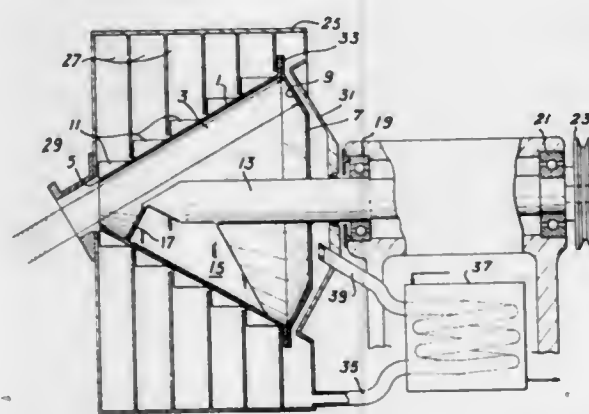
Michel Roche, Quetigny, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Jan. 8, 1971, Ser. No. 104,951

Int. Cl. G21g 3/00

U.S. Cl. 250-84.5

5 Claims



The rotary target has a generally annular shape and is carried by a rotor into which the beam of the accelerator penetrates, a stator being placed around said rotor and forming an end-shield behind the target. Heat-transporting fluid is circulated within the space formed between the end-shield and the target as a result of rotation of the rotor which acts on the fluid in the same manner as a pump. A heat exchanger is placed on the path of the heat-transporting fluid and at least one system of baffles is placed between the rotor and the stator.

3,733,491

**PHOTOMULTIPLIER TUBE CIRCUIT**

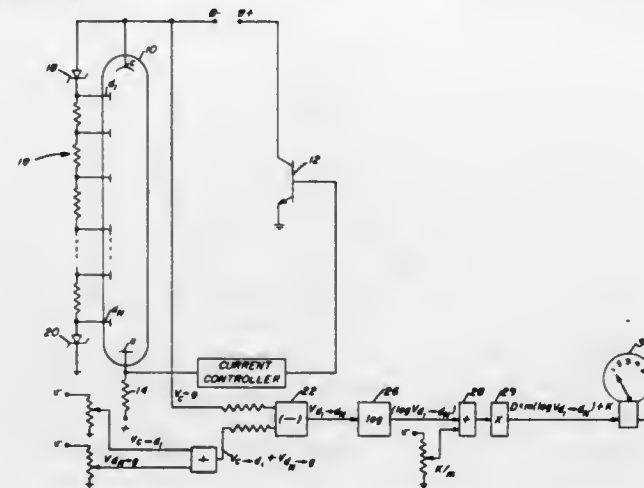
Frank H. Holland, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 23, 1971, Ser. No. 165,595

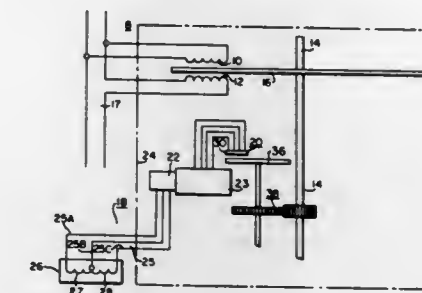
Int. Cl. H01J 39/12

U.S. Cl. 250-207

5 Claims



A voltage difference equal to the sum of the voltage differences appearing between the cathode and first dynode, and between the last dynode and ground of a photomultiplier tube is subtracted from the cathode-to-ground voltage difference of a photomultiplier tube. Optical density is calculated by producing the logarithm of the quotient signal so produced.



so as to be alternately energized in an out-of-phase relationship to prevent false triggering due to cross-radiation between the pairs. A radiation filter is provided on a sensing head carrying the source-pickup pairs so as to concurrently increase the triggering sensitivity of the source-pickup pairs and permit operation with reduced current levels when the pulse initiator is operated under strong ambient light conditions typical in certain meter applications.

3,733,492

**GATEABLE IMAGE INTENSIFIER TUBE**

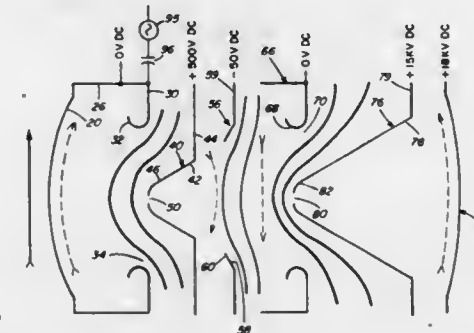
Robert A. Hagar, Fairfield, Conn., assignor to The Machlett Laboratories, Incorporated, Springfield, Conn.

Filed Apr. 3, 1972, Ser. No. 250,411

Int. Cl. H01J 31/50, 39/12

U.S. Cl. 250-213 VT

7 Claims



An image intensifier tube comprising an elongated envelope having therein axially spaced electrodes including a gateable photocathode located adjacent an input faceplate at one end of the envelope and low voltage means for increasing the intensity of an electrostatic field adjacent the photocathode without adversely affecting other interelectrode fields established within the tube envelope, thereby achieving an in-focus image having substantially constant brightness during the gating interval.

3,733,493

**SOLID STATE RADIOMETRIC PULSE INITIATOR FOR REMOTE METER READING SYSTEMS**

Theodore M. McClelland, III, Cary, N.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 12, 1971, Ser. No. 198,319

Int. Cl. G01d 5/36

U.S. Cl. 250-233

7 Claims

A solid state radiometric pulse initiator for a remote meter reading system includes a sensing head having two combined

3,733,494

**REPLACEMENT COIL SET FOR AUTOMOBILE STARTER MOTORS**

Henry P. Erwin, Jr., 1224 Arden Road, Pasadena, Calif.

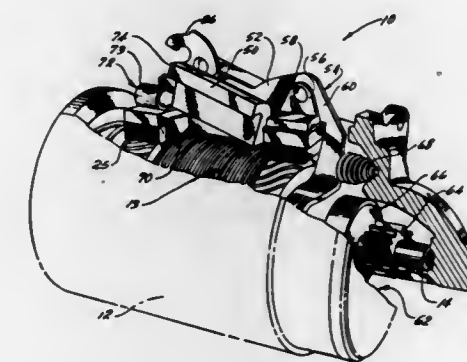
Continuation-in-part of Ser. No. 127,928, March 28, 1971.

This application May 15, 1972, Ser. No. 253,396

Int. Cl. F02n 11/00

U.S. Cl. 290-38

4 Claims



An improved replacement field coil set is provided for automobile starter motors of the movable pole type having four field coils of which one coil serves as a pull-in and hold-in coil for the movable pole-piece in addition to serving as a field coil for inducing rotation of the motor armature. In the improved coil set, the one coil is comprised of a single winding formed by a single conductor of predetermined turns and dimensions so selected that the one coil operates to pull the movable pole-piece into the center of the coil during initial current flow only through the single winding and also during current flow through all coils to hold the movable pole-piece in its pulled-in position without chatter of the movable pole-piece during no-load operating conditions of the motor. The four coils of the improved coil set are interconnected in a two-and-two series-parallel relation to each other so that, upon installation of the coil set in a starter motor, the conductors interconnecting the coils of the set are all disposed at a common end of the motor.



3,733,495

## ELECTRICAL CONTROL UNIT

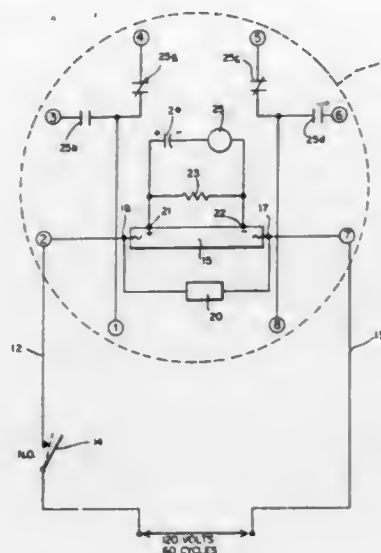
George S. Hudimac, Jr., Allentown, Pa., assignor to Mechanical Service Co., Inc., Allentown, Pa.

Filed June 12, 1972, Ser. No. 261,706

Int. Cl. H03k 3/00

U.S. Cl. 307-108

4 Claims



A device, preferably of the plug-in type, which is connected in an electrical master circuit and operates when the master circuit is energized to momentarily open and/or close a contact in an independent slave circuit and thereby perform a control function. The operation is momentary even though the master circuit is maintained in the energized condition.

3,733,496

## VARIABLE MODULO N SCS TYPE COUNTER

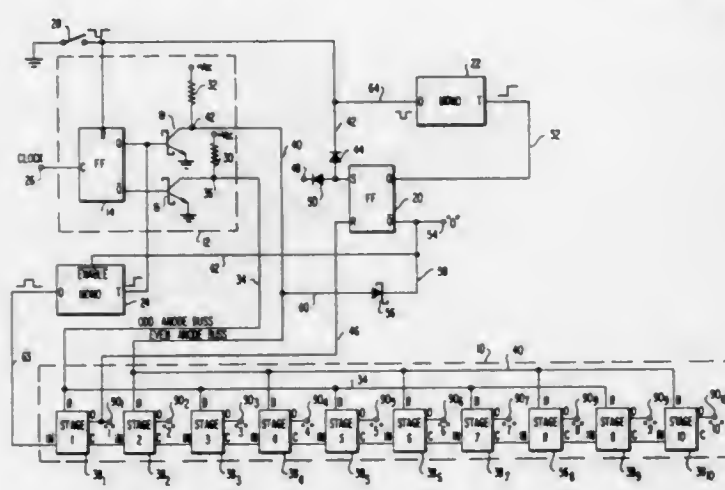
Peter A. Schade, 10650 Weymouth St., Bethesda, Md.

Filed Feb. 22, 1972, Ser. No. 227,754

Int. Cl. H03k 23/08; G11c 19/00

U.S. Cl. 307-223 B

11 Claims



An N stage counter-divider comprising a plurality of series coupled semiconductor SCS type switches wherein the switch of each stage is comprised of two complementary transistors, one of which comprises a Schottky transistor, interconnected in the form of a four terminal device having an anode, a cathode, and a pair of gate electrodes referred to as the anode gate and the cathode gate. The anodes of the odd and even numbered stages are respectively connected together in parallel relationship and share a respective common load resistor. A flip-flop circuit controlled by a clock input signal has a pair of complementary outputs which are respectively coupled to the common load resistors through logic inverter circuits and thereby alternately apply a supply voltage to the odd and even numbered SCS anodes as the flip-flop is clocked.

3,733,497

## ELECTRONIC FLASHER

Bertrand A. Warnod, Neuilly-sur-Seine, France, assignor to Klaxon S.A., Neuilly-sur-Seine, France

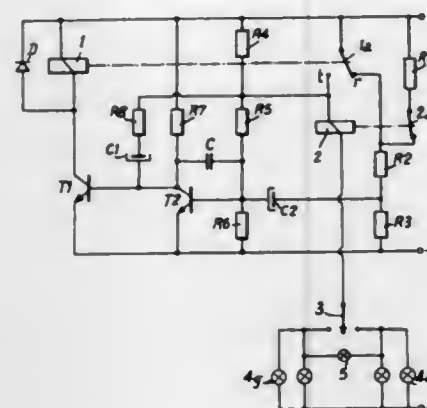
Filed Dec. 2, 1971, Ser. No. 204,231

Claims priority, application France, Dec. 4, 1970, 7043695

Int. Cl. H01h 47/00

U.S. Cl. 307-132 E

4 Claims



A circuit for respectively flashing signal lamps. The circuit includes at least two cooperable transistors, charging circuit with a main capacitor, a secondary capacitor to ensure stable operation, a main relay, a secondary relay, and a direct current source. The circuit is designed to be insensitive to transistor current gain variations and to be immune to parasitic capacitances.

3,733,498

## DUAL-VOLTAGE FEEDBACK COMPARATOR FOR SIMULTANEOUSLY MONITORING A POSITIVE AND NEGATIVE VOLTAGE

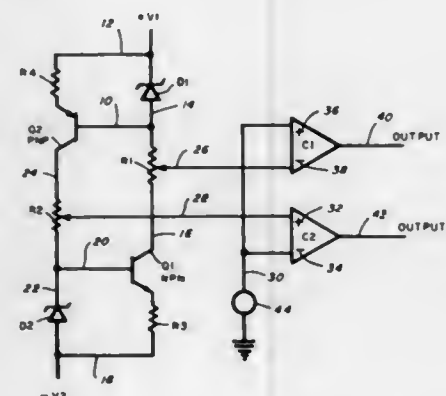
Milton R. Watson, Tulsa, Okla., assignor to Telex Computer Products, Inc., Tulsa, Okla.

Filed Sept. 27, 1971, Ser. No. 183,847

Int. Cl. H03k 1/12

U.S. Cl. 307-297

4 Claims



In this invention a positive voltage V1 and a negative voltage V2 are simultaneously monitored by two voltage comparators, which compare voltages on two potentiometers with a standard reference voltage. The potentiometers are tied between constant current loops, each comprising a zener diode, a resistance, and a transistor. When either of the voltages changes the collector of the appropriate transistor takes up the voltage, and thus the potentiometers shift in their potential in accordance with the change of the monitored voltages. These changes in potential are transferred to the comparators which switch their output from a logical zero to a logical one whenever the voltages they are monitoring vary by more than a selected value from a preselected value.

3,733,499

## PYROELECTRIC DETECTOR

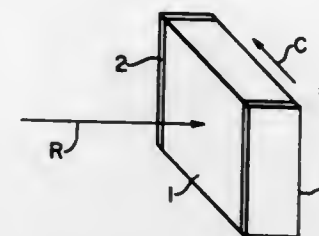
Daniel W. Deis, Pittsburgh, and George W. Roland, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 20, 1972, Ser. No. 246,008

Int. Cl. H01l 15/00

U.S. Cl. 310-4

10 Claims



A pyroelectric detector is disclosed which comprises a crystal of  $Tl_3AsSe_3$  having two opposing faces with an electrically conducting electrode contacting each face. The detector is connected to an amplifier, the output of which can be displayed on an oscilloscope or otherwise displayed or utilized electronically. The detector has superior electrical properties and can detect any form of radiation which increases the temperature of the crystal.

3,733,500

## ADJUSTABLE ELECTROMAGNETIC VIBRATOR

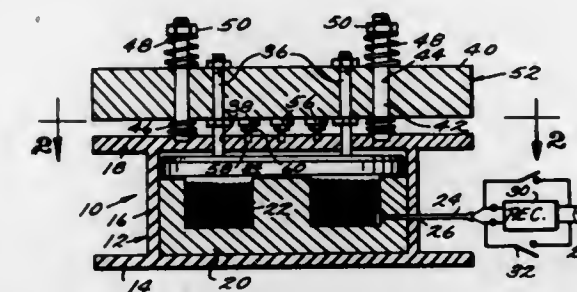
George W. Mushrush, 12903 Sturbridge Road, Woodbridge, Va.

Filed Mar. 1, 1972, Ser. No. 230,643

Int. Cl. H02k 33/02

U.S. Cl. 310-17

3 Claims



The housing of the electromagnetic vibrator has an outer plate through which studs secured on the armature protrude. A weight is secured on the studs outside the housing. Further studs secured on the plate outside the housing mount the armature/weight assembly on the housing via counter-balancing springs. Nuts secured on the latter studs are adjustable to adjust vibration amplitude. Resilient bumpers may be provided to limit movement of the armature toward the core and coil and to limit movement of the weight toward the housing. The vibrator may use AC electric service, as is, or rectified to DC. The adjustable nuts also accommodate switching from AC to DC electrical service.

3,733,501

## SEALING MEANS FOR LIQUID COOLED ROTORS FOR DYNAMOELECTRIC MACHINES

Paul R. Heller, Murrysville, Pa., and Ram T. Gehani, Bombay, India, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 17, 1971, Ser. No. 181,479

Int. Cl. H02k 9/00

U.S. Cl. 310-54

12 Claims

Gland seals are provided for the entrance and discharge passages of liquid cooled rotors for dynamoelectric machines.

3,733,503

## OIL SPRAY COOLED, BRUSHLESS, VARIABLE SPEED DIRECT CURRENT GENERATOR

Frederick Milton Potter, Little Silver, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed June 16, 1972, Ser. No. 263,504

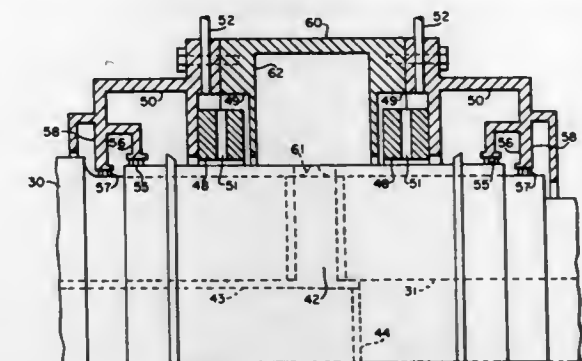
Int. Cl. H02k 11/00

U.S. Cl. 310-68

11 Claims

An oil cooled generator has a plurality of diodes for converting alternating current power to direct current power. The

Coolant liquid is introduced or discharged through stationary coolant chambers surrounding the rotor and enclosing the entrance and discharge passages. Gland seal rings encircle the rotor adjacent the coolant chambers and sealing liquid is introduced into the clearance between each seal ring and the rotor at a pressure not exceeding the pressure of the coolant liquid to minimize leakage of the coolant liquid while preventing contamination of the coolant liquid by the sealing liquid.



3,733,502

## LIQUID COOLED ROTOR FOR DYNAMOELECTRIC MACHINES

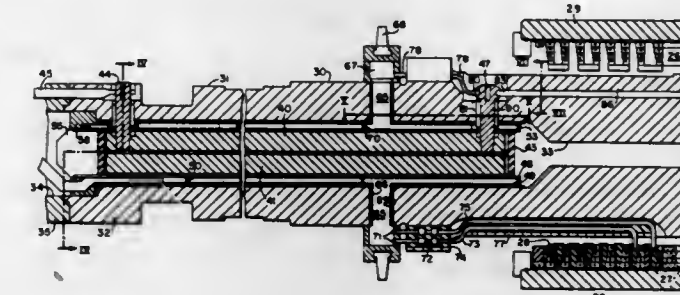
L. Paul Curtis, Murrysville; Sul-Chun Ying, and James E. Luzader, both of Monroeville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 17, 1971, Ser. No. 144,050

Int. Cl. H02k 9/00

U.S. Cl. 310-61

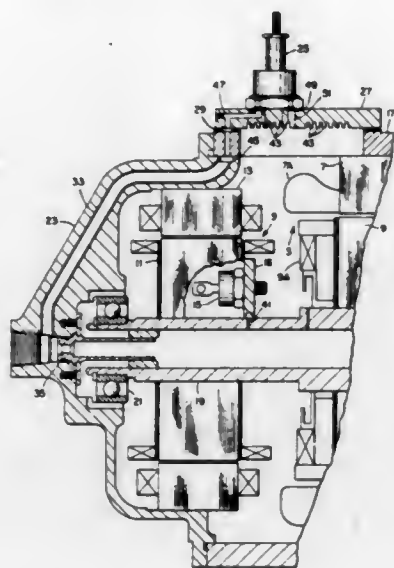
15 Claims



A liquid cooled rotor for dynamoelectric machines such as large turbine generators in which a coolant liquid is introduced along the shaft axis at one end of the machine, flows through passages in the shaft and rotor body, through passages or ducts in the rotor winding, and is discharged through the shaft axis. The leads to the rotor winding are disposed axially in a center bore of the shaft and provision is made for directing the coolant from the shaft axis to an annular passage around the axial leads to cool the leads as well as to carry the coolant to the central or body part of the rotor. Provisions are also made for liquid cooling of the radial leads to the rotor winding, and corrosion resistant linings are utilized in the coolant passages with provision for permitting thermal expansion of the linings.



diodes are mounted on heat sinks exteriorly of the generator so the diodes can be assembled to and disassembled from the generator without dismantling the generator. The heat sinks are cooled by spraying oil on finned surfaces of the heat sinks



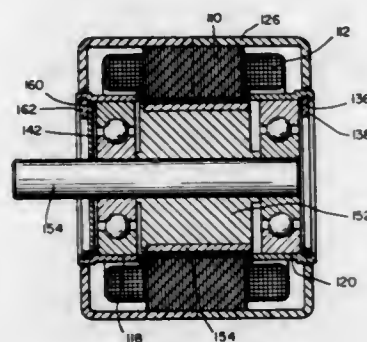
inside the generator and by circulating cooling oil at turbulent velocity between the diodes and heat sinks over major portions of the diode mounting surfaces for directly cooling the diodes and heat sinks.

3,733,504

**SELF SUPPORTING ROTARY ELECTRICAL DEVICE**  
Jack R. Dennis, West Chester, Pa., assignor to Harowe Servo Controls, Inc., West Chester, Pa.  
Filed July 27, 1971, Ser. No. 166,513  
Int. Cl. H02k 5/10

U.S. Cl. 310-86

8 Claims



A magnetic sleeve is disposed in the space between the stator and the rotor of a hysteresis synchronous motor. The sleeve supports the stator and closes internal slots in the stator core. The sleeve also carries bearings for mounting the rotor for relative movement with respect to the stator.

3,733,505

**INDUCTION TRANSDUCER OF THE EXCITATION CURRENT OF A SYNCHRONOUS GENERATOR**  
Vasily Semenovich Kildishev, Plekhanovskaya ulitsa, 41/43, kv. 55, Kharkov; Gely Alexeevich Kovalkov, Leningradsky prospekt, 26, kv. 174; Nikolai Sergeevich Maznikin, B. Pochtovaya ulitsa, 14/16, kv. 61, and Alexandr Vasilievich Misjulin, Vyazemskaya ulitsa, 24, kv. 23, all of Moscow, U.S.S.R.

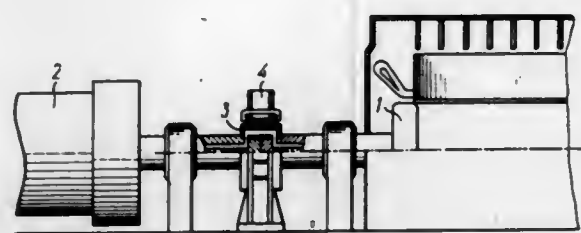
Filed Feb. 8, 1971, Ser. No. 113,290  
Int. Cl. H02k 7/20, 17/44

U.S. Cl. 310-112

3 Claims

The present invention relates to an induction transducer of the excitation current of a synchronous generator.

An induction current transducer according to the invention is characterized in that its rotor uses a coupling interconnecting the shafts of a synchronous generator and an exciter and carrying the field winding of the transducer, which uses the



conductors from the exciter to the synchronous generator, enclosed by a stator.

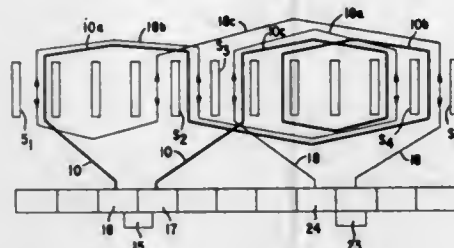
The current transducer is intended for use mainly on high-power turbo-alternators with brushless excitation.

3,733,506

**COMMUTATED WOUND ARMATURE ASSEMBLIES**  
Wolfgang Jaffe, Roselle Park, and John W. Wurst, Dover, both of N.J., assignors to The Singer Company, New York, N.Y.  
Filed Oct. 29, 1971, Ser. No. 193,934  
Int. Cl. H02k 3/16

U.S. Cl. 310-198

4 Claims



Winding configurations for the armature of small commutator type motors are disclosed in which a first winding can be identified as just completing commutation at one brush at the same time that a second winding is in the midst of being short circuited by the other brush. The windings are distributed and arranged to be closely coupled to each other by having coil sides of each winding in slots common to both. In this manner, the abrupt current change required by the commutation process can be compensated for by an opposite change in current in the coupled short-circuited winding and with a minimum instantaneous flux change. This results in significantly reduced sparking, longer brush and commutator life and reduced electromagnetic interference (EMI).

3,733,507

**BEAM-DEFLECTION SYSTEM FOR COLOR TELEVISION PICTURE TUBE**

Georges Casset, Issy-les-Moulineaux; Jean Pierre Driffort, Chatenay-Malabry, and Pierre Lebel, Kremlin-Bicetre, all of France, assignors to Ste d'ite France-Couleur, Paris, France

Filed Sept. 10, 1969, Ser. No. 857,638

Claims priority, application France, Sept. 16, 1968, 68166360

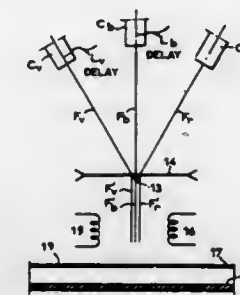
Int. Cl. H01j 31/20, 29/06; H01f 7/00

U.S. Cl. 313-70 C

7 Claims

A color television picture tube, having a plurality of electron guns delivering electron beams and a deflection device

for causing the television screen to be swept by said beams, comprises means for supplying parallel and coplanar electron beams at their entrance into the deflection device and means imposing a delay on the video signals controlling two of the



guns so that the three elements of a triad of elementary colors of the screen receive quantities of electrons according to the video information corresponding to one and the same televised dot.

3,733,508

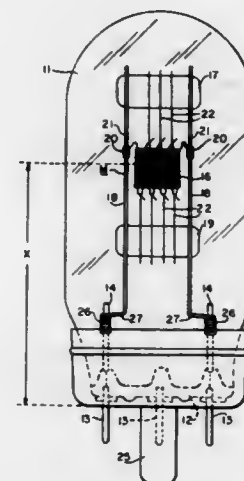
**HALOGEN-CYCLE INCANDESCENT LAMP HAVING AN IMPROVED FILAMENT MOUNT ASSEMBLY**  
Nicholas J. Rainone, Clifton, and Aristide R. De Caro, Edison, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 22, 1970, Ser. No. 100,665

Int. Cl. H01j 1/94, 19/48

U.S. Cl. 313-183

6 Claims



The planar tungsten-wire filament of a single-ended halogen type incandescent lamp is suspended at a predetermined location within the envelope by a unitary mount structure that is preassembled and has support wires that are coupled to the inner ends of the lead-in wires. The aforesaid coupling is achieved by providing helically coiled end portions on the tungsten support wires, slidably fitting the coiled end portions over the tungsten inner end segments of the lead wires, and locking the members in predetermined telescoped relationship by hot-clamping the coiled portions to the leads, or by spot-welding molybdenum stud wires to the protruding inner ends of the lead wires. The axial adjustability afforded by the telescoped juncture permits standard mount assemblies to be used for lamp types which require different light-center-lengths. The numerous and unreliable tungsten-to-tungsten welds heretofore required are also eliminated.

3,733,509

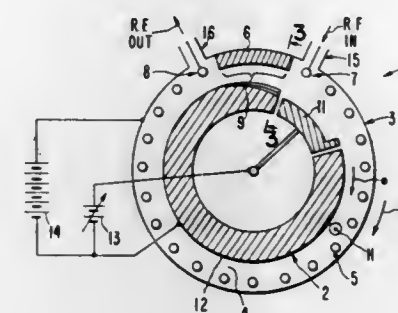
**CROSSED-FIELD MICROWAVE TUBES HAVING AN IMPROVED CONTROL ELECTRODE GEOMETRY**  
Andrew S. Wilczek, Old Bridge, N.J., assignor to Varian Associates, Palo Alto, Calif.

Filed July 15, 1969, Ser. No. 844,731

Int. Cl. H01j 25/34

U.S. Cl. 315-3.6

6 Claims



An improved control electrode geometry for crossed-field microwave tubes is disclosed. The control electrode geometry is disposed facing the microwave slow wave circuit and includes an upstream portion which is recessed from the anode microwave circuit by more than the downstream portion of the control electrode. With a certain positive bias potential applied to the control electrode relative to the cathode potential a certain fraction of the electron stream will be collected on the control electrode in the absence of microwave energy on the microwave circuit, but in the presence of microwave energy on the microwave circuit the microwave energy interacts with the electrons to decrease the fraction of electrons collected on the control electrode.

3,733,510

**ELECTRON DISCHARGE DEVICES USING ELECTRON-BOMBARDED SEMICONDUCTORS**

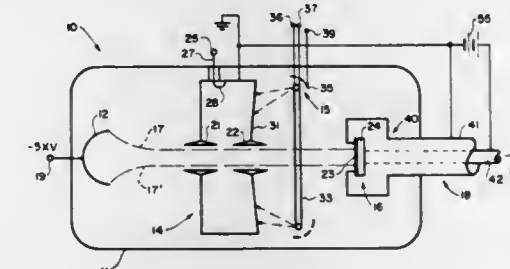
Paul Fischer, Oakhurst; Park Richmond, Farmingdale, and Gunther E. Wurthmann, Lincroft, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 17, 1971, Ser. No. 172,456

Int. Cl. H01j 25/22

U.S. Cl. 315-5.24

13 Claims



Amplifying and oscillating devices wherein an element beam from an appropriate electron gun is directed through an apertured microwave cavity resonator means and bombards a coaxially mounted semiconductor p-n junction.

In the case of an amplifier, an input r-f signal is coupled into the cavity resonator and modulates the electron beam. In the case of an oscillator, a pair of closely coupled microwave cavities is used to achieve the feedback essential to oscillation. In either case, a microwave cavity resonator means can be tuned mechanically or thermally.



3,733,511

**MOLECULAR BEAM TUBE HAVING MEANS FOR DEGAUSSING THE MAGNETIC SHIELDING STRUCTURE**

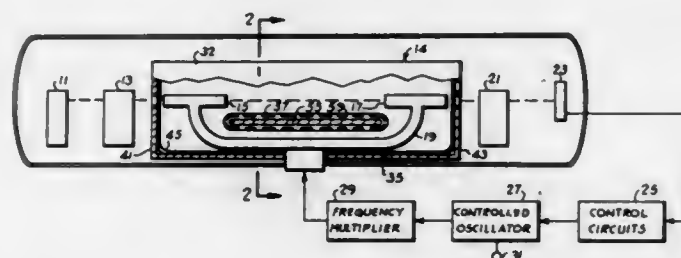
Leonard S. Cutler, Los Altos Hills, and Joseph H. Holloway, Saratoga, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 26, 1971, Ser. No. 137,455

Int. Cl. G01n 27/28; H01s 1/00

U.S. Cl. 315-8

9 Claims



The polarizing magnetic field structure of a molecular beam tube is degaussed during operation of the tube by a circuit including a solenoid coil coupled to a very low frequency, square wave, exponentially-decaying, current source.

3,733,512

**HOLOGRAM REPRODUCTION SYSTEM USING AN OPTICAL GRATING**

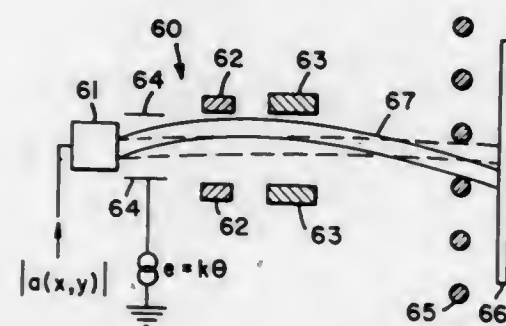
Albert Macovski, Palo Alto, Calif., assignor to American Express Investment Management Company, San Francisco, Calif.

Division of Ser. No. 889,392, Dec. 31, 1969, Pat. No. 3,641,264. This application July 19, 1971, Ser. No. 164,142

Int. Cl. H01j 29/70

U.S. Cl. 315-18

4 Claims



A holographic image reconstruction system in which holographic light amplitude and phase information are resolved separately for reconstruction of the original hologram. The amplitude component is separately detected and reproduced on a cathode ray tube or other electronically addressable optical display. The image of the amplitude component is projected through an external optical grating onto a film for recording or onto a real time imaging system. Phase information from the holographic data is separately detected and superimposed on the amplitude data by varying the phase of the shadow image of the optical grating on the amplitude image. Phase modulation of the image of the grating is accomplished by modulating the aperture or angle of the lens which images the amplitude pattern through the grating onto the film, or by modulating the grating itself.

3,733,513

**CIRCUITS FOR CENTERING PICTURES ON TELEVISION SCREENS**

Sadayoshi Yoshikawa, and Hiroshi Kawamura, both of Osaka, Japan, assignors to Hunt Electronics Company, Dallas, Tex.

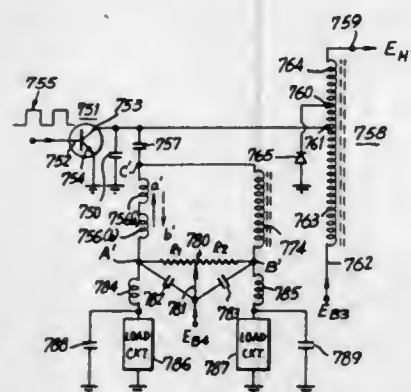
Filed Apr. 10, 1970, Ser. No. 27,391

Claims priority, application Japan, Apr. 30, 1969, 44/33955; Apr. 30, 1969, 44/33956; Apr. 30, 1969, 44/33957; Aug. 26, 1969, 44/67365; Sept. 5, 1969, 44/70343; Sept. 5, 1969, 44/70344; Sept. 5, 1969, 44/70345

Int. Cl. H01j 29/70

U.S. Cl. 315-27 TD

43 Claims



A variety of circuits for centering pictures on the screens of television tubes are characterized by the use of a picture centering variable resistor arranged in a loop including the horizontal and/or vertical deflection coils on said tubes. The variable resistor is connected by a brush or slidable contact with a source of direct current the magnitude and direction of which through the deflection coils controls the positioning of the associated picture. In connection with certain of the foregoing circuits, provision is also made for high voltage stabilization.

3,733,514

**WIDE BAND AMPLIFIER HAVING TWO SEPARATE HIGH AND LOW FREQUENCY PATHS FOR DRIVING CAPACITIVE LOAD WITH LARGE AMPLITUDE SIGNAL**

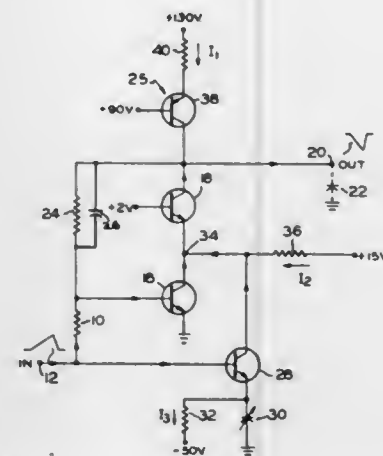
Valdis E. Garuts, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 19, 1971, Ser. No. 126,083

Int. Cl. H01j 29/70

U.S. Cl. 315-27 TD

15 Claims



A wide frequency bandwidth amplifier circuit for driving an output load capacitance with large amplitude signals is described in which two separate paths are provided for low frequency and high frequency portions of such signal. The low frequency path is provided by a shunt feedback amplifier connected as an operational amplifier, while the high frequency path is formed by a series feedback amplifier. The gain of the

series feedback amplifier, determined by the ratio of its series feedback capacitance divided by the output load capacitance, is made equal to the gain of the operational amplifier, determined by the ratio of its shunt feedback resistance divided by its input coupling resistance. The low frequency cutoff of the high frequency path is above the high frequency cutoff of the low frequency path. Thus, in one embodiment of the amplifier circuit with a frequency response of D.C. to 200 megahertz, the high frequency path has a response of one megahertz to 200 megahertz and the low frequency path has a response of D.C. to 30 megahertz. This embodiment is used as a horizontal sweep amplifier for driving the horizontal deflection plates of a cathode ray oscilloscope with a ramp shaped output signal of 80 volts amplitude and three nanoseconds rise time.

3,733,515

**LIGHTING SYSTEMS FOR ROAD VEHICLES**

Eric Bernard Parkes, 25 Langley Road, Selly Oak, Birmingham, England

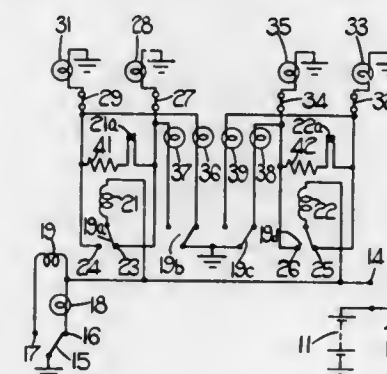
Filed June 28, 1971, Ser. No. 157,449

Claims priority, application Great Britain, June 27, 1970, 31,286/70

Int. Cl. B60q 1/14

U.S. Cl. 315-83

1 Claim



A vehicle lighting system has a dip switch which is connected to the vehicle battery through the vehicle lighting switch, and which operates a current sensing element. This current sensing element controls a changeover contact which in one position energizes the main beam filament and in the other position energizes the dip beam filament. The system incorporates devices for energizing an alternative headlamp if the selected headlamp filament fails.

3,733,516

**RELAY WITH SURGE SUPPRESSOR**

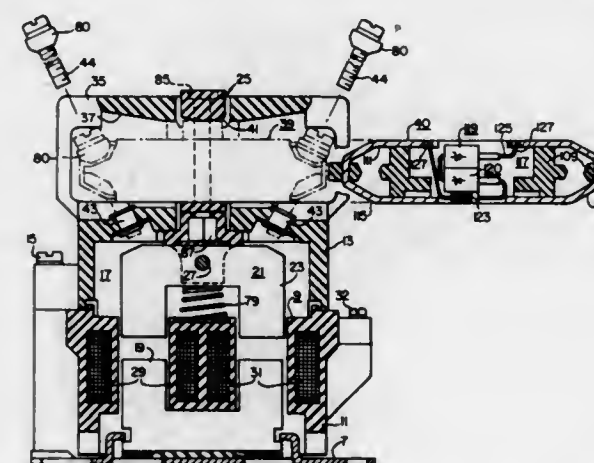
Kurt A. Grunert, Beaver, and Robert W. Schaltenbrand, Glenshaw, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 11, 1972, Ser. No. 270,775

Int. Cl. H02h 1/04, 9/04

U.S. Cl. 317-16

10 Claims



A relay characterized by removable modular contact assemblies and a removable modular surge suppressor assembly

which is substitutable for one of the modular contact assemblies, and the modular surge suppressor assembly comprising diode means electrically connected in parallel with an electromagnetic coil comprising an operating part of the relay.

3,733,517

**ELECTRICAL APPARATUS WITH GROUND FAULT DETECTOR AND INSTANTANEOUS TRIP CIRCUIT**

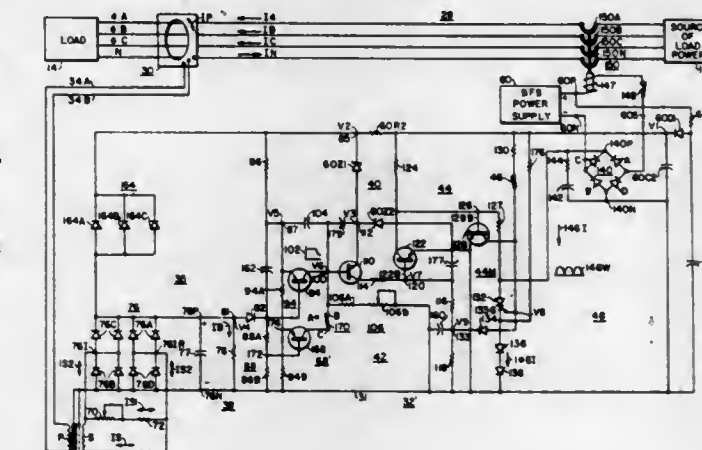
John T. Wilson, Beaver, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 30, 1971, Ser. No. 176,114

Int. Cl. H02h 3/30

U.S. Cl. 317-18 D

5 Claims



A ground fault sensor circuit adapted to be actuated to override a preset time delay for the actuation of a circuit interrupter in such a manner that a protective circuit breaker may be caused to open almost instantaneously in response to the sensing of a ground fault current rather than after a time delay.

3,733,518

**DEVICE FOR DETECTING FAULTS IN ROTARY ELECTRIC CIRCUITS OF BRUSHLESS EXCITERS OF SYNCHRONOUS MACHINES**

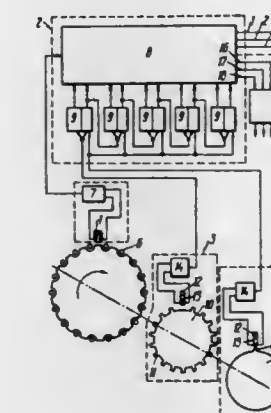
Valentin Stepanovich Polulyakh, ulitsa II Pyatiletki, 19, kv. 118; Viktor Nikolaevich Khodkevich, ulitsa Frantishka Krala, 35, kv. 8; Viktor Grigorovich Yakovenko, ulitsa Mira, 62, kv. 35, and Vasily Semenovitch Kildishev, ulitsa Plekhanovskaya 41, kv. 55, all of Kharkov, U.S.S.R.

Filed Mar. 3, 1972, Ser. No. 231,671

Int. Cl. H02h 7/06

U.S. Cl. 317-13 R

3 Claims



The proposed device includes an induction pickup for checking the circuits under control mounted close to these rotary circuits conducting an electric current. The output of the induction pickup of the controllable circuits is connected to one of the inputs of a signal distributing unit made in the form



of a trigger counter whose outputs are connected to a diode matrix. Connected to the other input of the signal distributing unit is the output of an interrogation pulse shaping unit. The output of the signal distributing unit is connected to the inputs of a unit for controlling and indicating the condition of the circuits under control employed for light signalling about a fault and for sending signals to the system for automatic control and protection of the exciter and the synchronous machine excited thereby.

3,733,519

# PROTECTION CIRCUIT FOR REGULATED POWER SUPPLIES

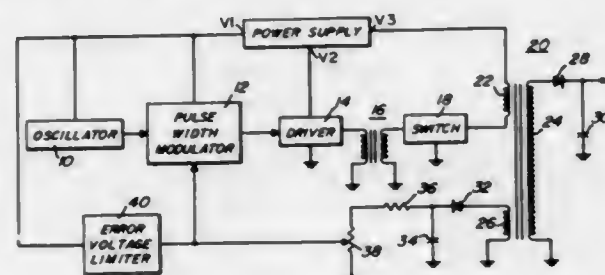
Donald E. Griffey, Skokie, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Apr. 24, 1972, Ser. No. 246,978

Int. Cl. H02h 3/20

U.S. Cl. 317-31

11 Claims



A protection circuit for regulated switching power supplies of the type employing a feedback circuit for adjusting the switching duty cycle to regulate the output thereof. A diode clamping circuit is provided within the feedback loop to prevent the error voltage developed by the feedback circuit from exceeding a predetermined level, thereby maintaining the switching duty cycle of the supply within a safe operating range during turn-on, turn-off, overload and other transient conditions.

3,733,520

# MEANS FOR LIMITING THE RESIDUAL LEVEL DURING SUPERIMPOSED OVER-VOLTAGE CONDITIONS IN A SURGE DIVERTER

Asle Schei, Ludvika, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

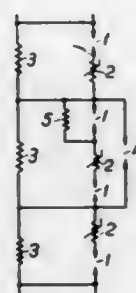
Filed Apr. 28, 1972, Ser. No. 248,601

Claims priority, application Sweden, May 3, 1971, 5673/71

Int. Cl. H02h 1/00

U.S. Cl. 317-61.5

4 Claims



In a surge diverter, in order to limit the residual level during superimposed over-voltage conditions, a plurality of spark gap stacks with associated non-linear resistors are provided with a shunt spark gap shunting at least one spark gap stack with the associated non-linear resistor. A shunt impedance is provided shunting at least one spark gap stack which is shunted by the shunt spark gap. The surge diverter includes a sufficient number of shunt gaps to prevent the total voltage over the diverter upon super-imposed over-voltage conditions from exceeding the protection level of the diverter.

3,733,521

# LIGHTNING ARRESTER

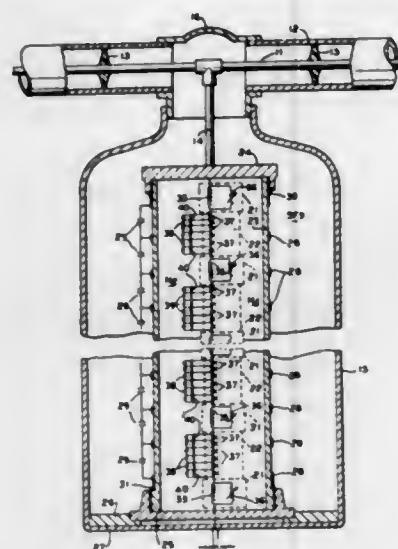
John W. Kalb, Medina, Ohio, assignor to The Ohio Brass Company, Mansfield, Ohio

Filed Sept. 27, 1971, Ser. No. 183,812

Int. Cl. H02h 9/06

U.S. Cl. 317-70

17 Claims



A voltage grading arrangement for lightning arresters particularly adapted for use in substations in which the conductors and the lightning arresters are enclosed within grounded metallic enclosures, the enclosures being filled with an "electronegative" gas such as sulphur hexafluoride (SF<sub>6</sub>) under pressure. The lightning arrester elements are enclosed in a porcelain housing and grading elements such as capacitors or resistors or both are disposed on the exterior of the porcelain housing and within the surrounding metal enclosure.

3,733,522

# ARC-OVER PROTECTIVE DEVICE

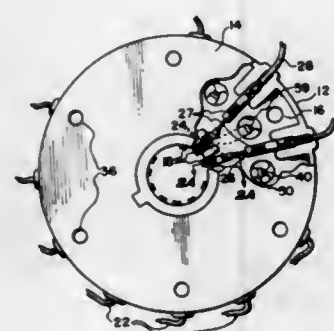
Stephen S. Simovits, Jr., Woodridge, and Christ J. Dumas, Forest View, both of Ill., assignors to American Plasticraft Company, Chicago, Ill.

Filed Jan. 18, 1971, Ser. No. 107,121

Int. Cl. H02h 9/06

U.S. Cl. 317-77

18 Claims



An arc-over protective device is disclosed having a discrete gap whereby the initial arcing is initiated across contiguous edges of the arc gap, and the surfaces adjacent the gap are positioned such that the arc initiated across the contiguous edges moves and spreads along the adjacent surfaces, thereby improving the characteristics of the device.

3,733,523

# ELECTRONIC CIRCUIT CARD CAGE

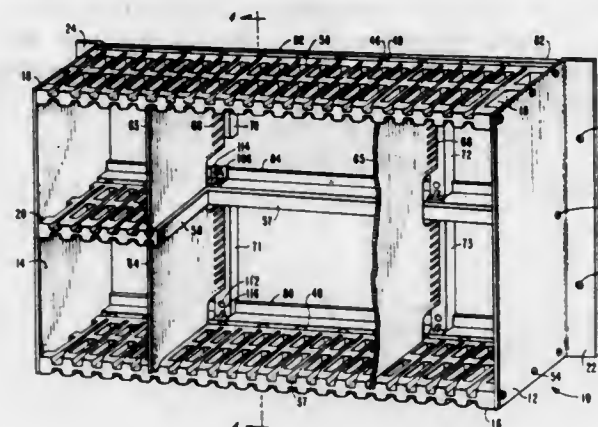
Don E. Reynolds, Redondo Beach; Daniel R. O'Neill, Palos Verdes Peninsula, and Jagdish M. Puri, Azusa, all of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Feb. 11, 1972, Ser. No. 225,469

Int. Cl. H02b 1/02

U.S. Cl. 317-101 DH

6 Claims



An extremely strong and adaptable card cage for removably receiving a number of circuit cards has spaced apart thick-walled apertured planar side panels extending longitudinally between spaced apart planar end panels and forming a hollow rectangular shell having an open top or bottom. Vertical or transverse grooves in the side walls receive card edges, the side panels being of high thermal conductivity materials and acting as a heat sink. More than one printed circuit card size can be accommodated by utilizing an internal thick-walled guide panel of shorter length between and parallel to the two side panels. The side and guide panels receive mounting brackets along their base edges which have planar, facing flanges for transversely and removably mounting electrical connector blocks which are secured by resilient clips. When slid into the card cage, a printed circuit merely plugs into one or more electrical connector blocks. Small cards are inserted in facing grooves between an internal panel and one of the side panels, while larger cards are inserted between the side panels at a location having no interposed guide panel.

3,733,524

# DEGAUSSING CIRCUIT

John A. Cooksey, Kirkwood, and James Anthony Fazio, Liverpool, both of N.Y., assignors to The Slinger Company, Binghamton, N.Y.

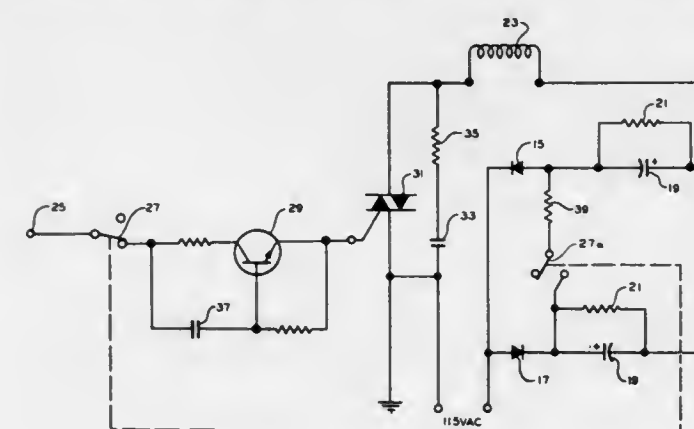
Continuation of Ser. No. 147,428, May 27, 1971, abandoned.

This application Mar. 1, 1972, Ser. No. 230,715

Int. Cl. H01f 13/00

U.S. Cl. 317-157.5

11 Claims



A degaussing circuit having fast recovery time for use in television displays, particularly useful where the display is

frequently moved and requires frequent degaussing. By using a parallel combination of two diodes and two capacitors in series placed between the source and the degaussing coil a current which is initially at a maximum but decreases towards zero as the capacitors charge is provided. Additional means provide for quick discharge of the capacitors for immediate reuse of the circuit and for a reduction of any leakage current.

3,733,525

# RF MICROWAVE AMPLIFIER AND CARRIER

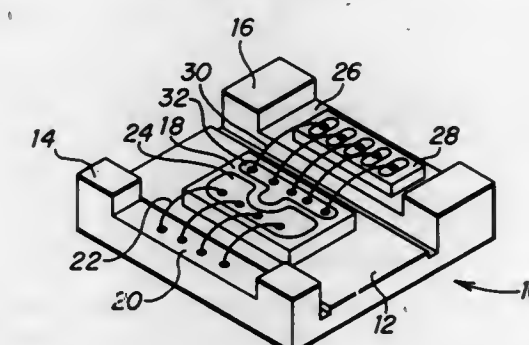
Eugene A. Robinson, Dallas, and Roy E. Shipley, Plano, both of Tex., assignors to Collins Radio Company, Dallas, Tex.

Filed Mar. 20, 1972, Ser. No. 236,008

Int. Cl. H01f 3/00, 5/00

U.S. Cl. 317-234 R

3 Claims



A power transistor and carrier advantageous for RF power (e.g. microwave) amplifier applications with improved linearity in class AB operation. The carrier comprises a channel-shaped member having a centrally located transistor mounting platform between two parallel rail members. One rail member includes a recessed plated portion for receiving base electrode wire bonds, and the other rail member includes a recessed portion including plating which is integrally contiguous with plating on the bottom surface of the carrier, whereby a resistive member may be mounted thereon with electrical contact to the bottom surface. The resistive member is low ohmage with high current capacity and is interconnected with the transistor emitter thereby insuring linear transistor operation by maintaining base-emitter junction forward bias, yet minimizes gain loss attendant with an emitter resistor.

3,733,526

# LEAD ALLOY JOSEPHSON JUNCTION DEVICES

Wilhelm Anacher, Yorktown Heights; Kurt R. Grebe, Beacon; James H. Greiner, Millwood; Syamal K. Lahiri, Croton-on-Hudson; Kyu C. Park, Yorktown Heights, and Hans H. Zappe, Granite Springs, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1970, Ser. No. 103,236

Int. Cl. H01f 3/10

U.S. Cl. 317-234 R

12 Claims



A superconducting Josephson junction tunnel device having in particular lead alloy electrodes (Pb-In and Pb-In-Sn) and a



very precisely defined and dense tunnel barrier comprising an oxide of the lead alloy electrode. Such devices can be thermally cycled between liquid helium temperatures and room temperatures, and provide large tunnelling currents.

3,733,527

# SEMICONDUCTOR DEVICE AND METHOD FOR MAKING THE SAME

Masatoshi Migita; Susumu Takahashi, both of Kokubunji; Hitoshi Sato, Nishitama; Hisao Nakashima; Shojiro Asai, both of Hachioji, and Yuichi Ono, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

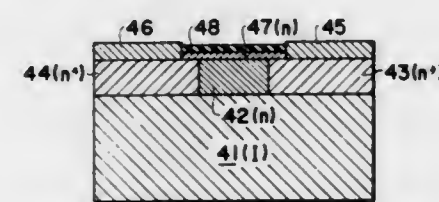
Filed July 22, 1971, Ser. No. 165,066

Claims priority, application Japan, July 22, 1970, 45/63614; Aug. 12, 1970, 45/70074

Int. Cl. H0113/20

U.S. Cl. 317-235 R

7 Claims



A semiconductor device characterized in that an insulation layer of  $\text{SiO}_2$ ,  $\text{SiO}_2\text{-P}_2\text{O}_5$ ,  $\text{Si}_3\text{N}_4$  or the like is deposited on a GaAs substrate through a mixed crystal layer of a ternary system comprising a III<sub>a</sub> group element (such as Al and In) or a V<sub>a</sub> group element (such as P and Sb), Ga and As. The semiconductor device is characterized in that, even when an impurity such as Zn is selectively diffused into the substrate through the mixed crystal layer, it is possible to prevent the impurity from being anomalously diffused along the boundary between the GaAs substrate and the insulation layer and to obtain a stabilized surface of the GaAs substrate.

3,733,528

# DIMMER UNIT FOR A LIGHTING CONTROL SYSTEM

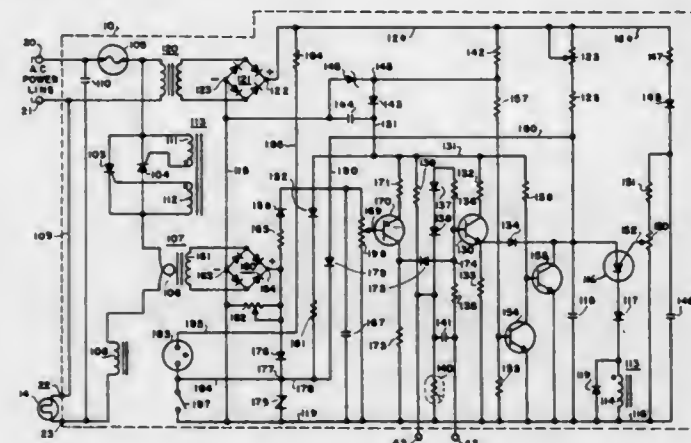
Benjamin F. Gilbreath, Richardson, Tex., assignor to Hunt Electronics Company, Dallas, Tex.

Filed Aug. 2, 1971, Ser. No. 168,317

Int. Cl. H05b 39/02

U.S. Cl. 315-291

7 Claims



A plurality of dimmer units are connected between an alternating-current power source and different ones of a plurality of lamp loads for separately controlling the flow of alternating current through such lamp loads. Each dimmer unit includes a switching mechanism for passing the alternating current to the lamp load and a controllable direct-current responsive timing mechanism for controlling the fraction of each alternating-current half cycle during which the switching mechanism is conductive. The direct-current control signal input terminals of each dimmer unit are connected between corresponding output terminals of a pair of multiple output pre-set control units. A fader control unit supplies direct-current voltages to the pre-set control units and includes means for varying such

voltages in an inverse manner for shifting control of the system from one pre-set control unit to the other. Each pre-set control unit includes a plurality of adjustable voltage dividers for individually determining the fractions of the pre-set unit input voltage appearing at the different ones of the pre-set unit output terminals.

3,733,529

# PLURAL MOTOR TAPE DRIVE SPEED CONTROL

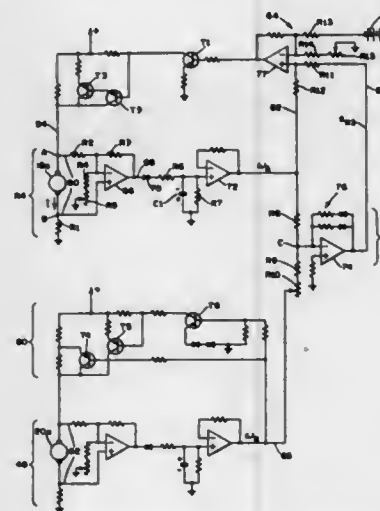
Edward A. Ross, Wellesley, Mass., and Gerhard M. Baule, Syracuse, N.Y., assignors to Ross Controls Corporation, Newton, Mass.

Filed May 22, 1972, Ser. No. 255,461

Int. Cl. H02p 5/46

U.S. Cl. 318-7

13 Claims



Controls for winding a strip such as magnetic recording tape at a constant linear speed on to a take-up reel from a supply reel. The controls are responsive to the instantaneous angular speeds of both reels, maintaining at a substantially constant value the ratio of the product of the squares of the speeds to the sum of the squares, by varying the speed of the take-up reel while sufficiently restraining the supply reel to maintain tension on the strip.

3,733,530

# RADIO CONTROLLED MOTOR DRIVEN BUCKING STRAP

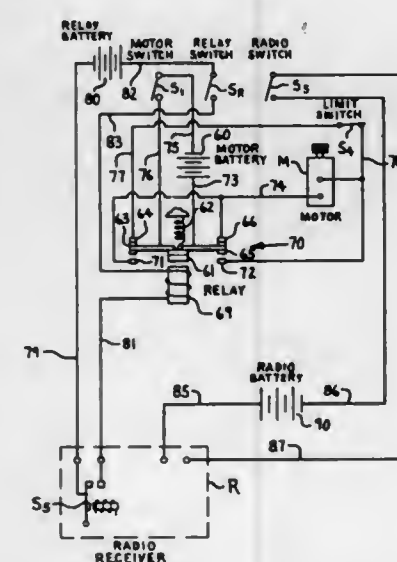
Melvin M. Labart, Myrtle Point Route, Box 8, Broadbent, Oreg., and Lew Blanksma, 714 Ash St., Myrtle Point, Oreg.

Filed Aug. 13, 1971, Ser. No. 171,514

Int. Cl. H02p 1/00

U.S. Cl. 318-16

7 Claims



A bucking strap is equipped with a radio-controlled latch device enabling a rodeo official in the judging stand to release

the bucking strap when a contestant has ridden a bucking horse or Brahma bull for a specified interval of time. The placing of the strap on the animal energizes a radio receiver in the device and operates a motor driven latch mechanism to close the latch. When a radio signal is received, it reverses the motor to release the latch and allow the bucking strap to fall off the animal.

3,733,531

# ELECTRONIC REGULATING CIRCUIT

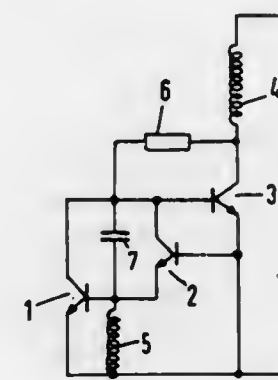
Helmut Stechmann, Schwenningen A. N., Germany, assignor to Kienzle Uhrenfabriken GmbH, Schwenningen am Neckar, Germany

Filed Dec. 23, 1971, Ser. No. 211,561

Int. Cl. H02k 33/12

U.S. Cl. 318-114

4 Claims



An electronic regulating circuit to stabilize the amplitude of swing of a mechanical vibrating system, comprising an output coil, a control coil, and an output transistor whose base is connected to a voltage divider comprising a resistor and the collector-emitter section of a first control transistor. The base of the first control transistor is connected to the control coil in such a manner that the first control transistor simultaneously will be rendered conductive at least in part, by the same inductive voltage of specific polarity that renders the output transistor conductive.

3,733,532

# CONTROL CIRCUITS FOR VEHICLE WINDOW LIFT MECHANISM

William Frank Hill, 2 Oakridge Close, Stafford, England

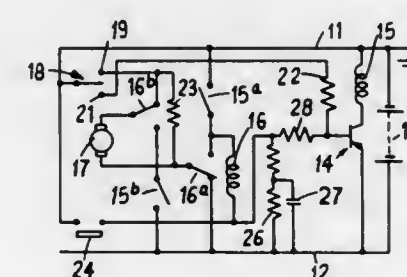
Filed Oct. 5, 1971, Ser. No. 186,720

Claims priority, application Great Britain, Oct. 13, 1970, 48497/70

Int. Cl. H02p 1/22

U.S. Cl. 318-266

1 Claim



A control circuit for a vehicle window lift mechanism incorporating a manually operable switch having an off position and first and second operative positions. A reversible electric motor is connected in the control circuit in such a manner that in the first operative position of the switch the motor is operated in a direction to lift the window, while in the second operative position of the switch the motor is operated in the opposite direction to lower the window. A limit switch is associated with the window, and is operable in the event of an

obstruction being placed in the path of movement of the window while the window is being lifted. The circuit further includes means operable upon operation of the limit switch for reversing the direction of operation of the motor even though the manually operable switch remains in its first operative position. Said means incorporates a delay network whereby the motor is only operated to lower the window for a predetermined period of time.

3,733,533

# D. C. CHARGING SYSTEM

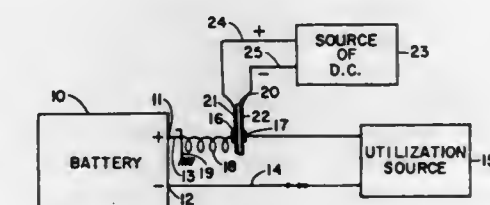
Clarence E. Fulkerson, 2012 N. 5th St., Ponca City, Okla.

Filed Apr. 24, 1972, Ser. No. 246,828

Int. Cl. H01m 45/04; F211 7/00

U.S. Cl. 320-2

4 Claims



A battery charging system which consists of a probe having opposite-facing conductive surfaces. The probe is insertable between the batteries. Charging current applied to the probe conductive surfaces will charge the battery. The probe can be attached to a bracket to provide a mounting for the battery-operated device.

3,733,534

# BATTERY CHARGING DEVICE

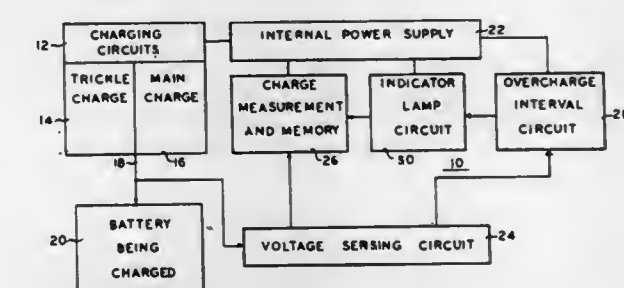
Seymour Saslow, Saratoga Springs, N.Y., assignor to Espey Mfg. & Electronics Corp., Saratoga Springs, N.Y.

Filed Aug. 25, 1971, Ser. No. 174,611

Int. Cl. H02J 7/04

U.S. Cl. 320-23

4 Claims



A battery charging device comprising in combination: a transformer for transforming an AC power line supply into usable energy; a pulsating charging circuit operatively coupled to said transformer and disposed for charging a battery across a charging terminal (18) supplying a pulsating charging current during each half cycle of AC alternation; sensing circuit means connected to said charging terminal for sensing the voltage charged in said battery during the non-charging 1/2 cycle; a measurement and memory circuit connected to said charging circuit and said sensing circuit means including storage means for storing a charge therein which is a function of said battery charge; and, control means responsive to said voltage sensing and coupled to said charging circuit for changing the rate of charge for a time period measured by said measurement and control circuit.







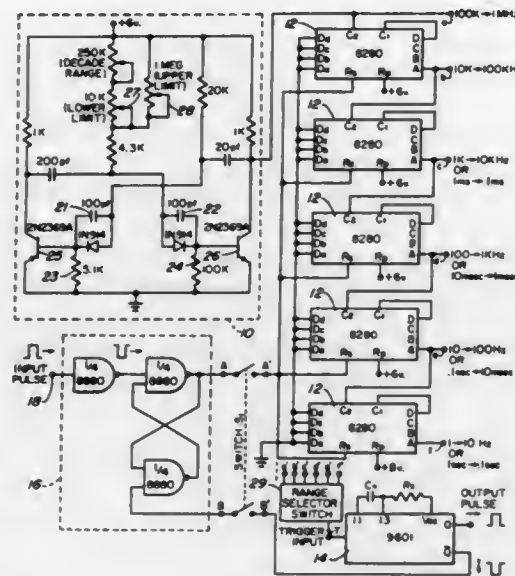








frequency pulses are obtainable from a series of dividers, with each decade range having a given delay period. Each successive



divisor decreases the lower frequency limit by a factor of ten and increases the output pulse delay by a similar factor of ten.

3,733,557

#### DEVICE FOR DETECTING RATE OF CHANGE IN VOLTAGE

Hiroshi Fujinami, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya-shi, Aichi-ken, Japan

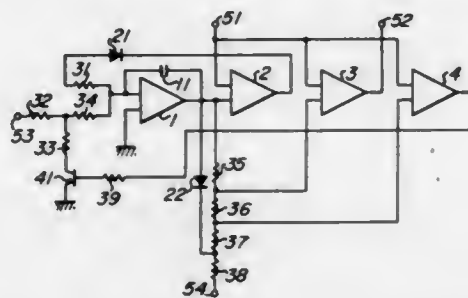
Filed Sept. 10, 1971, Ser. No. 179,429

Claims priority, application Japan, Nov. 27, 1970, 45/104983

Int. Cl. G01p 15/08; B60t 8/08; H03k 5/153

U.S. Cl. 328—132

2 Claims



When the difference between a voltage representative of a reference velocity which gradually falls off at a rate determined by an integrating constant and a voltage proportional to the rotating velocity of a rotating body, becomes greater than a predetermined value, the reference velocity voltage is made to approach the rotational velocity proportional voltage by rendering the integrating constant small. Thereby, the time during which a spurious signal indicating a deceleration is developed though the rotating body is actually accelerating, can be shortened to such a considerable extent that no undesirable effects are incurred in practical operation.

3,733,558

#### STABLE LOW CURRENT AMPLIFIER

Joseph F. Cramer, Coral Springs, and Douglas W. Nickerson, North Miami Beach, both of Fla., assignors to Motorola, Inc., Franklin Park, Ill.

Filed May 20, 1971, Ser. No. 145,264

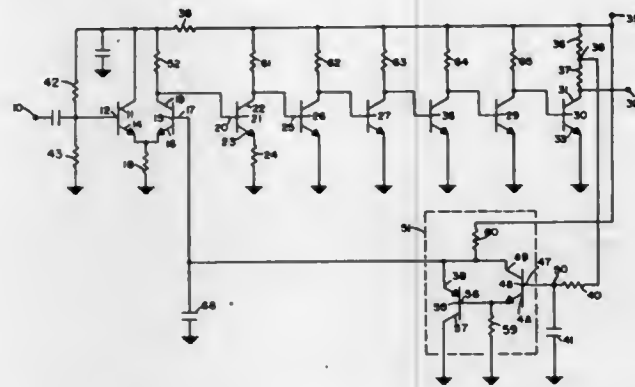
Int. Cl. H03f 3/18

U.S. Cl. 330—17

Limiter amplifier adapted to be constructed in integrated circuit form and including a plurality of direct current coupled

19 Claims

transistor stages capable of limiting operation from a one-cell battery. The amplifier has sufficient gain to limit on noise so that a rectangular wave output signal is developed at the output. An integrating network responsive to the output signal provides a bias voltage which is coupled through complemen-



tary emitter followers, having current sharing therebetween, to the input circuit to control the bias applied to the semiconductor devices so that the duty cycle of the rectangular wave output signal is regulated to be preferably a 50 percent duty cycle.

3,733,559

#### DIFFERENTIAL AMPLIFIER

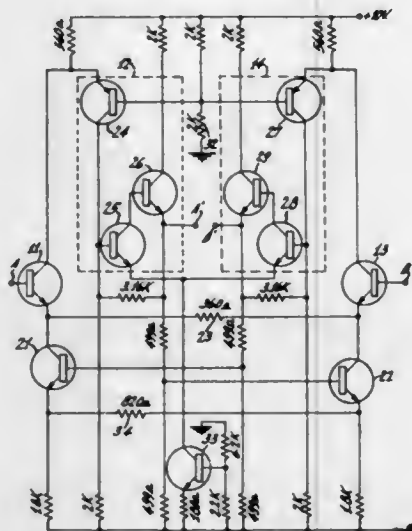
Laurence Joseph Thorpe, Marlton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 29, 1970, Ser. No. 50,534

Int. Cl. H03f 3/68

U.S. Cl. 330—30 D

8 Claims



The output circuit electrodes of first and second transistor input stages are coupled by unidirectional current conducting negative feedback means to the input circuit electrodes of the second and first stages respectively, the electrodes of each stage common to the input and output circuits thereof being coupled to one another by bidirectional current conducting means.

3,733,560

#### ELLIPTICAL STRUCTURE FOR COMBINING THE POWER OF MANY MICROWAVE SOURCES

Henry G. Oltman, Jr., Woodland Hills, and Hans A. Maurer, Tarzana, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 3, 1972, Ser. No. 231,663

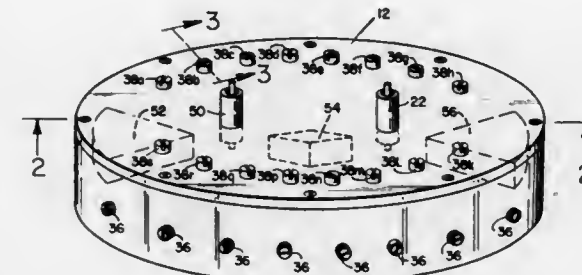
Int. Cl. H03f 3/10, 3/60

U.S. Cl. 330—34

A non-resonant microwave cavity shaped substantially in the form of a right elliptical cylinder, means for introducing

9 Claims

microwave energy at one focus of the elliptical cavity and removing microwave energy at the other focus of the elliptical cavity; and means on the periphery of the elliptical cylindrical cavity for amplifying incident microwave energy and for retransmitting it; whereby microwave energy introduced into the cavity at one focus of the ellipse is amplified by a plurality of microwave amplifiers, and the amplified energy is delivered to the other focus in phase. Because the total distance from



the input focus to the periphery of the cavity and back to the output focus is the same for all points on the periphery of the elliptical cavity. Alternatively microwave signals may be generated by a plurality of microwave generators at the periphery of the cavity, the generators being phased by microwave signals from the input focus of the cavity to cause high energy microwave signals from the generators to be in phase at the output focus of the cavity.

3,733,561

#### HIGH POWER, FUNDAMENTAL TRANSVERSE MODE OPERATION IN DOUBLE HETEROSTRUCTURE LASERS

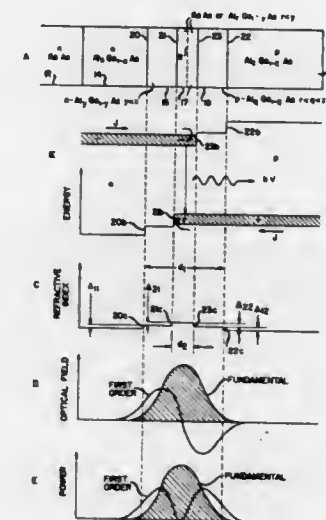
Izuo Hayashi, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed July 27, 1971, Ser. No. 166,370

Int. Cl. H01s 3/00

U.S. Cl. 331—94.5 H

12 Claims



For use in a semiconductor injection laser, an active medium comprises a body of semiconductor material having therein: first and second heteroboundaries defining a first active region therebetween of width  $d_1$  for confining optical photons, third and fourth heteroboundaries defining a second active region of width  $d_2$  for confining injected carriers, the second region being centrally located within the first region, a p-n junction located within the second region, and the magnitude of the index refraction step  $\Delta_{11}$  and  $\Delta_{12}$  at the first and second heteroboundaries, respectively, satisfying approximately the relationships  $\Delta_{11}d_1^2 = 0.1 \mu\text{m}^2 = \Delta_{12}d_1^2$ .

3,733,562

#### SIGNAL PROCESSING CIRCUIT FOR A COLOR TELEVISION RECEIVER

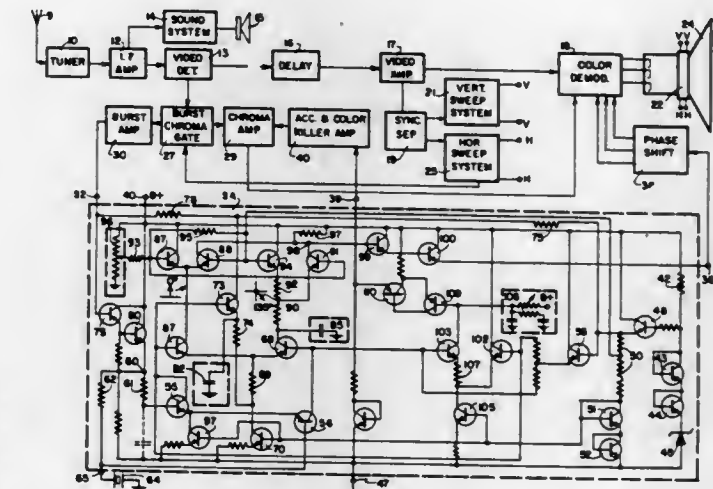
Gildo Cecchin, 8744 W. North Ter., Niles, Ill., and Francis H. Hilbert, 8741 Lyndale, River Grove, Ill.

Division of Ser. No. 880,320, Nov. 26, 1969. This application Mar. 4, 1971, Ser. No. 120,969

Int. Cl. H03c 1/54

U.S. Cl. 332—9 T

4 Claims



A color television receiver uses an integrated circuit to provide the subcarrier reference signals and ACC control voltage for the receiver. The circuit includes a first differential amplifier, unbalanced at the burst signal frequency, operated as the color reference oscillator to provide first and second differentially phased output signals which are applied to a pair of differential steering gates. A phase-shift hue control of the color reference signal is obtained by adding selected outputs of the pair of differential steering gates. In addition, a differential amplifier is operated as a diodeless detector for deriving an ACC voltage from the oscillator output when burst signals are applied to the input of the oscillator.

3,733,563

#### MICROSTRIP CIRCULATOR WHEREIN RELATED MICROSTRIP PATTERNS ARE DISPOSED ON OPPOSING SURFACES OF DIELECTRIC SUBSTRATE

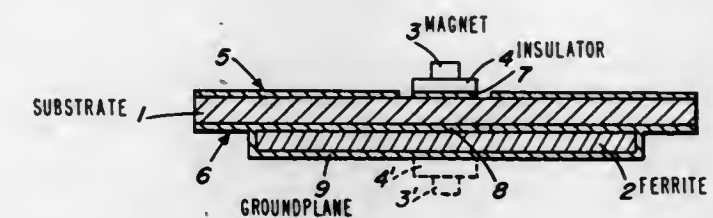
Arthur L. Poirier, Ottawa, Ontario, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of Defense, Canada

Filed Dec. 7, 1971, Ser. No. 205,669

Int. Cl. H01p 1/32

U.S. Cl. 333—1.1

7 Claims



This invention relates to a microstrip circulator used for steering electrical signals in predetermined directions along particular paths in a controlled manner. A particular embodiment of a microstrip circulator according to the present invention utilizes a non-ferrite dielectric substrate having metal film applied to both major surfaces of the substrate. The distributed electronic components of the circulator are formed in a circular configuration in the metal film on both major surfaces. A permanent magnet is spaced on one major surface directly over the circular configuration of electronic components and a ferrite disc is placed on the opposite major face directly opposite the magnet. A conductive groundplane is then applied to the outer surface and edges of the ferrite disc.

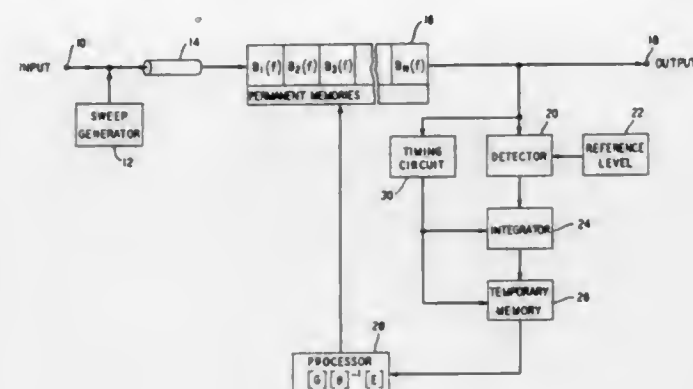


3,733,564

**ADJUSTABLE EQUALIZER CONTROL APPARATUS**  
Chih-Yu Kao, Lawrence, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Feb. 22, 1972, Ser. No. 227,739  
Int. Cl. H04b 3/04

U.S. Cl. 333-18

17 Claims



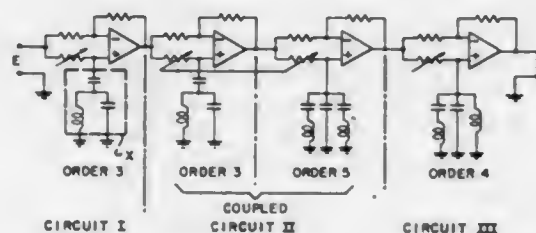
Apparatus for controlling an equalizer having a plurality of independently adjustable, serially connected equalizer sections. The apparatus controls the equalizer to minimize a sum of squares of integrated transmission system misalignments, the integrations taking place over as many frequency ranges as there are equalizer sections. The effect of each equalizer section in each frequency range is considered in determining required adjustments for all sections.

3,733,565

**EQUALIZER FOR LINEARIZING A TRANSMISSION CHANNEL PHASE-FREQUENCY RESPONSE UTILIZING ODD AND EVEN ORDER ALL-PASS NETWORKS**  
Jean Marc Pierret, Falcon Nice, France, assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed June 23, 1971, Ser. No. 155,930  
Claims priority, application France, July 9, 1970, 7026336  
Int. Cl. H03h 5/00

U.S. Cl. 333-28

7 Claims



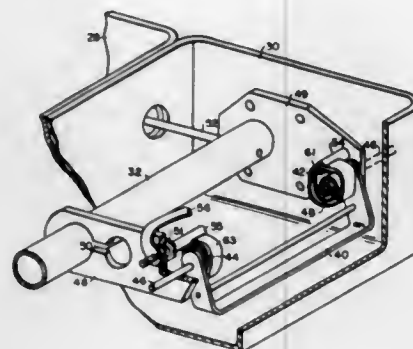
An equalizer for linearizing a non-linear phase-frequency characteristic and formed from successive all-pass filter stages in which at least first and second odd order filter stages align groups of frequencies along respective linear phase-frequency approximation through the introduction of appropriate symmetrical phase shifts. A third even order filter stage linearly superimposes the linear approximations by way of an antisymmetrical phase shift.

3,733,566

**VARIABLE OUTPUT RESONATOR COUPLING LOOP HAVING SHORTED TURN MOUNTED ABOUT FLEXIBLE CONNECTING CONDUCTOR**  
Herbert Hanft, Alexandria, Va., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.  
Filed June 3, 1971, Ser. No. 149,581  
Int. Cl. H01p 7/04, 5/04

U.S. Cl. 333-82 B

6 Claims



A flexible windup connector at each end of a coupling loop within a resonant cavity is enclosed in a shorted turn which minimizes the inductance change of each connector as the coupling loop is varied from maximum to minimum.

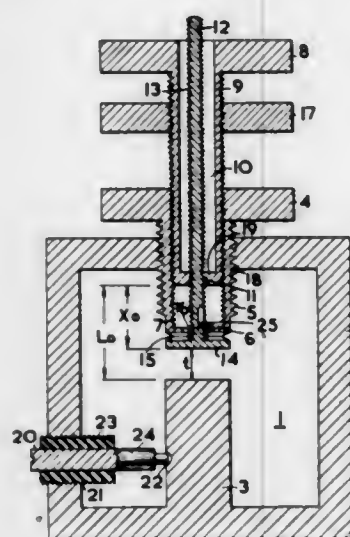
3,733,567

**COAXIAL CAVITY RESONATOR WITH SEPARATE CONTROLS FOR FREQUENCY TUNING AND FOR TEMPERATURE COEFFICIENT OF RESONANT FREQUENCY ADJUSTMENT**

Albert Henry Johnson, Christchurch, England, assignor to Minister of Aviation Supply in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England  
Filed Apr. 13, 1971, Ser. No. 133,691  
Int. Cl. H01p 1/30, 7/04

U.S. Cl. 333-82 B

4 Claims



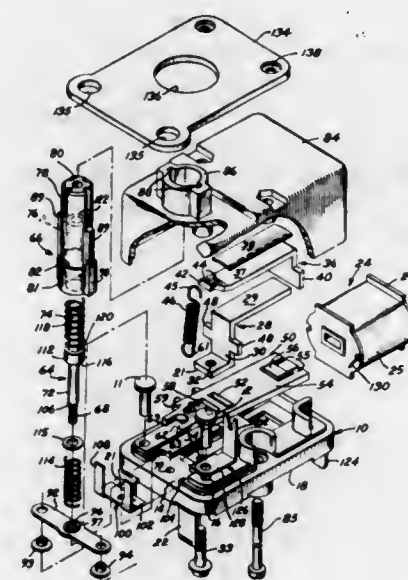
A temperature compensated tuning apparatus for a co-axial resonant cavity comprises a telescopic tuning member having a first section and a second section, the sections having different co-efficients of thermal expansion and being connected by a co-efficient of expansion adjusting screw which has an internally threaded bore engaged with the first section and an externally threaded part engaged with the second section; a capacitive disc mounted co-axially on the end of the first section within the cavity is maintained in electrical contact with the second section by means of resilient contact members while permitting a telescopic relative motion of the first sec-

3,733,568

**PUSH BUTTON RELAY**  
Robert E. Prouty, and Robert E. Graf, both of Logansport, Ind., assignors to Essex International, Inc., Fort Wayne, Ind.  
Filed Sept. 30, 1971, Ser. No. 185,082  
Int. Cl. H01h 3/12

U.S. Cl. 335-186

11 Claims



A push button relay, in which the closing of the relay contacts is independent of the magnetic circuit of the relay, includes a coil, a magnetizable armature, one end of which normally exerts a force upon a movable contact carrying member to move its contacts out of contact with the stationary contacts of the relay, and a manually operable push button which, when depressed, contacts the armature to overcome the contact opening force exerted by the armature upon the movable contacts, and urges the contact carrying member and its contacts toward the stationary contacts. When the contacts are closed and when the push button is returned, the coil is energized to maintain the armature out of contact opening relationship with the contact carrying member. The armature is preferably maintained in spaced relationship to the contact carrying member by energization of the coil, such that when the coil is deenergized, the armature impactingly opens the contacts.

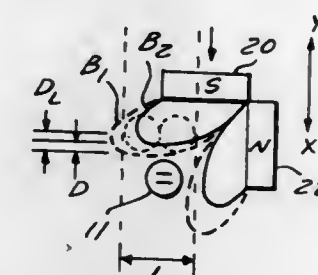
3,733,569

**MAGNETIC SWITCHING ASSEMBLY**  
Noboru Yanagisawa, and Taneo Murata, both of Tokyo, Japan, assignors to Alps Electric Co., Tokyo, Japan  
Filed Apr. 25, 1972, Ser. No. 247,319  
Claims priority, application Japan, May 10, 1971, 46/30964  
Int. Cl. H01h 13/14

U.S. Cl. 335-207

12 Claims

A magnetic switching assembly is disclosed in which the magnet stroke for operative switching is reduced while maintaining reasonably wide tolerances in the relative positioning of the components thereby to provide faster and more accurate switching at low cost. In a preferred embodiment of the invention an actuating magnet is positioned adjacent a reed



magnet stroke is thereby minimized while maintaining the positioning tolerances of the reed switch and magnet at values permitting low cost manufacture.

In another embodiment of the invention, the second magnet which serves to deflect the magnetic field of the driving magnet is formed integral with the driving magnet in an L-shaped configuration.

3,733,570

**INDICATOR MEANS FOR ELECTROMAGNETIC DEVICES**

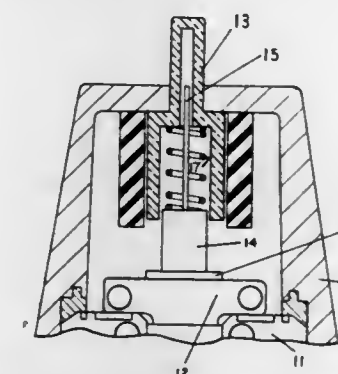
Brian Stanley Worrall, Sutton Coldfield, England, assignor to Expert Industrial Controls Limited, Lount, Ashby-de-La-Louch, England

Filed June 28, 1971, Ser. No. 157,258  
Claims priority, application Great Britain, July 2, 1970, 32,088/70

U.S. Cl. 335-255

Int. Cl. H01f 7/08

7 Claims



An electromagnetic device includes a casing in which is mounted a solenoid which when energized moves an armature. For manual operation of the armature a manually operable knob is provided which effects movement of the armature through the intermediary of a spring and a push piece. To enable a visual indication to be given of the position of the armature the push piece mounts an indicator rod which is visible through the manually operable knob and the position of the indicator rod indicates the position of the armature.

3,733,571

**SWITCH CONTROL**

Stanley J. Budlane, Fulton, and Donald H. Stoll, Morrison, both of Ill., assignors to General Electric Company, Fort Wayne, Ind.

Filed Dec. 27, 1971, Ser. No. 212,201  
Int. Cl. H01h 61/00

U.S. Cl. 337-89

13 Claims

A switch control is disclosed comprising a frame to which first and second contacts are mounted. An electrically con-



ductive pendant arm adapted to move when electrically heated is also mounted to the frame. A third contact is mounted on the pendant arm in position to make and break contact with the first contact upon movement of the pendant arm relative to the first contact. A fourth contact is mounted on the pendant arm in position to make and break contact



with the second contact upon movement of the second contact with respect to the pendant arm. Stop means are also mounted to the pendant arm for limiting movement of the second contact with respect to the fourth contact. The various switch contacts are adapted for suitable connection to motor start and run windings and to a source of electric current.

3,733,572

**CURRENT LIMITING FUSE**

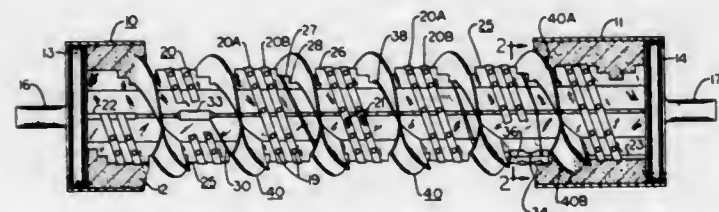
Harvey W. Mikulecky, Racine, Wis., assignor to McGraw-Edison Company, South Milwaukee, Wis.

Filed Dec. 24, 1970, Ser. No. 101,254

Int. Cl. H01h 85/38

U.S. Cl. 337-273

15 Claims



A current limiting fuse in a tubular casing has sand or highly divided quartz surrounding a fusible element helically wound on a core or spider. The fusible element is connected at its ends to electrical connecting terminals that enable connecting the fuse into the protected circuit. An auxiliary winding is helically wound over a portion of the length of the spider and has gap electrodes connected at each end. The gap electrodes are positioned adjacent the main element and are separated therefrom by a porous fiberglass member. A radially outwardly extending mica barrier is helically wound around the spider to extend between adjacent portions of the fusible element. The barrier is attached to the spider with a heat resistant adhesive, and the auxiliary elements are imbedded in the adhesive along a portion of its length.

3,733,573

**POTENTIOMETER CONTACT SPRINGS**

Frank L. Dieterich, 3979 East Boulevard, Los Angeles, Calif. Continuation-in-part of Ser. No. 728,683, May 13, 1968, Pat. No. 3,579,822. This application May 24, 1971, Ser. No. 146,360

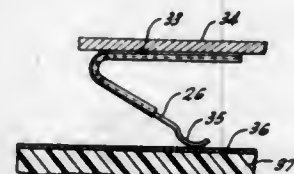
Int. Cl. H01c 1/12

U.S. Cl. 338-202

17 Claims

A method of manufacturing miniature potentiometer contact springs by winding a substantial length coil of a single layer of fine, heat-treatable precious metal alloy wire on a generally cylindrical form, masking spaced strips longitudinally of the wire coil, plating the wire coil between the masked strips, removing the strips and cutting the strip-plated

wire band from the mandrel as a sheet, cutting the wire sheet to produce contact strip blanks of various forms severable into individual contacts. A multi-layer masking system is used to photographically define the spaced strips. An adherent sup-



port about the wire coil permits the coil to be removed before masking and processed in sheet form.

Contact springs using wire of a reduced lateral diameter are produced by flattening the wire prior to winding on the form.

3,733,574

**MINIATURE TANDEM SPRING CLIPS**

Ray R. Scoville, LaCanada, and Ralph R. Wells, Van Nuys, both of Calif., assignors to Vector Electronic Company, Sylmar, Calif.

Filed July 23, 1971, Ser. No. 165,567

Int. Cl. H01r 13/12, 13/20, 29/00

U.S. Cl. 339-18 C

16 Claims



A miniature electrical terminal adapted for use in breadboarding experimental circuits utilizing various electrical components, including dual-in-line-package integrated circuits, comprises a bifurcated metallic spring clip adapted to receive an electrical connector between the bifurcations thereof, and cooperating with a U-shaped resilient metallic shell covering the clip and having the sides of the shell connected to the tines of the clip to increase the wire diameter handling range of the composite terminal by a ratio of about 1 to 3 with provision for contactor insertion from both top and bottom. Multiple connection points are achieved by providing strips of inter-connected spring clips which are covered by a common shell; and such strips can be used individually as patch blocks for assembling any desired circuit, or can be mounted on or between perforated boards. Strips of the terminal can be disposed closely adjacent one another, in insulated relation, to provide a ground bus and a voltage strip closely adjacent to, or between, groups of other terminal strips adapted to receive electrical components and connections.

3,733,575

**CLAMPING CONNECTOR FOR BUS BARS**

Friedrich Gottschalk, and Otto Wildgruber, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed Feb. 9, 1972, Ser. No. 224,692

Claims priority, application Germany, Feb. 25, 1971, P 21 08 920.3

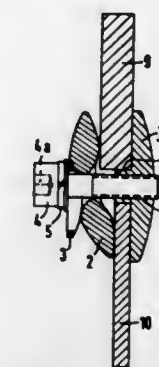
Int. Cl. H01r 13/60

U.S. Cl. 339-22 B

6 Claims

A clamping connector is provided for connecting bus bars, which includes a pressure plate having a planar contact with

the bus bars and a domed pressure piece which is formed so as to connect bus bars of different cross sections. The clamp bolt



3,733,576

**REVERSIBLE SAFETY GROUND PLUG**

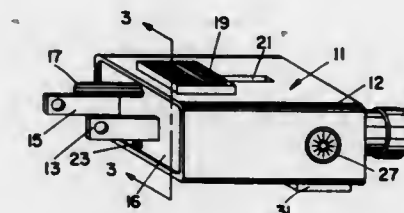
James R. Cooper, 125 Hell Drive, Gahanna, Ohio

Filed July 28, 1971, Ser. No. 166,705

Int. Cl. H01r 3/06

U.S. Cl. 339-14 P

11 Claims



An electric plug having a pair of alternative retractable prongs for insertion into an electrical receptacle connected with a source of electrical power. The electrical plug is arranged with a pair of contact blades which are inserted into appropriate slots in the electrical terminal or receptacle and also with a pair of ground prongs, one of which can be inserted in the ground opening of the receptacle assuming it is a three opening receptacle. The two round ground plugs are retractable into the housing for the plug. Both of the ground plugs are connected to the ground of the appliance. The appliance may be a refrigerator, television set, recreational vehicle or other vehicle or power tool or any other type of appliance with which the plug is designed to cooperate. One of the two blade contacts is connected to the positive side of the appliance and the other blade contact is connected to the neutral or negative side of the appliance. The neutral lead has a Y formed therein and a lead is provided from the end of the Y through a resistance, a small neon light, and a buzzer and back to the ground terminal of the cable leading to the plug. Means are provided for manually retracting either of the ground prong contacts, the means consisting of a button attached to each one of the ground prongs.

3,733,577

**ELECTRICAL TWO-PART CONNECTORS**

Peter George Henry Hammond, Whitstable, England, assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Feb. 16, 1971, Ser. No. 115,475

Claims priority, application Great Britain, Feb. 16, 1970, 7,332/70; Nov. 20, 1970, 55,380/70

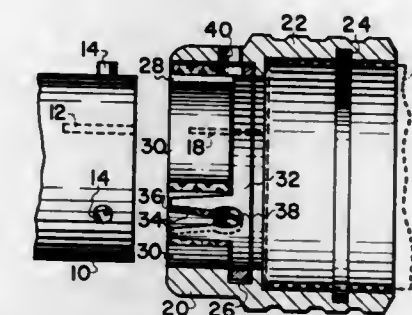
Int. Cl. H01r 13/54

U.S. Cl. 339-91 R

5 Claims

An improved two-part connector of which one part has one or more bayonet pins while the other part is fitted with a

coupling ring adapted to telescope over the one part. The coupling ring has an internal annular groove which receives an annular spring strip in the form of a band having one or more



3,733,578

**BATTERY CABLE**

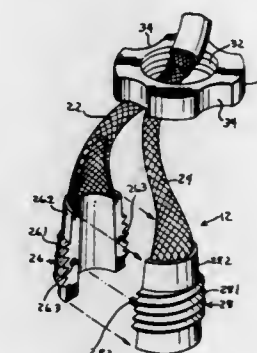
George H. Fouche, 111 Buxton Road, Falls Church, Va.

Filed Feb. 24, 1972, Ser. No. 228,890

Int. Cl. H01r 11/26

U.S. Cl. 339-232

8 Claims



A battery cable is described having attachment means at one end thereof for attachment to a battery terminal comprising split cable ends and on the separate ends thereof mated and threaded fittings for making electrical contact with the battery terminal and a threaded ring encompassing said cable, with the threads thereof mated to said threaded fittings for securing said cable to the battery terminal. The attachment means are easily attached and detached to the battery terminal without need of tools.

3,733,579

**SENSING DEVICE FOR DIGITAL MAGNETIC MEMORY**

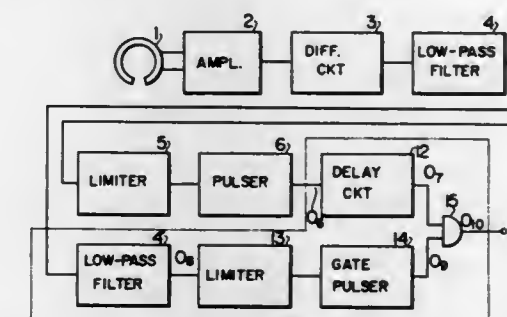
Yoshihiro Onishi, Kokubunji, and Kazuo Nakagoshi, Odawara-shi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 25, 1972, Ser. No. 247,330

Int. Cl. G11b 5/02, 5/44

U.S. Cl. 340-174.1 H

1 Claim



A sensing device for a digital magnetic memory in which a signal sensed by a magnetic head is, after being differentiated



by a differentiation circuit, supplied to a first low-pass filter by which harmonic components of the differentiated signal are eliminated therefrom. This signal is then supplied to both means for generating a first pulse signal each time the signal traverses the zero level and a second low-pass filter, the output signal of the second low-pass filter being further supplied to means for generating a second pulse signal each time the output signal of the second low-pass filter traverses the zero level. The first and second pulse signals are supplied to an AND gate to produce the logic product thereof to provide an inherent peak signal.

3,733,580

## ACOUSTICAL SENSING CURTAIN

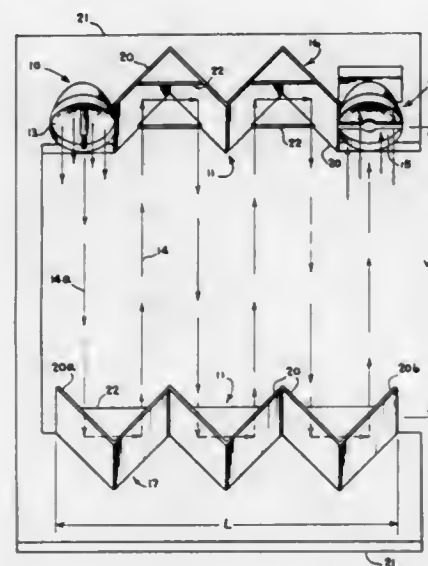
Basil B. Beeken, New Haven, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Dec. 22, 1970, Ser. No. 100,686

Int. Cl. G01s 9/66

U.S. Cl. 340-1 R

9 Claims



A collimated acoustical beam is propagated along a tortuous path by being successively reflected back and forth across a given field so that the successive path portions compositely define a substantially continuous acoustical sensing curtain; said beam being adapted to control an acoustically sensitive device. When an object to be sensed penetrates said curtain, at any point in the latter, said beam will be momentarily interrupted and a resultant output signal will thereby be generated by said acoustically sensitive device.

3,733,581

## ACOUSTIC DOPPLER WAVE RECOGNITION

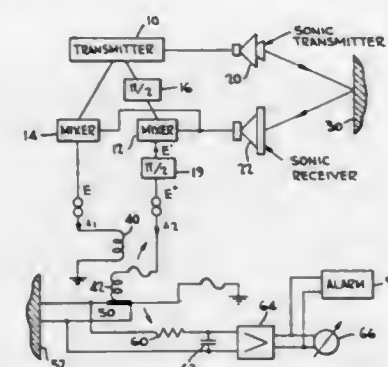
Henry P. Kalmus, 3000 University Terrace, N.W., Washington, D.C.

Filed Aug. 17, 1971, Ser. No. 172,460

Int. Cl. G01s 9/66; G08f 13/16

U.S. Cl. 340-1 R

13 Claims



A moving body indicator for detecting movement of bodies in the presence of clutter noise which utilizes ultrasonic waves

as a communicating means and a metallized foil electret transducer as a receiver and/or transmitter. The system uses the Doppler phenomenon to generate a signal that is a function of the relative velocity between the transmitter and the body. Another signal is simultaneously generated that is also a function of the relative velocity but has its phase shifted by a fixed amount. The two signals are fed to a correlator which will produce a voltage that is proportional to the velocity of the body and whose polarity is dependent on the direction of the velocity of the body with respect to the body indicator system. The voltage signal is also used to actuate an alarm as an indicator of intrusion or movement of a body.

3,733,582

## DIGITAL DEPTH SOUNDER

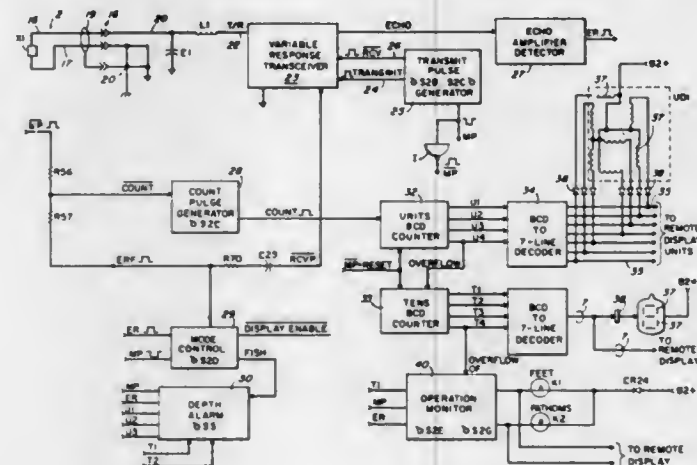
Calvert F. Eck, Osterville, and Howard H. Hill, Pocasset, both of Mass., assignors to Datamarine International, Inc., Pocasset, Mass.

Filed Feb. 25, 1971, Ser. No. 118,731

Int. Cl. G01s 9/68

U.S. Cl. 340-3 R

16 Claims



A digital depth sounder in which a pulse of radiant energy is directed towards a reflecting object, and reflection is detected by a receiver, wherein the time between the transmitted and received pulses are measured as an indication of the distance to the reflector, and in which both the gain of the receiver and the power output of the transmitter are regulated in accordance with the strength of the received reflection.

3,733,583

## INDICATOR LAMP SUPPORT APPARATUS FOR A MOTORIZED TWO WHEEL VEHICLE

Kiyoshi Ukal, Iruma-gun, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

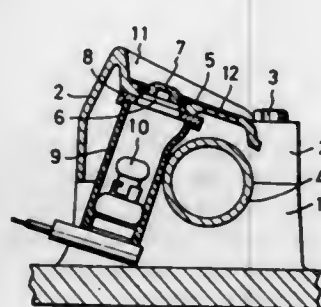
Filed Nov. 4, 1971, Ser. No. 195,626

Claims priority, application Japan, Nov. 26, 1970, 45/117611

U.S. Cl. 240-7.1 R

Int. Cl. B60q 1/00, 3/00

5 Claims



Indicator lights for the operating condition of various parts of a motorized two-wheel vehicle are provided at the flat

upper surface of a support assembly for a steering handle of the vehicle. The support assembly comprises a lower member fixed to the front fork of the vehicle and an upper member detachably connected to the lower member. The flat surface is formed on the upper portion of the upper member and lamp assemblies for the lights are mounted in tubular holders attached to the upper member below apertures in the upper member through which the condition of the lamps is visible to the driver.

3,733,584

## SYSTEM FOR REMOTELY CONTROLLING AND ACTIVATING A SEISMIC VIBRATOR

Charles R. Pelton, and Kim L. Mitchell, both of Ponca City, Okla., assignors to Pelton Company, Inc., Ponca City, Okla.

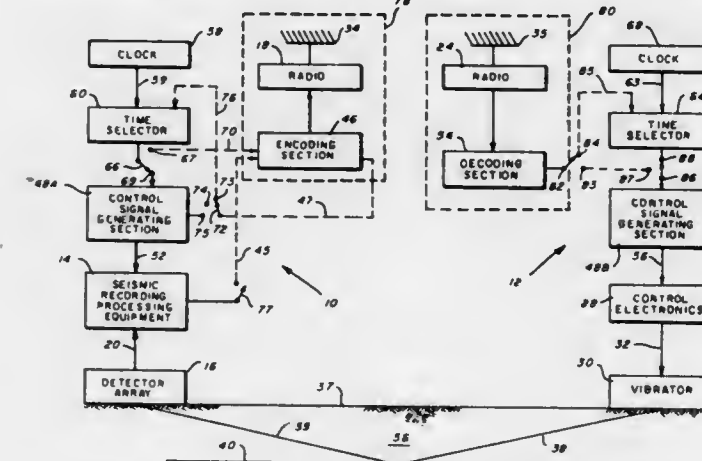
Continuation-in-part of Ser. No. 110,872, Jan. 29, 1971. This

application Mar. 3, 1971, Ser. No. 115,616

Int. Cl. G01v 1/02

U.S. Cl. 340-15.5 TG

12 Claims



This invention is applicable to seismic prospecting in which a vibrator is used as the source of seismic waves, and the seismic waves are detected, recorded and processed at a recording point remote from the vibrator, after passing through the earth. Means are provided at the vibrators and at the recording point for generating identical unique signals for controlling the vibrator and processing the recorded data. Precise clock and control means at the vibrator and recording point, after being synchronized, are used to control the simultaneous generation of the unique signals.

3,733,585

## SYSTEMS FOR DETECTING ERRORS IN A DIGITAL TRANSMISSION CHANNEL

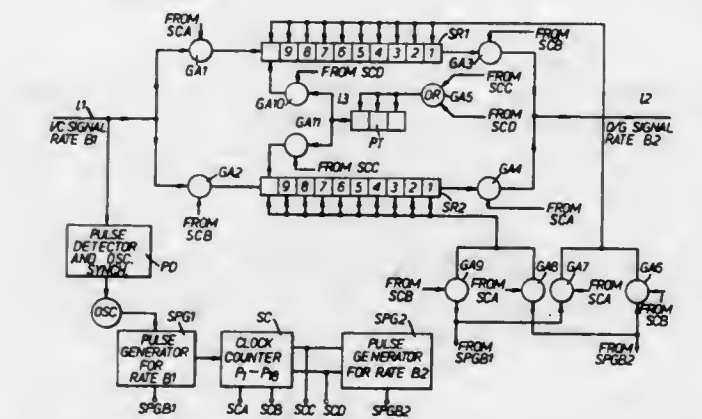
David Merlo, Hatfield, England, assignor to The Post Office, London, England

Filed June 7, 1971, Ser. No. 150,659

Int. Cl. G08c 25/00

U.S. Cl. 340-146.1 D

5 Claims



A system for detecting transmission errors arising in a digital transmission channel in which digits of a predetermined

multidigit check signal not related to the information digits, are inserted successively after respective groups of information digits before transmission. After transmission the digits of the check signal are extracted and compared with the predetermined check signal, errors extracted indicating malfunctioning of the channel and loss of alignment of the check signal extraction. If the extraction of the check signal digits is out of alignment with the structure of the digital information after transmission, the rate of occurrence of errors will be very high, and the detection of a very high error rate can be used to effect alignment of the check signal extraction with the structure of the digital information after transmission. A lower error rate indicates malfunctioning of the channel.

3,733,586

## METER INTERROGATION SYSTEM HAVING STROBE LOGIC CONTROL

Joe F. Lusk, Medford; William H. Rood, and Herbert L. Feldman, both of Acton, all of Mass., assignors to General Public Utilities Corporation, New York, N.Y.

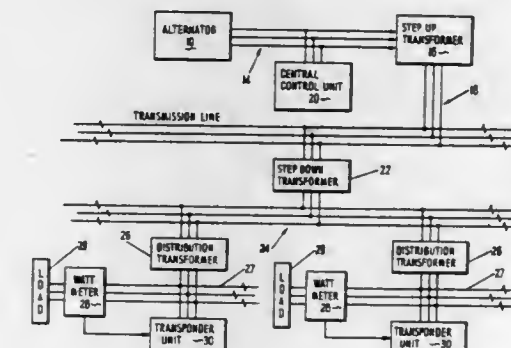
Continuation of Ser. No. 53,623, July 9, 1970. This application

Mar. 14, 1972, Ser. No. 234,670

Int. Cl. H04q 9/00

U.S. Cl. 340-151 R

28 Claims



A system adapted for connection to a polyphase power distribution network to interrogate a plurality of separate watt meters and store respective readings from the watt meters. The system comprises a central control unit coupled to the power distribution network for storing a plurality of separate meter identification codes each including a group of binary coded bits and means for serially sending the bits including means for modulating a signal on said power distribution network of fixed time duration and indicative of the binary state of each bit of said group. A plurality of meter transponder units are each coupled respectively to the plurality of watt meters for demodulating the signal impressed on the power distribution network and identifying the transmitted group of binary codes bits as its own predetermined identity code.

In one embodiment of the invention, the transmitted identity code is sequentially stored in a register and a variable strobe logic unit is provided for entering each received bit into this register at a time dependent upon the maximum delay of a particular power distribution network. The strobe logic includes means for determining the time difference between the receipt of the beginning of the bit over the shortest path, and the termination of the same transmitted bit over the maximum path. In a preferred embodiment, the strobe logic also includes means for strobing the bit of data at about the middle of the determined time difference, and means for preventing the subsequent bit from being strobed until after the determined time difference has elapsed, thus preventing an erroneous bit sensing due to system delay variations. Similar strobe logic can also be provided to compensate for system delay variations when transmitting the binary coded reading from the identified transponder unit to the central control unit.







3,733,594

**ALARM APPARATUS FOR DETECTING AND INDICATING OIL SLICKS**

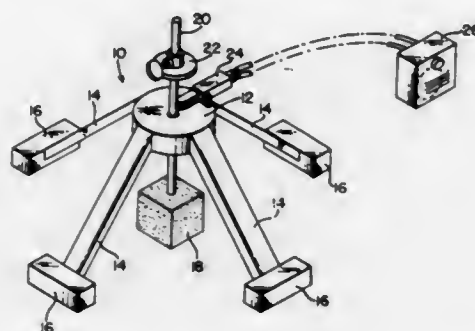
George Otto Orth, Jr., 10612 Riviera Place N.E., Seattle, Wash.

Filed Mar. 13, 1972, Ser. No. 234,296

Int. Cl. G08b 21/00; G01n 9/18

U.S. Cl. 340—236

9 Claims



Oil slicks floating on the surface of a body of water are detected by a device which floats on the body of water. The device incorporates therein a hydrophobic oil absorbent material which also floats on the surface of the water. On contact with the oil of an oil slick, the hydrophobic oil absorbent material absorbs the oil and sinks into the water. When the float of hydrophobic absorbent material sinks to a predetermined depth in the water, an alarm signaling device is actuated to indicate the presence of the oil slick.

3,733,595

**CONDITION RESPONSIVE SWITCHING CIRCUIT**

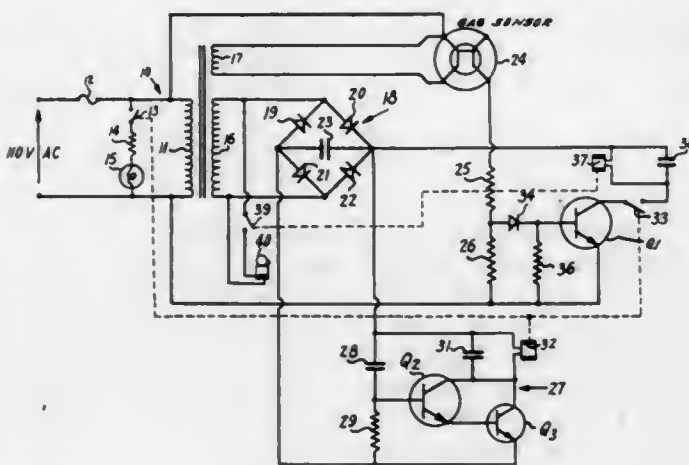
Elmer M. Benedict, 506 State Street, Schenectady, N.Y.

Filed Feb. 12, 1971, Ser. No. 117,968

Int. Cl. G08b 21/00

U.S. Cl. 340—237 R

9 Claims



A circuit which actuates a visible or audible alarm in response to the reception of dangerous fluids such as smoke, fumes, or gas. The circuit includes a sensor which changes internal resistance when the fluid to be detected is present in the environment surrounding the sensor. The change of the sensor actuates a switching or trigger circuit which results in the sounding of an audible alarm or the lighting of a visual alarm or both. A delay circuit which maintains the sensor circuitry in an unenergized condition until the system stabilizes after power is first applied is also provided to prevent spurious alarms.

3,733,596

**ALARM CIRCUIT**

Takeo Arima, Setagaya-ku, Tokyo-to, Japan, assignor to Tokyo Hachiki Kabushiki Kaisha, Tokyo-to, Japan

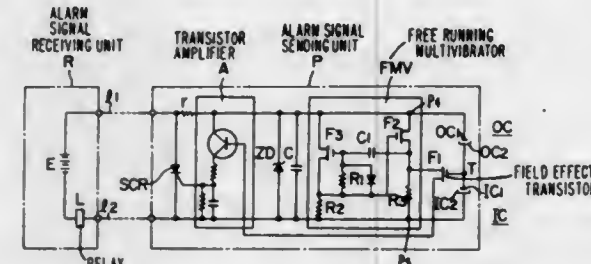
Continuation-in-part of Ser. No. 887,485, Dec. 23, 1969, abandoned. This application May 16, 1972, Ser. No. 253,868

Claims priority, application Japan, Dec. 26, 1968, 43/95614; May 3, 1969, 44/34012

Int. Cl. G08b 17/10

U.S. Cl. 340—237 S

9 Claims



An alarm system to detect combustion products such as smoke, gas and the like, has one or more alarm signal sending units and an alarm signal receiving unit interconnected by wiring to the sending units. Each alarm signal sending unit has a sensing or response element to detect the presence of vapors or smoke and the like and provide a signal; the sending unit also includes an amplifier non-continuously brought to its current-carrying state for amplifying an output signal of the response elements responding to a change of the surrounding physical condition. The alarm signal sending units are suitable for being connected in large numbers in parallel with a common alarm signal receiver unit, because the amplifier in each sending unit has a high impedance and dissipates low power. A smoke-sensing element of the ion type and necessitating no repeater is expediently included in the alarm signal sending device.

3,733,597

**PROXIMITY DETECTOR AND ALARM UTILIZING FIELD EFFECT TRANSISTORS**

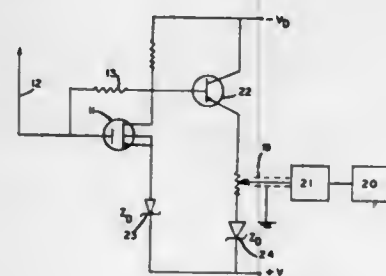
Gerald F. Healey, Seaside Heights, and Joseph C. Nirschl, West Long Beach, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 29, 1969, Ser. No. 854,084

Int. Cl. G08b 13/26

U.S. Cl. 340—258 D

7 Claims



A proximity detector and alarm in which an antenna is connected to the gate of a metal oxide semiconductor field effect transistor (MOSFET) which causes a silicon controlled switch (SCS) to trigger a blocking oscillator.

3,733,598

**VIBRATION-RESPONSIVE APPARATUS**

Tomezo Kato, 172 Motoderakoji, Sendai, Japan

Continuation of Ser. No. 887,211, Dec. 22, 1969, abandoned.

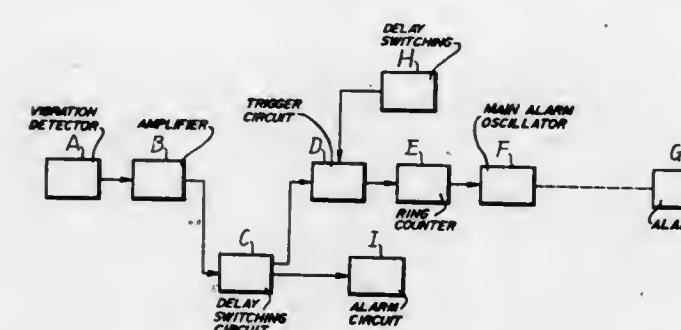
This application Dec. 22, 1971, Ser. No. 210,994

Claims priority, application Japan, Dec. 27, 1968, 44/127; Dec. 27, 1968, 44/129

Int. Cl. G08b 13/16

U.S. Cl. 340—261

4 Claims



A vibration-responsive apparatus having means for detecting a vibration and producing a signal in response to the detected vibration, and electric circuit means operating in response to the vibration when it lasts for more than a certain period of time and the signal corresponding thereto is produced a predetermined number of times, the electric circuit means being adapted to actuate a desired device connected thereto.

3,733,599

**TRIGGERING APPARATUS FOR A FLASH LAMP**

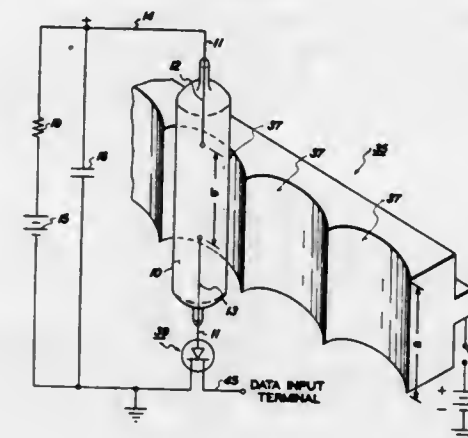
Louis J. Fantozzi, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 22, 1970, Ser. No. 74,437

Int. Cl. G08b 5/38

U.S. Cl. 340—343

4 Claims



Apparatus for triggering a flash lamp. The flash lamp is positioned in a groove formed on a conductive member. The width of the conductive member is selected to be at least equal to the space between the lamp electrodes. In a first embodiment, a voltage of an amplitude sufficient to trigger the flash lamp is applied to the conductive member whereby the flash lamp is caused to emit radiation of a desired wave-length. In a second embodiment, a plurality of flash lamps are positioned in contact with a plurality of grooves formed on the conductive member. A voltage of an amplitude sufficient to trigger all of the flash lamps is applied to the conductive member. Selected ones of said plurality of flash lamps are triggered by applying a signal to switch means connected in the electrode circuits of the selected flash lamps.

3,733,600

**ANALOG-TO-DIGITAL CONVERTER CIRCUITS**

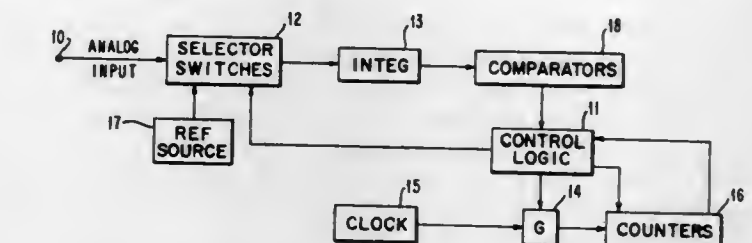
George A. Hellwarth, Deerfield Beach, and James E. Milton, Boca Raton, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 6, 1971, Ser. No. 131,748

Int. Cl. H03k 13/02, 13/20

U.S. Cl. 340—347 NT

5 Claims



Time delays associated with switching controls of analog-to-digital converter circuits permit switching transients to be blocked from reducing conversion accuracy. The time delays allow switching to be performed while normal conversion operations are suspended. Appropriate converter components are maintained with quiescent operating levels between conversion cycles so that drifting of those components during conversion cycles is minimized. At least the final portion of a simulated conversion cycle is used as a precedent to each conversion cycle so that the initiating and completing conversion levels are maintained equivalent. A precision semi-conductor switch effects on-off switching with constant resistance by referencing the switch control signals to the switch input level.

3,733,601

**DIGITAL READOUT SYSTEM FOR ANALYTICAL MEASURING INSTRUMENTS**

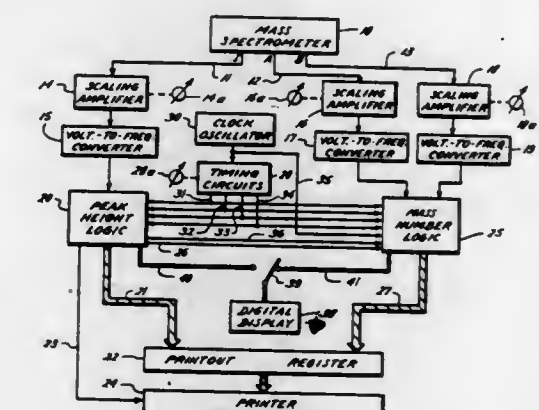
Donald L. Oliver, Austin, Tex., assignor to Infotronics Corporation, Houston, Tex.

Filed May 20, 1969, Ser. No. 826,096

Int. Cl. H03k 13/02

U.S. Cl. 340—347 AD

21 Claims



A digital readout system for use with analytical measuring instruments, such as mass spectrometers, which produce a fluctuating analog measurement signal in response to a varying control effect. The system includes a pair of digitizer channels, one for detecting and digitizing the maximum values of peaks in the analog measurement signal and the other for processing and digitizing signals which identify these maximum values in terms of a parameter related to the magnitude of the varying control effect.

As applied to a mass spectrometer, the maximum value or peak height measurement is accomplished by utilizing a voltage-to-frequency converter to produce a pulse train having a frequency or repetition rate directly proportional to the am-



plitude of the spectrometer ion current signal. The output of the converter is fed to digital logic circuitry wherein it is periodically sampled and analyzed. In particular, the value of each sample is compared with the last sample that was stored in a memory circuit and the logic circuitry automatically makes decisions as to whether the sample in the memory circuit should be retained, replaced by the new value or read out. In a peak sensing mode, the stored sample is replaced by the new value if the new value is larger. The most recent sample stored in the memory circuit is read out whenever a new sample is a given percentage less than the stored value and the logic circuitry is then switched to a valley sensing mode. In this latter mode, the sample value stored in the memory circuit is replaced by a new value if the new value is smaller than the stored value. When the sample value rises above the most recent stored value by a given percentage, the logic circuitry is switched back to the peak sensing mode, whereupon the logic circuitry starts looking for the maximum value of a new peak.

The second digitizer channel or peak identification channel is provided with six selectable operating modes for enabling selection of a digital readout that is related to one or more of three parameters. These parameters are the spectrometer accelerating voltage, the spectrometer magnetic field intensity and the elapsed time of the control effect variation. In all cases, the value that was present when the maximum value of a peak occurred will be read out. The first two operating modes enable either the accelerating voltage or the magnetic field intensity to be read out directly. The next three modes utilize computing circuits for computing and reading out mass number values as determined from either the accelerating voltage or the magnetic field intensity or both. The sixth mode provides an elapsed time readout expressed in terms of the number of sample intervals that have occurred.

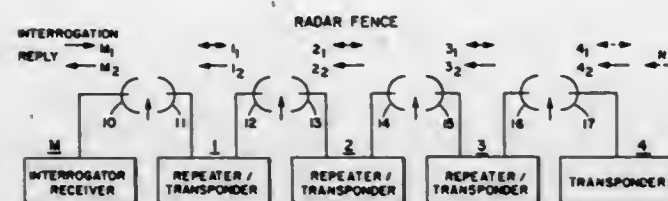
3,733,602

### MICROWAVE INTRUSION DETECTING SYSTEM AND APPARATUS

Virgil A. Cuckler, Scottsdale, and Laverne A. Wente, Tempe, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.  
Filed May 20, 1971, Ser. No. 145,169  
Int. Cl. G08b 13/24

U.S. Cl. 343-5 PD

15 Claims



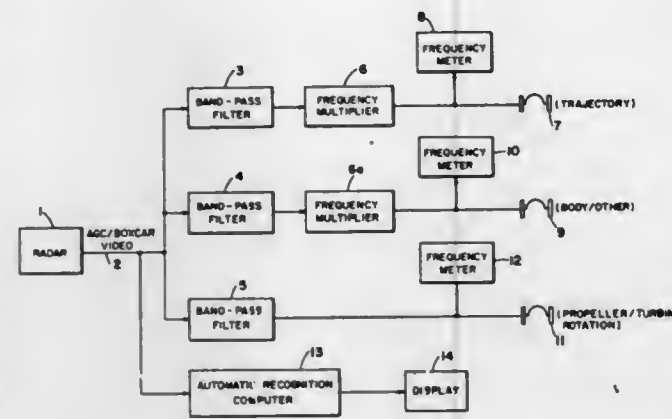
A digital microwave intrusion detecting system and apparatus is disclosed wherein a plurality of repeater/transponders with receiving and transmitting antennas define a perimeter and in response to each interrogation pulse sent down the perimeter reply pulses are received back at the monitoring location corresponding in number to the last transponder to send a reply. The location of the perimeter violation is defined by the last transponder to reply to an interrogation pulse. If a certain number of replies, for example one, are not received back from all transponders in response to an interrogation pulse a warning signal is given and if a different number of replies are not received back, as for example, two in succession, an alarm signal is given that the perimeter has been violated.

### 3,733,603 RADAR TARGET IDENTIFICATION SYSTEM

Stephen L. Johnston, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.  
Filed July 31, 1968, Ser. No. 749,538  
Int. Cl. G01s 9/02

U.S. Cl. 343-5 SA

1 Claim



This system utilizes the low frequency modulations of the signal from a radar which result from target scintillation and target motion. Outputs are provided for three types of identification — aural, frequency meter, and automatic recognition computer. A frequency multiplier may be used with the aural and frequency meter outputs.

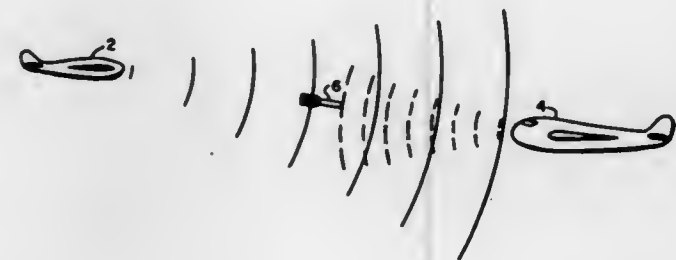
3,733,604

### AIRCRAFT GUIDANCE SYSTEM

Harry B. Smith, Catonsville, Md., assignor to Westinghouse Electric Corporation, East Pittsburgh, Pa.  
Filed Sept. 11, 1957, Ser. No. 683,918  
Int. Cl. F41g 7/00; G01s 9/02

U.S. Cl. 343-7 A

8 Claims



6. In an aircraft guidance system in which a guided aircraft is launched and thereafter guided by pulses of radio frequency energy transmitted from a pulse Doppler radar system, the combination of a directional antenna for said pulse Doppler system, means for driving said antenna through a search pattern, means in said pulse Doppler system for tracking a target in range, means in said pulse Doppler system for tracking a target in velocity, a guided aircraft, having a rearward-looking antenna on said guided aircraft for receiving energy transmitted directly from the antenna of said pulse Doppler radar after the guided aircraft is launched and traveling along the beam of energy transmitted by the pulse Doppler antenna, a

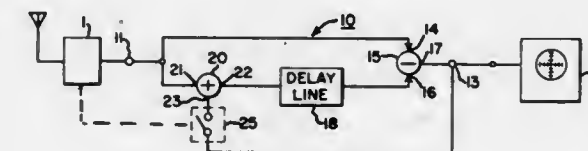
forward-looking antenna on said guided aircraft for receiving transmitted energy from said pulse Doppler radar which is reflected from said target means in said guided aircraft for deriving an output proportional to the difference in frequencies received by the two antennas on said guided aircraft, a velocity tracking circuit in said aircraft responsive to the output of said deriving means, means responsive to the output of said tracking circuit for varying the angular position of said forward-looking antenna, means connecting the antenna driving means of said pulse Doppler radar to the means for varying the angular position of said guided aircraft forward-looking antenna prior to launch, means connecting the velocity tracking means of said pulse Doppler radar to the velocity tracking means in said guided aircraft prior to launch, and means for increasing the illuminating power of said pulse Doppler radar when the range of said target falls below a predetermined value.

### 3,733,605 INTERRUPTED FEEDBACK CANCELLATION IN A RADAR SYSTEM

Laurence Oliver Osterman, Utica, N.Y., assignor to General Electric Company, Utica, N.Y.  
Filed Oct. 23, 1970, Ser. No. 83,325  
Int. Cl. G01s 9/42

U.S. Cl. 343-7.7

8 Claims



In a radar system a canceller circuit including in one form a single delay means which produces an output signal having an order of cancellation equal to that of the canceller circuit using two delay means. Undelayed and delayed video or intermediate frequency inputs are coupled from a signal input to a subtractor. A first input of a summing circuit is connected between the signal input and the delay means, and the output of the subtractor is connected to a second input of the summing junction on alternate interpulse periods of the radar system.

### 3,733,606 CAMOUFLAGING MEANS FOR PREVENTING OR OBSTRUCTING DETECTION BY RADAR RECONNAISSANCE

Sven-Goran Johansson, Upplands Vasby, Sweden, assignor to Barracudavärken AB, Skarsnasvagen 4, Djursholm, Sweden  
Continuation-in-part of Ser. No. 812,414, April 1, 1969, abandoned. This application Apr. 6, 1971, Ser. No. 131,652  
Claims priority, application Sweden, Apr. 1, 1968, 4293/68; Aug. 13, 1968, 10897/68  
Int. Cl. G01s 7/36

U.S. Cl. 343-18 A

14 Claims



Camouflage means for minimizing detection of objects by radar reconnaissance consisting of a multi-layered material

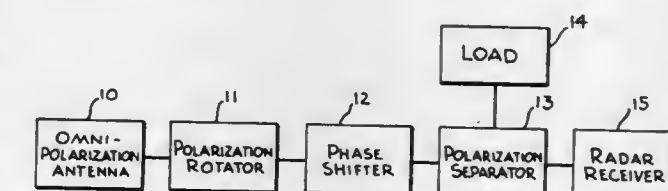
both absorbing and reflecting radar signals and wherein at least one layer is a thin inhomogeneous electrically conductive film having a surface resistivity such as to establish reflection for a portion of the incident radar power. The conductive film may take the form of metallic grid which may be regular or irregular, metal or metallized fibers and fibrils, flakes, or a layer of colloidal, conductive particles.

### 3,733,607 ANTI-JAMMING APPARATUS

Edwin N. Bobrow, Palos Verdes Estates, and Lawrence C. Murdock, Torrance, both of Calif., assignors to Thompson Ramo Wooldridge, Inc., Cleveland, Ohio  
Filed Oct. 3, 1958, Ser. No. 766,171  
Int. Cl. G01s 7/36

U.S. Cl. 343-100 PE

13 Claims



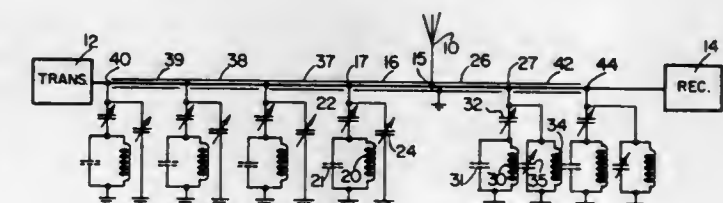
A linearly polarized wanted signal is separated from a non-linearly polarized unwanted signal by transforming the wanted signal to a non-linearly polarized signal and the unwanted signal to a linearly polarized signal and transmitting these signals to a polarized filter to pass only the component of the wanted signal orthogonal to the unwanted signal.

### 3,733,608 CIRCUIT FOR COUPLING RADIO RECEIVER AND RADIO TRANSMITTER TO A COMMON ANTENNA FOR DUPLEX OPERATION

Maynard H. McGhay, Schaumburg, and Demetrios G. Afendras, Melrose Park, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.  
Filed Dec. 9, 1971, Ser. No. 206,484  
Int. Cl. H04I 5/08

U.S. Cl. 343-180

14 Claims



Antenna coupling circuit for duplex radio transmission and reception by use of a common antenna (duplexer), including plurality of helical resonator sections provided within conductive enclosures in a conductive housing. A helical winding is provided in each enclosure having one end connected to the housing, and an adjustable conductive stud forms a capacitor with the other end of the winding. The winding and enclosure form a parallel tuned resonator, and the series capacitor forms therewith a series tuned circuit. One series tuned circuit at the receiver frequency is coupled to the antenna by a transmission



line having a length equal to an odd multiple of a quarter wave length at the transmitter frequency, and this junction is connected to the transmitter through a circuit which may include additional tuned circuits. A second series tuned circuit at the transmitter frequency is coupled to the antenna by a transmission line having a length equal to an odd multiple of a quarter wave length at the receiver frequency, and this junction is connected to the receiver through a circuit which may include additional tuned circuits. A reactance may be connected in parallel with the first series tuned circuit to provide an anti-resonant circuit at the transmitter frequency, and a different reactance may be connected in parallel with the second tuned circuit to provide an anti-resonant circuit at the receiver frequency. Additional resonator sections can be connected in the transmitter and/or receiver branches of the circuit.

3,733,609

## SHROUDED OFFSET PARABOLIC REFLECTOR ANTENNA

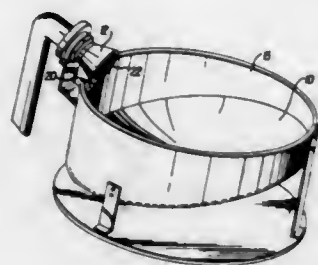
Homer E. Bartlett, Melbourne, Fla., assignor to Radiation Incorporation, Melbourne, Fla.

Filed July 2, 1971, Ser. No. 159,352

Int. Cl. H01q 19/14

U.S. Cl. 343—782

11 Claims



A reflector antenna has a reflector with an offset feed. The reflector is partially encompassed by a shroud which may be reflecting, absorbing, or both, to energy radiated by the feed. The shroud is effective to block energy radiated by the feed that would otherwise spill over the edge of the reflector, only along a portion of the edge less than its entirety.

3,733,610

## ELECTROMAGNETIC HORN WITH MOVEABLE VANE FOR GENERATING MONOPULSE RADIATION PATTERNS

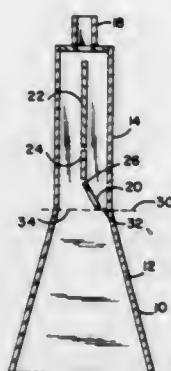
Derling G. Killion, and Floyd B. Shacklock, both of San Diego, Calif., assignors to Ryan Aeronautical Company, San Diego, Calif.

Filed July 14, 1969, Ser. No. 841,357

Int. Cl. H01q 13/00

U.S. Cl. 343—786

6 Claims



An electromagnetic horn with amplitude monopulse radiation patterns has a Magic Tee attached to a waveguide feeding the horn. The Magic Tee provides two signals that have dis-

placed phase centers in the feeding waveguide. Each signal, whose phase center is displaced, provides a radiation pattern whose maximum radiation is angularly skewed from the axis of the horn. A rotationally variable septum provides an angular rotation of both radiation patterns in such a manner as to rotate the reference axis, thereby scanning the monopulse antenna patterns.

3,733,611

## RECTILINEAR POLARIZATION ANTENNAS

Henri Becavin, Paris, France, assignor to Thomson-CSF, Paris, France

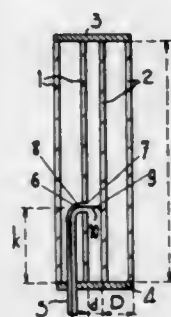
Filed June 29, 1971, Ser. No. 157,966

Claims priority, application France, July 17, 1970, 7026431

Int. Cl. H01q 9/16

U.S. Cl. 343—792

9 Claims



The elementary antenna, allowing the obtention of a radiation pattern similar to that of an infinitely short dipole in the E-plane comprises two metal tubes inserted between two plates closing off their ends. A coaxial cable passing through one of the tubes has its inner conductor connected to the outer surface of the other tube.

A four-tube arrangement allows the obtention of a radiation pattern such as provided by two crossed dipoles and may be used for radio-beacons.

3,733,612

## SIGNATURE REPRODUCTION

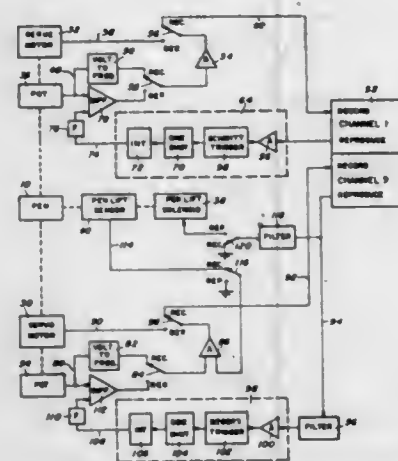
Harvey L. Huston, Silver Spring, Md., and Donald K. Belcher, Gainesville, Fla., assignors to Signa-Sigmet, Inc., Silver Spring, Md.

Filed Mar. 30, 1971, Ser. No. 129,462

Int. Cl. G11b 31/00

U.S. Cl. 346—33 MC

9 Claims



The position of a pen or stylus with respect to a piece of paper is converted into two DC signals in a pair of potentiometers.

ters which are mechanically linked to the pen support mechanism. The DC signals are then converted into AC signals which are recorded on magnetic tape. When the tape is played back, the AC signals are reconverted into DC voltages which drive a negative feedback servomechanism system and thereby reproduce a signature previously recorded on the magnetic tape.

3,733,613

## ELECTRODE AND TERMINAL STRUCTURE FOR NON-IMPACT PRINTER

Paul L. Koch, Saugus, and James C. Maxwell, Winchester, both of Mass., assignors to The Carter Ink Company, Cambridge, Mass.

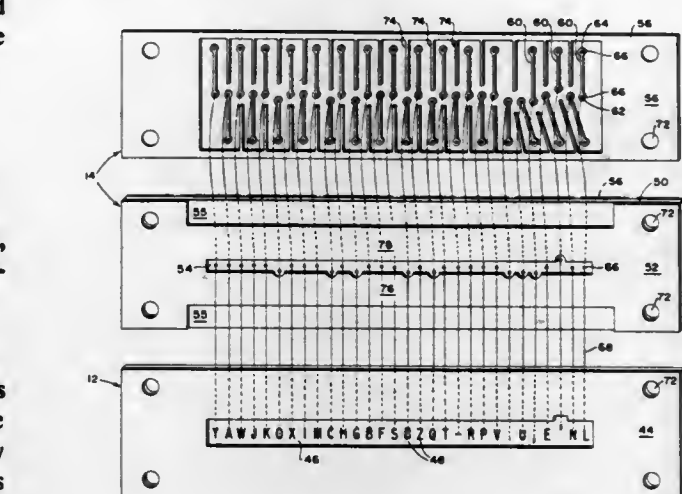
Filed Aug. 16, 1971, Ser. No. 172,067

Int. Cl. G01d 15/06, 15/20

U.S. Cl. 346—74 E

10 Claims

Printing means for high-speed non-impact printers of the type having character-shaped, pulsed electrodes. Mutually facing electrode and terminal sheets have insulating bases upon the nonfacing surfaces of which are disposed character electrodes and corresponding connection terminals. The respective electrodes and terminals are mutually connected by conductor leads extending through the sheets. Surrounding portions of the non-facing surfaces and portions of the facing



the purpose of shielding and suppressing arcs between electrodes or between terminals, or between electrodes and terminals.



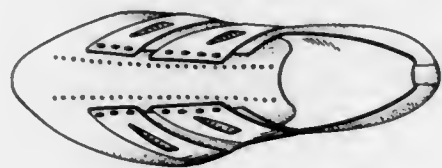
# DESIGNS

MAY 15, 1973

226,882  
SHOE

Alfred Powers, Los Angeles, Calif., assignor to Nippon Rubber U.S.A. Corp., Los Angeles, Calif.  
Filed May 17, 1971, Ser. No. 144,380  
Term of patent 14 years  
Int. Cl. D2—04

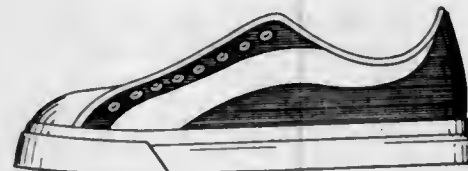
U.S. Cl. D2—268



226,885  
SHOE

George Philbrick McBarron, 105 Colonial Cove Drive, Hope Mills, N.C. 28348  
Filed Apr. 26, 1972, Ser. No. 247,937  
Term of patent 3½ years  
Int. Cl. D2—04

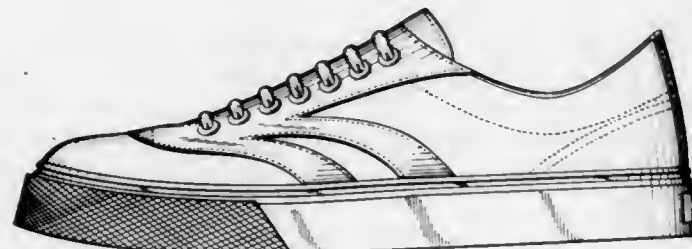
U.S. Cl. D2—310



226,883  
SHOE

Jaromir Babicka, Reisterstown, and Clarence E. Phillips, Taneytown, Md., assignors to Cambridge Rubber Company, Taneytown, Md.  
Filed Nov. 4, 1971, Ser. No. 195,903  
Term of patent 14 years  
Int. Cl. D2—04

U.S. Cl. D2—310



226,886  
PAINT APPLICATOR

Anthony E. Codina, 2337 Cypress Ave., Lemon Grove, Calif. 92045  
Filed July 19, 1971, Ser. No. 164,200  
Term of patent 14 years  
Int. Cl. D4—04

U.S. Cl. D4—38



226,887  
CRIB

Robert Sterling Brunk, Rte. 2, Sugar Creek Road, P.O. Box 175B, Weaverville, N.C. 28787  
Filed Mar. 27, 1972, Ser. No. 238,761  
Term of patent 14 years  
Int. Cl. D6—06

U.S. Cl. D6—15



226,884  
SHOE

Helge Persson, 6 Ekstubbavägen, S-260 40 Viken, Sweden  
Filed Jan. 14, 1972, Ser. No. 218,046  
Claims priority, application Sweden Nov. 3, 1971  
Term of patent 14 years  
Int. Cl. D2—04

U.S. Cl. D2—310



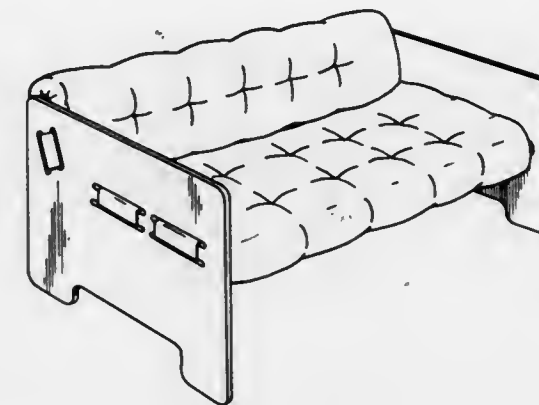
MAY 15, 1973

U. S. PATENT OFFICE

981

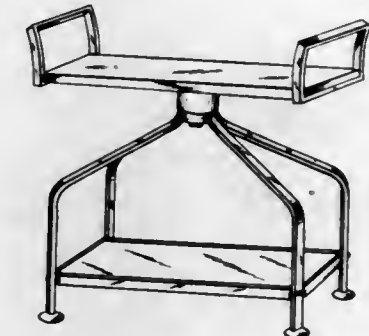
226,888  
ARM LOUNGE SEAT OR THE LIKE  
Stuart John Gilbert and Karen T. Gilbert, Constantine, Mich., assignors to Harter Corporation, Sturgis, Mich.  
Filed June 4, 1970, Ser. No. 23,301  
Term of patent 14 years  
Int. Cl. D6—02

U.S. Cl. D6—63



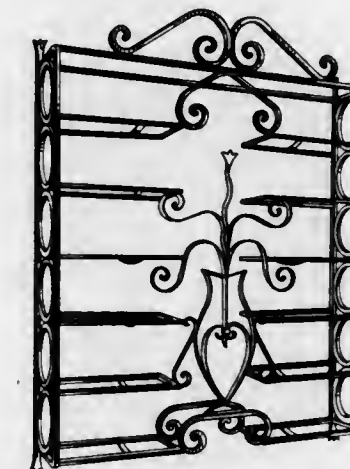
226,891  
PEDESTAL STAND  
Walter Gusdorf, 1042 Orchard Lakes, Creve Coeur, Mo. 63141  
Filed Oct. 20, 1971, Ser. No. 191,152  
Term of patent 7 years  
Int. Cl. D6—06

U.S. Cl. D6—181



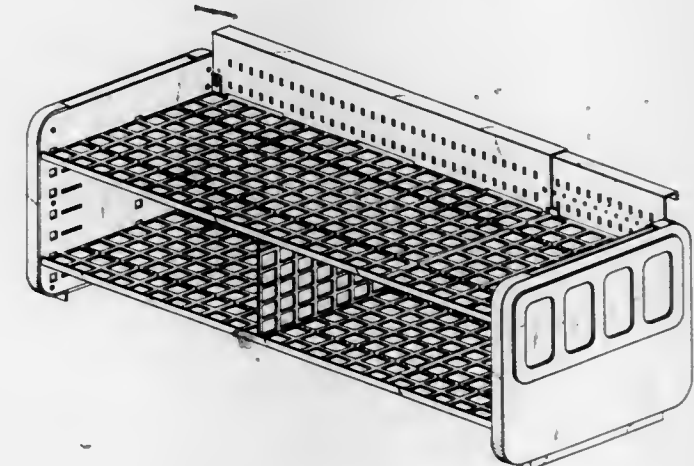
226,889  
WINE RACK  
Ernest A. Bauer, 21 Cliff St., Hastings-on-Hudson, N.Y. 10706  
Filed July 21, 1971, Ser. No. 164,981  
Term of patent 14 years  
Int. Cl. D6—04

U.S. Cl. D6—130



226,892  
MERCHANDISE DISPLAY MODULE  
Michael Degennaro, New Rochelle, and Phillip Schatten, Spring Valley, N.Y., assignors to Jonathan Leigh Inc.  
Filed Nov. 12, 1971, Ser. No. 198,493  
Term of patent 14 years  
Int. Cl. D6—04

U.S. Cl. D6—186



226,890  
TABLE  
Gary J. Neville, 458 Sycamore Road, Santa Monica, Calif. 90402  
Filed Jan. 7, 1971, Ser. No. 104,839  
Term of patent 14 years  
Int. Cl. D6—03

U.S. Cl. D6—146



226,893  
DEAD LOCK LEVER  
Raymond U. H. Tegner, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.  
Filed Jan. 10, 1972, Ser. No. 216,905  
Term of patent 14 years  
Int. Cl. D8—07

U.S. Cl. D8—137

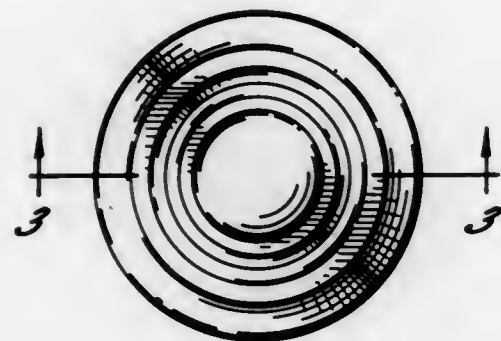




226,894  
KNOB

Raymond U. H. Tegner, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.  
Filed Dec. 2, 1971, Ser. No. 204,412  
Term of patent 14 years  
Int. Cl. D8—06

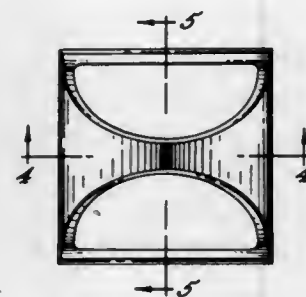
U.S. Cl. D8—144



226,897  
PULL

Bruce N. Bingham, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.  
Filed Dec. 3, 1971, Ser. No. 204,795  
Term of patent 14 years  
Int. Cl. D8—06

U.S. Cl. D8—173



226,898

ELECTRICAL CORD-REEL

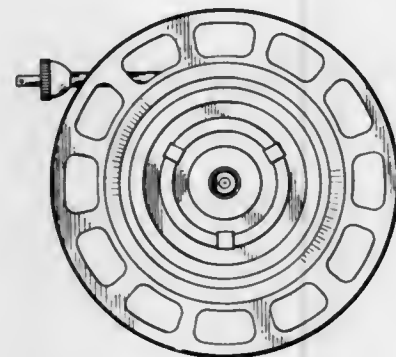
Bernard J. Tamarin, Philadelphia, Pa., assignor to Vacuum Cleaner Corporation of America, Philadelphia, Pa.

Filed Apr. 6, 1972, Ser. No. 241,883

Term of patent 14 years

Int. Cl. D8—08

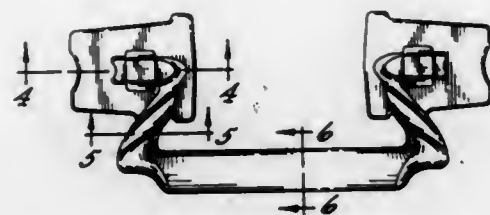
U.S. Cl. D8—220



226,895  
PULL

Raymond U. H. Tegner, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.  
Filed Dec. 22, 1971, Ser. No. 211,166  
Term of patent 14 years  
Int. Cl. D8—06

U.S. Cl. D8—166



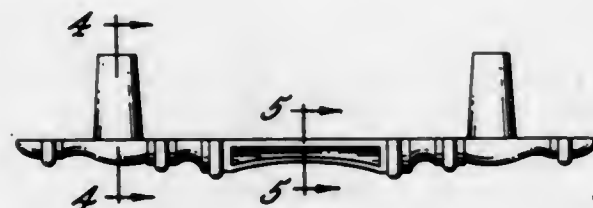
226,896  
PULL

Raymond U. H. Tegner, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.  
Original design application Dec. 7, 1970, Ser. No. 26,332.  
Divided and this application Mar. 10, 1972, Ser. No. 233,848

Term of patent 14 years

Int. Cl. D8—06

U.S. Cl. D8—166



226,899

HOOK FOR SHOWER CURTAINS OR THE LIKE

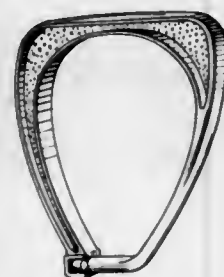
Ned Strongin, Baldwin, N.Y., assignor to Heinz Nathanson Incorporated, New York, N.Y.

Filed Nov. 19, 1971, Ser. No. 200,660

Term of patent 14 years

Int. Cl. D8—08

U.S. Cl. D8—248



226,900  
BOTTLE

Howard Cooper, Suite 7707, 175 E. Delaware, Chicago, Ill. 60611  
Filed Jan. 20, 1971, Ser. No. 108,249  
Term of patent 14 years  
Int. Cl. D9—01

U.S. Cl. D9—28



226,901

CONTAINER FOR LIQUID PRODUCTS

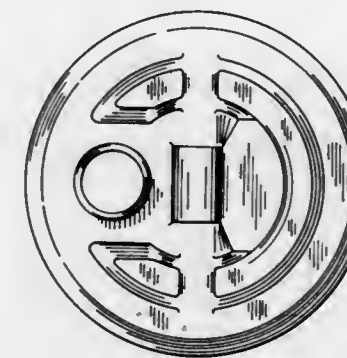
Herbert W. Galer, Circleville, Ohio, assignor to United States Steel Corporation

Filed July 12, 1971, Ser. No. 161,411

Term of patent 14 years

Int. Cl. D9—03

U.S. Cl. D9—175



226,902

CONTAINER FOR LIQUIDS

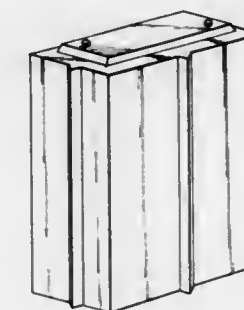
Leard Evander Lisk, Jr., Summerfield, N.C., assignor to Lisk Enterprises Corporation, Greensboro, N.C.

Filed Oct. 8, 1971, Ser. No. 187,928

Term of patent 14 years

Int. Cl. D9—02

U.S. Cl. D9—175



226,903

TELEPHONE BOOTH

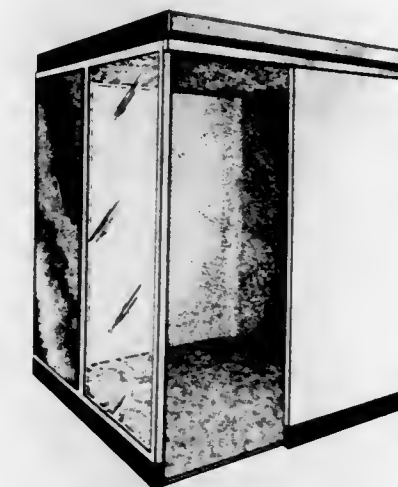
Donald Michael Genaro, Haworth, N.J., John Niel McGarvey, Drexel Hill, Pa., and Frederick Allen Rosebrock, Greenfield, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed July 16, 1971, Ser. No. 163,556

Term of patent 14 years

Int. Cl. D25—99

U.S. Cl. D13—1 L



226,904

EXTRUDED PLASTIC MEETING RAIL FOR A WINDOW UNIT

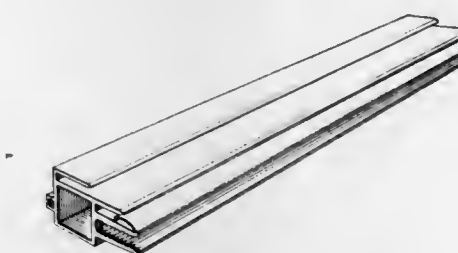
Dominique Dallaire and Raymond M. Dallaire, both of P.O. Box 220, Levis, Quebec, Canada

Filed July 15, 1971, Ser. No. 163,123

Term of patent 14 years

Int. Cl. D25—01

U.S. Cl. D13—6



226,905

MUFFLER

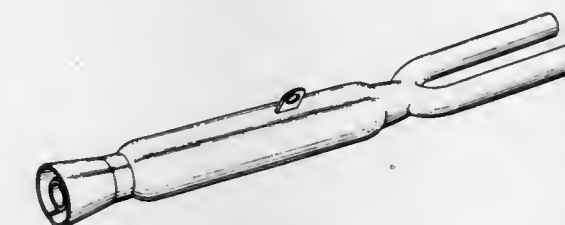
Robert F. Buckalew and John D. Owens, both of 1859 Blake Ave., Los Angeles, Calif. 90039

Filed July 8, 1971, Ser. No. 160,998

Term of patent 14 years

Int. Cl. D12—16

U.S. Cl. D14—6 D

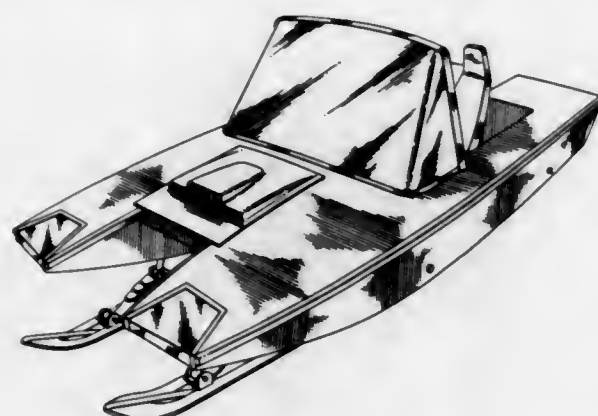




226,906

**COMBINED SNOW AND WATER VEHICLE**  
Robert V. Albertson, Wayzata, Minn., assignor to  
Massey-Ferguson Inc., Detroit, Mich.  
Filed July 12, 1971, Ser. No. 161,381  
Term of patent 14 years  
Int. Cl. D12—14, 06

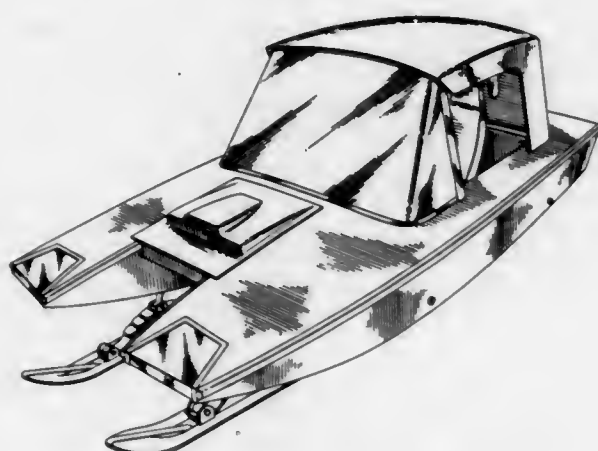
U.S. Cl. D14—24



226,907

**COMBINED SNOW AND WATER VEHICLE**  
Robert V. Albertson, Wayzata, Minn., assignor to  
Massey-Ferguson Inc., Detroit, Mich.  
Filed July 12, 1971, Ser. No. 161,382  
Term of patent 14 years  
Int. Cl. D12—14, 06

U.S. Cl. D14—24



226,908

**COMBINED DEFENSIVE WEAPON AND FLASHLIGHT**  
Max Tadlock, Santa Clara, Calif.  
(86 3rd St., P.O. Box AB, Los Altos, Calif. 94022)  
Filed Oct. 4, 1971, Ser. No. 186,576  
Term of patent 14 years  
Int. Cl. D22—02; D26—02

U.S. Cl. D22—1

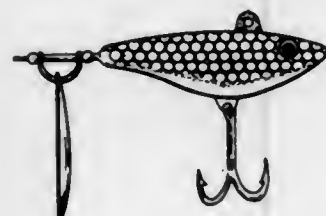


226,909

**SPINNER SINKER FISHING LURE**  
George S. Perrin, Fort Smith, Ark., assignor to Plastics  
Research and Development Corporation, Fort Smith,  
Ark.

Filed May 19, 1972, Ser. No. 255,309  
Term of patent 14 years  
Int. Cl. D22—05

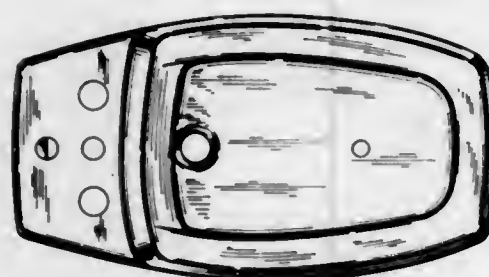
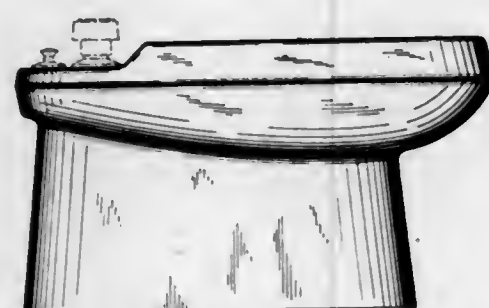
U.S. Cl. D22—27



226,910

**BIDET**  
Donald W. Doman, Janesville, Wis., assignor to  
Kohler Co., Kohler, Wis.  
Filed Dec. 16, 1971, Ser. No. 209,008  
Term of patent 14 years  
Int. Cl. D23—02

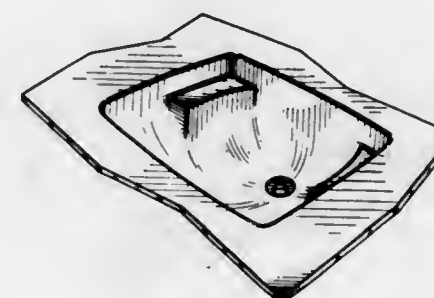
U.S. Cl. D23—51



226,911

**LAVATORY**  
Richard J. Ganger, Los Angeles, Calif., assignor to  
Gruber Systems, Inc., North Hollywood, Calif.  
Filed Nov. 11, 1971, Ser. No. 198,049  
Term of patent 14 years  
Int. Cl. D23—02

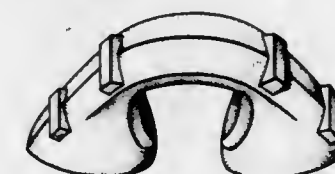
U.S. Cl. D23—58



226,912

**TOILET SEAT**  
Matthias Scherer, Trierer Strasse 40,  
Weiskirchen, Saar, Germany  
Filed July 6, 1971, Ser. No. 160,247  
Claims priority, application Germany Jan. 6, 1971  
Term of patent 14 years  
Int. Cl. D23—02

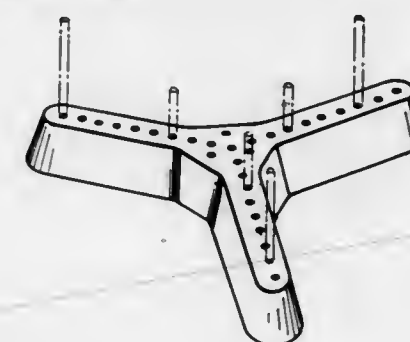
U.S. Cl. D23—71



226,913

**CERAMIC STILT FOR KILNS**  
Louis San Antonio, 96 Commodore St.,  
Providence, R.I. 02904  
Filed July 12, 1971, Ser. No. 161,399  
Term of patent 14 years  
Int. Cl. D23—99; D26—01

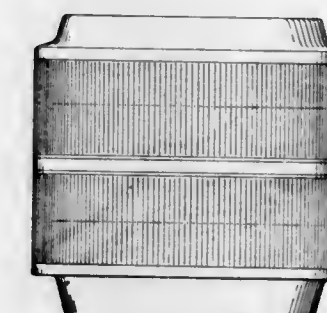
U.S. Cl. D23—82



226,914

**CASING FOR REFRIGERATION SYSTEM  
CONDENSING UNITS OR THE LIKE**  
Walter W. Hoyle, Fayetteville, N.Y., assignor to  
Carrier Corporation, Syracuse, N.Y.  
Filed Aug. 2, 1971, Ser. No. 168,517  
Term of patent 14 years  
Int. Cl. D23—04

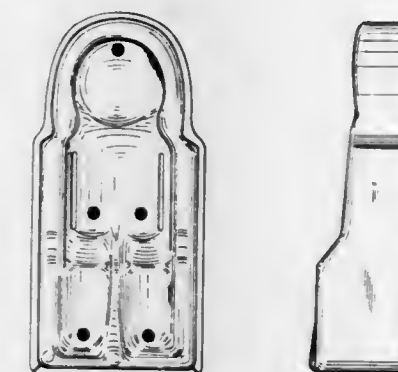
U.S. Cl. D23—139



226,915

**ORTHODONTIC CRADLEBOARD**  
Hal A. Huggins, 100 E. Cheyenne Road,  
Colorado Springs, Colo. 80906  
Filed July 6, 1971, Ser. No. 160,248  
Term of patent 14 years  
Int. Cl. D24—01; D6—01

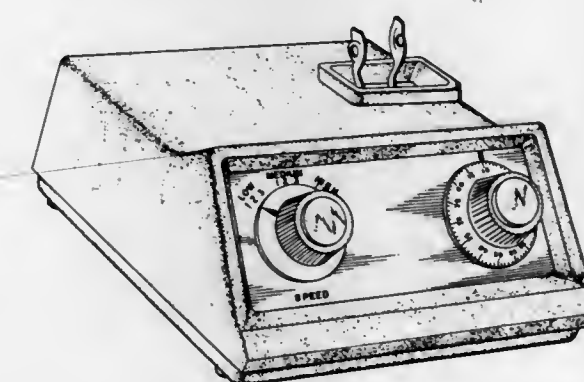
U.S. Cl. D24—1 B



226,916

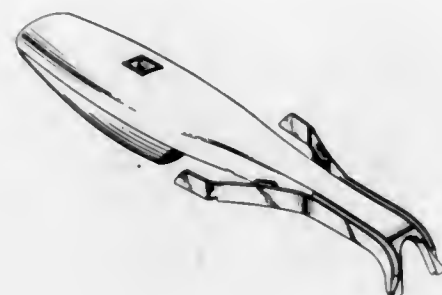
**DENTAL MATERIAL MIXER**  
Ronald C. Webb and Kenneth B. Wikel, York, Pa., as-  
signors to Dentsply Research & Development Corp.,  
Wilmington, Del.  
Filed July 14, 1971, Ser. No. 162,761  
Term of patent 14 years  
Int. Cl. D24—01

U.S. Cl. D24—1 A





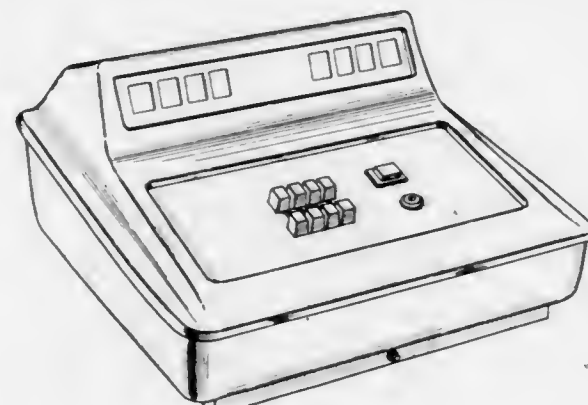
**226,917**  
**COMBINED DENTAL FLOSS HOLDER**  
**AND APPLICATOR**  
 Talmadge E. Foster, 6618 Belmead, Dallas, Tex. 75230  
 Filed Mar. 16, 1972, Ser. No. 235,468  
 Term of patent 14 years  
 Int. Cl. D24—99  
 U.S. Cl. D24—1 D



**226,918**  
**MOMENTUM TRANSFER DEMONSTRATION**  
**DEVICE**  
 Jerar Andon, 98 Loma Media Road,  
 Santa Barbara, Calif. 93103  
 Filed Oct. 4, 1971, Ser. No. 186,565  
 Term of patent 14 years  
 Int. Cl. D19—07  
 U.S. Cl. D25—1 R



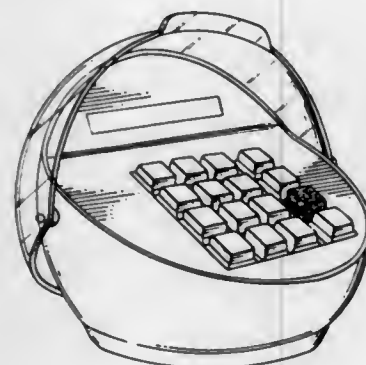
**226,919**  
**CONSOLE UNIT**  
 Robert T. Day, Jr., Greensboro, N.C., and David D.  
 Tompkins, Worthington, Ohio, assignors to Gilbert &  
 Barker Manufacturing Company, New York, N.Y.  
 Filed Sept. 21, 1971, Ser. No. 182,576  
 Term of patent 14 years  
 Int. Cl. D14—02  
 U.S. Cl. D26—5 C



**226,920**  
**DATA PROCESSING CONTROL UNIT**  
 Thomas A. Molyneaux, Waterford Township, Oakland  
 County, Mich., assignor to Emerson Electric Co., St.  
 Louis, Mo.  
 Filed Sept. 30, 1971, Ser. No. 185,044  
 Term of patent 14 years  
 Int. Cl. D14—02  
 U.S. Cl. D26—5 C



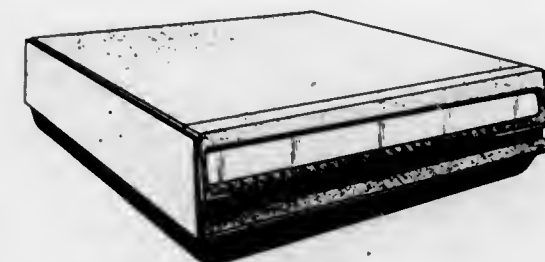
**226,921**  
**CALCULATOR**  
 George W. Cone, La Jolla, and Donald C. Stephan, San  
 Diego, Calif., assignors to Garrett Comtronics Corpo-  
 ration, San Diego, Calif.  
 Filed June 5, 1972, Ser. No. 260,060  
 Term of patent 14 years  
 Int. Cl. D14—02  
 U.S. Cl. D26—5 C



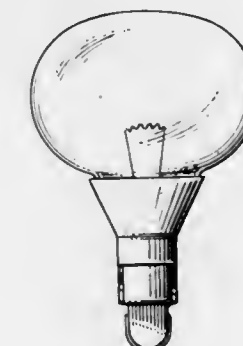
**226,922**  
**CALCULATOR CASING**  
 Fred M. Gore, Dallas, Tex., assignor to Texas  
 Instruments Incorporated, Dallas, Tex.  
 Filed June 9, 1972, Ser. No. 261,572  
 Term of patent 14 years  
 Int. Cl. D14—02  
 U.S. Cl. D26—5 C



**226,923**  
**DIGITAL COMPUTER**  
 John W. Carroll, Pepperell, Mass., assignor to Digital  
 Equipment Corporation, Maynard, Mass.  
 Filed June 19, 1972, Ser. No. 264,136  
 Term of patent 14 years  
 Int. Cl. D14—02  
 U.S. Cl. D26—5 C



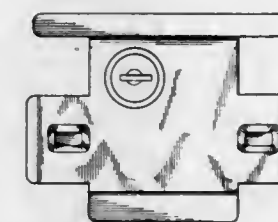
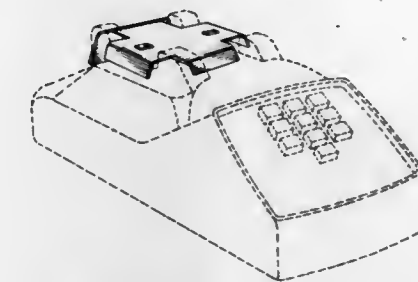
**226,924**  
**COMBINED BULB AND HUSK-ADAPTER UNIT**  
**FOR DECORATIVE LIGHTS**  
 Terry Hermanson, New York, N.Y., assignor to  
 Mr. Christmas, Incorporated, New York, N.Y.  
 Filed Dec. 2, 1971, Ser. No. 204,394  
 Term of patent 14 years  
 Int. Cl. D26—04  
 U.S. Cl. D26—8



**226,925**  
**INDICATOR LAMP**  
 Robert G. Morgan, Antrim, N.H., assignor to  
 GTE Sylvania Incorporated  
 Filed Dec. 9, 1971, Ser. No. 206,584  
 Term of patent 14 years  
 Int. Cl. D26—04  
 U.S. Cl. D26—8



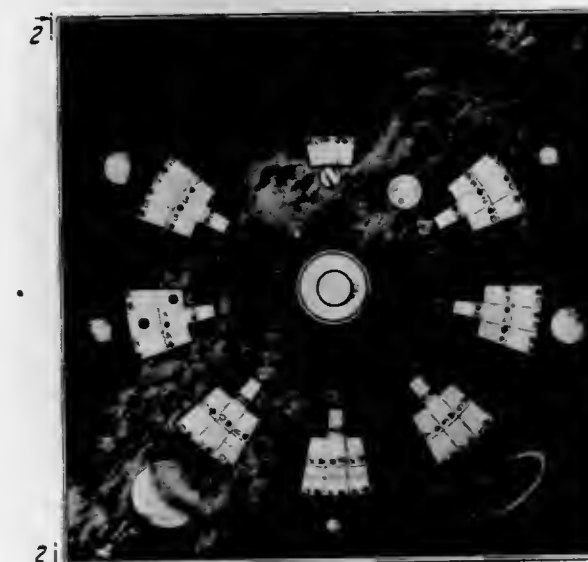
**226,926**  
**TELEPHONE SECURITY LOCK**  
 Edwin C. Glass, Northbrook, Ill., assignor to  
 Gregory Enterprises, Inc., Chicago, Ill.  
 Filed May 22, 1972, Ser. No. 255,961  
 Term of patent 14 years  
 Int. Cl. D14—03; D8—07  
 U.S. Cl. D26—14 A



**226,927**  
**GOLF TEE AND TETHERED WEIGHT**  
 Edward G. Roe, 19 Orchard St.,  
 Pleasantville, N.Y. 10570  
 Filed June 24, 1971, Ser. No. 156,580  
 Term of patent 14 years  
 Int. Cl. D21—02  
 U.S. Cl. D34—5 GT



**226,928**  
**GAME BOARD**  
 Elaine G. Vigan, 1932 Weepah Way,  
 Hollywood, Calif. 95234  
 Filed July 19, 1971, Ser. No. 164,189  
 Term of patent 14 years  
 Int. Cl. D21—01  
 U.S. Cl. D34—5 SS



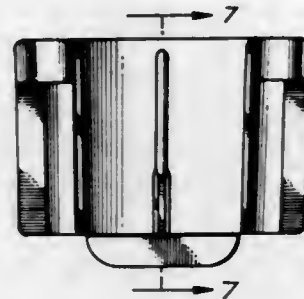


226,929

**GOLF BALL HOLDER**

William G. Kinard, Pasadena, Calif., assignor to Relton Corporation, Arcadia, Calif.  
 Filed Sept. 20, 1971, Ser. No. 182,278  
 Term of patent 14 years  
 Int. Cl. D21-02

U.S. Cl. D34-5 CB

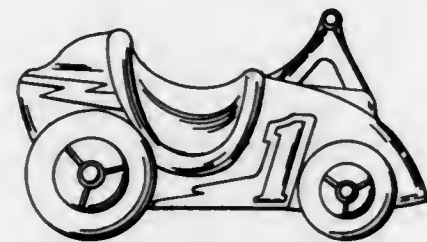


226,930

**RACE CAR SHAPED SEAT FOR PLAYGROUND APPARATUS**

Robert S. Wormser, Hillsdale, Mich., assignor to Game Time, Inc., Litchfield, Mich.  
 Filed Nov. 1, 1971, Ser. No. 194,799  
 Term of patent 14 years  
 Int. Cl. D21-03

U.S. Cl. D34-5 L

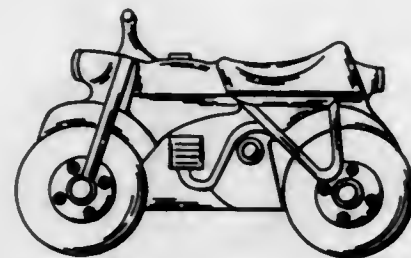


226,931

**MINI-BIKE SHAPED SEAT FOR PLAYGROUND APPARATUS**

Robert S. Wormser, Hillsdale, Mich., assignor to Game Time, Inc., Litchfield, Mich.  
 Filed Nov. 1, 1971, Ser. No. 194,800  
 Term of patent 14 years  
 Int. Cl. D21-03

U.S. Cl. D34-5 L



226,932

**THREE-DIMENSIONAL GAME BOARD**

Thomas D. Ledgerwood, 823 Mockingbird Lane, Norman, Okla. 73069  
 Filed Dec. 1, 1971, Ser. No. 203,933  
 Term of patent 14 years  
 Int. Cl. D21-01

U.S. Cl. D34-5 SS

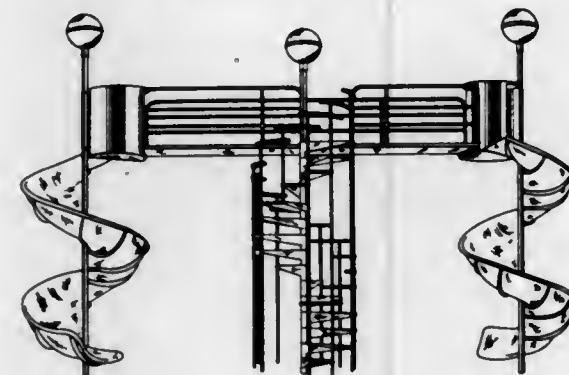


226,933

**PLAYGROUND SLIDE WITH DOUBLE SPIRAL SLIDES**

Robert S. Wormser and Ronald L. Ewers, Hillsdale, Mich., assignors to Game Time, Inc., Litchfield, Mich.  
 Filed Dec. 20, 1971, Ser. No. 210,299  
 Term of patent 14 years  
 Int. Cl. D21-03

U.S. Cl. D34-5 E

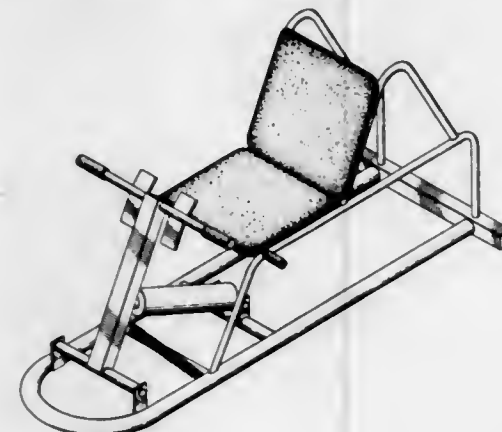


226,934

**EXERCISER**

Cliff J. Coker, 24641 La Hermosa, Laguna Niguel, Calif. 92677, and Edward A. Burke, 1806 Port Westborne, Newport Beach, Calif. 92660  
 Filed Mar. 9, 1972, Ser. No. 233,392  
 Term of patent 14 years  
 Int. Cl. D21-02

U.S. Cl. D34-5 K

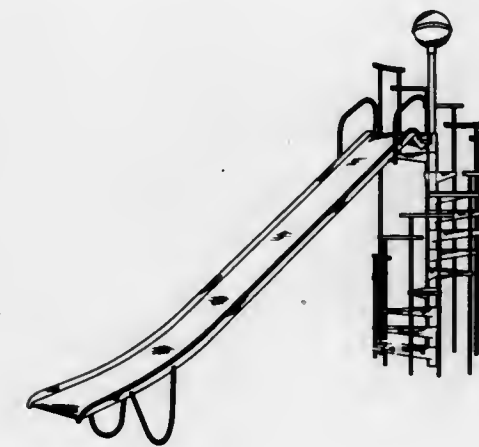


226,935

**PLAYGROUND SLIDE WITH CIRCULAR STAIRCASE**

Robert S. Wormser and Ronald L. Ewers, Hillsdale, Mich., assignors to Game Time, Inc., Litchfield, Mich.  
 Filed Dec. 20, 1971, Ser. No. 210,300  
 Term of patent 14 years  
 Int. Cl. D21-03

U.S. Cl. D34-5 E

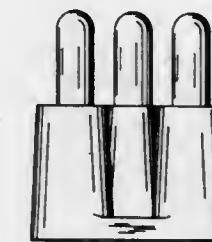


226,936

**BUILDING BLOCK**

Salvatore C. Parrilla, 811 Literary Road, Cleveland, Ohio 44113  
 Filed Aug. 20, 1971, Ser. No. 173,723  
 Term of patent 14 years  
 Int. Cl. D21-01

U.S. Cl. D34-15 GG



226,937

**SLALOM TOBOGGAN**

William B. Heniges, 6219 SE. 72nd Ave., Portland, Oreg. 97206  
 Filed Jan. 17, 1972, Ser. No. 218,642  
 Term of patent 14 years  
 Int. Cl. D21-02

U.S. Cl. D34-15 AK

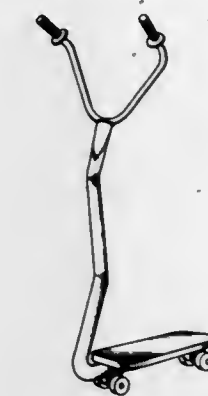


226,938

**SCOOTER**

Donald Dean Levens, 14 McAfee Court, and Samuel Grimaldo, 776 W. San Doval, both of Thousand Oaks, Calif. 91360  
 Filed Feb. 7, 1972, Ser. No. 224,378  
 Term of patent 14 years  
 Int. Cl. D21-01

U.S. Cl. D34-15 AT

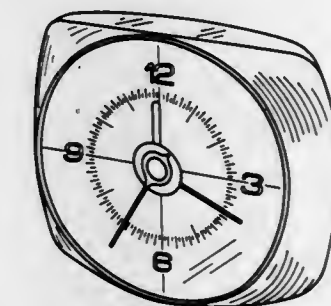


226,939

**WALL CLOCK**

Petrus Joannes Stut, Eelde, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.  
 Filed July 23, 1971, Ser. No. 165,432  
 Claims priority, application Netherlands Jan. 28, 1971  
 Term of patent 14 years  
 Int. Cl. D10-01

U.S. Cl. D42-7

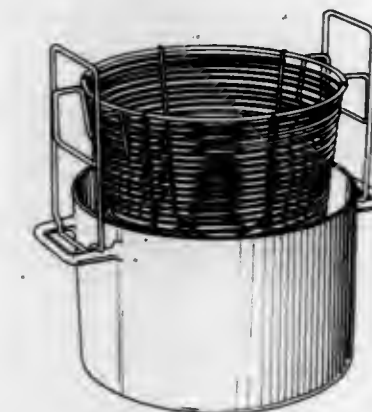


226,940

**DEEP FRIER**

Michael Lax, New York, N.Y., assignor to Copco, Inc., New York, N.Y.  
 Filed July 2, 1971, Ser. No. 159,582  
 Term of patent 14 years  
 Int. Cl. D7-02

U.S. Cl. D44-1 F





# LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF MAY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Adams, Lloyd M., to Geotel, Inc. Film drive, and cinematographic apparatus incorporating the same. 3,733,120, Cl. 352-187.000.
- Adams, Phillip: See—  
Merianos, John J.; Shay, Edward Griffin; Adams, Phillip; and Petrocci, Alfonso N., 3,733,421.
- Adee, Raymond A.; Brooks, Dean P.; and Anderson, John Dale, to Heaston Corporation. Stack forming loader. 3,732,672, Cl. 56-13.300.
- Aerospace Corporation, The: See—  
Whittaker, Arthur G., 3,733,394.
- Afendras, Demetrios G.: See—  
McGhay, Maynard H.; and Afendras, Demetrios G., 3,733,608.
- Affa, Stephen N.: See—  
Yorke, Roy E.; and Affa, Stephen N., 3,733,092.
- AGA Aktiebolag: See—  
Bostrom, Bertil I., 3,732,621.
- Agfa-Gevaert N.V.: See—  
Van Paesschen, August Jean; and Van Gossum, Lucien Janbaptist, 3,733,215.
- Ahlvers, Dieter, to Kabel- und Metallwerke Gutehoffnungshutte. Apparatus for the production of helically corrugated metal tubing. 3,732,717, Cl. 72-77.000.
- Air Products & Chemicals, Inc.: See—  
Spector, Marshall L.; Jones, Robert D.; and McDowell, Curtis S., 3,733,264.
- Aitken, Roxburgh Richmond, to Imperial Chemical Industries Limited. Process for the manufacture of polyurethane spinning and coating solutions. 3,733,310, Cl. 260-77.5a.
- Akiyama, Hisao; Tobiki, Hisao; Mitani, Toru; Miura, Yasuharu; and Suzuki, Hiroyuki, to Sumitomo Chemical Company, Ltd. Preparation of D-threo-1-p-methylsulfonylphenyl-2 dichloroacetamidopropane-1,3-diol. 3,733,352, Cl. 260-470.000.
- Akiyama, Shunichi: See—  
Suzuki, Takashi; Sumino, Yasuhiro; Akiyama, Shunichi; and Fukuda, Hideo, 3,733,253.
- Aktiebolaget Svenska Flaktfabriken: See—  
Bockman, Ole Kristian, 3,733,061.
- Albany International Industries, Inc.: See—  
Fritz, Rene; and Fritz, Rene E., 3,732,765.
- Albert, Martin. Keyhole cover lock. 3,732,711, Cl. 70-425.000.
- Allam, James N.; and Bense, William M., to Leeson Corporation. Winding apparatus. 3,733,034, Cl. 242-18.00r.
- Allamatic Corporation: See—  
Ottavan, Gerald, 3,732,770.
- Allander, Claes G. Gastaf; and Bengtsson, Lars E., to AB Gutavsborgs Fabriker, mesne. Vacuum water-closet. 3,732,579, Cl. 4-41.000.
- Allen, David Thomas; and Apple, David Linley, to Deere & Company. Electric drive riding mower. 3,732,671, Cl. 56-10.200.
- Allen, Fred W., Jr.; Kopf, Rowland J.; and Thompson, Royal W., said Allen and said Thompson assors. to said Kopf, Rowland J. Method and apparatus for testing compressive strength of concrete and the like. 3,732,725, Cl. 73-81.00.
- Allen, Herbert. Valve and method of assembling same. 3,732,885, Cl. 137-315.000.
- Allen, Jack R.: See—  
Ridge, Charles K.; and Allen, Jack R., 3,733,450.
- Allen, Walter E., to Paul, Peter, Electronics. Compensating plunger for solenoid valve and method of making. 3,733,047, Cl. 251-141.000.
- Allergan Pharmaceuticals: See—  
Eriksen, Stuart P., 3,733,178.
- Allied Chemical Corporation: See—  
Steen, Donald M., 3,733,203.
- Stephenson, Robert L., 3,733,088.
- Allis, Louis, Company, The: See—  
Rettig, Charles E., 3,733,543.
- Allis-Chalmers Corporation: See—  
Davis, Owen R.; Haupt, Robert C.; Hansen, Kenneth N.; and Slosirek, Michael L., 3,732,941.
- Allis-Chalmers Manufacturing Company: See—  
Hansen, Kenneth N., 3,733,103.
- Allison, William D., to Ford Motor Company. Independent suspension system for a motor vehicle. 3,733,087, Cl. 280-96.20r.
- Allmanna Svenska Elektriska Aktiebolaget: See—  
Schei, Asle, 3,733,520.
- Van Santen, Aart; and Elofsson, Kjell, 3,733,250.
- Alperin, George; and Vaniotis, Socrates, to Clairol Incorporated. Hair dye blend of a yellow component and red components and/or blue components. 3,733,175, Cl. 8-10.100.
- Alps Electric Co., Ltd.: See—  
Yanagisawa, Noboru; and Murata, Taneo, 3,733,569.
- Aluminium Suisse S.A.: See—  
Rouzier, Philippe; and Pelissier, Maurice, 3,733,009.
- Aluminum Company of America: See—  
La Barge, Robert L., 3,732,659.
- Alwitt, Robert S., to Sprague Electric Company. Formation process for producing dielectric aluminum oxide films. 3,733,291, Cl. 204-29.000.
- Alza Corporation: See—  
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- Amara Refrigeration, Inc.: See—  
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- Bourgeois, Joseph F., 3,732,806.
- Foerstner, Richard A.; and Mims, James R., 3,733,455.
- American Cyanamid Company: See—  
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- Firth, William Charles, Jr., 3,733,304.
- Padmanathan, Thuraiarah, 3,733,334.
- Shimoda, Keitaro; Sumi, Takehiko; and Mochida, Yoshiharu, 3,733,386.
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- Wright, William Blythe, Jr., 3,733,322.
- American Express Investment Management Company: See—  
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- American Home Products Corporation: See—  
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- American Plasticraft Company: See—  
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- American Velcro, Inc.: See—  
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- Ametek, Inc.: See—  
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- AMP Incorporated: See—  
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- Ampex Corporation: See—  
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- Anacher, Wilhelm; Grebe, Kurt R.; Greiner, James H.; Lahiri, Syamal K.; Park, Kyo C.; and Zapf, Hans H., to International Business Machines Corporation. Lead alloy Josephson junction devices. 3,733,526, Cl. 317-234.00r.
- Andersen, Raymond E. Animal holder. 3,732,847, Cl. 119-103.000.
- Anderson, Brian, to Ilford Limited. Indazolone magenta couplers. 3,733,335, Cl. 260-310.00a.
- Anderson, Frank R., to Westates Space-Era Products, Inc. Ribbon-inking method. 3,733,211, Cl. 117-2.00r.
- Anderson, James E., to Jackson Vibrators, Inc. Railroad track working machine. 3,732,827, Cl. 104-7.00r.
- Anderson, John Dale: See—  
Adee, Raymond A.; Brooks, Dean P.; and Anderson, John Dale, 3,732,672.
- Anderson, Ralph, to Future Systems, Inc. Process for extracting silver from silver bearing materials. 3,733,256, Cl. 204-109.000.
- Anderson, Terry G.: See—  
Gaynor, Joseph; and Anderson, Terry G., 3,733,485.
- Anderson-Jacobson, Inc.: See—  
Keith, Craig L., 3,733,437.
- Angstadt, John W., to Blaw-Knox Food and Chemical Equipment, Inc. Method and apparatus for automatic cleaning of coffee roasters. 3,733,172, Cl. 432-41.000.
- Angus, William A.: See—  
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- Anlihem (Proprietary) Limited: See—  
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- Apotheloz, Robert, to Werkzeugmaschinenfabrik Oerliken-Buhrie AG. Impact fuze for a spin stabilized projectile. 3,732,825, Cl. 102-80.000.
- Appell, Herbert R.; and Toash, John S., to United States of America, Interior. Conversion of municipal refuse, sewage sludge and other wastes to heavy oil or bitumen. 3,733,255, Cl. 201-25.000.
- Apple, David Linley: See—  
Allen, David Thomas; and Apple, David Linley, 3,732,671.
- Applequist, Roy A.; and Wilson, Laurence M. Split pawl positioning mechanism for a magnetic head. 3,733,592, Cl. 340-174.10c.
- Aqua-Mec, Inc.: See—  
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- Argus Chemical Corporation: See—  
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- Arima, Takeo, to Tokyo Hochiki Kabushiki Kaisha. Alarm circuit. 3,733,596, Cl. 340-237.00a.



Arimura, Ichiro; and Taniguchi, Hiroshi, to Matsushita Electric Industrial Co., Ltd. System for producing a continuous signal in synchronous phase with a reference signal. 3,733,432, Cl. 178-5.4cd.

Arle, Emil D.: See—  
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Armstrong Cork Company: See—  
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Armstrong, William H., to Montgomery Ward & Co. Catcher for rotary mower. 3,732,675, Cl. 56-202.000.

Arneson, Edwin L., to Federal Paper Board Company, Inc. Cup-shaped carton with gusseted seams. 3,733,023, Cl. 229-31.000.

Arnold, Dan McCay; and Pitts, Robert William, Jr., to Texaco Inc. Radiological well logging methods and apparatus for reducing the effect of activation from the detector crystal. 3,733,486, Cl. 250-71.50r.

Arnold, Richard B.; and Smith, Dallas F., to General Electric Company. Apparatus for developing winding coils. 3,732,897, Cl. 140-92.100.

Aro Corporation, The: See—  
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Aronson, Daniel, Jr.: See—  
Termohlen, David E.; and Irvine, William G., 3,732,655.

Arora, Harpal S., to Graf, Edward D. Method for stabilizing soils and abating active slides. 3,732,698, Cl. 61-36.00r.

Arthur, Jett C., Jr.; and Harris, James A., to United States of America, Agriculture. Radiation initiated process for the graft copolymerization of binary monomer mixtures and cellulose. 3,733,257, Cl. 204-159.120.

Asahi Kogyo Co., Ltd.: See—  
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Asai, Shojiro: See—  
Miyatake, Masatoshi; Takahashi, Susumu; Sato, Hitoshi; Nakashima, Hisao; Asai, Shojiro; and Ono, Yuichi, 3,733,527.

Aache, Henning, to Ciba-Geigy A.G. Elixirs with acid addition salts of therapeutically active organic bases as active substances. 3,733,410, Cl. 424-232.000.

Aaquith, Anthony, to Girling Limited. Brake adjusters. 3,732,952, Cl. 188-71.900.

Associated Electrical Industries Limited: See—  
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Avakian, Souren, to Centaur Chemical Co. Micropipette with disposable tips. 3,732,734, Cl. 73-425.600.

Avery, Robert T.: See—  
Faltens, Andris; Hartwig, Edward C.; and Avery, Robert T., 3,733,546.

Bach, Hartwig C., to Monsanto Company. Highly ordered azo-aromatic polyimides. 3,733,308, Cl. 260-65.000.

Badessa, Rosario S., to Damon Corporation. Transmittance signal processor for photometric apparatus. 3,733,137, Cl. 356-204.000.

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Hohwiler, Frieder; Koehling, Klaus; Schneider, Walter; and Lpemog, Dietrich, 3,732,791.

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Ballard, Donald R. Extendable boom apparatus. 3,732,743, Cl. 74-89.180.

Balli, Heinz; and Krueger, Ulf, to Ciba-Geigy AG. Diamino-xanthene (or thioxanthene)-spirodibenzopyranes. 3,733,337, Cl. 260-328.000.

Ballman, Gray C. Battery charger. 3,733,535, Cl. 320-40.000.

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Greiner, Harry M.; and Banfer, Hartwig, 3,732,815.

Banko, Anton, to Surgical Design Corporation. Apparatus for removing blood clots, cataracts and other objects from the eye. 3,732,858, Cl. 128-2.00b.

Barbero, Louis; and Cornacchio, Americo, to Kings Electronics Co., Inc. Cable crimping die tool. 3,732,718, Cl. 72-410.000.

Barker, James D. Transportable container for electric cords and connectors. 3,733,478, Cl. 240-2.00r.

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Barr, Charles Robert, to Eastman Kodak Company. Photographic compositions and elements comprising coupling compounds which on development release silver halide-complexing materials and dyes. 3,733,201, Cl. 96-100.000.

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Barrier, Miller M., to Schlumberger Technology Corporation. Wire guide for a cabling machine. 3,732,680, Cl. 57-58.340.

Bartlett, Homer E., to Radiation Incorporated. Shrouded offset parabolic reflector antenna. 3,733,609, Cl. 343-782.000.

Basila, Michael R.; and Pate, Alfred R., Jr., to Howe-Baker Engineers, Inc. Aromatics extraction process. 3,733,262, Cl. 208-331.000.

Batzner, Hans: See—  
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Bauer, H. Fred: See—  
Pillipovich, Donald; Wilson, Richard D.; and Bauer, H. Fred, 3,733,392.

Bauer, James J., to Clark Equipment Company. Apparatus and method for mounting an attachment on a vehicle. 3,732,996, Cl. 214-152.000.

Baule, Gerhard M.: See—  
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Bausch & Lomb Incorporated: See—  
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Bayer Aktiengesellschaft: See—  
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Bayer, Carl, Jr.; and Kelley, Robert, to Data Peripheral Inc. Perforated tape reader. 3,733,467, Cl. 235-61.11c.

Beach, David E., to Eastman Kodak Company. Camera body release lever mechanism. 3,732,794, Cl. 95-11.00l.

Becavin, Henri, to Thomson-CSF. Rectilinear polarization antennas. 3,733,611, Cl. 343-792.000.

Bech, Mogens. Device comprising a number of rotatable shelves. 3,732,829, Cl. 108-95.000.

Becher, Heinz-Manfred; and Sehring, Richard, to Boehringer Ingelheim G.m.b.H. Acaricidal compositions containing an O-(2-alkyl-4,6-dinitro-phenyl)-O'-( $\alpha$ -carbalkoxy-alkyl)-carbonate. 3,733,415, Cl. 424-301.000.

Beck, Henry Nelson: See—  
Vrieland, G. Edwin; and Beck, Henry Nelson, 3,733,327.

Becker, Joseph Gerald; Mitchell, Robert Lee; and Pierson, William Grant, to Colgate-Palmolive Company. Oral compositions containing an enzyme. 3,733,399, Cl. 424-50.000.

Becken, Basil B., to Pitney-Bowes, Inc. Acoustical sensing curtain. 3,733,580, Cl. 340-1.00r.

Begun, Cary A., to Diamond Shamrock Corporation. Removal of solder flux with azeotropic solvent mixtures. 3,733,218, Cl. 134-38.000.

Behner, Otto; and Puls, Walter, to Bayer Aktiengesellschaft. Substituted 1-amino 4,9-dihydro-3H-pyrido (3,4-B) indoles and process for their preparation. 3,733,333, Cl. 260-296.00a.

Behr, Erich: See—  
Wolfe, Wolfgang; and Behr, Erich, 3,733,306.

Beig, Willi; Kuhnle, Willi; and Seibold, Herbert, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Digital shift control for vehicular transmission. 3,732,755, Cl. 74-866.000.

Belcher, Donald K.: See—  
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Bell & Howell Company: See—  
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Bell, James E.: See—  
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Benedict, Elmer M. Condition responsive switching circuit. 3,733,595, Cl. 340-237.00r.

Bengtsson, Lars E.: See—  
Allander, Claes G. Gastaf; and Bengtsson, Lars E., 3,732,579.

Bennett, James G.: See—  
Cooper, Glenn D.; and Bennett, James G., 3,733,299.

Bense, William M.: See—  
Allam, James N.; and Bense, William M., 3,733,034.

Benton, Charles Michael; and Niehaus, Howard E., to National Southwire Aluminum Company. Muffler for aluminum cell tapping crucible. 3,732,948, Cl. 181-36.00r.

Berchold, Ludwig, to Marker, Hannes. Setting means for use with safety ski bindings. 3,733,083, Cl. 280-11.35r.

Berde, Botond, to Sandoz Ltd., a/k/a Sandoz AG. Hydrogenated ergot alkaloid compositions and methods of using same. 3,733,423, Cl. 424-253.000.

Berg, Albert T., Jr.; and Langlie, Howard. Fence insulator with eccentric post-attaching means. 3,733,429, Cl. 174-161.00f.

Berk, Sigmund, to United States of America, Army. Radiation timing device. 3,733,489, Cl. 250-83.30r.

Berman, Baruch; Gelb, George Howard; Richardson, Neal Allen; and Wang, Tai C., to TRW Inc. Power train using multiple power sources. 3,732,751, Cl. 74-675.000.

Bernstein, Jack: See—  
Hoehn, Hans; and Bernstein, Jack, 3,733,328.

Berry, Walter C., Jr., to Du Pont de Nemours, E. I., and Company. Apparatus for joining filaments to a tow. 3,732,678, Cl. 57-22.000.

Bessett, Clifford H.; and Misdorn, Theodore H., to Packaging Corporation of America. Package for fragile articles. 3,732,976, Cl. 206-65.00r.

Bettermann, Peter; Reuschel, Heinz; and Wolf, Manfred, to Rheinmetall G.m.b.H. Device on weapon barrels for reduction of the angle jump of a projectile. 3,732,778, Cl. 89-19.00r.

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McCain, William B.; Cosgrove, James F.; and Bewersdorf, Elmer D., 3,732,766.

Bhatty, Saleem Sabir: See—  
Clark, Michale Gordon; and Bhatty, Saleem Sabir, 3,733,427.

Biale, Giovanni, to Union Oil Company of California. Vapor phase carbonylation. 3,733,362, Cl. 260-604.0hf.

Binns, Julian R. H.; and Grange, Kenneth H. Coat hook assembly. 3,733,043, Cl. 248-225.000.

Bio-Rad Laboratories: See—  
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Biome Company Inc., The: See—  
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Bischoff Chemical Corporation: See—  
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Bishop, Dolloff F.; Cassel, Alan F.; and Pressley, Thomas A., to United States of America, Environment Protection Agency. Waste water purification by breakpoint chlorination and carbon adsorption. 3,733,266, Cl. 210-26.000.

Bisson, Flavio, to Olivetti, Ing. C., & C., S.p.A. Tape cassettes. 3,733,019, Cl. 226-119.000.

Bjork, Lars; Erikson, Uno Eugen; Granath, Kirsti Annikki; Ingelman, Bjorn Gustav-Adolf; and Lindberg, Bernt Jabes, to Pharmacia AB. Method for the X-ray visualization of body cavities and a preparation for carrying out the method. 3,733,397, Cl. 424-5.000.

Blackburn, Louis W., to Amana Refrigeration, Inc. Microwave oven door latch. 3,733,456, Cl. 219-10.550.

Blackwell, Elliott H., to Warren Pumps, Inc. Rotary pump. 3,733,152, Cl. 418-201.000.

Blankemeyer, James C.; and Blankemeyer, Robert L. Variable tensioning stake. 3,732,878, Cl. 135-15.0pe.

Blankemeyer, Robert L.: See—  
Blankemeyer, James C.; and Blankemeyer, Robert L., 3,732,878.

Blankma, Lew: See—  
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Blaw-Knox Food and Chemical Equipment, Inc.: See—  
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Blossom, Frank M.; and Silberbauer, John, to Donnelley, Reuben H., Corporation, The. Collating and inserting machine control system. 3,732,664, Cl. 53-57.000.

Blume, Erich: See—  
Naumann, Gerhard; Marx, Gerhard; and Blume, Erich, 3,733,128.

Blumenthal, Jack L.; and Guth, Eugene D., to TRW Inc. Method for the catalytic decomposition of monopropellant hydrazine. 3,732,694, Cl. 60-218.000.

Bobrow, Edwin N.; and Murdock, Lawrence A., to TRW Inc. Anti-jamming apparatus. 3,733,607, Cl. 343-100.0pe.

Bockman, Ole Kristian, to Aktiebolaget Svenska Flaktfabriken. Gas-liquid contact apparatus. 3,733,061, Cl. 261-21.000.

Boehringer Ingelheim G.m.b.H.: See—  
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Boeing Company, The: See—  
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Boivin, Joseph J. R.: See—  
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Bolin, Nils Johan Mauritz. Boiler. 3,732,848, Cl. 122-14.000.

Bolkow Gesellschaft mit beschränkter Haftung: See—  
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Bolling, Robert W., Jr.; McCall, Frank S.; and Rawl, Henry J., to Union Camp Corporation. Container. 3,733,024, Cl. 229-55.000.

Bombardi, Aldo L. Automatic page turner. 3,732,773, Cl. 84-491.000.

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Bopst, John H., III. Rotary movement distance measurement device. 3,732,623, Cl. 33-141.00r.

Bor, Maria, nee Szabo: See—  
Tuba, Zoltan; and Bor, Maria, nee Szabo, 3,733,329.

Boesch, Robert, G.m.b.H.: See—  
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Ziesche, Kurt; Hans, Waldemar; Duffner, Josef; Brune, Gerhard; and Grob, Alfred, 3,732,893.

Bostrom, Bertil I., to AGA Aktiebolag. Permanently implantable fixture means for prosthesis and the like. 3,732,621, Cl. 32-10.00a.

Botsolas, Chris J. Pipefitting cover. 3,732,894, Cl. 138-178.000.

Bouchard, Kenneth G.; and Teich, Wesley W., to Raytheon Company. Heating element for flush top ranges. 3,733,462, Cl. 219-464.000.

Bourgeois, Joseph F., to Amana Refrigeration, Inc. Ram head for trash compactor. 3,732,806, Cl. 100-29.00a.

Boutell, Henry E., to EMF, Inc. Method for making motor shells and the like. 3,732,614, Cl. 29-477.000.

Boyce, Alvie E.: See—  
Evers, John J.; Jones, Ralph E.; and Boyce, Alvie E., 3,732,980.

Boychem Corporation: See—  
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Boydell, Kenneth Raymond, to Dowty Technical Developments Limited. Fluid pressure apparatus. 3,732,785, Cl. 91-506.000.

Boyer, Albert E., to Western Electric Company, Incorporated. Bending apparatus for multiple wire-like articles. 3,732,898, Cl. 140-105.000.

BP Chemicals Limited: See—  
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Brachich, Louis A., to Nu-Air Humidifier Corporation. Humidifier. 3,733,062, Cl. 261-92.000.

Brady, Clifford H. Inertia type switch with adjustable selective seating surface for movable contact. 3,733,448, Cl. 200-61.45r.

Braga, Albert T.; Grall, Kenneth J.; and Marcade, Roque D., to Whirlpool Corporation. Dishwasher silverware basket with soaker means. 3,732,876, Cl. 134-58.00d.

Brandenburg, Karl A., to Aro Corporation, The. Fluid-driven tool with built-in work control mechanism. 3,732,934, Cl. 173-12.000.

Branton, Eric Swdney, to Activated Sludge Limited. Means for diffusing gases into liquids. 3,733,064, Cl. 261-122.000.

Braun A.G.: See—  
Buxmann, Heinrich-Julius, 3,732,803.

Bray, Charles W. Dual sight attachment for a gun. 3,732,642, Cl. 42-1.00a.

Breimayer, Joseph F., to Eastman Kodak Company. Print inspection and reprint apparatus. 3,733,018, Cl. 226-2.000.

Bremner, David F., to National Cash Register Company, The. Differentially positionable type wheels in remotely controlled print modules. 3,732,812, Cl. 101-99.000.

Bride, John Edwin, to Du Pont de Nemours, E. I., and Company. Werner chromium complexes and method for their preparation. 3,733,346, Cl. 260-438.50c.

Bride, John Edwin, to Du Pont de Nemours, E. I., and Company. Werner chromium complexes and methods for their preparation. 3,733,347, Cl. 260-438.50c.

Bridges, William B., to Hughes Aircraft Company. Laser distance detector. 3,733,129, Cl. 356-5.000.

Briggs, Peter James; and Hurlock, Ronald James, to Imperial Chemical Industries Limited. Nickel complexes from aromatic oximes containing phenolic groups. 3,733,348, Cl. 260-439.

Bronstein, Harry. Circumcision method and probe. 3,732,869, Cl. 128-304.000.

Brookhyser, Byron B.; and Erickson, Harold E., to Weyerhaeuser Company. Stitching unitizer. 3,732,833, Cl. 112-203.000.

Brooks, Dean P.: See—  
Adee, Raymond A.; Brooks, Dean P.; and Anderson, John Dale, 3,732,672.

Brotton, James: See—  
Catford, John Russell; and Brotton, James, 3,732,739.

Broughton, Douglas J., to Buxton, Incorporated. Integral key plate for key cases. 3,732,713, Cl. 70-456.00b.

Brown, Alfred; Carlin, Joseph T.; Fontaine, Marc F.; and Haynes, Stewart, Jr., to Texaco Inc. Method for recovery of hydrocarbons utilizing steam injection. 3,732,926, Cl. 166-272.000.

Brown, D. S., Company, The: See—  
Brown, Delmont D., 3,732,788.

Brown, Delmont D., to Brown, D. S., Company, The. Pavement joint seals. 3,732,788, Cl. 404-64.000.

Browncombe, Philip J., to Dietzen, Eugene, Co. Step-by-step drive useful in microfiche cameras. 3,733,126, Cl. 355-54.000.

Brune, Gerhard: See—  
Ziesche, Kurt; Hans, Waldemar; Duffner, Josef; Brune, Gerhard; and Grob, Alfred, 3,732,893.

Bryant, Jack R.: See—  
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Bubula, Thomas J., to Caterpillar Tractor Company. Fluidic motion limiting system for motor driven apparatus. 3,732,892, Cl. 137-609.000.

Buchman, Carl S.: See—  
Gwilliam, Willard E.; Buchman, Carl S.; and Hall, Robert, 3,732,650.

Buckman Laboratories, Inc.: See—  
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Buckman, Stanley J.; Flanagan, Kenneth J.; Pera, John D.; and Wienert, Lester A., to Buckman Laboratories, Inc. Organic esters and their use as ultraviolet light absorbers and as heat stabilizers. 3,733,297, Cl. 106-178.000.



- Budlane, Stanley J.; and Stoll, Donald H., to General Electric Company. Switch control. 3,733,571, Cl. 337-89.000.
- Bunker-Ramo Corporation, The: See—  
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- Gutman, Arnold D., to Stauffer Chemical Company. Controlling fungi and bacteria with certain oxime esters. 3,733,419, Cl. 424-327.000.
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- Haubein, Albert H., to Hercules Incorporated. Use of N- $\alpha$ -dialkoxyposphinothioacetyl-N-methylcarbamates of phenols as insecticides and acaricides. 3,733,406, Cl. 424-211.000.
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- Johnson, Albert Henry, to United Kingdom of Great Britain and Northern Ireland, Minister of Aviation Supply in her Britannic Majesty's Government of the. Coaxial cavity resonator with separate controls for frequency tuning and for temperature coefficient f resonant frequency adjustment. 3,733,567, Cl. 333-82.00b.
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- Kakei, Takehiko: See—  
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- Kalmus, Henry P. Acoustic doppler wave recognition. 3,733,581, Cl. 340-1.00r.
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- Kavanagh, Arthur. Fishing rod. 3,732,644, Cl. 43-22.000.
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- Marciniak, John C.; and Burkey, William D., to Diebold, Incorporated. Modular concrete vault structure. 3,732,831, Cl. 109-83.000.
- Marcy, Raymond, to Thomson-CSF. Line tracing systems using laser energy for exposing photo-sensitive substrates. 3,732,796, Cl. 95-12.000.
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- Margolis, Bern; and Saunders, Irving B., to Ply & Gem Industries, Inc. Sliding panel display. 3,732,633, Cl. 35-55.000.
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- Marker, Hannes. Skiing boot. 3,732,635, Cl. 36-2.5al.
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- Marmor, Ralph A., to Pillsbury Company, The. Deep fat frying process. 3,733,202, Cl. 99-1.000.
- Marple, Wendell P.: See—  
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- Marquardt, Delbert C. Book match dispenser. 3,733,112, Cl. 312-97.100.
- Marques, Javier Sensat. Single piece pouring spout and lid. 3,733,015, Cl. 222-570.000.
- Marr, Colin Andrew: See—  
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- Marschall, Karl. Process of treating and purifying sewage, particularly of sewage contaminated with detergents. 3,733,268, Cl. 210-27.000.
- Marsh, Milton M.; and Marsh, Robert A. Smoke dissipating ashtray lamp. 3,733,168, Cl. 431-253.000.
- Marsh, Robert A.: See—  
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- Marshall, Preston F., to Kendall Company, The. Fiber shattering process. 3,732,595, Cl. 19-300.
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- Martin-Marietta Corporation: See—  
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- Martinez, Robert: See—  
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- Marwil, Stanley J.; and Harrison, Roy C., to Phillips Petroleum Company. Purification of amorphous polyolefins. 3,733,314, Cl. 260-93.700.
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- Marx, Michael, to Syntex Corporation. 21-Orthoesters of cortical steroids and methods of preparing same. 3,733,318, Cl. 260-239.55d.
- Masaki, Kenji, to Nissan Motor Company, Limited. Vehicular air-pollution preventive. 3,732,696, Cl. 60-274.000.
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- Masrodonato, Alfred; Porter, Kurt; and Rhoads, Robert R., to Universal Electric Company, mesne. Method of making end frame structures for electric motors. 3,732,616, Cl. 29-596.000.
- Masuda, Hiromasa; Nomura, Yukio; Fuyuki, Toru; and Matsuzaka, Junichi, to Nippon Oils and Fats Company, Limited. Paint compositions capable of being cured by irradiation of electron ray. 3,733,287, Cl. 260-21.000.
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- Mathe, George L., to Morris, Philip, Incorporated. Extruding tow filled mouthpiece rod having serrated inner surfaces clenching the tow. 3,733,241, Cl. 161-116.000.
- Mathews, Arthur Cahlan. Anti-skid traction device. 3,732,910, Cl. 152-225.000.
- Matsushita Electric Industrial Co., Ltd.: See—  
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- Hata, Kotaro; and Fujii, Toshikazu, 3,732,951.
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- Mayer, Nathan. Bobbin runout signalling device. 3,732,834, Cl. 112-219.00r.
- Mayo, Henry C., to United States of America, Army. Explosively embedded anchor. 3,732,841, Cl. 114-206.00a.
- Maznikin, Nikolai Sergeevich: See—  
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- McCabe, Edward M., to Societe d'Assistance technique pour Produits Nestle S.A. Preparation of a soy protein fraction. 3,733,207, Cl. 99-17.000.
- McCaferly, Edward A., to Natmar, Inc. Heat sealable label carrying an indelible ink. 3,733,212, Cl. 117-14.000.
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- McCain, William B.; Cosgrove, James F.; and Bewersdorf, Elmer D., to McCain Manufacturing Corporation. Sheet trimming machines. 3,732,766, Cl. 83-104.000.
- McCall, Frank S.: See—  
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- McConnell, Richard L.; and Weemes, Doyle A., to Eastman Kodak Company. Poly-1-butene resins. 3,733,373, Cl. 260-897.00a.
- McCord, Robert S.; Nail, Donald H.; and Sheratte, Martin B., to McDonnell Douglas Corporation. Functional fluids having increased fire resistance. 3,733,276, Cl. 252-78.000.
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- McDonnell Douglas Corporation: See—  
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- McEwen, John C., to General Motors Corporation. Free wheel device. 3,732,957, Cl. 192-45.000.
- McGavie, John P., to General Motors Corporation. Electronic fuel injection system having speed enrichment. 3,732,852, Cl. 123-32.0ea.
- McGhay, Maynard H.; and Afendras, Demetrios G., to Motorola, Inc. Circuit for coupling radio receiver and radio transmitter to a common antenna for duplex operation. 3,733,608, Cl. 343-180.000.
- McGraw-Edison Company: See—  
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- McKee, Arthur G., & Company: See—  
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- McKnight, Edmund; and Tuttle, Michale Lee, to General Electric Company. Ultrasonic nozzle measuring system. 3,732,946, Cl. 181-5np.
- McLain, Charles D., to Olin Corporation. High frequency weld box. 3,733,453, Cl. 219-8.500.
- McLeod, Harold D. Quick load pressure pot. 3,733,032, Cl. 239-373.000.
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- Mechanical Service Co., Inc.: See—  
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- Meijer, Roelf Jan, to U.S. Philips Corporation. Device for converting calorific energy into mechanical energy. 3,732,690, Cl. 60-39.460.
- Meline, Robert S.; and Lee, Robert G., to Tennessee Valley Authority. Process for the production of ammonium polyphosphate. 3,733,191, Cl. 71-34.000.
- Menasco Manufacturing Company: See—  
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- Merck & Co., Inc.: See—  
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- Merianos, John J.; Shay, Edward Griffin; Adams, Phillip; and Petrocci, Alfonso N., to Millmaster Onyx Corporation. Microbiocidal nitrogen derivatives of halogenated biphenyls. 3,733,421, Cl. 424-330.000.
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- Merlo, David, to Post Office, The. Systems for detecting errors in a digital transmission channel. 3,733,585, Cl. 340-146.10d.
- Mero, Peter G. S., to Extel Corporation. Telegraph transceiver with retractable keyboard. 3,732,965, Cl. 197-186.00a.
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- Meshino, Joseph Albert; and Plampin, James Nelson, to McNeil Laboratories, Inc. 5-Chloro-2-ethylbenzyl methyl sulfoxide and its preparation. 3,733,364, Cl. 260-607.00a.
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- Mielbeck, Roger L.; and Scheuer, Nicholas G., to Josam Manufacturing Co. Close closet fitting and closet carrier with bowl connection. 3,732,582, Cl. 4-252.00r.
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- Miller, Allan. Door lock cylinder plate. 3,732,712, Cl. 70-452.000.
- Miller, Jack V.; and Monte, Ernest, to Sunbeam Lighting Co. Fluorescent luminaire with vertically oriented U-shaped lamp. 3,733,482, Cl. 240-51.120.
- Miller, John W., Jr., to United States of America, Navy. Spline wear measurement gage. 3,732,626, Cl. 33-179.50r.
- Miller, William E.; and Mecham, William J., to United States of America, Atomic Energy Commission. Method for detecting and monitoring a fuel element failure in a nuclear reactor. 3,733,249, Cl. 176-19.0ld.
- Milliken, Paul E.; and Bell, Larry L., to Goodyear Tire & Rubber Company, The. Hay conditioner roll. 3,732,670, Cl. 56-1.000.
- Millmaster Onyx Corporation: See—  
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- Wakeman, Reginald L.; Shay, Edward G.; and Petrocci, Alfonso N., 3,733,420.
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Moziek, John, to Monsanto Company. Apparatus for minimizing strand drop-off. 3,733,153, Cl. 425-71,000.

Muller, Ernest. Method and apparatus for producing high hydraulic pressure, particularly for operating a forging press. 3,732,691, Cl. 60-51,000.

Muller, Helmut, to Rheinmetall G.m.b.H., Firma. Hollow charge with an insert of progressive or degressive wall. 3,732,816, Cl. 102-24,000.

Muller, Jacques. Filling device for preventing overflow of liquid-containing tanks. 3,732,902, Cl. 141-198,000.

Mullins, John W. Copper tube service valve. 3,732,886, Cl. 137-318,000.

Munch, Otto R., to Johnson Service Company. Fluidic linear accelerometer. 3,732,883, Cl. 137-81,500.

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Murtin, Fernand R. C., to Societe Industrielle d'Electronique et d'Informatique. Injection-control system for internal-combustion engine. 3,732,854, Cl. 123-32,000.

Mushrush, George W. Adjustable electromagnetic vibrator. 3,733,500, Cl. 310-17,000.

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Nakanishi, Taro; and Kameo, Nobumitsu, to Nitsubishi Jukogyo Kabushiki Kaisha. Lift loader. 3,732,970, Cl. 198-154,000.

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- Parekh, Amritlal C.; and Jung, David H., to Research Corporation. Reagent for the solubilization of cholesterol. 3,733,279, Cl. 252-363.500.
- Parish, Roger C.; and Trei, John E., to Smith Kline & French Laboratories. Methods and compositions for improving feed efficiency of ruminants using polyhaloalkamines. 3,733,417, Cl. 424-322.000.
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- Petrovick, Mathew L., to United States of America, Health, Education, and Welfare. Fluidic heart sound synthesizing techniques and apparatus. 3,732,631, Cl. 35-17.000.
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- Pitts, Felix L.; and Spencer, John L., to United States of America, National Aeronautics and Space Administration. Electronic strain-level counter. 3,733,424, Cl. 73-88.50r.
- Pitts, Robert W. Packaging apparatus for packaging continuous production of a discrete product in predetermined quantities. 3,732,665, Cl. 53-62.000.
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- Plumb, Edwin W. Blanking die stripping system. 3,732,762, Cl. 83-98.000.
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- Pokhodnya, Igor Konstantinovich; Golovko, Vladimir Nikolaevich; and Suptel, Alexander Mikhailovich. Flux cored electrode. 3,733,458, Cl. 219-146.000.
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- Pollack, Herman G., 1/2 to Pollack, Elliot S. Diagnostic and interfacial pad for use with the socket of a prosthetic device. 3,732,578, Cl. 3-19.000.
- Polulyakh, Valentin Stepanovich; Khodkevich, Viktor Nikolaevich; Yakovenko, Viktor Grigorievich; and Kildishev, Vasily Semenovich. Device for detecting faults in rotary electric circuits of brushless exciters of synchronous machine. 3,733,518, Cl. 317-13.0r.
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- Poncy, George W. Sterile package for clinical thermometers and the like and method of making it. 3,732,975, Cl. 206-63.200.
- Porath-Furedi, Asher. Method and apparatus for measuring the degree of asymmetry of non-spherical particles. 3,733,136, Cl. 356-197.000.
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- Rainone, Nicholas J.; and De Caro, Aristide R., 3,733,508.
- Sandler, Yehuda L.; and Durigon, Docile D., 3,733,221.
- Savino, Henry C., 3,732,950.
- Smith, Harry B., 3,733,604.
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- Westlake, Donald; and Coles, Kenneth F., to Shell Oil Company. Porous media tunnel burner. 3,733,164, Cl. 431-328.000.
- Westvaco Corporation: See—  
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- White, William D.: See—  
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- Whitley, John A.: See—  
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- Whittaker, Arthur G., to Aerospace Corporation. The Process for making chaotite. 3,733,394, Cl. 423-460.000.
- Whitworth, Franka D., to Clark Equipment Company. Inboard strike-off blade actuating mechanism. 3,732,637, Cl. 37-124.000.
- Wieland, Howard N., to TRW Inc., meise. Stud welding tool construction. 3,733,457, Cl. 219-98.000.
- Wienert, Lester A.: See—  
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- Wilczek, Andrew S., to Varian Associates. Crossed-field microwave tubes having an improved control electrode geometry. 3,733,509, Cl. 315-3.600.
- Wildgruber, Otto: See—  
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- Wilkinson, Lester, to General Motors Corporation. Electronic fuel injection system having high speed compensation. 3,732,853, Cl. 123-32.0ea.
- Willems, Leonardus Franciscus; Neelen, Joseph Jacobus Marie; and Cardozo, Benjamin Lopes, to U.S. Philips Corporation. Device for the audible reproduction of a cardiogram with speech-like sounds. 3,732,868, Cl. 128-2.06g.
- Willette, Edward E.; and Mazur, Conrad F., to Standard Oil Company. Continuous process for making thermoformed articles of manufacture. 3,733,381, Cl. 264-47.000.
- Williamitis, Victor A., to General Motors Corporation. Self-cleaning cooking oven. 3,732,857, Cl. 126-19.00r.
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- Williams, Laurence Lyman; and Coscia, Anthony Thomas, to American Cyanamid Company. Polyamidepoly amine-epichlorohydrin wet strength resin. 3,733,290, Cl. 260-29.20n.
- Williamson, T. D., Inc.: See—  
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- Wilson, John T., to Westinghouse Electric Corporation. Electrical apparatus with ground fault detector and instantaneous trip circuit. 3,733,517, Cl. 317-18.00d.
- Wilson, Joseph R. Heat exchanger. 3,732,919, Cl. 165-110.000.
- Wilson, Laurence M.: See—  
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- Wilson, Raymond F.; Cole, Edward L.; and Peck, Reese A., to Texaco Inc. Treatment of heavy petroleum oils. 3,733,259, Cl. 208-86.000.
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- Wirtz, Rainer, to Bosch, Robert, G.m.b.H. Multi-phase thyristor inverter. 3,733,539, Cl. 321-45.00c.
- Wisdom, William H. Method for cleaning carpets and like materials. 3,733,176, Cl. 8-149.100.
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- Wolff, Bernhard B., to PPG Industries, Inc. Apparatus for making hermetically sealed glazing units. 3,733,237, Cl. 156-468.000.
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- Wydler, Robert; and Ruesch, Erhard, to Maag Gear Wheel & Machine Company Limited. Apparatus for producing variable ratio gearing. 3,732,780, Cl. 90-8.000.
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- Yeakey, Ernest Leon; and Keller, Clarence Edward, to Jefferson Chemical Company, Inc. Process for ortho-alkylation. 3,733,365, Cl. 260-624.00c.
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- Yorke, Roy E.; and Affa, Stephen N., to General Connectors Corporation. Conduit restraining and sealing connector. 3,733,092, Cl. 285-166.000.
- Yoshikawa, Minoru: See—  
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- Yoshimoto, Hiromu, to Daido Steel Co., Ltd. Covered type heat treatment combustion furnace. 3,733,174, Cl. 432-199.000.
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- Young, Jack P., to United States of America, Atomic Energy Commission. Slotted probe for spectroscopic measurements. 3,733,130, Cl. 356-74.000.
- Young, John T.; Michels, Charles E.; Zimmermann, Thomas C.; and Hagemann, Gilbert M., to Reliance Electric Company, mesne. Reversible manual and automatic labeling machine. 3,733,236, Cl. 156-360.000.
- Yueh, Mao H.; and Jordan, Wesley A., to General Mills, Inc. Fluid loss control agent. 3,733,274, Cl. 252-8.50c.
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- Zamorano, Luis Ramirez. Apparatus for pressing connector members on structural elements. 3,732,715, Cl. 72-253.000.
- Zappi, Hans H.: See—  
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- Zemaitis, Joseph F., Jr., to Esso Research and Engineering Company. Two step controlled flow gasification process. 3,733,186, Cl. 48-202.000.
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- Zielinski, James, to Esso Research and Engineering Company. Thiophosphate acetyl hydrazines. 3,733,374, Cl. 260-923.000.
- Ziesche, Kurt; Hans, Waldemar; Duffner, Josef; Brune, Gerhard; and Grob, Alfred, to Bosch, Robert, G.m.b.H. Solenoid valve. 3,732,893, Cl. 137-625.650.
- Zimmerman, Abraham A.; Furlong, Louis E.; and Shannon, Hugh F., to Esso Research and Engineering Company. Composition for improving airfuel ratio distribution in internal combustion engines. 3,733,184, Cl. 44-80.000.
- Zimmerman, Michael C.: See—  
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## LIST OF PLANT PATENTEEES

TO WHOM

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- Albertson, Robert V., to Massey-Ferguson Inc. Combined snow and water vehicle. 226,907, 5-15-73, Cl. D14—24.
- Andon, Jerar. Momentum transfer demonstration device. 226,918, 5-15-73, Cl. D25—1.
- Buckalew, Robert F., and J. D. Owens. Muffler. 226,905, 5-15-73, Cl. D14—8.
- Burke, Edward A.: See—  
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- Coker, Cliff J., and E. A. Burke. Exerciser. 226,934, 5-15-73, Cl. D34—5.
- Cone, George W., and D. C. Stephan, to Garrett Comtronics Corp. Calculator. 226,921, 5-15-73, Cl. D26—5.
- Copco, Inc.: See—  
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- Dallaire, Dominique and R. M. Extruded plastic meeting rail. 226,904.
- Day, Robert T., Jr., and D. D. Tompkins, to Gilbert & Barker Mfg. Co. Console unit. 226,919, 5-15-73, Cl. D26—5.
- Dentsply Research & Development Corp.: See—  
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- Gore, Fred M., to Texas Instruments Inc. Calculator casing. 226,922, 5-15-73, Cl. D26—5.
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- Heniges, William B. Slalom toboggan. 226,937, 5-15-73, Cl. D34—15.
- Hermanson, Terry, to Mr. Christmas, Inc. Combined bulb and husk-adaptor unit for decorative lights. 226,924, 5-15-73, Cl. D26—8.
- Hoyle, Walter W., to Carrier Corp. Casing for refrigeration system condensing units or the like. 226,914, 5-15-73, Cl. D23—139.
- Huggins, Hal A. Orthodontic cradleboard. 226,915, 5-15-73, Cl. D24—1.
- Kinard, William G., to Relton Corp. Golf ball holder. 226,929, 5-15-73, Cl. D34—5.
- Kohler Co.: See—  
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- Ledgerwood, Thomas D. Three dimensional game board. 226,932, 5-15-73, Cl. D34—555.
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- Perrin, George S., to Plastics Research and Development Corp. Spinner sinker fishing lure. 226,909, 5-15-73, Cl. D22—27.
- Plastics Research and Development Corp.: See—  
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- Roe, Edward G. Golf tee and tethered weight. 226,927, 5-15-73, Cl. D34—5.
- San Antonio, Louis. Ceramic still for kilns (used in kilns for making ceramic ware). 226,913, 5-15-73, Cl. D23—82.
- Scherer, Matthias. Toilet seat. 226,912, 5-15-73, Cl. D23—71.
- Stephan, Donald C.: See—  
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- Webb, Ronald C., and K. B. Wikel, to Dentsply Research & Development Corp. Dental material mixer. 226,916, 5-15-73, Cl. D24—1.
- Wikel, Kenneth B.: See—  
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- Wormser, Robert S., to Game Time, Inc. Race car shaped seat for playground apparatus. 226,930, 5-15-73, Cl. D34—5.1.
- Wormser, Robert S., to Game Time, Inc. Mini-bike shaped seat for playground apparatus. 226,931, 5-15-73, Cl. D34—5.1.
- Wormser, Robert S., and R. L. Ewers, to Game Time, Inc. Playground slide with double spiral slides. 226,933, 5-15-73, Cl. D34—5.
- Wormser, Robert S., and R. L. Ewers, to Game Time, Inc. Playground slide with circular staircase. 226,935, 5-15-73, Cl. D34—5.



# CLASSIFICATION OF PATENTS

ISSUED MAY 15, 1973

NOTE.—First number, class; second number, subclass; third number, patent number

|         |           |        |           |       |           |     |           |       |           |      |           |
|---------|-----------|--------|-----------|-------|-----------|-----|-----------|-------|-----------|------|-----------|
| 9       | CLASS 2   | 17     | 3,732,631 | 39.46 | 3,732,690 | 62  | CLASS 81  | 96    | 3,732,811 | 533  | 3,732,870 |
| 161R    | 3,732,574 | 31A    | 3,732,632 | 51    | 3,732,691 | 62  | 3,732,756 | 99    | 3,732,812 |      |           |
| 221     | 3,732,576 | 55     | 3,732,633 | 70    | 3,732,692 |     | CLASS 82  | 216   | 3,732,813 | 84C  | 3,732,871 |
|         |           | 2.5AH  | 3,732,634 | 207   | 3,732,693 | 2   | 3,732,757 | 218   | 3,732,814 | 133R | 3,732,872 |
| 19      | CLASS 3   | 2.5AL  | 3,732,635 | 218   | 3,732,694 | 4C  | 3,732,758 | 220   | 3,732,815 | 170R | 3,732,873 |
|         | 3,732,578 |        |           | 274   | 3,732,695 | 19  | 3,732,759 | 463   | 3,732,808 | 171R | 3,732,874 |
|         |           |        |           |       | 3,732,696 | 36R | 3,732,760 |       | CLASS 102 |      |           |
| 18      | CLASS 4   | 124    | 3,732,636 | 35    | 3,732,697 |     | CLASS 83  | 24HC  | 3,732,816 | 8    | 3,732,875 |
| 41      | 3,732,579 |        | 3,732,637 | 36R   | 3,732,698 | 34  | 3,732,764 |       | 3,732,817 |      |           |
| 159     | 3,732,580 |        |           | 45D   | 3,732,699 | 37  | 3,732,761 |       | 3,732,818 | 38   | 3,732,876 |
| 172.12  | 3,732,581 |        |           | 72.4  | 3,732,700 | 98  | 3,732,762 | 40    | 3,732,819 | 58D  | 3,732,877 |
| 252R    | 3,732,582 | 102.91 | 3,732,638 |       | 3,732,701 |     | 3,732,763 | 41    | 3,732,821 | 111  | 3,732,877 |
|         |           | 139    | 3,732,639 |       |           | 102 | 3,732,765 | 45    | 3,732,822 |      |           |
|         |           |        |           |       |           | 104 | 3,732,766 | 70.2R | 3,732,823 | 15PE | 3,732,878 |
| 3       | CLASS 5   | 2.2    | 3,732,640 |       |           | 171 | 3,732,767 |       | 3,732,824 | 20   | 3,732,879 |
| 81      | 3,732,583 |        |           |       |           |     | 3,732,768 | 78    | 3,732,825 | 22   | 3,732,880 |
| 345     | 3,732,584 | IS     | 3,732,642 |       |           | 176 | 3,732,769 | 80    | 3,732,826 | 25   | 3,732,881 |
| 348WB   | 3,732,585 | IY     | 3,732,641 |       |           | 572 | 3,732,770 | 92.7  | 3,732,827 |      |           |
|         |           | 50     | 3,732,643 |       |           | 663 | 3,732,771 |       | 3,732,828 |      |           |
| 10.1    | CLASS 8   | 22     | 3,732,644 |       |           | 730 | 3,732,772 |       | 3,732,829 |      |           |
| 149.1   | 3,733,175 |        |           |       |           |     |           |       | 3,732,830 |      |           |
|         | 3,733,176 |        |           |       |           |     |           |       | 3,732,831 |      |           |
| 6       | CLASS 9   | IR     | 3,733,183 |       |           |     |           |       | 3,732,832 |      |           |
| 8R      | 3,732,587 | 80     | 3,733,184 |       |           |     |           |       | 3,732,833 |      |           |
|         | 3,732,588 |        |           |       |           |     |           |       | 3,732,834 |      |           |
| 22R     | CLASS 15  | 75     | 3,732,645 |       |           |     |           |       | 3,732,835 |      |           |
| 49R     | 3,732,589 |        |           |       |           |     |           |       | 3,732,836 |      |           |
| 245     | 3,732,590 |        |           |       |           |     |           |       | 3,732,837 |      |           |
| 246.5   | 3,732,591 |        |           |       |           |     |           |       | 3,732,838 |      |           |
| 257.006 | 3,732,592 |        |           |       |           |     |           |       | 3,732,839 |      |           |
|         | 3,732,593 |        |           |       |           |     |           |       | 3,732,840 |      |           |
| 72      | CLASS 16  | 144    | 3,733,185 |       |           |     |           |       | 3,732,841 |      |           |
|         | 3,732,594 | 202    | 3,733,186 |       |           |     |           |       | 3,732,842 |      |           |
|         |           | 209    | 3,733,187 |       |           |     |           |       | 3,732,843 |      |           |
|         |           | 487    | 3,732,646 |       |           |     |           |       | 3,732,844 |      |           |
| 3       | CLASS 19  |        |           |       |           |     |           |       | 3,732,845 |      |           |
| 267     | 3,732,595 |        |           |       |           |     |           |       | 3,732,846 |      |           |
|         | 3,732,596 |        |           |       |           |     |           |       | 3,732,847 |      |           |
| 230B    | CLASS 23  | 54     | 3,732,647 |       |           |     |           |       | 3,732,848 |      |           |
|         | 3,733,177 | 103R   | 3,732,648 |       |           |     |           |       | 3,732,849 |      |           |
|         | 3,733,178 | 358    | 3,732,651 |       |           |     |           |       | 3,732,850 |      |           |
| 281     | 3,733,179 | 401    | 3,732,652 |       |           |     |           |       | 3,732,851 |      |           |
| 288F    | 3,733,180 |        |           |       |           |     |           |       | 3,732,852 |      |           |
|         | 3,733,181 |        |           |       |           |     |           |       | 3,732,853 |      |           |
| 31B     | CLASS 24  | 71     | 3,732,653 |       |           |     |           |       | 3,732,854 |      |           |
| 68D     | 3,732,597 | 108    | 3,732,655 |       |           |     |           |       | 3,732,855 |      |           |
| 103     | 3,732,598 | 221    | 3,732,656 |       |           |     |           |       | 3,732,856 |      |           |
| 204     | 3,732,599 | 169    | 3,732,649 |       |           |     |           |       | 3,732,857 |      |           |
| 205.13D | 3,732,600 | 221    | 3,732,650 |       |           |     |           |       | 3,732,858 |      |           |
|         | 3,732,601 | 241    | 3,732,651 |       |           |     |           |       | 3,732,859 |      |           |
|         |           | 245    | 3,732,652 |       |           |     |           |       | 3,732,860 |      |           |
|         |           | 282    | 3,732,653 |       |           |     |           |       | 3,732,861 |      |           |
|         |           | 461    | 3,732,654 |       |           |     |           |       | 3,732,862 |      |           |
| 1       | CLASS 27  | 489    | 3,732,655 |       |           |     |           |       | 3,732,863 |      |           |
|         | 3,732,602 |        | 3,732,656 |       |           |     |           |       | 3,732,864 |      |           |
| 28      | CLASS 28  |        |           |       |           |     |           |       | 3,732,865 |      |           |
| 76P     | 3,732,603 |        |           |       |           |     |           |       | 3,732,866 |      |           |
|         | 3,732,604 |        |           |       |           |     |           |       | 3,732,867 |      |           |
| 148.4A  | CLASS 29  | 57     | 3,732,662 |       |           |     |           |       | 3,732,868 |      |           |
| 148.4C  | 3,732,606 | 62     | 3,732,663 |       |           |     |           |       | 3,732,869 |      |           |
| 195     | 3,732,607 | 134    | 3,732,664 |       |           |     |           |       | 3,732,870 |      |           |
| 204D    | 3,732,608 | 182    | 3,732,665 |       |           |     |           |       | 3,732,871 |      |           |
| 407     | 3,732,609 |        | 3,732,666 |       |           |     |           |       | 3,732,872 |      |           |
| 428     | 3,732,610 |        |           |       |           |     |           |       | 3,732,873 |      |           |
| 463     | 3,732,611 |        |           |       |           |     |           |       | 3,732,874 |      |           |
| 470.1   | 3,732,612 |        |           |       |           |     |           |       | 3,732,875 |      |           |
| 470.3   | 3,732,613 |        |           |       |           |     |           |       | 3,732,876 |      |           |
| 477     | 3,732,614 |        |           |       |           |     |           |       | 3,732,877 |      |           |
| 503     | 3,732,615 |        |           |       |           |     |           |       | 3,732,878 |      |           |
| 596     | 3,732,616 |        |           |       |           |     |           |       | 3,732,879 |      |           |
| 608     | 3,732,617 |        |           |       |           |     |           |       | 3,732,880 |      |           |
| 97      | CLASS 30  |        |           |       |           |     |           |       | 3,732,881 |      |           |
| 287     | 3,732,618 |        |           |       |           |     |           |       | 3,732,882 |      |           |
|         | 3,732,619 |        |           |       |           |     |           |       | 3,732,883 |      |           |
| 2       | CLASS 32  | 22     | 3,732,678 |       |           |     |           |       | 3,732,884 |      |           |
| 10A     | 3,732,620 | 34HS   | 3,732,679 |       |           |     |           |       | 3,732,885 |      |           |
| 22      | 3,732,621 | 58.34  | 3,732,680 |       |           |     |           |       | 3,732,886 |      |           |
|         | 3,732,622 | 58.95  | 3,732,681 |       |           |     |           |       | 3,732,887 |      |           |
| 141R    | 3,732,623 | 59     | 3,732,682 |       |           |     |           |       | 3,732,888 |      |           |
| 141.5   | 3,732,624 | 77.3   | 3,732,677 |       |           |     |           |       | 3,732,889 |      |           |
| 174Q    | 3,732,625 | 140BY  | 3,732,684 |       |           |     |           |       | 3,732,890 |      |           |
| 179.5R  | 3,732,626 | 140R   | 3,732,683 |       |           |     |           |       | 3,732,891 |      |           |
| 9       | CLASS 34  |        |           |       |           |     |           |       | 3,732,892 |      |           |
| 32      | 3,732,627 |        |           |       |           |     |           |       | 3,732,893 |      |           |
|         | 3,732,628 |        |           |       |           |     |           |       | 3,732,894 |      |           |
| 9E      | CLASS 35  |        |           |       |           |     |           |       | 3,732,895 |      |           |
| 12N     | 3,732,629 |        |           |       |           |     |           |       | 3,732,896 |      |           |
|         | 3,732,630 |        |           |       |           |     |           |       | 3,732,897 |      |           |



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|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| CLASS 161 | 3,732,957 | 499       | 3,733,463 | 141       | 3,733,047 | 624C      | 3,733,365 | 217       | 3,733,110 |
| 48        | 3,733,243 | 70.3      | 3,732,958 | 205       | 3,733,048 | 649D      | 3,733,366 | 218       | 3,733,111 |
| 89        | 3,733,239 | 91A       | 3,732,959 | 214       | 3,733,050 | 669A      | 3,733,367 | 236       | 3,733,108 |
| 102       | 3,733,240 | 142R      | 3,732,787 | 22.3      | 3,733,003 | 677A      | 3,733,368 | CLASS 310 |           |
| 116       | 3,733,241 | CLASS 193 |           | 85B       | 3,733,005 | 680R      | 3,733,369 | 4         | 3,733,499 |
| 160       | 3,733,242 | 5         | 3,732,960 | 8.5C      | 3,733,273 | 830TW     | 3,733,282 | 17        | 3,733,500 |
| 173       | 3,733,245 | 7         | 3,732,961 | 46.3      | 3,733,274 | 862       | 3,733,370 | 54        | 3,733,501 |
| 176       | 3,733,246 | CLASS 194 |           | 78        | 3,733,276 | 880R      | 3,733,371 | 61        | 3,733,502 |
| 78        | 3,733,247 | 92        | 3,732,962 | 106       | 3,733,277 | 886       | 3,733,372 | 68        | 3,733,503 |
| CLASS 162 |           | 262       | 3,733,006 | 135       | 3,733,278 | 897A      | 3,733,373 | 86        | 3,733,504 |
| CLASS 164 |           | 295       | 3,733,007 | 363.5     | 3,733,279 | 923       | 3,733,374 | 112       | 3,733,505 |
| 252       | 3,732,915 | CLASS 195 |           | 539       | 3,733,280 | 938       | 3,733,375 | 198       | 3,733,506 |
| 1         | 3,732,916 | 30        | 3,733,253 | 544       | 3,733,281 | 941       | 3,733,376 | CLASS 312 |           |
| 106       | 3,732,918 | 51C       | 3,733,254 | 94        | 3,733,051 | 948       | 3,733,377 | 97.1      | 3,733,112 |
| 110       | 3,732,919 | 6.7       | 3,732,963 | 150R      | 3,733,052 | 950       | 3,733,378 | 330       | 3,733,113 |
| 119       | 3,732,920 | 17        | 3,732,964 | 192       | 3,733,053 | CLASS 261 |           | 70C       | 3,733,507 |
| 154       | 3,732,921 | 186A      | 3,732,965 | 504       | 3,733,011 | 1         | 3,733,060 | 183       | 3,733,508 |
| 158       | 3,732,922 | 21        | 3,732,966 | 570       | 3,733,012 | 21        | 3,733,061 | CLASS 313 |           |
| 166       | 3,732,924 | 33AB      | 3,732,967 | 86        | 3,733,016 | 92        | 3,733,062 | CLASS 315 |           |
| CLASS 166 |           | 33AC      | 3,732,967 | CLASS 223 |           | 112       | 3,733,063 | 3.6       | 3,733,509 |
| 55        | 3,732,923 | 34        | 3,732,969 | CLASS 224 |           | 122       | 3,733,064 | 5.24      | 3,733,510 |
| 72        | 3,732,924 | 154       | 3,732,970 | CLASS 226 |           | 4         | 3,733,056 | 8         | 3,733,511 |
| 272       | 3,732,926 | 177R      | 3,732,971 | CLASS 227 |           | 185       | 3,733,058 | 18        | 3,733,512 |
| 294       | 3,732,927 | CLASS 200 |           | 119       | 3,733,019 | 191       | 3,733,059 | 27TD      | 3,733,513 |
| 315       | 3,732,928 | 61.45R    | 3,733,448 | CLASS 229 |           | 88        | 3,733,383 | 83        | 3,733,515 |
| CLASS 168 |           | 61.52     | 3,733,447 | CLASS 230 |           | 98        | 3,733,384 | 291       | 3,733,528 |
| 18        | 3,732,929 | 81R       | 3,733,449 | CLASS 232 |           | 105       | 3,733,385 | CLASS 317 |           |
| 2R        | 3,732,930 | 85R       | 3,733,450 | CLASS 233 |           | 182       | 3,733,386 | 13R       | 3,733,518 |
| CLASS 172 |           | 148A      | 3,733,452 | CLASS 235 |           | 43        | 3,733,065 | 16        | 3,733,516 |
| 6         | 3,732,931 | 168R      | 3,733,451 | CLASS 236 |           | CLASS 266 |           | 18D       | 3,733,517 |
| 7         | 3,732,932 | CLASS 201 |           | CLASS 237 |           | CLASS 267 |           | 31        | 3,733,519 |
| 137       | 3,732,936 | 25        | 3,733,255 | CLASS 238 |           | 148       | 3,733,066 | 61.5      | 3,733,520 |
| CLASS 173 |           | 29        | 3,733,291 | CLASS 239 |           | CLASS 269 |           | 70        | 3,733,521 |
| 28        | 3,732,935 | 109       | 3,733,256 | CLASS 240 |           | 245       | 3,733,067 | 77        | 3,733,522 |
| 137       | 3,732,936 | 159.12    | 3,733,257 | CLASS 241 |           | CLASS 271 |           | 101LH     | 3,733,523 |
| CLASS 174 |           | 192       | 3,733,258 | CLASS 242 |           | 9         | 3,733,068 | 157.5     | 3,733,524 |
| 23C       | 3,733,426 | CLASS 206 |           | CLASS 243 |           | 50        | 3,733,069 | 234R      | 3,733,525 |
| 72A       | 3,733,428 | 1.7       | 3,732,972 | CLASS 244 |           | 89        | 3,733,070 | 235R      | 3,733,527 |
| 161F      | 3,733,429 | 15.1E     | 3,732,973 | CLASS 245 |           | CLASS 272 |           | CLASS 318 |           |
| 3         | 3,733,248 | 61.11C    | 3,733,467 | CLASS 246 |           | 8R        | 3,733,071 | 7         | 3,733,529 |
| 19LD      | 3,733,249 | 61.12R    | 3,733,468 | CLASS 247 |           | CLASS 273 |           | 16        | 3,733,530 |
| 30        | 3,733,250 | 61.5E     | 3,733,465 | CLASS 248 |           | 7         | 3,733,072 | 114       | 3,733,531 |
| 36R       | 3,733,251 | 61.6E     | 3,733,466 | CLASS 249 |           | 102.1E    | 3,733,073 | 266       | 3,733,532 |
| 78        | 3,733,252 | 61.6R     | 3,733,469 | CLASS 250 |           | 134A      | 3,733,074 | CLASS 320 |           |
| 68        | 3,732,937 | 61.6R     | 3,733,469 | CLASS 251 |           | 141A      | 3,733,075 | 2         | 3,733,533 |
| 126       | 3,732,938 | 70R       | 3,733,470 | CLASS 252 |           | 143R      | 3,733,076 | 23        | 3,733,534 |
| CLASS 176 |           | 92DN      | 3,733,472 | CLASS 253 |           | 186A      | 3,733,077 | 40        | 3,733,535 |
| 5.1       | 3,733,430 | 92NG      | 3,733,471 | CLASS 254 |           | CLASS 274 |           | CLASS 321 |           |
| 5.4CD     | 3,733,432 | 151.12    | 3,733,473 | CLASS 255 |           | 4F        | 3,733,078 | 2         | 3,733,543 |
| 6.8       | 3,733,433 | 151.3     | 3,733,474 | CLASS 256 |           | CLASS 277 |           | 10        | 3,733,536 |
| 7.3D      | 3,733,435 | 151.35    | 3,733,475 | CLASS 257 |           | 184       | 3,733,079 | 13        | 3,733,537 |
| 7.82      | 3,733,436 | 164       | 3,733,477 | CLASS 258 |           | CLASS 279 |           | 45C       | 3,733,538 |
| IC        | 3,733,437 | CLASS 209 |           | CLASS 259 |           | 4         | 3,733,080 | 47        | 3,733,539 |
| 15FD      | 3,733,438 | 110.5     | 3,732,977 | CLASS 260 |           | 46        | 3,733,081 | 60        | 3,733,542 |
| 18B       | 3,733,440 | 122       | 3,732,978 | CLASS 261 |           | CLASS 280 |           | CLASS 324 |           |
| 18E       | 3,733,439 | 199       | 3,732,979 | CLASS 262 |           | 11.35R    | 3,733,083 | 32        | 3,733,544 |
| 81B       | 3,733,441 | 421       | 3,732,980 | CLASS 263 |           | 11.35T    | 3,733,082 | 52        | 3,733,545 |
| 99        | 3,733,442 | CLASS 210 |           | CLASS 264 |           | 47.17     | 3,733,086 | 71CP      | 3,733,547 |
| 100.2B    | 3,733,444 | 7         | 3,733,263 | CLASS 265 |           | 81.5      | 3,733,084 | 71R       | 3,733,548 |
| 100.2S    | 3,733,443 | 23        | 3,733,264 | CLASS 266 |           | 96.2R     | 3,733,087 | 79D       | 3,733,549 |
| 115A      | 3,733,445 | 26        | 3,733,265 | CLASS 267 |           | 150AB     | 3,733,088 | CLASS 325 |           |
| CLASS 180 |           | 27        | 3,733,267 | CLASS 268 |           | 415A      | 3,733,089 | 38A       | 3,733,550 |
| 5R        | 3,732,939 | 47        | 3,733,269 | CLASS 269 |           | 432       | 3,733,090 | 105       | 3,733,551 |
| 11        | 3,732,942 | 58        | 3,733,270 | CLASS 270 |           | CLASS 285 |           | 122       | 3,733,552 |
| 55        | 3,732,943 | 63        | 3,733,271 | CLASS 271 |           | 166       | 3,733,092 | 321       | 3,733,553 |
| 64R       | 3,732,940 | 94        | 3,733,281 | CLASS 272 |           | 342       | 3,733,093 | 478       | 3,733,554 |
| 89R       | 3,732,941 | 198C      | 3,732,982 | CLASS 273 |           | CLASS 287 |           | CLASS 328 |           |
| 103       | 3,732,944 | 221       | 3,733,272 | CLASS 274 |           | 53R       | 3,733,094 | 14        | 3,733,555 |
| CLASS 181 |           | 273       | 3,733,283 | CLASS 275 |           | 38        | 3,733,494 | 39        | 3,733,556 |
| 5AC       | 3,732,947 | 289       | 3,733,284 | CLASS 276 |           | 52        | 3,733,095 | 132       | 3,733,557 |
| 5AG       | 3,732,945 | 446       | 3,733,285 | CLASS 277 |           | CLASS 294 |           | CLASS 330 |           |
| 5NP       | 3,732,946 | CLASS 211 |           | CLASS 278 |           | 19R       | 3,733,097 | 17        | 3,733,558 |
| 36R       | 3,732,948 | 119.13    | 3,732,987 | CLASS 279 |           | 55        | 3,733,099 | 30D       | 3,733,559 |
| CLASS 185 |           | 144       | 3,732,988 | CLASS 280 |           | 87.2      | 3,733,100 | 34        | 3,733,560 |
| 40R       | 3,732,949 | CLASS 212 |           | CLASS 281 |           | 104       | 3,733,101 | CLASS 331 |           |
| CLASS 187 |           | 18D       | 3,732,989 | CLASS 282 |           | CLASS 296 |           | 94.5H     | 3,733,561 |
| 29        | 3,732,950 | 10Q       | 3,732,990 | CLASS 283 |           | 23MC      | 3,733,102 | 9T        | 3,733,562 |
| CLASS 188 |           | 6P        | 3,732,991 | CLASS 284 |           | 35R       | 3,733,103 | CLASS 333 |           |
| 24        | 3,732,951 | 16.4B     | 3,732,992 | CLASS 285 |           | CLASS 297 |           | 1.1       | 3,733,563 |
| 71.9      | 3,732,952 | 18        | 3,732,993 | CLASS 286 |           | 377       | 3,733,104 | 18        | 3,733,564 |
| 218XL     | 3,732,953 | 36        | 3,732,994 | CLASS 287 |           | CLASS 299 |           | 28        | 3,733,565 |
| 259       | 3,732,954 | 92        | 3,732,995 | CLASS 288 |           | 37        | 3,733,105 | 82B       | 3,733,566 |
| CLASS 190 |           | 152       | 3,732,996 | CLASS 289 |           | CLASS 303 |           | 186       | 3,733,568 |
| 51        | 3,732,955 | 302       | 3,732,997 | CLASS 290 |           | 6C        | 3,733,106 | 207       | 3,733,569 |
| CLASS 191 |           | 450       | 3,732,998 | CLASS 291 |           | 10        | 3,733,107 | 255       | 3,733,570 |
| 49        | 3,733,446 | CLASS 215 |           | CLASS 292 |           | CLASS 307 |           | 89        | 3,733,571 |
| CLASS 192 |           | 6         | 3,732,999 | CLASS 293 |           | 108       | 3,733,495 | 273       | 3,733,572 |
| 45        | 3,732,956 | 9         | 3,733,000 | CLASS 294 |           | 132E      | 3,733,497 | 202       | 3,733,573 |
|           |           | 12R       | 3,733,001 | CLASS 295 |           | 223B      | 3,733,496 | CLASS 339 |           |
|           |           | 8.5       | 3,733,453 | CLASS 296 |           | 297       | 3,733,498 | 14P       | 3,733,576 |
|           |           | 10.55     | 3,733,454 | CLASS 297 |           | 216       | 3,733,109 |           |           |
|           |           |           | 3,733,455 | CLASS 298 |           |           |           |           |           |
|           |           |           | 3,733,456 | CLASS 299 |           |           |           |           |           |
|           |           |           | 3,733,457 | CLASS 300 |           |           |           |           |           |
|           |           |           | 3,733,458 | CLASS 301 |           |           |           |           |           |
|           |           |           | 3,733,459 | CLASS 302 |           |           |           |           |           |
|           |           |           | 3,733,460 | CLASS 303 |           |           |           |           |           |
|           |           |           | 3,733,461 | CLASS 304 |           |           |           |           |           |
|           |           |           | 3,733,462 | CLASS 305 |           |           |           |           |           |
|           |           |           |           | CLASS 306 |           |           |           |           |           |
|           |           |           |           | CLASS 307 |           |           |           |           |           |
|           |           |           |           | CLASS 308 |           |           |           |           |           |
|           |           |           |           | CLASS 309 |           |           |           |           |           |
|           |           |           |           | CLASS 310 |           |           |           |           |           |
|           |           |           |           | CLASS 311 |           |           |           |           |           |
|           |           |           |           | CLASS 312 |           |           |           |           |           |
|           |           |           |           | CLASS 313 |           |           |           |           |           |
|           |           |           |           | CLASS 314 |           |           |           |           |           |
|           |           |           |           | CLASS 315 |           |           |           |           |           |
|           |           |           |           | CLASS 316 |           |           |           |           |           |
|           |           |           |           | CLASS 317 |           |           |           |           |           |
|           |           |           |           | CLASS 318 |           |           |           |           |           |
|           |           |           |           | CLASS 319 |           |           |           |           |           |
|           |           |           |           | CLASS 320 |           |           |           |           |           |
|           |           |           |           | CLASS 321 |           |           |           |           |           |
|           |           |           |           | CLASS 322 |           |           |           |           |           |
|           |           |           |           | CLASS 323 |           |           |           |           |           |
|           |           |           |           | CLASS 324 |           |           |           |           |           |
|           |           |           |           | CLASS 325 |           |           |           |           |           |
|           |           |           |           | CLASS 326 |           |           |           |           |           |
|           |           |           |           | CLASS 327 |           |           |           |           |           |
|           |           |           |           | CLASS 328 |           |           |           |           |           |
|           |           |           |           | CLASS 329 |           |           |           |           |           |
|           |           |           |           | CLASS 330 |           |           |           |           |           |
|           |           |           |           | CLASS 331 |           |           |           |           |           |
|           |           |           |           | CLASS 332 |           |           |           |           |           |
|           |           |           |           | CLASS 333 |           |           |           |           |           |
|           |           |           |           | CLASS 334 |           |           |           |           |           |
|           |           |           |           | CLASS 335 |           |           |           |           |           |
|           |           |           |           | CLASS 336 |           |           |           |           |           |
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|-----|-----------|-----|-----------|----|-----------|-----------|-----|-----------|-----|-----------|
| 18C | 3,733,574 | 55A | 3,733,603 | 10 | 3,733,124 | 3,733,141 | 466 | 3,733,396 | 330 | 3,733,421 |
| 22B | 3,733,575 | 7A  | 3,733,604 |    | 3,733,127 | CLASS 408 | 478 | 3,733,395 | 340 | 3,733,422 |
| 91R | 3,733,577 | 7.7 | 3,733,605 | 43 | 3,733,125 | 3,733,142 | 5   | 3,733,397 | 71  | 3,733,153 |
| 232 | 3,733,578 | 18A | 3,733,606 | 54 | 3,733,128 | CLASS 415 | 80  | 3,733,398 | 78  | 3,7       |



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| 3,733,191     | 3,732,961 | 3,733,546 | 3,733,008 | 3,733,381 | 3,732,674 |
| 3,733,243     | 3,732,973 | 3,733,556 | 3,733,060 | 3,733,411 | 3,732,845 |
| 3,733,245     | 3,732,980 | 3,733,560 | 3,733,073 | 3,733,414 | 3,732,998 |
| 3,733,603     | 3,732,981 | 3,733,573 | 3,733,308 | 3,733,435 | 3,733,011 |
| 4 : 3,732,800 | 3,732,985 | 3,733,574 | 3,733,431 | 3,733,436 | 3,733,040 |
| 3,732,886     | 3,732,995 | 3,733,588 | 3,733,453 | 3,733,453 | 3,733,055 |
| 3,733,027     | 3,733,032 | 3,733,590 | 3,733,548 | 3,733,454 | 3,733,257 |
| 3,733,185     | 3,733,044 | 3,733,592 | 3,733,558 | 3,733,466 | 3,733,344 |
| 3,733,602     | 3,733,050 | 3,733,593 | 3,733,600 | 3,733,484 | 3,733,369 |
| 5 : 3,733,269 | 3,733,056 | 3,733,607 | 3,733,609 | 3,733,519 | 3,733,390 |
| 6 : 3,732,583 | 3,733,077 | 3,733,610 | 3,732,870 | 3,733,522 | 3,732,623 |
| 3,732,586     | 3,733,092 | 3,732,612 | 3,733,024 | 3,733,540 | 3,732,682 |
| 3,732,587     | 3,733,101 | 3,732,760 | 3,733,104 | 3,733,543 | 3,732,838 |
| 3,732,588     | 3,733,120 | 3,733,102 | 3,733,224 | 3,733,545 | 3,733,022 |
| 3,732,599     | 3,733,121 | 3,733,270 | 3,733,070 | 3,733,562 | 3,733,070 |
| 3,732,624     | 3,733,129 | 3,733,444 | 3,733,629 | 3,733,571 | 3,733,099 |
| 3,732,642     | 3,733,133 | 3,732,578 | 3,732,640 | 3,733,608 | 3,733,132 |
| 3,732,649     | 3,733,139 | 3,732,641 | 3,732,643 | 3,732,582 | 3,733,350 |
| 3,732,651     | 3,733,160 | 3,732,722 | 3,732,645 | 3,732,591 | 3,733,398 |
| 3,732,655     | 3,733,171 | 3,732,725 | 3,732,657 | 3,732,594 | 3,733,413 |
| 3,732,660     | 3,733,178 | 3,732,734 | 3,732,664 | 3,732,705 | 3,733,587 |
| 3,732,668     | 3,733,211 | 3,732,762 | 3,732,709 | 3,732,852 | 3,733,591 |
| 3,732,669     | 3,733,227 | 3,732,764 | 3,732,766 | 3,732,853 | 3,733,604 |
| 3,732,673     | 3,733,229 | 3,732,909 | 3,732,798 | 3,732,897 | 3,733,612 |
| 3,732,692     | 3,733,256 | 3,733,039 | 3,732,813 | 3,732,957 | 3,732,595 |
| 3,732,693     | 3,733,276 | 3,733,047 | 3,732,814 | 3,733,001 | 3,732,634 |
| 3,732,694     | 3,733,295 | 3,733,090 | 3,732,875 | 3,733,113 | 3,732,650 |
| 3,732,697     | 3,733,316 | 3,733,146 | 3,732,892 | 3,733,223 | 3,732,653 |
| 3,732,698     | 3,733,318 | 3,733,175 | 3,732,908 | 3,733,262 | 3,732,710 |
| 3,732,721     | 3,733,319 | 3,733,206 | 3,732,932 | 3,733,279 | 3,732,713 |
| 3,732,723     | 3,733,327 | 3,733,247 | 3,732,965 | 3,733,441 | 3,732,727 |
| 3,732,729     | 3,733,362 | 3,733,251 | 3,732,967 | 3,733,568 | 3,732,840 |
| 3,732,745     | 3,733,368 | 3,733,290 | 3,732,976 | 3,732,887 | 3,732,887 |
| 3,732,751     | 3,733,375 | 3,733,298 | 3,732,992 | 3,732,806 | 3,732,898 |
| 3,732,777     | 3,733,392 | 3,733,304 | 3,733,006 | 3,732,847 | 3,732,945 |
| 3,732,779     | 3,733,394 | 3,733,360 | 3,733,048 | 3,733,089 | 3,732,946 |
| 3,732,811     | 3,733,407 | 3,733,396 | 3,733,062 | 3,733,163 | 3,733,029 |
| 3,732,821     | 3,733,419 | 3,733,468 | 3,733,075 | 3,733,456 | 3,733,035 |
| 3,732,826     | 3,733,430 | 3,733,480 | 3,733,115 | 3,733,554 | 3,733,127 |
| 3,732,851     | 3,733,437 | 3,733,492 | 3,733,118 | 3,732,585 | 3,733,137 |
| 3,732,855     | 3,733,463 | 3,733,580 | 3,733,122 | 3,732,672 | 3,733,153 |
| 3,732,860     | 3,733,464 | 3,732,683 | 3,733,143 | 3,732,740 | 3,733,154 |
| 3,732,868     | 3,733,469 | 3,732,684 | 3,733,158 | 3,732,807 | 3,733,238 |
| 3,732,873     | 3,733,473 | 3,733,294 | 3,733,168 | 3,732,865 | 3,733,291 |
| 3,732,890     | 3,733,479 | 3,733,357 | 3,733,183 | 3,732,937 | 3,733,455 |
| 3,732,910     | 3,733,482 | 3,733,406 | 3,733,236 | 3,733,025 | 3,733,462 |
| 3,732,911     | 3,733,485 | 3,732,820 | 3,733,249 | 3,733,112 | 3,733,529 |
| 3,732,918     | 3,733,494 | 3,732,913 | 3,733,261 | 3,732,628 | 3,733,555 |
| 3,732,931     | 3,733,511 | 3,732,935 | 3,733,286 | 3,732,646 | 3,733,564 |
| 3,732,934     | 3,733,512 | 3,732,938 | 3,733,339 | 3,732,948 | 3,733,586 |

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| 3,732,605      | 3,733,281 | 36 : 3,732,581 | 3,732,676 | 3,733,530 | 3,732,947 |
| 3,732,609      | 3,732,615 | 3,732,592      | 3,732,708 | 3,732,574 | 3,732,176 |
| 3,732,614      | 3,733,116 | 3,732,597      | 3,732,867 | 3,732,576 | 3,733,260 |
| 3,732,616      | 3,732,601 | 3,732,600      | 3,732,874 | 3,732,610 | 3,733,271 |
| 3,732,618      | 3,732,602 | 3,732,617      | 3,732,949 | 3,732,630 | 3,733,272 |
| 3,732,675      | 3,732,652 | 3,732,622      | 3,732,984 | 3,732,644 | 3,733,325 |
| 3,732,711      | 3,732,731 | 3,732,632      | 3,732,997 | 3,732,659 | 3,733,365 |
| 3,732,730      | 3,732,733 | 3,732,633      | 3,732,677 | 3,732,677 | 3,733,391 |
| 3,732,744      | 3,732,770 | 3,732,648      | 3,733,051 | 3,732,720 | 3,733,448 |
| 3,732,746      | 3,732,773 | 3,732,661      | 3,733,460 | 3,732,792 | 3,733,474 |
| 3,732,747      | 3,732,808 | 3,732,688      | 3,733,493 | 3,732,802 | 3,733,476 |
| 3,732,750      | 3,732,824 | 3,732,704      | 3,732,996 | 3,732,819 | 3,733,486 |
| 3,732,752      | 3,732,830 | 3,732,712      | 3,732,718 | 3,732,906 | 3,733,525 |
| 3,732,753      | 3,732,834 | 3,732,719      | 3,732,735 | 3,732,993 | 3,733,528 |
| 3,732,756      | 3,732,836 | 3,732,719      | 3,732,735 | 3,732,670 | 3,733,601 |
| 3,732,767      | 3,732,843 | 3,732,719      | 3,732,742 | 3,732,685 | 3,733,604 |
| 3,732,783      | 3,732,846 | 3,732,719      | 3,732,794 | 3,732,732 | 3,733,108 |
| 3,732,784      | 3,732,864 | 3,732,842      | 3,732,858 | 3,732,732 | 3,733,187 |
| 3,732,801      | 3,732,872 | 3,732,861      | 3,732,861 | 3,732,781 | 3,733,188 |
| 3,732,805      | 3,732,894 | 3,732,862      | 3,732,869 | 3,732,782 | 3,733,189 |
| 3,732,810      | 3,732,950 | 3,732,862      | 3,732,901 | 3,732,788 | 3,733,213 |
| 3,732,827      | 3,732,974 | 3,732,869      | 3,732,901 | 3,732,812 | 3,733,216 |
| 3,732,876      | 3,732,975 | 3,732,878      | 3,732,930 | 3,732,831 | 3,733,221 |
| 3,732,933      | 3,733,013 | 3,732,889      | 3,732,972 | 3,732,835 | 3,733,237 |
| 3,732,954      | 3,733,023 | 3,732,900      | 3,732,978 | 3,732,857 | 3,733,239 |
| 3,732,959      | 3,733,038 | 3,732,916      | 3,733,000 | 3,732,878 | 3,733,252 |
| 3,733,066      | 3,733,046 | 3,732,926      | 3,733,010 | 3,732,889 | 3,733,254 |
| 3,733,079      | 3,733,126 | 3,733,018      | 3,733,042 | 3,732,916 | 3,733,255 |
| 3,733,084      | 3,733,138 | 3,733,042      | 3,733,054 | 3,732,956 | 3,733,255 |
| 3,733,087      | 3,733,142 | 3,733,054      | 3,733,074 | 3,732,966 | 3,733,256 |
| 3,733,088      | 3,733,149 | 3,733,074      | 3,733,081 | 3,732,968 | 3,733,278 |
| 3,733,091      | 3,733,159 | 3,733,081      | 3,733,098 | 3,732,990 | 3,733,283 |
| 3,733,148      | 3,733,181 | 3,733,110      | 3,733,110 | 3,733,003 | 3,733,285 |
| 3,733,151      | 3,733,184 | 3,733,119      | 3,733,119 | 3,733,021 | 3,733,309 |
| 3,733,152      | 3,733,186 | 3,733,123      | 3,733,123 | 3,733,033 | 3,733,345 |
| 3,733,155      | 3,733,248 | 3,733,123      | 3,733,123 | 3,733,052 | 3,733,361 |
| 3,733,274      | 3,733,258 | 3,733,161      | 3,733,161 | 3,733,065 | 3,733,364 |
| 3,733,311      | 3,733,280 | 3,733,162      | 3,733,162 | 3,733,086 | 3,733,416 |
| 3,733,366      | 3,733,292 | 3,733,172      | 3,733,172 | 3,733,097 | 3,733,417 |
| 3,733,446      | 3,733,305 | 3,733,177      | 3,733,177 | 3,733,106 | 3,733,478 |
| 3,733,582      | 3,733,313 | 3,733,193      | 3,733,193 | 3,733,140 | 3,733,489 |
| 27 : 3,733,016 | 3,733,320 | 3,733,196      | 3,733,196 | 3,733,141 | 3,733,495 |
| 3,733,059      | 3,733,321 | 3,733,199      | 3,733,199 | 3,733,150 | 3,733,499 |
| 3,733,068      | 3,733,322 | 3,733,201      | 3,733,201 | 3,733,157 | 3,733,501 |
| 3,733,072      | 3,733,323 | 3,733,231      | 3,733,231 | 3,733,173 | 3,733,502 |
| 3,733,179      | 3,733,334 | 3,733,259      | 3,733,259 | 3,733,207 | 3,733,504 |
| 3,733,202      | 3,733,341 | 3,733,293      | 3,733,293 | 3,733,209 | 3,733,516 |
| 3,733,273      | 3,733,356 | 3,733,301      | 3,733,301 | 3,733,210 | 3,733,517 |
| 3,733,277      | 3,733,374 | 3,733,302      | 3,733,302 | 3,733,212 | 3,733,538 |
| 3,733,349      | 3,733,377 | 3,733,307      | 3,733,307 | 3,733,218 | 3,733,541 |
| 3,733,429      | 3,733,384 | 3,733,333      | 3,733,333 | 3,733,242 | 3,733,541 |
| 3,733,477      | 3,733,399 | 3,733,355      | 3,733,355 | 3,733,242 | 3,733,541 |
| 3,733,496      | 3,733,403 | 3,733,379      | 3,733,379 | 3,733,242 | 3,733,541 |
| 29 : 3,732,714 | 3,733,404 | 3,733,395      | 3,733,395 | 3,733,242 | 3,733,541 |
| 3,732,903      | 3,733,409 | 3,733,418      | 3,733,418 | 3,733,242 | 3,733,541 |
| 3,732,905      | 3,733,418 | 3,733,420      | 3,733,420 | 3,733,242 | 3,733,541 |
| 3,732,960      | 3,733,421 | 3,733,426      | 3,733,426 | 3,733,242 | 3,733,541 |
| 3,732,986      | 3,733,426 | 3,733,438      | 3,733,438 | 3,733,242 | 3,733,541 |
| 3,732,999      | 3,733,438 | 3,733,450      | 3,733,450 | 3,733,242 | 3,733,541 |
| 3,733,045      | 3,733,450 | 3,733,465      | 3,733,465 | 3,733,242 | 3,733,541 |
| 3,733,063      | 3,733,465 | 3,733,467      | 3,733,467 | 3,733,242 | 3,733,541 |
| 3,733,071      | 3,733,477 | 3,733,503      | 3,733,503 | 3,733,242 | 3,733,541 |
| 3,733,312      | 3,733,503 | 3,733,506      | 3,733,506 | 3,733,242 | 3,733,541 |
| 3,733,363      | 3,733,508 | 3,733,534      | 3,733,534 | 3,733,242 | 3,733,541 |
| 3,733,367      | 3,733,509 | 3,733,536      | 3,733,536 | 3,733,242 | 3,733,541 |
| 3,733,461      | 3,733,510 | 3,733,553      | 3,733,553 | 3,733,242 | 3,733,541 |
| 3,733,535      | 3,733,510 | 3,733,553      | 3,733,553 | 3,733,242 | 3,733,541 |
| 30 : 3,732,829 | 3,733,542 | 3,733,559      | 3,733,559 | 3,733,242 | 3,733,541 |
| 3,733,459      | 3,733,551 | 3,733,599      | 3,733,599 | 3,733,242 | 3,733,541 |
| 31 : 3,732,837 | 3,733,559 | 3,733,605      | 3,733,605 | 3,733,242 | 3,733,541 |
| 3,733,030      | 3,733,561 | 3,732,577      | 3,732,577 | 3,733,242 | 3,733,541 |
| 3,733,203      | 3,733,597 | 3,732,603      | 3,732,603 | 3,733,242 | 3,733,541 |

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## PATENT OFFICE NOTICES

### Examination

Pursuant to the provisions of Rule 341(c), an examination for persons seeking registration before the United States Patent Office as patent attorneys or agents will be held on Tuesday, September 11, 1973.

With the exception of those former patent examiners for whom the examination is waived, all persons recognized for practice before the Patent Office in patent cases must, pursuant to the noted rule, pass the examination. Those passing the examination do not thereby qualify for recognition for practice before the Patent Office in trademark cases. Recognition for practice in trademark cases is governed by Rule 2.12 of the Trademark Rules of Practice, which does not require the passing of an examination.

The examination will be given under the supervision of the Civil Service Commission, and may be taken in any of the cities in which the Civil Service Commission regularly conducts examinations. Applications to take the examination must be filed in the Patent Office together with a \$35 fee not later than July 31, 1973.

Application blanks may be obtained from the Clerk of the Patent Office Committee on Enrollment, Bldg. 3, 11th Floor, Room C16, Crystal Plaza, Arlington, Va., or by mail addressed to the Commissioner of Patents, Washington, D.C., 20231, and directed to the attention of the Clerk of the Committee on Enrollment.

LUTRELLE F. PARKER,  
Chairman, Committee on Enrollment.

### Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent Office, either on the basis of 4 years or more service in the Examining Corps; under Rule 341(e) of the "Rules of Practice of the United States Patent Office in Patent Cases"; or, having passed the examination for registration to practice before the Patent Office, held on September 12, 1972. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds should be furnished the Commissioner of Patents on or before June 22, 1973.

LUTRELLE F. PARKER,  
Chairman, Committee on Enrollment.

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Rock, H. Wayne, 100 Sparks St., Rm. 1000, Ottawa, Ontario, Canada  
Sussman, Morris, 636 G St. SW., Washington, D.C. 20024

## TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

### Chapter I—Patent Office, Department of Commerce

#### PART 1—RULES OF PRACTICE IN PATENT CASES

#### PART 5—SECRECY OF CERTAIN INVENTIONS AND LICENSES TO FILE APPLICATIONS IN FOREIGN COUNTRIES

##### Interference Practice

These rules changes are intended to clarify the current practice before the Board of Patent Interferences and to correct several inconsistencies in rule language. The rule change: (1) Provides for a 30-day period in which the junior party may request a final hearing to review a decision granting a motion over his opposition, (2) changes several 10-day periods to be 20-day periods, (3) provides for considera-

tion of a motion to add or remove names of inventors, filed after the time for taking testimony has been set, to be deferred to final hearing, (4) provides that documentary exhibits not be included in bound volumes of testimony, (5) provides that in testimony papers, questions to a witness need not be consecutively numbered if paper with numbered lines is used, and (6) provides that a notice be placed in the file wrapper of a patent if claims therefrom are copied in an application under secrecy order.

On June 30, 1972, notice of proposed rulemaking regarding the amendment of §§ 1.225, 1.231, 1.251, 1.253, 1.272, 1.277, 1.281, and 5.3 of title 37, Code of Federal Regulations, dealing with interference practice, was published in the Federal Register (37 FR 12986). Interested persons were given until October 10, 1972, to submit written comments or suggestions regarding the proposed amendments. The changes in §§ 1.243 and 1.244 are made without publication of proposed rule change since it merely relieves a restriction.

Full consideration having been given to all comments received in response to the public notice, the amendments originally proposed have been somewhat modified and are hereby adopted as set forth below.

**Effective date.**—These amendments shall become effective June 25, 1973, and shall apply only to interferences declared after such effective date.

In consideration of the comments received and pursuant to the authority contained in section 6 of the act of July 19, 1952 (66 Stat. 798; 35 U.S.C. 6), as amended October 5, 1971 (85 Stat. 364), parts 1 and 5 of title 37, Code of Federal Regulations are hereby amended as follows:

#### 1. Section 1.225 is revised to read as follows:

§ 1.225 *Failure of junior party to file statements or to overcome filing date of senior party.*

If a junior party to an interference fails to file a preliminary statement, or if his statement fails to overcome the prima facie case made by the filing date of the application of another party, judgment on the record will be entered against such junior party unless he has filed a motion under § 1.231, within the time set for such motions, for some action in the interference or he has opposed a motion under § 1.231(a) (2), (3), (4), or (5). If such a motion has been timely filed but does not result in action in the interference which will remove the basis for a judgment on the record, such judgment on the record will be entered unless the motion related to matters which may be reviewed at final hearing under § 1.258, and within 30 days of the decision disposing of the motion the junior party concerned requests that final hearing be set to review such matter. Also, such a junior party may within such 30-day period request a final hearing to review such a matter raised by his opposition to motion under § 1.231(a) (2), (3), (4), or (5) which was granted over his opposition.

2. In § 1.231, subparagraphs (4) and (5) of paragraph (a) and paragraph (d) are revised to read as follows:

§ 1.231 *Motions before the primary examiner.*

(a) . . . .  
(4) To be accorded the benefit of an earlier application or to attack the benefit of an earlier application which has been accorded to an opposing party in the notice of declaration. See § 1.224.

(5) To amend an involved application by adding or removing the names of one or more inventors as provided in § 1.45. (See par. (d) of this section.)

(a) All proper motions as specified in paragraph (a) of this section, or of a similar character, will be transmitted to and considered by the primary examiner without oral argument, except that consideration of a motion to dissolve will be deferred to final hearing before a Board of Patent Interferences where the motion urges unpatentability of a count to one or more parties which would be reviewable at final hearing under § 1.258(a) and such unpatentability is urged against a patentee or has been ruled upon by the Board of Appeals or by a court in ex parte proceedings. Also consideration of a motion to add or remove the names of one or more inventors may be deferred to final hearing if such

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motion is filed after the times for taking testimony have been set. Requests for reconsideration will not be entertained.

§ 1.243 [Amended]

3. In § 1.243, the last sentence is amended by deleting "10 days" and inserting in lieu thereof, the expression "20 days from the date of service of the motion."

§ 1.244 [Amended]

4. In § 1.244, paragraph (c) and paragraph (d), last sentence, is amended by deleting "10 days from the filing" and inserting in lieu thereof, the expression "20 days from the date of service."

5. In § 1.251, paragraph (a) is revised to read as follows:

§ 1.251 *Assignment of times for discovery and taking testimony.*

(a) A period for preparation for testimony will be set in which all parties should complete discovery and other preparatory activities, except for service by the senior party required by § 1.287(a)(1) which is governed by § 1.287(a)(2)(iii).

6. In § 1.253, paragraph (f) is revised to read as follows:

§ 1.253 *Copies of the testimony.*

(f) When the copies of the record are in typewritten form, they must be clearly legible on opaque unglazed, durable paper approximately 8½ by 11 inches in size (letter size) and one of the three copies must be a ribbon copy, but need not be executed by the certifying officer. (The certified transcript may be a properly executed carbon copy. See § 1.277). The typing shall be on one side of the paper, in not smaller than pica type; and double-spaced with a margin of 1½ inches on the left-hand side of the page. The sheets shall be bound at their left edges, in such manner to lie flat when opened, in a volume or volumes of convenient size (approximately 100 pages per volume is suggested) provided with covers. Documentary exhibits should not be included in bound volumes of testimony. Multigraphed or otherwise reproduced copies conforming to the standards specified will be accepted.

7. In § 1.272, paragraph (c) is revised to read as follows:

§ 1.272 *Manner of taking testimony of witnesses.*

(c) By agreement of the parties, the testimony of any witness or witnesses of any party may be submitted in the form of an affidavit by such witness or witnesses. The parties may stipulate what a particular witness would testify to if called, or the facts in the case of any party may be stipulated. When evidence is submitted in one of these forms, four copies of such affidavit or stipulated testimony (§ 1.253 (a), (c), (f)) are required.

8. In § 1.277, paragraph (a) is revised to read as follows:

§ 1.277 *Form of deposition.*

(a) The testimony must be written on letter size paper, with a wide margin on the left-hand side of the page, and with the writing on one side only of the sheet. The pages must be serially numbered throughout the entire record for each party (§ 1.253(c)) and the name of the witness must be plainly and conspicuously written at the top of each page. The questions propounded to each witness must be consecutively numbered, unless paper with numbered lines is used, and each question must be followed by its answer.

9. Section 1.281 is revised to read as follows:

§ 1.281 *Additional time for taking testimony.*

If either party has proceeded with the taking of testimony on his behalf but is unable to complete his case because of inability to procure the testimony of a witness or witnesses within the time limited and said time has expired, and he desires additional time for such purpose, he must file a motion, accompanied by a statement under oath or in the form of a declaration setting forth specifically the cause of such inability, the name or names of the witness or witnesses, the facts expected to be proved by such witness or witnesses, the steps which have been taken to procure such testimony, and

the dates on which efforts have been made to procure it. (See § 1.245 for extensions of time in other situations.)

10. In § 5.3, paragraph (b) is revised to read as follows:

§ 5.3 *Prosecution of application under secrecy order; withholding patent.*

(b) An interference will not be declared involving applications under secrecy order. However, if an application under secrecy order copies claims from an issued patent, a notice of that fact will be placed in the file wrapper of the patent.

Date: April 10, 1973.

ROBERT GOTTSCHALK,  
Commissioner of Patents.

RICHARD O. SIMPSON,  
Acting Assistant Secretary  
for Science and Technology.

[FR Doc. 73-7744; Filed 4-20-73; 8:45 am]

### Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,714,269, G. R. S. Charles, ORNAMENTAL BEADED NECKLACE; 3,215,507, Christian and Pearson, STUD AND SOCKET FASTENER, filed May 17, 1972, D.C.N.J. (Camden), Doc. C-863-72, *Plasti-Hook, Inc. v. Scovill Manufacturing Co.*

2,727,069, J. P. M. Van Waes, PREPARATION OF UREA, filed Nov. 1, 1972, D.C., M.D. La. (New Orleans), Doc. 72-275 CA, *Stamcarbon, N.V. v. Borden, Inc.* On Nov. 22, 1972, a voluntary dismissal was filed by plaintiff under the provisions of FRCP 41(c) dismissing this action with prejudice, Dec. 12, 1972.

2,847,318, E. E. Ellies, METHOD OF TREATING FRESH MEATS, filed Nov. 8, 1971, D.C., N.D. Ohio (Cleveland), Doc. C71-1094, *Tee-Pak, Inc. v. St. Regis Paper Co.* Memorandum opinion and order granting motion of St. Regis Paper Co. for partial summary judgment in C71-446 and declaring claims 5 and 7 of *Reissue Patent 24,992* to be void; further entering summary judgment against *Tee-Pak* in companion infringement suit C71-1094, filed Dec. 22, 1972.

2,858,775, F. D. Marasso, DOUGH HANDLING MACHINE, filed Dec. 27, 1972, D.C., N.D. Ga. (Atlanta), Doc. 17599, *AMF Incorporated v. Pak-It Mfg. Co., Inc.*

3,147,878, I. L. Wissmiller, CRYOGENIC STORAGE TANK, filed Dec. 18, 1972, D.C., N.D. Ohio (Cleveland), Doc. C72-1351, *Chicago Bridge & Iron Company v. Aerojet-General Corporation.*

3,178,820, H. D. Kesling, INTRA-ORAL TOOTH POSITIONER, filed Dec. 21, 1972, D.C., E.D. Wis. (Milwaukee), Doc. 72-C-697, *TP Laboratories, Inc. v. Professional Positioners, Inc., Gerald W. Hoge and Richard Allesee.*

3,196,122, R. M. Evans, CEMENTITIOUS COMPOSITIONS CONTAINING ACRYLIC ESTER POLYMERS, filed Oct. 12, 1967, D.C., N.D. Ohio (Cleveland), Doc. C-67-726, *The Master Mechanics Co. v. The Cleveland Marble Mosaic Co.* Order entering judgment for defendant on its counterclaim for declaratory judgment finding patent to be invalid, further order dismissing plaintiff's complaint, Dec. 21, 1972. *Same*, filed Nov. 3, 1967, D.C., N.D. Ohio (Cleveland), Doc. C-67-811, *The Master Mechanics Co. v. The Rohm & Haas Co.* Judgment for defendant on its counterclaim for declaratory judgment finding patent to be invalid, Dec. 21, 1972.

3,300,643, R. C. McCall, THERMOLUMINESCENT RADIATION DOSIMETER READOUT APPARATUS USING NITROGEN GAS IN THE READOUT CHAMBER, filed Mar. 24, 1971, D.C., N.D. Ga. (Atlanta), Doc. 14,903, *Isotopes, Inc. v. The Harshaw Chemical Company, a division of Kewanee Oil and Joseph J. Piersante.* Settled by parties, Dec. 20, 1972.

3,215,507. (See 2,714,269.)

3,304,127, W. D. Huffaker, MATERIAL HANDLING APPARATUS, filed Dec. 18, 1972, D.C., E.D. Tenn. (Knoxville), Doc. 8114, *Free Flow, Inc. and Billy P. Freeman, formerly doing business as Free Flow Company, and Billy P. Freeman v. MaTran Corporation.*

3,319,384, E. T. Berg, CONSTRUCTION FOR EXTRUDED REGLETS, filed Aug. 18, 1972, D.C., N.D. Ohio (Cleveland), Doc. C-72-874, *Edward T. Berg and Superior Concrete Ac-*



*cessories v. Vari-Seal Corp.* Consent judgment in favor of the plaintiffs; patent valid and has been infringed by the defendant; further order permanently enjoining and restraining defendants, Dec. 21, 1972.

3,400,227. Lear and Auld, COMBINED RADIO AND MAGNETIC TAPE PLAYER; 3,403,868, W. P. Lear, MAGNETIC TAPE CARTRIDGE SYSTEM; 3,437,762, Lear and Auld, MULTI-TRACK TAPE CARTRIDGE PLAYER; 3,500,126, W. P. Lear, MAGNETIC TAPE CARTRIDGE PLAYER SYSTEM, filed Apr. 26, 1972, D.C. Del. (Wilmington), Doc. 4370, *Motorola, Inc. v. Gates Lear Jet Corporation*; Order, Hon. Caleb M. Wright, Chief Judge, transferred this case pursuant to 28 U.S.C. Section 1404(a) to the United States District Court for the District of Colorado, Nov. 24, 1972.

3,403,868. (See 3,400,227.)

3,437,762. (See 3,400,227.)

3,470,834, A. R. Bone, FASTENER ATTACHING DEVICE; 3,518,729, F. G. Merse, EYE-SHANK BUTTON ATTACHMENT, filed Dec. 4, 1972, D.C., S.D. Ohio (Dayton), Doc. 4329, *Dennison Manufacturing Co. v. The Elder-Beerman Stores, Corp.*

3,472,939, Petrocci, Prodo, Shay, and Wakeman, SYNERGISTIC BLENDS OF MICROBICIDAL QUATERNARY AMMONIUM COMPOUNDS; 3,525,793, same MICROBICIDAL QUATERNARY AMMONIUM COMPOUNDS CONTAINING SYNERGISTIC BLENDS OF ALKYL GROUPS, filed Dec. 2, 1971, D.C.N.J. (Newark), Doc. C-1800-71, *Millmaster Onys Corporation v. Lonsa Inc.* Consent order for permanent injunction and for dismissal of first and second counterclaims, Dec. 21, 1972.

3,488,673, S. J. Popell, HAIR CUTTER AND SHAVER; 3,537,449, same; D. 215,640, same, COMBINED HAIR CUTTER AND SHAVER, filed Oct. 24, 1969, D.C.N.J. (Trenton), Doc. 1250-69, *Popell Brothers, Inc. v. Nathan K. Morris, doing business as N. K. Morris Mfg. Co. and W. T. Grant Company.* Judgment entered finding patents all invalid, Dec. 29, 1972.

3,493,956, Andrews, Kolesar, Payne and Posner, TRAVELING MESSAGE DISPLAY, filed Dec. 21, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c3219, *Stewart Warner Corp. and Bunker Ramo Corp. v. Ultronic Systems Corp. et al.*

3,518,729. (See 3,470,834.)

3,525,793. (See 3,472,939.)

3,557,449. (See 3,488,673.)

3,500,126. (See 3,400,227.)

3,627,057, R. M. Carr, Jr., FACTORY-ASSEMBLED HEAT EXCHANGER, filed Apr. 25, 1972, D.C., N.D. Okla. (Tulsa), Doc. 72-C-141, *Heat/Fluid Engineering Corporation v. R & R Engineering Company, Inc.* Plaintiff owner of patent; defendant perpetually enjoined, Dec. 14, 1972.

3,673,410, Walte and Nodine, METHOD OF EXAMINATION OF CELL SAMPLES USING A RADIOACTIVELY TAGGED DYE; 3,678,148, L. Calola, ANALYSIS OF RADIOACTIVE SLIDE SPECIMEN AND METHOD OF PREPARATION, filed Aug. 4, 1972, D.C.N.J. (Trenton), Doc. C-1341-72, *Isomedics, Incorporated and Information Utilization Corporation v. Bio-Digital Sciences, Inc.* Consent order of dismissal without costs, Nov. 21, 1972.

3,678,148. (See 3,673,410.)

3,678,616, Goldfarb, Strader and Strader, DOLL, filed Dec. 19, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72-3012-CC, *Mattel, Inc. v. Sidney L. Lee Co.*

D. 215,640. (See 3,488,673.)

Re. 24,992, E. E. Ellies, METHOD OF TREATING FRESH MEATS, filed Apr. 28, 1971, D.C., N.D. Ohio (Cleveland), Doc. C71-446, *St. Regis Paper Company v. Tee-Pak, Inc.* Memorandum opinion and order granting motion of St. Regis Paper Co. for partial summary judgment in C71-446 and declaring claims 5 and 7 of Reissue Patent 24,992 to be void; further entering summary judgment against Tee-Pak in companion infringement suit C71-1094, filed Dec. 22, 1972.

# Certificates of Correction for the Week of May 22, 1973

|            |           |           |           |
|------------|-----------|-----------|-----------|
| P.P. 3,173 | 3,678,105 | 3,694,280 | 3,704,744 |
| P.P. 3,248 | 3,678,892 | 3,694,884 | 3,705,029 |
| Re. 27,386 | 3,675,256 | 3,694,512 | 3,705,710 |
| 3,405,517  | 3,680,625 | 3,694,787 | 3,705,754 |
| 3,524,738  | 3,681,113 | 3,695,498 | 3,705,853 |
| 3,581,838  | 3,682,044 | 3,695,545 | 3,706,356 |
| 3,581,493  | 3,682,892 | 3,695,847 | 3,706,415 |
| 3,584,307  | 3,683,066 | 3,695,893 | 3,706,612 |
| 3,574,747  | 3,683,201 | 3,696,000 | 3,706,677 |
| 3,577,410  | 3,684,799 | 3,696,044 | 3,706,685 |
| 3,581,172  | 3,685,009 | 3,696,122 | 3,706,693 |
| 3,588,216  | 3,685,635 | 3,697,118 | 3,706,704 |
| 3,589,725  | 3,685,656 | 3,697,380 | 3,706,714 |
| 3,602,886  | 3,685,796 | 3,697,948 | 3,706,892 |
| 3,602,887  | 3,685,953 | 3,699,017 | 3,706,900 |
| 3,607,272  | 3,686,287 | 3,699,065 | 3,706,944 |
| 3,607,939  | 3,686,862 | 3,699,103 | 3,707,060 |
| 3,617,288  | 3,687,325 | 3,699,475 | 3,707,122 |
| 3,622,788  | 3,687,665 | 3,699,696 | 3,707,183 |
| 3,624,450  | 3,687,734 | 3,700,285 | 3,707,255 |
| 3,627,385  | 3,687,900 | 3,700,373 | 3,707,464 |
| 3,627,716  | 3,688,227 | 3,700,422 | 3,707,775 |
| 3,629,589  | 3,688,540 | 3,700,461 | 3,707,862 |
| 3,631,488  | 3,688,668 | 3,700,804 | 3,708,027 |
| 3,632,021  | 3,688,788 | 3,700,851 | 3,708,092 |
| 3,632,545  | 3,689,107 | 3,701,936 | 3,708,387 |
| 3,633,013  | 3,689,555 | 3,702,145 | 3,708,509 |
| 3,633,781  | 3,689,576 | 3,702,254 | 3,708,580 |
| 3,634,167  | 3,689,783 | 3,702,291 | 3,708,620 |
| 3,638,684  | 3,690,266 | 3,702,590 | 3,709,034 |
| 3,641,993  | 3,690,782 | 3,702,827 | 3,709,320 |
| 3,642,806  | 3,690,883 | 3,702,886 | 3,709,517 |
| 3,654,241  | 3,692,406 | 3,703,437 | 3,709,758 |
| 3,655,832  | 3,692,408 | 3,703,670 | 3,709,866 |
| 3,660,375  | 3,692,453 | 3,703,687 | 3,709,948 |
| 3,663,124  | 3,692,712 | 3,703,774 | 3,710,453 |
| 3,663,685  | 3,693,389 | 3,704,138 | 3,710,781 |
| 3,666,097  | 3,693,584 | 3,704,144 | 3,710,930 |
| 3,667,355  | 3,693,661 | 3,704,146 | 3,711,275 |
| 3,668,165  | 3,694,058 | 3,704,163 | 3,711,372 |
| 3,669,953  | 3,694,195 | 3,704,350 | 3,711,416 |
| 3,671,192  | 3,694,245 | 3,704,518 | 3,711,669 |
| 3,672,877  | 3,694,273 | 3,704,643 |           |

## Disclaimers

3,543,720.—*Roger A. Dresler and Conrad Altmann, Rochester, N.Y.* APPARATUS FOR DEVELOPMENT OF ELECTROSTATIC IMAGES. Patent dated Dec. 1, 1970. Disclaimer filed Jan. 23, 1973, by the assignee, *Eastman Kodak Company.*

Hereby enters this disclaimer to claims 1 through 13 of said patent.

3,640,652.—*John R. Mattox and Thomas W. Mattox, Charlotte, N.C.* LOCKING DEVICE FOR TIRE RETREADING MOLD. Patent dated Feb. 8, 1972. Disclaimer filed Aug. 25, 1971, by the inventors.

Hereby disclaim the portion of the term of the patent subsequent to June 23, 1987.

3,640,735.—*Seymour Oppenheimer, Chicago, and Albin F. Turbak, Danville, Ill.* FIBROUS REINFORCED POLY-VINYL ALCOHOL CASINGS. Patent dated Feb. 8, 1972. Disclaimer filed Mar. 23, 1973, by the assignee, *Tee-Pak, Inc.*

Hereby disclaims the portion of the term of the patent subsequent to Dec. 21, 1988.

3,643,466.—*Edward W. Bottum, Brighton, Mich.* REFRIGERATION SUCTION ACCUMULATOR. Patent dated Feb. 22, 1972. Disclaimer filed Aug. 16, 1971, by the inventor.

Hereby disclaims the portion of the term of the patent subsequent to Feb. 16, 1988.

3,646,168.—*Robert E. Barrett, Baton Rouge, La.* OIL AND OZONE RESISTANT ELASTOMER BLENDS COMPRISING EPDM RUBBER. Patent dated Feb. 29, 1972. Disclaimer filed Aug. 12, 1971, by the inventor and the assignee, *Copolymer Rubber & Chemical Corporation.*

Hereby disclaim the portion of the term of the patent subsequent to Jan. 27, 1987.

3,646,169.—*Kenneth H. Wirth, Baton Rouge, La.* SULFUR VULCANIZABLE ELASTOMERIC BLENDS COMPRISING DIOLEFIN RUBBER AND EPDM TERPOLYMERS. Patent dated Feb. 29, 1972. Disclaimer filed Aug. 12, 1971, by the inventor and the assignee, *Copolymer Rubber & Chemical Corporation.*

Hereby disclaim the portion of the term of the patent subsequent to Jan. 27, 1987.

3,663,536.—*William J. Houlihan, Mountain Lakes, N.J.* 1,5-DIAZACYCLONONANES. Patent dated May 16, 1971. Disclaimer filed Aug. 12, 1971, by the assignee, *Sandoz-Wander, Inc.*

Hereby disclaims the portion of the term of the patent subsequent to Apr. 28, 1987.

3,704,123.—*Katsuo Makino and Iwa Sawato, Minami-Ashigara Machi, Japan.* DYE SENSITIZED PHOTOCONDUCTIVE MATERIAL. Patent dated Nov. 28, 1972. Disclaimer filed May 12, 1972, by the assignee, *Fuji Photo Film Co., Ltd.*

Hereby disclaims the portion of the term of the patent subsequent to Feb. 10, 1987.

## Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,382,285, R. R. Egan and L. D. Smlens, LIQUID NONIONIC POLYOXYALKYLENE SURFACE-ACTIVE MATERIALS, decided Mar. 7, 1972, Interference No. 96,880, claim 1.

Patent No. 3,428,471, J. D. Tuthill, N. Kulka and B. S. Arban, METHOD FOR THE MANUFACTURE OF EMBOSSED VINYL FLOOR COVERINGS AND PRODUCTS OBTAINED THEREBY, decided Dec. 15, 1972, Interference No. 96,844, claims 1-4, 6, 7, and 9.

Patent No. 3,469,155, H. W. Van Beek, PUNCH-THROUGH MEANS INTEGRATED WITH MOS TYPE DEVICES FOR PROTECTION AGAINST INSULATION LAYER BREAK-DOWN, decided Dec. 29, 1972, Interference No. 97,388, claims 1-8.

Patent No. 3,486,905, E. B. Hotelling, STABILIZED CHOCOLATE BEVERAGES, decided Jan. 2, 1973, Interference No. 97,986, claims 1, 2 and 5.

## Dedications

2,796,376.—*Oren F. Williams, South Charleston, W. Va., Oscar H. Johnson, Westport, Conn. and Jack R. Graham, St. Albans, W. Va.* ALKYLENEBISDITHIOCARBAMATES, FUNGICIDAL COMPOSITION CONTAINING SAME AND METHOD OF APPLYING. Patent dated June 18, 1957. Dedication filed Dec. 11, 1972, by the assignee, *Food Machinery and Chemical Corporation.*

Hereby dedicates to the Public the remaining term of said patent.

3,594,703.—*Clyde Norman Holtzapfle, Duncannon, Pa.* ELECTRICAL TAPOFF CONNECTOR. Patent dated July 20, 1971. Dedication filed Jan. 9, 1973, by the assignee, *AMP Incorporated.*

Hereby dedicates to the Public all the claims 1-24 for the remaining term of said patent.



## National Technical Information Service

## GOVERNMENT-OWNED INVENTIONS

## Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for licensing in accordance with the GSA Patent Licensing Regulations.

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Paper copies of patents cannot be purchased from NTIS but are available from the Commissioner of Patents, Washington, D.C., 20231, at \$0.50 each. Requests for licensing information should be directed to the address cited below for each agency.

DOUGLAS J. CAMPION,  
Patent Program Coordinator,  
National Technical Information Service.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
Assistant General Counsel for Patent Matters, NASA,  
Code GP-2, Washington, D.C. 20546

- Patent application 326,198. Apparatus for Microbiological Sampling. Filed Jan. 24, 1973. PC \$3/MF \$0.95.
- Patent 3,710,257. Multichannel Telemetry System. Filed Mar. 17, 1971. Patented Jan. 9, 1973. Not available NTIS.
- Patent application 315,069. Ultra-Stable Oscillator. Filed Dec. 14, 1972. PC \$3/MF \$0.95.
- Patent 3,710,261. Data-Aided Carrier Tracking Loops. Filed Dec. 24, 1970. Patented Jan. 9, 1973. Not available NTIS.
- Patent 3,710,329. Phase Control Circuits Using Frequency Multiplications for Phased Array Antennas. Filed July 16, 1970. Patented Jan. 9, 1973. Not available NTIS.
- Patent 3,708,671. System for Indicating Direction of Intruder Aircraft. Filed Mar. 16, 1971. Patented Jan. 2, 1973. Not available NTIS.
- Patent 3,710,122. Laser Communication System for Controlling Several Functions at a Location Remote to the Laser. Filed Apr. 24, 1970. Patented Jan. 9, 1973. Not available NTIS.
- Patent 3,711,728. Solid State Double-Pole Double-Throw Relay. Filed Aug. 19, 1971. Patented Jan. 16, 1973. Not available NTIS.

- Patent 3,708,359. Hydrazinium Nitroformate Propellants With Saturated Polymeric Hydrocarbon Binder. Filed Sept. 23, 1970. Patented Jan. 2, 1973. Not available NTIS.
- Patent 3,695,101. Lift Balancing Device. Filed Sept. 8, 1970. Patented Oct. 3, 1972. Not available NTIS.
- Patent 3,696,833. Observation Window for a Gas Confining Chamber. Filed Dec. 21, 1970. Patented Oct. 10, 1972. Not available NTIS.
- Patent 3,697,021. Geysering Inhibitor for Vertical Cryogenic Transfer Pipe. Filed Dec. 31, 1971. Patented Oct. 10, 1972. Not available NTIS.
- Patent 3,700,575. Method of Forming Transparent Films of ZnO. Filed Nov. 26, 1969. Patented Oct. 24, 1972. Not available NTIS.
- Patent 3,697,630. Bonding or Repairing Process. Filed Aug. 23, 1967. Patented Oct. 10, 1972. Not available NTIS.
- Patent 3,700,291. Two Degree Inverted Flexure. Filed Oct. 29, 1971. Patented Oct. 24, 1972. Not available NTIS.
- Patent 3,700,869. Pseudonoise Sequence Generators With Three Tap Linear Feedback Shift Registers. Filed Dec. 4, 1970. Patented Oct. 24, 1972. Not available NTIS.
- Patent 3,697,733. High Speed Direct Binary to Binary Coded Decimal Converter and Scaler. Filed Dec. 16, 1970. Patented Oct. 10, 1972. Not available NTIS.
- Patent 3,697,950. Versatile Arithmetic Unit for High Speed Sequential Decoder. Filed Feb. 22, 1971. Patented Oct. 10, 1972. Not available NTIS.
- Patent 3,696,418. Altitude Measuring System. Filed Sept. 14, 1970. Patented Oct. 3, 1972. Not available NTIS.
- Patent 3,700,812. Audio System With Means for Reducing Noise Effects. Filed Mar. 11, 1971. Patented Oct. 24, 1972. Not available NTIS.
- Patent 3,701,631. Nondestructive Spot Test Method for Titanium and Titanium Alloys. Filed Apr. 21, 1971. Patented Oct. 31, 1972. Not available NTIS.
- Patent 3,700,538. Polyimide Resin-Fiberglass Cloth Laminates for Painted Circuit Boards. Filed Sept. 10, 1970. Patented Oct. 24, 1972. Not available NTIS.
- Patent 3,700,193. A Method of Delivering a Vehicle to Earth Orbit and Returning the Reusable Portion Thereof to Earth. Filed Jan. 14, 1971. Patented Oct. 24, 1972. Not available NTIS.
- Patent 3,700,893. Method and Apparatus for Determining the Contents of Contained Gas Samples. Filed Feb. 12, 1971. Patented Oct. 24, 1972. Not available NTIS.
- Patent 3,700,897. Infrared Detectors. Filed Feb. 5, 1971. Patented Oct. 24, 1972. Not available NTIS.
- Patent 3,700,334. Interferometer-Polarimeter. Filed Nov. 13, 1970. Patented Oct. 24, 1972. Not available NTIS.
- Patent 3,700,503. Irradiance Measuring Device. Filed June 9, 1971. Patented Oct. 24, 1972. Not available NTIS.

[FR Doc. 73-7853; Filed 4-24-73; 8:45 am]

## PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner  
WILLIAM FELDMAN, Deputy Assistant Commissioner

## CONDITION OF PATENT APPLICATIONS AS OF MAY 1, 1973

| PATENT EXAMINING GROUPS                                                                                                                                                                                                                                                                                                                                                                 | Actual Filing Date of Oldest New Case Awaiting Action |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| <b>CHEMICAL EXAMINING GROUPS</b>                                                                                                                                                                                                                                                                                                                                                        |                                                       |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director.....                                                                                                                                                                                                                                                                                                          | 1-27-72                                               |
| Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.                                                                                                                       |                                                       |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director.....                                                                                                                                                                                                                                                                                                                           | 4-03-72                                               |
| Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.                                                                                                                                                                    |                                                       |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director.....                                                                                                                                                                                                                                                                                                  | 12-15-71                                              |
| Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Fore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.                                                       |                                                       |
| COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director....                                                                                                                                                                                                                                                                                           | 1-07-72                                               |
| Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.                                                                                                                                                                             |                                                       |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director....                                                                                                                                                                                                                                                                                           | 1-10-72                                               |
| Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. |                                                       |
| <b>ELECTRICAL EXAMINING GROUPS</b>                                                                                                                                                                                                                                                                                                                                                      |                                                       |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director.....                                                                                                                                                                                                                                                                                                | 9-20-72                                               |
| Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.                                                                                                                                                               |                                                       |
| SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director.....                                                                                                                                                                                                                                                                                                                    | 8-01-72                                               |
| Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.                                                                                                                                                                     |                                                       |
| INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director.....                                                                                                                                                                                                                                                                                                   | 7-03-72                                               |
| Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Device; and Related Arts.                                                                                                                                                                                                                                                      |                                                       |
| RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director.....                                                                                                                                                                                                                                                                                        | 1-10-72                                               |
| Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.                                                                                                                                                                       |                                                       |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director.....                                                                                                                                                                                                                                                                                                        | 1-05-72                                               |
| Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.                                                                                                                                                                                                                         |                                                       |
| DESIGNS, GROUP 290—R. L. CAMPBELL, Director.....                                                                                                                                                                                                                                                                                                                                        | 7-06-71                                               |
| Industrial Arts; Household, Personal and Fine Arts.                                                                                                                                                                                                                                                                                                                                     |                                                       |
| <b>MECHANICAL EXAMINING GROUPS</b>                                                                                                                                                                                                                                                                                                                                                      |                                                       |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director.....                                                                                                                                                                                                                                                                                                                     | 5-06-72                                               |
| Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.                                           |                                                       |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director.....                                                                                                                                                                                                                                                                                                 | 2-07-72                                               |
| Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding; Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.                    |                                                       |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director.....                                                                                                                                                                                                                                                                                                | 4-10-72                                               |
| Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletary; Printing; Typewriters; Stationery; Information Dissemination.                                                                                                              |                                                       |
| HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director.....                                                                                                                                                                                                                                                                                                               | 3-06-72                                               |
| Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.                                                         |                                                       |
| MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director.....                                                                                                                                                                                                                                                                                                 | 3-29-72                                               |
| Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.                                                                         |                                                       |

Expiration of patents: The patents within the range of numbers indicated below expire during May 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,743,442 to 2,748,387, inclusive  
Plant Patents..... Numbers 1,472 to 1,480, inclusive



## PLANT PATENTS

GRANTED MAY 22, 1973

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,338

### AZALEA PLANT

Hubert B. Lewis and Helen H. Lewis, both of 16562 E. Leffingwell Road, Whittier, Calif. 90603  
Filed Dec. 11, 1970, Ser. No. 97,399  
Int. Cl. A01h 5/00

U.S. Cl. Plt.—56

1 Claim

1. A new and distinct variety of azalea plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a superior habit of growth, good flower size, a flower form very similar to the flowers of the azalea variety known as "Pink Enchantress" (Plant Patent No. 2,310), a distinctive, attractive and bright Phlox Pink basic flower color with shadings ranging from a pale blush to white, and excellent suitability for year around forcing.

3,339

### PIERIS JAPONICA

Paul R. Bosley, 9579 Mentor Ave., Mentor, Ohio 44060  
Filed Apr. 26, 1971, Ser. No. 137,720  
Int. Cl. A01h 5/00

U.S. Cl. Plt.—54

1 Claim

1. The new and distinct variety of *Pieris japonica* plant, substantially as herein described, characterized particularly by its ability to stay green under adverse conditions and not winter burn as *Pieris japonica* will often do, and having a glossier and wavy foliage than other known *Pieris japonica*.

3,340

### ROSE PLANT

David L. Armstrong, Upland, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.  
Filed May 5, 1971, Ser. No. 140,543  
Int. Cl. A01h 5/00

U.S. Cl. Plt.—19

1 Claim

A hybrid tea rose plant which bears average to large size purplish pink blooms on rather strong moderately long stems. Most stems bear a single bloom, though some may bear four or five in an irregular cluster. The plant foliage is abundant, with moderately large leathery but not glossy leaves and longer-than-average peduncles:

somewhat better than average resistance to mildew. The buds are quite long, either pointed or urn-shaped, and open into blooms which comprise quite broad petals, especially towards the center. Fragrance: moderately strong tea rose.

3,341

### CARNATION PLANT

Vincent P. Quinn, 1235 S. Irving St., Denver, Colo. 80219  
Filed June 21, 1971, Ser. No. 155,365  
Int. Cl. A01h 5/00

U.S. Cl. Plt.—70

1 Claim

1. The new and distinct variety of carnation plant, substantially as herein described and illustrated.

3,342

### PEACH TREE

Wilfred A. Pratt, Wenatchee, Wash. 98801  
Filed June 28, 1971, Ser. No. 157,697  
Int. Cl. A01h 5/03

U.S. Cl. Plt.—43

1 Claim

A mutant of the Red Haven peach tree, with fruit similar in appearance and time of ripening to Early Red Haven (Plant Patent 2,343) but characterized in the greater firmness and longer storage life of its fruit than that of Early Red Haven.

3,343

### CHRYSANTHEMUM PLANT

Yoshio Nishimoto, Mountain View, Calif., and Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoshio Nishimoto, Mountain View, Calif.

Filed Sept. 14, 1971, Ser. No. 180,531  
Int. Cl. A01h 5/00

U.S. Cl. Plt.—78

1 Claim

1. A new and distinct cultivar of chrysanthemum characterized particularly as to its uniqueness when compared to the parent cultivar Fuji Mefo by its light yellow flower color, approximately 1/2" larger flowers, and by its petal tubes which are narrower in diameter thereby providing a more delicate appearance.

## PATENTS

GRANTED MAY 22, 1973

### GENERAL AND MECHANICAL

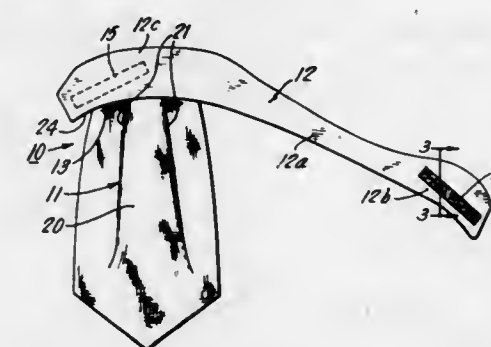
3,733,614

#### OPEN COLLAR NECKTIE

Lorne Abramowitz, Westmount, Quebec, Canada, assignor to Abbey Incorporated, Montreal, Quebec, Canada  
Filed Jan. 10, 1972, Ser. No. 216,570  
Int. Cl. A41d 25/00

U.S. Cl. 2—144

7 Claims



An article of neckwear comprising a neckband having a display side and a reverse side for engaging the wearer's neck and opposed upper and lower margins and opposed ends for connection together. The neckband is provided with a frontal portion and a neck encircling portion extending angularly therefrom in the direction of the upper margin whereby the frontal portion rests on the lower part of the neck when worn. A bib having a display side and a reverse side and an upper margin is connected to the neckband. More specifically, the upper margin of the bib is connected to the upper margin of the frontal portion of the neckband so that the bib when worn rests on the lower part of the neckband and depends over the neckband from the upper margin thereof and the display side of both the bib and neckband face outwardly.

3,733,615

#### INSERTABLE SKI CUFF FOR STRETCH PANTS

Wilton Jaffee, Lambertville, N.J., assignor to H. Freeman & Son, Inc., Philadelphia, Pa.  
Filed July 13, 1971, Ser. No. 162,210  
Int. Cl. A41d 1/08

U.S. Cl. 2—232

5 Claims



A form of skiing and sports apparel, having an insertable cuff piece attachable inside each leg portion of a pair of verti-

cal stretch pants, the cuff piece extending from approximately two inches above the bottom edge downward and out of the leg of the trouser and over the user's ski boot, having a pair of elastic bands designed to firmly hold the cuff piece onto the ski boot. The cuff piece is attached to the inside of the trousers by a pair of Velcro type fasteners, and may be easily removed so that the pants may be worn without the insertable cuff pieces in normal non-skiing wear.

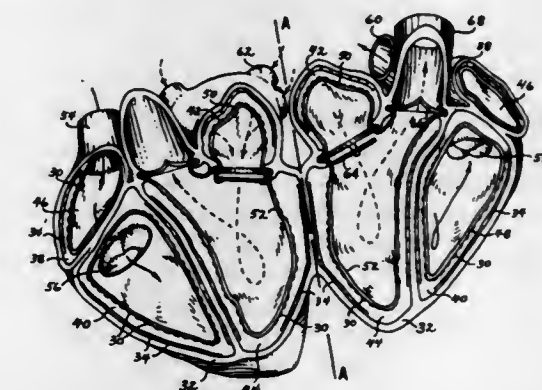
3,733,616

#### ELECTROMAGNETICALLY ACTUATED ARTIFICIAL HEART

Frederick Gordon Willis, Jr., Belmont, Mass., assignor to Richard J. Birch, Wellesley, Mass., a part interest  
Filed May 3, 1971, Ser. No. 139,701  
Int. Cl. A61f 1/24

U.S. Cl. 3—1

8 Claims



An artificial heart pump which utilizes a plurality of electromagnets to alternately repel and attract a corresponding plurality of permanent magnets mounted on two flexible membranes each of which forms one of the heart's two ventricle chambers.

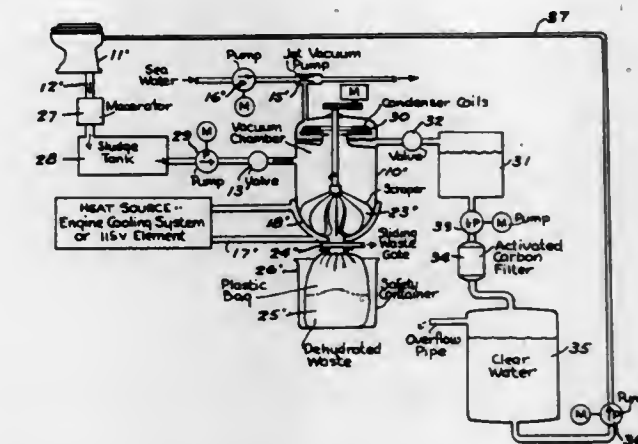
3,733,617

#### DISPOSAL SYSTEM FOR HUMAN WASTE

Charles H. Bennett, 20400 Nine Mile Road, St. Clair Shores, Mich.  
Filed July 23, 1971, Ser. No. 165,643  
Int. Cl. E03d 1/00, 3/00, 5/00

U.S. Cl. 4—10

26 Claims



Apparatus for handling human waste wherein the human waste is delivered to a vessel and heat is applied to the vessel,



preferably simultaneously with the application of vacuum, to vaporize the liquid component of the waste material leaving dehydrated waste which can be readily removed.

3,733,618

# WATER SAVER ATTACHMENT FOR TOILET TANK FLUSH VALVE

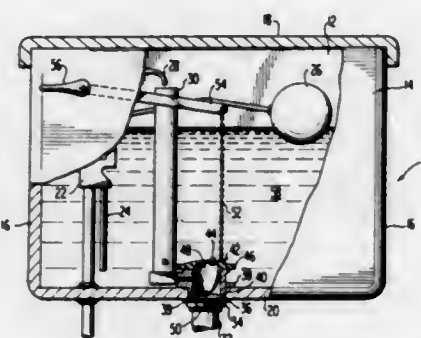
William A. Wiegand, 2440 East Commercial Boulevard, Fort Lauderdale, Fla.

Filed Jan. 4, 1972, Ser. No. 215,361

Int. Cl. E03d 1/34

U.S. Cl. 4-57 R

23 Claims



A water saver attachment for toilet tank flush valves is presented. The attachment includes an automatic one-way vent valve mounted in an opening through the wall of the flush valve. The vent valve may be preset to control the rate of flow therethrough. As the buoyant flush valve vents water replaces the vented air to decrease the buoyancy of the valve causing it to close before all water has drained from the tank. The rate of flow through the vent then is proportional to the amount of water retained in the tank when the flush valve closes. A variety of one-way valves are contemplated, within the scope of this invention, however, in a preferred embodiment, a ball check or stem check valve is utilized. A kit is also disclosed including a vent valve and a punch for making the valve-receiving opening in a conventional flush valve. Flush valves are also described wherein the vent valve is molded therein.

3,733,619

# VENTILATED TOILET

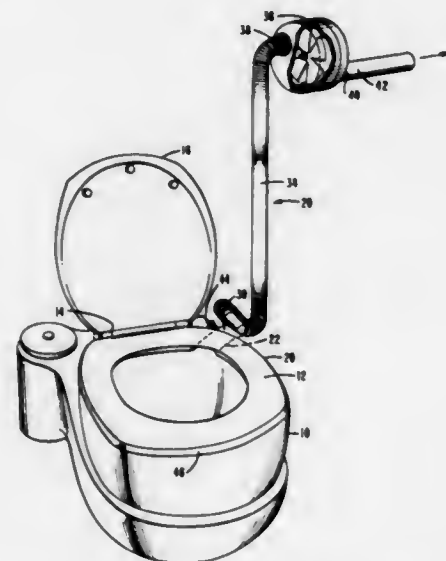
Forrest D. Smith, P.O. Box 222, Orleans, Calif.

Filed Jan. 3, 1972, Ser. No. 214,669

Int. Cl. E03d 9/04, 11/02, 11/18

U.S. Cl. 4-72

7 Claims



A conventional toilet stool to which is hinged a seat that seals in the down position with the upper rim of the toilet

stool. An exhaust vent extending through the toilet seat from the inner lower edge to the outer edge. A flexible hose is detachably connected to the discharge side of the vent. The other end of the flexible hose is connected to the intake side of an exhaust fan. The exhaust fan discharges directly or through a second flexible hose to some exterior location.

3,733,620

# COLLAPSIBLE BED SHAMPOO BASIN WITH THROW AWAY LINER

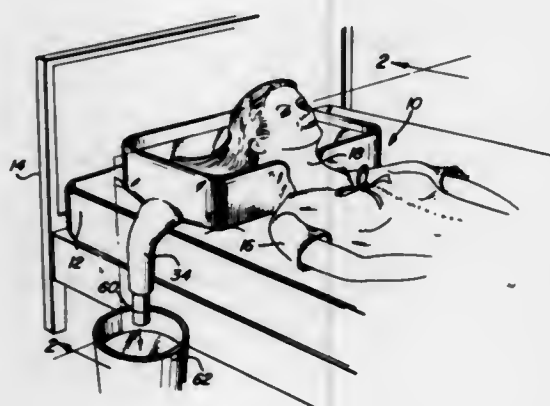
Georgia E. Gintz, 2909 University Avenue, Des Moines, Iowa

Filed May 20, 1971, Ser. No. 145,443

Int. Cl. A47k 3/12

U.S. Cl. 4-159

4 Claims



An upwardly opening tray of generally rectangular configuration and including a bottom wall inclined toward one side of the tray. The side of the tray toward which the bottom wall is inclined is provided with an outlet neck into which fluids within the tray may readily drain by gravity and a liner of the throw away type and constructed of flexible material is provided. The liner is of the same plan shape as the tray so as to be seatingly receivable therein and also provided with a somewhat smaller diameter outlet neck which may be telescoped down into the outlet neck of the tray. In addition, the liner includes side wall portions of greater vertical extend which project above the side walls of the tray and may be folded outwardly and downwardly over the outer surfaces of the side walls of the tray.

3,733,621

# WINTERIZING COVER FOR ABOVE-THE-GROUND SWIMMING POOL SKIMMER OPENING

Frank Jannuzzi, Jr., 239 Maple Avenue, North Plainfield, N.J.

Filed Apr. 2, 1971, Ser. No. 130,679

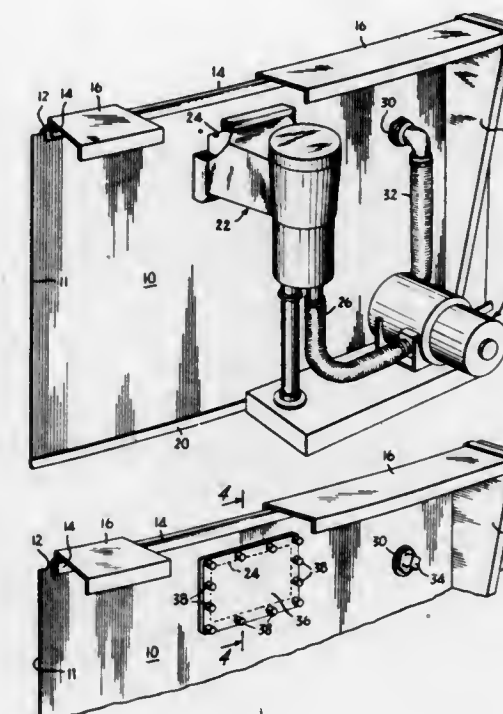
Int. Cl. E04h 3/16, 3/18

U.S. Cl. 4-172.19

4 Claims

A winterizing cover for the skimmer opening in the wall of an above-the-ground swimming pool is flat and plate-like in shape and dimensioned to overlap and engage the pool wall around the periphery of the opening. A plurality of bosses formed integrally with the cover project from the outer face of the overlapping portion of the cover, and an equal number of holes, corresponding with holes in the pool wall around the

periphery of the opening, extend from the inner face of the cover into the bosses so that the holes extend beyond the



thickness of the cover without penetrating the outer face so that a leak proof cover is provided that can be securely fastened to the pool wall.

3,733,622

# ACCESS PANEL FOR PLUMBING FITTINGS

John W. Searles, 107 Springdale Circle, Thomasville, Ga.

Filed Jan. 13, 1972, Ser. No. 217,476

Int. Cl. E03c 1/00; F16l 5/00

U.S. Cl. 4-191

8 Claims



A supporting frame for an access panel covering bath or shower fittings includes horizontal bars which are fixed directly to wall studs. Vertical bars are mounted for lateral adjustment on the horizontal bars to accommodate various center distances found in plumbing fittings. The access panel proper attaches to the frame in such a manner that it may be adjusted into flush relationship with tiled or painted walls of varying thicknesses.

3,733,623

# HOSPITAL BEDS

John Mervyn Croxton, Birmingham, England, assignor to J. Nesbitt-Evans & Company Limited, Wednesbury, Stafford County, England

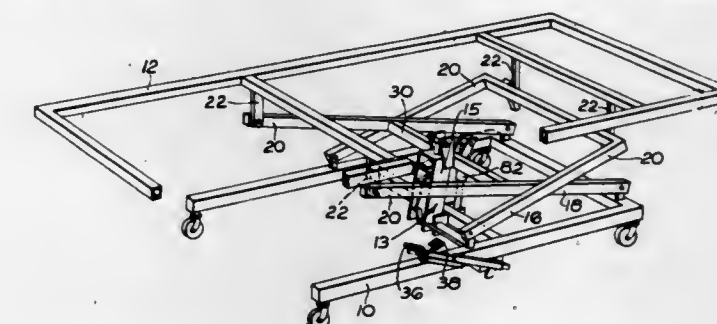
Filed Nov. 17, 1971, Ser. No. 199,411

Claims priority, application Great Britain, Nov. 24, 1970, 55,709/70

Int. Cl. A61g 7/00, 7/10

U.S. Cl. 5-63

5 Claims



A hospital bed having a mattress supporting element which can be elevated or lowered relative to the bed chassis through the agency of a mechanical jack is additionally provided with a hydraulic damper for controlling descent of the supporting element.

3,733,624

# BACK FOR A SOFA

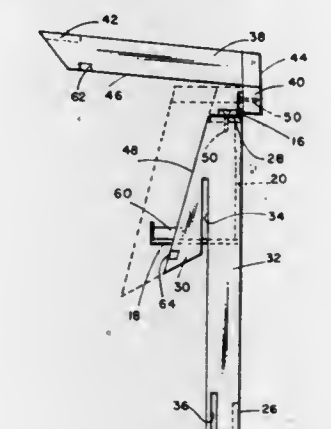
Sidney A. Trabin, 14 North Granville Avenue, Margate City, N.J.

Filed Sept. 15, 1971, Ser. No. 180,637

Int. Cl. A47c 17/04

U.S. Cl. 5-58

1 Claim



A back for a sofa, the back comprising a frame, the frame including a stationary segment and a movable segment connected to the stationary segment. The stationary and movable segments include respective abutments mutually engageable with one another for maintaining respective portions of both the stationary and movable segments in spaced relation with one another and between which portions is defined an accessible concealed storage space in which accessories to the sofa are storable.

3,733,625

# SPRING DECK AND INSULATOR FOR FURNITURE

John G. Platt, Carthage, and Robert O. Isaacs, Joplin, both of Mo., assignors to Flex-O-Lators, Inc., Carthage, Mo.

Filed Aug. 5, 1971, Ser. No. 169,279

Int. Cl. A47c 27/22

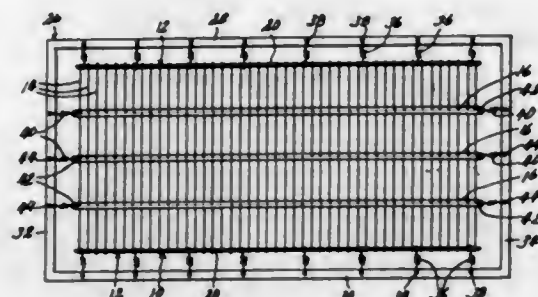
U.S. Cl. 5-354

10 Claims

A spring deck and insulator for furniture consisting of a planar sheet having a continuous series of closely spaced



parallel cross wires connected at their ends to flexible side strands and a series of flexible straps extending parallel to and spaced intermediate the side strands, each strap being secured to each of the cross wires at its point of intersection therewith, the sheet being adapted to be inserted with or without edge



connections between a spring deck and padding layers of upholstered furniture for use as an insulator pad, or to be used as a spring deck by securing it in a rigid furniture frame by resilient fasteners extending from each of the side strands and from each end of each of the straps, to the frame.

3,733,626

# COMPOUND ACTION TOOL WITH WIRE STRIPPER AND BOLT CUTTER

Irving Allen, Westbrook, Conn., assignor to Sargent and Company, New Haven, Conn.

Filed Sept. 21, 1971, Ser. No. 182,446  
Int. Cl. H02g 1/12; B25b 7/22

U.S. Cl. 7-5.3

5 Claims



This specification discloses a compound action tool of the type commonly employed for crimping purposes with a wire stripper and bolt cutter being incorporated in the tool. The tool comprises a pair of handles having laterally extending ears in overlapping relation and pivotally connected. An arm is pivoted to the end of each handle and terminates in a jaw. Each arm has a lobe extending laterally towards the other arm. Each arm is formed with an arcuate slot in the region of the lobe with each slot receiving a pin on the lobe of the other arm. The end edge of each lobe is formed as a curved cam surface which is engaged by a portion of the jaw on the other arm which projects therefrom and overhangs the cam surface.

A pair of plates having end portions formed as wire stripping jaws are pivotally mounted on the pivot which connects the handles. One of these plates is fixed to one handle and the other is adjustable on the other handle. An adjusting disc is pivoted on the latter handle and is connected to the adjustable plate by a pin and slot connection. A spring ratchet cooperates with the disc to secure an adjusted position of the stripping jaw controlled thereby. The arms are deformed in the regions of the lobes to provide a sliding face to face engagement of the latter. Each arm and the lobe thereon is formed with a series of openings for bolt cutting purposes.

3,733,627

# ELECTRICIAN'S COMBINATION TOOL

Harry Epstein, Seaford, N.Y., assignor to Kastar, Inc., Bellport, N.Y.

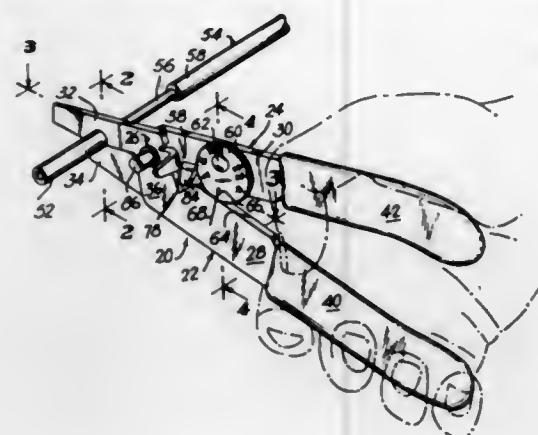
Filed May 20, 1971, Ser. No. 145,345  
Int. Cl. H02g 1/12

U.S. Cl. 7-5.4

10 Claims

Combination tool of particular utility to electricians or other craftsmen, handymen, mechanics or the like, for per-

forming any of a plurality of operations involved in terminating electrical wires including cutting of wires, stripping of in-



sulation therefrom, crimping solderless terminals, forming screw connection loops and turning screws.

3,733,628

# BOAT WITH PIVOTALLY MOUNTED DETACHABLE WHEEL ASSEMBLIES

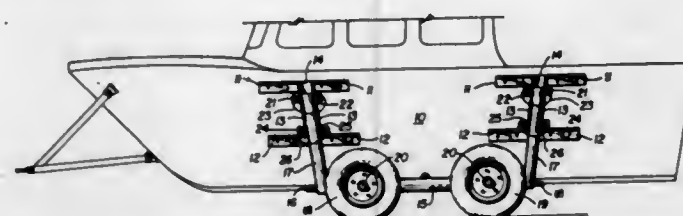
Jim D. Helbig, 11484 West 68th Avenue, Arvada, Colo.

Filed Sept. 16, 1971, Ser. No. 181,043

Int. Cl. B63c 13/00

U.S. Cl. 9-1 T

8 Claims



A boat provided with a two-wheel assembly pivotally and detachably fastened to each side of the boat for supporting the boat in substantially horizontal position on land, without other supporting means, for cooperating in transportation of the boat on land and for launching the boat. The two wheels of each assembly are rotatably mounted in tandem fashion on a single frame pivotally mounted on the boat, and each assembly includes locking means for maintaining the wheeled frame in boat supporting position, the locking means being removable to permit pivotal movement and removal of the wheel assembly.

3,733,629

# BUOYANT MATRIX MATERIALS

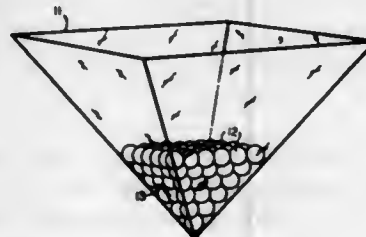
Laurent A. Beaubien, Arlington, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 884,526, Dec. 12, 1969. This application May 27, 1971, Ser. No. 147,692

Int. Cl. B63b 21/00

U.S. Cl. 9-8 R

3 Claims



A matrix material for a buoyant composite structure formed with spheres of buoyant material.

3,733,630

# AQUATIC SPORTING DEVICE

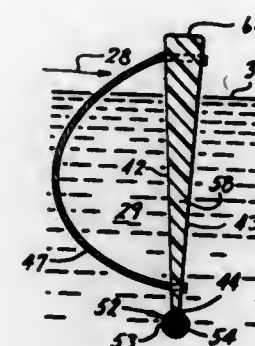
Richard O. Bagley, 1610 Milvia, Berkeley, Calif.

Filed Apr. 16, 1971, Ser. No. 134,760

Int. Cl. A63b 31/06

U.S. Cl. 9-311

3 Claims



An aquatic sporting device is disclosed which includes a body formed of a density to float in water and having a first side providing a wave engaging surface, a second oppositely facing side, a connecting portion and manually engageable handle means. The body is further formed for securement of weighting means thereto adjacent the connecting portion to cause body to float in a stable position with the connecting portion extending downwardly below the top surface of the water and the wave engaging surface oriented transverse to the top surface of the water. The body is preferably formed with a V-shaped end cross-section and is weighted to float with at least the majority, and preferably about 80 percent, of the wave engaging surface below the top surface of the water. The body of the device may be formed of a foamed material or be pneumatically inflated. Weighting may be accomplished by the use of granular weighting materials such as sand.

3,733,631

# REINFORCED STRAP HOLDER

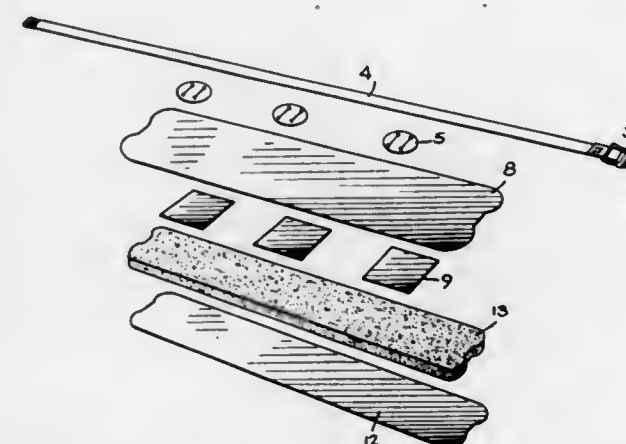
H. Marvin Cohn, 31-74 Monterrey Drive, Merrick, N.Y.

Filed Oct. 16, 1970, Ser. No. 81,198

Int. Cl. B63c 9/10

U.S. Cl. 9-340

10 Claims



A reinforced water ski belt strap holder comprised of heat sealed nylon impregnated material on two sides of the protective covering of the ski belt provides an economical and sturdy means for securing a strap to a ski belt. Other forms of life preservers such as life jackets or buoyant seat cushions having a heat sealable material coating can be adapted to utilize the improved strap holder.

3,733,632

# ROUGHENING MACHINE FOR LASTED UPPERS

Johann Bechtold, Oberursel, Germany, assignor to Maschinenfabrik Moenus Aktiengesellschaft, Frankfurt am Main, Germany

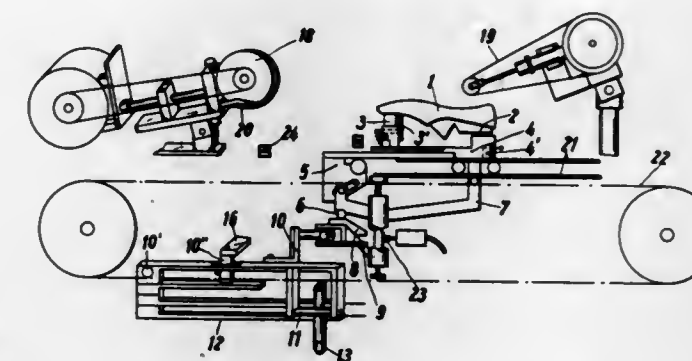
Filed May 19, 1972, Ser. No. 255,052

Claims priority, application Germany, May 22, 1971, P 21 25 485.3

Int. Cl. A43d 00/00

U.S. Cl. 12-1 R

8 Claims



The marginal portion of an upper is roughened by rotary brushes while the upper is transported by a carriage having a heel support, and a toe support mounted on an adjustable slide. Adjustment to different sizes of the uppers is carried out by sensing a three dimensional cam which preferably has two parallel cam discs which are both sensed by bridging rollers whose positions are sensed by feeler rollers. The rotary brushes are adjusted in accordance with the positions of the sensing rollers.

3,733,633

# BALL CLEANING APPARATUS

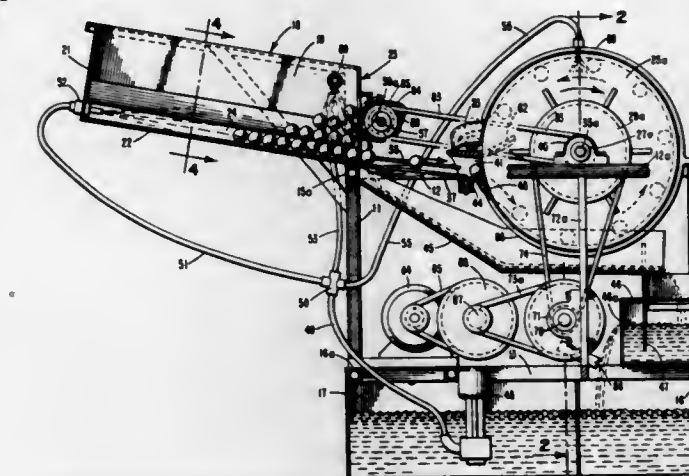
August W. Gustafson, 350 Pasadena Place, Corpus Christi, Tex.

Filed Nov. 23, 1971, Ser. No. 201,512

Int. Cl. A63b 47/04

U.S. Cl. 15-21 A

4 Claims



An apparatus for cleaning golf balls and the like combines a pair of cleansing brushes rotatable in opposite directions at different speeds with a means for placing the balls one after the other between the rotating brushes which includes a hopper having a rotatable drum to prevent bridging of balls therein and an open runway between the hopper and brushes having a means which deflects the ball entering the space between the brushes more firmly against the faster rotating brush than the other to avoid rejection of the ball by the oppositely rotating brushes.



3,733,634

**ELECTRIC SKIN HYGIENE BRUSH**

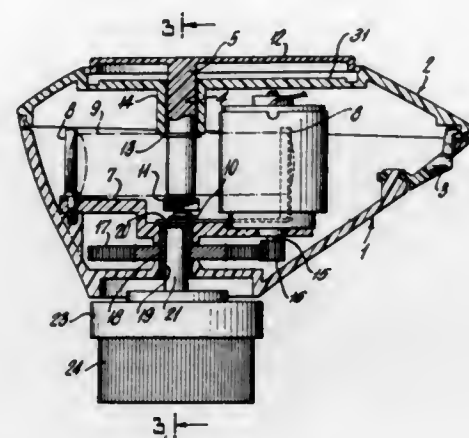
Alvin Victor Golbe, Englewood, N.J., assignor to Clairol Incorporated, New York, N.Y.

Filed May 27, 1971, Ser. No. 147,414

Int. Cl. A46b 13/02

U.S. Cl. 15-28

5 Claims



A skin cleansing brush including a housing with a battery powered motor mounted therein rotating a tubular drive shaft which removably receives the stem of a brush having soft bristles for engaging the skin of a user. The housing has a configuration to be gripped by a single hand of a user, and an actuator button is disposed on a broad end of the housing to facilitate actuation of the brush.

a raised, inoperative position to a lowered, operative position projecting below the broom head, and a scraper mounted on the opposite side of said broom adapted to be shifted from a raised position to a lowered position projecting below said



broom, said shovel and scraper forming rigid elements when in their raised, inoperative positions preventing the broom bristles from bending too far and breaking during use, thereby promoting the useful life of said broom.

3,733,635

**SPLASH GUARD FOR SCRUBBING MACHINES**

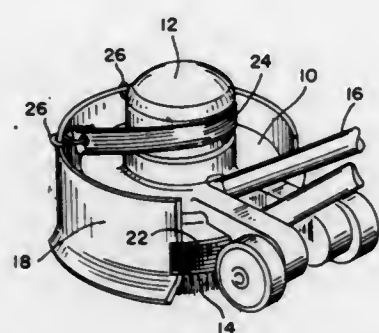
Charles A. Carden, 6332 West 26th Street, Berwyn, Ill.

Filed Aug. 30, 1971, Ser. No. 176,002

Int. Cl. A471 11/162

U.S. Cl. 15-49 R

2 Claims



A splash guard for scrubbing machines removably held around the periphery of a scrubbing machine wherein relatively large circular brushes are rotatably mounted. Said machines, in use, continually throw dirty water outwardly with some centrifugal force around the entire machine, the splash guard preventing such dirty water reaching base boards and the like when the machine is maneuvered closely thereto.

3,733,637

**FLOOR SCRAPER**

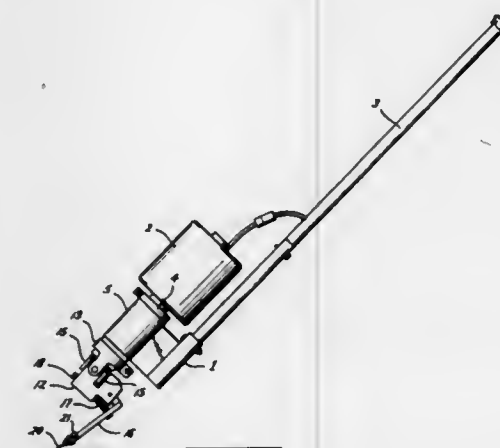
Anthony F. Becker, 6130 Cavalier, Houston, Tex.

Filed June 7, 1971, Ser. No. 150,443

Int. Cl. A471 11/12

U.S. Cl. 15-93 R

3 Claims



A floor scraper for removing tile, grease and other debris from a floor surface, having a framework, a motor mounted on said framework and an eccentric cam rotated by said motor, a blade holder mounted pivotally on said framework and bearing against said cam, means for constantly urging said blade holder into contact with said cam to apply a forwardly exerted thrust to said blade.

3,733,636

**COMBINATION BROOM SHOVEL, AND SCRAPER**

Paul Osadsky, Racine, Wis., assignor to Dawn E. Kawa, Racine, Wis.

Filed Apr. 15, 1971, Ser. No. 134,361

Int. Cl. E01h 5/02; A471 13/00

U.S. Cl. 15-111

5 Claims

A combination implement including a broom, a shovel mounted on one side of said broom adapted to be shifted from

3,733,638

**PAINT BRUSH CONSTRUCTION**

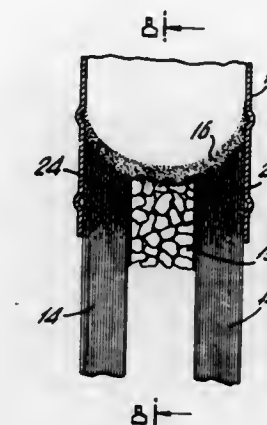
Ronald M. Kaplan, Cedar Grove, N.J., assignor to H & G Industries, Inc., Belleville, N.J.

Filed May 24, 1971, Ser. No. 146,336

Int. Cl. A46b 3/02, 3/02

U.S. Cl. 15-193

6 Claims



In a paint brush consisting of a handle, bristles, a ferrule, binder and a plug where the plug is used to form a pocket within the bristles, the plug is formed of a resilient cellular plastic material with exposed cells on part of its surface to form a mechanical bond between the plug and the binder by means of the exposed cells.

3,733,640

**VACUUM CLEANER NOZZLE**

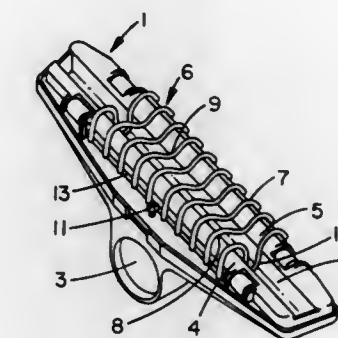
Raymond H. Finberg, Elkins Park; Robert B. Edelson, Dresher, both of Pa., and Richard E. De Sisto, Salem, Mass., assignors to Proctor-Silex Incorporated, Philadelphia, Pa.

Filed Aug. 2, 1971, Ser. No. 168,275

Int. Cl. A471 9/06

U.S. Cl. 15-402

7 Claims



A vacuum cleaner nozzle having a wire-form carpet contact portion configured curvilinearly with a taper toward the nozzle in the direction of forward movement of the nozzle.

3,733,641

**APPARATUS FOR STRIPPING FLUID FROM WELL PIPE**

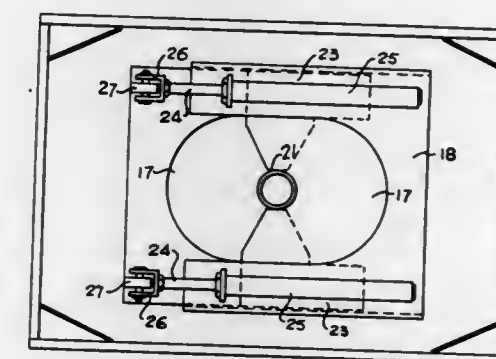
William Henry Brown, 13055 149th St., Edmonton, Alberta, Canada

Filed Aug. 17, 1971, Ser. No. 172,428

Int. Cl. E21b 33/08

U.S. Cl. 15-210 B

4 Claims



The apparatus is used in conjunction with a rig to strip mud or oil from a tubular string as it is pulled from a well. The apparatus comprises a pair of opposed, overlapping rubber pads mounted in a container. One or more air cylinders or like means link the pads. The cylinders can be actuated from the rig floor to draw the pads together around the string as it sways laterally during tripping. The pressure with which the pads press against the string can be adjusted; this permits the unit to operate as a stripper when the string is being pulled from the well, and as a well bore cover when the string is being run back into the well.

3,733,639

**RENOVATOR**

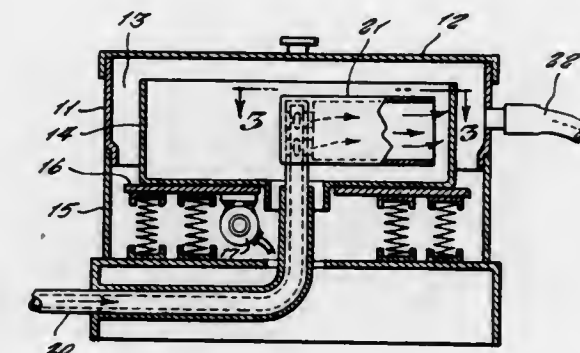
Martin R. Timian, 1518 7th, Bremerton, Wash.

Filed Oct. 19, 1970, Ser. No. 82,011

Int. Cl. A471 5/14

U.S. Cl. 15-304

1 Claim



A cleaning apparatus for an automobile air cleaning element, the device comprising a housing with a removable cover plate so to position an automobile air cleaner unit there within, a spring-supported element support and a unit foundation there below, and an air line delivering air to a revolving air distributor while the housing is connected by a flexible hose to a vacuum cleaner, and a vibrating motor below the spring-supported element support, the motor having an extension cord therefrom for being connected to an electric power supply.



3,733,642

**HINGE COUPLING FOR A WINDSHIELD WIPER ASSEMBLY**

Eckhardt Schmid, Guglingen/Wurtemberg, Germany, assignor to SWF-Spezialfabrik Fuer Autozubehor Gustav Rau GmbH, Bietigheim, Germany

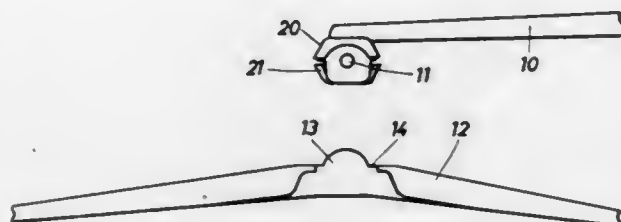
Filed Sept. 20, 1971, Ser. No. 182,487

Claims priority, application Germany, Sept. 29, 1970, P 70 35 947.6

Int. Cl. B60s 1/40

U.S. Cl. 15—250.32

9 Claims



In connecting a windshield wiper arm to the yoke of a wiper blade, a monolithic coupling part formed of a plastic material is used. The wiper arm is pivotally connected to the coupling part and, in turn, the coupling part is disposed in locked engagement with the yoke. The coupling part is formed of a plurality of spaced wall sections which form recesses into which a U-shaped part of the wiper arm fits. A bearing pin fits through a continuous bore extending through the wall sections of the coupling part and through the U-shaped part of the wiper arm to afford the pivotal connection between the two. The portion of the yoke connected to the coupling part fits into slots formed on the outer surface of the coupling part and retains the bearing pin within the continuous bore.

3,733,643

**WINDSHIELD WIPER FOR AUTOMOTIVES**

Dario Arman, P.zza Adriano 15, Torino, Italy

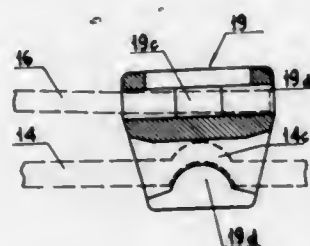
Filed Oct. 1, 1971, Ser. No. 185,717

Claims priority, application Italy, Oct. 26, 1970, 70577 A/70

Int. Cl. B60s 1/04, 1/40

U.S. Cl. 15—250.42

1 Claim



An improved automotive windshield wiper blade which simplifies the connections between the central bar of the blade support and the rocker arms. This device comprises a pair of brackets and a pair of bridges, both with superimposed cavities therein and internal projections within said cavities to fittingly engage a plurality of seats provided at the ends of said central bar, at the end of the rocker arms and at a bend formed in the middle of the rocker arms. This improved structure permits noiseless operation of the wiper even at high travelling speed.

3,733,644

**SCRAPER MEMBER FOR DRAFTING SYSTEM**

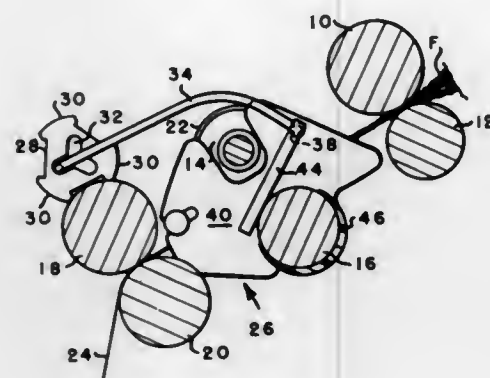
Grady H. Sanders, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 857,767, Sept. 15, 1969,

abandoned. This application July 16, 1971, Ser. No. 163,174

Int. Cl. D01h 5/64

4 Claims



An intermittently actuated scraper member for one of the front rolls of a drafting system to scrape lint from such roll to prevent the accumulation of lint, trash, etc.; thereon, thereby eliminating the cause of lap ups on such roll.

3,733,645

**PAINT MIXING AND PAINT ROLLER MOUNTING APPARATUS**

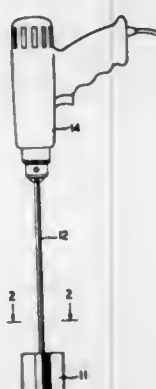
Edwin Nail Seller, 80 Hunterdon Boulevard, Murray Hill, N.J.

Filed Aug. 31, 1971, Ser. No. 176,488

Int. Cl. B08b 1/04

U.S. Cl. 15—257 R

10 Claims



A mixer-mount attachment is included on the end of a rotatable mandrel driven by an electric drill or the like. The attachment has a star-shaped cross-section, is made of flexible material, and has a maximum diameter slightly larger than the inner diameter of a hollow paint roller jacket. It constitutes an efficient paint mixer, and, when inserted in the paint roller jacket, constitutes a mount for rotating a paint roller jacket within a helical channel for cleaning purposes.

3,733,646

**VACUUM CLEANER HEAD WITH SHAG RUG RAKE**

Gary W. Mein, 6108 Cypress, Kalamazoo, Mich.

Filed June 14, 1971, Ser. No. 152,550

Int. Cl. A47I 9/06

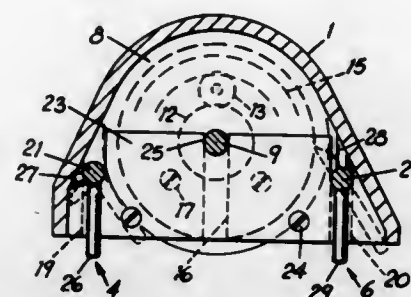
U.S. Cl. 15—369

2 Claims

A transversely elongated suction head arranged in T-shaped and fixed relation to a tubular suction wand has transversely extending front and rear rake bars pivoted in its ends. Teeth

on the bars swing down on retracting motion of the head, and upwardly and rearwardly on advancing motion. A rotary brush positioned within the head and between the rakes is rotated

each other, rotatable about a vertical axis, by means of a ball bearing, the outer ring of said bearing being connected to said housing and the inner ring being connected to the wheel fork,



oppositely to the motion of the head by friction drive of wheels on the end of the head connected to the brush by reverse drive gearing also connected to the ends of the head.

3,733,647

**FASTENING STRIP FOR SYNTHETIC TURF**

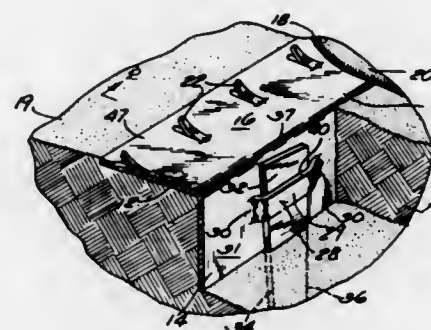
Joseph B. Jakel, 201 1/2 Harrison St., Reeseville, Wis.

Filed July 6, 1971, Ser. No. 159,696

Int. Cl. A47g 27/04

U.S. Cl. 16—16

4 Claims



A fastening strip for anchoring the margins of synthetic turf for lawns, golf courses or game playing fields to a dirt base includes horizontal and vertical flanges with the horizontal flange resting on the surface of the dirt base and having upstanding angularly projecting teeth to hook the backing of the synthetic turf and providing a flat bonding surface for gluing the turf backing to the strip. The vertical flange extends into a narrow slot in the ground and is provided with stamped loops for receiving thin flat stakes with tapered edges which wedge in the loops and firmly anchor the strip to the dirt base.

3,733,648

**BEARING ASSEMBLY FOR A SWIVEL CASTOR**

Sture Lennart Asberg, Svedalen, Sweden, and Hendrikus Jacobus Maria Timmer, Ede, Netherlands, assignors to SKF Industrial Trading and Development Company N.V., Amsterdam, Netherlands

Filed June 10, 1971, Ser. No. 151,839

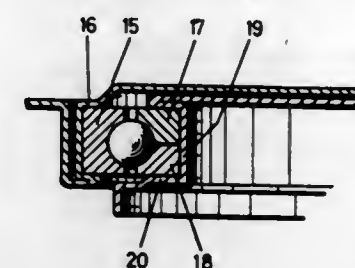
Claims priority, application Netherlands, June 10, 1970, 7008444

Int. Cl. B60b 33/00

U.S. Cl. 16—21

3 Claims

A swivel bearing assembly for a swivel castor comprising a housing and a wheel fork, which parts are connected with



characterized in that the two rings are restrained by deformation, such as folding of the material of housing and fork respectively.

3,733,649

**TAMPER PROOF DOOR BUTT HINGE ASSEMBLY**

Charles E. Nagy, 3221 Benda Place, Hollywood, Calif., and

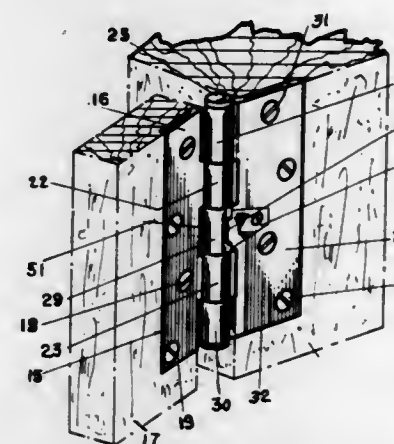
John F. Nagy, 785 West End Avenue, New York, N.Y.

Filed Aug. 11, 1971, Ser. No. 170,847

Int. Cl. E05d 11/00

U.S. Cl. 16—137

8 Claims



This hinge plate assembly is generally of standard construction except that it has been provided with additional formations of the hinge parts and an added hinge pin keeper to prevent the extraction of the hinge pin when the door is closed with its hinged edge in the door jamb. The keeper is formed of flat spring metal and is fixed to the surface of one of the hinge plate and extends laterally through a slot in its bearing portion for engagement with a flattened shouldered recess on the side face of the hinge pin to thereby lock the hinge pin in place against axial displacement from the assembly when the door is closed. In order to keep access to the projection of the keeper when the door is closed and the bearing portions thereof extend into the room space, the keeper is shouldered or widened to overlie the edges of the bearing portion slot into which the keeper extends. Further to prevent access of a tool to the bearing portion to unroll the bearing portion and relieve the keeper projection there is provided a gap-closure on the other of the hinge plates.

3,733,650

**HINGES**

Jack E. Douglas, Walsall, England, assignor to Arthur Shaw Manufacturing Limited, Willenhall, Staffordshire, England

Filed June 7, 1971, Ser. No. 150,700

Claims priority, application Great Britain, June 19, 1971, 29,810/71

Int. Cl. E05f 7/02

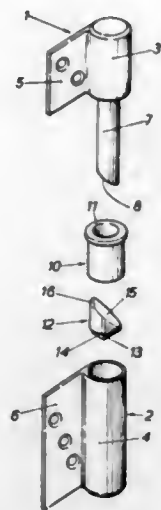
U.S. Cl. 16—160

3 Claims

In a lift-off hinge comprising two barrel members and a hinge pin which projects from and co-axially of one barrel



member and makes a sliding and rotatable fit within a bore in the other barrel member, the free end of the hinge pin is



formed with a cam face which is inclined to the axis of rotation and which engages with a complementary inclined cam face extending in the bore of the said other barrel member.

3,733,651

**HINGE FOR KNOCKDOWN CABINET**

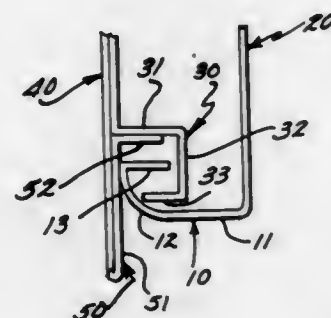
Robert H. McKay, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Aug. 25, 1971, Ser. No. 174,679

Int. Cl. E05d 1/04

U.S. Cl. 16-178

14 Claims



In a knockdown cabinet, the side panel is bent along its rear edge to define a laterally projecting, generally J-shaped flange which hooks back inwardly towards the side panel. The hooked portion of this flange interengages the hooked portion of a generally J-shaped retaining flange which projects laterally from the back panel of the cabinet, at a point spaced from its edge. The distance from the retaining flange to the edge of the back panel is approximately the same as the total length of the generally J-shaped flange projecting from the side panel such that when the side panel is opened, the leg of its generally J-shaped flange abuts the back panel and the interengaging hooked portions of the two flanges abut to thereby limit further rotation of the side panel and to provide a neat appearing seam between the side panel and the back panel.

3,733,652

**DEVICE FOR MOLDING PATTIES AND THE LIKE**

Eugene R. House, R.D. 1, Emporium, Pa.

Filed June 24, 1971, Ser. No. 156,192

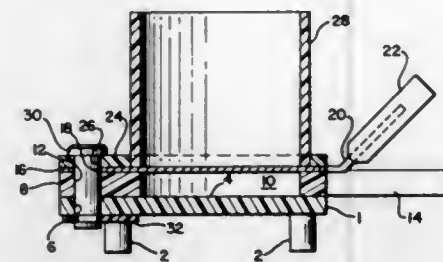
Int. Cl. A22c 7/00

U.S. Cl. 17-32

9 Claims

A molding device for hamburger patties and the like has a mold, or a plurality of stacked molds, each providing a

through cavity and each covered by a cut-off blade, all mounted on an imperforate base surface and all pivoted thereon in communication with a supply hopper so that the



molds can be loaded after the blades have been swung out, the blades can then be swung in to cut off the material in them from the hopper and from the other molds, and the molds can then be swung out to discharge the patties.

3,733,653

**DOSIFYING SAUSAGE MAKING MACHINE**

Don Jose Manuel Javaloy, and Don Jaime Prenafeta Garrusta, both of Nr. 306 Avenida Meridiana, Barcelona, Spain

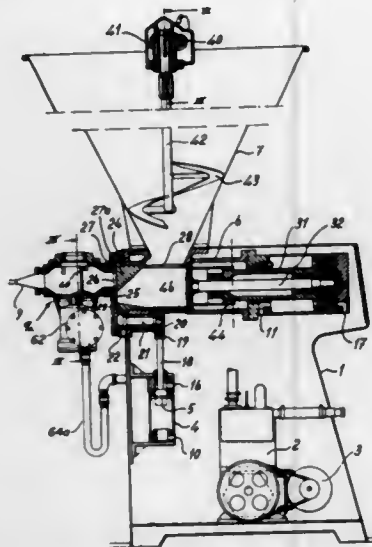
Filed Nov. 27, 1970, Ser. No. 93,125

Claims priority, application Spain, June 11, 1970, 374060; June 11, 1970, 378890

Int. Cl. A22c 11/02

U.S. Cl. 17-35

11 Claims



In a machine for measuring and dispensing dosages of sausage or other meats, a hopper forces minced meat into a piston chamber, with said piston forcing said deposited meat into a pair of passages formed to either side of a partition which then forces the deposited meat out of one or alternately a pair of outlet funnels.

3,733,654

**HOSE CLAMP**

Hugh C. Willanson, Willoughby, Ohio, assignor to Universal Metal Products, Inc., Wickliffe, Ohio

Filed May 10, 1971, Ser. No. 141,534

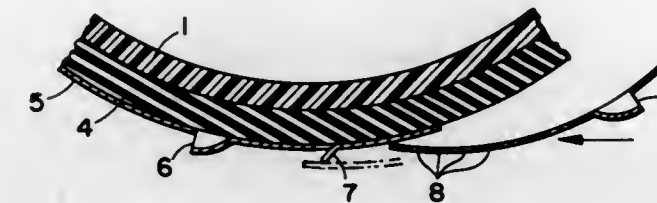
Int. Cl. B65d 63/02

U.S. Cl. 24-20 TT

5 Claims

A hose clamp comprising a unitary spring metal strip having end portions which are curved to a radius equal to or less than the radius of the hose to be clamped, one end portion having circumferentially spaced from each other and from that end of the strip an inclined tongue and a tool abutment shoulder and the other end portion having circumferentially spaced from each other and from that end of the strip a series of circum-

ferentially spaced apart transverse slots therethrough and a tool abutment shoulder. The length of the strip from the tongue to the farthest slot is preferably approximately equal to the circumference of the hose to be clamped so that the strip may be wrapped manually around the hose with the tongue engaged in said farthest slot without requiring use of any tool. By reason of the curved end portions of the strip, the end of the strip which contains the tongue will engage the outer surface of the hose, and, as the strip is wrapped around the hose, the end of the strip containing the slots will contact the first



mentioned portion of the strip between the end thereof and the tongue and will slide therealong and be cammed radially outwardly by the tongue until such farthest slot registers with the tongue whereupon the slotted end portion will snap against the strip end portion which is against the hose to a holding position with the tongue engaged in the farthest slot. Thereafter, a tool such as a pair of pliers may be employed to squeeze the abutment shoulders toward each other thus to contract the strip around the hose with the tongue engaging a succeeding transverse slot to tightly clamp the hose against a nipple therewithin.

3,733,655

**FASTENER DEVICE**

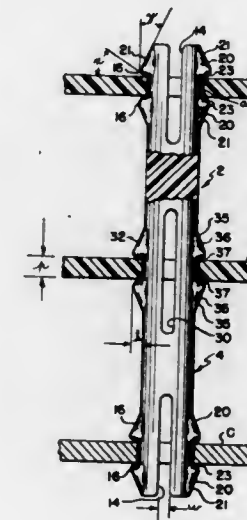
Richard W. Kollbar, 7265 Glenn Oval Drive, Parma, Ohio

Filed Nov. 3, 1971, Ser. No. 195,227

Int. Cl. A44b 21/00

U.S. Cl. 24-73 P

5 Claims



A unitary, one-piece fastener device for detachably mounting a plurality of apertured panels in stacked, spaced relation including an elongated body adapted for insertion at either end through the apertures in the panels. The body includes a series of lengthwise spaced, cam-like abutments disposed for resilient camming and locking engagement with respective of the panels for detachably mounting the same in such stacked relation in the installed position thereof.

3,733,656

**CLOTHES-PEG**

Fred Stalder, rue de Charmilles, 38 Geneva, Switzerland

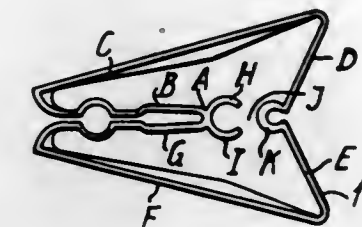
Filed Apr. 4, 1972, Ser. No. 240,355

Claims priority, application Switzerland, Apr. 8, 1971, 5218/71

Int. Cl. D06f 55/02

U.S. Cl. 24-137 R

4 Claims



A clothes-peg made of a closed looped strip of synthetic material extending along the geometrical outline of a standard peg, wherein the elasticity of the peg is no longer obtained by a spring, but by the mere straining of the peg produced by the interengagement of the points joining two clothes engaging jaws on one hand and the two finger gripping ends on the other, the stress arising through the drawing together of said points stressing and deforming the structure, the jaws of which are thus normally urged into cooperation.

3,733,657

**ASSEMBLY OF ATTACHMENTS AND METHOD OF MANIPULATING THE SAME**

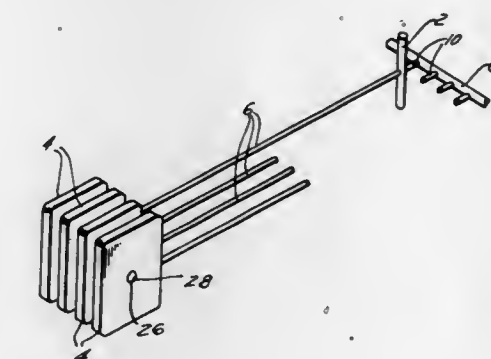
Gordon B. Lankton, West Boylston, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed May 25, 1972, Ser. No. 256,890

Int. Cl. A44b 9/00; G09f 3/12

U.S. Cl. 24-150 FP

22 Claims



A plurality of attachments, each designed for insertion through an object and comprising enlarged parts connected by a narrow elongated section, are formed into an easily handled assembly by being secured together not only at those ends bearing the part adapted to be inserted through said object but also at the other ends thereof, thereby to prevent the individual attachments from tangling or snarling while they remain a part of the assembly. Preferably the latter securement is of a type more readily frangible in torsion than in tension, thereby to facilitate the separation of a given attachment from the assembly after that attachment has been operatively associated with said object while reliably retaining the attachments secured to one another in the assembly under standby conditions.



3,733,658

## UPHOLSTERY NAIL

David B. Mitchell, 2905 Walnut, Garland, Tex.  
Filed Nov. 13, 1970, Ser. No. 89,327  
Int. Cl. A47b 19/01

U.S. Cl. 24-152

1 Claim



A decorative one-piece plastic fastener for securing layers of sheet material together. The fastener is a penetrating nail having a head with an embossed design on the center surface and a locking disk for holding the nail and upholstery material in assembled relation.

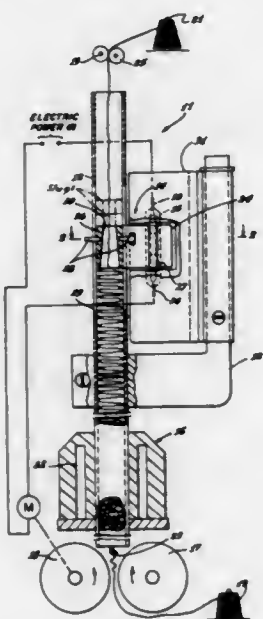
3,733,659

## APPARATUS FOR CRIMPING THERMOSETTING FIBER

Ashley P. Smith, Asheville, N.C., assignor to Northrop Carolina, Inc., Swannanoa, N.C.  
Filed Apr. 5, 1971, Ser. No. 130,934  
Int. Cl. D02g 1/12

U.S. Cl. 28-1.7

2 Claims



Apparatus useful in the textile art adapted to maintain the uniformity of a filament in a crimping facility in which the facility functions to continuously monitor the level of crimped filament therein insuring a filament of uniform quality having predetermined characteristics.

3,733,660

## SLOT APPLICATOR METHOD

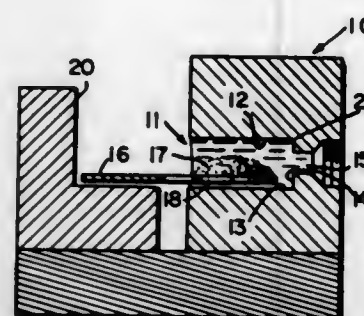
Milton Kallianides, 49 Raymond Street, Brockton, Mass., and Gerhart P. Klein, 52 Gifford Street, Manchester, Mass.  
Division of Ser. No. 701,488, Jan. 29, 1968, abandoned. This application Nov. 27, 1970, Ser. No. 93,486  
Int. Cl. B44d 1/18; C23c 1/10

U.S. Cl. 29-25.41

9 Claims

The combination of a reservoir containing a fluid and applicator means for applying the fluid to means carrying a plu-

rality of pellets to be used as capacitors. The applicator means includes upper and lower walls connected by a rear wall so as to form a slot having a determined length and width. A channel is formed in one of the walls so as to couple the slot to the



fluid containing reservoir allowing fluid to flow to the slot in a controlled manner. The applicator means applies determined amounts of the fluid to the means carrying said pellets and the pellets passing therethrough.

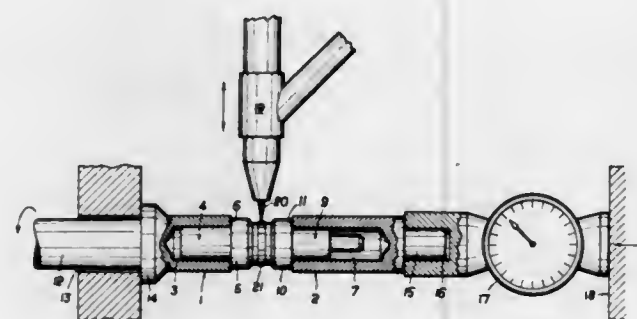
3,733,661

## METHOD FOR THE MANUFACTURE OF A PIEZOELECTRIC TRANSDUCER AND TRANSDUCER MANUFACTURED BY THIS METHOD

Rudolf Zieringer, Graz, Austria, assignor to Hans List, Graz, Austria  
Division of Ser. No. 778,936, Nov. 26, 1968, abandoned. This application Jan. 25, 1971, Ser. No. 109,443  
Int. Cl. B01j 17/00; H04r 17/00

U.S. Cl. 29-25.35

3 Claims



Method and apparatus for the manufacture of piezoelectric transducers in which a tube spring is prestressed by an axial load with the tube welded to a transducer housing member.

3,733,662

## SELF-DRIVEN TURRET LATHE ROTATING TOOL ATTACHMENT

Joseph B. Plevyak, 19 Jefferson Street, Newton, N.J.  
Continuation-in-part of Ser. No. 345,200, Feb. 17, 1964, Pat. No. 3,349,656, and a continuation-in-part of Ser. No. 677,675, Oct. 24, 1967, Pat. No. 3,538,731. This application Nov. 9, 1970, Ser. No. 87,976  
Int. Cl. B23b 47/02

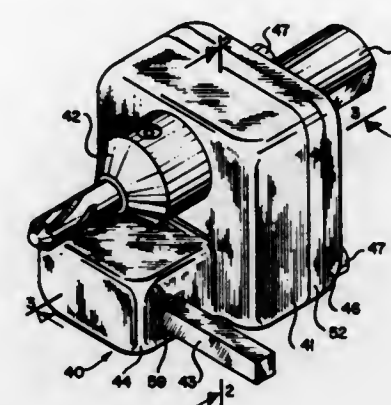
U.S. Cl. 29-57

4 Claims

A turret lathe rotating tool attachment is provided with gear ring to effect rotation of a rotary tool in response to a mere bumping of a laterally extending rack bar slide as by the manipulation of the lathe cross slide that can be cam operated from the lathe machine drive. The attachment is self contained and has a rearwardly extending shank that is adapted to be secured in a radially extending opening in the turret head and clamped therein against rotation and axial movement therefrom. A spindle is provided in each of the forms of this invention which will be rotated at sufficient speed to effect

with a drill or tapping element a completed operation upon a workpiece. In one of the forms of the invention provision is

about the periphery of the cutting face of the said insert in a closed path wherein the transverse width of the groove is



made to pre-accelerate the drive spindle prior to a main drive through a gear train effecting high speed rotation upon the spindle.

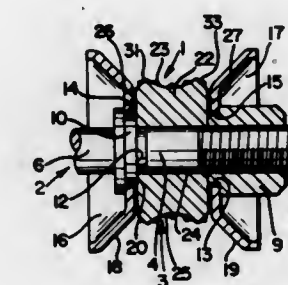
3,733,663

## CORNER SHAPING TOOL

William S. Brucker, Towson, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.  
Filed May 12, 1971, Ser. No. 142,675  
Int. Cl. B23d 71/00; B26d 1/12; B27g 13/00

U.S. Cl. 29-78 R

2 Claims



A rotary tool for corner shaping wood and other materials and adapted for use as an attachment for a portable power drill. The tool comprises a rasp or toothed cutter assembly mounted on a spindle and rotatable therewith between two guides. The guides are free to rotate about the spindle and roll along the workpiece as the shaping operation progresses. The surface of the cutter assembly is contoured complimentary to that desired on the workpiece corner. The cutter assembly may include one suitably shaped cutter, or it may include a plurality of cutters, and the spindle assembly is constructed to readily accommodate one or more cutters, so that a number of different shaped corners can be produced.

3,733,664

## CUTTING INSERT

Richard E. McKelvey, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.

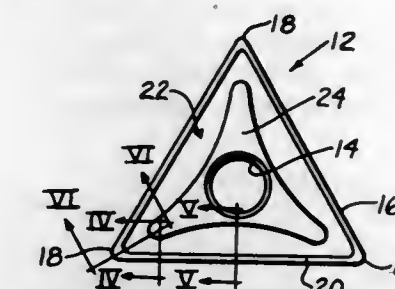
Filed Nov. 23, 1971, Ser. No. 201,366

Int. Cl. B26d 1/00

U.S. Cl. 29-95

12 Claims

The present invention is drawn to an indexable cutting insert having a cutting edge land and a chip controlling groove



varied to provide more favorable chip controlling function when rates and depths of machining feeds are varied with the said insert during operational use.

3,733,665

## ROTARY CUTTING TOOL

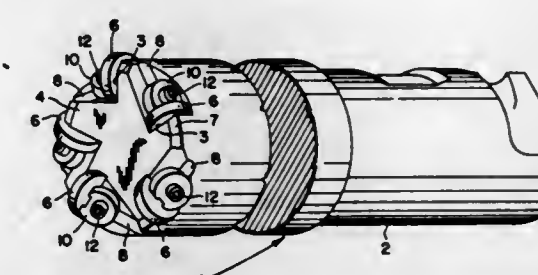
Frank A. Spriggs, Willoughby, Ohio, assignor to Pneumo Dynamics Corporation, Cleveland, Ohio

Filed Feb. 22, 1971, Ser. No. 117,418

Int. Cl. B26d 1/12

U.S. Cl. 29-105 R

8 Claims



Rotary cutting tool has plural circumferentially spaced milled arcuate slots in the end face of the cutter body providing arcuate seats for circular blade inserts which are releasably clamped in the slots. The slots are of sufficient depth to provide adequate support for the blade inserts during the cutting operation, and the slots also provide a preset dimension for the blade inserts as determined by the depth of the slots thus permitting turning of the blade inserts within the slots to present a new cutting edge or replacement of the blade inserts without affecting the cutting diameter of the tool.

3,733,666

## SPHERICAL BEARING ASSEMBLY

Alfreds R. Rozentals, Fairfield, Conn., assignor to Helm Universal Corporation, Fairfield, Conn.

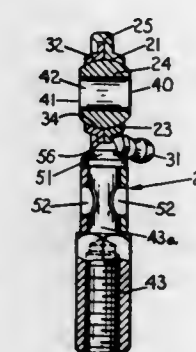
Division of Ser. No. 887,217, Dec. 22, 1969, Pat. No.

3,614,182. This application Oct. 14, 1971, Ser. No. 189,304

Int. Cl. B23p 11/00

U.S. Cl. 29-149.5 B

5 Claims



A self-aligning, spherical bearing assembly comprising a first and second housing member, each of said housing mem-



bers having circular openings therethrough with each opening being defined by a spherical seating portion, a spherical ball rotatably enclosed within said housing members and in alignment with said openings and seated on said spherical seating portions, interlocking means integral with at least one of said housing members for mechanically interlocking said first housing member to said second housing member.

3,733,667

## PARA-MAGNETIC HARD ALLOYS

Hirotochi Miyashita, 4724 Oaza Danchi; Tomio Nishimura, 225 Oaza Notame, and Sumiharu Tomono, 802 Oaza Shimay Amado, all of Fukuoka, Japan  
Filed Sept. 10, 1971, Ser. No. 179,496  
Int. Cl. B22f 1/00

U.S. Cl. 29—182.7

2 Claims

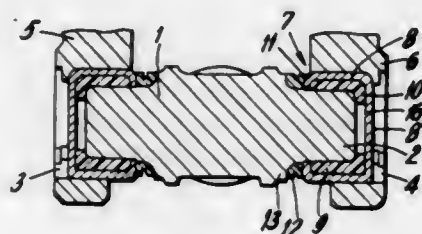
Para-magnetic WC base hard alloys comprising a carbide composition primarily consisting of tungsten carbide and a binder consisting of nickel and molybdenum wherein a part of said nickel is replaced by an eutectic Ni-P composition.

3,733,668

## METHOD FOR PRODUCING A SLIDING BEARING FOR A UNIVERSAL JOINT

Gunther Lange, Siedlung Gluckauf, and Jurgen Ulderup, Haldem, both of Germany, assignors to Lemforder Metallwaren AG, Lemförde/Hann., Germany  
Division of Ser. No. 152,082, June 11, 1971. This application Apr. 10, 1972, Ser. No. 242,852  
Int. Cl. B21d 53/00; B23p 11/00, 19/00  
U.S. Cl. 29—149.5 NM

4 Claims



The sliding bearing includes an outer cup-shaped thin metal bearing bush seated in the ends of a fork of the universal joint, and an inner sliding bush, of abrasion and oil resistant plastic composition material, embracing each pin of the universal joint, there being a predetermined clearance between the inner and outer bushes. The plastic inner bush is formed by pouring around a cylindrical core inserted into the outer bush. The plastic bush, when it sets, shrinks to disengage its outer surface from the inner surface of the outer bush, and has a gripping fit with the pin of the joint. In this embodiment also the outer bush has an in-turned flange at its open end.

3,733,669

## REACTION RAIL PRETENSION METHOD

Owen C. Cohn, Erie, Pa., assignor to General Electric Company, Erie, Pa.  
Filed Jan. 3, 1972, Ser. No. 214,973  
Int. Cl. B23p 17/00, 11/02

U.S. Cl. 29—155 R

7 Claims

A method of prestressing a reaction rail for a linear induction motor by securing the lower convex surface of a longitudinally curvilinear rail to a rigid planar base to place them in contiguous relationship along the length of the rail, and to

dinally curvilinear rail to a rigid planar base to place them in contiguous relationship along the length of the rail, and to



thereby place the upper and lower portions thereof in conditions of tension and compression, respectively.

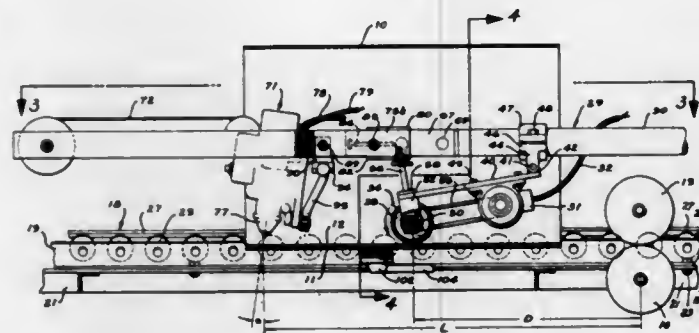
3,733,670

## APPARATUS FOR MAKING FOOD CONTAINERS

Thomas D. Troughton, Richmond, Calif., assignor to Rheem Manufacturing Company, New York, N.Y.  
Continuation-in-part of Ser. No. 25,637, April 6, 1970. This application June 29, 1972, Ser. No. 267,498  
Int. Cl. B23p 19/00, 3/00

U.S. Cl. 29—200 A

15 Claims



Apparatus for making tin lined drums and other large containers adapted for use in storing and shipping food products. The apparatus is particularly concerned with making the shell or body tube for such a container, and it utilizes as the starting material for the body tube a flat metal sheet plated along at least one side thereof with a layer of tin and formed into a tube having overlapping longitudinal edges and the layer of tin disposed within its interior. The apparatus includes welding mechanism located along a conveyor adapted to transport such body tube through an operating station at which the welding mechanism is effective to secure the overlapping edge portions of the body tube one to another. The apparatus further includes an abrading brush operative to scale the inner surface of the body tube along the welded edge portions thereof, and it still further includes tin spraying mechanism for spraying molten tin onto the inner surface of the body tube along its welded overlapping edge portions. The brush and spraying mechanism are carried by boom structure supported with respect to the conveyor so as to pass through the interior of any body tube transported thereby; and the brush, spraying mechanism, and welding mechanism have particular mechanical and functional relationships with respect to each other, to the conveyor, and to any body tube being transported by the latter.

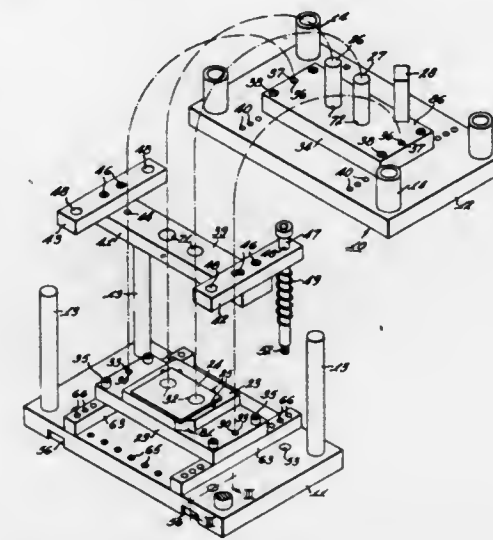
3,733,671

## FIXTURE FOR ASSEMBLING DIE AND WORK SUPPORT PLATES

Walter Strobel, 4433 North 68th St., Milwaukee, Wis.  
Division of Ser. No. 9,537, Feb. 9, 1970, Pat. No. 3,673,902.  
This application Feb. 3, 1972, Ser. No. 223,328  
Int. Cl. B23p 19/00

U.S. Cl. 29—200 J

2 Claims



A fixture assembly has lower and upper fixture shoes mounted on guide pins for reciprocal movement toward and away from each other with the lower and upper fixture shoes having first and second series of apertures in precise alignment with each other. A first access opening is provided in the lower fixture shoe and a second access opening is provided in the upper fixture shoe to facilitate locating and installing working tools on a support plate in proper alignment and working relationship relative to a cooperating die.

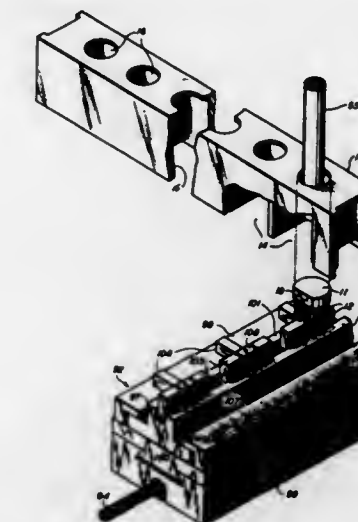
3,733,672

## APPARATUS FOR AUTOMATICALLY INSERTING COMPONENTS IN A WORKPIECE

William D. Bohannon, Jr., Graham, and Hoyer D. Church, Burlington, both of N.C., assignors to Western Electric Company Incorporated, New York, N.Y.  
Filed Sept. 13, 1971, Ser. No. 179,848  
Int. Cl. H05k 13/04; B23p 19/04; B23q 7/10

U.S. Cl. 29—203 B

8 Claims



A machine that automatically inserts electrical components in preselected locations on a workpiece includes a hopper assembly which houses a plurality of containers and means connected with the hopper assembly to dispense the containers

from the assembly to a station remote from the assembly. The station includes means for selectively ejecting components within the containers therefrom and a collector assembly movable to and from the station for receiving the ejected components. A transfer assembly picks up the components from the collector assembly and transfers the components to the preselected location on the workpiece.

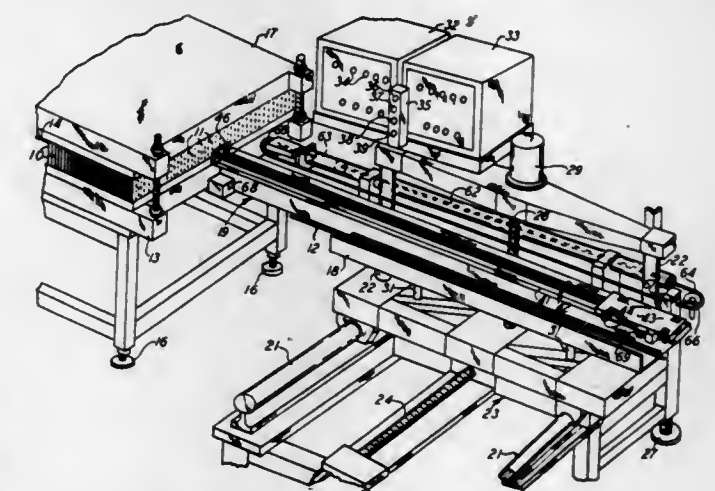
3,733,673

## HEAT-EXCHANGE CORE ASSEMBLY MACHINE

Fred M. Young, and Ronald E. Jones, both of Racine, Wis., assignors to Young Radiator Company, Racine, Wis.  
Filed Nov. 29, 1971, Ser. No. 202,782  
Int. Cl. B23p 15/26

U.S. Cl. 29—202 R

18 Claims



An assembly machine for heat exchange cores and having a jig for holding a bank of core fins with rows of holes and a tube guide for slidably guiding tubes into the holes. A slide moves over the guide forcing the tubes into the holes, and the slide actuates a switch which causes the slide to retract and get set for engaging additional tubes and force them into other rows of holes. Also, the machine includes a switch and index means for aligning the tube guide with the rows of fin holes after the previous tube or tubes has been inserted into the holes. The index means includes horizontal and vertical indexing so that the guide can be aligned with all of the rows of fin holes. The guide has a nose which extends between the extending ends of the tubes in fins, and the nose has a guide slot or tunnel for closely guiding the tubes into the rows of holes.

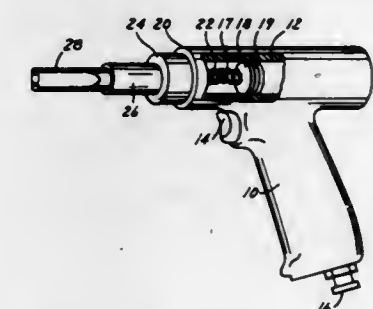
3,733,674

## DEVICE FOR WIRING SOLDERLESS CONNECTOR TERMINAL BLOCKS

Edward E. Shirley, 1510 South King St., Denver, Colo.  
Filed Oct. 28, 1971, Ser. No. 193,343  
Int. Cl. H05k 13/04

U.S. Cl. 29—203 HC

7 Claims



A wire setting tool for inserting a wire into a slit type contact on an electrical terminal block, including a housing which



encloses a power driven piston connected to an extendable shaft. The end of the shaft is bifurcated forming a slot and is arranged to straddle the thickness of a contact. The device is positioned over a contact with the wire held across the shaft slot so that as the shaft is extended the wire is inserted into the slit of contact. The housing can be provided with a plurality of parallel shafts which are extendable in unison and spaced to engage a plurality of contacts so that a number of wires can be set simultaneously.

3,733,675

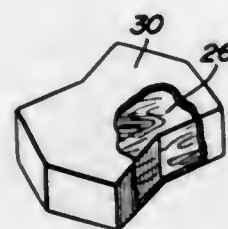
# METHOD OF UTILIZING JUNK CARS TO PRODUCE BUILDING BLOCKS

Warren B. Diederich, P.O. Box 406, Fargo, N. Dak.  
Continuation of Ser. No. 738,996, June 21, 1968, abandoned.  
This application Aug. 16, 1971, Ser. No. 172,185

Int. Cl. B23g 17/00

U.S. Cl. 29-403

3 Claims



The method of compressing discarded cars into geometrically complementary shapes and coating the shapes with an air and water impervious material. The shapes can then be used for paving revetments, building retaining walls, or piled up to form dikes or jetties.

3,733,676

# METHOD FOR CONNECTING PIPELINES

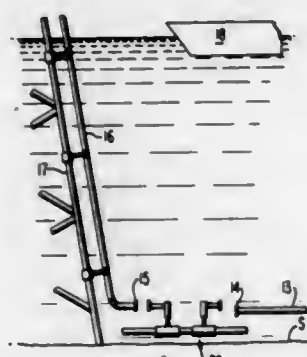
William A. Morgan, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Division of Ser. No. 835,647, June 23, 1969, Pat. No. 3,667,128. This application Jan. 17, 1972, Ser. No. 218,393

Int. Cl. B23q 17/00

U.S. Cl. 29-407

1 Claim



A method and apparatus for determining the spatial relationship between a pair of adjacent but separated conduit

ends, re-establishing the spatial relationship thus determined at a remote environment, fashioning a conduit connecting segment at the remote environment and connecting the conduit thus fabricated to the spaced conduit ends.

3,733,677

# APPARATUS AND METHOD TO PRODUCE CYLINDRICAL ARTICLES

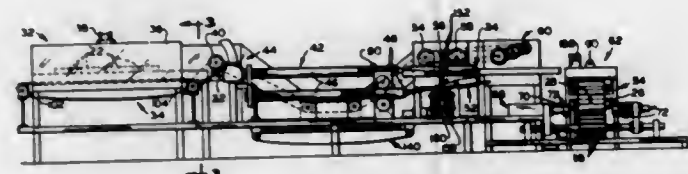
Romain Eugene Loeffler, Defiance, and Vernon Charles Plotts, Waterville, both of Ohio, assignors to Johns-Manville Corporation, New York, N.Y.

Filed Sept. 29, 1970, Ser. No. 76,552

Int. Cl. B23p 17/00

U.S. Cl. 29-411

24 Claims



A method and apparatus of applying stocking sheaths to cylindrical articles involving passing the articles longitudinally through the interior of a cylindrical mandrel bearing on its outer surface a supply of continuous stocking material. As the articles emerge from the mandrel they pickup overhanging stocking material and draw it off the mandrel. The interconnecting stocking between successively emerging articles is severed by shearing means. Spacing sufficient to provide stocking portions overhang the ends of the articles is achieved by driving the articles emerging from the mandrel at a greater speed than they are driven through the mandrel. Filter elements are formed of hollow, fibrous cylinders covered with a cloth stocking by tucking the overhanging ends of the stocking into the hollow ends of the cylinders.

3,733,678

# METHOD OF MAKING STRIPS OR TAPE FROM SMALL METAL PARTICLES

Otto Wessel, Duisburg-Ungelshelm, Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

Filed Nov. 23, 1970, Ser. No. 92,277

Claims priority, application Germany, Nov. 27, 1969, P 19 60 460.5

Int. Cl. B22f 3/24

U.S. Cl. 29-420.5

10 Claims

Strips or tapes are made in that metal particles are pressed into a porous ingot, a tube is extruded from the ingot, and the tube is flattened and rolled.

3,733,679

# PHOTOGRAPHIC CASSETTE LOADING

Louis O. Bruneau, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 21, 1971, Ser. No. 136,070

Int. Cl. B23p 19/00; B23q 7/10

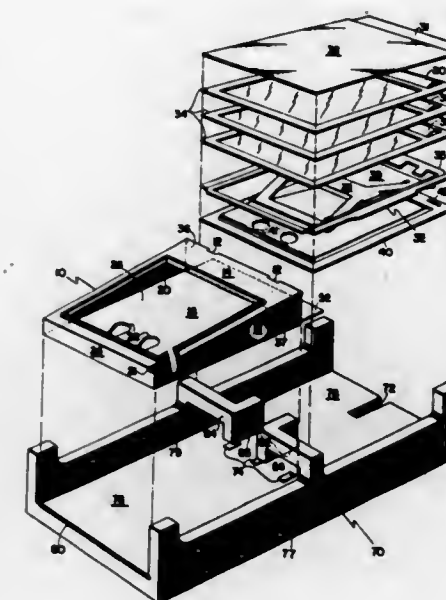
U.S. Cl. 29-431

10 Claims

Cassettes in which photographic film units are contained and exposed are loaded with battery means, spring means and

photographic film units by forming a stack of components, compressing the stack and inserting it partially into the mouth

elevated positions above the containers temporarily and then to serially release the bottles and permit them to be positioned within the respective containers.



of an open cassette, removing the compressive force and inserting the stack or components the rest of the way into the cassette.

3,733,680

# METHOD OF AND APPARATUS FOR ASSEMBLING INTERESTING MEMBERS

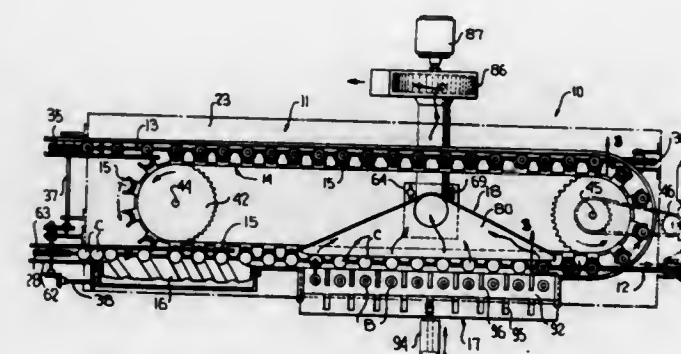
William J. Cartwright, Palos Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Mar. 17, 1971, Ser. No. 125,048

Int. Cl. B23p 19/00, 19/04

U.S. Cl. 29-429

20 Claims



This disclosure relates to an automatic mechanism for assembling plastic bottles or liners within containers, the mechanism including holders which are mounted for movement about an endless path and there being associated with the holders means for serially positioning containers in the lower portions of the holders and means for simultaneously placing a plurality of plastic bottles in the upper portions of the holders, and in the area of the positioning of bottles within the holders, there being vacuum means to retain the bottles in

3,733,681

# METHOD OF FORMING GRIPPING DEVICE

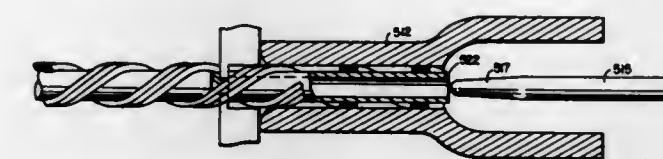
Seymour N. Schlein, University Heights, Ohio, assignor to The Tanner Manufacturing Company, Cleveland, Ohio

Division of Ser. No. 729,610, May 16, 1968, Pat. No. 3,561,071. This application Aug. 17, 1970, Ser. No. 64,617

Int. Cl. B23p 11/02

U.S. Cl. 29-447

7 Claims



A device, and method of making the same, for gripping a linear body wherein a plurality a helical preformed resilient elements are secured in a socket member between a sleeve and a core by swaging or other mechanical action. The preformed elements project from the socket and are disposed to wrappingly engage a line.

3,733,682

# METHOD OF FORMING A LOCKING RING FOR PRESSURE VESSEL

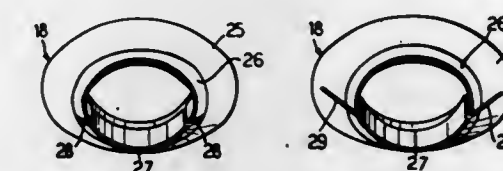
Jacques H. Mercier, 49 rue de Naples, Paris, France

Division of Ser. Nos. 613,660, Feb. 2, 1967, Pat. No. 3,537,481, and Ser. No. 822,445, May 7, 1969, Pat. No. 3,640,172. This application Oct. 13, 1971, Ser. No. 188,955

Int. Cl. B23p 11/02

U.S. Cl. 29-450

1 Claim



This invention relates to a method of forming a locking ring for the closure plug of a pressure vessel for storing fluid under pressure and particularly of the type having a deformable partition such as a bladder therein. The closure plug has a flanged inner end of diameter slightly less than the diameter of the port of the pressure vessel into which it is to be inserted and the locking ring normally is of greater diameter than said port and is foldable for insertion through said port so that it may then be restored to its original shape to encompass the closure plug and restrain outward movement thereof from such port.



3,733,683

**METHOD OF MANUFACTURING AN EXPANSION ELEMENT**

Johannes A. Kemper, c/o N. V. Machinefabrie "Arnhem", Industriestraat 9, Arnhem, Netherlands

Filed May 12, 1971, Ser. No. 142,735

Claims priority, application Netherlands, May 12, 1970, 7006873

Int. Cl. B23k 31/02

U.S. Cl. 29—471.1

3 Claims



Expansion element consisting of a corrugated stainless steel pipe welded to stubs of normal steel, the said weld being made by depositing stainless steel as a welding material onto end surfaces of the stubs, milling the deposited material for forming a substantially radial and a substantially cylindrical surface intersecting each other and welding the corrugated pipe to said surface.

3,733,684

**EXPLOSIVE BONDING OF WORKPIECES**

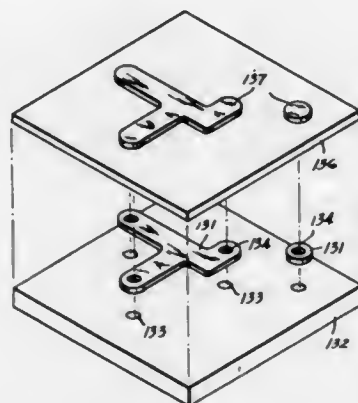
Benjamin Howell Cranston, Trenton, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 68,431, Aug. 31, 1970, which is a continuation-in-part of Ser. No. 6,829, Jan. 29, 1970, abandoned. This application Nov. 26, 1971, Ser. No. 202,349

Int. Cl. B23k 21/00

U.S. Cl. 29—470.1

11 Claims



First workpieces, for example, beam-leaded integrated circuits, and the like, are bonded to second work-pieces, for example, metallized ceramic substrates by first depositing a quantity of primary explosive, such as lead azide, onto each beam lead and then detonating the explosive to explosively bond the integrated circuits to the substrate. In another embodiment of the invention, the explosive bonding force is applied through a buffer sheet of plastic or metallic material which protects the surface of the substrate from contamination and which, in addition, dampens the shock of the explosion. In yet another embodiment of the invention, metal conductive paths are explosively bonded directly to a ceramic or glass substrate to form a "printed circuit pattern." The same techniques are used to manufacture resistors, capacitors, inductors, etc.

3,733,685

**METHOD OF MAKING A PASSIVATED WIRE BONDED SEMICONDUCTOR DEVICE**

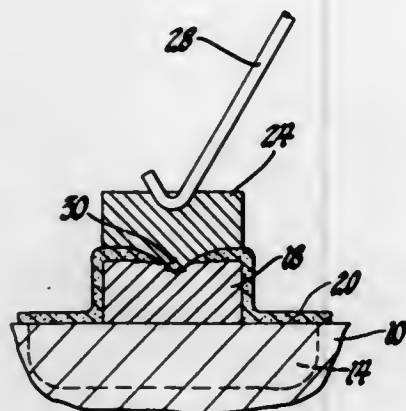
James E. Kaupilla, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 778,625, Nov. 25, 1968, Pat. No. 3,629,669. This application May 3, 1971, Ser. No. 139,733

Int. Cl. B23k 21/00

U.S. Cl. 29—470.1

6 Claims



A semiconductor device is described in which electrical contact is made with the semiconductor surface through a rupture in an overlying frangible dielectric coating. Contact is achieved by forming an electrode pad on the semiconductor surface, coating the surface of the semiconductor and the electrode pad with a frangible layer of dielectric, forming a terminal connector contact pad on the dielectric coating over the electrode pad, rupturing the dielectric layer to communicate the pads, and bonding a terminal lead to the connector contact pad. In a preferred embodiment, the rupturing and bonding steps are simultaneously achieved by compression bonding a terminal wire to the connector contact pad.

3,733,686

**METHOD FOR WELDING TITANIUM CLAD STEEL**

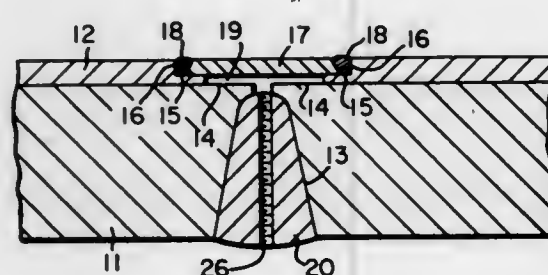
Lawrence Ambrose Maucher, Lancaster Village, Wilmington, Del., assignor to E.I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 27, 1971, Ser. No. 192,931

Int. Cl. B23k 31/02

U.S. Cl. 29—472.1

1 Claim



Titanium clad steel parts are welded together by removing the titanium clad from the steel for a sufficient distance to permit welding of the steel without contaminating the titanium, machining into the titanium clad, adjacent to surface from which the titanium clad was removed, a shelf, welding the steel portion with steel to form a steel joint uncovered by titanium the length of the steel weld, applying a titanium strip over said uncovered steel area but not touching the steel area, said titanium strip resting on the titanium shelves of the parts to be welded, and welding said titanium strip to said titanium clad at each side of said strip.

3,733,687

**METHOD OF SOLDERING AN ALUMINUM METAL TO AN ALUMINUM OR ANOTHER METAL**

Jun Tanaka; Toshihiko Taguchi, and Yoshihiro Nishibori, all of Tokyo, Japan, assignors to Senju Metal Industry Co., Ltd., Tokyo, Japan

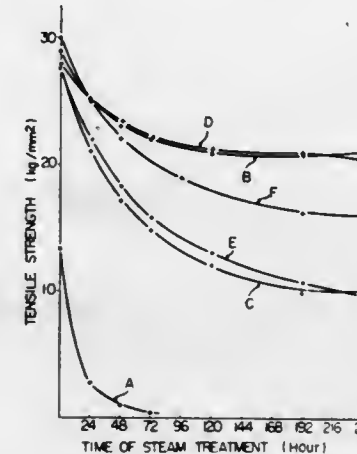
Filed May 25, 1971, Ser. No. 146,625

Claims priority, application Japan, May 30, 1970, 45/46133; July 30, 1970, 45/66128

Int. Cl. B23k 31/02, 35/24

U.S. Cl. 29—504

5 Claims



A solder alloy and method for its use in soldering an aluminum metal consisting of:

- Al 0.5—4.5% by weight
- Cu 0.1—4% by weight
- Mg 0.005—0.08% by weight
- Ni 0—0.5% by weight
- Cr 0—0.5% by weight, and
- Zn balance.

3,733,688

**METHOD OF MANUFACTURE OF SHORT-CIRCUIT RINGS**

Hans-Joachim Lippmann, Boxdorf, and Horst Schenk, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

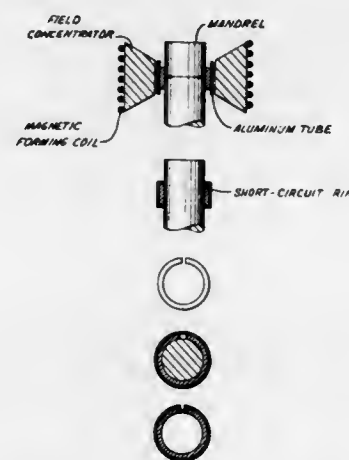
Filed Jan. 23, 1970, Ser. No. 5,203

Claims priority, application Germany, Jan. 30, 1969, P 19 04 402.1

Int. Cl. B23p 11/00

U.S. Cl. 29—523

8 Claims



A slit ring is rolled from a band of metal to a diameter which deviates from a desired diameter. The slit ring is clamped to maintain it at a desired diameter. A tube is fitted to the inner or outer surface of the ring. The tube is fitted to the ring by electromagnetic forming and the ring is unclamped after the fitting of the tube.

3,733,689

**METHODS OF PREPARING WALL COVERING**

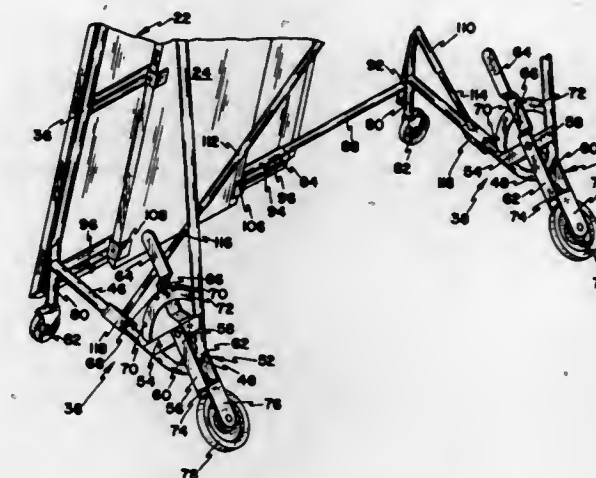
Firth Kay Armitage, 3317 South 3130 East, Salt Lake, Utah

Division of Ser. No. 870,002, Oct. 15, 1969, Pat. No. 3,598,390. This application Apr. 14, 1971, Ser. No. 133,930

Int. Cl. B23q 7/00

U.S. Cl. 29—559

6 Claims



Method for preparing wall covering prior to placement of the wall covering on a wall, the method relying upon a laterally expandable frame and a plurality of work surface panels removably mounted upon the frame. The frame can be oriented in either a generally horizontal or an upright position disposed at any one of a plurality of angles with respect to the vertical. Wheels mounted upon one end of the frame accommodate lateral movement when the frame is in the upright orientation and are restrainable so that in the upright orientation, the apparatus can be easily displaced in only a side-to-side direction. A guide for the wall covering dispenses wall covering over the assembled work surface segments at a controlled rate.

3,733,690

**DOUBLE JUNCTION READ ONLY MEMORY AND PROCESS OF MANUFACTURE**

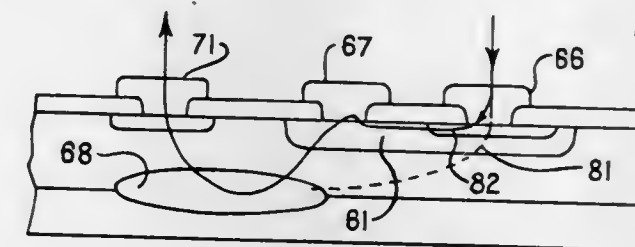
Joseph D. Rizzi, Los Gatos, and Lloyd D. Fagan, Santa Clara, both of Calif., assignors to Intel Corporation, Cupertino, Calif.

Continuation-in-part of Ser. No. 54,531, July 13, 1970, abandoned. This application Dec. 14, 1970, Ser. No. 97,492

Int. Cl. B01j 17/00

U.S. Cl. 29—577

2 Claims



An integrated circuit READ ONLY MEMORY matrix having back-to-back PN junctions between each intersection of rows and columns. One junction of selected connections are electrically shorted to program the ROM by establishing single diode or junction connections at predetermined intersections. Electrical shorting is accomplished by causing ohmic contact material to migrate along the surface of semiconductor material by the selective application of electrical power to establish a low resistance current path between such contacts.



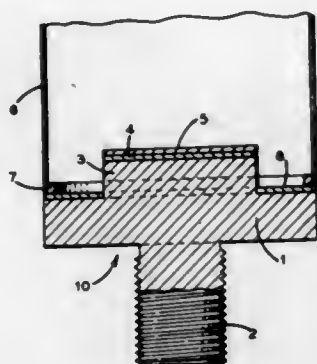
3,733,691

**PROCESS FOR MAKING SEMICONDUCTOR DEVICES**  
 Helmut Mann, Osnabrueck, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hanover, Germany

Filed Oct. 7, 1968, Ser. No. 765,503  
 Int. Cl. B01j 17/00

U.S. Cl. 29—588

1 Claim



A process for making semiconductor devices of the type comprising a base portion of copper or copper alloy having a threaded stem portion extending from one side of the base portion, a semiconductor element being mounted on the other side of the base portion, together with a cover member for enclosing the semiconductor element; the cover member being secured to the base portion in a manner to avoid weakening the base portion.

3,733,692

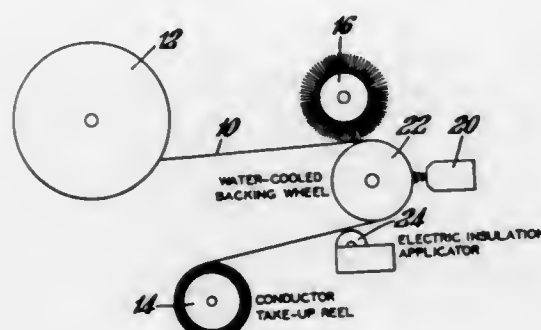
**METHOD OF FABRICATING A SUPERCONDUCTING COILS**

William A. Fietz, Somers, N.Y., and Donald M. Yenni, Indianapolis, Ind., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 16, 1971, Ser. No. 134,756  
 Int. Cl. H01v 11/00

U.S. Cl. 29—599

8 Claims



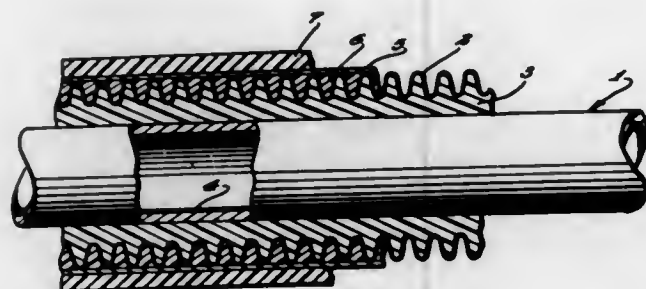
A superconducting coil fabricated in a single operation from a flat strip of electrically conductive tape by roughening a clean surface of the tape and passing it under an arc plasma effluent of metallic particles to establish a direct superconductive coating thereon, superimposing a layer of insulator and winding the resulting composite tape structure into the desired inductive geometry.

**HIGH PRECISION HOLLOW CONDUCTOR STRUCTURE FOR THE TRANSMISSION OF ELECTROMAGNETIC WAVES, AND METHOD OF MAKING THE SAME**  
 Herbert Larson, Munich, and Martin Helmut, 3 Hannover, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hanover, Germany

Division of Ser. No. 771,253, Oct. 28, 1968. This application Mar. 13, 1970, Ser. No. 24,405  
 Int. Cl. H01p 11/00; B23p 11/02

U.S. Cl. 29—600

4 Claims



A high precision hollow conductor structure, and method of making same, for the transmission of electromagnetic waves, such as H<sub>11</sub> type waves, in which a hollow conductor member forming the inner wall of the conductor structure is constructed with high accuracy by electro-formation on a mandrel, the conductor member having an inner diameter of circular configuration with the inner surface being uniform within very low tolerances, whereby, efficient wave transmission therein may be achieved, a metal jacket, having an undulating longitudinal cross-section, encircling said conductor member in rigid relation with respect thereto, with the interstices between the member and the jacket being filled with a rigid material, the matrix core being removed from said hollow conductor member following assembly of said member and jacket.

3,733,694

**PROCEDURE FOR SEALING WAVEGUIDE NOZZLES**  
 Jan Viletstra, Hengelo, Netherlands, assignor to N.V. Hollandse Signaalapparaten, Hengelo, Netherlands

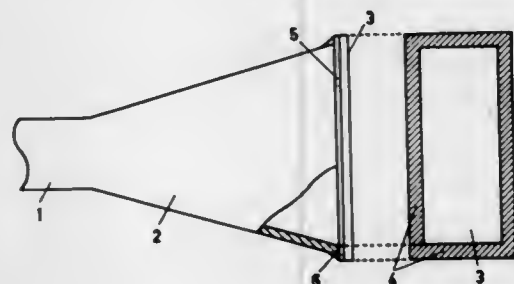
Filed June 18, 1971, Ser. No. 154,281

Claims priority, application Netherlands, July 2, 1970, 7009767

Int. Cl. H01p 11/00; H01q 13/00

U.S. Cl. 29—600

2 Claims



Waveguide nozzles are sealed by means of polytetrafluoroethylene strips, whose dimensions correspond with those of the waveguide nozzles to be sealed. The edges of a polytetrafluoroethylene strip are provided with a film of solderable material. The strip is soldered to a waveguide nozzle using said film.

3,733,695

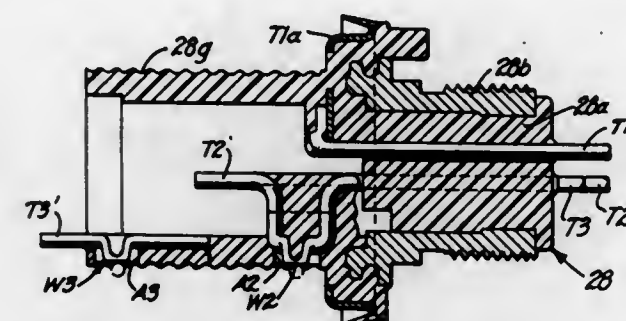
**METHOD OF MAKING POTENTIOMETER TERMINATIONS**

Sydney W. Frey, Jr., Upland, and Robert W. Gaines, Mira Loma, both of Calif., assignors to Bouras, Inc., Riverside, Calif.

Filed Oct. 26, 1971, Ser. No. 192,118  
 Int. Cl. H01c 17/00

U.S. Cl. 29—610

3 Claims



A potentiometer of the wirewound type having a wirewound helical resistance element with electrical ends precisely positioned at respective locations and wire terminal members economically and accurately fusion-united with the element at said electrical end locations by a procedure including reducing the cross-section of portions of the wire terminals, disposing such portions at respective ones of said locations with the portions on opposite sides of a line parallel to the axis of the helix of the winding and the edges along the line and in line of contact with the wire of the element, fusing fusible electrically conductive material to the wire terminals at said locations, disposing electrical-end portions of the resistance element in contact with the fusible material at respective ones of said locations, and passing heating electrical current through the portions of reduced cross-section of said wire terminal members to fuse said fusible electrically conductive material to said element to fusion-unite and electrically connect said wire terminal members to respective electrical ends of the resistance element. The terminal wire members are embedded in part in a potentiometer body member and exposed at said locations and have terminal end portions extending from the potentiometer body member, and are thus precisely located and maintained in exactly the desired position for welding.

3,733,696

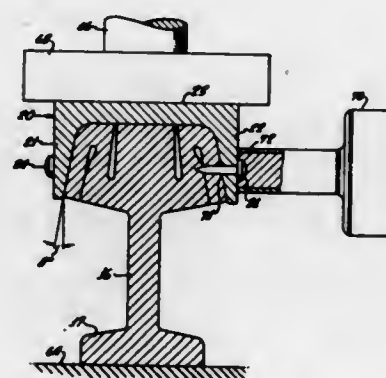
**COMPOSITE CONDUCTOR BAR AND METHOD OF MANUFACTURING**

Donald H. Scofield, and James A. Corl, both of San Carlos, Calif., assignors to Insul-S-Corp., San Carlos, Calif.

Division of Ser. No. 771,931, Oct. 30, 1968. This application Mar. 15, 1971, Ser. No. 124,551  
 Int. Cl. H01b 13/22

U.S. Cl. 29—624

4 Claims



An elongated structural steel cap which is slightly smaller than an extruded aluminum conductor bar is forced onto the

3,733,697

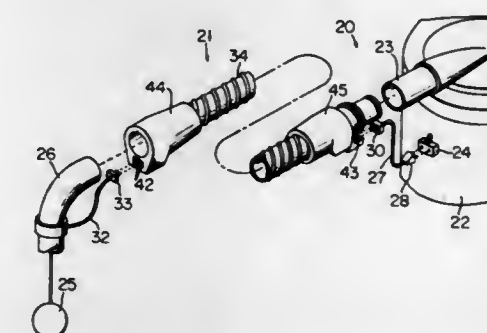
**METHOD OF MAKING A VACUUM CLEANER HOSE ASSEMBLY**

William T. Wickham, 930 Brunswick Dr., Waynesville, N.C.; Frank Brown, 5556 Viewpoint Dr., Dayton, Ohio; Donald L. Kleykamp, 868 Heinke Dr., West Carrollton, Ohio, and Otto Kossuth, 5936 Deamont Pl., Dayton, Ohio

Division of Ser. No. 848,272, Aug. 7, 1969. This application July 28, 1971, Ser. No. 176,372  
 Int. Cl. H01r 43/00

U.S. Cl. 29—628

5 Claims



A vacuum hose is provided having a plurality of reinforcing wires in the form of electrical conductors which are made as an integral part of the hose and each conductor has electrical components fixed to its opposite ends. A pair of hose connectors is provided at opposite ends of the hose end formed substantially as an integral part thereof to define an assembly with each hose connector having associated electrical components embedded therein and providing the sole support therefor.

3,733,698

**ELECTRIC CAN OPENER**

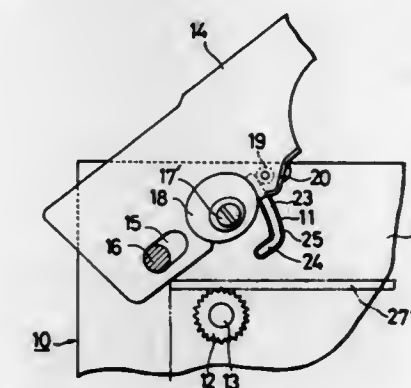
Osamu Yamamoto, Kasugai, Japan, assignor to Kawaguchi Shochi, Aichi-ken, Japan

Filed Mar. 5, 1971, Ser. No. 121,479

Claims priority, application Japan, Aug. 29, 1970, 45/75701  
 Int. Cl. B67b 7/38

U.S. Cl. 30—4 R

2 Claims



An electric can opener has an elongate lever carrying a cutter wheel and pivoted forwardly of a front member of a housing at a slot formed at one end portion and longitudinally of the lever.

The lever is provided with a locking member extending towards the front member and is locked in a longitudinally displaced position by the engagement between the locking

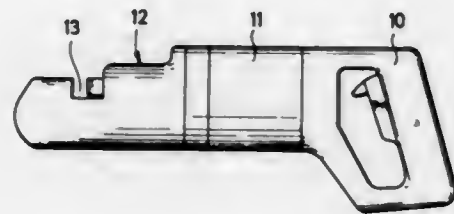


member and a engaging piece extending forwardly of the front member when the lever is displaced along its longitudinal direction within the length of the slot by the thrust exerted to the lever as the result of the can opening operation of the cutter wheel.

**3,733,699**  
**HYDRAULICALLY ACTUATED CUTTING MACHINE FOR RODS AND THE LIKE**  
Rudolf Bock, Palmerstrasse 9, 7031 Holzgerlingen, Germany  
Filed May 19, 1971, Ser. No. 144,767  
Claims priority, application Germany, May 22, 1970, P 20 24 890.2

U.S. Cl. 30—180 Int. Cl. B26b 17/00

4 Claims

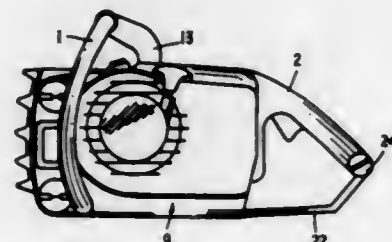


A hydraulically actuated cutting machine for cutting round steel rods and the like having a stationary cutting member which coacts with a movable cutting member. A pump body has a shaft to which there is operatively connected a pumping member which pumps hydraulic fluid from the pump body into an adjoining cylindrical member. A piston, having a piston rod eccentrically extending therefrom, is slidably mounted in this cylindrical member. The piston rod terminates at the aforementioned movable cutting member. A cutting mouth housing is formed with an open recess, one wall of which faces the movable cutting member and forms the stationary cutting member. The housing adjoins the cylindrical member and defines a chamber which is in communication with the interior of the cylindrical member. The cylindrical member in turn is in communication with the pump body via a passage which is selectively sealed by valve means which coact with the piston.

**3,733,700**  
**DUAL GRIP HANDLE FOR POWER TOOLS**  
John Arthur Notaras, and Angelo Lambrinos Notaras, both of 15-21 Reynolds Street, New South Wales, Australia  
Filed Aug. 19, 1970, Ser. No. 65,001  
Int. Cl. B27b 17/02; F16t 16/08

U.S. Cl. 30—381

7 Claims

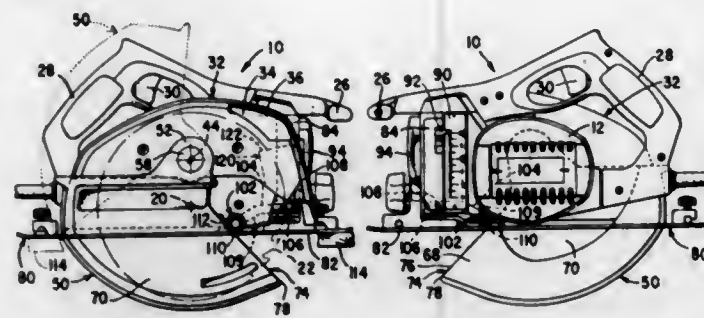


A dual grip handle for power tools, the grip comprising two components flexibly connected together and each adapted for flexible connection to the power tool.

**3,733,701**  
**LOWER GUARD FOR CIRCULAR SAWS**  
Joseph P. Lubas, Cranford, N.J., assignor to The Slinger Company, New York, N.Y.  
Filed Jan. 26, 1972, Ser. No. 220,946  
Int. Cl. B27g 19/04

U.S. Cl. 30—391

2 Claims

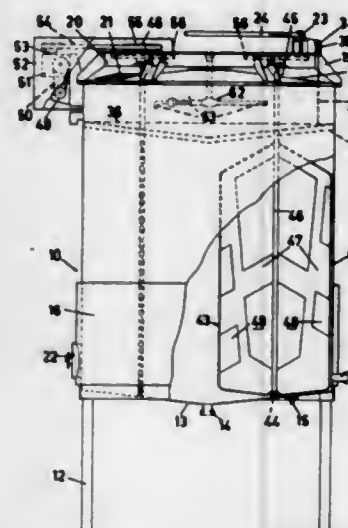


A lower guard for circular saws having an adjustable base plate carrying a fixed stop continuously to engage the lower guard prior to the introduction of a workpiece, thus, to prevent complete closure of the lower guard. The stop and a cam surface of the leading edge of the lower guard coact increasingly to shift a front portion of the leading edge below the base plate as the same is lowered relative the lower guard.

**3,733,702**  
**CHEESE VATS**  
Peter Struan Robertson, and Raymond Bysouth, both of Palmerston North, New Zealand, assignors to New Zealand Dairy Research Institute, Fitzherbert, Palmerston North, New Zealand  
Filed Aug. 23, 1971, Ser. No. 173,965  
Int. Cl. A01j 25/02

U.S. Cl. 99—462

20 Claims

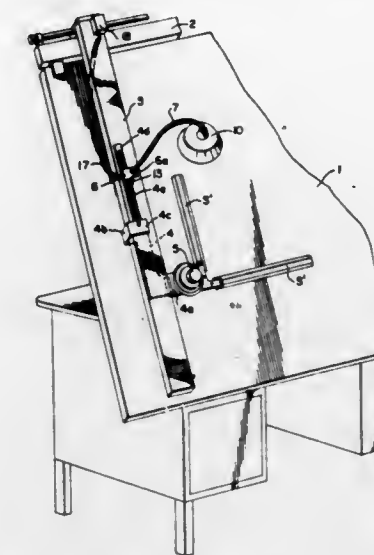


A cheese-making vat including a vertical tank, a plurality of agitators having shafts journaled in bearings mounted on the tank, the agitators having vertical blades arranged so as to effectively sweep almost all the volume of the tank, a wire cutter frame arranged to cover the cross-sectional area of the tank and having apertures positioned to receive the cross-sectional area of the agitator blades and their shafts when the agitators and their shafts are stopped a drive assembly arranged to move the cutter frame, a variable speed drive arranged to drive the agitator shafts a switch arranged to stop rotation of the agitators before the cutter frame is lowered prior to coagulation of the milk and subsequent cutting of the coagulum by raising the cutter within the tank.

**3,733,703**  
**DRAFTING BOARD ATTACHMENTS**  
Ruth Ann Smith, 22 McArthur Dr., Jacksonville, N.C.  
Filed July 20, 1972, Ser. No. 273,453  
Int. Cl. B43i 13/02

U.S. Cl. 33—79 R

5 Claims



The drafting board has a drafting machine provided with a vertical track laterally movable across the board. A protractor support plate is vertically slidably mounted on the vertical track. A protractor head carrying vertical and horizontal scales is mounted on the lower portion of the support plate, the support plate having a narrowed extension track disposed parallel with and spaced from the vertical track, and the extension track having a longitudinally disposed keyway therein. A lamp support base is adjustably mounted on the extension track in way of the keyway. A swingable lamp support tube has one end fixedly mounted on the lamp base, the tube carrying at its other end a reflector carrying a lamp. And a transformer is mounted on the vertical track and connected to a source of electrical power. The transformer having leads extending therefrom and through the lamp support tube to the lamp, whereby the lamp may be fixedly adjusted into close proximity to the protractor head to always illuminate the head while eliminating shadows on the vertical scale as the protractor head is shifted vertically or horizontally across the drafting board.

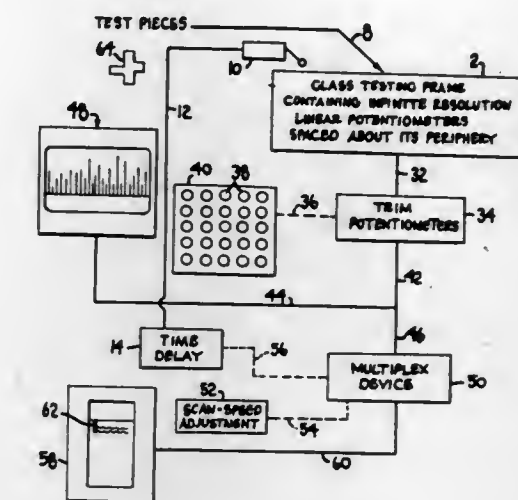
**3,733,704**  
**METHOD AND APPARATUS FOR DETERMINING CONTOURS OF OBJECTS, ESPECIALLY OF GLASS**  
Aloysius W. Farabaugh, Verona, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.  
Continuation-in-part of Ser. No. 858,713, Sept. 16, 1969, abandoned. This application July 23, 1970, Ser. No. 57,576  
Int. Cl. G01b 3/38

U.S. Cl. 33—174 L

17 Claims

Contours of objects are determined by using equipment comprising a frame, generally conforming to a predetermined contour, a plurality of infinite-resolution linear potentiometers (preferably cermet) connected to the frame, a histogram-type visual-display device, a plurality of trimming potentiometers operatively associated such that there is one for each of said linear potentiometers and the outputs of the trimming potentiometers are connected to the visual-display device, and preferably also a checking tool. Desirably but not necessarily, there are also provided a strip-chart recorder, and a multiplex-scan and filter circuit leading from the inputs to the visual-display device and to the strip-chart recorder, whereby there may be produced a series of traces indicative of the contour of the piece tested. The equipment disclosed will check contours of pieces shaped from flat glass, such as backlights, to an accuracy of about 0.001 inch at high production rates (above five

pieces per minute), yet the equipment is simple, does not require calibration against a perfect master, is readily set up,



and is readily adapted for use with a different frame to permit inspection of lights of glass of different size and/or shape.

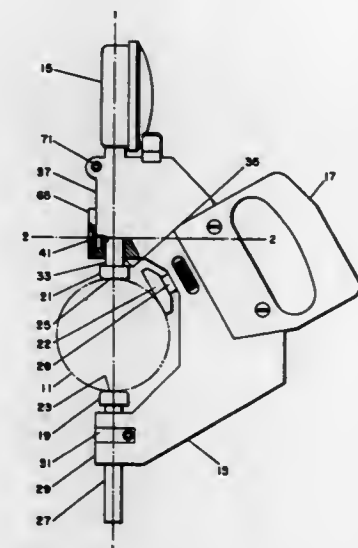
**3,733,705**  
**MEASURING DEVICES HAVING MEANS TO CONTROL THE MOTION OF THE FREE SPINDLE**  
Gary Powell Avalear, Highland, N.Y., assignor to Topper Corporation

Filed Nov. 4, 1971, Ser. No. 195,617

Int. Cl. G01b 5/02

U.S. Cl. 33—147 R

8 Claims



Measuring devices of the type having opposed spindles which define the measuring range space, such as snap gages and the like, are provided with a motion control means which selectively controls the motion of the movable or sensitive spindle to make presetting of the device to a reference master more simplified and convenient. To this end, a rotatable member is provided for the measuring device which is disposed so that one end thereof coacts with a recess provided in the movable, or sensitive, spindle so that when the rotatable member is in a first position movement of the sensitive spindle is prevented and when the rotatable member is in a second position the sensitive spindle is allowed a desired amount of movement.



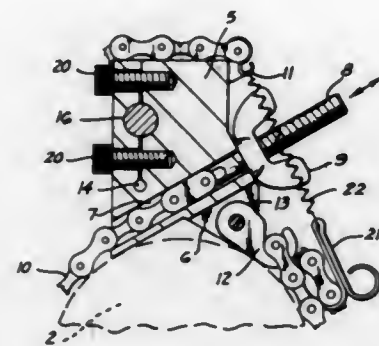
3,733,706

**MACHINE ALIGNING DEVICE**

Arthur M. Blohm, 7901 Leonora, Houston, Tex.  
Filed July 15, 1970, Ser. No. 55,073  
Int. Cl. G01b 3/38

U.S. Cl. 33-180 R

1 Claim



A machine aligning device for aligning a driving and a driven shaft, having means for mounting a block on a driving shaft, and adjustably anchoring said block in place, and a transverse shaft extending from said block on which a gauge is mounted.

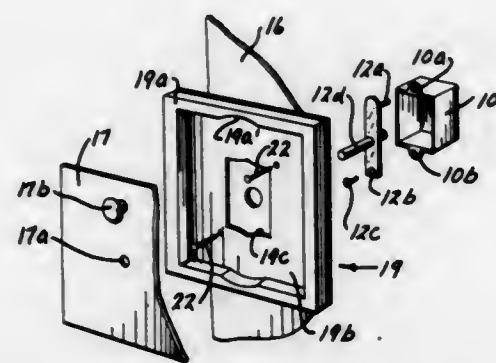
3,733,707

**METHOD AND APPARATUS FOR CUTTING OPENINGS IN PANELING OR THE LIKE**

William R. Nix, 200 South Tekoppel Avenue, Evansville, Ind.  
Filed Jan. 29, 1970, Ser. No. 6,906  
Int. Cl. G01b 5/14

U.S. Cl. 33-180 R

8 Claims



A method and structure for simplifying the cutting of an opening in paneling, wallboard or the like, as for access to an electrical outlet box, characterized by the use of a jig having a centering pin, where the jig is removably secured to the electrical outlet box, a guide plate having an opening which receives such centering pin, and a template surrounding the guide plate. After removing the guide plate, and with the use of a conventional router in combination with the template, an accurate opening for the electrical outlet box is readily achieved.

3,733,708

**NAVIGATIONAL AID**

Charles Jimmie Goodman, 1742 Temple Drive, Winter Park, Fla.

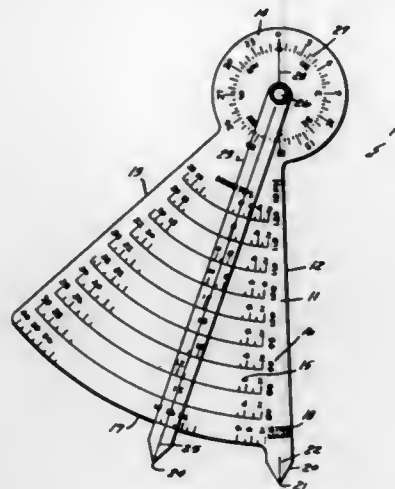
Filed Mar. 15, 1971, Ser. No. 124,287  
Int. Cl. F26b 11/18; G01b 5/00

U.S. Cl. 33-355

1 Claim

A time, speed and distance computer apparatus having a prong fixed to a surface having indicia thereon and a second

prong rotatably connected to the surface so that it can pass over the indicia. The two prongs can be placed on two points on the surface of a map for instantaneous determination of the



time required to travel between the two points at predetermined speeds. The apparatus may also have a compass associated therewith for use in orienting the surface of the map, or the like.

3,733,709

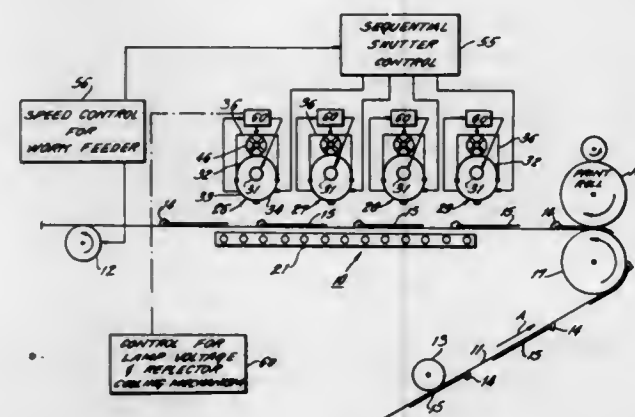
**REFLECTOR AND COOLING MEANS THEREFOR**

Robert W. Bassemir, Jamaica, N.Y., and Julius Robert Mayer, Waldwick, N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Filed May 6, 1971, Ser. No. 140,760  
Int. Cl. F26b 3/28

U.S. Cl. 34-4

11 Claims



Printing apparatus utilizing lamps generating ultraviolet light to cure solvent-free ink by photopolymerization is provided with lamp reflectors having shutters to permit the lamps to remain energized while the printed work conveyor is stopped or is moving at a slow rate. A plurality of such lamps, each with an individual shutter, are arranged in parallel rows extending transverse to direction of movement of the work. As the shutters are closed, lamp voltage is reduced to a standby point where the lamps remain fired. Air is circulated at the same time behind the lamp reflector for cooling of the latter without appreciably cooling the lamp. Each reflector is a sheet of non-oxidizing metal mounted in the concave portion of a structurally strong housing. End reflectors prevent end scattering of the lamp-radiated energy and shield the lamp sockets from the heating effects of this energy. The lamp sockets are repositionable with respect to the reflector so that the arc thereof may be positioned generally along the focus line of the reflector for different positions of the focus line with respect to earth.

3,733,710

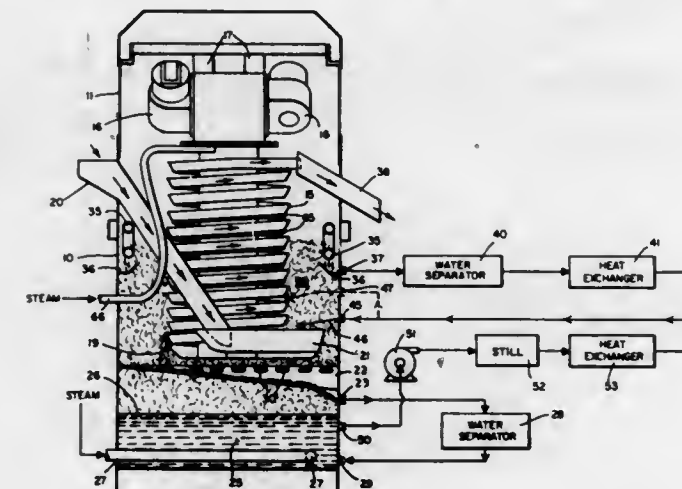
**METHOD FOR DRYING METAL PARTS**

Thomas J. Kearney, Detroit, Mich., and George F. Bieber, Arlington Heights, Ill., assignors to Detrex Chemical Industries, Inc., Detroit, Mich.

Filed July 13, 1971, Ser. No. 162,186  
Int. Cl. B01d 12/00; B08b 3/10

U.S. Cl. 34-9

3 Claims



A method for removing water from metal parts, wherein the parts are introduced into a bath of a solvent which displaces the water from the parts, the parts then being conveyed upward on a spiral conveyor through saturated vapors of the solvent. The articles are then conveyed out of the vapor zone and are heated to completely dry them of all traces of the solvent.

3,733,711

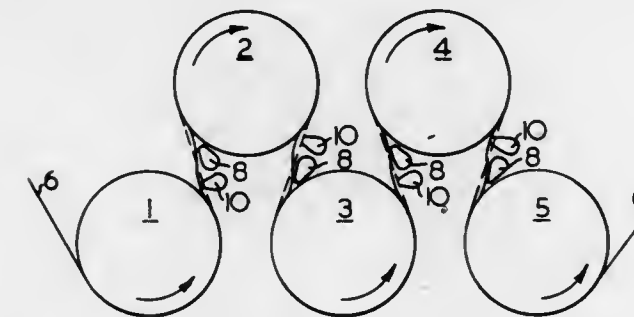
**APPARATUS FOR AND METHOD OF TREATING A WEB**

James Haythornthwaite, Joliette, Quebec, Canada, assignor to Scapa Dryers (Canada) Ltd., Joliette, Quebec, Canada

Filed Sept. 7, 1971, Ser. No. 178,361  
Int. Cl. B65b 17/28; F26b 13/08

U.S. Cl. 34-23

4 Claims



A web is treated, for example dried, by passing it around a rotary cylinder, and deflecting it by air pressure, positive and/or suction, applied to the web immediately adjacent the junction of the web and the cylinder to cause the web to contact a greater portion of the circumferential surface of the cylinder than it would in the absence of the air pressure.

910 O.G.-40

3,733,712

**CLOTHES DRIER HAVING MOISTURE SENSING CONTROL**

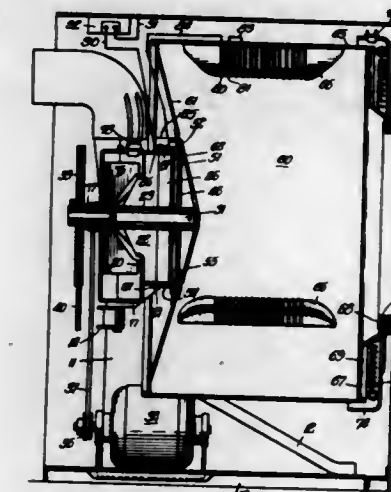
Thomas R. Smith, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Division of Ser. No. 604,757, Dec. 27, 1966, Pat. No. 3,651,579, which is a continuation-in-part of Ser. No. 329,155, Dec. 9, 1963, Pat. No. 3,613,254, which is a continuation of Ser. No. 22,323, April 14, 1960, abandoned. This application Dec. 16, 1971, Ser. No. 208,832. The portion of the term of this patent subsequent to Mar. 28, 1989, has been disclaimed.

Int. Cl. F26b 19/00

U.S. Cl. 34-45

13 Claims



A control for a drying apparatus uses an electrical breakdown device, for example, a neon bulb, to generate a signal that actuates a relay when the articles sensed by electrodes attain a predetermined moisture content as determined by their electrical resistance. A timer motor is energized upon actuation of the relay to control the drying apparatus in one embodiment.

3,733,713

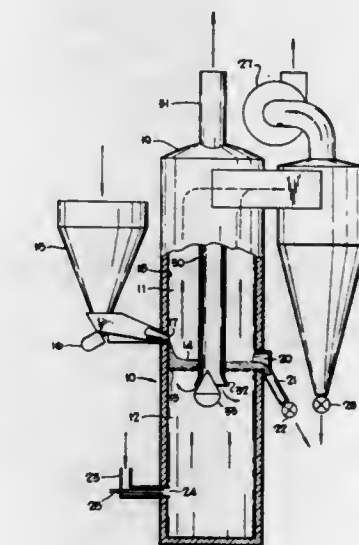
**APPARATUS FOR PROCESSING A BED OF FLUIDIZED SOLIDS**

Harry Williamson, Jr., 215 South Main Street, Benton, Ill.

Filed Apr. 21, 1971, Ser. No. 136,122  
Int. Cl. F27b 15/00

U.S. Cl. 34-57 A

10 Claims



This apparatus includes a processing chamber and a heating chamber separated by a gas permeable partition adapted to



support a bed of solids. The solids are fluidized by an upwardly directed gas stream which processes the particles as they flow between the supply and discharge orifices of the processing chamber. An internally disposed gas handling conduit provides a by-pass stack for evacuation of the heated gas during emergencies and scheduled shut-downs. The gas handling conduit also provides a supply line for introducing blending air to the heating chamber to temper the hot gas stream during normal operation. A deflector distributes the blending air in a controlled pattern to the fluidized bed to provide optimum operating temperature conditions.

3,733,714

## CASEIN OR THE LIKE DRYING MACHINES

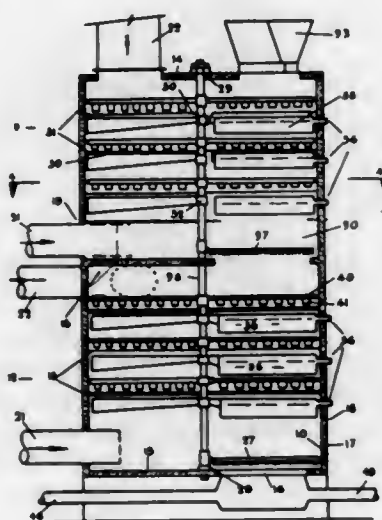
Desmond John Connor, Hamilton, New Zealand, assignor to Mauri Brothers & Thomson Limited, Sydney, New South Wales, Australia

Filed Dec. 7, 1970, Ser. No. 95,688

Int. Cl. F26b 11/12

U.S. Cl. 34-173

3 Claims



A casein drying machine has a pair of vertically superposed chambers, the upper feeding to the lower. Gaseous drying medium is fed to the bottom of each chamber. Screens with non-registering openings are superposed in each chamber and scrapers rotating about a central vertical axis sweep the screens so that the drying casein moves from top to bottom of the apparatus along a circuitous path including a plurality of gravity falls.

3,733,715

## DRY CLEANING MACHINE

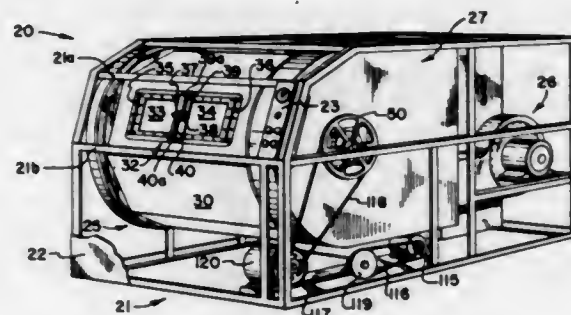
John H. Hales, P.O. Box 1008, Aurora, Utah

Filed Mar. 11, 1971, Ser. No. 123,170

Int. Cl. F26b 21/06

U.S. Cl. 34-82

18 Claims



A dry cleaning machine that gently tumbles fabrics, furs, and other such materials with a dry cleaning compound to remove dirt from the materials and that efficiently removes

the compound and dirt from the machine tumbler. A forced, circulating, air flow system is provided to aerate the materials and to assist in moving the cleaning compound through folds of the materials so that a maximum amount of dirt is contacted by the compound. Control means are provided to regulate the air flow and to prevent premature loss of the cleaning compound used.

3,733,716

## LYOPHILIZATION INSTALLATION

Robert C. Bontell, Clichy, France, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

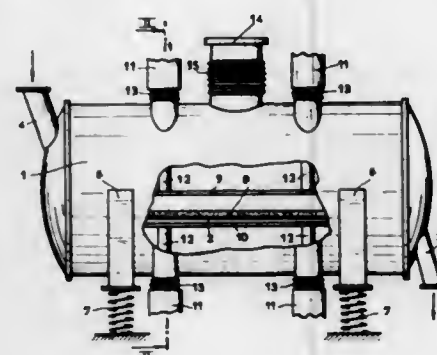
Filed May 28, 1971, Ser. No. 148,009

Claims priority, application France, June 2, 1970, 7020098

Int. Cl. F26b 13/30

U.S. Cl. 34-92

6 Claims



A lyophilization installation comprising a vacuum vessel having a plate rigidly fixed inside the vessel and upon which, in operation, a vibration bed is produced and particles of a product to be lyophilized are dried. Vibration means are provided and connected to the vessel for vibrating the vessel as a whole. The vacuum vessel is constructed to define, above the plate, an increasing flow cross-section for vapors liberated from the particles of the product.

3,733,717

## AUTOMATED INFORMATION TRANSMITTING APPARATUS

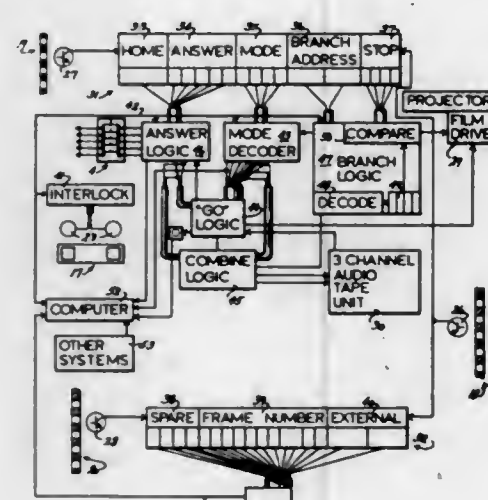
Harold S. Montgomery, Milwaukee, and Alan F. Stevens, Oak Creek, both of Wis., assignors to David J. Nutting and Phyllis M. Nutting, both of Milwaukee County, Wis.

Filed June 29, 1971, Ser. No. 157,836

Int. Cl. G09b 7/08

U.S. Cl. 35-9 A

37 Claims



A shutterless film projector projects from a film with an interlock track along one frame edge, and a clock track and a pair of data tracks laterally placed along the opposite frame

edge. Each film frame projects a question with a plurality of answers, selected by operation of corresponding switches. The clock track includes alternate transparent and opaque areas and the data tracks corresponding areas with appropriate transparent and opaque codes. The interlock track includes a pair of transparent areas aligned with a pair of light sensitive transistors with a film frame stopped in proper position. As the film moves, transistors serially read the data and clock tracks to actuate a pair of serial shift registers to accept the several data tracks. The first data track includes correct and incorrect answer logic, a mode determining logic, a frame address logic and next stop frame logic. This code information is interconnected through an answer input comparator and a mode decoder to a combination logic circuit to selectively actuate a "go" control for the projector, and, if desired, a multiple channel audio tape unit or the like. The second data track includes a frame number which with the particular answer selected is selectively fed to a computer.

3,733,718

## MATHEMATICAL DEMONSTRATION DEVICE

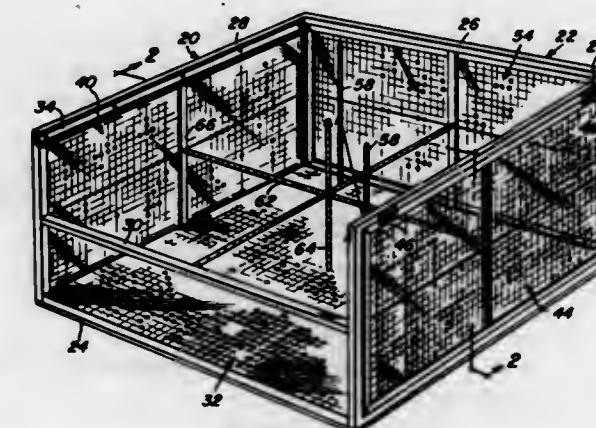
Fred D. Hill; Fred J. Hill, and Stanley L. Hill, all of Hattiesburg, Miss., assignors to R. A. Gray, Jr. and Frank D. Montague, Jr., both of Hattiesburg, Miss., a part interest to each

Filed July 23, 1971, Ser. No. 165,614

Int. Cl. G09b 23/04

U.S. Cl. 35-34

16 Claims



A demonstration device incorporating an open frame mounting an XY plane, an XZ plane and two YZ planes. The planes are normally recessed so as to define a central demonstration area. Alternatively, the XY plane, XZ plane and one YZ plane can be oriented coplanar to each other. Point locating strings and rods, as well as a trigonometric function demonstration attachment in the nature of a compass pivotally mounting radially extending arms are also provided.

3,733,719

## TAPE RECORDER FOR TEACHING, PARTICULARLY FOR LANGUAGE TEACHING

Erich Josef Ley, Reutlinger Strasse 51, D-71 Heilbronn, Germany

Filed Mar. 31, 1971, Ser. No. 129,706

Claims priority, application Germany, Apr. 2, 1970, P 20 15 671.2

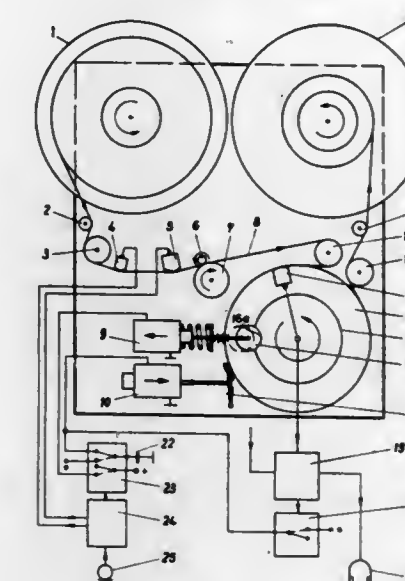
Int. Cl. G09b 5/04

U.S. Cl. 35-35 C

7 Claims

Tape recorder for teaching utilizing a tape having a track for recordal of a student's voice. The recorder has spaced-apart recording and reproducing heads for the student's track. A tape guiding disc carries this reproducing head and is rotatable by the tape during recordal of the student's voice to

increase the spacing between the recording and the reproducing heads. The disc can be automatically arrested on comple-



tion of a recording which is then immediately reproduced as the tape travels past the stationary reproducing head.

3,733,720

## ORRERY

Edward Victor Byers, 17 Cavendish Crescent, The Park, Nottingham, England

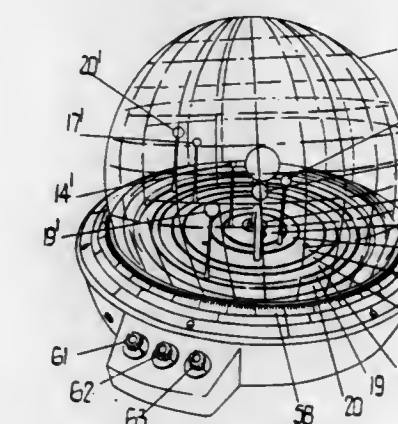
Filed Jan. 22, 1971, Ser. No. 108,813

Claims priority, application Great Britain, Jan. 29, 1970, 4,262/70

Int. Cl. G09b 27/02

U.S. Cl. 35-45

8 Claims



An orrery, being a mechanical model demonstrating movements of planets in their orbits around the sun, comprises a central sun-carrying member, a plurality of annular planet-carrying members nested one within another and individually rotatable about the central member, and a driving mechanism for driving the annular members at different rotational speeds, which mechanism comprises three sets of friction wheels rotatable respectively about three axes which are radial to and spaced apart about the rotational axis of the annular members, wherein each set consists of a wheel for each annular member, each said wheel engages and supports a circular track on the associated annular member, a plurality of wheels in each set have differing diameters and the tracks for them are concentric and have differing diameters and are disposed at appropriately different levels, and at least one of the sets is driven.



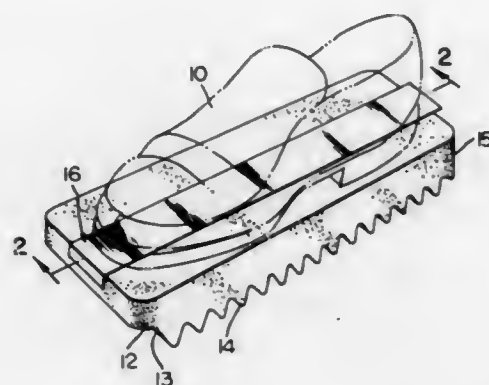
3,733,721

**RESILIENT PAD FOR USE ON FOOTWEAR**

Philip M. Clemens, 1835 Pemberton Drive, Fort Wayne, Ind.  
Filed May 17, 1971, Ser. No. 143,786  
Int. Cl. A43b 13/04

U.S. Cl. 36—32 R

2 Claims



The specification discloses a resilient pad, for example, foamed elastomeric material with the pad being generally contoured for mounting on the bottom of an article of footwear, such as a shoe, or the like. The pad is provided with pressure sensitive adhesive on the upper side so that it can be adhered to the bottom of an article of footwear to provide a cushion, while the pad can readily be removed from the article of footwear when desired.

3,733,722

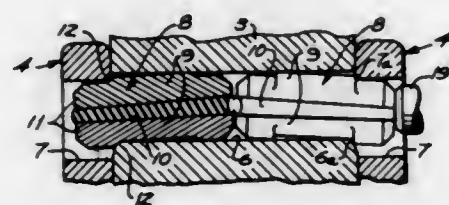
**DUAL DIGGING TOOTH RETAINER**

Richard L. Launder, 1540 South Greenwood Avenue, Whittier, Calif.

Continuation-in-part of Ser. No. 84,974, Nov. 12, 1970, abandoned. This application June 9, 1971, Ser. No. 151,454  
Int. Cl. E02f 9/28

U.S. Cl. 37—142 A

3 Claims



Dual retainer pins for a digging tooth, forming a socket having opposed holes in its sidewalls and arranged to fit over a mating holder having a cross bore positioned to align with the opposed holes; each of the dual retainer pins comprising a pair of complementary bars joined by a rubber body so that the bars may be compressed toward each other, and the pair of pins dimensioned to be disposed in the holder with their inner ends in abutment and their extended ends projecting into the holes in the sidewalls of the tooth so that localized force is applied adjacent their extended ends tending to cause the pins to assume wedge shapes by causing their extended ends to compress and their abutting ends to expand. Also contemplated is a removing tool insertable between closely spaced teeth and including a wedge element operated driving pin engageable with one retainer pin to force the other pin free while placing the first pin wholly within the bore of the holder.

3,733,723  
**STEAMER**

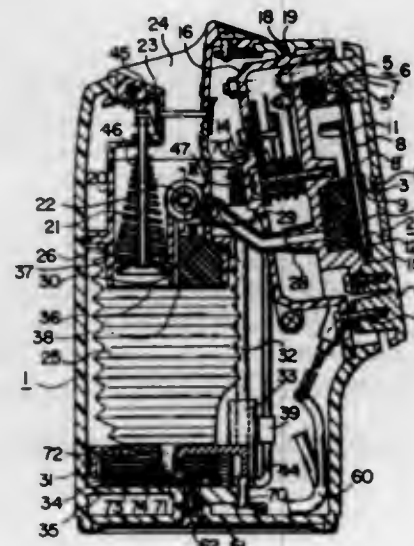
Shigeru Takakuwa, Suita; Kenichi Iwami, Kawanishi, and Mitsuo Ide, Takahashi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 31, 1972, Ser. No. 285,219  
Claims priority, application Japan, Sept. 7, 1971, 46/69440; May 17, 1972, 47/58026

Int. Cl. A47j 51/00

U.S. Cl. 38—69

14 Claims



A steamer having pressure imparting means for imparting pressure to a flexible tank containing water for compressing the tank thereby forcedly feeding water in the tank into a vaporizing chamber, in which steamer manual push button means are provided so that steam can be ejected and ejection of steam can be ceased as desired in response to the manipulation of the manual push button means.

3,733,724

**IRONING BOARD PAD**

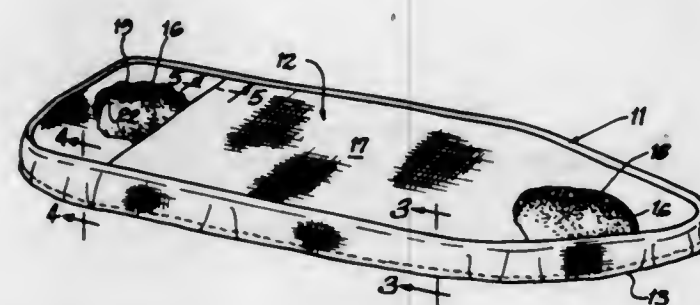
Harvey L. Davis, Highland Park, Ill., assignor to Bishop Freeman Company, Evanston, Ill.

Filed Feb. 11, 1971, Ser. No. 114,581

Int. Cl. D06f 81/14, 83/00

U.S. Cl. 38—140

4 Claims



An ironing board pad is provided having a cover portion, shaped and sized to cover the upper surface of an ironing board, and a skirt portion to attach the pad to an ironing board. The cover portion comprises an underlying resilient supporting layer, a portion of which is covered by layers to provide a good ironing surface and a portion of which is covered by layers to permit a hot iron to stand thereon for extended periods without a trivet. The layers of the ironing surface comprise an outermost stretchable knit material and an intermediate resilient flexible foam, the knit material being made of a blend of yarns, plated so that a heat-resistant yarn is predominant on its outer surface and a yarn of lesser heat resistance is predominant on its inner surface.

3,733,725

**STEAM-GENERATING WATER-SPRAYING FLAT IRON**

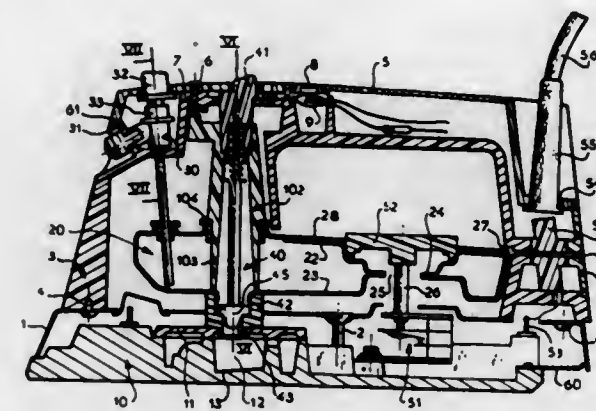
Maurice Marie Achille Trouilhet, Lyon, France, assignor to Calor, Lyon, France  
Filed Nov. 10, 1971, Ser. No. 197,447

Claims priority, application France, Nov. 4, 1970, 7043760; May 11, 1971, 7116992

Int. Cl. D06f 75/06

U.S. Cl. 38—77.5

11 Claims



The present invention relates to a number of improvements in an iron of the steam-generating and water-spraying type. According to these improvements, there is essentially provided an elongated transparent reservoir extending over the whole length of the sole-plate, an unlosable plug fitted in a filling orifice bored in said reservoir, the latter being traversed by a moulded member bearing upon its lower face and containing a vapourizing device provided with a needle valve.

3,733,726

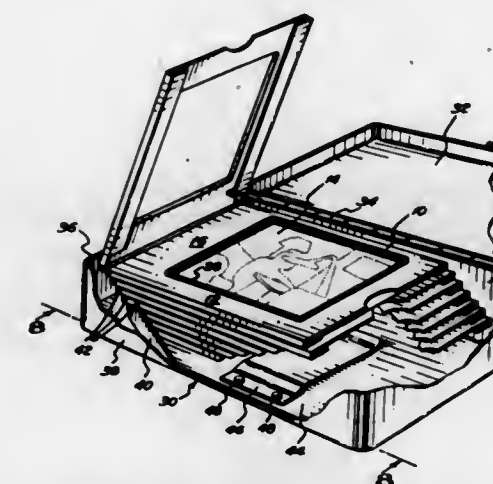
**PHOTOPRINT HOLDER AND STORAGE CONTAINER**

Herbert T. Nelson, 992 Mason Lake Drive, Grapeview, Wash.  
Filed Aug. 25, 1971, Ser. No. 174,676

Int. Cl. B42f 13/00

U.S. Cl. 40—104.17

1 Claim



A rectangular frame, having a center picture opening therein, is provided for holding and storing wet photoprints of the type obtaining from Polaroid, or the like, cameras. All such photoprints, whether coated black and white or color, are originally wet and sticky. The frames for storing and holding such wet photoprints comprise spaced apart top and bottom rails, which are of U-shape in section and spaced end rails, said four rails forming a frame with a center picture opening and spaced apart top and bottom slots for slidably receiving therein the edge portions of a photoprint. One of said end rails is provided with a stop to arrest sliding traveling movement of a photoprint therepast and the other end rail is

provided with an opening permitting end grasping of a photoprint for sliding insertion or removal of the photoprint from the spaced apart slots. A storage container is provided for mounting said rectangular frames and is preferably provided with a shallow lid hinged to a top edge portion along the longest side of the containers, providing a convenient and stable support for photoprints while they are being coated, if desired. Diagonally extending side rails are secured to the inside surfaces of the side walls of the container and the rectangular frames are disposed in superposed, steplike relation, each having an end portion thereof pivoted to said side rails, the pivot means of each rectangular photoprint holder being spaced from the pivot means of the next below photoprint holder permitting free upward turning movements of a photoprint holder as respects the next below photoprint holder. Also, a refuse clip is preferably provided in a bottom portion of the receptacle for the stowing therein of refuse from the film package providing said photoprints.

3,733,727

**NON-LETHAL PROJECTILE AND LAUNCHER THEREFOR**

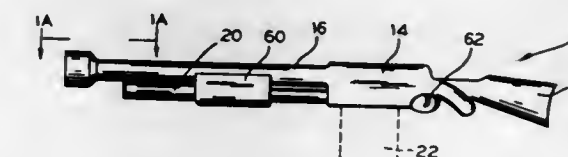
Kenneth W. Jones, 9512 West 47th Street, Brookfield, and Edward H. Richie, 4327 Elm Street, Downers Grove, both of Ill.

Filed Nov. 12, 1970, Ser. No. 88,687

Int. Cl. F41c 21/00; F42b 5/14, 11/18

U.S. Cl. 42—I R

4 Claims



A non-lethal projectile and launcher therefor for riot control and the like comprising a body formed from a relatively soft, pliant latex material compressed to projectile form and mounted within a restraining cup which in turn is mounted in a firing shell. The body at its rearward end includes retracted guidance structure that extends on the projectile being fired, a chamber at its forward end to receive a marking fluid for marking the target, and internal subdivisions in its mid portion designed to permit the body to expand laterally on impacting into a soft textured mass that flattens on impact to avoid injury to the target. The projectile launcher is in the form of a barrel assembly including a bell shaped muzzle which permits the projectile to be fired without jamming even when held against the target and braking slots for discharging the propelling gases rearwardly of the launcher to reduce recoil.

3,733,728

**SHELL CATCHER FOR REPEATING FIREARMS**

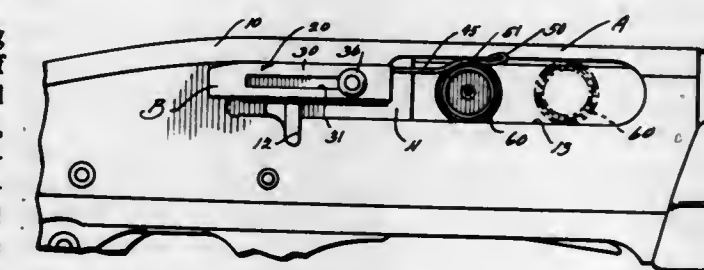
John S. Kuslich, 1064 Arzyle St., St. Paul, Minn.

Filed Aug. 12, 1971, Ser. No. 171,235

Int. Cl. F41c 27/00

U.S. Cl. 42—I R

6 Claims



A spent shell catching device for repeating firearms having compact means with a sliding fore and aft action whereby the



same may be placed in an inoperative position or in position to catch spent shells upon ejection from the receiver of the gun. Furthermore the invention comprehends the provision of the above shell catching means modified to the extent that the shell catcher can be used in shooting doubles in which the first shell is totally ejected and the second shell caught by the catcher mechanism which is automatically operated to catch the shell bolt action of the gun.

3,733,729

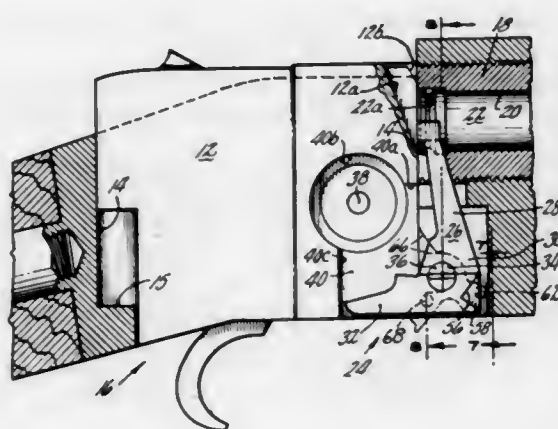
# SHELL EXTRACTOR FOR FIREARM WITH FALLING BREECHBLOCK

Richard L. Baker, Hartford, Conn., assignor to Colt Industries Operating Corp., Hartford, Conn.

Filed Jan. 12, 1972, Ser. No. 217,614  
Int. Cl. F41c 15/08, 11/04

U.S. Cl. 42-23

4 Claims



A firearm with a falling breechblock has a shell extractor loosely mounted upon a pivot structure in the receiver for pivoting movement between a first position and a second position, and for lateral tilting motion. The shell extractor occupies the first position in which it is adapted to engage the periphery of a chambered cartridge when the breechblock occupies its battery position. The shell extractor occupies its second position free from engagement with the periphery of the cartridge when the breechblock is in its retracted position. A cam arrangement is employed to tilt the extractor away from engagement with the cartridge during pivoting movement of the extractor from the first position to the second position so as to permit complete withdrawal of the cartridge from the chamber and subsequent insertion of a new cartridge. The cam arrangement may be adjusted to vary the tilt of the shell extractor in the second position so as to allow for a wider latitude in tolerances.

3,733,730

# BY-PASS HAND CONNECTION

Richard L. Baker, Wallingford, Conn., assignor to Colts, Inc., Hartford, Conn.

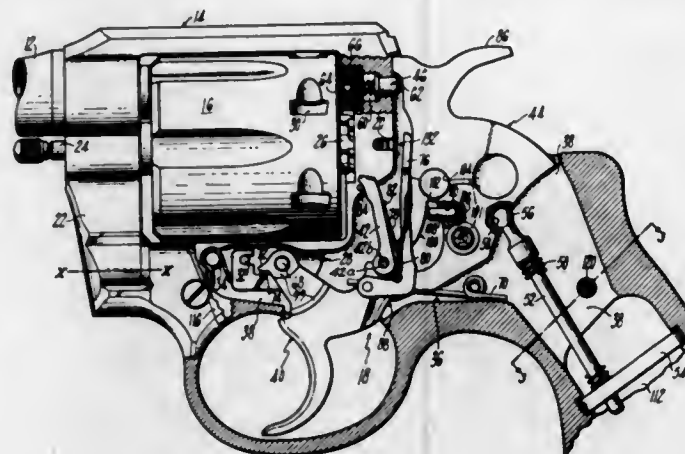
Filed June 8, 1970, Ser. No. 44,311  
Int. Cl. F41c 1/00

U.S. Cl. 42-65

3 Claims

A revolver has a cylinder, including a by-pass ratchet, mounted for rotation within a frame. A trigger is pivotally mounted in the lower portion of the frame. A cylinder lock is positioned in the lower portion of the frame adjacent the frame and is so arranged that it locks the cylinder in certain trigger positions. A hammer is mounted for rotation in the rear portion of the frame and is urged into the firing position by means of a compression spring. The lower portion of the hammer is adapted to contact the trigger and move it to a rearward position during movement of the hammer from the firing position to the cocked position. A by-pass hand and a safety connector are pivotally mounted on the trigger on separate

pivots. A leaf spring is interposed between the safety connector and the hand to urge the hand in the direction of the cylinder. The pin upon which the hand is mounted is significantly smaller than the mounting aperture on the hand. As the hammer is cocked the hand engages the by-pass ratchet to



rotate the cylinder to a locked position. The trigger pull in the cocked position is substantially constant at all cylinder positions since the effects of the friction between the hand and the ratchet are not transmitted to the trigger because of the play in the connection between the trigger and the hand.

3,733,731

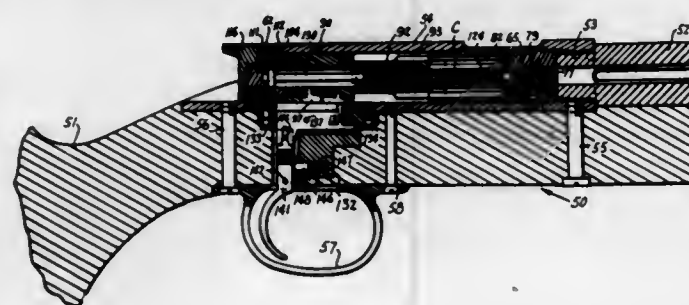
# FIREARM WITH REMOVABLE LOCKING SYSTEM

Morris R. Nicholson, 2001 Yeager Drive, Longmont, Colo.

Filed Nov. 11, 1971, Ser. No. 197,853  
Int. Cl. F41c 19/00, 11/00

U.S. Cl. 42-69 A

9 Claims



A simplified locking and firing mechanism for a firearm using metallic cartridges having an action constructed from a straight cylinder to transfer the pressure from the barrel to the rear section of the action. The locking and unlocking structure, the safety and striker, as well as the sear are combined in one assembly cooperating with a simple leverage assembly for the trigger.

3,733,732

# BARREL RETAINER FOR SHOTGUNS

Edward M. Stark, East Longmeadow, and Louis Elkas, Agawam, both of Mass., assignors to Emhart Corporation, Bloomfield, Conn.

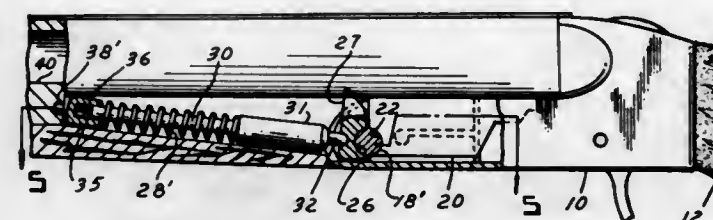
Filed July 12, 1971, Ser. No. 161,736  
Int. Cl. F41c 27/00, 7/00

U.S. Cl. 42-75 D

9 Claims

Shotgun barrel retainer in which the barrel is pivotable about a hinge pin supported by the laterally spaced arm portions of the gun frame by means of a depending barrel lug disposed between the arms of the frame and having a semi-cylindrical recess engaged with the forward portion of the hinge pin. A coil spring urges the barrel outwardly to maintain the barrel lug firmly engaged with the hinge pin having at one

end a shoe or saddle member engaged with the cylindrical surface of the hinge pin opposite the barrel lug and being compressible between the hinge pin and a second barrel lug toward the fore-end of the barrel. A resilient leaf spring is car-



ried on the hinge pin and is disposed between the frame and the barrel lug. The leaf spring, in combination with the coil spring and shoe member, serves to retain the barrel in fixed position on the frame and prevents undesirable relative motion therebetween when the barrel is pivoted to an open position.

3,733,733

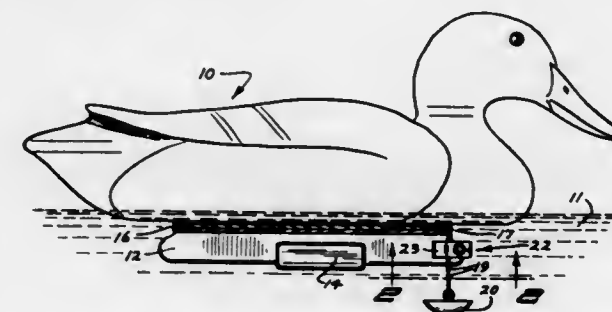
# FLOATING BUOYANT OBJECT

Lewis L. Ruter, 218 26th Avenue North, Apt. No. 7, Minneapolis, Mich.

Filed Mar. 18, 1971, Ser. No. 125,542  
Int. Cl. A01m 31/06

U.S. Cl. 43-3

8 Claims



A floating buoyant object such as a duck decoy having an anchor and an attaching anchor line. Resilient line-holding clip means are provided whereby the length of the anchor line may be adjusted. Means are provided on the object for the storage of reserve anchor line.

3,733,734

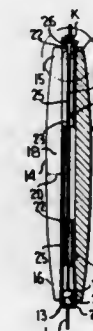
# QUICK-CHANGE SLIP-FLOAT

Jimmie H. Hysaw, 302 Summit Avenue, Lawton, Okla.

Filed Oct. 1, 1971, Ser. No. 185,773  
Int. Cl. A01k 93/00

U.S. Cl. 43-44.9

10 Claims



A quick-change slip-float and particularly a novel connector for quickly attaching and detaching fishing elements

(floats, bobbers, sinkers, etc.) to a fishing line while precluding fouling and/or snagging of the line when in use. The connector includes one or more generally tubular sleeves slit from end to end along their entire length, a plug having a longitudinally extending bore defined by an internal unbroken peripheral surface, and means for removably fastening each plug in internal telescopic relationship to an associated sleeve. The bores are adapted to guide a fishing line centrally of the sleeve spaced away from the slit thereof to prevent fish line fouling and/or snagging when the sleeves are positioned telescopically internally of opposite ends of slit and bored floats, bobbers, etc.

3,733,735

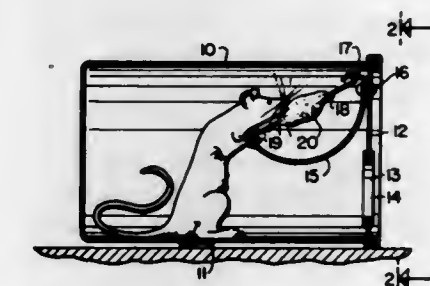
# ANIMAL TRAP

Clifford Burton Hirsch, Wukupumu Road, Woodbury, Conn.

Filed Jan. 19, 1971, Ser. No. 107,687  
Int. Cl. A01m 23/18

U.S. Cl. 43-61

7 Claims



An animal trap for vermin has a container with an end wall containing an opening. A spring closed door within the container seals the opening when bait, fixed behind the door, is attacked. The door may be held open by link members connected between the end wall and the door, the link members being joined by a hard bait so that the devouring of the bait releases the link members and the door springs closed.

3,733,736

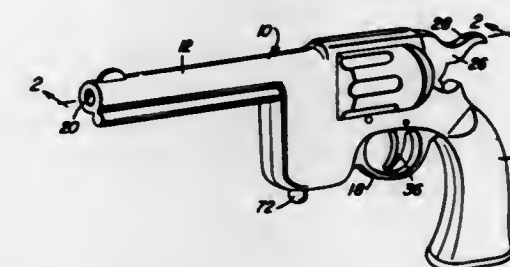
# BUBBLE BLOWING TOY GUN

Lee S. Glessner, Sr., 2829 Eoff St., Wheeling, W. Va.

Filed Oct. 6, 1971, Ser. No. 187,086  
Int. Cl. A63h 33/28

U.S. Cl. 46-7

10 Claims



A bubble producing device including a walled reservoir for a bubble producing liquid, and also an intermittently operable compressed gas jet producing structure disposed outward of the reservoir with liquid conveying structure operatively associated with the walled reservoir for selectively conveying measured quantities of liquid from the reservoir to a position for acting upon by the gas jet producing structure.



3,733,737

## TOY AIRPLANE

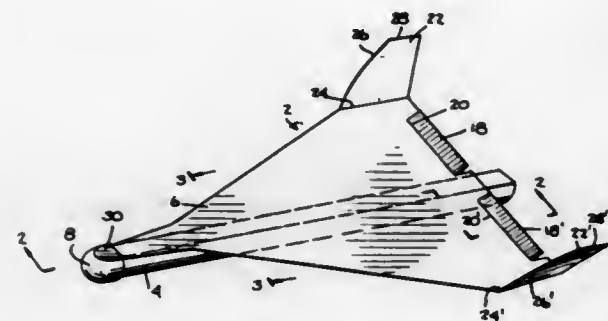
Harold Goodman, 590 Ocean Avenue, Long Branch, N.J.

Filed Jan. 14, 1972, Ser. No. 217,826

Int. Cl. A63h 27/00

U.S. Cl. 46-79

8 Claims



A toy airplane having a single section fuselage with a flattened upper surface adapted to provide a glue surface for a flattened integrally formed wing structure.

3,733,738

## LIQUID-GASEOUS INTERACTION TOY

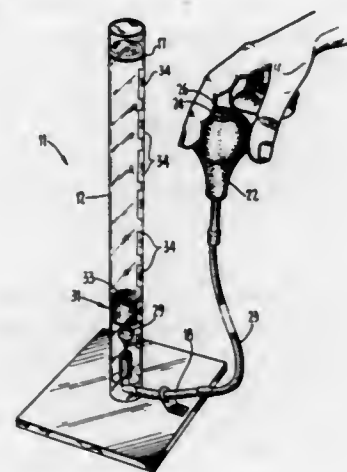
Frederick J. Kramer, 686 28th Street, Oakland, Calif.

Filed Oct. 7, 1971, Ser. No. 187,420

Int. Cl. A63h 23/00

U.S. Cl. 46-91

5 Claims



A toy that tests the skill of a user in performing a function is described which relies for operation on the interaction of various substances having different specific gravities. A tubular container is provided for supporting a column of a liquid such as water, and a syringe-type squeeze bulb communicates with the bottom of the container to enable introduction of controlled amounts of air into the bottom of the column. A capsule is also provided having a greater specific gravity than the liquid in the container so that the same will normally sink through the liquid in the container. The capsule includes a chamber for capturing air which has been introduced into the container. Since air is a gas and has a lower specific gravity than the liquid, it will tend to rise within the column. By controlling the amount of air introduced into the liquid for capture by the capsule, a user of the toy can control the movement of the capsule. That is, the user can slow the descent of the capsule by introducing a small amount of air, suspend the capsule at a prescribed location within the liquid by introducing a specific greater amount of air, and reverse the direction of the capsule by introducing more air.

3,733,739

## MOTOR OPERATED TOY VEHICLE

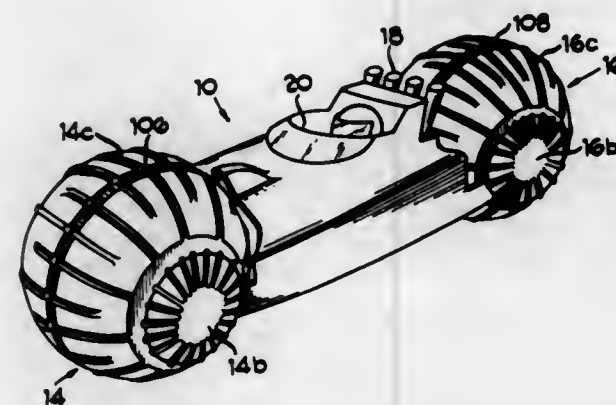
Rouben T. Terzian, Chicago, Ill., assignor to Marvin Glass &amp; Associates, Chicago, Ill.

Filed Dec. 30, 1971, Ser. No. 214,022

Int. Cl. A63h 17/00

U.S. Cl. 46-206

9 Claims



A toy vehicle which is capable of mobility on a solid surface or through a liquid medium, and which is possessed of self-righting capability, characterized by the provision of forward and rear driven spherical wheels and an intermediate body between the wheels having a low center of gravity with a power source for the vehicle and motor means held in sealed compartments within the body.

3,733,740

## AIR ACTUATED EYE FOR TOYS WITH HOLLOW FLEXIBLE BODIES

Giovanni Palumbo, Viale Faenza 10, 20142 Milan, Italy

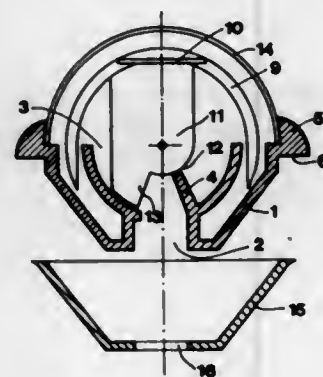
Filed Nov. 19, 1971, Ser. No. 200,487

Claims priority, application Italy, Nov. 19, 1970, 31955 A/70

Int. Cl. A63h 29/16

U.S. Cl. 46-44

3 Claims



A new artificial eye for puppets or toys made of rubber or other non-rigid hollow plastic material, comprises a hollow body of frusto-conical configuration with a duct in the middle, which has a rectangular configuration in the upper part. The artificial pupil is a circular portion located in the middle of a hollow spherical cap serving as the ocular globe. When the puppet is pressed, air enters the duct, is brought into recesses located in diametrically opposed position on the edge of the hollow body by a deflector, strikes a projection on an extension piece placed in the duct and displaces the pupil. When the pressure is released, the air makes the deflector rotate the pupil in the opposite direction.

3,733,741

## CHILD'S MUSICAL TOY

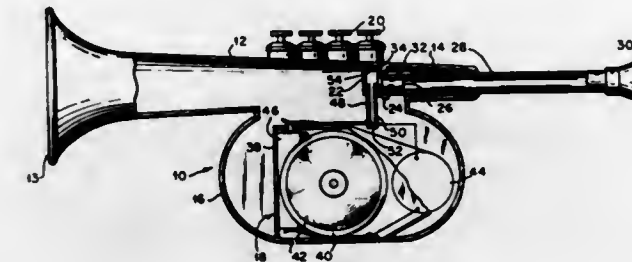
William J. Pipa, New Hyde Park, N.Y., assignor to Dicker International, Inc., New York, N.Y.

Filed Apr. 30, 1971, Ser. No. 139,046

Int. Cl. A63h 5/00

U.S. Cl. 46-175 AR

11 Claims



A child's toy musical instrument simulating the form of a real wind instrument and incorporating a battery-operated toy phonograph, including a grooved record on which music played on the real instrument is reproduced. The body of the toy includes a tube portion with a mouth piece at one end and a plug slidable within the tube under the pressure of air blown into it through the mouth piece. The electrical circuit of the phonograph includes a normal open switch positioned to be closeable by the plug when moved under pressure of breath blown into the mouth piece.

3,733,742

## INERTIA TOY

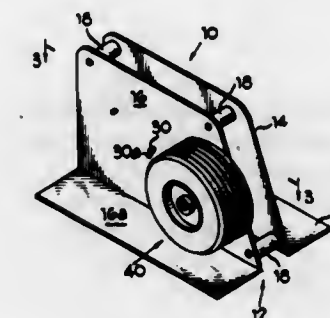
Rouben T. Terzian, Chicago, Ill., assignor to Marvin Glass &amp; Associates, Chicago, Ill.

Filed Dec. 30, 1971, Ser. No. 214,023

Int. Cl. A63h 11/10

U.S. Cl. 46-202

5 Claims



A launching and racing type toy characterized by the provision of a frame having a crank arm, intermediate gears and a driven rotatable spindle having a threaded portion thereon; and a wheel having a threaded interior for mating with the spindle thread.

3,733,743

## DOLL HAVING GRASPING HAND AND ELECTRICAL MEANS ACTUATED THEREBY

Joseph Kossoff, Hawthorne; Ronald R. Liedtke, and Joe W. Young, both of Redondo Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed June 18, 1971, Ser. No. 154,453

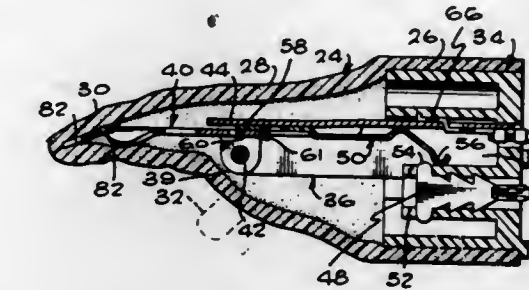
Int. Cl. A63h 33/26

U.S. Cl. 46-228

9 Claims

A doll with a hand that can be forced to close or open by directly bending the doll fingers, and which thereafter remains closed or open. The hand includes a resilient flesh-colored shell, a frame extending within the palm region of the shell, and a lever pivotally mounted on the frame at the front of the

palm region and extending into the finger region. An over-center spring arrangement maintains the lever extending straight ahead to keep the hand open, or bent to keep the hand closed. In one doll whose eyes are illuminated when the hand is operated, an electrical contact coupled to the lever in the hand touches another electrical contact only when the lever is



intermediate the extreme positions to which it is urged by the spring arrangement. This assures that the batteries, which energize a lamp that lights up the eyes, are not depleted if a child accidentally leaves the hand completely open or closed. In another doll, an electrical contact located in the hand can be closed by squeezing the hand, which a child can do as holds the hand to open or close it or at other times.

3,733,744

## POWER MODULE FOR DRIVING VEHICLE-PROPELLING ELEMENT, INCLUDING STATIONARY AXLE MEANS MOUNTING SAID ELEMENT

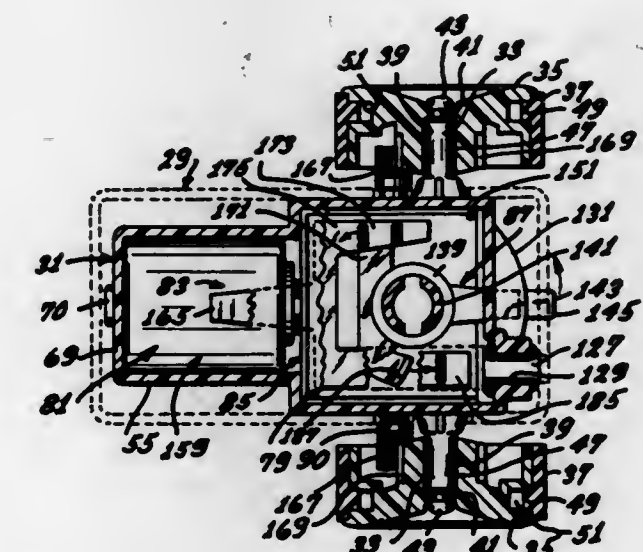
John P. Hiltbold, Manhattan Beach, and George Soukakis, North Hollywood, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 9, 1972, Ser. No. 224,821

Int. Cl. A63h 29/22

U.S. Cl. 46-243 E

9 Claims



A completely self-contained power module for supplying rotational power to drive wheels, tractor tracks, airplane propellers, and the like, of miniature toy vehicles, the module including in a single housing a rechargeable battery, an electric motor with a drive shaft, switch means for electrically connecting the battery to the motor, a non-rotating axle integrally a part of the module's housing and disposed at a fixed relationship to the motor's drive shaft for rotatably carrying the driven wheels, etc., and a means for providing recharging current to the battery, preferably including means for disconnecting the motor from the battery circuit during charging.



3,733,745

**GERMINATION AND SEEDLING PROMOTING UNIT**  
Sven Ingerstedt, Asbro, and Max Paabo, Norrköping, both of Sweden, assignors to Hanselors Bruks Aktiebolag, Skylberg, Sweden

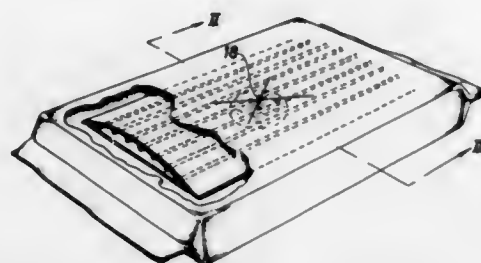
Filed Mar. 30, 1971, Ser. No. 129,552

Claims priority, application Sweden, Apr. 1, 1970, 4463/70;  
Apr. 1, 1970, 4464/70

Int. Cl. A01c 1/04

U.S. Cl. 47-37

10 Claims



The present germination and seedling promoting unit includes an envelope containing a piece of preferably compressed moisture absorbing material such as peat for holding the seed or seeds. The bottom side of the envelope is provided with holes for absorbing ground moisture. The top surface of the envelope is provided with passage means for the growing seedling. Between the passage means and the seed or seeds there are provided mechanical protection means as well as evaporation protection means which are preferably formed as a web on a piece of tape, portions of which are taped to the peat to locate the protection means between the seed and the passage means.

3,733,746

**SELF FEEDING FLOWER POT**

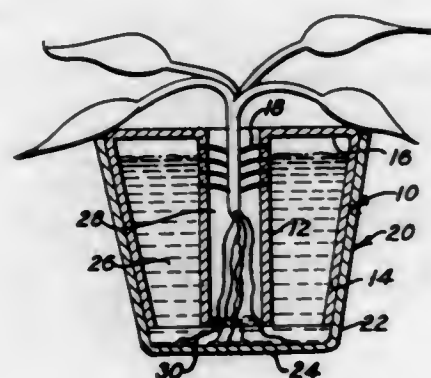
William G. Allen, Jr., 2329 Tuscora Road, Bon Air, Va.

Filed July 29, 1971, Ser. No. 167,175

Int. Cl. A01g 27/00

U.S. Cl. 47-38

4 Claims



A flower pot having an imperforate core that includes an annular inner wall that forms a tube in which a plant is received, an annular outer wall that in conjunction with the inner wall forms a reservoir for a nutrient solution and a top wall that extends between the inner and outer walls. The pot also has an imperforate jacket that includes a floor that extends below and across the bottom of the core and an annular wall that extends upwardly of the floor and is outwardly of and in close proximity to the outer wall of the core. A passage between the floor and the bottom of the inner wall enables the nutrient solution to flow from the reservoir to the bottom of the tube.

3,733,747

**DOOR OPERATING MECHANISM**

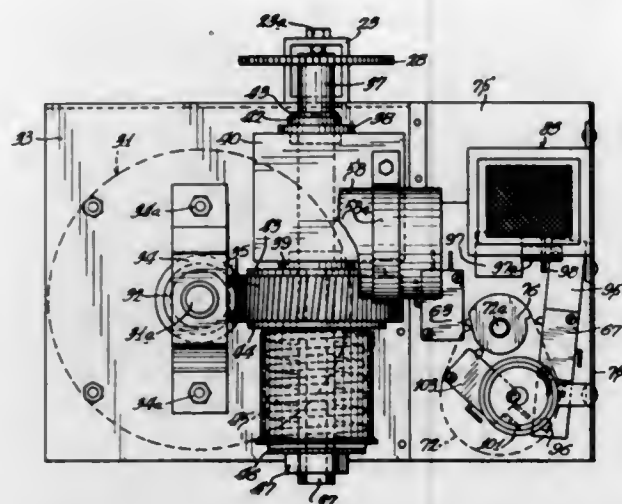
Edward I. Fox, Chicago, and Raymond J. Fullem, North Riverside, both of Ill., assignors to H. W. Crane Company, Maywood, Ill.

Filed Mar. 1, 1972, Ser. No. 230,628

Int. Cl. E05f 15/20

U.S. Cl. 49-30

13 Claims



This invention relates to a door operating mechanism for moving a door in opening and closing movements in response to actuation of a selectively operable door operating switch. The door operating mechanism has an electric drive motor which is reversibly operated under the control of reverse and forward motor control switches to respectively open and close the door at a selected rate. The door operating mechanism is characterized by the provision of an electric timer, operated under the control of the door operating switch, and a cam mechanism driven by the timer at a speed related to the selected rate of door movement for operating forward and reverse motor control switches to control the mode and duration of door movement.

3,733,748

**MULTIPLE STAGE WINDOW REGULATOR**

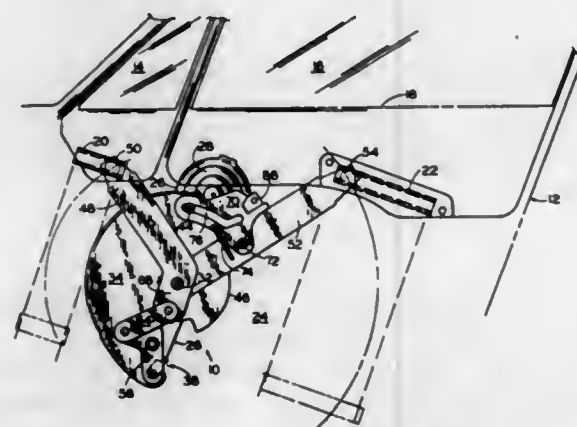
Max O. Heesch, Brooklyn, Mich., assignor to Hancock Industries, Inc., Jackson, Mich.

Filed Dec. 16, 1971, Ser. No. 208,556

Int. Cl. E05f 11/38

U.S. Cl. 49-103

15 Claims



A window regulator for sequentially operating two, substantially coplanar, separate, window panels slidably mounted within an automobile door, one of the window panels constituting a small vent, and the other window panel constituting a primary side window. Single operating means for both window panels, which is either manual or motorized, actuates the regulator mechanism through two consecutive stages of

operation whereby movement of the regulator in a single direction first fully operates one window panel through its full range of adjustment, and upon such panel adjustment being completed, then operates the other panel through its adjustment range. The regulator includes a gear segment and a lever pivotally associated with each window panel. Lost motion means interconnecting the gear segment and the levers produces the sequential window regulation, and locking means are utilized with the levers to lock the window panels in desired terminal conditions.

3,733,749

**DEVICE FOR THE ARTICULATION OF DOORS**

Pedro Pere Parera, Calle Alba No. 3, Barcelona, Spain

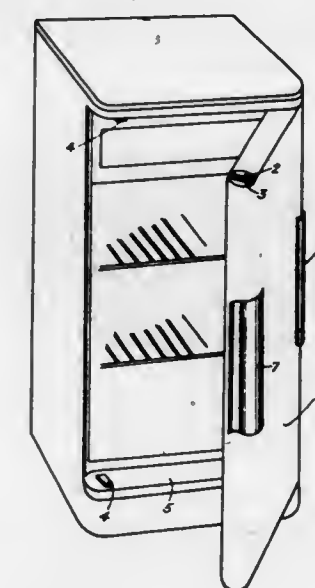
Filed Jan. 25, 1971, Ser. No. 109,152

Claims priority, application Spain, Jan. 28, 1970, 155 717

Int. Cl. E05d 15/50

U.S. Cl. 49-193

2 Claims



A door hingedly connected to a suitable frame structure by means of hinge structure for enabling the door to be swingably moved about the opposite side extremities of the door. A first pair of rotary bearings are mounted on the upper and lower ends of the door adjacent one extremity thereof, which bearings have arcuate slots therein which coact with arcuate projections provided on the frame and disposed for coaction with the first pair of bearings. A second pair of rotary bearings are mounted on the upper and lower edges of the door adjacent the opposite extremity thereof and include arcuate slots disposed for coaction with a further pair of arcuate projections mounted on the frame, whereby the door can be swingably moved about either extremity thereof.

3,733,750

**AIR RELEASE LID**

Sanford L. Hege, R.D. No. 2, Chambersburg, Pa.

Filed Dec. 20, 1971, Ser. No. 209,714

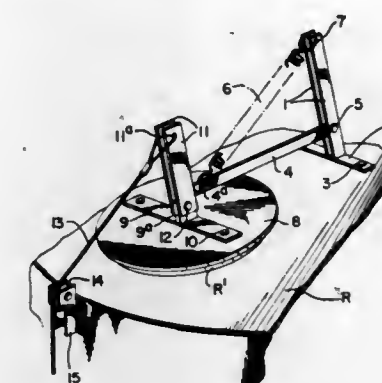
Int. Cl. E05f 1/00

U.S. Cl. 49-379

4 Claims

The air release lid for sealed silos has a bracket secured on the silo roof disposed radially inwardly of the opening therein. An arm is pivoted on the bracket adjacent the lower end thereof, the arm terminating at substantially the center of said opening. A spring connects the upper end of the bracket with the outer end portion of the arm for normally urging the arm to swing upwardly. A second bracket is disposed normal to the arm and fixedly secured intermediate its ends to the outer end of the arm. A lid of same shape as but larger than the opening is pivotally connected to the lower end of the second bracket;

and a cable extends from the upper end of the second bracket radially across the silo roof and down the side of the silo and is



adapted to be locked when the cable is drawn taut, thereby maintaining the lid tightly seated across the opening.

3,733,751

**METHOD OF AND APPARATUS FOR SHARPENING SMALL HAND TOOLS**

Patrick Robert Williams, Misty Hill, Mt. Eliza, Victoria, Australia, assignor to Temtool Pty. Limited, Notting Hill, Victoria, Australia

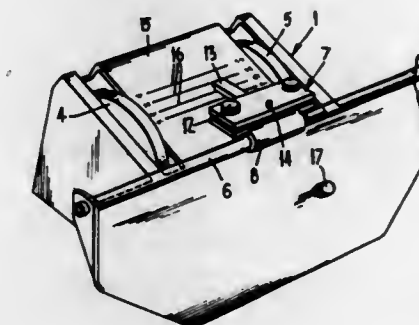
Filed May 6, 1971, Ser. No. 140,909

Claims priority, application Australia, May 6, 1970, PA 1107/70

Int. Cl. B24b 3/38, 3/54

U.S. Cl. 51-3

6 Claims



A grinder for tool blades having spaced coaxial grinding and stropping wheels, the stropping wheel being of smaller diameter than the grinding wheel, and a tool carrier movable along an axis parallel to the axes of the wheels. The angle made by a blade with the stropping wheel is greater than that made with the grinding wheel to remove the burr from the blade and provide a sharp edge thereon.

3,733,752

**LINER ASSEMBLY FOR BLAST CABINETS AND ELEMENTS THEREFOR**

Roger A. Johnson, Granger, Ind., assignor to The Wheelabrator Corporation, Mishawaka, Ind.

Filed Mar. 31, 1971, Ser. No. 129,794

Int. Cl. B24c 9/00

U.S. Cl. 51-8

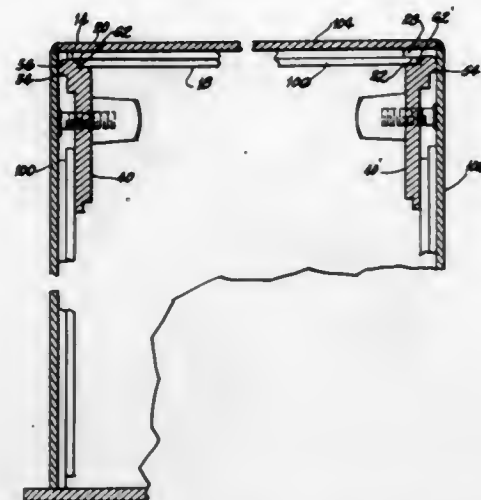
13 Claims

A new and improved liner system for use in blast cabinets and the like in which parts are subjected to surface treatment



wherein the linear assembly includes a universal liner panel in the form of a rectangular panel having structure for mounting

fingers can be provided on at least some of the hubs extending into corresponding openings in others of the hubs so as to in-



the panel to the walls of a blast cabinet and one or more corner liner panels adapted to be mounted on the lateral walls of a blast cabinet in an overlapping relation with the universal liner panel.

3,733,753

## FRICTION CONTROL DEVICE

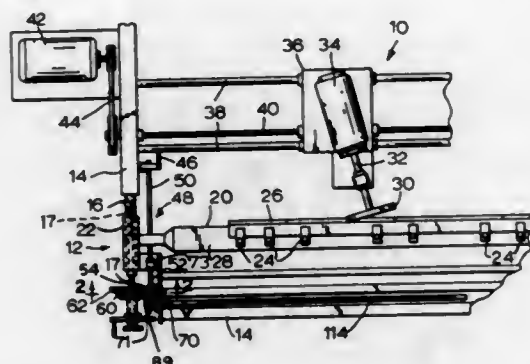
Robert C. Miller, 3350 Greenhill Road, Junction City, Oreg., and Gordon E. Stoddard, 2677 Friendly Street, Eugene, Oreg.

Filed Oct. 20, 1971, Ser. No. 190,786

Int. Cl. B24b 7/00, 9/00

U.S. Cl. 51—34 E

10 Claims



A control device selectively applies friction to a control mechanism adapted for feeding lathe knives in a grinding machine, whereby overrun of the mechanism or inaccuracy in its operation is substantially prevented. The control device is selectively locked out of its friction-applying position to allow rapid insertion and removal of knives.

3,733,754

## BUFFING WHEEL AND CARTRIDGE

Bernard G. Jeske, 1614 Clay Avenue, Detroit, Mich.

Continuation of Ser. No. 648,717, June 26, 1967, abandoned.

This application Jan. 26, 1970, Ser. No. 6,044

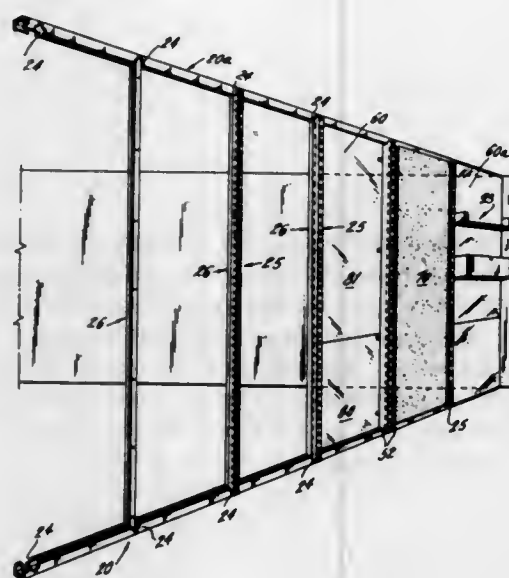
Int. Cl. B24d 9/02, 17/00, 11/00

U.S. Cl. 51—375

11 Claims

A buffing wheel consisting of a generally ring-shape body of buffing material, a ring-like clamping member of polygonal shape disposed coaxially within and attached to the body of buffing material, and a polygonal mounting hub disposed coaxially within the clamping member and formed of a resilient rubber-like material. A cartridge consisting of a plurality of such buffing wheels arranged in a side-by-side relation is semi-permanently mounted on a buffing spindle. Projecting

A modular partition comprising a plurality of modular panels, each supported between vertical posts which in turn are supported by and on a base rail. The vertical posts are so arranged that the modular panels may be hung therefrom by hooks along their vertical edges entering into appropriate slots in flanges on the post. The post, supported by a base rail, when arranged back to back, provides for a two sided wall; where the posts are supported on a rail so that they are not back to back, a single sided wall can be arranged which may be placed against an existing adjacent wall. The vertical posts not only provide means for suspending the modular wall panels, but also provide a channel with bracket support hooks on the inside of the channel from which modular furniture such as bookshelves having appropriate inter-engaging brackets may be hung and may be readily attached and removed.



3,733,755

## BRACKET STANDARD AND BASE RAIL SYSTEM

David R. Butler, New York, N.Y., assignor to Raymond Loewy/William Snaith, Inc., New York, N.Y.

Filed Feb. 25, 1971, Ser. No. 118,828

Int. Cl. A47f 5/08

U.S. Cl. 52—36

5 Claims

terlock adjacent wheels in the cartridge and flanged end hubs can be provided where additional locking of the end hubs to the clamping members is desired.

3,733,756

## MODULAR PARTITION SYSTEM

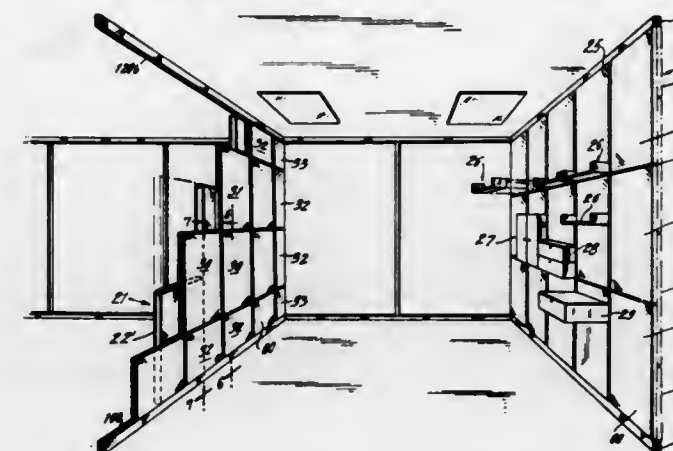
David R. Butler, New York, N.Y., assignor to Raymond Loewy/William Snaith, Inc., New York, N.Y.

Filed Feb. 25, 1971, Ser. No. 118,871

Int. Cl. E04b 2/72

U.S. Cl. 52—36

16 Claims



A readily assemblable and disassemblable wall or partition, consisting of a plurality of smooth faced rectangular panels, each providing interlocking elements at the rear thereof so that the smooth faces on each set of panels will together form one side of the partition and the interlocking faces of the panels will integrate both sides of the partition. The interlocking panels are so arranged that each panel interlocks four adjacent quadrants of four adjacent panels on the opposite side. The peripheral surface of each panel is so arranged that it provides vertical and horizontal channels between adjacent panels for utilities such as wiring with the wiring concealed and so that it also conceals in such channels mounting means for hanging shelves or other furniture on the walls.

3,733,757

## CONCRETE BUILDING FRAME CONSTRUCTION

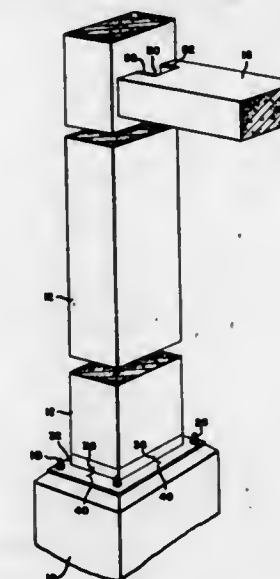
Norman L. Scott, Glenview, Ill., assignor to The Flexcore Company, Inc., Dayton, Ohio

Filed July 30, 1971, Ser. No. 167,677

Int. Cl. E04g 1/41

U.S. Cl. 52—105

11 Claims



A building construction system which utilizes precast, concrete structural members and mechanical connectors. In the system precast columns are attached to a footer or other foundation with one type of connection while beams are at-

tached to columns with a second type of mechanical connection. Preferably, the beam-column connection is also grouted after the mechanical interconnection is made.

3,733,758

## MECHANISM FOR UNFOLDING ACCORDION-LIKE FOLDED STRUCTURAL ELEMENTS

Horst Maier, Munich; Erich Arbeitland, Ottobrunn, and Peter Kleber, Munich, all of Germany, assignors to Messerschmidt-Bolkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Germany

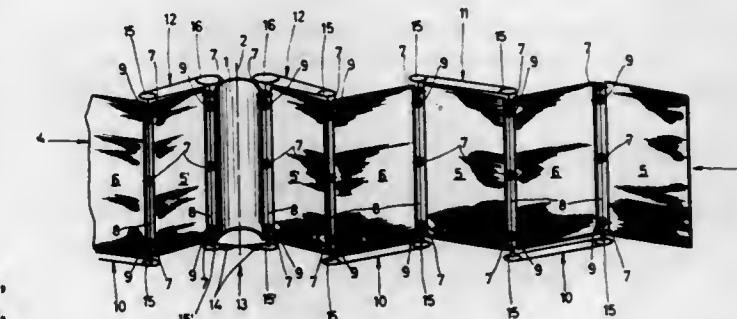
Filed Apr. 29, 1971, Ser. No. 138,451

Claims priority, application Germany, May 2, 1970, P 20 21 580.9

Int. Cl. B64g 1/10

U.S. Cl. 52—113

11 Claims



Mechanism for unfolding series-connected, accordionlike folded structural elements, particularly for use in supporting large surface solar cells. The several sections to be folded and unfolded are connected by hinge structure including a torsion-bar tensioned when said parts are in a selected on of folded or unfolded conditions. In addition, force transmission means are arranged between panels which rotate in the same direction during movement in response to the urging of said tensioned torsion bars. These force transmission devices ensure that said arm sections will unfold (or fold) at predetermined ratios with respect to each other, regardless of the effectiveness of successive individual torsion bars and will further ensure predetermined response by said arm sections, even if certain of said torsion bars are out of action. If desired, a power means can be applied to operate through said force transmission means for restoring the arm sections against the force of said torsion bars to said selected condition.

3,733,759

## FITTING ROOM

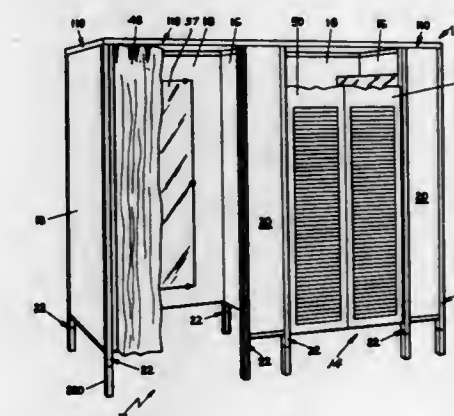
Donald W. Schulte, Grand Rapids, and Charles F. Logie, Spring Lake, both of Mich., assignors to American Store Equipment Corporation, Muskegon, Mich.

Filed July 26, 1971, Ser. No. 165,476

Int. Cl. E04h 1/12

U.S. Cl. 52—122

16 Claims



A fitting room assembly includes panel sides and posts, the latter having individual levelers which include a keeper plate



cocked angularly with respect to the posts so that its corners project beyond the post periphery to prevent feature strips mounted in the posts from sliding down beyond the ends of the posts. The levelers are encased by a sheath which is slidably positioned on the post. The tops of the panels and posts are covered by cornices which include an integral trackway for mounting draw curtains over the room opening. The cornices are open at their tops so that connector plates can be secured to adjoining panels which are cocked at oblique angles to one another rather than at right angles. The bottoms of the panels are covered by U-shaped caps having barbed legs for gripping the sides of the panels.

### 3,733,760 REACTOR VESSEL

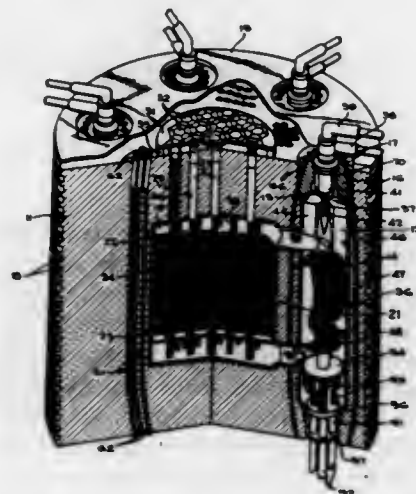
Ricahrd J. Koerner, La Jolla, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Mar. 5, 1970, Ser. No. 16,645

Int. Cl. E04c 1/06; A47j 27/08

U.S. Cl. 52-224

5 Claims



A concrete pressure containment vessel for a nuclear reactor is described wherein an access opening therein is sealed by a closure member. A plurality of tendons extend generally parallel with the axis of the access opening and are distributed about the access opening and pass entirely through the main portion of the pressure vessel and also through the closure member. The tendons are placed under tension to secure and seal the closure member in place and to prestress the remainder of the pressure vessel.

### 3,733,761

#### TRENCH DUCT END CLOSURE

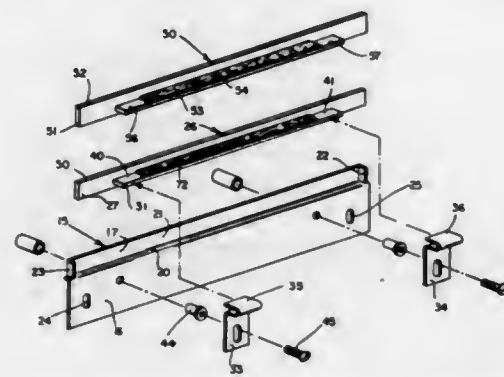
John P. Casto, Vienna, W. Va., assignor to Textron Inc., Providence, R.I.

Filed Jan. 14, 1972, Ser. No. 217,898

Int. Cl. E04b 5/48; E04f 17/08

U.S. Cl. 52-220

4 Claims



A member which extends across the end of a trench duct and closes off the same so as to secure the interior against the

entry of concrete during a pour, the top of the member having a pocket which carries alternatively a filler piece during shipment or tile or carpet trim when the trench is installed.

### 3,733,762 BINARY PRECAST CONCRETE TRIANGULATED BUILDING SYSTEM

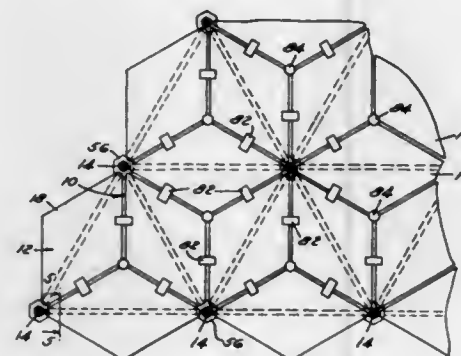
Jorge Pardo, 20181 Exeter, Detroit, Mich.

Filed May 18, 1971, Ser. No. 144,547

Int. Cl. E04b 5/04, 5/23

U.S. Cl. 52-263

11 Claims



The invention relates to a prefabricated building structure utilizing precast concrete steel reinforced T-shaped building elements and precast concrete steel reinforced hexagonal shaped columns. The T-shaped building elements are arranged in building units to form the framework of the building structure, said units respectively constituting the floors and roof of the structure and being vertically aligned and spaced apart by means of the columns. Each building element comprises a diamond shaped slab and an integral beam extending along the major axis of the slab on the under side thereof. The hexagonal shaped columns are each provided with a plurality of vertically spaced annular shelves upon which the ends of the T-shaped building elements on the major axes thereof rest. Moment connections are welded in the field between adjacent slabs and between the building elements and columns.

### 3,733,763

#### MODULAR BUILDING AND SERVICE TOWER THEREFOR

Ernest R. Drucker, 86 Saginaw Crescent, P.O. Box 5105, Ottawa, Ontario, Canada

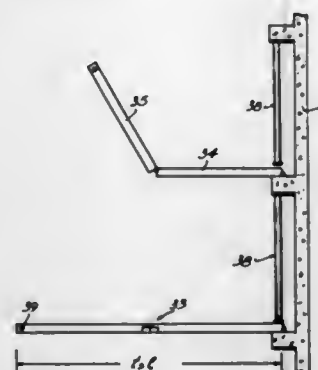
Filed Oct. 21, 1971, Ser. No. 191,510

Claims priority, application Canada, Oct. 26, 1970, 096530

Int. Cl. E04h 1/04

U.S. Cl. 52-126

9 Claims

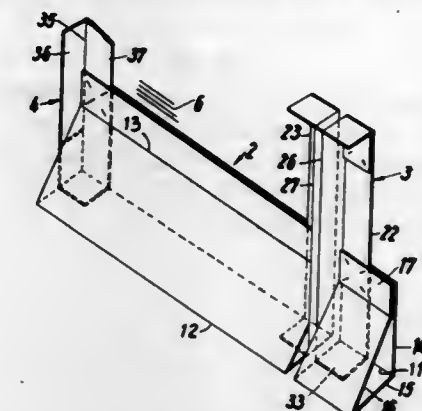


A support and service tower is described for supporting a plurality of independent modular building units to form a multistorey building. The tower of the invention comprises a generally vertical column mounted on the ground and a series of cantilevered support means mounted on this column. The

support means are capable of assuming a retracted vertical position and an extended horizontal position for supporting independent modular building units.

The cantilevered support means are preferably in the form of beams which are pivotally mounted on a horizontal support on the service tower and these can be swung from a vertical retract position against the service tower wall and a horizontal extended position for receiving and supporting a modular building unit. These beams can also contain additional hinges along their length to assist in folding them in a compact manner in retracted position against the side of the tower.

as walls, having at least one flat blank of collapsible material of which one side is provided with stiffening or reinforcing elements consisting of a similar material, while the other side is not reinforced.



### 3,733,764

#### SEALED SILO FILLING LID

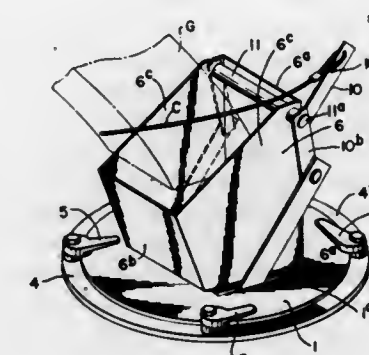
Sanford L. Hege, R. D. No. 2, Chambersburg, Pa.

Filed Dec. 20, 1971, Ser. No. 209,713

Int. Cl. E04h 7/22

U.S. Cl. 52-192

3 Claims



The filling lid for sealed silos has a base plate adapted to close an inlet in the silo roof, the base plate having an opening therethrough registering with the silo inlet. A filling hopper is provided on the base plate around the opening, the hopper being open at its top to receive the usual gooseneck of a silage blower. A closure plate is hingedly mounted on the underside of the base plate adapted in operative position to cover the opening in said base plate in an airtight manner. Linkage is provided for swinging the closure plate into operative position, including a bell crank lever pivoted on the side of the hopper having one arm disposed substantially vertically when the closure plate is normally hanging freely in inoperative position. The other arm of the bell crank lever extends downwardly and rearwardly and is pivotally connected to the upper end of a link extending downwardly through a slot in the base plate with its other end pivoted to the closure plate. And a cable extends from the first arm of the bell crank lever across the silo roof and down the side of the silo and is adapted to be locked when the cable is drawn taut, thereby maintaining the closure plate in operative position.

A profiled panel for broad structural surfaces constituted of a juxtaposition of elements of bent plates, characterized in that the said elements have at least two parallel edges and a surface bent along a line parallel to the said edges and having plural asymmetrical skirts, forming a polyhedron that the space between the edges is the same in all of the elements mounted in any one series and that the supports of the said elements are smooth or profiled, provided with known attachment fixtures, and attached to the surface to be paneled. The described panel is applied to walls, facades and ceilings, particularly to those of a theater, concert or movie auditorium.

### 3,733,767

#### INTERLOCKING PANEL ASSEMBLY

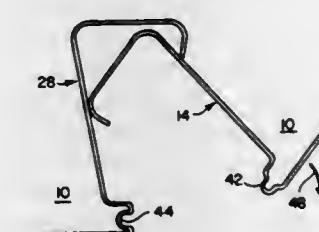
Darrel W. Crank, San Marcos, Calif., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed Apr. 21, 1971, Ser. No. 136,048

Int. Cl. E04d 3/362

U.S. Cl. 52-529

10 Claims



### 3,733,765

#### WALL STRUCTURES

Friedrich Bartels, Via Baraggia 3, Ascona, Switzerland

Filed Mar. 2, 1971, Ser. No. 120,133

Claims priority, application Germany, Mar. 7, 1970, P 20 10 933.5

Int. Cl. A63j 23/00

U.S. Cl. 52-474

13 Claims

A component for the production of ornamental units, such

An interlocking panel assembly is disclosed in which each panel in the assembly includes a male flange section and a



female flange section. The flange sections are configured such that, when assembled, an interlocked flange is provided which has a trapezoidal cross-section.

3,733,768

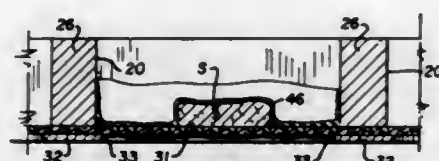
## STORAGE OF HISTOLOGY SPECIMENS

Billy F. Carl, 15025 West 48th Avenue, Golden, Colo., and Paul R. Bell, 4825 East 18th Avenue, Denver, Colo.  
Filed Feb. 12, 1971, Ser. No. 114,894

Int. Cl. B65b 63/08

U.S. Cl. 53—25

11 Claims



A storage tray for histology specimens which is formed as a rectangular sheet having rows and columns of compartments within the face of the sheet. The thickness of the sheet is selected to provide for compartment depths sufficient to receive the specimens. The floors of the compartments are porous to permit melted wax to flow through the compartments. The method of transferring the specimens from their wax embedments and to the compartments thus includes the steps of placing embedments above each compartment, melting the wax forming the embedments to permit it to flow through the tray but retain the specimens on the compartment floors. Subsequent cooling causes a residual layer of wax to harden to secure the specimens in position.

3,733,769

## PROCESS OF WRAPPING AND STRAPPING BALES OF FIBERS

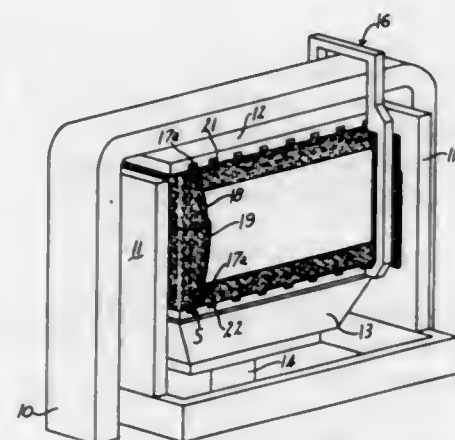
Donald W. Van Doorn, Columbus, Ga., assignor to Lummus Industries, Inc., Columbus, Ga.

Filed Dec. 29, 1971, Ser. No. 213,300

Int. Cl. B65b 63/02

U.S. Cl. 53—24

4 Claims



A time saving process of wrapping and strapping bales of fiber such as cotton, man-made fibers and the like. While the bale is held compressed in the baling apparatus such as a press, a first strap or tie is placed about the bale adjacent an end of the bale. The wrapping or bagging is tucked about the first applied tie while the remaining ties are applied starting at the opposite end of the bale. As soon as the wrapping is tucked about the first applied tie the operator tucks the wrapping about the tie which has been applied to said opposite end, allowing time for the application of the intermediate ties while the operator is tucking the bagging about said second tie, thus reducing the overall time required to secure the bale.

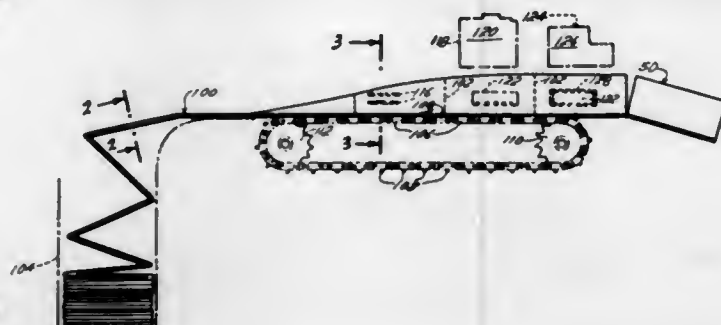
3,733,770  
PROCESSOR'S METHOD AND APPARATUS FOR PACKING PHOTOGRAPHS

Arlen J. Erickson, Mercer Island, and Leonard H. Tall, Seattle, both of Wash., assignors to CX Processing Laboratories, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 26,723, April 8, 1970, abandoned. This application Mar. 3, 1971, Ser. No. 120,551  
Int. Cl. B65b 43/00, 39/00

U.S. Cl. 53—29

11 Claims



Items such as processed cut films and interrelated prints representing individual customer orders are packed in respective multi-leaf, flexible strip assembly carriers interjoined at a common edge and separable at the opposite and intervening edges for insertion and removal of films and prints received in the successive inter-leaf spaces. A packing method and apparatus are disclosed utilizing carrier stock comprising an elongated multi-leaf flexible strip assembly adapted, such as by a series of perforations therein, to be machine fed lengthwise in positive manner and the leaves of which spread apart progressively as they approach a packing station. There the cut films and prints are packed in the strip assembly by transverse insertion into the open spaces between the leaves in such timed relation with advancement of the strip assembly as to space the groups of interrelated items respectively in successive carrier-length sections of the strip assembly. Then the packed individual carrier-length sections are severed from the stock body for subsequent processing. In the preferred embodiment the carrier stock leaves, of material protective to the films and prints, are transversely scored and thereby weakened at carrier-length intervals along their lengths so as to permit severing the carrier-length sections by tearing. The face leaf is transparent so as to permit markings to be seen through it, and is of lesser width than an underlying leaf such that the latter's projecting edge may serve as a marking tab.

3,733,771

## CLOSURE MEANS AND METHOD

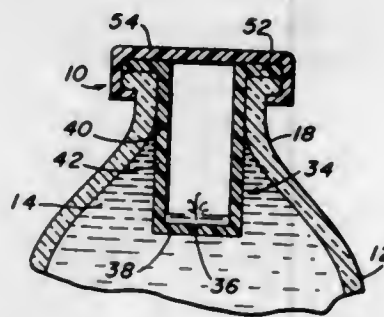
William J. Megowen, Russell St., Carleton, Mass.

Filed Mar. 11, 1971, Ser. No. 123,167

Int. Cl. B65b 7/28

U.S. Cl. 53—37

5 Claims



A closure for fragile containers of gassy liquids having a depending volumetric member extending down into the interior

of the container to displace free gas from within the container, thereby substantially reducing or completely eliminating the chance of an explosion should the container be broken. The member occupies a volume such that when the container is filled with a usual amount of liquid either all free gas is purged by introducing the member or a small volume of free gas is left not exceeding the amount by which the liquid will expand if heated to the highest temperature normally expected to be encountered in use. The member is either a hollow, flexible walled body or composed of a cellular foam so as to be compressible under liquid thermal expansion forces to relieve excess pressure on the container, or is a hollow body provided with a small opening to admit liquid under expansionary pressures. The container is sealed by the member either in cooperation or in unitary construction with a cap.

3,733,772

## AUTOMATIC CASE SLITTING AND FLAP FOLDING APPARATUS

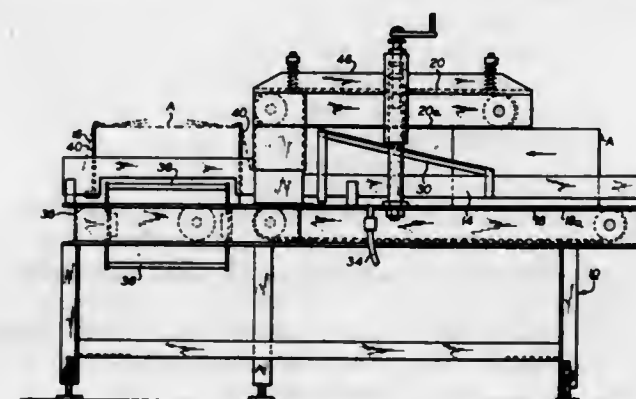
Anthony J. Dichiaro, 133-03 128th St., South Ozone Park, Queens, N.Y.

Filed May 21, 1971, Ser. No. 145,792

Int. Cl. B65b 61/06

U.S. Cl. 53—167

7 Claims



Apparatus for conveying in sequential order cases having hinged flaps in an open condition to a tab slitting unit for releasing said flaps, and then laterally conveying the cases to a flap folding unit for folding the flaps upwardly and inwardly into closed relationship.

3,733,773

## APPARATUS INCLUDING RECIPROCATING WEB FEEDING MEANS FOR A CONTINUOUSLY FEEDING WEB

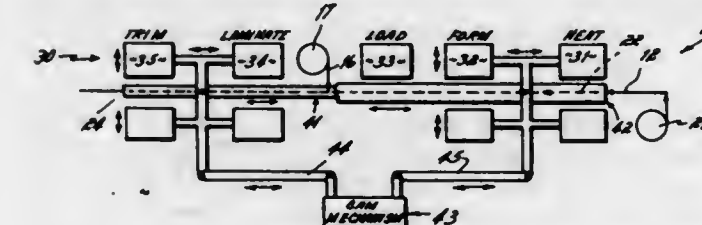
Joel A. Hamilton, Englewood, N.J., assignor to R. A. Jones & Company, Inc., Covington, Ky.

Filed May 27, 1971, Ser. No. 147,507

Int. Cl. B65b 1/02

U.S. Cl. 53—184

21 Claims



A blister packaging machine is provided with a pair of alternating reciprocating clamps which feed a web of sheet material in a continuous motion through the machine by alternately engaging the web by the clamps during the advancing portions of their strokes and transferring engagement back and forth between the clamps while the clamps are moving forwardly at the same velocity. The clamps are driven by a cam and cam follower mechanism linked to the clamps. A movable flat bed work station is supported for movement with one of the clamps and has a working member which works upon the

sheet by a reciprocating stroke against the sheet. The actuation of the clamps, the motion of the clamps, and the timing of the actuation of the working elements is derived from the cam mechanism. The machine is particularly useful in forming blister packages for pills and the like through the use of reciprocating dies.

3,733,774

## APPARATUS FOR PACKAGING STACKS OF FLAT ARTICLES INTO PACKAGES

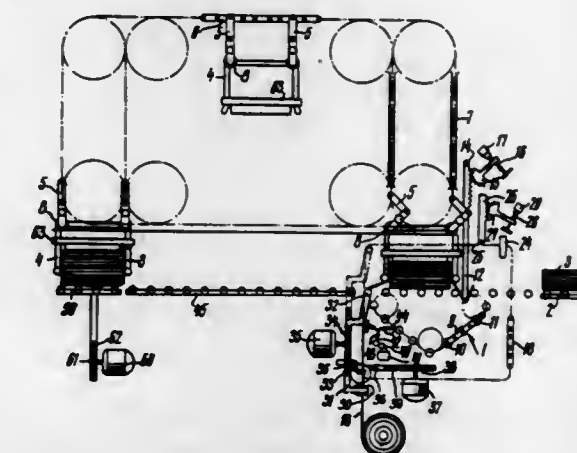
Yakov Efimovich Duchinsky, Tbilissky pereulok, 3, kv. 19, Kiev; Grigory Avramovich Radutsky, 16 Parkovaya ulitsa, 49, korpus 2, kv. 68, Moscow; Rafail Efimovich Kheifets, Brest-Litovskiy prospekt, 162, kv. 30; Grigory Iosifovich Zax, ulitsa Mechnikova, 14a, kv. 24, both of Kiev; Nikolai Ivanovich Anikanov, Bolshaya Bronnaya ulitsa, 2/6, kv. 6, and Leonid Pavlovich Grachev, ulitsa Serafimovicha, 2, kv. 181, both of Moscow, all of U.S.S.R.

Filed Mar. 4, 1971, Ser. No. 120,842

Int. Cl. B65b 11/12, 41/14

U.S. Cl. 53—232

2 Claims



An apparatus for packaging stacks of flat articles into packages, wherein the mechanism for wrapping the stack into a package having its vertical face ends open comprises an endless roller conveyor adapted to support thereon a stack to be packaged, and an openable frame mounted on a vertically closed conveyor, this frame being adapted to wrap the stack along the top side and two opposite vertical sides thereof into wrapping material, as the frame is put onto this stack. The bottom side of the stack has the wrapping material folded thereupon by means of the said endless roller conveyor.

3,733,775

## ADSORPTION PROCESS FOR RECOVERING ADSORBABLE COMPONENTS FROM A MULTI-COMPONENT GAS STREAM

Clem A. Barrere, Jr., Houston, Tex., assignor to Continental Oil Company, Ponca City, Okla.

Filed July 14, 1971, Ser. No. 162,462

Int. Cl. B01d 53/04

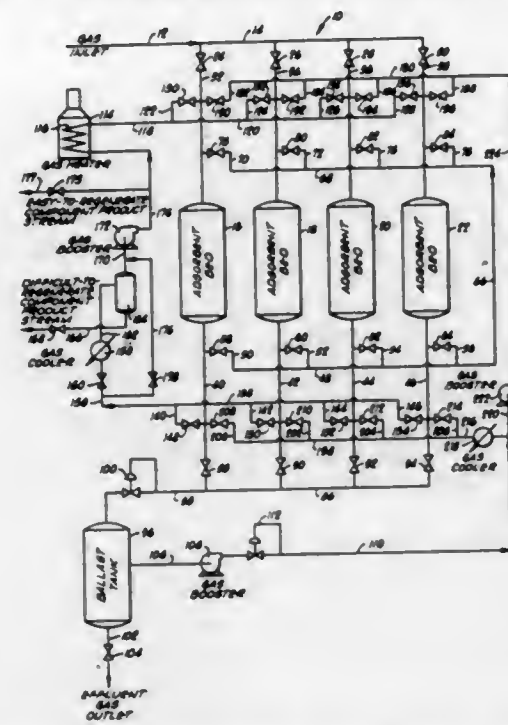
U.S. Cl. 55—28

21 Claims

By the present invention a cyclic adsorption process is provided for recovering adsorbable components from a multi-component inlet gas stream. One or more of a plurality of fixed beds of solid adsorbent are contacted with the inlet gas stream so that adsorbable components contained therein are adsorbed on the bed or beds. Simultaneously, one or more other of the bed or beds are contacted with a heated regeneration gas stream so that previously adsorbed components which are easy to regenerate are desorbed therefrom into said regeneration gas stream and recovered and one or more additional beds are contacted with a cooling gas stream so that the bed or beds are cooled. The flow patterns of the inlet gas stream, the regeneration gas stream and the cooling gas stream are continuously changed or cycled so that the bed or beds just contacted with the inlet gas stream are contacted with the heated regeneration gas stream thereby desorbing easy-to-regenerate components therefrom, the bed or beds just contacted with the cooling gas stream are contacted with the inlet gas stream and the bed or beds just contacted with



the heated regeneration gas stream are contacted with the cooling gas stream. Each of the beds is periodically contacted with a second heated regeneration gas stream so that previ-



ously adsorbed components which are difficult to regenerate are desorbed into the second regeneration gas stream and recovered thereby preventing the buildup of difficult-to-regenerate components on the beds.

3,733,776

## LIQUID MEMBRANE ARTIFICIAL LUNG

Norman N. Li, 158 Oakwood Avenue, Edison, and William J. Asher, 12 Byron Lane, Fanwood, both of N.J.

Filed Sept. 16, 1970, Ser. No. 72,851

Int. Cl. B01d 53/22; A61m; C12b

U.S. Cl. 55-16

12 Claims

An artificial lung is created by contacting liquid membrane encapsulated, oxygen containing gas bubbles with blood. The oxygen permeates the membrane rapidly going into the blood. The  $\text{CO}_2$  initially in the blood permeates the membrane going into the bubble where the initial  $\text{CO}_2$  partial pressure is lower.

In this manner the blood is oxygenated and  $\text{CO}_2$  is simultaneously removed.

3,733,777

## FLUE GAS RECOVERY METHOD AND APPARATUS

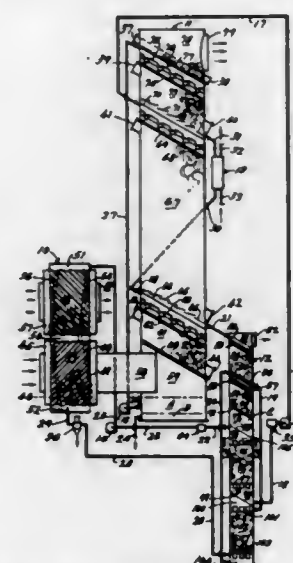
Richard L. Huntington, Route No. 1, Van Buren, Ohio

Filed June 10, 1971, Ser. No. 151,759

Int. Cl. B01d 19/53

U.S. Cl. 55-48

23 Claims



The invention is an improved process for the recovery of, for example, sulfur dioxide and heat from hot flue gas employ-

ing direct contact packed-bed heat exchangers, a packed bed absorber and desorber and packed bed liquid-liquid heat exchangers of improved design. The process utilizes the thermal energy of the hot flue gas to: desorb sulfur dioxide, pre-heat combustion air and to reheat absorber tail gas. The formation of a vapor plume and loss in stack gas draft is minimized by operating the absorber at low temperatures and by reheating the absorber tail gases.

Heat is extracted from the hot flue gas and cooled by direct contact with an immiscible heat transfer fluid in a packed bed. Moisture is condensed from the flue gas by direct contact with cold heat transfer fluid, and separated from the heat transfer fluid by decantation. Sulfur dioxide is absorbed from the cooled flue gas in a packed bed by direct contact with a cold aqueous sulfite solution to form a bisulfite salt solution. The aqueous bisulfite salt solution is thermally decomposed and the sulfur dioxide desorbed by heating through direct contact with hot heat transfer fluid from the initial flue gas cooling step. Heat is recovered from the stripped sulfite absorption solution by direct contact with heat transfer fluid and used to preheat combustion air.

The decomposition of the bisulfite solution during the sulfur dioxide desorption process is aided by the heat transfer fluid which contains an organic acid which is partially miscible with water at elevated temperatures.

Improved absorber design is based upon the use of slant packed beds, slant inlet-outlet packed bed access parts and slant packed bed tower internals for reduced bed cloggage, reduced absorber height and ease of packing replacement while the absorbers are in use.

3,733,778

## POLLUTION CONTROL METHOD AND APPARATUS

Ernest C. Hungate; Harold A. Ogletree, and Graeson T. Nickell, all of Greensboro, N.C., assignors to Air Conditioning Corporation, Greensboro, N.C.

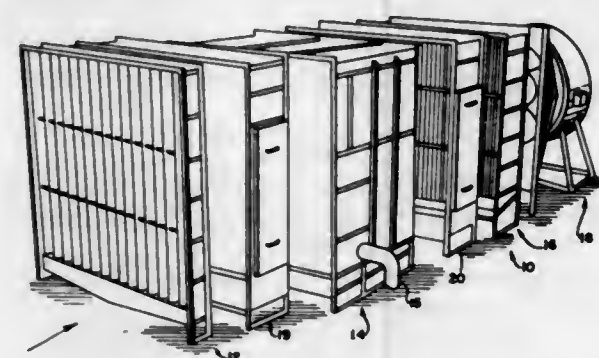
Continuation-in-part of Ser. No. 103,039, Dec. 31, 1970. This

application May 1, 1972, Ser. No. 248,805

Int. Cl. B01d 47/06

U.S. Cl. 55-89

9 Claims



A method of controlling the emission of odors and particulate matter, for example, from a rendering and meat packing plant. The method comprises the steps of providing a source of gas, for example air, containing an undesirable level of odor and particulate matter, causing the gas to pass through a chamber containing a densely sprayed chemical solution which contacts the gas at a high contact efficiency between the gas and the liquid to collect and suspend particulate matter in the solution and absorb odors, and causing the gas again to be placed into forced intimate contact with the solution while simultaneously separating the chemical solution from the cleansed gas. The method may also include the step of creating a uniform gas velocity prior to treatment, and, in an alternate embodiment, the gas may be subjected to a plurality of spraying treatments with the same or different solutions. The solutions may be acidic, basic, masking, oxidizing, neutralizing, or reacting. Specific solutions disclosed include solutions of water with sodium carbonate (soda ash), sodium bisulfite, sodium hydroxide, chlorine dioxide, potassium permanganate, and calcium hypochlorite. Chlorine gas may also be introduced into the air stream for the same purpose. The

method may also be practiced using a plurality of sequential treatments using different solutions in each of the plurality of subsequent stages.

3,733,779

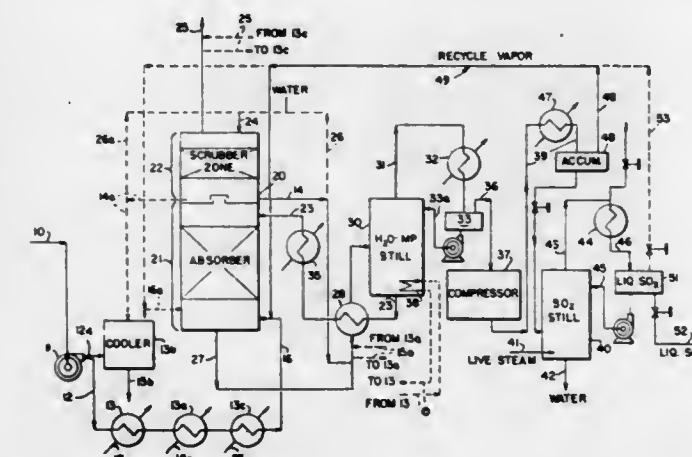
## STRIPPING OF SULFUR DIOXIDE FROM GAS STREAMS BY USE OF N-ALKYL LACTAMS

Arthur A. Bellisio, Huntington Station, N.Y.; Hippocrates G. Pyrras, Berkeley Heights, and Marvin M. Fein, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y. Continuation-in-part of Ser. No. 872,775, Oct. 30, 1969. This application Apr. 17, 1972, Ser. No. 244,766

Int. Cl. B01d 53/14

U.S. Cl. 55-73

36 Claims



Sulfur dioxide is stripped from a gas stream by N-alkyl lactam, particularly an N-lower alkyl pyrrolidone, e.g., N-methyl pyrrolidone, sufficiently to permit the non-polluting discharge of the gas stream to the atmosphere. Gas streams containing from about 0.05 percent to about 10 percent sulfur dioxide by volume can thus be passed at a gas mass flow velocity of 200-3,000 lbs/hr/ft<sup>2</sup> through an N-alkyl lactam-containing contacting zone of 5-85 ft in length, to reduce the sulfur dioxide content thereof to less than about 250 ppm, advantageously to less than 100 ppm, or even 50 ppm, prior to discharge to the atmosphere. Gas streams having  $\text{SO}_2$  contents of from about 0.01 percent to about 50 percent by volume can thus be treated to achieve at least about 90 percent  $\text{SO}_2$  removal by volume, desirably at least about 95 percent, and advantageously at least about 98 percent removal. Gas temperatures of about 0°-75°C, preferably about 35°-65°C, are employed. Lactam entrained in the gas stream discharged from the contacting zone is conveniently recovered in a water scrubbing zone. Lactam from the contacting zone and lactam in water removed from the scrubbing zone can conveniently be recovered in a distillation zone by heating to 100°-200°C. The lactam recovered can be recycled to the contacting zone, and the  $\text{SO}_2$  stripped from said lactam can be conveniently recovered for non-polluting disposal or use.

3,733,780

## PROCESS FOR USING N-ALKYL LACTAM FOR STRIPPING SULFUR DIOXIDE FROM GAS STREAMS AND RECOVERING LIQUID SULFUR DIOXIDE

Arthur A. Bellisio, Huntington Station, N.Y.; Hippocrates G. Pyrras, Berkeley Heights, and Marvin M. Fein, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y. Continuation-in-part of Ser. No. 872,775, Oct. 30, 1969. This application Apr. 17, 1972, Ser. No. 244,767

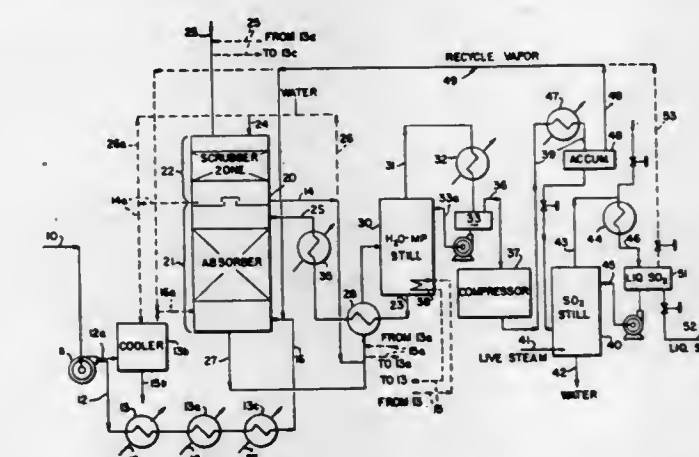
Int. Cl. B01d 53/14

U.S. Cl. 55-73

24 Claims

Sulfur dioxide is stripped from a gas stream by N-alkyl lactam sufficient to permit the non-polluting discharge or use of the treated gas stream, the stripped sulfur dioxide being recovered as essentially pure liquid  $\text{SO}_2$ . A gas stream to be

treated is passed through an absorption zone generally 5-85 ft in length and containing said lactam, e.g., N-lower alkyl pyrrolidone, preferably N-methyl pyrrolidone, at a gas mass flow velocity of about 200-3,000 lbs/hr/ft<sup>2</sup> at a gas temperature of 0°-75°C, preferably 35°-65°C, to reduce its  $\text{SO}_2$  content to less than about 250 ppm, preferably less than 100 ppm, and/or to remove at least 90 percent by volume, desirably 95 percent and advantageously 98 percent or more, of its  $\text{SO}_2$  content. The treated gas stream, together with entrained or vaporized lactam, is passed, prior to discharge to the atmosphere or other disposal or use, directly to a water scrubber zone in which at least about 90 percent by weight, advantageously at least about 98 percent and preferably at least about 99 percent of the lactam content is removed therefrom, permitting the gas stream to be discharged or otherwise disposed of



3,733,781

## RECOVERY OF N-ALKYL LACTAMS EMPLOYED IN STRIPPING OF SULFUR DIOXIDE FROM GAS STREAMS

Arthur A. Bellisio, Huntington Station, N.Y.; Hippocrates G. Pyrras, Berkeley Heights, and Marvin M. Fein, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y. Continuation-in-part of Ser. No. 872,775, Oct. 30, 1969. This application Apr. 17, 1972, Ser. No. 244,762

Int. Cl. B01d 53/14

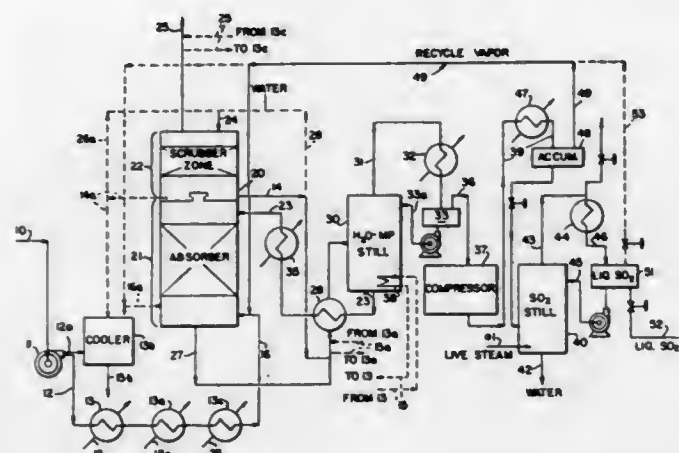
U.S. Cl. 55-73

15 Claims

A gas stream from an absorption zone in which sulfur dioxide is stripped therefrom by N-alkyl lactam is passed to a water-containing scrubber zone at a gas mass flow velocity of 200-3,000 lbs/hr/ft<sup>2</sup> in a gas temperature of 0°-75°C, preferably 35°-65°C, wherein at least about 90 percent by weight, advantageously at least about 98 percent, preferably at least about 99 percent, of the lactam vaporized or entrained in the gas stream is recovered. The gas stream leaving the scrubber zone, with an  $\text{SO}_2$  content of less than about 250 ppm and/or at least 90 percent of its  $\text{SO}_2$  content stripped therefrom, can be discharged to the atmosphere or otherwise disposed of without unacceptable loss of lactam. A water stream having the thus recovered lactam dissolved therein is removed from the scrubber zone and may be passed directly



into the absorption zone or to a distillation zone from which a lactam-rich liquid stream can be recycled to the absorption zone. The scrubber zone will generally have a length of from about 2 ft to about 25 ft, typically from about 3 ft to about 15



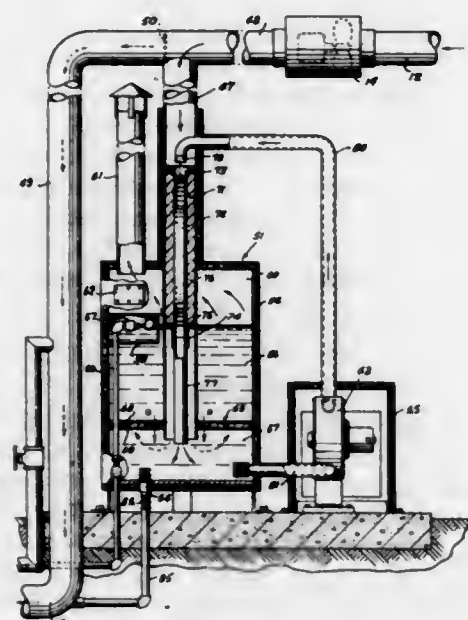
ft. The water flow rate to the scrubber zone to replace the lactam-containing stream withdrawn therefrom will generally be from about 0.05 to about 2.0, advantageously about 0.05 to about 0.25, gals of water per MCF of gas passing through the scrubber zone.

3,733,782

**GAS TREATMENT APPARATUS AND METHOD**  
Charles Lee Hatchel, Rte. 12, Box 604M, Fort Worth, Tex.  
Filed May 11, 1971, Ser. No. 142,217  
Int. Cl. B01d 47/02

U.S. Cl. 55-95

7 Claims



A treatment plant for polluted air or gas includes a water tank having a vertical inlet conduit communicating with the upper end of the tank. The tank is divided into upper and lower water chambers by a transverse filter assembly. In the inlet conduit, the gas is wetted from a spray nozzle and then directed through filtering elements to remove solid particles prior to being discharged into a lower chamber of the water tank. The gas is further purified in passing through the water, in the lower and upper water chambers, and through the filter submerged assembly. The gas to be treated may be received from building enclosures, or may be received from intake stacks collecting polluted air from particularly contaminated outside areas such as city streets.

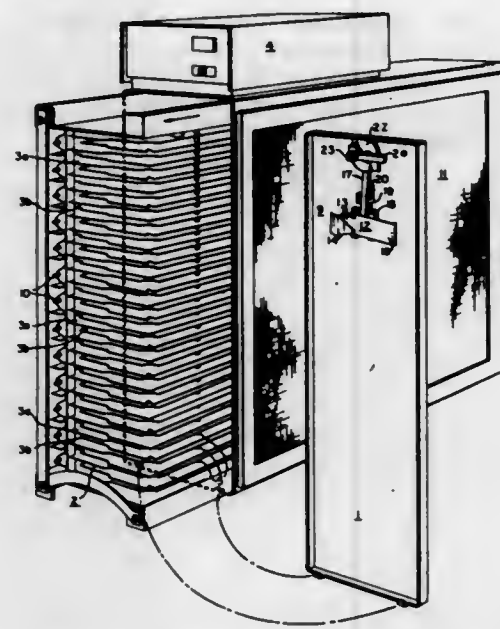
3,733,783

**ELECTROSTATIC PRECIPITATOR**

Ivan T. Burney, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.  
Filed Oct. 29, 1971, Ser. No. 193,764  
Int. Cl. B03c 3/66

U.S. Cl. 55-104

6 Claims



A door latch and safety arrangement for an electrostatic precipitator is comprised of a spring contact to engage at least one of the plates of one polarity to thereby connect those plates to a first grounded terminal of a high voltage power supply when the door is in place and the latch is in the locked position. A test button is arranged so that when it is momentarily depressed and while the latch is locked, the spring contact is also moved towards the plates that are connected to the second terminal of the power supply and charged with the other polarity to thus produce an audible spark indicating the charged condition of the plates. When the latch is moved to the unlocked position, switch means connected therewith de-energizes the power supply. Moving the latch to the unlocked position also moves the spring means to simultaneously connect together precipitator plates of opposite charges and thus short circuit the collector cell and eliminate any residual charge therein.

3,733,784

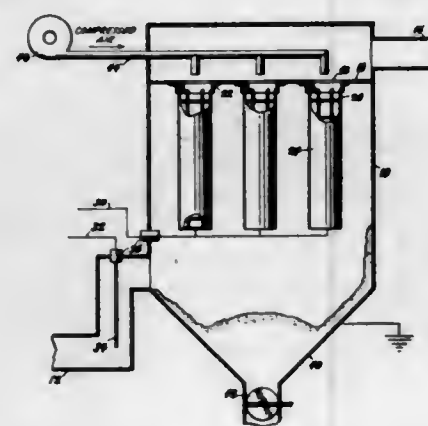
**ELECTRO-BAG DUST COLLECTOR**

William M. Anderson, and John R. Dervay, II, both of Wellsville, N.Y., assignors to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Oct. 5, 1971, Ser. No. 186,743  
Int. Cl. B03c 3/80

U.S. Cl. 55-117

2 Claims



A filter arrangement that first imposes an electrostatic charge upon all particulate matter carried by a stream of gas

to be filtered. A charge of similar polarity is placed upon the filtering means whereby the particulate matter having a like charge is repelled therefrom to permit only the dust-free carrier gas to pass therethrough.

3,733,785

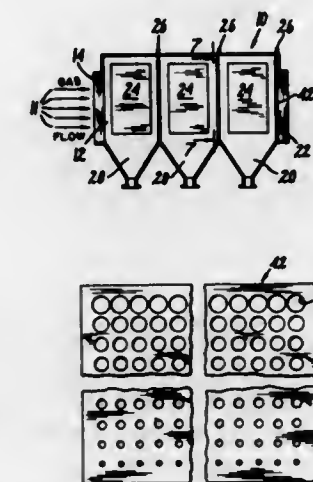
**GAS FLOW REGULATION FOR ELECTRIC PRECIPITATORS**

Charles A. Gallier, Palmyra, Pa., assignor to Envirotech Corporation, Salt Lake City, Utah

Filed Feb. 4, 1971, Ser. No. 112,541  
Int. Cl. B03c 3/36

U.S. Cl. 55-129

21 Claims



A horizontal, dry-type electric precipitator is provided with one or more gas flow diverter units located between the inlet and outlet and extending across the precipitator chamber to increase the gas flow near the top of the chamber relative to the flow near the bottom. Each diverter unit is constituted by, for example, resistance baffles spaced to leave graded openings, an orifice plate with graded openings, or baffles inclined at graded angles. Where more than one diverter unit is provided, the gradation of succeeding units is such as to provide a higher gradation of flow rate, the farther downstream the unit is located.

3,733,786

**AEROSOL PRECIPITATOR**

Volodimir Petrovich Koka, ul. Kikvidze 3, Kv. 10, Kiev, U.S.S.R.

Continuation of Ser. No. 764,803, Oct. 3, 1968, abandoned.  
This application July 19, 1971, Ser. No. 164,032

Int. Cl. B01d 47/00

U.S. Cl. 55-222

11 Claims



An apparatus for precipitating aerosol particles comprises at least one pair of tubular elements placed one inside the other and forming an annular working space. The inner tubular element is connected to a source of steam or liquid to be

evaporated and is made porous to enable penetration therethrough of the steam or liquid to be evaporated into the working space. The outer tubular element is maintained at a temperature below that of the inner tubular element and rotary motion is imparted to the aerosol flow in the annular working space by means of rotary blades.

3,733,787

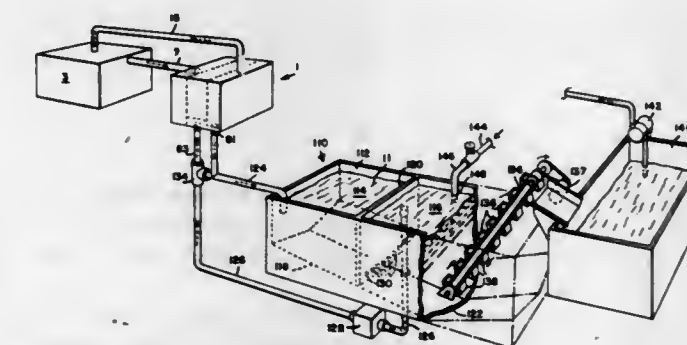
**METHOD, APPARATUS AND SYSTEM FOR SEPARATING PARTICULATE MATTER FROM GASES LADEN THEREWITH AND ACCUMULATING THE PARTICULATE MATTER**

Truman Winningham, Monta Vista, Calif., assignor to Truman Smog Control, Inc., San Francisco, Calif.

Filed Jan. 31, 1972, Ser. No. 222,228  
Int. Cl. B01d 47/00

U.S. Cl. 55-228

7 Claims



A method, apparatus and system for separating particulate matter from gases laden therewith and for accumulating the particulate matter including apparatus for separating the particulate matter from the gases. The gas-particulate matter separating apparatus comprises means forming a first chamber adapted to receive a quantity of separating liquid having a predetermined specific gravity and having a gas inlet port in an upper portion thereof; means forming a second chamber adapted to receive a quantity of said separating liquid and having a gas exit port in an upper portion thereof; means forming a liquid conveyor passage communicating an intermediate portion of said first chamber with an intermediate portion of said second chamber; a sludge discharge port communicating with the lower portion of said second chamber; and conveyor means operative to mix particulate matter and gases entering said first chamber through said gas inlet port with liquid in said first chamber and to convey said mixture through said liquid conveyor passage into said second chamber wherein the gases and particulate matter are gravity separated with the gases exiting through said gas exit port and the particulate matter precipitating toward the bottom of said second chamber and toward said sludge discharge port.

3,733,788

**APPARATUS FOR REMOVING PARTICULATE AND GASEOUS POLLUTANTS FROM STACK SMOKE**

William A. Crowley, 8418-52 Avenue, Elmhurst, N.Y.

Filed May 10, 1972, Ser. No. 251,941  
Int. Cl. B01d 47/06

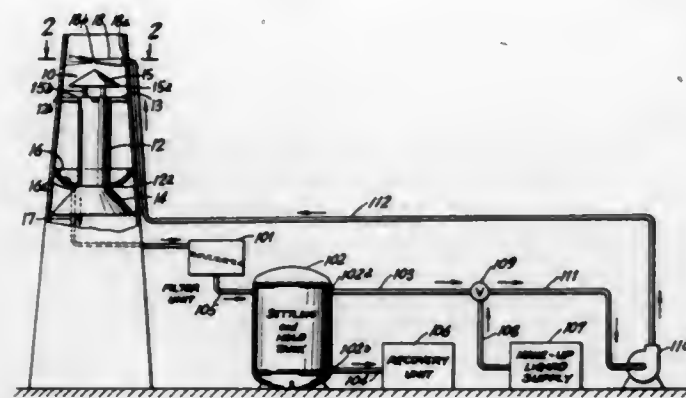
U.S. Cl. 55-228

10 Claims

Apparatus for cleaning a stack smoke by removing particulate and gaseous pollutants therefrom, having a conduit in the stack for conducting the stack smoke therethrough and a conical deflector spaced above and across the top of the conduit to



provide an annular passage for the stack smoke and a nozzle to deliver a curtain of water transversely to the direction of the



deflected stack smoke to remove pollutants, the water then flowing to a collection tank and outlet line for discharge from the stack.

3,733,789

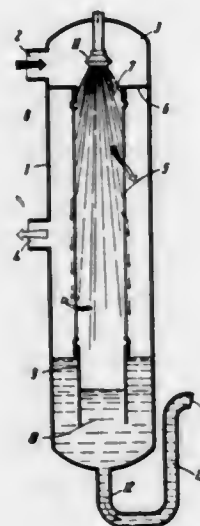
**GAS-LIQUID CONTACTING APPARATUS FOR SEPARATING MICROMISTS FROM A CARRIER GAS**  
Albert Rebours, Chatou, France, assignor to Prat-Daniel-Poelman, Courbevoie, France

Continuation-in-part of Ser. No. 48,943, June 22, 1970, abandoned, which is a continuation of Ser. No. 736,832, June 13, 1968, abandoned. This application Mar. 13, 1972, Ser. No. 233,886

Int. Cl. B01d 47/00

U.S. Cl. 55-233

4 Claims



A gas-liquid contacting apparatus particularly adapted for the separation and precipitation of microparticulate liquid micromists from a carrier gas comprising filters made of filter cloth through which the gas is forced to pass. The filters are preferably of tubular or bag-like form and may consist of single or multiple filter cloth layers, if required, with felted or tangled fibers placed as intermediate layer between two filter cloth layers. The filters are attached to the gas inlet compartment by specific collars which permit rapid removal and exchange. By providing a special extension piece or counterweight at the lower part of the filter a gas seal is formed at the bottom of the apparatus housing. The filters are continuously provided during filtration with a liquid washing layer forming a microsiege for intercepting the liquid micromists contained in the carrier gas.

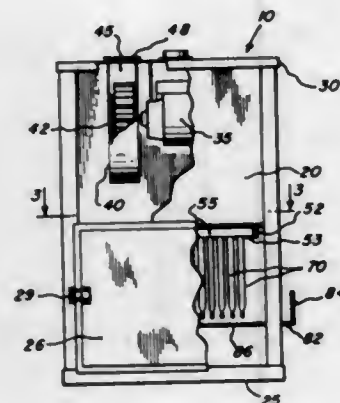
3,733,790  
**FILTERING APPARATUS**  
Leo A. Pierce, St. Paul, Minn., assignor to The Torit Corporation, St. Paul, Minn.

Filed Feb. 11, 1971, Ser. No. 114,537

Int. Cl. B01d 49/00

U.S. Cl. 55-324

3 Claims



A filtering apparatus incorporating an enclosure having a motor blower mounted on a removable top cover of the same and a bag type filter section in which the number of bag type filters may be increased or decreased to increase or decrease the filtering capacity of the apparatus.

3,733,791

**HEAT TRANSFERER**

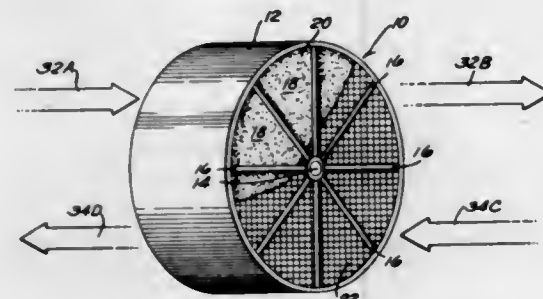
Konstantin Dravnieks, Madison, Wis., assignor to Wehr Corporation, Milwaukee, Ill.

Filed Aug. 13, 1971, Ser. No. 171,500

Int. Cl. B01d 53/16

U.S. Cl. 55-390

9 Claims



A rotary air-to-air heat transferer, which is capable of transferring both sensible and latent heat from one air stream to another, includes a heat transfer media comprised of a lattice-like support coated with a thin film of an aqueous solution of a hygroscopic material such as lithium chloride.

3,733,792

**FILTERS**

Roland Taylor, Egremont, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 9, 1970, Ser. No. 27,034

Claims priority, application Great Britain, Apr. 17, 1969, 19,786/69

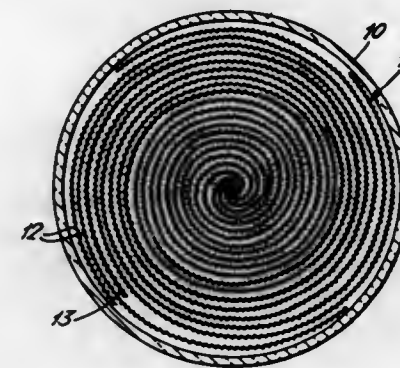
Int. Cl. B01d 25/04

U.S. Cl. 55-488

2 Claims

A filter for a liquid aerosol comprising knitted wire mesh with a surface of a material not wetted by the aerosol, arranged in layers and rolled into a cylindrical spiral, a minor

proportion of the layers of wire mesh being of coarser wire than the remainder of the layers and being disposed between



layers of the remainder. The invention finds application in the filtering of blanket gas in sodium-cooled nuclear reactors.

3,733,793

**FILTER LATCH**

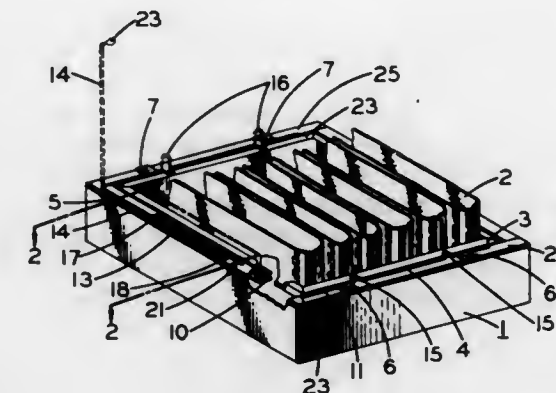
George W. Young, Fern Creek, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Oct. 22, 1971, Ser. No. 191,862

Int. Cl. B01d 27/08

U.S. Cl. 55-493

5 Claims



A filter latch including a pair of opposed latch members pivotally mounted to a flow-through housing, the latch members being adaptable for being received by a filter unit wherein base portions of the latch members are pivotally connected to the housing and an arm portion of each latch member is adaptable for engagement with an opposing arm portion of the opposing latch member, the base portions of the latch members including inwardly extending tabs adaptable for engagement with the filter unit, the arm portions of the latch members being pivotable in interlocking coextensive side by side relation.

3,733,794

**SAFE STARTING SYSTEM FOR LAWN AND GARDEN EQUIPMENT**

David Thomas Allen, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

Filed Mar. 22, 1972, Ser. No. 236,908

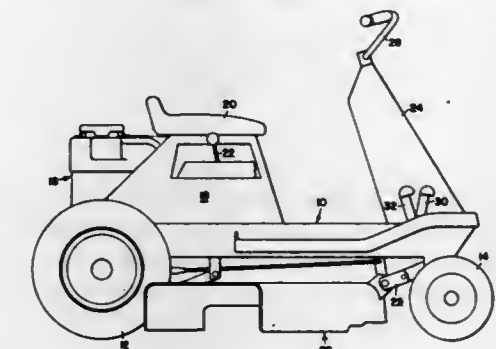
Int. Cl. A01d 75/18

U.S. Cl. 56-10.5

9 Claims

A riding mower has an internal combustion engine with a magneto type ignition system. A mower is suspended from the tractor and driven from the engine through a belt drive, which includes a clutch, while the traction wheels are driven through a different drive system, which also includes a clutch. A pair of series connected switches are respectively connected to the clutches, so that they are open when the clutches are engaged,

and closed only when the clutches are disengaged. The ignition system generates a sine wave voltage in the primary winding, the positive voltage excursion being utilized to generate the high voltage spike in the secondary winding which fires the spark plug. However, the positive voltage excursion in the primary coil can be shorted to ground through a diode and a relay, when the relay is de-energized. The relay is energized



3,733,795

**BET TOPPING AND WINDROWING APPARATUS AND KNIFE ORIENTATION MEANS THEREFOR**

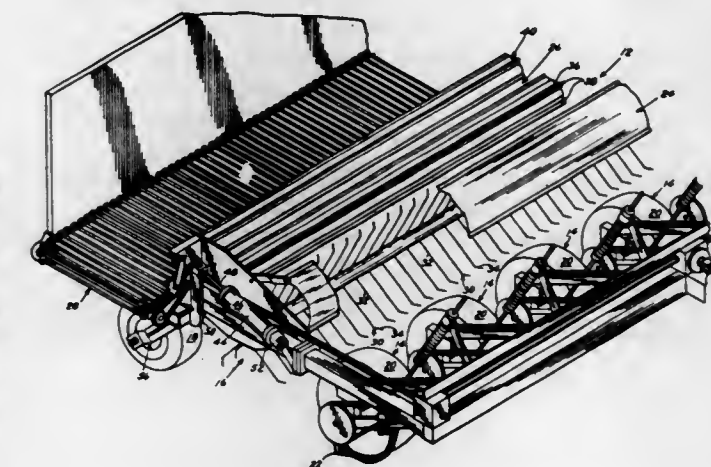
Joseph C. Rabb, Boise, Idaho, and Larry W. Miller, Fort Collins, Colo., assignors to Heath Farm Equipment Inc., Fort Collins, Colo.

Filed Sept. 24, 1971, Ser. No. 183,553

Int. Cl. A01d 23/02

U.S. Cl. 56-121.45

12 Claims



An improved beet topping and windrowing apparatus of the trail-mounted type having a substantially reduced turning radius. The reduced turning radius is achieved through the use of a plurality of follower wheels for supporting said apparatus, and resisting movement in a lateral direction when operated along an inclined surface, said wheels being disposed beneath the conveyor and inwardly of the ends thereof. The apparatus includes a pickup means having a plurality of rows of fingers, each finger being generally L-shaped in configuration and having a base portion extending in the direction of rotation of the pickup means, said base portion providing resistance against radially outwardly movement of items being picked up by the pickup means, a stripper means disposed vertically above and rearwardly of the pickup means for transferring items picked up by the pickup means to a conveyor, said



stripper means including a rotatably mounted member having a plurality of longitudinally extending flaps disposed about the periphery thereof, said rotatably mounted member being disposed such that a plane passing through the longitudinal axes of said member and said pickup means forms an included angle of approximately 27 degrees or more with a horizontally disposed plane, and means for adjusting the vertical distance separating the pickup assembly relative to the follower wheels. The apparatus also includes means for maintaining the topping knife of each topping unit in a predetermined attitude relative to a predetermined plane upon pivotal movement of the means supporting said topping knife.

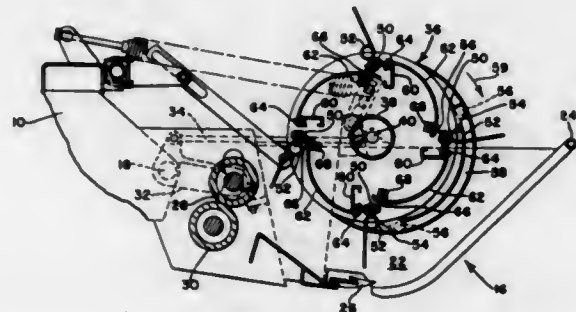
3,733,796

# HEADER HAVING HARVESTER REEL WITH TANGLE-PREVENTING FILLER PLATES THEREON

William Robert Wood, and Donald E. Burrough, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.  
Filed Oct. 4, 1967, Ser. No. 672,853  
Int. Cl. A01d 57/02

U.S. Cl. 56-220

9 Claims



A pull-type harvesting machine having a transverse mower bar, a finger-type harvester reel coextensive with and above the mower bar for sweeping the crop thereto and then upwardly and rearwardly to a pair of conditioner rolls which condition the crop and throw it rearwardly against windrow shields which deflect the crop into a windrow on the ground, the harvester reel being provided with a plurality of plates detachably mounted around the reel to enclose the reel interior.

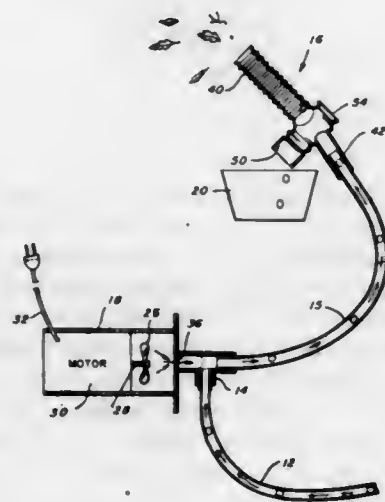
3,733,797

# NUT HARVESTER

George P. Kelley, 1102 E. Sixth, Okmulgee, Okla.  
Filed Dec. 30, 1970, Ser. No. 102,807  
Int. Cl. A01d 51/00

U.S. Cl. 56-328 R

7 Claims



A nut harvesting machine includes a motor and blower adapted to send high pressure air into a venturi producing a

vacuum on one side thereof. Attached to the vacuum side is a flexible hose and nozzle arrangement adapted to pick up nuts or other fruit from the ground and cause same to travel into the venturi and thence to a separator where the air velocity is reduced to allow the nuts to drop into a receptacle while the trash is separated and blown away.

3,733,798

# PRESS FOR UNINTERRUPTED FILLING OF STACK FORMING WAGONS

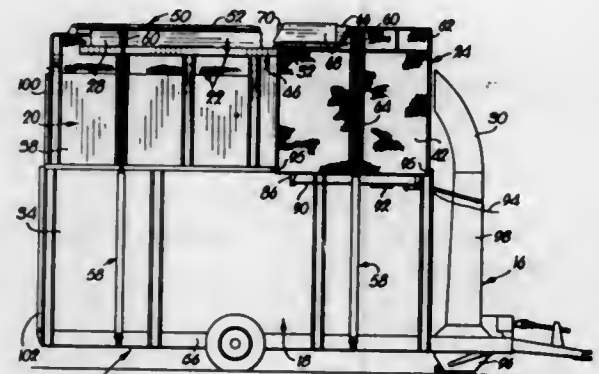
Harold Keith Garrison, Newton, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed Dec. 17, 1971, Ser. No. 209,312

Int. Cl. A01d 87/00

U.S. Cl. 56-350

22 Claims



In the stacking of hay or other crops, a windrow or swath is lifted off the ground, fed into a pile collected by a vehicle-supported, stack forming body and the pile compressed from time to time in the body, all in a continuous operation as the vehicle is advanced across the field, by virtue of the provision of an accumulator which receives the crop while the pile is being compressed, and from which accumulator the crop so accumulated is thereupon dumped onto the compressed pile by retraction of a shiftable section of the press roof.

3,733,799

# FORWARD AND REVERSE YARN FEEDING DEVICE FOR WITHDRAWING AND PIECING YARN IN A SPINNING APPARATUS

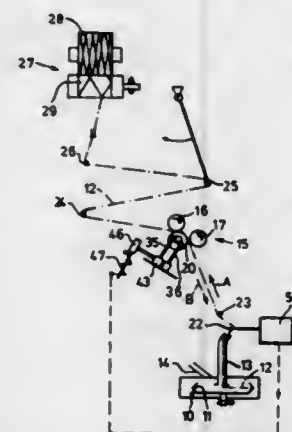
Ernst Roethke, Schorndorf, Germany, assignor to Zinser-Textilmaschinen Gesellschaft mit beschränkter Haftung, Ebersbach, Germany

Filed Aug. 6, 1971, Ser. No. 169,684

Int. Cl. D01h 15/00

U.S. Cl. 57-34 R

10 Claims



In a spinning apparatus there is provided a yarn device which has two continuously and oppositely spaced rollers (a withdrawing roller and a reversing roller) and a pinch roller shiftable, in response to the tension of the spun

yarn, into engagement with either withdrawing to advance the yarn forward from a spinning device to a winding device, or the reversing reversing to return the yarn, in case of breakage, to the spinning device for piecing. In either operative position, the pinch roller projects the space between the withdrawing roller and the reversing roller.

3,733,800

# WINDING STEM BEARING ASSEMBLY FOR WATCHES

Katsutoshi Maeda, Ichikawa, and Norio Kobayashi, Tokyo, both of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

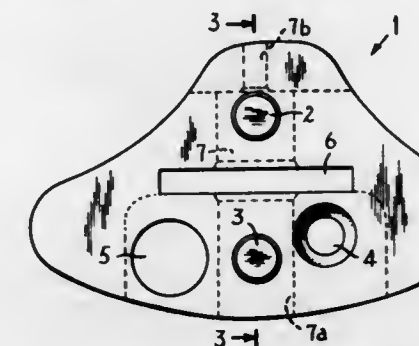
Filed May 25, 1972, Ser. No. 256,989

Claims priority, application Japan, May 27, 1971, 46/36460

Int. Cl. G04b 31/00

U.S. Cl. 58-140 R

6 Claims



A winding stem bearing assembly for use in a watch having an injection molded plastic bearing made as an integral, unitary block with precision molded cavities therein for mounting components in the assembly. A winding stem is rotatably supported in an elongated cavity and a bearing pin and is retained with a part thereof housed in the bearing cavity by a bent part of a setting lever. A winding stem pinion is housed in a cavity in the bearing block and has a central opening through which the winding stem extends and is coupled thereto for joint rotation. A barrel and train-wheel bridge and plate are mounted on opposite sides of the bearing block which functions as their support and as a spacer. The bearing assembly requires no lubrication.

3,733,801

# YARN PROCESS

Charles A. Jones, Shelby, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Filed July 1, 1971, Ser. No. 158,827

Int. Cl. D02g 1/00

U.S. Cl. 57-157 TS

11 Claims



A process for stringing-up an operational simultaneous draw-false twist machine is disclosed. In the process, the feed

roll is engaged first and then the false twister is engaged to insert a low level of false twist in the yarn before the draw roll is engaged by the yarn.

## ERRATUM

For Class 58-140 R see:  
Patent No. 3,733,800

3,733,802

# ALARM DEVICE

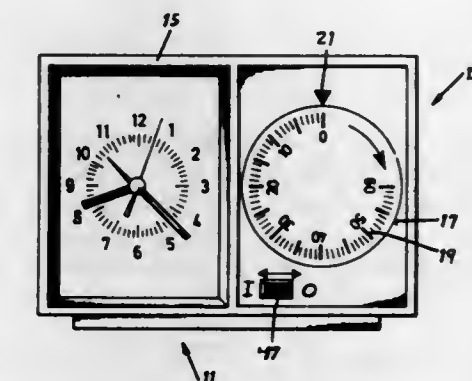
Otto Wisser, 7745 Schonach, Germany, assignor to Jahresuhren-Fabrik GmbH, Aug. Schatz & Sohne, Schwarzwald, Germany

Filed July 26, 1971, Ser. No. 165,928

Int. Cl. G04b 23/06; G04c 21/30

U.S. Cl. 58-16.5

8 Claims



An alarm device with a double signal arrangement provided by a combination of two chronological movements united by means which initiates operation of the second chronological movement and the alarm mechanism thereof while stopping the alarm mechanism of the other.

3,733,803

# DEVICE FOR CORRECTING TIME DISPLAYED ON ELECTRONIC TIMEPIECE

Michio Hiraga, Hoya-shi, and Makoto Yoshida, Tokorozawa-shi, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

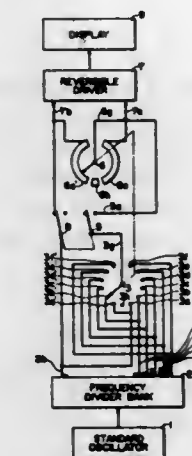
Filed June 21, 1972, Ser. No. 265,013

Claims priority, application Japan, June 23, 1971, 46/44847

Int. Cl. G04c 3/00

U.S. Cl. 58-23 R

5 Claims



A device for correcting the time displayed on an electronic timepiece having a standard oscillator, a frequency divider bank, a time display unit, a reversible driver and an external actuating member for correcting the time display from the exterior of the timepiece. In the device, means, including an on-



off switch, for applying a correcting signal at a variable frequency is connected to the driver through a normal-reverse switch, and these means are arranged for interlocking operation with the external actuating member so that the time display can be corrected at a rapid and controlled rate in response to the manipulation of the external actuating member.

3,733,804

## ELECTRONIC ALARM WATCH

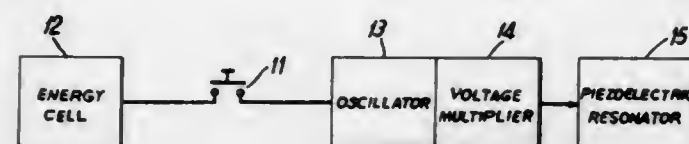
Ganther Rudolph Diersbock, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Sept. 29, 1971, Ser. No. 184,735

Int. Cl. G04c 21/00

U.S. Cl. 58—38

11 Claims



An electronic alarm wrist watch comprises a piezoelectric oscillator which vibrates the watch dial, crystal, or parts of the bezel such as the crystal mounting ring to produce an audible sound at predetermined times. The piezoelectric oscillator is energized by a low or high voltage power oscillator.

3,733,805

## BALANCE WHEEL AND STARTING LEVER ASSEMBLY OF TIME PIECE

Toshibumi Kashimura, Funabashi, and Noriaki Kato, Tokyo, both of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

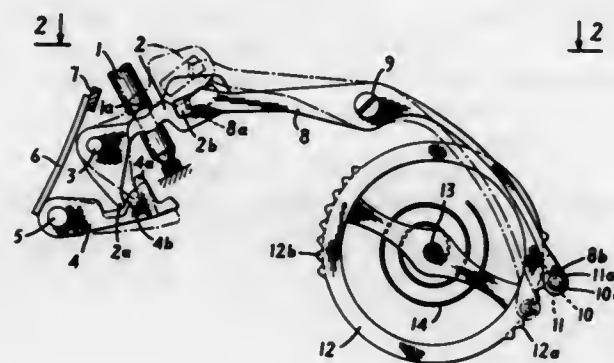
Filed May 8, 1972, Ser. No. 251,178

Claims priority, application Japan, May 7, 1971, 46/35807

Int. Cl. G04f 7/04

U.S. Cl. 58—79

8 Claims



Indentations provided on the periphery of the balance wheel of a time piece are engageable by a starting spring carried on one end of a starting lever actuated by a push-pull movement of the winding stem to stop the time piece with the balance wheel angularly displaced from neutral position. Preferably two indented portions are provided at diametrically opposite sides of the balance wheel.

3,733,806

## SELF-WINDING MECHANISM FOR WATCHES

Kurt Murrie, Pforzheim, Germany, assignor to Firma Bernhard Forster, Pforzheim, Germany

Filed July 7, 1972, Ser. No. 269,520

Claims priority, application Germany, July 22, 1971, P 21 36 545.7

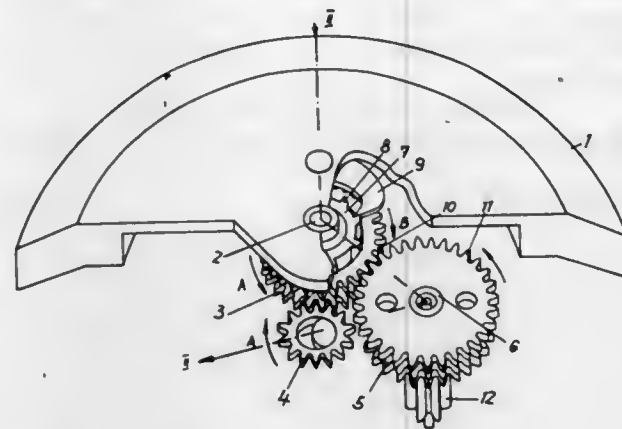
Int. Cl. G04b 5/02

U.S. Cl. 58—82 R

11 Claims

A rotor is mounted on mounting means for rotation in first and second senses. A drive pinion is coaxial to and non-

rotatably connected to said rotor. A ratchet wheel is freely rotatably mounted on said rotor. A stepping pawl is mounted on said rotor and arranged to interengage with said ratchet wheel so as to couple to said rotor for rotation in, and only in, said second sense. Idler gear means are rotatably mounted on said mounting means. A reversing gear is radially floatingly



mounted on said mounting means and in mesh with said drive pinion and arranged to mesh with said idler gear means to rotate the same in said first sense only during a rotation of said drive pinion in said first sense. Means are provided to transmit motion from said ratchet wheel to said idler gear means to rotate the same in said first sense during a rotation of said rotor in said second sense.

3,733,807

## WATERTIGHT WATCH CASE

Hideo Nozawa, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

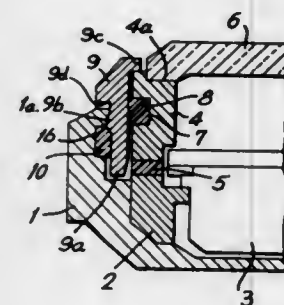
Filed May 24, 1972, Ser. No. 256,487

Claims priority, application Japan, June 5, 1971, 46/47468; June 5, 1971, 46/47470

Int. Cl. G04b 37/08

U.S. Cl. 58—90 R

11 Claims



A watertight watch case wherein a bezel is inserted into a space formed between a case body and a crystal-support ring such that the bezel watertightly presses first and second sealing gaskets respectively mounted within a first groove provided on the outer surface of the crystal-support ring and within a second groove provided on the inner surface of the case body. A third gasket is interposed between the crystal-support ring and a case ring mounted in the case body, the third gasket being axially compressed by the insertion of the bezel into the space.

3,733,808

## DEVICE FOR THE PRECISION ADJUSTMENT OF A BALANCE

Robert Wolber, Lauterbach; Josef King, Schramberg-Sulgen, and Eckhart Kern, Schramberg, all of Germany, assignors to Firma Gebrüder Junghans G.m.b.H., Schramberg, Germany

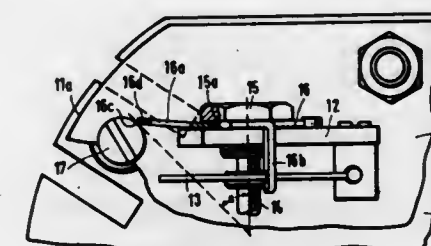
Filed Nov. 5, 1971, Ser. No. 195,968

Claims priority, application Germany, Nov. 9, 1970, P 20 55 063.4

Int. Cl. G04b 17/14

U.S. Cl. 58—112

8 Claims



Balance wheel adjusting apparatus for a timepiece characterized by an adjusting lever which elastically engages an inclined surface on a regulating spindle. The inclined surface on the regulating spindle is inclined at an acute angle in relation to a swivel axis of the adjusting lever and this swivel axis generally coincides with the axis of the balance wheel.

3,733,809

## PERSONALIZED PHOTOGRAPH TYPE WATCH

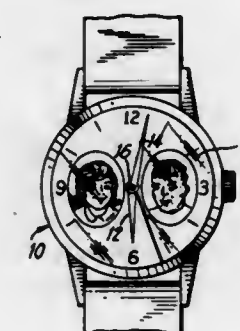
Ell Reiter, Dix Hills, and Herbert P. Hickey, Brentwood, both of N.Y., assignors to I.D.L. Co., Inc., Albertson, N.Y.

Filed Jan. 25, 1971, Ser. No. 109,108

Int. Cl. G04b 19/06

U.S. Cl. 58—127 R

10 Claims



A personalized photograph type watch and, more particularly a personalized photograph watch dial comprising a standard watch mechanism and enclosure structure; i.e., a case, a bezel and a crystal, wherein the dial or face plate comprises a metal foil of predetermined geometrical configuration having at least one personalized photograph print on the viewable surface of said dial, said metal foil initially having a photosensitive coating on one surface thereof and said coating having a half-tone negative of said personalized photograph exposed on said coated surface to produce said photograph watch dial.

3,733,810

## TIMEPIECE WITH ELECTRONICALLY DESIGNED DIGITAL READ-OUT

Pierre Girard, Bienne, Switzerland, assignor to Manufacture des Montres Rolex S.A. Bienne, Bienne, Canton of Berne, Switzerland

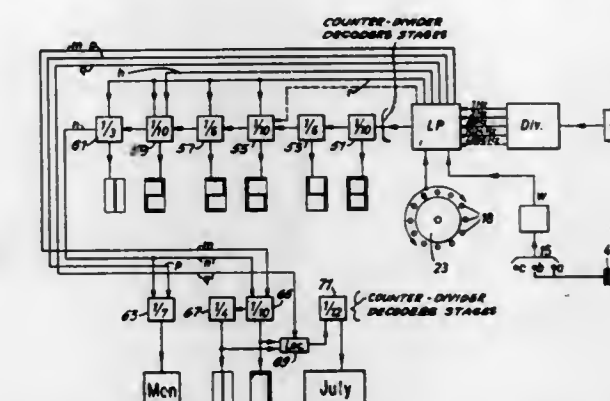
Filed Mar. 5, 1971, Ser. No. 121,251

Claims priority, application Switzerland, Mar. 6, 1970, 3337/70

Int. Cl. G04b 19/24, 19/30, 27/00

U.S. Cl. 58—4 A

37 Claims



In a timepiece having an electronically designed read out, an improved means which makes it possible to manually operate and set at least part of the digital readout elements. The setting means comprise a preselector capable of being set in different positions and a driving mechanism. Both the preselector and driving mechanism are arranged in such a manner that the position occupied by the preselector at the time that the driving mechanism is manipulated determines the element or elements of the digital read-out to be affected by the manipulation as well as the function accorded by the manipulation.

3,733,811

## PROCESS FOR THE FABRICATION OF A LINK CHAIN

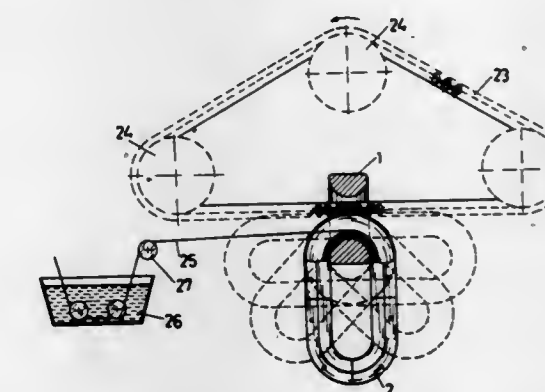
Peter Florjancic, St. Martin-Strasse 12, Garmisch-Partenkirchen, Germany

Filed June 1, 1970, Ser. No. 42,039

Int. Cl. F16g 15/12

U.S. Cl. 59—35

13 Claims



Link chain is made by forming links of fiber-reinforced thermoset plastic, the fiber reinforcement of each link being wound over a mould hung in a previously fabricated link after which the polymerizable impregnating resin, e.g., polyester, is cured to form the link which has no welding seams or the like. Moulds for winding and moulding of the links may be provided with teeth, indents or the like upon which a driving device may act to rotate the mould to wind the reinforcing fiber through a preformed link. High-grade chains having strength surpassing that of welded steel link chain can be produced.



3,733,812

**YARDER HAVING AN INFINITE RATIO DRIVING INTERLOCK FOR SPOOLING DRUMS**

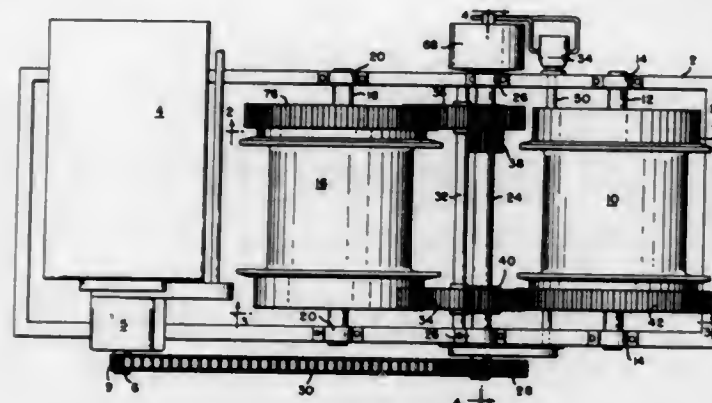
Frank L. Lawrence, Vancouver, British Columbia, Canada, assignor to Smith-Berger Manufacturing Corporation, Seattle, Wash.

Filed Apr. 22, 1970, Ser. No. 30,678

Int. Cl. F01b 21/00

U.S. Cl. 60-6

4 Claims



A yarder having a plurality of cable drums and a driving connection between the drums having an infinite variable driving ratio including an improved application of a hydraulic motor driving the haulback drum of a logging yarder allowing a controlled relative rotation between the drums. The pump for driving the motor is directly associated with the drive of the main drum. Further included are means for driving a mobile yarder mechanism using the power source and control mechanism for the drums as the motivating and control means for driving the tracks of the vehicle.

3,733,813

**SPEED CONTROL SYSTEM FOR HYDRAULIC MOTOR**

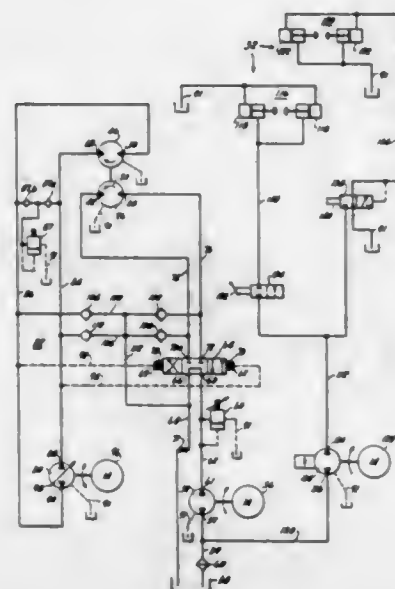
Richard O. Gordon, Belgium, Wis., assignor to Harnischfeger Corporation, West Milwaukee, Wis.

Filed Nov. 3, 1971, Ser. No. 195,093

Int. Cl. F15b 15/18

U.S. Cl. 60-393

16 Claims



Several embodiments of a speed control system for a hydraulic hoist motor are disclosed. The speed control means comprise a main hydraulic pump for driving the hoist motor; regulating means to vary the direction of flow and volume of fluid supplied to the hoist motor to thereby regulate motor direction and speed, respectively; and selectively operable

operating means to actuate the regulating means. The operating means comprise a speed sensing hydraulic motor responsive to hoist motor speed. The operating means further comprise a manually or remotely controlled over-center pump for supplying a predetermined volume of fluid to the speed sensing motor through a control circuit to obtain a predetermined operating speed for the hoist motor. The fluid pressure in the control circuit theoretically is constant for any predetermined hoist motor speed but actually varies in proportion to changes in hoist motor speed (caused by load changes) to effect constant motor speed. In one embodiment, the main pump is a constant volume pump and its output (and therefore hoist motor speed) is regulated by a pilot operated multi-position directional valve responsive to fluid pressure in the control circuit. In another embodiment, the main pump is a variable volume pump having its output (therefore hoist motor speed) regulated by a servo-stem device movable by a hydraulic actuator which, in turn, is responsive to fluid pressure in the control circuit.

3,733,814

**TRANSLATABLE ENGINE INLET PARTICLE SEPARATOR**

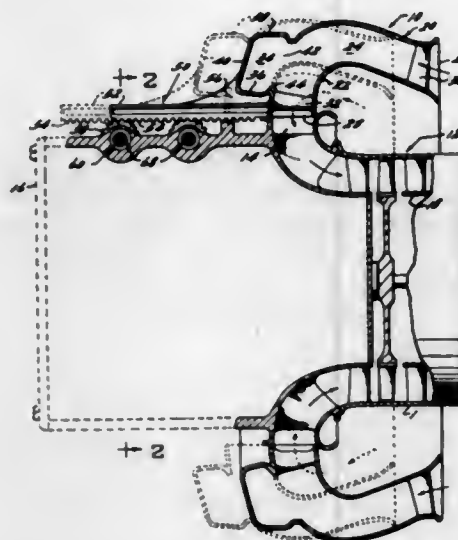
Thomas Neil Hull, Jr., Marblehead, and Anton Klug, Lawrence, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Feb. 22, 1972, Ser. No. 227,885

Int. Cl. F02c 7/04; F01d 45/12

U.S. Cl. 60-39.09 DP

8 Claims



An inlet particle separator is provided for use with a gas turbine engine wherein the separator may be axially translated out of the compressor inlet flowpath for improved engine efficiency in areas of relatively clean air where ingestion of extraneous matter within the engine appears unlikely.

3,733,815

**ACTUATING DEVICE FOR A GAS TURBINE ENGINE FUEL CONTROL**

Joseph A. Karol, Orange, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Oct. 22, 1971, Ser. No. 191,742

Int. Cl. F02c 3/10

U.S. Cl. 60-39.16 R

9 Claims

An operator foot pedal actuates through a linkage a fuel control which meters fuel to the gas generator of a gas turbine engine. A power turbine is driven by the gas generator and is connected to a vehicle transmission. The transmission has a

3,733,817

**EMERGENCY PUMP SYSTEM WITH DUPLICATE FLUID LINES**

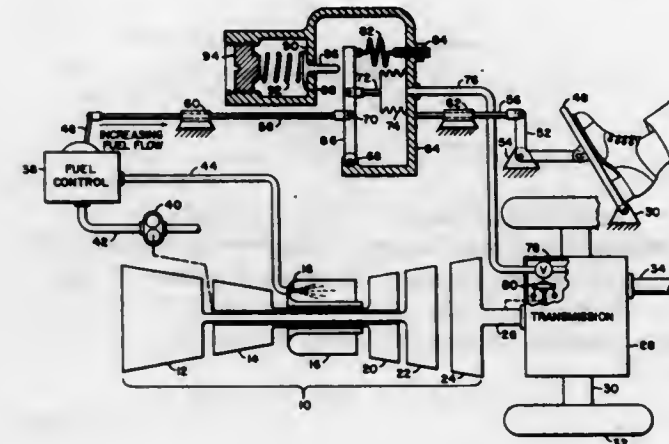
Stanley I. MacDuff, Daytona, Fla., assignor to The Bendix Corporation, South Bend, Ind.

Filed June 25, 1971, Ser. No. 156,721

Int. Cl. F15b 15/18, 7/00

U.S. Cl. 60-405

6 Claims



lengthens the effective length of the linkage to vary the output of the gas producer and thus control the speed of the turbine for these conditions.

3,733,816

**PUMP OPERATED COOLING SYSTEM USING COLD FUEL**

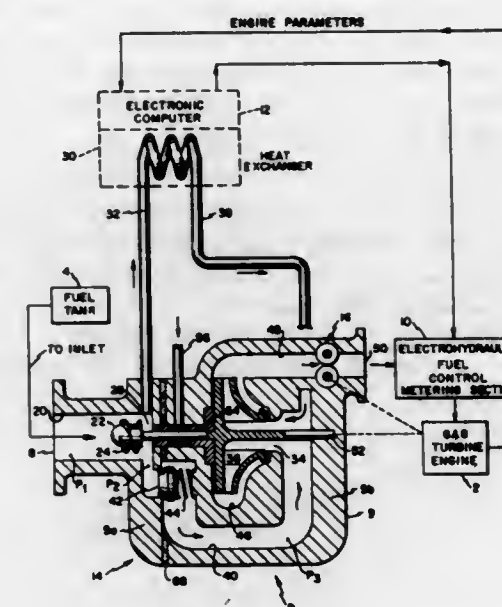
John E. Nash, Avon, and Charles W. Grennan, Newington, both of Conn., assignors to Chandler Evans Inc., West Hartford, Conn.

Filed June 11, 1971, Ser. No. 152,264

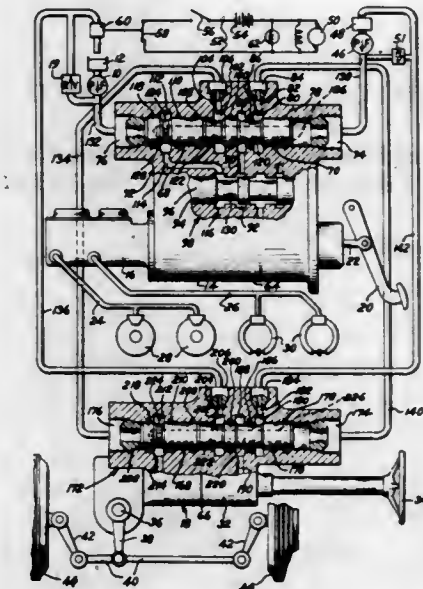
Int. Cl. F02c 9/04, 7/12

U.S. Cl. 60-39.28 R

7 Claims



A cooling system for an electronics unit of a fuel control which includes a pump with an axial inducer first stage and a centrifugal impeller second stage, the stages being thermally insulated from each other. Relatively cold fuel from a fuel tank enters the axial stage and is delivered from there to a heat exchanger arrangement in the electronics unit. Fuel flow from the heat exchanger is returned to the pump at the inlet of the centrifugal stage which pumps the fuel to the fuel control. A bypass valve, designed to crack at a predetermined pressure, furnishes an additional flow path from the outlet of the axial stage to the inlet of the centrifugal stage.



A hydraulic power brake and steering system for an automobile in which a primary engine driven pump provides fluid power for normal requirements, and an auxiliary electric motor driven pump provides fluid power in event of failure of the primary system. The system includes flow sensing means to determine when the primary system has failed, and also includes duplicate sets of hydraulic lines and pump reservoirs and a pair of shuttle valves for switching the flow from one set of lines and reservoir to the other depending upon which pump is providing fluid power.

3,733,818

**HYDRAULIC SYSTEM FOR TRUCKS**

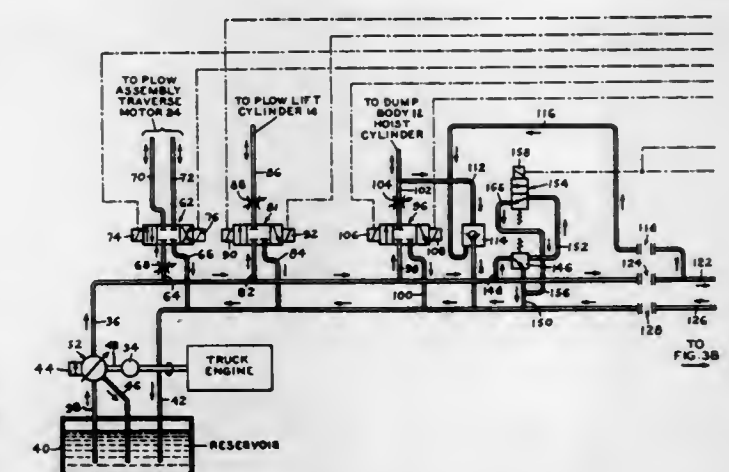
Raymond M. Veres, Brooklyn, N.Y., assignor to The Port of New York Authority, New York, N.Y.

Filed July 21, 1971, Ser. No. 164,551

Int. Cl. F15b 11/16

U.S. Cl. 60-422

8 Claims



A hydraulic system for simultaneously operating a plurality of attachments on a motor vehicle, such as a snow plow, dump body, or salt spreader. Separate valves for controlling the attachments are connected in parallel hydraulically between a common pressure manifold and a common return line so that the same pressure is available to each valve. In one embodi-



ment a pressure compensated pump is connected between a fluid reservoir and the pressure manifold. The return line empties fluid into the reservoir. In another embodiment a pressure compensated main pump is connected between the common pressure manifold and the common return manifold to continually circulate fluid under pressure through the system while a priming pump initially charges the hydraulic system with fluid from the reservoir and thereafter maintains a pressurized flooded suction line on the main pump, and supplies make up hydraulic fluid to the system.

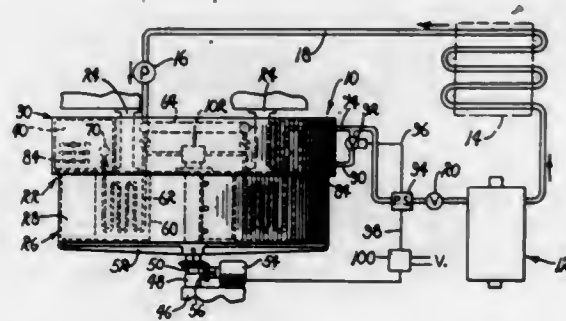
3,733,819

# SYSTEM FOR CONVERTING HEAT TO KINETIC ENERGY

Anthony Mushlines, 534 N. Winery, Fresno, Calif.  
Filed July 16, 1971, Ser. No. 163,333  
Int. Cl. F01d 25/28

U.S. Cl. 60-108

13 Claims



A system for converting heat to kinetic energy, characterized by a fluid-driven motor responsive to an introduction of high-pressure fluid for driving a selected power train, and a pressure generator for introducing the high-pressure fluid to the motor. The pressure generator includes a plurality of boiler tubes for receiving low-pressure fluid, a fire-box for successively transferring heat to the boiler tubes, and a pressure equalizer for incrementally equalizing pressures within boiler tubes, whereby an introduction of low-pressure fluid, followed by an efficient conversion to a high-pressure fluid, is facilitated within the system.

3,733,820

# COMBUSTION GAS GENERATOR

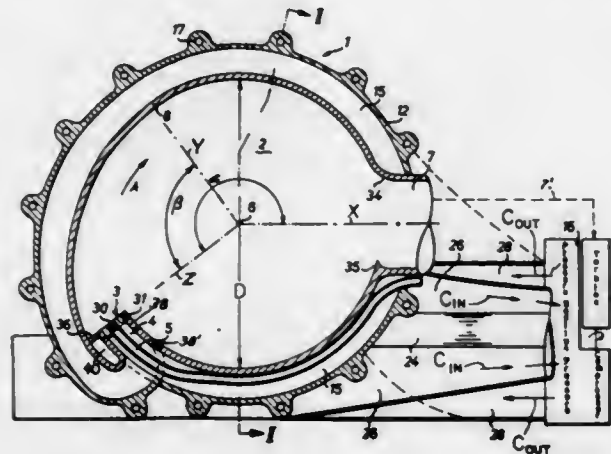
Louis Anderson, Gotgatan 73 IV, Stockholm, Sweden  
Filed Apr. 12, 1971, Ser. No. 133,321

Claims priority, application Switzerland, Apr. 16, 1970, 5652/70

Int. Cl. F02c 5/10

U.S. Cl. 60-39.77

12 Claims



A combustible mixture of air and fuel is provided to a chamber formed in a housing; the combustion chamber is of a

specific shape, so arranged that, in longitudinal section, it has approximately the shape of a single turn spiral, with the fuel and supply means connected to the spiral at the point of the maximum rate of change of curvature of the spiral wall, and the outlet from the spiral being located such that its axis is shifted with respect to the location of maximum rate of change of curvature of the spiral, by an angle of over 180° and less than 300°, and preferably between 200° and 235°, for example about 217°; upon admission of pre-heated air and fuel, self-ignition will occur providing combustion gases in shock wave or surges.

3,733,821

# SCOOP-TRIMMED FLUID COUPLINGS

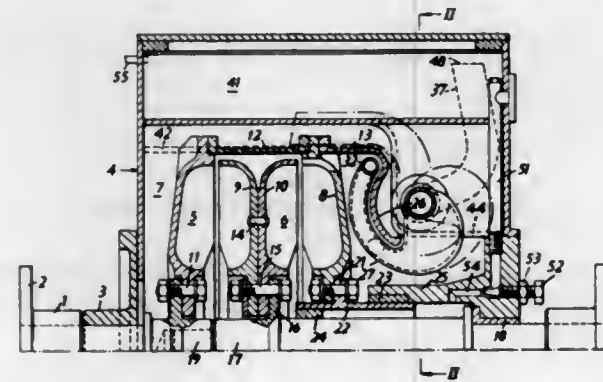
John Bilton, Hampton, England, assignor to Fluidrive Engineering Company Limited, Isleworth, Middlesex, England  
Filed Sept. 22, 1971, Ser. No. 182,624

Claims priority, application Great Britain, Sept. 24, 1970, 45,599/70

Int. Cl. F16d 33/14; F16h 41/04

U.S. Cl. 60-351

7 Claims



The trimming scoop of a scoop-trimmed fluid coupling is interconnected with a movable weir tube in an overhead reservoir to effect complementary changes in the volumes of liquid in the reservoir and the working circuit or circuits of the coupling on movement of the weir tube and scoop tube in either direction. A cooling flow path may extend from the reservoir to the working circuit or circuits.

3,733,822

# DUAL RATIO FORCE TRANSFER APPARATUS

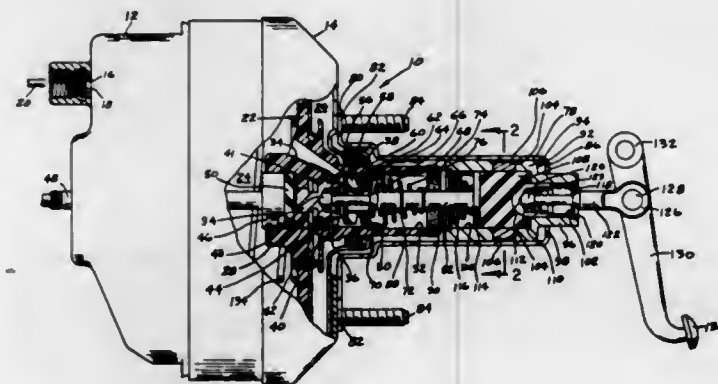
William E. Monroe, Oak Park, Mich., assignor to The Bendix Corporation, South Bend, Ind.

Filed Aug. 11, 1971, Ser. No. 170,903

Int. Cl. F15b 7/00, 13/10

U.S. Cl. 60-54.5 R

11 Claims



An apparatus for transforming an input force to an operational force to activate a pressure controlled power device. In a first mode of operation the input force is directly communicated through a confined deformable medium to an output

member. Upon a predetermined operational force being required, the confined deformable medium changes its characteristics from a solid-like body to a liquid-like body for a second mode of operation. In the second mode of operation the input force is converted to an operational force which is the product of the pressure in the liquid-like body acting over the contacting area of the output member.

3,733,823

# MASTER CYLINDER FOR HYDRAULIC CLUTCH CONTROL SYSTEM

Roland Mutterel, Bessancourt, France, assignor to Societe Anonyme D.B.A.

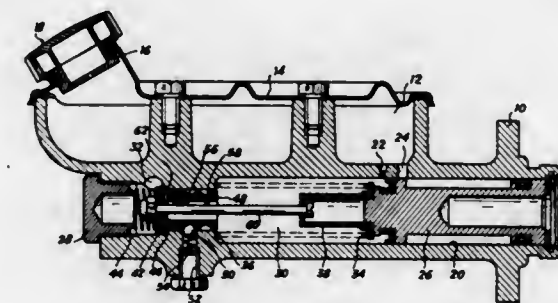
Filed Dec. 16, 1971, Ser. No. 208,564

Claims priority, application France, Dec. 30, 1970, 7047278

Int. Cl. F15b 7/00

U.S. Cl. 60-54.6 R

10 Claims



A hydraulic master cylinder more particularly adapted to control a hydraulic clutch control system. The variable volume fluid chamber of the master-cylinder communicates with the outlet port connected to an hydraulic clutch receiver through a one-way valve 42 in such a manner that the check-valve normally delays the return fluid flow to the chamber. The valve 42 is unseated by a sliding sleeve when the inward travel of the piston exceeds a predetermined value. A ball cooperates with sleeve to maintain the latter in either of two predetermined positions corresponding to the opened and closed position of the one-way valve.

3,733,824

# ANTIPOLLUTION JET ENGINE WITH REVERSIBLE AUXILIARY JET ENGINES OPERABLE INDEPENDENTLY TO SERVE AS AUXILIARY THRUSTERS AND BRAKES

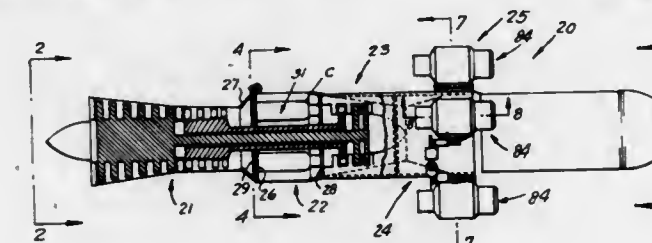
Lewis M. D. Grainger, Glen Allen, Va.

Filed July 20, 1971, Ser. No. 164,391

Int. Cl. F02k 3/08

U.S. Cl. 60-224

9 Claims



An antipollution jet engine in which air is fed through the chamber walls of the combustion chamber downstream of the fuel oil nozzle. The air is caused to have a tangential swirling motion to assist in obtaining a complete burning mixture so as to burn all combustible material in the fuel to eliminate pollution.

Additional fuel is supplied to a downstream burner similarly provided with downstream air admission ports to create a circular tangential turbulence for a complete mixing and

complete burning of the combustible materials. The function of the downstream burner is to assist in completely burning all of the combustible materials resulting from the first burners. The fuel for the first burners and the downstream burner is preheated to improve ignition and burning.

3,733,825

# THRUST CONTROL MECHANISM

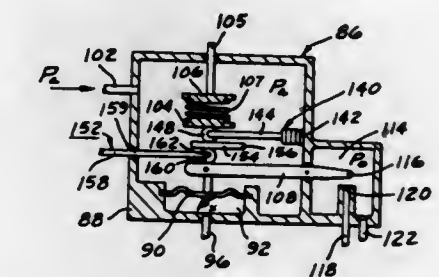
Samuel E. Arnett, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Division of Ser. No. 748,416, July 29, 1968, Pat. No. 3,572,038. This application Nov. 18, 1970, Ser. No. 90,777

Int. Cl. F02k 1/16

U.S. Cl. 60-235

4 Claims



A thrust control mechanism for use in association with a combustion engine having a valve means to control the flow of fuel to said combustion engine upon command, which is responsive to a pressure responsive member for sensing thrust as a function of the pressure drop across said combustion engine exhaust nozzle. Said thrust control mechanism may further include an absolute reference means to compensate for changes in ambient pressure of the device and a variable nozzle area input means to compensate for changes in combustion engine thrust due to different settings of nozzle area.

3,733,826

# FUEL COOLED RAM AIR REACTION PROPULSION ENGINE

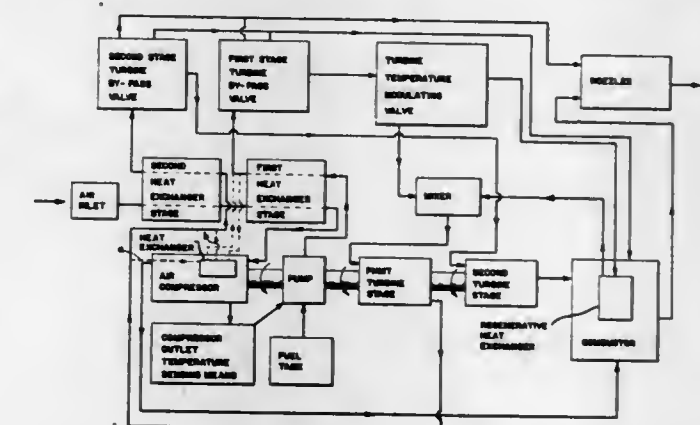
Robert L. Wolf, Chesterfield County, Va., and Rodney McGann, Northridge, Calif., assignors to Texaco Experiment Incorporated, Richmond, Va.

Filed Feb. 10, 1964, Ser. No. 343,871

Int. Cl. F02k 3/10

U.S. Cl. 60-263

7 Claims



1. A reaction propulsion system including means providing a combustion chamber having an impulse expansion outlet nozzle therefrom, means providing a ram air intake, means directing air from the ram air intake to the combustion chamber, a fuel storage chamber, multi-stage heat exchange means in heat exchange contact with the air in said air directing means, means directing fuel from said storage chamber through a first stage of said heat exchange means, an air compressor providing a portion of the air directing means between



the heat exchange means and said combustion chamber, a multi-stage direct expansion turbine for driving said compressor, means directing at least a portion of fuel from the first stage of said heat exchange means through a first stage of said direct expansion turbine and then into a second stage of said heat exchange means, means directing at least a portion of fuel from the second stage of said heat exchange means through a second stage of said direct expansion turbine and then into said combustion chamber, a regenerative heat exchanger in said combustion chamber, and means for selectively directing a portion of the fuel passing through the first stage of said heat exchange means to said regenerative heat exchanger and then to the first stage of said turbine.

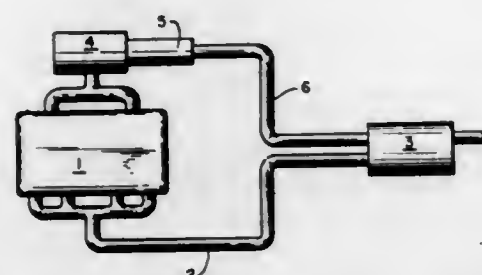
3,733,827

# ANTI-POLLUTION DEVICE FOR COMBUSTION ENGINE EXHAUST GASES

Ken Suzuki, 1360 Alapua St., Honolulu, Hawaii  
Filed Feb. 3, 1972, Ser. No. 223,125  
Int. Cl. F02b 75/10; F02m 25/06

U.S. Cl. 60-278

8 Claims



An anti-pollution device for combustion engine exhaust gases in which the toxic elements of the exhaust gases are removed as much as possible through an exhaust gas cleaner which is connected with the exhaust pipe of the engine and is also connected to the carburetor air regulator of the engine on its suction side. The exhaust gases thus purified through the exhaust gas cleaner and the carburetor air regulator are mixed with air by the sucking force of the engine and are sent into the combustion chamber of the engine for recombustion of the same therein.

3,733,828

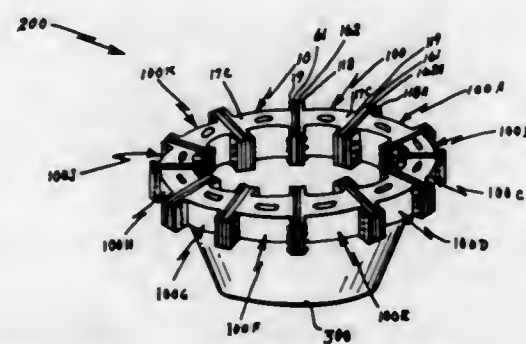
# ROCKET CHAMBER AND INJECTOR SEGMENTATION AND SUPERSONIC BAFFLES

Donald G. Brown, Canoga Park, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 6, 1972, Ser. No. 241,570  
Int. Cl. F02k 9/02; B05b 1/06

U.S. Cl. 60-258

2 Claims



The conventional thrust chamber and injector assembly of a liquid propellant rocket engine are manufactured by removably connecting together a plurality of identical arcuate segments thereof, with each segment having an identical baffle plate at each of the two ends of the segment. The identical arcuate segments, together with the identical baffle plates, collectively form the toroidal thrust chamber and injector assembly.

lectively form the toroidal thrust chamber and injector assembly. The segmentation accelerates manufacture of the assembly and permits easy and rapid removal and replacement of any of the segments. The baffle plates extend beyond the throat of the thrust chamber and into the supersonic region in the nozzle area and, thereby, provide circumferential stability of the rocket motor.

3,733,829

# DEPOLLUTION GASES

Claude Henaut, Chevilly-Larue, France, assignor to Regie Nationale des Usines Renault et Societe Dite des Automobiles Peugeot, Paris, France

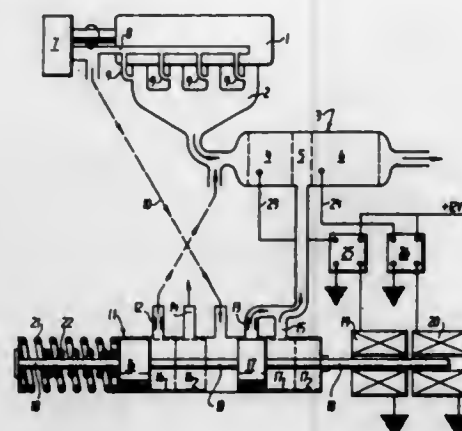
Filed Oct. 5, 1972, Ser. No. 295,357

Claims priority, application France, Dec. 28, 1971, 7146986

Int. Cl. F02b 75/10

U.S. Cl. 60-289

4 Claims



An apparatus for supplying air to a catalytic, oxidizing-reducing reactor for the exhaust gases from an internal combustion engine. An air pump with an output rate at least twice that required for complete combustion of carbon monoxide delivers an amount of air to a pair of catalytic beds which are adjusted from common thermostatically and discontinuously controlled distribution means determined by the catalytic bed temperatures, such that the reducing bed initially functions as an oxidizer and the oxidizing bed is cooled by excess air the moment a critical temperature is reached.

3,733,830

# TIDAL FLOW SYSTEM AND METHOD FOR CAUSING WATER TO FLOW THROUGH WATERWAYS

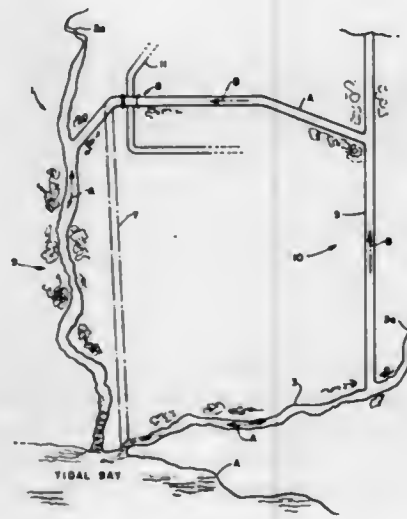
Marcellus L. Jacobs, Rt. 3 Box 722, Fort Myers, Fla.

Filed June 7, 1971, Ser. No. 150,286

Int. Cl. E02b 3/00, 15/00

U.S. Cl. 61-1

13 Claims



A tidal flow system and method for causing flow of water through waterways to flush said waterways and prevent stagnation.

nation of water and accumulation of debris therein, wherein a one-way valve means is in said waterway between the ends thereof, said valve means being closed when the depth of water on the discharge side of the valve is greater than on the inlet side of the valve and said valve means being opened when the depth of water on the discharge side of the valve is less than on the inlet side thereof, the depth of water at least on the discharge side of the valve being controlled by tidal action.

3,733,831

# METHOD AND APPARATUS FOR PREVENTING EROSION AND FOR CONVEYING

Charles W. Sticker, Jr., Mohnton, Pa., assignor to Gray Tech Industries, Inc., Mohnton, Pa.

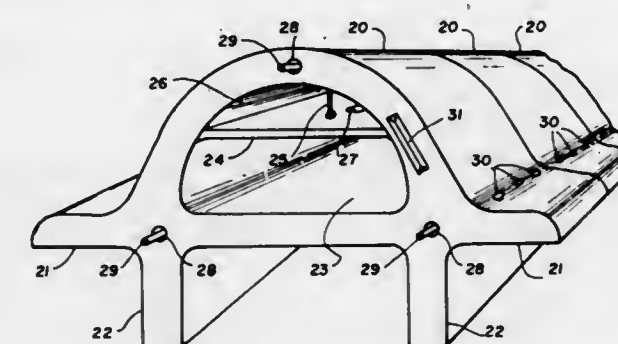
Continuation-in-part of Ser. No. 26,829, April 9, 1970. This

application Mar. 12, 1971, Ser. No. 123,538

Int. Cl. E02b 3/06, 3/08

U.S. Cl. 61-4

5 Claims



This invention relates to improvements for preventing erosion of beaches by tidal waves comprising placing a plurality of conduit units in mating end-to-end relationship and bolting them together by stressing wires extending through registering holes. Each unit has a pair of deep legs or drag footers through which fluid is forced so as to stabilize the support. The same type of structure when considerably increased in size may serve as a vehicular tunnel and may be provided with a horizontal partition to provide ventilation at the top of the tunnel.

3,733,832

# TROUGH STRUCTURE

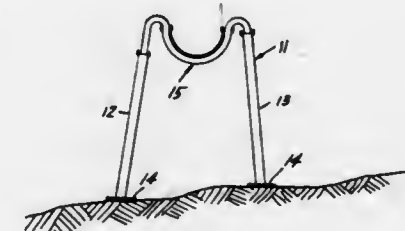
Todd D. Bailey, 2767 Olive Highway, Oroville, Calif.

Filed Aug. 18, 1969, Ser. No. 850,814

Int. Cl. E02b 9/04

U.S. Cl. 61-15

2 Claims



A trough structure particularly adapted for use as an irrigation trough or flume which is formed from a plurality of rectangular sheets of relatively inexpensive material such as corrugated roofing and which is supported above the ground by portable supports spaced apart longitudinally of the path of the trough. The ends of adjacent sheets of material are secured in lapping relationship to each other at said supports and means is provided for preventing leakage at the lapped seams.

3,733,833

# PLUGGING OF PERMEABLE MATERIALS

Christ F. Parks, Tulsa, and Louis H. Eilers, Inola, both of Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 30, 1971, Ser. No. 176,324

Int. Cl. E02d 3/12

U.S. Cl. 61-36 R

11 Claims

A method is provided for plugging permeable materials, preferably permeable earthen materials. An aqueous solution having a neutral to basic pH and containing dispersed therein a water soluble organic polymer containing a plurality of carboxylic groups and an organic material having an acid reaction is acidized to form a precipitate in situ in the permeable material thus reducing the permeability of the material.

3,733,834

# DYNAMIC DAMPER FOR OFFSHORE STRUCTURES

Ludwig Ludwig, deceased, late of 110 St. Albans Road, Berkeley, Calif. (by Gina L. Cline, executrix)

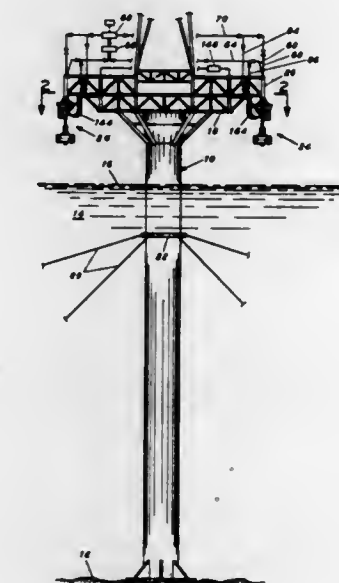
Continuation of Ser. No. 139,075, April 30, 1971. This

application May 1, 1972, Ser. No. 249,429

Int. Cl. E02d 21/00

U.S. Cl. 61-46

14 Claims



Apparatus for dynamically damping the vibrations of a marine structure in which oscillation is induced by the impact of periodically occurring wave forces. In the preferred embodiment, a massive pendulum is used and is tuned to be forced into synchronous vibration at the critical stages of oscillation of the marine structure. A viscous fluid restrains the swing of the pendulum and thus dissipates energy from the marine structure to thereby control the amplitude of its oscillation.

3,733,835

# APPARATUS FOR ADVANCING TUNNEL SUPPORTS

J. Donovan Jacobs, c/o Jacobs Associates, 500 Sansome Street, San Francisco, Calif.

Continuation-in-part of Ser. No. 798,097, Feb. 10, 1969. This

application Apr. 2, 1971, Ser. No. 130,686

Int. Cl. E01g 3/04

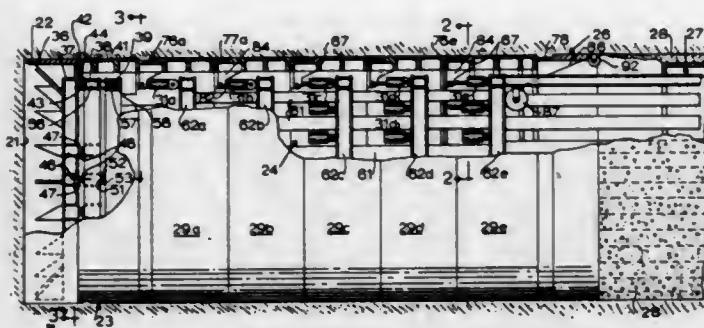
U.S. Cl. 61-84

14 Claims

Apparatus and method for continuously or intermittently advancing tunnel supports against surrounding earth pressure. Cutting edge and trailing shells are interconnected by a longitudinal frame or cage structure. Intermediate the forward and trailing shell are overlapping intermediate shells which are individually connected to the cage structure by hydraulic cylinders so that each intermediate shell can be moved lon-



gitudinally relative to the others and relative to the tunnel wall while the other intermediate shells engage the tunnel wall and advance the cage as well as the forward or support and trailing shells. The intermediate shells are sequentially moved forwardly, preferably by releasing the pressure exerted against the wall, as by contracting the shell or by projecting through the shell various-shaped devices which grip or penetrate the



wall. The support may incorporate steering guidance means for adjusting the direction of the excavation device about perpendicular transverse axes. Means is also provided on the trailing shell for feeding out the rearward end ribbons, or rods to support the tunnel walls prior to concreting and also a retainer shell which functions as a screed for the concrete and supports the concrete as it is gaining strength.

3,733,836

## TEMPERATURE CONTROLLED MOBILE CART

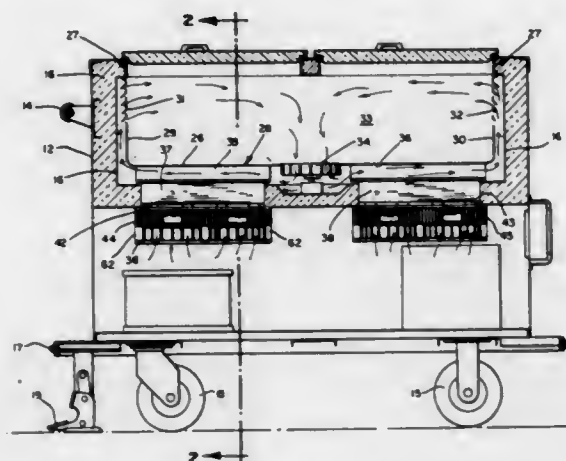
Louis J. Corini, Philadelphia, Pa., assignor to Melbro Corporation, Philadelphia, Pa.

Filed Jan. 17, 1972, Ser. No. 218,356

Int. Cl. F25d 17/06

U.S. Cl. 62—3

1 Claim



A mobile cart is provided with thermoelectric cooling means actuated by a circuit which provides for either external A. C. current input or integral D. C. current power supply. A cabinet is specially constructed to pass air through a finned heat sink for heat transfer purposes and through the controlled temperature container portion of the cart.

3,733,837

## THERMODYNAMIC RECIPROCATING MACHINE

Alexander James Lobb, Surrey, England, assignor to The British Oxygen Company Limited, London, England

Filed Nov. 15, 1971, Ser. No. 198,631

Claims priority, application Great Britain, Nov. 18, 1970, 54,880/70; Mar. 24, 1971, 7,746/71

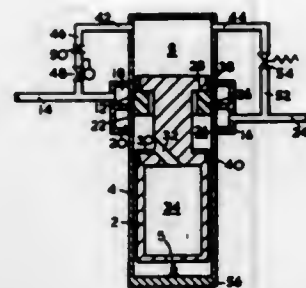
Int. Cl. F25b 9/00

U.S. Cl. 62—6

13 Claims

A simple form of refrigerator in which gas is cooled by expansion of a gas in an expansion chamber. The refrigerator in-

cludes a reciprocable displacer located within the cylinder, the expansion chamber being defined, at least in part, between



the end of the displacer and the inner wall of the cylinder. Inlet and outlet of gas to the expansion chamber is controlled by a valve or valves operated by the displacer.

3,733,838

## SYSTEM FOR RELIQUEFYING BOIL-OFF VAPOR FROM LIQUEFIED GAS

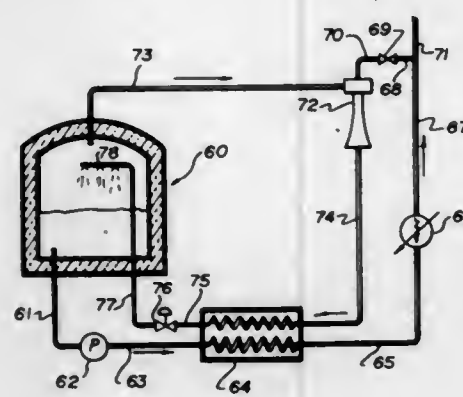
Terry Wayne Delahunty, Plainfield, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Dec. 1, 1971, Ser. No. 203,729

Int. Cl. F17c 13/00

U.S. Cl. 62—54

9 Claims



Apparatus and processes for recondensing boil-off vapor from an insulated storage tank containing a liquefied gas, such as liquefied natural gas, so that it continues to comprise a part of the stored liquefied gas.

Boil-off vapor is recondensed by refrigeration obtained from expansion of a liquefied gas stream withdrawn from the storage tank. The expanded stream, as a vapor, can be pressurized by feeding it to the suction side of an ejector to which a high pressure gas is fed to supply the motive force. Alternatively, a vapor stream derived from the stored liquefied gas can be fed to a venturi ejector as the motive force to pressurize boil-off vapor fed from the storage tank to the suction side of the ejector. The combined stream from the ejector, after being refrigerated by the withdrawn liquefied gas stream, is expanded to the tank vapor space to cool the tank contents. Under either system, liquefied gas stored at about atmospheric pressure can be vaporized and distributed at a pressure greater than atmospheric pressure.

3,733,839

## PROCESS FOR REMOVING ARTICLES FROM HEAT EXTRACTION DEVICES

Vincent Howard Waldin, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 12, 1971, Ser. No. 171,098

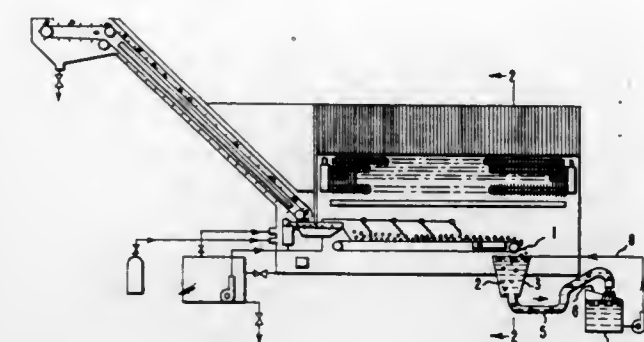
Int. Cl. F25d 17/02

U.S. Cl. 62—64

5 Claims

In a process for extracting heat from articles by contacting them directly with an ebullient liquid polyfluorinated C<sub>1</sub>-C<sub>4</sub>

saturated halohydrocarbon freezant in a 100 percent freezant vapor zone, the method of removing the articles from said freezant-vapor zone by dropping them into a flowing stream of



liquid which carries them to a discharge point outside the 100 percent freezant vapor zone; discharging the stream with the articles and separating the articles from the stream.

3,733,840

## METHOD AND APPARATUS FOR INHIBITING BACTERIAL GROWTH IN AUTOMATIC ICEMAKERS

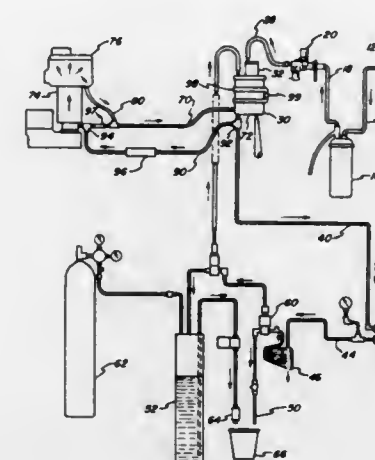
Donald C. Pearl, Lake Zurich, and Arthur P. Gross, Bensenville, both of Ill., assignors to Canteen Corporation, Chicago, Ill.

Filed May 17, 1971, Ser. No. 143,888

Int. Cl. F25c 1/14; F24f 3/16

U.S. Cl. 62—78

14 Claims



In an automatic icemaker of the type used in automatic vending machines, the ice cubes, chunks or slush are normally stored in a compartment. In many instances melt-down liquid from the stored ice is allowed or circulated to return and join the water in the freezing chamber. With water at these low temperature levels, the network must be cleaned out periodically to prevent growth of bacteria, slime and other contaminants, both in the storage compartment and in the entire water network. The present invention provides a method and apparatus for automatically sanitizing the water network periodically. The sanitizing cycle includes heating the water in the network to a sanitizing temperature and recirculating the heated water throughout the network. Stored ice is melted and its water may be allowed to join with the circulating water. Once the water in the network has reached the desired sanitizing temperature, it is maintained at that level long enough to ensure the destruction of any bacteria and slime which may have formed. Naturally the sanitizing cycle is set to occur during periods when the icemaker is normally not being used.

3,733,841

## REFRIGERATOR TEMPERATURE CONTROL

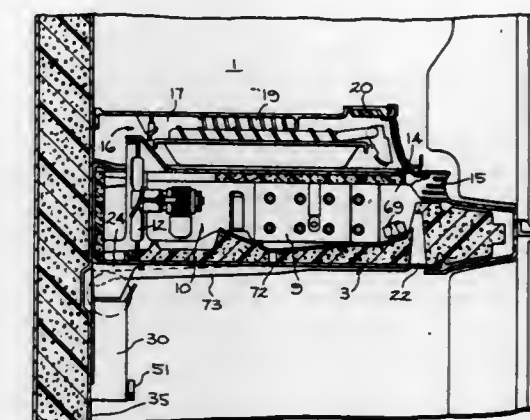
Robert B. Gelbard, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 15, 1971, Ser. No. 189,692

Int. Cl. F25d 17/00

U.S. Cl. 62—180

4 Claims



A refrigerator including a storage compartment cooled by forced circulation of air from the compartment over an evaporator and the return of cooled air to the compartment includes a fixed temperature control means for controlling the operation of the refrigeration system and means for varying the flow of cooled air over the fixed temperature control in order to control the operating temperature of the compartment.

3,733,842

## FIRE PLACE AIR CONDITIONING APPARATUS

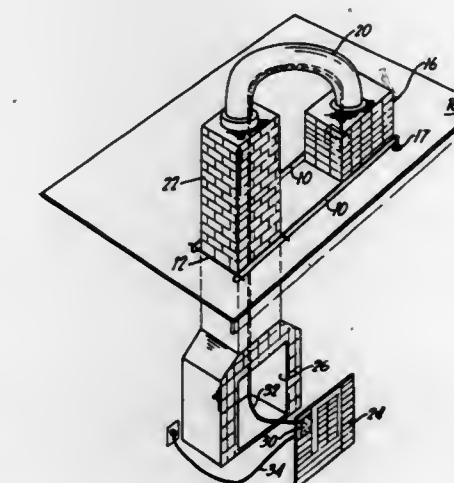
Harry P. Numsen, Antioch, Calif.

Filed July 21, 1971, Ser. No. 164,670

Int. Cl. F25d 23/12

U.S. Cl. 62—259

1 Claim



Air conditioning apparatus cooperates with and is at least partially installed in a fire place and its chimney to enable the fire place to be used for cooling as well as heating.

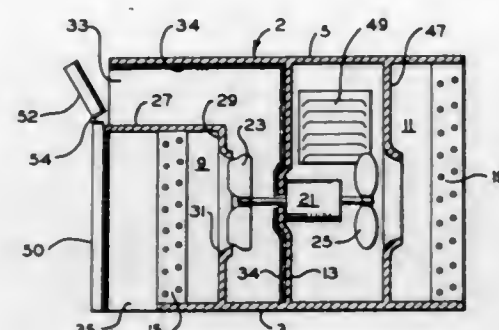


3,733,843

**SELF-CONTAINED AIR CONDITIONING UNIT**  
David E. MacLeod, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.  
Filed Sept. 9, 1971, Ser. No. 178,980  
Int. Cl. F25d 23/12

U.S. Cl. 62-262

3 Claims



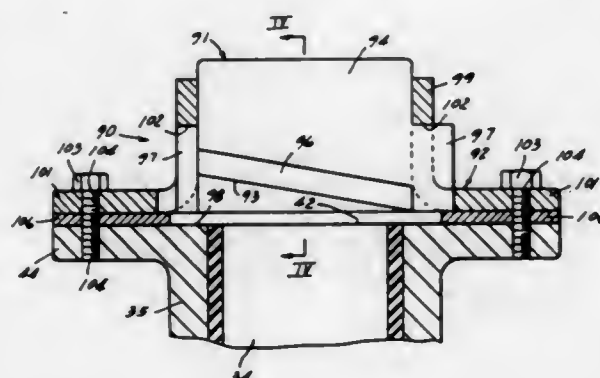
A self-contained air conditioning unit employing a front panel including a hinged door for cooperation with the conditioned air discharge opening, friction means being provided to maintain the door in any desired position against the force of the discharge air and limit the maximum door open position.

3,733,844

**AUGER ICE MAKER WITH KNIFE CRACKING DEVICE**  
Phillip H. Turner, Inver Grove Heights, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.  
Division of Ser. No. 39,774, May 20, 1970. This application June 24, 1971, Ser. No. 156,289  
Int. Cl. F25c 1/14

U.S. Cl. 62-320

4 Claims



A method and means for producing ice by gravitationally feeding water from a source of supply in excess of the freezing capacity of a refrigerated cylinder, wherein the feed water is directed into a lower part of the cylinder and the excess feed water is vented through a drain located in a compression nozzle above the level of the cylinder. The water is circulated through openings formed in the top of a harvesting auger. The water flow aids in lifting harvested ice product and also serves to thaw out the unit and prevent it from becoming ice bound.

3,733,845

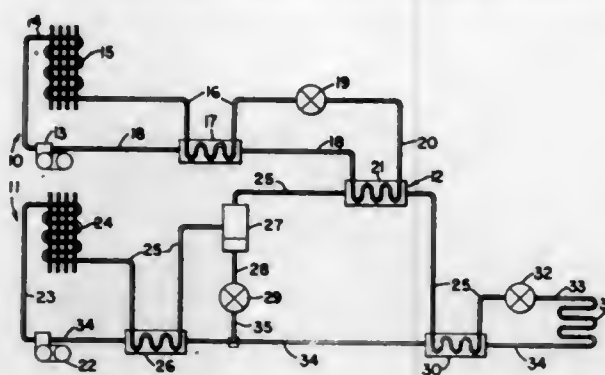
**CASCADED MULTICIRCUIT, MULTIREFRIGERANT REFRIGERATION SYSTEM**  
Daniel Lieberman, 2931 Piedmont Avenue, Berkeley, Calif.  
Filed Jan. 19, 1972, Ser. No. 218,870  
Int. Cl. F25b 7/00

U.S. Cl. 62-335

10 Claims

A refrigeration system having two or more closed refrigerant circuits in which each circuit has a compressor, a condenser connected to the compressor outlet, a high-pressure line connecting the condenser to an evaporator and a

low-pressure line returning from the evaporator to the compressor inlet and in which each circuit after the first has at least one vapor-liquid separator in the high-pressure line and is charged with a mixture of refrigerants. The evaporator of each circuit is in heat exchange with the high-pressure line of



the next successive circuit at a point downstream of the first separator therein. The system enables very low temperatures to be reached in the evaporator of the final circuit with conventional, relatively low-pressure, oil-lubricated compressors being used throughout.

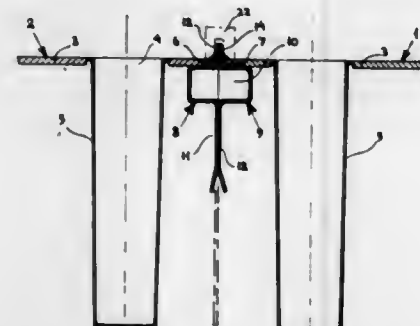
3,733,846

**ANNULAR TABLE FOR A ROTATING FREEZING APPARATUS**

Hans Gram, Vojens, Denmark, assignor to Brodrene Gram A/S, Vojens, Denmark  
Filed Oct. 22, 1971, Ser. No. 191,590  
Claims priority, application Denmark, Oct. 27, 1970, 5459  
Int. Cl. F25c 7/12

U.S. Cl. 62-345

3 Claims



Annular table for a rotating freezing apparatus wherein the lower surface of the table is subjected to the action of the freezing medium, wherein the table is divided into a plurality of adjacent sections, each of such sections having duct means secured to their adjacent edges, the duct means of two adjacent edges forming in cooperation a duct extending in the radial direction of the table and being open at least at one end thereof, each of said adjacent duct means comprising a lip, the lips of two adjacent duct means forming a narrow slit along the bottom of the duct formed by said two adjacent duct means.

3,733,847

**DIRECT CONTACT HALOCARBON FREEZANT APPARATUS**

Harold R. Powell, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.  
Filed Mar. 24, 1971, Ser. No. 127,620  
Int. Cl. F25d 17/02

U.S. Cl. 62-375

8 Claims

Direct contact halocarbon freezant system employs a chamber whose article inlet and outlet are open to atmosphere and includes blower for drawing air through both while gases and vapors are discharged through a pair of condenser arrays

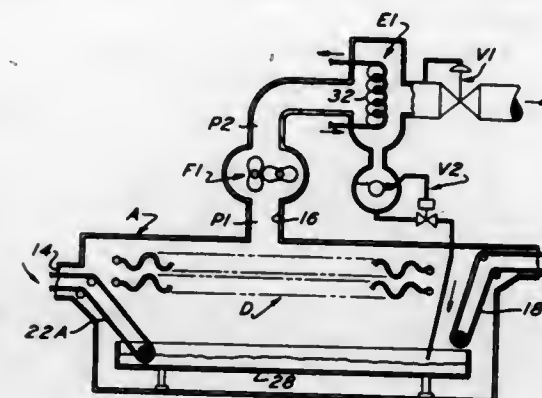
3,733,849

**APPARATUS FOR TRANSPORTATION OF COMMODITIES**

Raymond E. Cantagallo, Drexel Hill, and J. Lutz, Swarthmore, both of Pa., assignors to Sun Shipbuilding & Dry Dock Company, Chester, Pa.  
Division of Ser. No. 834,281, June 18, 1969, abandoned. This application June 29, 1971, Ser. No. 158,025  
Int. Cl. F25d 17/06

U.S. Cl. 62-414

1 Claim



secondary condenser temperature determines partial pressure of freezant vapor and accordingly the relative freezant-to-air volume.

Large insulated containers are used for the transport of chilled or frozen commodities. Each of the containers has its own electric-motor-driven refrigeration equipment, which is supplied with electric power from the ship or trailer chassis on which the containers are being transported. In the containers, a continuous flow of refrigerated (or, in some cases, heated) air is maintained up through and/or around the packaged commodity. Means is provided to change the atmosphere inside the container by the addition of fresh air. A temperature set point adjustment is provided to maintain the temperature of the air being circulated in the container. A relatively simple and convenient arrangement is provided for mounting the refrigeration equipment on the container.

3,733,848

**FREEZING SYSTEM**

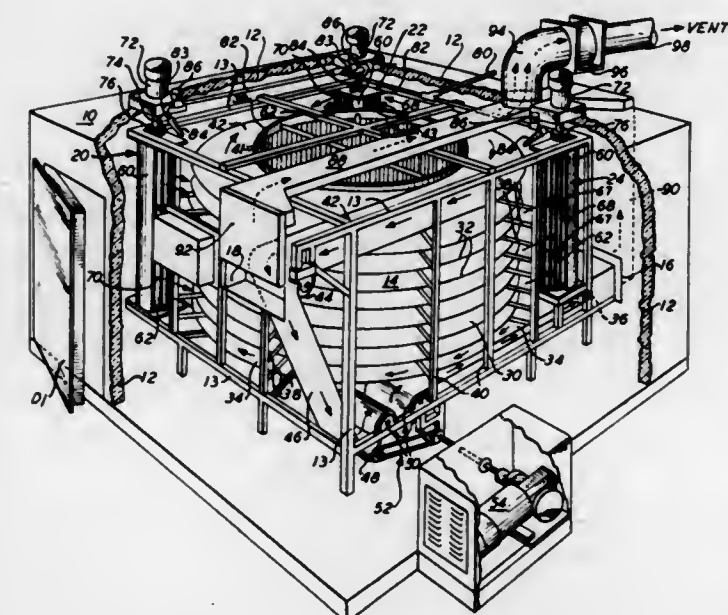
Paul P. Duron, Orange; Thomas A. Carter, Jr., Whittier, and Frank Mondok, Glendora, all of Calif., assignors to Airco, Inc., New York, N.Y.

Filed Aug. 9, 1971, Ser. No. 170,175

Int. Cl. F25d 25/02

U.S. Cl. 62-381

9 Claims



3,733,850

**REFRIGERATION HEAT PUMP, AND HEAT ENGINE APPARATUS**

Sven A. Olund, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 3,523, Jan. 16, 1970, Pat. No. 3,642,634. This application Dec. 28, 1971, Ser. No. 213,174

Int. Cl. F25b 43/02

U.S. Cl. 62-468

3 Claims

An apparatus capable of being employed as a refrigeration, heat pump, or heat engine containing a halogenated alkane working fluid and a lubricant combination of alkylbenzenes containing from 10 to 25 carbon atoms in the alkyl groups and from about 2 to about 50 percent by weight of polyisobutylene having a viscosity in the range of about 3,000 to about 1,000,000 SUS at 100°F.

3,733,851

**GEMS IN LINKED SETTINGS AND MECHANICALLY SECURED TO A BASE MEMBER**

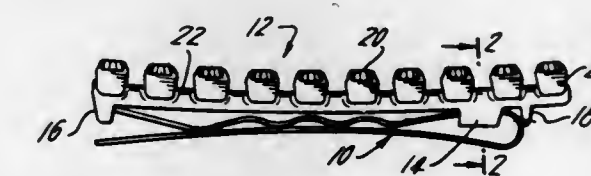
Louis D'Apuzzo, Fairfield, N.J., assignor to H. Goodman & Sons, Inc., Kearney, N.J.

Filed Dec. 27, 1971, Ser. No. 211,987

Int. Cl. A44c 25/00

U.S. Cl. 63-1

5 Claims



A high rate freezing system comprising an insulating housing wherein expansion of liquid carbon dioxide (CO<sub>2</sub>) maintains a freezing atmosphere. A belt conveyor with multiple flights defining a vertical helix passes food products through the housing. A plurality of line-flow blowers with vertical axes of rotation at spaced positions around the helix direct wide streams of cold CO<sub>2</sub> gas respectively, generally tangentially across all the conveyor flights for causing swirling movement of the gas throughout the helix.

A chain of artificial gems in settings of sheet-metal, interconnected by links. The bottoms of the gem settings, and the sides, bottom and at least part of the top of each link, are intimately received in mechanically conforming portions of a cast



base member that rigidly unifies the whole. In one example, the base member has an integral mounting formation that secures the gem-bearing unit to a bobby pin or other article, and in another example, the chain of artificial gems unified by the base member forms the bar of a barrette.

3,733,852

# ORNAMENTAL CONSTRUCTION OF SAFETY PINS AND BEADS

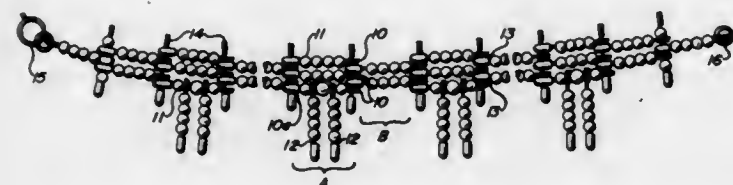
Lu Wanna M. Johnson, 7515 E. Hubbell, Scottsdale, and Barbara L. Zachariae, P.O. Box 136, Young, both of Ariz.

Filed July 14, 1972, Ser. No. 271,805

Int. Cl. A44c 25/00

U.S. Cl. 63-2

1 Claim



A novel hobby-craft construction for costume jewelry is provided. The construction consists of recurring units of common safety pins. Each recurring unit consists of two or more parallel safety pins arranged so that the ends of the pins in each unit are adjacent the ends of the parallel pins of the next unit. Transverse linking pins join the ends of the parallel pins of one unit to the ends of the parallel pins in the next unit. Ornamental beads are selectively strung on the needle shafts of the longitudinal and transverse pins.

3,733,853

# FLEXIBLE DRILL STRING JOINT

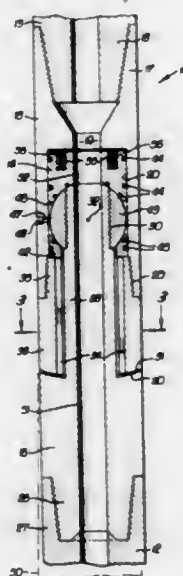
Wayne N. Sutliff, and Jim L. Downen, both of 2931 Pierce Rd., Bakersfield, Calif.

Filed July 19, 1971, Ser. No. 163,898

Int. Cl. F16d 3/16

U.S. Cl. 64-7

4 Claims



Upper and lower subs are short coupled by a ball and socket connection embodying a torque-absorbing spline means loose enough not to interfere with flexing of the two subs about the center of their connection.

# 3,733,854 SHIELDED ANGULAR DRIVE TRANSMITTING JOINT AND SHIELDED QUICKLY DETACHABLE COUPLING THEREOF

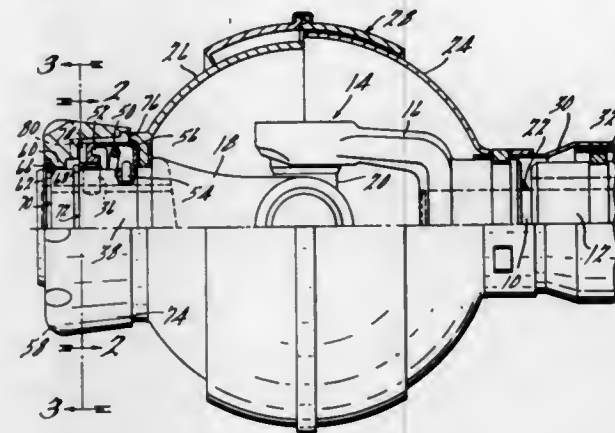
John R. Young, and John C. McElwain, both of Rochester, Mich., assignors to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1971, Ser. No. 211,202

Int. Cl. F16d 18/32

U.S. Cl. 64-32

10 Claims



A shielded angular drive assembly such as a drive transmitting joint adapted for connection to the power takeoff shaft of an agricultural vehicle is provided with a shielded externally actuatable quick detachable coupling by which the drive transmitting shaft can be easily connected to and disconnected from the power take-off shaft of a vehicle and to the power in-put shaft of the driven auxiliary unit and in which the mechanism of the coupling is completely enclosed to prevent injury to personnel resulting from inadvertent contact with the coupling while the shaft is rotating and to prevent entanglement of stray objects in the rotating components of the coupling.

3,733,855

# ELECTRONICALLY CONTROLLED NEEDLE SELECTION SYSTEM FOR KNITTING MACHINES

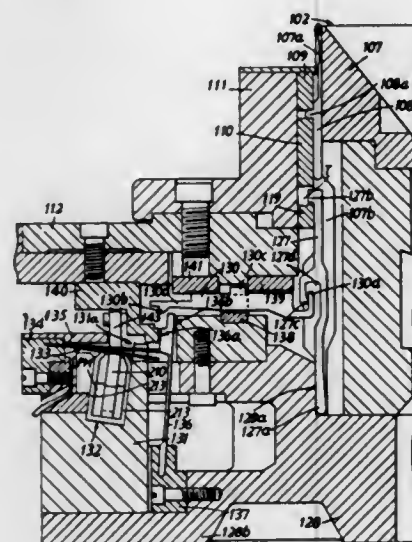
Herbert Brian Bliss-Hill, Evington, and Eric William Tewsley, Kirby Muxloe, both of England, assignors to Stibbe Machinery Limited, Leicester, England

Filed Dec. 2, 1970, Ser. No. 94,427

Int. Cl. D04b 15/78

U.S. Cl. 66-50 R

9 Claims



A knitting machine having individually operable needles, pattern information carrier means movable in sympathy with the machine and an electronically controlled needle selection

system which, at the dictates of the pattern information and via butts associated with the needles, selectively controls the latter. Each needle has its own magnetic actuator unit. Each such unit includes a light responsive detector responsive to light signals transmitted to it by the pattern information carrier means. A light level detector circuit provides a step voltage output when the level of signal received by the detector exceeds a threshold value. When triggered by this output a monostable circuit produces an output pulse. This pulse energizes an opposing winding associated with a permanent magnet included in the unit to re-direct the attractive force of the magnet. Associated with each unit is an armature normally retained by the magnet but releasable therefrom, to change the path of flux, to exercise selective control over corresponding needle.

3,733,856

# FLAT KNITTING MACHINE

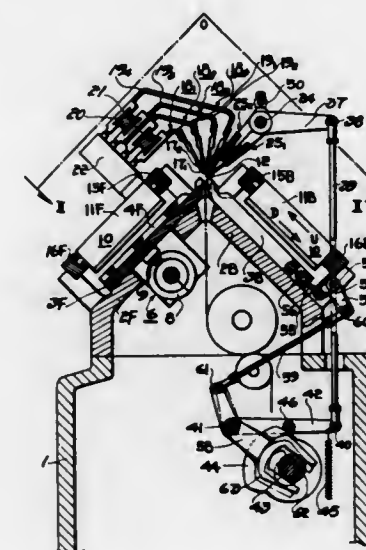
Masahiro Shima, Wakayama, Japan, assignor to Shima Idea Center Co., Ltd., Sakata, Wakayama, Japan

Filed June 16, 1971, Ser. No. 153,566

Int. Cl. D04b 7/00

U.S. Cl. 66-62

7 Claims



A flat knitting machine wherein, besides horizontally movable yarn feeders which are also provided in the conventional flat knitting machine, there are provided above the back or front needle bed vertically movable yarn feeders which feed weft knitting yarns to optional or desired transversely divided portions of optional distance in desired optional courses. Owing to the provisions of said vertically movable yarn feeders, there may be produced not only conventional weft knitted constructions or fabrics such as plain stitch, rib stitch, cardigan stitch or the like and RAHLEN stitch, milano rib or the like, but also various knitted constructions or fabrics having constructions similar to warp knitted ones and variously combined constructions of such knitted constructions.

3,733,857

# HOLDING DEVICE FOR THE INSTRUMENTALITIES OF AN AUTOMATIC WARP KNITTING MACHINE

Karl Kohl, Chlorodontstrasse 10, 6053 Obertshausen, Germany

Continuation-in-part of Ser. No. 857,529, Sept. 12, 1969, abandoned. This application May 4, 1971, Ser. No. 140,063

Claims priority, application Germany, Sept. 12, 1968, P 17 85 341.7; Mar. 13, 1971, P 21 12 122.2

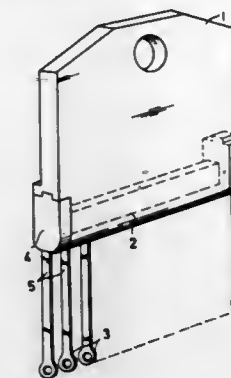
Int. Cl. D04b 27/02, 27/06

U.S. Cl. 66-86 R

6 Claims

A holding device for an automatic warp knitting machine, in which a plurality of knitting needles or needle-like instrumen-

talities, such as yarn guides, are held in rigid alignment. The device includes an anchor bar in which one end of each needle is embedded. Advantageously, the bar is made of lead, or similar alloy, and is itself embedded in a plastic plate which,



together with the anchor bar and the needles, forms the entire assembly. The ends of the anchor bar are formed into flanges which inhibit dimensional changes in the plastic, thereby maintaining the alignment of the needles.

3,733,858

# FEED SYSTEM OF A RESILIENTLY ELONGATED YARN IN A HOSIERY MACHINE AND ESPECIALLY IN A STOCKING MACHINE

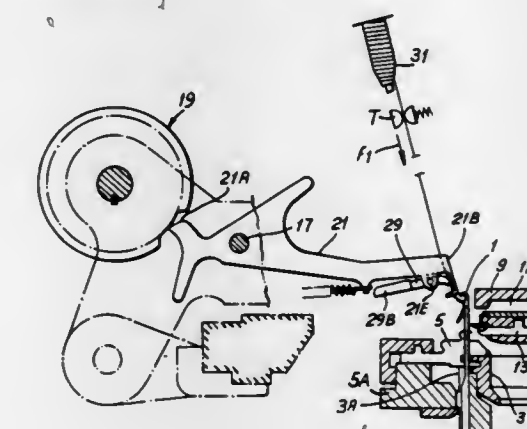
Mario Gasparri, Firenze, Italy, assignor to G. Billi & Co. S.p.A., Florence, Italy

Filed Aug. 11, 1970, Ser. No. 62,986

Int. Cl. D04b 15/54

U.S. Cl. 66-140 R

5 Claims



A yarn guide provided with a rocking lever for the feeding of yarn, in stretched condition, to circular knitting machines, the guide and the lever having opposed surfaces which permit free passage of the yarn therebetween when the yarn is being fed to the machine and which press upon and clamp the yarn therebetween when feeding of the yarn is discontinued.

3,733,859

# WARP KNIT ELASTIC FABRIC

Christoph J. Wittmann, Newton, N.J., assignor to Darlington Fabrics Corporation, New York, N.Y.

Filed Sept. 4, 1970, Ser. No. 69,761

Int. Cl. D04b 23/06

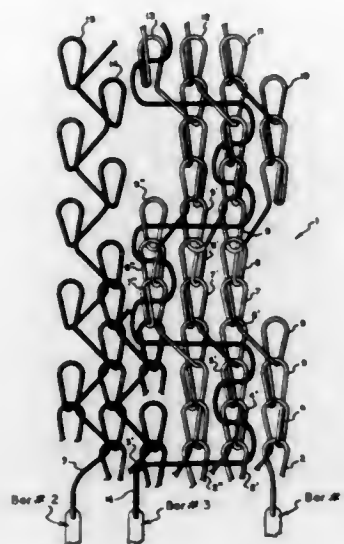
U.S. Cl. 66-193

5 Claims

An elastic warp knit fabric having two base-non-elastic yarns interlooped to form a net with one of the base yarns being knitted for a plurality of successive courses in a single wale and having in addition an elastic yarn laid in the successive courses of the base yarn and crossing over adjacent wales where it is laid in further successive courses whereby the elastic yarn may allow the fabric to stretch and contract in a plurality of directions.



Method for making an elastic warp knit fabric which may stretch and contract in a plurality of directions comprising the steps of knitting two base non-elastic yarns to form a net



where one of the base yarns is knitted into a plurality of successive courses in a single wale and laying in an elastic yarn in the successive courses and crossing the elastic yarn over adjacent wales and laying it into other successive courses.

3,733,860

## WARP KNIT FOOT COVERING

Otto Engelhard, Forest Hill, N.Y., assignor to Mark Tarnoff and Fleurette Tarnoff, Erdenheim, Pa.

Filed June 1, 1971, Ser. No. 148,593

Int. Cl. D04b 21/00

U.S. Cl. 66—195

5 Claims



A continuous connected series of warp knit foot coverings formed of an endless length of relatively narrow warp knit fabric of wales and courses having relatively short alternate sections of single wall construction knit in continuation of relatively long intervening sections of double wall construction, the double wall fabric section being U-shaped in coursewise cross-section, the single wall fabric sections being adapted to be coursewise severed midway of their walewise length thereby to produce fully formed individual foot coverings of each of the double wall fabric sections and of the severed portions of the single wall fabric sections adjacent thereto. The walewise extending edges of the double wall fabric sections are selvaged and a plurality of walewise extending elastic yarns are incorporated in each wall of the double

wall fabric sections adjacent to the edges thereof, the elastic yarns also being incorporated in the single wall fabric sections.

3,733,861

## ELECTRONIC RECOGNITION DOOR LOCK

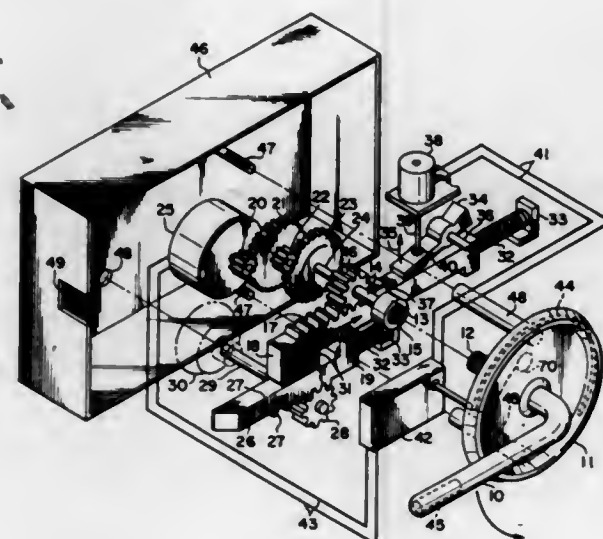
Robert W. Lester, Manhasset, N.Y., assignor to Recognition Devices, Inc., Great Neck, N.Y.

Filed Jan. 19, 1972, Ser. No. 218,948

Int. Cl. E05b 47/06

U.S. Cl. 70—153

16 Claims



An electronic, door lock controlled by a passive transponder used as a key by the person desiring to open the door. A hand-operated electric generator is coupled by a gearing system to the door handle, and generates power to operate a door lock transceiver which receives coded signals from the personal transponder to open the lock. Upon the reception of properly coded signals, a solenoid is activated to withdraw an abutment member from the path of a laterally slidable door bolt mechanism so that the door may be opened. The personal transponder may be disposed within a watch case, or have the size and shape of a conventional writing pen. The system may be radio frequency or ultrasonic.

3,733,862

## COMBINED MECHANICAL AND PHOTOELECTRIC LOCK

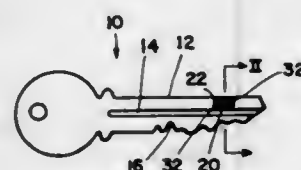
William S. Killmeyer, Youngstown, Ohio, assignor to Elsie Marie Mears; Thomas G. Welsh and Michael J. Kardas, Jr., Youngstown, Ohio, part interest to each

Filed June 22, 1971, Ser. No. 155,573

Int. Cl. E05b 47/00

U.S. Cl. 70—277

9 Claims



A combined mechanical and photoelectric lock. The mechanical lock is a conventional key operated tumbler lock. One portion of the key is provided either with a series of small holes or with an insert having a pattern of light and dark areas. A light beam is directed through the holes or the insert and is focused by an optical system on a photodetector which determines whether the projected pattern is valid or invalid.

3,733,863

## LOCK CYLINDER MECHANISM

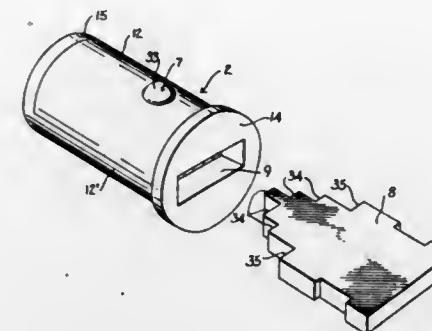
Edwin F. Toepfer, 1119-B S. 16th St., Milwaukee, Wis.

Filed Sept. 27, 1971, Ser. No. 183,801

Int. Cl. E05b 19/18, 27/08

U.S. Cl. 70—363

13 Claims U.S. Cl. 70—370



In an elongated rectangular cavity in a cylindrical body, elongated tumblers, in a row across the cavity, are lengthwise slidable parallel to the body axis. Each has longitudinal edges engaging opposite cavity walls, one edge having one notch therein, the other several, lengthwise spaced. Across each of said walls a groove-like recess extends in which the tumblers, when out of unlocking positions, confine a bar. In their unlocking positions the tumblers' notches align to define grooves facing into said recesses and in which the bars are receivable. Balls guided in radial bores in the body engage the medial portions of the bars to be held projected by them when the bars are confined in said recesses.

3,733,864

## ANTI-PICK TUMBLER LOCK DEVICE

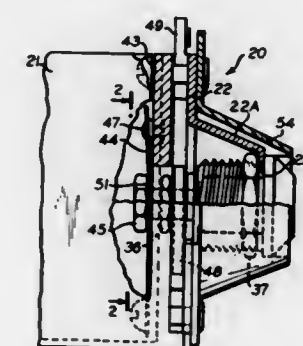
Harry Greenwald, Whitestone, N.Y., assignor to Walter Kilde & Company, Inc., Clifton, N.J.

Filed Apr. 14, 1971, Ser. No. 133,831

Int. Cl. E05b 27/10

U.S. Cl. 70—363

11 Claims



This disclosure is directed to a tumbler lock having relatively movable lock members and associated locking pins or tumblers which are required to be displaced a predetermined amount to permit relative movement between the complementary locking members in which there is operatively connected to one of the relatively movable lock members a biasing member for imparting a limited biasing force on the movable lock member to resist initial movement of the movable lock member toward the open position of the lock to prohibit a would-be lock picker from setting up the lock pins and picking the lock.

3,733,865

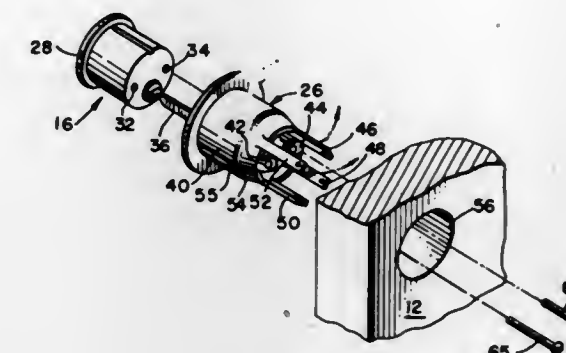
## PROTECTIVE COMPONENTS FOR LOCKS

Arthur Vorob, 18 Spring Street, Wallington, N.J.

Filed Feb. 11, 1972, Ser. No. 225,509

Int. Cl. E05b 9/08

19 Claims



A kit of interrelated protective components for safeguarding rim cylinder locks mounted in doors, such components including (1) a mounting sleeve that fits over a conventional cylinder lock as it extends through a door, (2) reinforcing plates that are seated on the inner side of the door adjacent to the deadbolt for the lock, and (3) adapter means for securing locks of different sizes snugly within the sleeve and flush with the outer side of the door. The sleeve includes an annular lip that fits against the outer side of the door, a substantially cylindrical body, bent-over tabs with apertures therein to receive the elongated mounting screws that engage similar holes in the lock to retain the lock within the sleeve; and spaced ears that are bent into engagement with the rear face of the door to securely anchor the tube thereto. One reinforcing plate has an indented portion so that the second reinforcing plate can be seated therein; both plates have central apertures that enable the tongue of the cylinder lock to pass freely therethrough and screw holes to accommodate the pair of elongated mounting screws that hold the lock in position within the sleeve. The adapter means comprise an annular ring, a shim and a wedge that is forced into the ring to secure same to the body of the cylinder lock; such components enable locks having different sized front lips to be secured within the body of the mounting sleeve.

3,733,866

## METHOD OF CONTROLLING A CONTINUOUS HOT ROLLING MILL

Tobru Arimura; Masaru Okado, both of Kawasaki; Yuji Fukuma, and Yoshimitsu Ido, both of Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Chiyoda-ku, Tokyo, Japan

Filed June 9, 1971, Ser. No. 151,350

Claims priority, application Japan, June 18, 1970, 45/52579 Int. Cl. B21b 37/00

U.S. Cl. 72—6

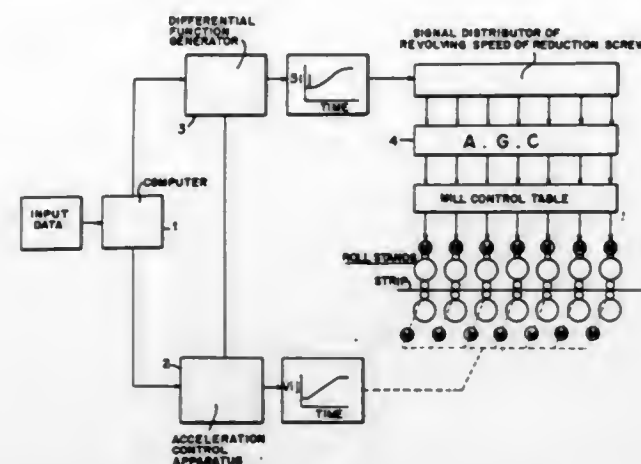
5 Claims

In a method of controlling a continuous hot rolling mill including a plurality of mill stands during acceleration thereof, variations in the screw down pressure (i.e., rolling load), in the speed of the material on the delivery side and in the thickness of the oil film of the back-up roll bearing of each mill stand at the time of acceleration, are anticipated, the width of the finished plates, types and compositions of the materials being rolled, plate gauges on the entrance side, pass speeds of the plates, the instants at which the accelerations are initiated, and accelerations are classified into a plurality of groups, an acceleration controlling schedule for each group that satisfies a relation that the product of the volume and speed of the material is constant is computed by an electronic computer as-



sociated with the rolling mill, and the roll gap and roll peripheral speed are controlled in accordance with the

The selectivity is accomplished by providing for controlled movement of particular forming rolls into and out of a forming



schedule for each mill stand so as to maintain the tension of the material between adjoining stands at a constant value.

### 3,733,867 THREAD ROLLING MACHINE

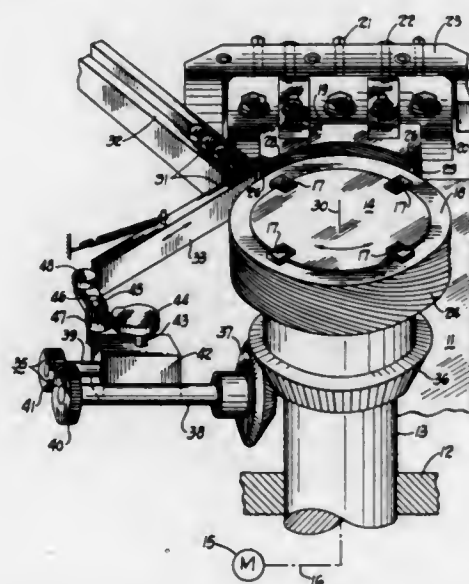
Edward A. Prutton, Parma Heights, Ohio, assignor to Prutton Corporation, Cleveland, Ohio

Filed Feb. 14, 1972, Ser. No. 225,849

Int. Cl. B21h 3/04

U.S. Cl. 72-93

19 Claims



A thread rolling machine is disclosed wherein a rotary die has multiple starts of a thread form and workpieces are fed in synchronism so that the starting points of threads on successive workpieces gradually moves around the periphery of the die. By this means all of the thread starts are used in a sequence so that just a few are not subjected to this starting of threading. By this means die life is materially extended. The above description is merely one form of the invention and is not to be construed as limiting on the scope of the invention.

### 3,733,868 METHOD AND APPARATUS FOR FORMING SHEET MATERIAL

Roger A. Welty, Swisher, Iowa, assignor to Welty-Way Products, Inc., Cedar Rapids, Iowa

Filed Feb. 16, 1972, Ser. No. 226,696

Int. Cl. B21d 5/08

U.S. Cl. 72-181

12 Claims

A method of roll forming sheet material so that only selected portions along an edge of the sheet will be formed.

Improved bridling attachment for a rolling mill generally comprised of an underslung and movable carriage with its upper and lower portions respectively disposed above and beneath a lower series of bridge rolls and with the upper carriage portions connected to an upper series of bridge rolls whereby upon advancement of the underslung carriage the upper bridge rolls can be moved relative to the lower bridge rolls for selectively tensioning a fed length of sheet therebetween without injury to the fed sheet and/or attachment such as excessive stretching of the sheet or scratching of a bridge roll.

position in such a way that the movement does not interfere with the continuous travel of the sheet through the machine.

### 3,733,869 BRIDLING ATTACHMENT FOR A ROLLING MILL

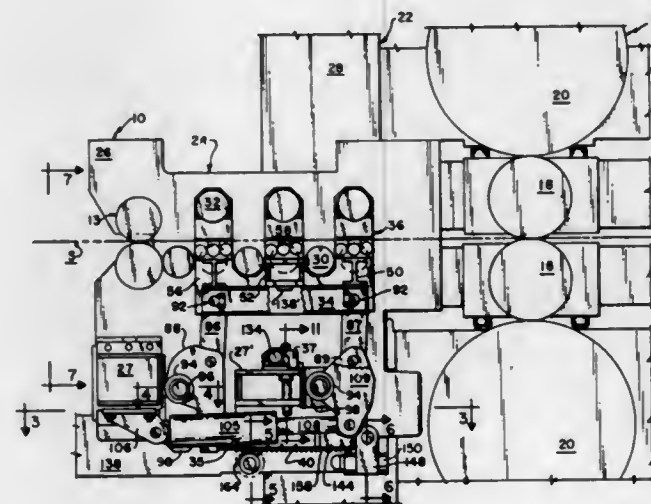
Albert H. Elgert, Walnut Creek, and Lee D. Harmes, Castro Valley, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Jan. 31, 1972, Ser. No. 222,166

Int. Cl. B21b 39/08

U.S. Cl. 72-205

14 Claims



### 3,733,870 ROLLING MILL EMPLOYING NON-VARIABLE PRESTRESSING

Lucien Diolot, Neuilly, France, assignor to Societe Nouvelle Spidem, Paris, France

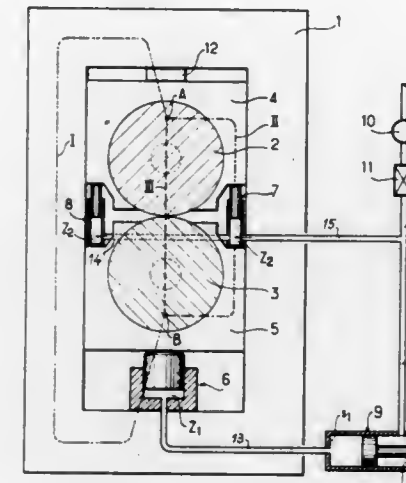
Filed Oct. 28, 1971, Ser. No. 193,355

Claims priority, application France, Oct. 28, 1970, 7038962

Int. Cl. B21b 31/32

U.S. Cl. 72-245

5 Claims



In a rolling mill in each upright there is provided a first hydraulic jack forming part of a hydromechanical clamping system and a pair of second hydraulic jacks forming part of a prestressing device. One side of a cylinder of a plunger piston jack also forming part of the hydromechanical clamping system communicates with the pressure chamber of the first hydraulic jack, while the other side of said cylinder is in continuous communication with the pressure chambers of the second hydraulic jacks associated with the same upright.

### 3,733,871 METHOD OF EJECTING PLUG FOR ROLLING MILL AND AN APPARATUS THEREFOR

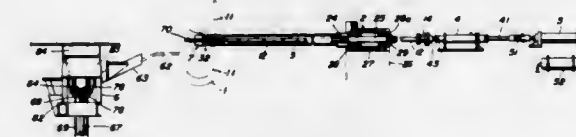
Hiroshi Nagai, Kawasaki; Masatoshi Shirohama; Kenichi Matsumoto, and Haruo Kamimura, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1971, Ser. No. 137,143

Int. Cl. B21b 17/10

U.S. Cl. 72-209

18 Claims



The invention is to pneumatically eject a plug on the end of mandrel after completing steel rolling, thereby to improve the plug treating operation.

### 3,733,872 ROLLER BENDER FOR OFFSET PRINTING PLATES

Clyde G. Gregoire, 4N194 Briar Ln., Bensenville, Ill.

Filed July 15, 1971, Ser. No. 162,988

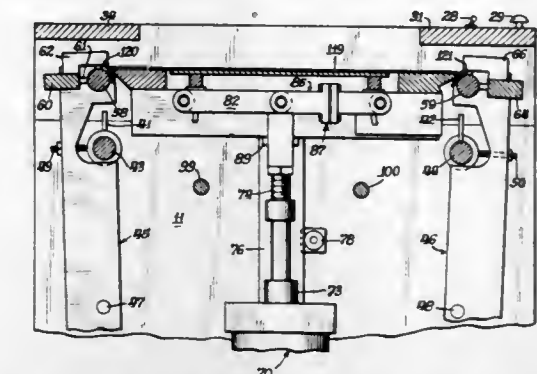
Int. Cl. B21d 9/08

U.S. Cl. 72-213

6 Claims

A bending machine for offset printing plates. The bender includes a table support for the plate to be bent. The table is

provided with end edges having contours identical to the desired contours of the end edges of the plate after bending.



Spring biased rollers are employed to bend the end edges of the plate around the contoured ends of the table support.

### 3,733,873 METHOD OF AND APPARATUS FOR COMPRESSION FORGING OF COMPONENTS

Ernst Ballmer, Basel, Switzerland, assignor to F.B. Hatebur AG, Basel, Switzerland

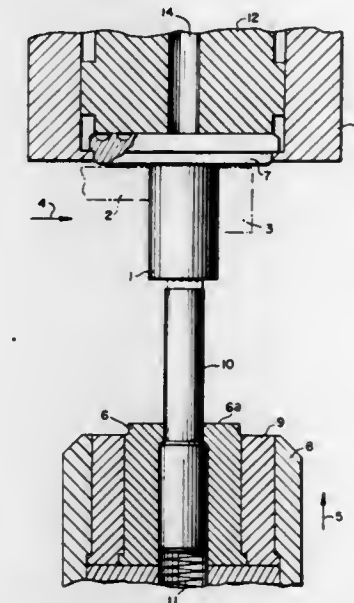
Filed June 3, 1971, Ser. No. 149,743

Claims priority, application Germany, June 5, 1971, P 20 27 692.0

Int. Cl. B21d 28/00, 37/16

U.S. Cl. 72-332

11 Claims



A method of, and apparatus for, compression forging of components in which a bar section is pre-shaped by upsetting in a direction along its axis. The pre-shaped bar section is then supported by its ends between a pair of die faces and is deformed to a shape close to its final shape by transverse flow pressing. The shaped bar section is then ejected from the dies and is transferred to means for removing burrs from the bar section. Preferably at least one of the die faces is sprayed with a cooling fluid after the shaped bar section is ejected.

### 3,733,874 WIRE MILL IN BLOCK FORM

Karl Heinz Spiecker, Duisburg, Germany, assignor to Demag AG, Duisburg, Germany

Filed June 3, 1971, Ser. No. 149,632

Claims priority, application Germany, June 30, 1970, P 20 32 294.5

Int. Cl. B21b 13/12

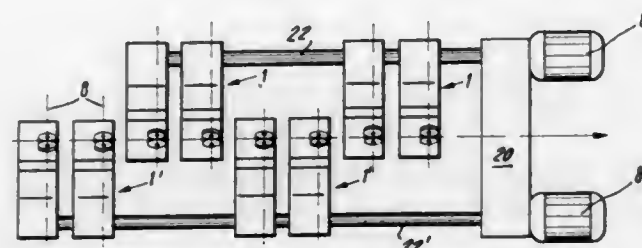
Several substantially identical rolling heads or stands are arranged in series along a wire rolling line with each head having

U.S. Cl. 72-235

6 Claims



a driving unit carrying a pair of rotatable rolling disks cooperable with each other to exert a rolling force on the wire, the axes of rotation of the disks of each pair extending parallel to each other at an angle of 45° to the horizontal. The disk axes of one set of rolling heads extend at 90° to those of the other set of rolling heads relative to a transverse plane through the rolling line. The respective pairs of disk axes of at least two rolling heads immediately succeeding each other along the



rolling line extend parallel to each other, and these two or more rolling heads are followed by rolling heads having the respective pairs of disk axes extending at right angles to those of the at least two rolling heads. The rolling heads of each set may be driven by a respective driving shaft and the two driving shafts may be driven by associated motors operated in synchronism with each other or otherwise coupled to operate synchronously. Each driving shaft is connected to the driving unit of each head or stand of the associated set.

### 3,733,875 WORK ROLL SENSING AND/OR BALANCING ARRANGEMENTS

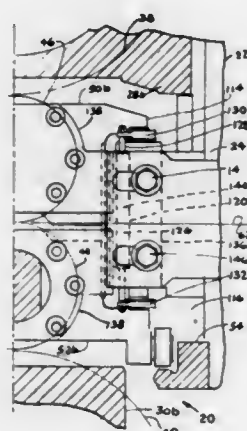
Robert G. Stelmer, West Mifflin, Pa., assignor to Mesta Machine Company, Homestead, Pa.

Filed July 12, 1971, Ser. No. 161,540

Int. Cl. B21b 37/00, 31/08

U.S. Cl. 72—237

20 Claims



In a rolling mill stand having housing means, window means in the housing means, and a pair of work rolls having bearing chocks for rotatably supporting the ends of the work rolls in the window means, the disclosed combination comprises at least one extension on each of the bearing chocks, position sensing means disposed generally between a pair of the work roll extensions which are respectively and spacedly disposed on a juxtaposed pair of the work roll chocks, means for removably mounting the sensing means on the mill stand, and means for bearingly and respectively engaging movable components of the sensing means with the pair of roll chock extensions for movement therewith.

### 3,733,876 MILL ROLL CHANGING ARRANGEMENT

Joseph L. Hlafcsak, Whitehall, Pa., assignor to Mesta Machine Company, Pittsburgh, Pa.

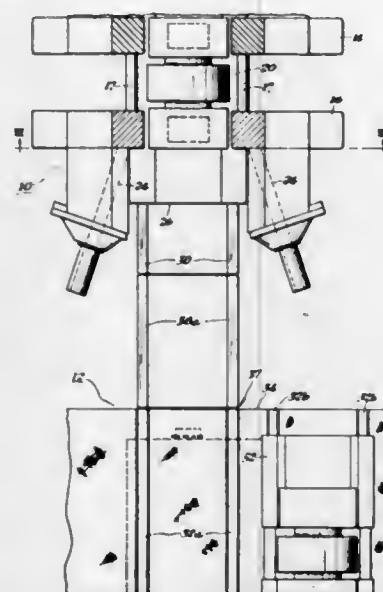
Division of Ser. No. 112,336, Feb. 3, 1971, Pat. No. 3,691,809.

This application July 7, 1972, Ser. No. 269,753

Int. Cl. B21b 31/08

U.S. Cl. 72—239

12 Claims



A quick-replaceable roll assembly for a rolling mill stand, said assembly comprising an inner carriage, rail engaging wheels rotatably mounted on said carriage, means for mounting a lower roll and a pair of bearing structures therefor on said carriage, said means comprising a number of balancing plungers reciprocally mounted on said carriage and engaging said bearing structures, and means for mounting an upper roll and bearing structures therefor on said assembly in faced engagement with said lower roll.

### 3,733,877 MILL ROLL CHANGING ARRANGEMENT

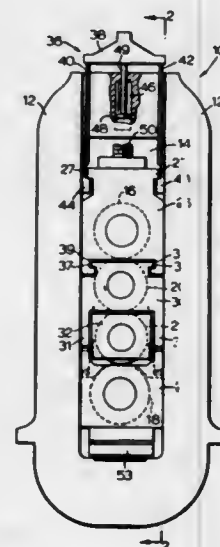
Michael Frank Field, Dollard des Ormeaux, Quebec, Canada, assignor to Dominion Engineering Works Limited, Montreal, Canada

Filed Jan. 4, 1972, Ser. No. 215,312

Int. Cl. B21b 31/08

U.S. Cl. 72—239

7 Claims



A rolling mill having a roll changing sledge is provided with latching means connecting a lower set of chocks with an upper set to permit raising of a lower roll with the upper roll, and normally disengaged load transfer posts extending between

one set of chocks and a lower set of chocks to permit transfer of the weight of the upper roll to the sledge for simplified and rapid roll changing. The load transfer posts permit the use of different sizes of working rolls, the posts being repositioned after separation of the rolls to a roll supporting position by minor axial displacement of the sledge. The arrangement is well suited to automated roll changing.

### 3,733,878 ROLL END RELIEF FOR ROLLING MILLS

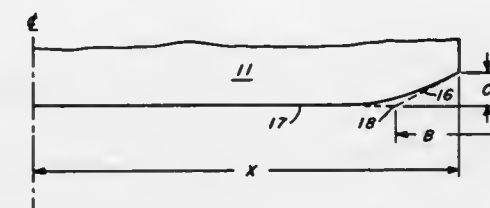
Arvid N. Anderson, and Richard H. Batterman, both of New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 20, 1971, Ser. No. 190,902

Int. Cl. B21b 27/00

U.S. Cl. 72—241

7 Claims



A roll for a rolling mill, the roll having end reliefs that reduce substantially roll end spalling and increase substantially the range of roll contour control by roll bending. The end reliefs of the roll comprise two symmetrically located, smoothly curving exponential functions extending either (1) from the center line of the roll face to the two ends of the roll, or (2) from two locations intermediate the ends of the roll and the roll face center line to the ends of the roll.

### 3,733,879 CONJUGATE CAM ARRANGEMENT AND PUNCH PRESS UTILIZING SAME

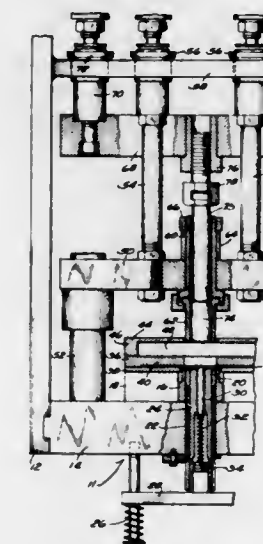
Robert F. Sellman, 9534 North 60th Street, Milwaukee, Wis.

Filed July 28, 1971, Ser. No. 166,835

Int. Cl. B21d 31/02; B21j 9/18

U.S. Cl. 72—328

13 Claims



Both the blanking punch and the forming punch (which telescopes inside the blanking punch) are reciprocally driven by separate cam assemblies. Each cam assembly includes an eccentric plate drive cam which cooperates with two plate cam followers to provide a reciprocating stroke to the punches. The two drive cams are symmetrically arranged on a common drive shaft so that the outer ends of the two punches remain substantially flush with each other during the blanking stroke and during dwell at the top of the back stroke. The forming punch drive cam has separate conjugate cam surfaces

which selectively engage the cam followers cooperating therewith. One of these cam surfaces includes a lobe which imparts the additional stroke to the forming punch required for forming the completed parts while the blanking punch is in dwell at the bottom of the forward stroke. A slot relief in the backward motion cam follower accommodates the lobe so the forming punch is permitted to dwell at the top of the backstroke.

A ceiling plate, positioned above the dies and having side walls, defines an open-ended passage through which the completed parts are expelled, preferably assisted by a stream of pressurized air introduced into the passage. While in dwell at the top of the backstroke, the outer ends of blanking and forming punches are flush with each other and with the underside of the ceiling plate. Impingement of the completed parts ejected from the die cavities is against the substantially smooth surface provided by the ceiling plate and the bottom ends of the punches thereby minimizing ricocheting of the parts.

### 3,733,880 APPARATUS FOR AND METHOD OF FACILITATING THE STRIPPING OF CANS FROM A PUNCH AND THE ARTICLE FORMED THEREBY

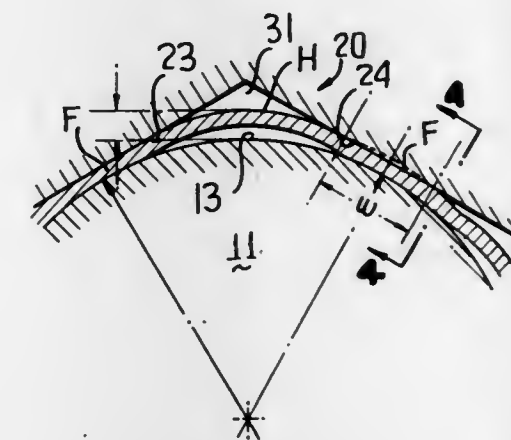
Ants Hansson, Evanston, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Dec. 15, 1971, Ser. No. 208,374

Int. Cl. B21d 45/00

U.S. Cl. 72—344

17 Claims



This disclosure relates to apparatus for and a method of facilitating the stripping of a can body or a like cup-shaped article from a wall ironing punch by applying radially directed circumferentially spaced forces against the can body exterior as it moves with the punch whereby lateral or circumferential flow of the can body material is produced along axially extending portions of the can body which increases the circumferences of the can body to facilitate the subsequent stripping thereof from the punch.

### 3,733,881 METHOD AND APPARATUS FOR MAKING DEEP DRAWN METAL SHELLS

Donald C. Grigorenko, Franklin County, Ohio, assignor to Shape Farm, Inc., Columbus, Ohio

Filed Sept. 28, 1970, Ser. No. 75,950

Int. Cl. B21d 22/24

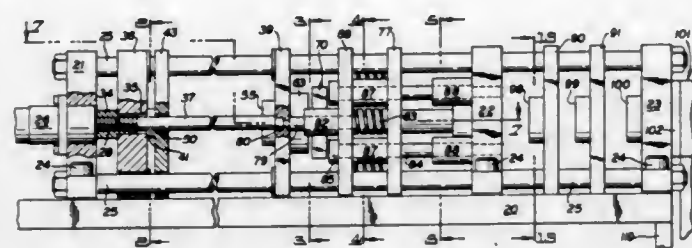
U.S. Cl. 72—349

3 Claims

A method and machine for making a comparatively deep metal shell in which a piece of sheet metal is successively cut or blanked to desired size and shape, drawn in one direction into cup shape, redrawn in the opposite direction into an elongated



gated shell, and then ironed one or more times to further elongate and decrease the wall thickness of the shell, all such steps



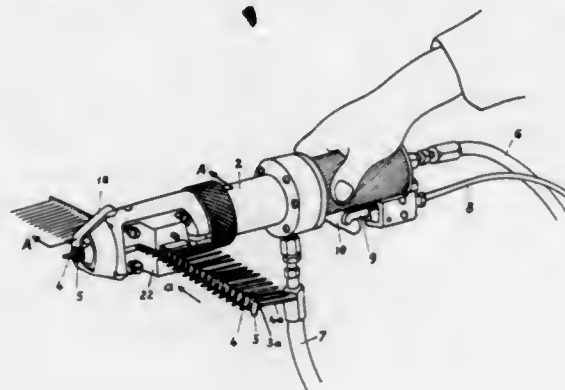
being performed by movement of the workpiece along a linear path and in a single continuous working stroke of the machine.

### 3,733,882 BLIND RIVETTING TOOL WITH AUTOMATIC LOADING MEANS

Jean-Pierre Klein, Haut-Rhin, France, assignor to Rivtac Blindnieten, A.G., Bale, Switzerland  
Filed Feb. 9, 1971, Ser. No. 113,911  
Int. Cl. B21J 15/20

U.S. Cl. 72-391

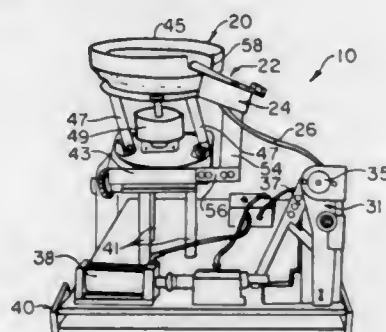
16 Claims



A blind rivetting tool having an automatic loading means. The said means includes a feed belt which carries rivets into the gun, and also carries the sheared mandrels out of the gun. The invention further includes a novel mechanism for intermittently advancing the belt through the rivetting tool.

### 3,733,883 CRIMPING APPARATUS

Leonard J. Kaczmarek, Wonderlake, Ill., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.  
Filed Feb. 8, 1971, Ser. No. 113,341  
Int. Cl. B21d 43/20; B23q 7/10  
U.S. Cl. 72-402



Crimping apparatus for feeding and crimping electrical contacts or the like of a type having a hollow sleeve portion at one end and a reduced diameter portion at the other end. The apparatus includes a crimping mechanism which indents the sleeve portion to fix it to a wire inserted therein. A reciprocable plunger moves the contact into the crimping mechanism

and is mounted within a tube having a slot therein through which a contact is dropped. A vibratory feed bowl is positioned above the plunger and supplies the contacts serially to an orienting mechanism which includes an arm pivotally mounted on a base plate to receive the contacts one-by-one from the bowl and transfers them to an orienting slot in the plate to drop the contacts with a predetermined orientation of the sleeve and pin portions of the contact into a feed tube for guiding the properly oriented contact to the slot in the plunger tube.

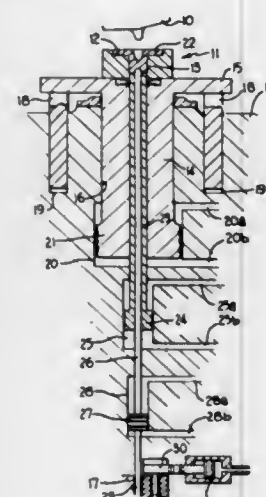
### 3,733,884 FORGING PRESSES WITH EJECTOR MEANS

John Foster, and Geoffrey Wilson, both of Denton, Manchester, England, assignors to B. & S. Massey Limited, Manchester, England  
Filed July 1, 1970, Ser. No. 51,536  
Claims priority, application Great Britain, July 3, 1969, 33,510/69

U.S. Cl. 72-429

Int. Cl. B21J 9/12

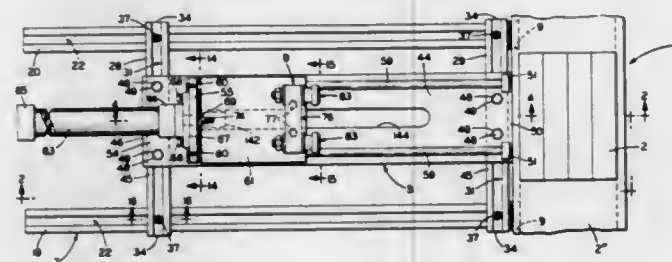
14 Claims



An upsetting or forging machine having at least one pair of relatively movable dies, one of which is arranged to carry out a circular rocking motion about a point related to the center of one of the dies of the die set, the other die including at least one linearly movable element in order that the die can be moved towards or away from the rockable die, there being a ram means associated with the linearly movable die in order that a workpiece after upsetting or forging can be ejected from the die set.

### 3,733,885 AUTOMATIC PRESS BRAKE BACK GAUGE

Edwin Henry Brauer, 3876 Silsby, Cleveland, Ohio  
Filed Apr. 19, 1971, Ser. No. 138,459  
Int. Cl. B21d 11/22  
U.S. Cl. 72-461



A back gauge for a press brake having a stop assembly controlled by an indexing roller. The stop assembly is positioned adjacent a press brake die and punch by a pneumatic cylinder actuated in response to the position of the press brake ram.

The indexing roller controls the positioning of the stop member at pre-selected distances from the press brake die to control the position of a work piece on the press brake die.

### 3,733,886 TOOTHED TOOL FOR WORKING OF GEARS

Herbert Loos, Munich, Germany, assignor to Carl Hurth Maschinen-und Zahnradfabrik, Munich, Germany  
Filed Mar. 4, 1971, Ser. No. 120,991  
Claims priority, application Germany, Mar. 7, 1970, P 20 10 963.1

U.S. Cl. 72-469

Int. Cl. B21d 17/00

4 Claims



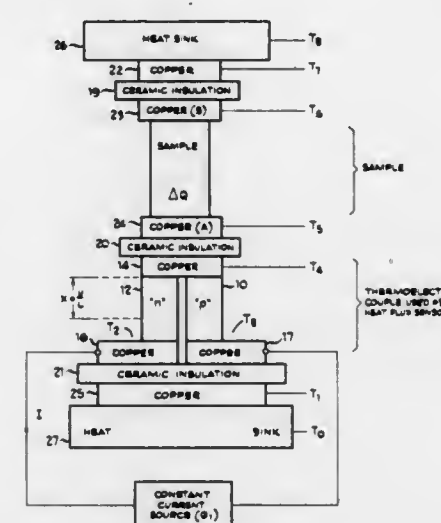
A toothed tool for the roll-working of toothed workpieces. There is provided a toothed tool having spaced serrations along the length of a tooth, said serrations extending from the dedendum to the addendum of the tool teeth whereby said serrations define a plurality of spaced ribs on the tool teeth. Said serrations are arranged in such a manner that the ribs are offset on one tooth with respect to the corresponding ribs on an adjacent tooth. The relative width and spacing of the serrations and ribs are such that the sum of widths of the ribs on one tooth flank is equal to the sum of the width of ribs on all, or at least most, of the other tool flanks facing in the same direction.

### 3,733,887 METHOD AND APPARATUS FOR MEASURING THE THERMAL CONDUCTIVITY AND THERMO-ELECTRIC PROPERTIES OF SOLID MATERIALS

Marland L. Stanley, Idaho Falls, Idaho, and Allen D. Reich, Des Plaines, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.  
Filed Jan. 31, 1972, Ser. No. 222,265  
Int. Cl. G01n 25/18

U.S. Cl. 73-15 A

4 Claims



A method and apparatus for measuring the thermal conductivity, surface heat transfer coefficients and the thermo-electric power of materials, involving the employment of the Peltier effect to establish the temperature difference across, while simultaneously measuring the rate of heat flow through the investigated sample material.

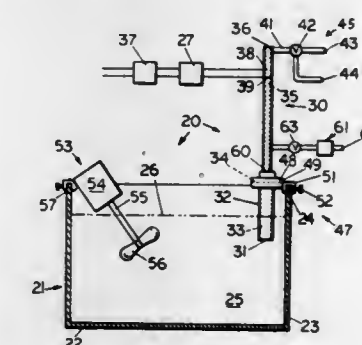
A predetermined current is applied to a thermoelectric couple sensor to produce a temperature difference across the thermoelectric couple sensor by controlling the temperature of the cold junction of the sensor. The thermal conducting body is engaged with the cold junction of the sensor. The current is then adjusted by a predetermined amount to re-establish the temperature differential. By measuring the change in the current required to restore the temperature differential, the thermal conductance of the body may be determined.

### 3,733,888 FREENESS TESTING APPARATUS AND METHOD FOR OPEN CONTAINERS

Donald W. Danforth, Andover, Mass., assignor to Bolton-Emerson, Inc., Lawrence, Mass.  
Filed Apr. 28, 1971, Ser. No. 138,075  
Int. Cl. G01n 33/34

U.S. Cl. 73-63

9 Claims



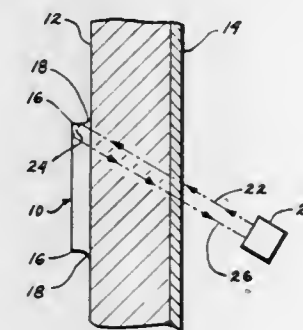
A freeness detector of the vertical stand pipe type, used on closed paper stock lines, is combined with an open vessel containing groundwood paper stock or the like with the open intake end of the freeness detector submerged, but the screen above the level of the stock. Sub-atmospheric pressure in the filtrate chamber permits atmospheric pressure to raise filtrate for testing and positive pressure blows the filtrate and mat downwardly. The apparatus preferably also includes an agitator in the stock and back flushing liquid passages in the detector.

### 3,733,889 REFERENCE MARKER FOR NONDESTRUCTIVE INSPECTION TECHNIQUES

Edward S. Proctor, Jr., Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.  
Filed Aug. 26, 1970, Ser. No. 67,152  
Int. Cl. G01n 29/00

U.S. Cl. 73-67.5

4 Claims



A reference marker for use in conjunction with volumetric inspection techniques on nuclear reactor pressure vessels. A block of material having a sharp corner geometry is provided at particular locations on the vessel structure to be inspected. The block of material then serves as a physical location reference marker and/or means for use in calibration of the volumetric inspection device.







to define a direct-current amplifier whose base current is substantially constant, but whose collector current varies as a function of the heat extracted from the transistor by the fluid, thereby producing a corresponding output signal.

3,733,898

## FLOW CONDITIONING APPARATUS

Hiroshi Yamamoto, Kanagawa; Kunitaru Okuda, Machida, and Hiroaki Nomoto, Koganei, all of Japan, assignors to Oval Engineering Co., Ltd., Tokyo, Japan

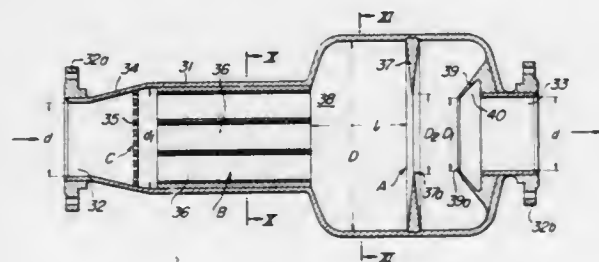
Filed Apr. 19, 1971, Ser. No. 135,018

Claims priority, application Japan, June 5, 1970, 45/48188; Sept. 26, 1970, 45/83896; Nov. 24, 1970, 45/105245

Int. Cl. G01p 5/14

U.S. Cl. 73-198

8 Claims



A flow conditioning apparatus is connected to the inlet of a flow meter in a conduit system for conditioning the flow of a fluid supplied to the flow meter for the purpose of measurement of the flow rate. The apparatus comprises a device for uniformizing the velocity distribution of fluid flow, and this device is combined with a vortex regulator and a flow straightener for more effectively conditioning the fluid flow.

3,733,899

## DEVICE FOR MEASURING THE FLOW RATE OF A LIQUID

Michel Joseph Auphan, Courbevoie, and Jean Robert Perilhous, Bourg-la-Reine, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

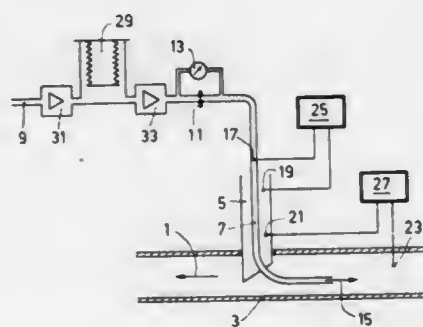
Filed May 17, 1971, Ser. No. 144,008

Claims priority, application France, May 25, 1970, 7018962

Int. Cl. A61b 5/02; G01p 5/10

U.S. Cl. 73-204

2 Claims

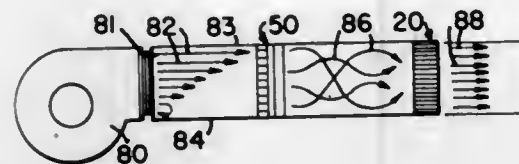


An improved device for regulating the flow of liquid through a conduit is described. The device is particularly useful in the regulation of blood flowing through a blood vessel. Unlike previous devices of this type the device described herein is readily usable on blood vessels situated well below the skin. The device comprises an injection duct for an auxiliary liquid which is mixable with the flowing liquid and thermocouples for measuring temperature differences, characterized in that the device is provided with means for the pulsating supply of the auxiliary liquid.

3,733,900  
FAN CAPACITY MEASURING STATION  
Kenneth W. De Baun, Novato, Calif., assignor to Air Monitor Corporation, Santa Rosa, Calif.  
Filed Nov. 22, 1971, Ser. No. 201,127  
Int. Cl. G01f 1/00

U.S. Cl. 73-212

5 Claims



A fan capacity measuring station wherein the fan discharge is first conditioned for accurate flow rate measurement by fixed mixing vanes that break up stratification and negative pressure pockets and by subsequent straightening means that eliminate turbulence and produce substantially laminar air flow through a measuring section of known cross-sectional area. Then in the measuring section total pressure sensors, manifolded in a traverse, average the total pressure and manifolded static pressure sensors average the static pressure. The difference between the average total and static pressure of the conditioned discharge is a direct and accurate measurement of flow rate within  $\pm 1$  percent.

3,733,901

## FLOW METERING DEVICE OF THE PRESSURE DIFFERENTIAL PRODUCING TYPE

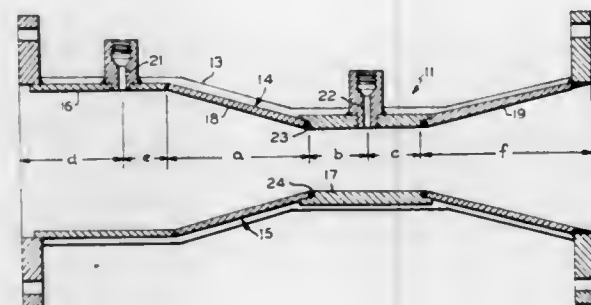
Dezsoe Halmi, Cranston, R.I., assignor to General Signal Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 144,899, May 19, 1971, abandoned. This application Aug. 9, 1972, Ser. No. 279,153

Int. Cl. G01f 1/00

U.S. Cl. 73-213

7 Claims



The disclosure concerns fluid flow metering devices of the differential pressure producing type comprising a tube of polygonal, preferably rectangular, cross section which defines a converging section which guides the fluid to a throat. The throat has a pressure tap located to sense true static pressure, and the converging section accelerates the fluid over a distance that is from approximately  $2.7 A_1 (1-B)$  to approximately  $3.1 A_1 (1-B)$ , where  $A_1$  is the cross sectional area of the inlet of the tube, and  $B$  is the ratio of the square roots of the cross sectional areas of the throat and the inlet. This flow metering device affords a discharge coefficient comparable to that of the classical or Herschel Venturi, and a "2 sigma" accuracy of  $\pm 1$  percent.

3,733,902

## MINIMUM LENGTH HIGH QUALITY DIFFERENTIAL PRESSURE PRODUCING FLOW METER

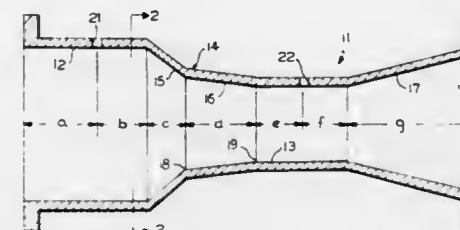
Dezsoe Halmi, Cranston, R.I., assignor to General Signal Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 144,898, May 19, 1971, abandoned. This application Aug. 9, 1972, Ser. No. 279,154

Int. Cl. G01f 1/00

U.S. Cl. 73-213

10 Claims U.S. Cl. 73-233



The disclosure concerns fluid flow metering devices of the differential pressure producing type comprising a tube which defines a throat and a converging section for guiding fluid thereto from an inlet region of larger cross section. The tube has a special converging section which accelerates the fluid at two different rates and causes it to form two vena contractas before it reaches a true static pressure tap in the throat. The tube is designed in accordance with specified dimensional relationships which provide a tube of minimum length preferably having a discharge coefficient of 0.98 and a "2 sigma" accuracy tolerance between  $\pm 0.5$  percent and  $\pm 1$  percent depending upon whether the tube has a circular or a polygonal cross section.

3,733,903

## DIFFERENTIAL PRESSURE PRODUCING FLOW METER

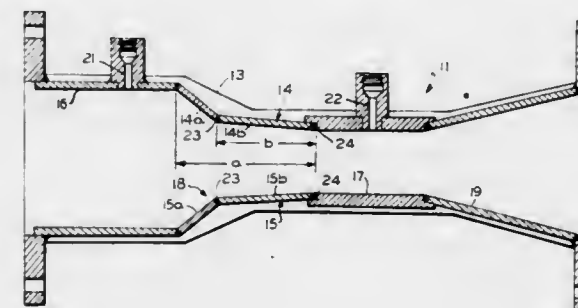
Dezsoe Halmi, Cranston, R.I., assignor to General Signal Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 144,802, May 19, 1971, abandoned. This application Aug. 9, 1972, Ser. No. 279,155

Int. Cl. G01f 1/00

U.S. Cl. 73-213

6 Claims



The disclosure concerns fluid flow metering devices of the differential pressure producing type comprising a tube of polygonal, preferably rectangular, cross section which defines a converging section which guides fluid to a throat. The converging section accelerates the fluid to throat velocity in two carefully controlled phases, each of which is terminated by the formation of a vena contracta, and the throat is equipped with a tap which senses true static pressure. The flow metering device affords a discharge coefficient on the order of 0.98 and preferably has a "2 sigma" uncalibrated accuracy of  $\pm 1$  percent.

3,733,904

## TEMPERATURE COMPENSATED GAS METER REGISTER

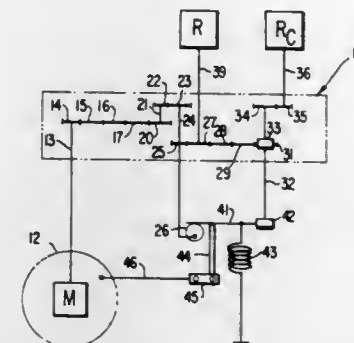
Joseph A. Bonner, Pittsburgh, and Howard J. Evans, New Kensington, both of Pa., assignors to Rockwell Manufacturing Company, Pittsburgh, Pa.

Filed Jan. 4, 1971, Ser. No. 103,365

Int. Cl. G01f 3/00; F01f 15/04

U.S. Cl. 73-233

9 Claims



A gas meter assembly wherein a positive displacement meter disposed in a conduit through which flows gas to be measured is connected through a gear transmission unit to drive both corrected and uncorrected volume indicating registers, the unit comprising an initial gear train common to the drive to both registers, a first branch gear train connecting the initial gear train to the uncorrected register, a second branch gear train connecting the initial gear train to a shaft in the drive to the corrected register and a cam actuated unidirectional clutch connected to impart additive rotation to that shaft in accord with the gas temperature in the conduit, for continually automatically modifying the drive to said corrected register to correct the indicated volume to a predetermined base temperature.

3,733,905

## CHEMICAL THERMOMETER AND HOLDER

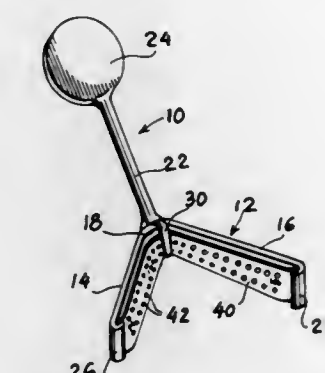
Norman C. Bremer, 608 East Seneca Street, Ithaca, N.Y.

Filed Sept. 2, 1971, Ser. No. 177,396

Int. Cl. G01k 1/12, 1/14

U.S. Cl. 73-356

6 Claims



A thermometer incorporating on a flexible and disposable substrate a plurality of spaced temperature-sensitive chemicals which are calibrated to indicate a temperature in the clinical range. The substrate is secured by a holder having a bifurcated mouthpiece and a handle extending from the mouthpiece. The bifurcated mouthpiece is generally V- or U-shaped so as to fit beneath a patient's tongue while carrying the substrate. The temperature-sensing chemicals on the substrate are activated and the holder and substrate are withdrawn for temperature reading. The substrate is disposed and a new one placed in the holder. It is a feature of the invention that there be a minimum surface area contact between the holder and the substrate to minimize heat exchange between them.



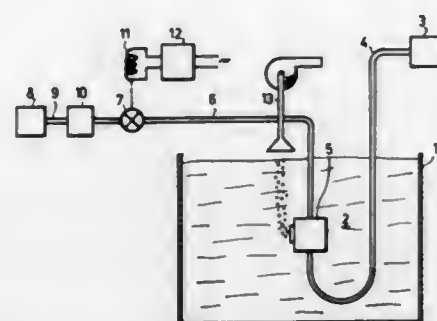
**3,733,906**  
**METHOD AND APPARATUS FOR THE CONTINUOUS WITHDRAWAL OF SAMPLES FROM INDUSTRIAL PROCESS BATHS OR THE LIKE FOR ANALYSIS**  
 Robert W. Barnhardt, Concord, and William J. Grubbs, Charlotte, both of N.C., assignors to Zellweger AG, Uster, Switzerland

Filed Nov. 23, 1970, Ser. No. 91,983

Int. Cl. G01n 1/14

U.S. Cl. 73-421 B

8 Claims



A method and apparatus is disclosed for drawing a filtered sample from a solution or bath, especially an industrial process bath, for continuous or continual analysis. This invention involves periodically blowing a suitable pressurized fluid medium compatible with the bath, that is one which does not affect the sampling process, typically air, although other media can be employed, into the sampling bath on the downstream side of a filter. Backwash of the filter with air initially forces the clean filtered sample back through the filter, then such pressurized fluid medium itself is forced back through the filter for a brief time, after which the flow of such fluid medium is stopped, allowing normal liquid filter flow to resume.

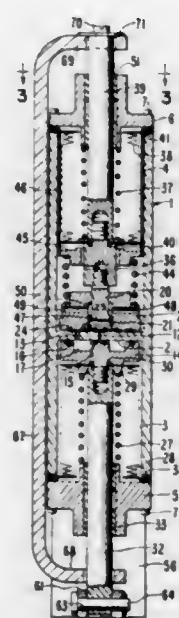
**3,733,907**  
**VALVE STRUCTURE FOR COLLECTING MULTIPLE SAMPLES**  
 Walton Ellis Briggs, Lynnfield, Mass., assignor to Varian Associates, Palo Alto, Calif.

Filed Jan. 24, 1972, Ser. No. 220,123

Int. Cl. G01n 1/22

U.S. Cl. 73-421.5 R

9 Claims



A valve structure for collecting multiple samples of a fluid comprises a housing forming an inlet chamber and an outlet chamber separated by a valve seat partition between the chambers. The partition has a first central passage therethrough and a second passage therethrough radially out-

ward of the first passage. A valve is located in the inlet chamber and seats against the partition to close one side of each of said passages. In the outlet chamber a first valve seats against the partition to close the other end of said center passage. A third valve is located in said outlet chamber to seat against said partition and close the other end of said outward passage. The first valve has an annular recess in its face which communicates with said outward passage and together with said outward passage forms a large sample collecting volume. The center passage forms a small sample collecting volume. Means are provided for opening and then closing the first valve to fill both of said sample collecting volumes with sample gas while the second and third valves are closed. The operating structure then provides for opening the second valve to release the small sample collecting volume for transmission to a leak detector. If the small volume does not contain enough leak gas to register on the leak detector, the third valve is opened to release the large sample collecting volume to the leak detector.

**3,733,908**  
**SAMPLING VALVE AND COMPOUND DETECTION SYSTEM**

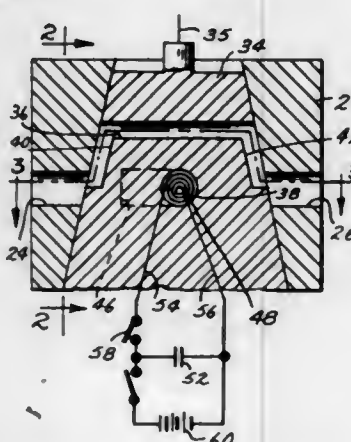
Amos Linenberg, Rehovot, Israel, assignor to Hydronautics-Israel Ltd., Rehovot, Israel

Continuation-in-part of Ser. No. 62,215, Aug. 19, 1970, Pat. No. 3,675,466. This application Apr. 28, 1971, Ser. No. 138,267

Int. Cl. G01n 1/22

U.S. Cl. 73-422 GC

9 Claims



A sampling valve is provided for use with a chromatographic column or any other appropriate detection device for use in the detection of compounds in an ambient medium, such as air. The valve includes a housing having a plurality of apertures therein for respective communication with at least a carrier medium, the ambient medium and the detection device. A movable valve body is mounted within the housing and is provided with a plurality of apertures for selective communication with predetermined ones of the housing apertures. A platinum wire or other absorbing means is retained within a predetermined one of the valve body apertures and is selectively exposed to the ambient medium. The valve body is then moved and the platinum wire is heated to desorb the compounds in the presence of the carrier medium, such as helium, and the carrier medium, together with the compounds, are passed through the detection device to enable detection of the presence of the compounds.

**3,733,909**  
**APPARATUS FOR INJECTING A SAMPLE INTO A GAS CHROMATOGRAPH**

Jury Nikolaevich Golovistikov, Bolshoi Kondratievsky pereulok, 10, kv. 52, Moscow, U.S.S.R.

Filed Mar. 10, 1972, Ser. No. 233,524

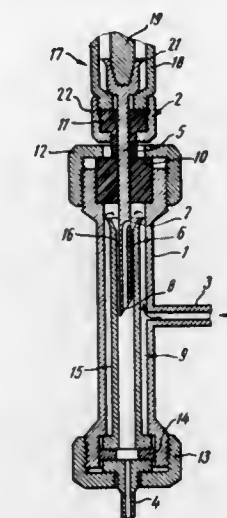
Int. Cl. G01n 1/28

U.S. Cl. 73-422 GC

8 Claims

An apparatus for injecting a sample into a gas chromatograph, has a sample evaporation chamber, wherein there is

reciprocally received a sample-injecting pipette in the form of a needle with an internal longitudinal capillary passage for accommodation of a sample, having an inlet and an outlet. The inlet of the passage is made through the external side wall of the needle. The sample evaporation chamber is hermetically sealed from the ambient atmosphere with the help of sealing means; it communicates with the supply source of the carrier gas of the gas chromatograph and with the chromatographic



column of this chromatograph. The sample evaporation chamber incorporates a member for guiding the carrier gas into the capillary passage of the needle. The sealing means includes a septum made of an elastic material and a sleeve. The septum is received at an end portion of the sample evaporation chamber, where the needle is introduced, whereas the sleeve envelopes the external surface of the needle. The needle is made of a material which can pierce the septum, as a sample is being injected into the sample evaporation chamber.

**3,733,910**  
**TURBINE METER ASSEMBLY**  
 Howard J. Evans, Kensington, Pa.; Joseph P. Lofink, Lancaster, Ohio, and Joseph A. Bonner, Pittsburgh, Pa., assignors to Rockwell Manufacturing Company, Pittsburgh, Pa.

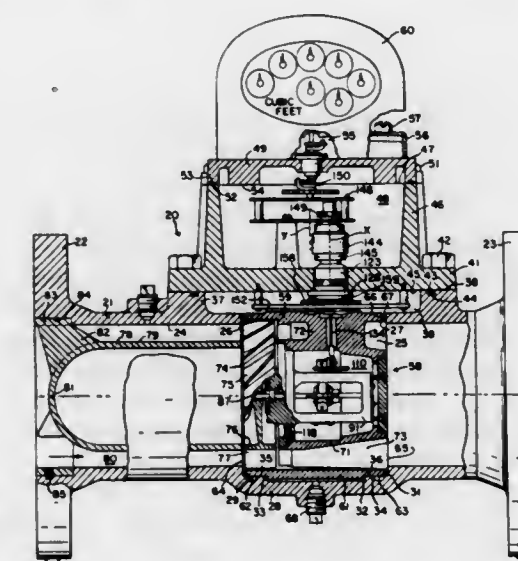
Continuation of Ser. No. 838,890, July 3, 1969, abandoned.

This application July 14, 1971, Ser. No. 162,639

Int. Cl. G01f 3/00

U.S. Cl. 73-231 R

19 Claims



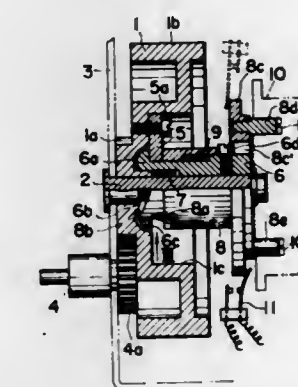
A turbine meter has a measuring chamber assembly complete with rotor and a magnetic drive train to an external register mounted on a detachable cover plate mounted over a side opening in a hollow-meter body. The measuring chamber assembly has a special slide guide fit and internal seating on

**ERRATUM**  
 For Class 73-23 see:  
 Patent No. 3,734,489

**3,733,911**  
**TIME SWITCH APPARATUS**  
 Yasuhisa Matsuda, Mitaka-shi, Tokyo, Japan, assignor to Kabushiki Kaisha Kōparu, Tokyo-To, Japan  
 Filed Oct. 28, 1971, Ser. No. 193,292  
 Claims priority, application Japan, Nov. 4, 1970, 45/109416  
 Int. Cl. G05g 21/00

U.S. Cl. 74-3.52

4 Claims



A time switch apparatus wherein the switch can positively and instantaneously perform changeover action twice in succession at small intervals of time therebetween, exactly at a pre-set time with no relevance to either the vibration applied thereto externally or to the site where this apparatus is placed, by the arrangement comprising a time-setting ring having a lug and being rotatably mounted on a stationary shaft, a charge cam cylinder rotatably as well as thrustwardly slidably mounted on the stationary shaft and having a flange portion slidably contacting the lug and also having a cam portion and a recessed portion which are both formed on the flange portion, and a switch-actuating member mounted on the charge cam cylinder for sliding movement permitted only in the direction of thrust and operatively coupled to a clock mechanism and having an end face portion designed so as to slidably receive therebetween the lug in cooperation with the flange portion and also having a recessed portion formed on the end face portion and a switch-actuating portion.

**3,733,912**  
**TRANSMISSION FOR FARM TRACTOR**  
 Yoshinobu Murayama; Tadashi Morimoto; Mikio Kinoshita, and Isamu Yamanishi, all of Sakai-shi, Osaka, Japan, assignors to Kubotekko Kabushikigisha, Osaka, Japan  
 Filed May 24, 1971, Ser. No. 146,149

Claims priority, application Japan, May 25, 1970, 45/51690; May 25, 1970, 45/51691

Int. Cl. F16h 37/06, 3/08

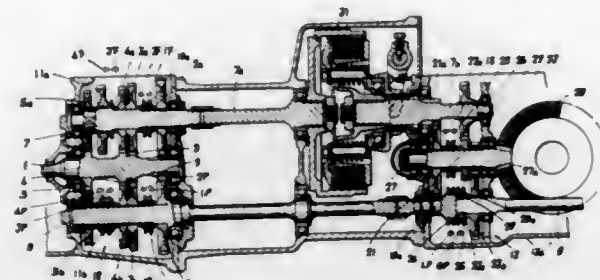
U.S. Cl. 74-15.4

4 Claims

A transmission comprising a primary speed change mechanism including a main shaft provided with a plurality of gears for power transmission, an upper counter shaft and a lower counter shaft disposed in parallel on the opposite sides of the main shaft, the upper counter shaft being provided with a group of speed change gears for running the tractor, the lower counter shaft being equipped with a group of speed



change gears for power takeoff. The upper counter shaft is coupled with a secondary speed change mechanism including a bevel pinion shaft which is provided with gears in meshing engagement with gears on the extension of the upper counter shaft and a bevel pinion meshing with a bevel gear. The lower



counter shaft also extends in parallel relation to the upper counter shaft and is coupled with a power takeoff shaft so as to provide live power takeoff independent of the speed of the tractor and ground power takeoff in synchronism with the speed of the tractor.

3,733,913

### WINDSHIELD WIPER ASSEMBLY FOR VEHICLES, PARTICULARLY FOR MOTOR VEHICLES

Theodor Schneider, 30 Seestr., 7121 Freudental; Willy Bock, 16 Erwin-Balz Str., and Karl-Friedrich Schubert, 10 Friedrich-Naumann-Str., both of 712 Bietigheim, all of Germany

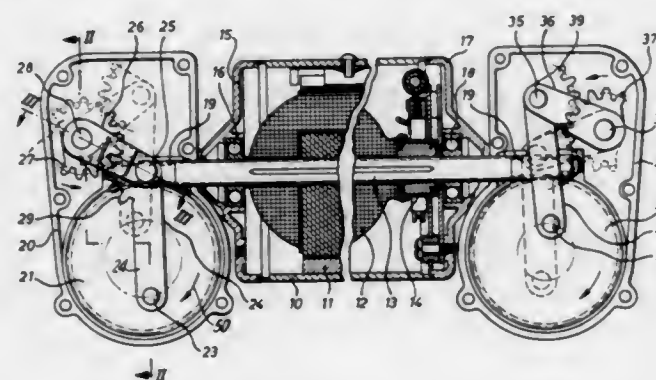
Filed Aug. 26, 1971, Ser. No. 175,140

Claims priority, application Germany, Oct. 3, 1970, P 20 48 717.6

Int. Cl. F16h 21/40

U.S. Cl. 74-78

15 Claims



A windshield wiper assembly includes a central casing or housing for a rotary electric motor with the rotor mounted around the shaft which extends outwardly and is supported on a roller bearing at each end of the housing. The portion of the shaft which extends outwardly on each end carries a worm which engages with a quadrant gear of an oscillating drive mechanism. The oscillating drive mechanism is contained in the housing at each end of the central casing, the housing also forms a bearing support for the windshield wiper blades and which carries the oscillatable drive mechanism which is connected to the bearing support to oscillate the windshield wipers.

3,733,914

### MOTION CONVERSION MEANS

John M. Sheesley, Houston, Tex., assignor to Research Engineering Company, Houston, Tex.

Filed June 1, 1971, Ser. No. 148,603

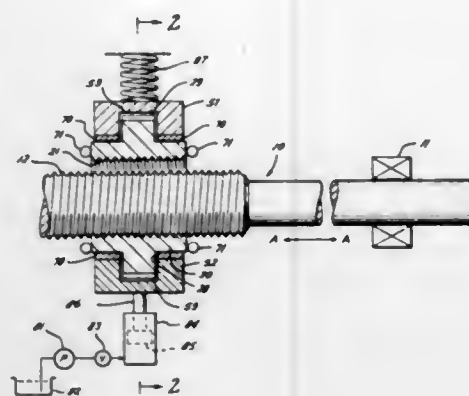
Int. Cl. F16h 27/02

U.S. Cl. 74-89.15

9 Claims

A device for converting rotary motion of one member into linear motion of a further member. Rotating member, such as

a spur gear rotates an intermediate, internally and externally toothed or threaded nut. The internal threads may be caused



to engage or disengage the external threads on a linearly moveable rod member, causing such linear motion thereof.

3,733,915

### CONCEALED WINDSHIELD WIPER SYSTEM

Dionysios D. Papadatos, Kenmore; Raymond A. Delbel, West Falls, and William C. Riester, Williamsville, all of N.Y., assignors to Trico Products Corporation, Buffalo, N.Y.

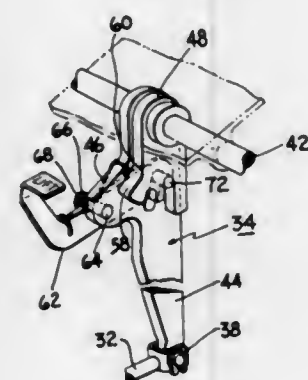
Division of Ser. No. 12,627, Feb. 19, 1970, Pat. No. 3,619,847.

This application July 2, 1971, Ser. No. 159,255

Int. Cl. F16h 21/44

U.S. Cl. 74-99

1 Claim



A motor vehicle includes a transversely extending hinged cowl panel adjacent the lower edge of the windshield for concealing therebelow the windshield wiper arms and blades when parked. The hinged cover or cowl panel is movable from a closed position when the wipers are parked to an open position when the wipers are operating. A fluid pressure windshield wiper motor oscillates the wiper arms and blades through a linkage transmission. The motor includes an auxiliary linearly reciprocating drive shaft for moving the cowl panel to open position when the wiper motor is started before the arms and blades move out of parked position and to closed position when the wiper motor is switched off following movement of the wiper arms and blades to a depressed park position. The linearly reciprocating drive shaft is coupled to the hinged cowl panel through a releasable coupling assembly which can be uncoupled to permit manual movement of the cowl panel to an extreme open detent position for access to the equipment stowed therebelow. The coupling assembly is provided with an intermediate detent position for returning the cowl to a position to permit wiper operation in case of failure of the cowl retracting mechanism.

3,733,916

### DEVICE TO SLOW DOWN A MECHANICAL STEP DRIVE

Walter K. Holzer, Meersburg, Germany, assignor to Holzer Patent AG, Zug, Poststrasse, Switzerland

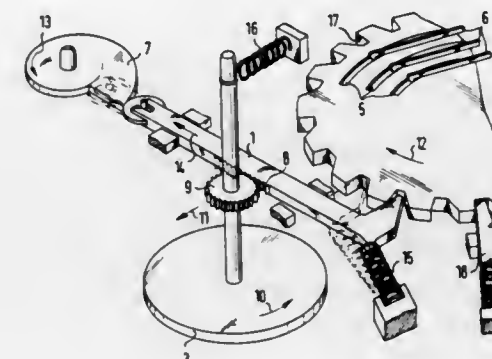
Filed June 17, 1971, Ser. No. 154,075

Claims priority, application Switzerland, June 17, 1970, 9166/70

Int. Cl. F16h 29/00

U.S. Cl. 74-125

5 Claims



A device for the slowing down of a mechanical step drive, especially for use in electric automatic cycle operations, wherein the speed of a conveying movement element is decreased by means of a flywheel so that a continued turning of a control element disc is substantially prevented thereby beyond a predetermined conveying step of said element.

3,733,917

### PAWL AND RATCHET DEVICE

Francois Nikles, 2087 Cornaux, NE, and Rene Besson, Neuchatel, both of Switzerland, assignors to Centre Electronique Horloger SA, Neuchatel, Switzerland

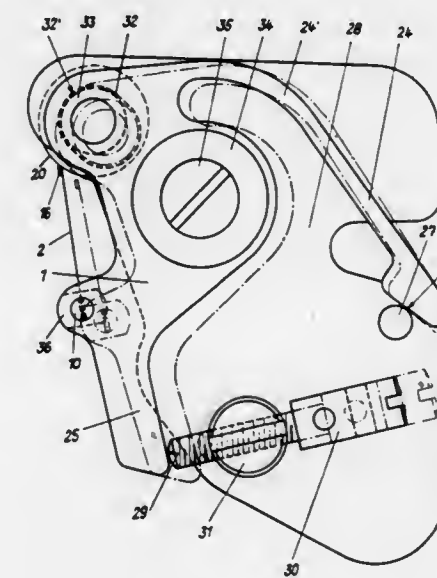
Filed Oct. 19, 1970, Ser. No. 81,665

Claims priority, application Switzerland, Oct. 21, 1969, 15739/69

Int. Cl. F16d 7/00

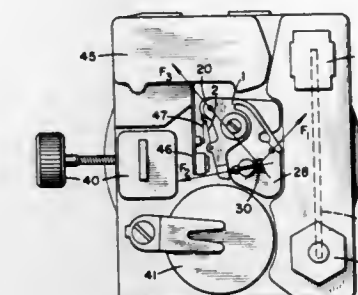
U.S. Cl. 74-144

4 Claims



The holding pawl of a pawl and ratchet device is independently adjustable for phase and pressure on a ratchet. A fork-like support carrying the holding pawl can be translationally moved to bring the pawl into engagement with a ratchet. To adjust the phase, the support is then pivoted about the axis of the ratchet by elastic deformation of an arm of the support.

Displacement and pivoting of the support is effected by pressure on converging bearing surfaces on the arms of the support.



3,733,918

### CENTRIFUGAL CLUTCH

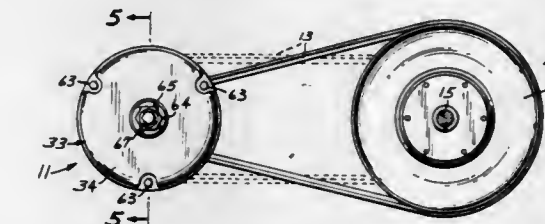
Perry M. Domaas, Minneapolis, Minn., assignor to Textron Inc., Providence, R. I.

Continuation-in-part of Ser. No. 82,633, Oct. 21, 1970. This application Mar. 9, 1972, Ser. No. 233,223

Int. Cl. F16h 55/52

U.S. Cl. 74-230.17 E

11 Claims



The disclosure is directed to a variable ratio centrifugal clutch having driving and driven assemblies connected by an endless belt. The driving assembly consists of a pair of sheaves affixed to a drive shaft, one being axially stationary and the other being axially movable with respect thereto. The movable sheave forms part of an enclosed housing in which a plurality of flyweights are pivotally mounted. The flyweights operate in conjunction with a stationary member which is also disposed inside the enclosure. Guide members formed integrally with the rotatable enclosure operate in conjunction with guiding portions of the axially stationary member to insure proper relative axial movement therebetween. In response to increases in drive shaft speed, the flyweights swing outward and engage the stationary member to move the housing in its entirety along the shaft to bring the sheaves together.

3,733,919

### ADJUSTABLE ECCENTRIC BEARING MOUNTINGS

Herbert E. Rupp, II, Mansfield, Ohio, assignor to Rupp Industries, Inc., Mansfield, Ohio

Filed Sept. 20, 1971, Ser. No. 181,724

Int. Cl. F16h 7/10

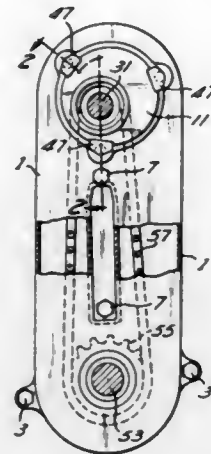
U.S. Cl. 74-242.16

5 Claims

A device for laterally shifting one shaft relative to another shaft which includes two separate, axially spaced, eccentric



bearing mountings, means interconnecting those two perforated strip having radial projections which are sized and shaped substantially to conform to the gear teeth. Preferably,



mountings for simultaneous adjusting rotation and means for clamping those mountings in adjusted position.

3,733,920

## TRANSMISSION AND HYDRAULIC SOURCE

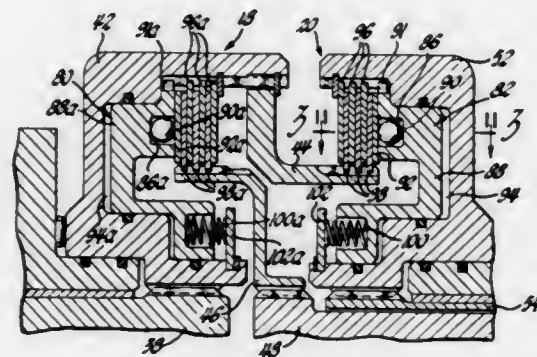
Robert E. Annis, Howell, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 16, 1971, Ser. No. 172,109

Int. Cl. F16h 57/10, 47/00

U.S. Cl. 74-763

3 Claims



A transmission having a positive displacement pump for supplying fluid pressure to the transmission control and accessory devices such as power steering. The pump is driven by the input shaft during normal operation when the engine is running. However, when the engine is not running and the vehicle is moving a drive connection between the output shaft and the input shaft is established through self-energizing mechanisms in the transmission input clutches. These self-energizing mechanisms engage one or more input clutches to provide a drive connection between the output shaft and the pump during the engine off coast condition regardless of the transmission drive mode previously selected or the direction of vehicle movement.

3,733,921

## REINFORCED PLASTIC GEAR

William H. Carveth, 11329 79th Avenue, Edmonton, Alberta, Canada

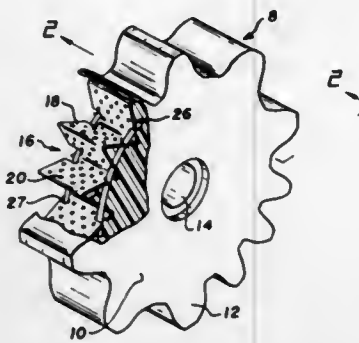
Filed Oct. 15, 1971, Ser. No. 189,517

Int. Cl. F16h 55/12

U.S. Cl. 74-439

5 Claims

A gear formed of plastic by a molding process, and having an annular reinforcing member incorporated within the gear to strengthen the teeth thereof. The reinforcing member is a



the reinforcing member itself is reinforced by one or more annular stiffeners.

3,733,922

## FLEXIBLE CONTROL LEVER FOR MECHANICAL DEVICES

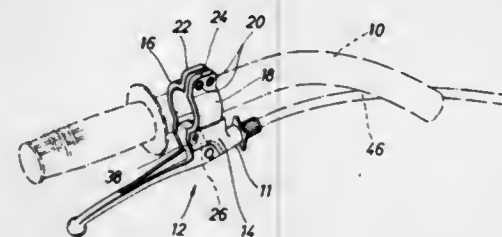
Virgil P. Tripp, Houston, Tex., assignor to Interstate Sports Incorporated, Houston, Tex.

Filed Nov. 11, 1971, Ser. No. 197,728

Int. Cl. G05g 1/04

U.S. Cl. 74-523

13 Claims



A flexible control lever for mechanical devices such as motorcycles that facilitate precise and sensitive manual control of the mechanical device and prevent damage to the mechanical device by over-stressing of mechanical parts. The control lever may be adapted for manipulation by the hand or foot of the user during operation of the mechanical device. The control lever may include an integral web that cooperates with the control lever structure to gradually increase the resiliency of the control lever from a pivoted extremity thereof toward the free extremity thereof. The control lever may also be formed to define an elongated tapered groove that presents a control lever structure gradually increasing in resiliency from the pivoted extremity toward the free extremity thereof. The control lever may be composed of any one of a number of commercially available impact-resistant plastic materials to prevent breakage or other damage to the control lever upon receiving an impact.

3,733,923

## ECONOMICAL AUTOMATIC BALANCER FOR ROTATING MASSES

Eugene A. Goodrich, 4101 Wedgworth Road, Fort Worth, Tex., and Robert H. Johnson, P.O. Box 924, Champaign, Ill.

Filed Aug. 30, 1971, Ser. No. 175,938

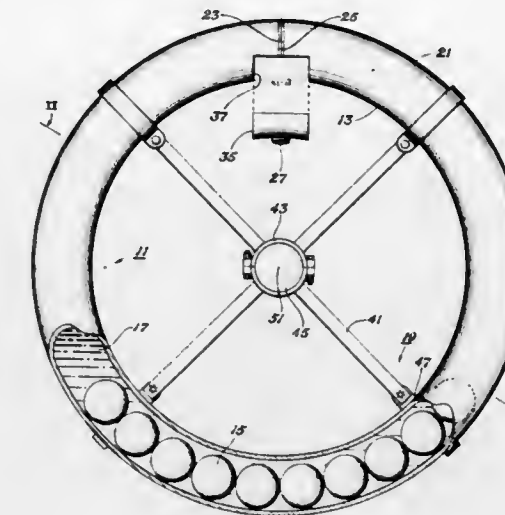
Int. Cl. F16f 15/32

U.S. Cl. 74-573

3 Claims

An economical automatic balancer for rotating masses characterized by a circular rigid self-sustaining race formed of a precision bent metallic tube having its ends welded together and having a substantially uniform internal diameter so as to define a smooth raceway for spherical counterweights; a plurality of counterweights and a lubricating and damping fluid movably disposed within the race; and means for rigidly connecting the race with the rotating mass such that the spherical

counterweights will align themselves within the race so as to compensate for dynamic unbalance thereof. The use of the precision bent metallic tube effects an automatic balancer that



is advantageous over similar prior art balancers, is easily installed in a wide variety of applications, yet is much more economical in its total cost than the prior art balancers.

3,733,924

## HYDROMECHANICAL TRANSMISSION

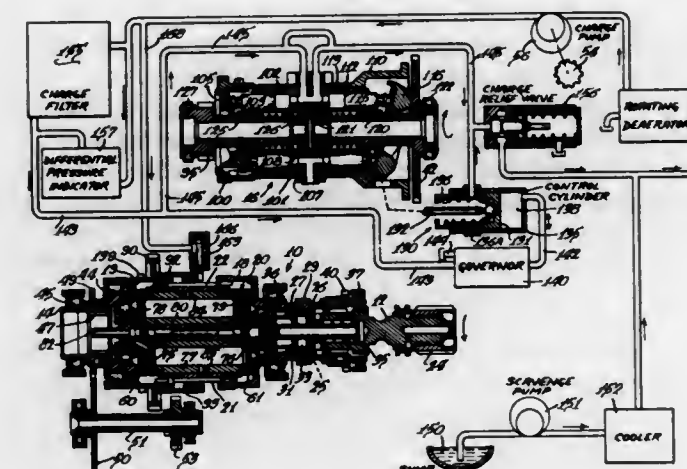
Robert J. Zentz, and Robert A. Stutler, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 24, 1972, Ser. No. 220,289

Int. Cl. F16h 47/04

U.S. Cl. 74-687

17 Claims



A hydromechanical high speed drive transmission for driving an aircraft alternator at constant speed even though the speed of the engine fluctuates, including a mechanical differential having an input ring gear, an output ring gear, and a carrier with intermeshing pinions respectively engaging the ring gears, a variable hydrostatic transmission driven with the input gear and connected for controlling rotation of the carrier to vary the speed of the output gear relative to the speed of the input gear, releasable detent means for preventing reverse rotation of the carrier on cold starts, a charge pump driven with the output gear for supplying fluid to the hydrostatic transmission, and means responsive to pressure developed by the charge pump for withdrawing the releasable detent means acting on the carrier.

3,733,925

## THREAD CUTTING DEVICE FOR SLIDE LATHES

Reinar Schmidt, and Erik Schmidt, both of Skyttegatan 5-7, S-771 01 Ludvika, Sweden

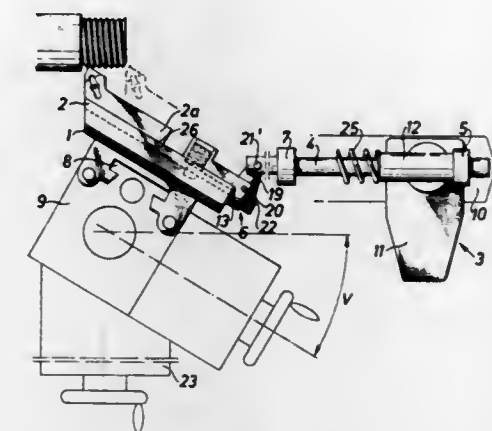
Filed Apr. 29, 1971, Ser. No. 138,573

Claims priority, application Sweden, May 6, 1970, 6237/70

Int. Cl. B23b 21/00

U.S. Cl. 82-24 A

7 Claims



A thread cutting device for a slide lathe comprising a tool holder support member constructed of a guide member and a slide member reciprocatingly slidable with respect to each other and mounted at a pre-determined oblique angle with respect to the axis of rotation of the lathe spindle whereby the members move in a straight line movement at the oblique angle. A spring biased latch means normally lock the guide and slide members against relative movement when the tool is in a work cutting position. Stop means are connected to the support member to release the latch means to permit the guide and slide members to move relative to each other to cause the cutting tool to move out of engagement with a workpiece and stop continued feed of the tool at a position where the cutting operation is to be terminated.

3,733,926

## INTERCHANGEABLE DRIVE WITH BALANCING GEARS

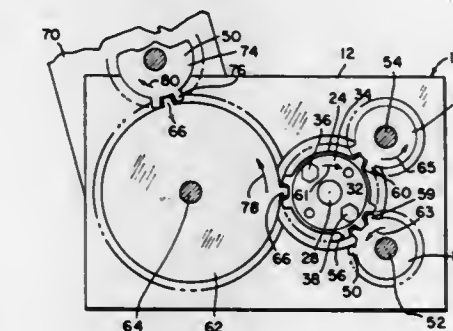
Henry F. Hope, 195 Welsh Road, Huntingdon Valley, Pa., and Stephen F. Hope, 2421 Wyandotte Road, Willow Grove, Pa.

Filed June 18, 1971, Ser. No. 153,168

Int. Cl. F16h 57/00

U.S. Cl. 74-410

2 Claims



An interchangeable drive with balancing gears in peripheral arrangement about a drive gear to equalize stresses upon the drive gear shaft and bearings when the drive gear meshes with and drives a gear train system.



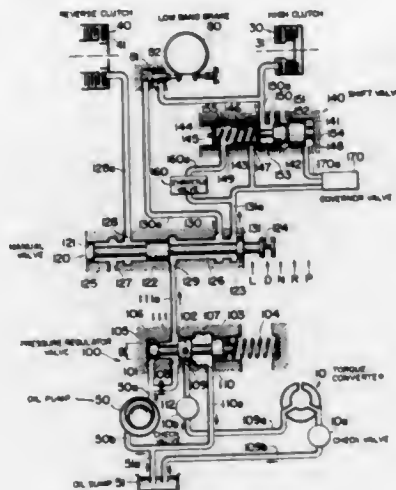
### 3,733,927 HYDRAULIC CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION

Sumio Uozumi, and Kiyoshi Ohnuma, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi-ken, Japan

Continuation-in-part of Ser. No. 36,954, May 13, 1970, abandoned. This application Oct. 26, 1971, Ser. No. 192,252  
Int. Cl. F16h 57/10, 47/00; B60k 21/00

U.S. Cl. 74-753

10 Claims



A hydraulic control system, for an automatic transmission having a torque converter or a fluid coupler and a servo-operated speed change gear for use in vehicles, includes a pressure regulator valve regulating a control pressure applied to the servos of the speed change gear, an oil pump driven by an engine crank shaft for supplying the control pressure, and a shunt passage which is opened or blocked off by the pressure regulator valve to recirculate or shut off the flow of pressure oil to the pump according to the vehicle speed. When the vehicle is driven above a predetermined speed, the shunt passage is opened and the pressure oil circulates through an orifice which reduces the discharge oil pressure or the control pressure for the servo units due to an increase in oil flow to assure a smooth gear change in the drive range of the transmission and, when the vehicle is started, or driven at a low speed, the shunt passage is blocked, thereby establishing a high control pressure applied to the servo units, assuring a sure and smooth gear change in low and reverse ranges of the transmission.

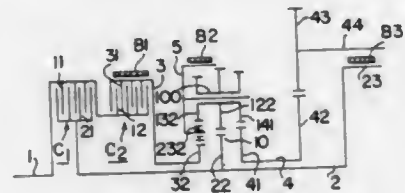
### 3,733,928 SPEED CHANGE GEAR DEVICE

Sumio Uozumi, Toyota, and Koichi Kurosawa, Kariya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi-ken, Japan

Filed June 2, 1970, Ser. No. 42,661  
Claims priority, application Japan, June 3, 1969, 44/42929  
Int. Cl. F16h 57/10

U.S. Cl. 74-753

6 Claims



A speed change gear device which comprises a relatively small number of planetary gears and associated parts and which is especially applicable to the transmission mechanism of a smaller-sized automotive vehicle. The speed change gear device employs additional brake means to fix an input member of a planetary gear train to the gear case to furnish a greater speed change ratio or a greater number of speed

change steps without increasing the number of gears in the planetary gear train.

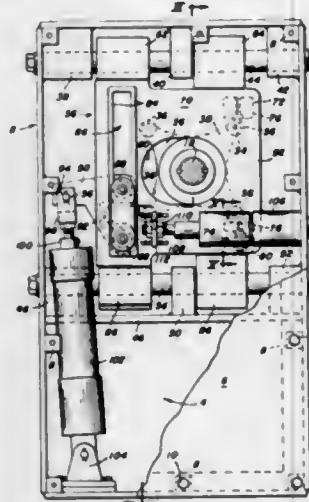
### 3,733,929 INDEXING APPARATUS

James J. Fatula, Perry Township, Lawrence County, Pa., assignor to Ryman Engineering Company, Ellwood City, Pa.

Filed Aug. 20, 1971, Ser. No. 173,397  
Int. Cl. B23b 29/32

U.S. Cl. 74-822

11 Claims



Indexing apparatus includes a housing, a rotatable indexing shaft mounted in the housing, a spider mounted on the shaft for rotation therewith, a plurality of rollers equally spaced about the periphery of the spider, and an indexing bracket mounted in the housing for movement transversely of the shaft. A stop block on the bracket engages one of the rollers to prevent rotation of the spider. A slotted arm on the bracket engages another roller to rotate the spider when the first roller is disengaged from the stop block.

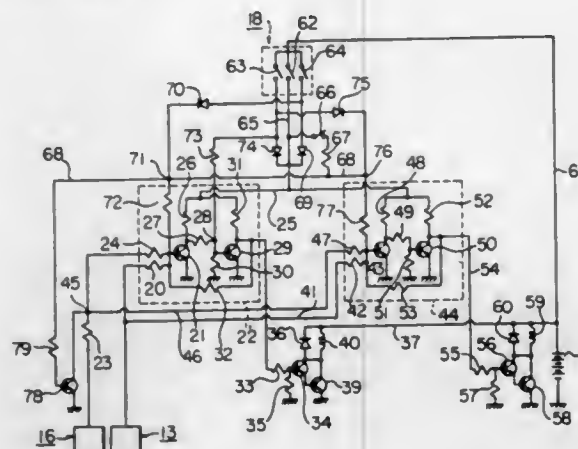
### 3,733,930 ELECTRONIC CONTROL DEVICE FOR AUTOMATIC POWER TRANSMISSION

Masanori Mizote, Kanagawa-ku, Yokohama, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Apr. 12, 1971, Ser. No. 133,117  
Claims priority, application Japan, Apr. 19, 1970, 45/32937  
Int. Cl. B60k 21/02

U.S. Cl. 74-866

7 Claims



An electronic shift control device for an automatic power transmission causing the level of vehicle speed at which shifting takes place to change in dependence on driving conditions to prevent the engine from overspeeding or to increase the engine output torque for quick acceleration. Sensor sensing vehicle speed throttle valve position, position of a manual

selector lever and a kick-down position of an accelerator pedal generate voltages which are fed into a gear shift control circuit which computes an appropriate gear reduction ratio at all times and generates a corresponding command signal for changing the reduction ratio or shifting over a wide vehicle speed range, whenever necessary.

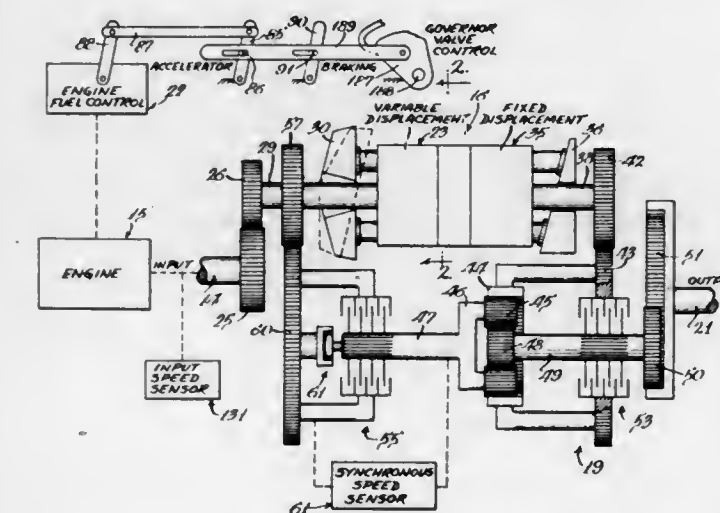
### 3,733,931 HYDROMECHANICAL TRANSMISSION

Bengt E. Nyman, Redmond, Wash., and Larry T. Becker, Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 16, 1971, Ser. No. 171,925  
Int. Cl. B60k 21/00; F16h 47/04

U.S. Cl. 74-868

20 Claims



An infinitely variable hydromechanical transmission for a highway truck or the like including a hydraulic pump and motor together with a mechanical differential, means for varying the displacement of one of the hydraulic units, a low range clutch for transmitting power directly from the hydraulic units to the output shaft in a purely hydrostatic mode, a high range clutch engageable synchronously under full load for establishing split power paths in a hydromechanical mode, and control means for actuating the clutches and the displacement varying means. The control system includes a governor valve for controlling the displacement varying means, an acceleration control for simultaneously establishing an engine throttle setting and a governor valve setting, a charge pump for supplying charge fluid under pressure, an engine speed sensing valve for receiving charge fluid and supplying pressure proportional to engine speed to actuate the governor valve in opposition to the manual bias for establishing a transmission ratio to control engine speed, a pressure regulating valve for receiving charge pressure and supplying control pressure to the governor responsive to a pressure signal from the engine speed responsive valve in a manner to establish maximum control pressure at approximately 70 percent of rated engine speed, a drive selector valve for establishing neutral, low range forward, reverse and high range forward, a shift valve for controlling energization of the high range clutch and deenergization of the low range clutch, a shift qualifying valve controlled by the engine speed responsive valve for supplying a signal to the shift valve indicating attainment of predetermined minimum engine speed, a synchronous speed sensitive valve for supplying a shift signal to the shift valve when the speed of the output shaft exceeds the speed of the input shaft, a sequence valve controlled by the shift valve for reversing the displacement varying means when shifting from low range to high range, a reshift delay valve for preventing immediate downshift from high range due to transitory signals, and shunt valve means for connecting opposite sides of the displacement varying means in event of panic stops.

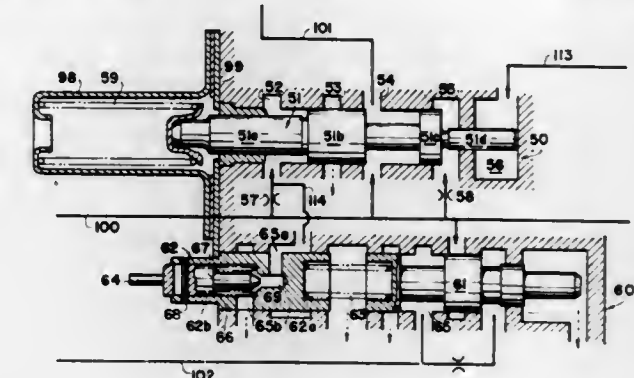
### 3,733,932 HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSIONS

Sumio Uozumi, and Ichio Sakai, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi-ken, Japan

Filed May 5, 1971, Ser. No. 140,327  
Claims priority, application Japan, May 9, 1970, 45/39414  
Int. Cl. B60k 21/00; F16h 3/08

U.S. Cl. 74-869

8 Claims



A hydraulic control system for automatic transmissions comprising hydraulic servo means operable to actuate clutch means of the transmission assembly, a pressure oil source for generating pressure oil to be supplied to said hydraulic servo means, a pressure control valve adapted to control pressure oil from said pressure oil source to obtain a required line pressure, a throttle valve for generating a throttle pressure corresponding to the opening of the engine throttle valve, a governor valve generating a governor pressure corresponding to the vehicle speed, a manual valve for distributing the line pressure to a required hydraulic servo circuit to achieve a required transmission condition, a 1-2 shift valve for shifting between the first speed and second speed conditions of the transmissions according to the vehicle running conditions regulated by the throttle pressure and governor pressure, a 2-3 shift valve for shifting between the second speed and third speed conditions of the transmission according to the vehicle running conditions, accumulator means for moderating the application of the line pressure to a servo oil chamber of the clutch means for the third speed, a 2-3 timing valve for determining the timing of up or down shift in the second and third speed conditions of the transmission, and an orifice control valve adapted to control the flow rate of the line pressure supplied to the servo oil chamber in the clutch means for the second speed so as to lessen the shift shock. The throttle valve is so arranged that when the opening of the engine throttle valve is less than 1/4 of the full opening, it functions to drain pressure oil from the pressure oil source by a pilot valve in cooperation with a throttle lever thereby to change the controlling action of the pressure control valve so as to obtain an extremely low constant line pressure from said pressure control valve, this valve being also so arranged that when the transmission is in the third speed condition, the controlling action of said valve is further changed by the line pressure supplied to the servo oil chamber in the clutch means for the third speed so as to obtain a still lower line pressure.

### 3,733,933 SHARPENER FOR ARROWHEADS

Howard R. Longbrake, R. D. No. 2, Grafton, Ohio

Filed Jan. 8, 1971, Ser. No. 104,940  
Int. Cl. B21k 5/12

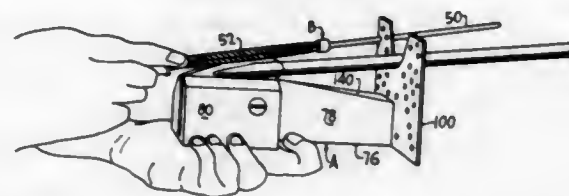
U.S. Cl. 76-88

6 Claims

An arrow broadhead sharpener to be held in one hand of an operative and comprising clamp members between which one blade of an arrowhead, another blade of which is to be sharpened or resharpened, is secured and a tool guide member extending transversely of the clamp members having apertures



therein in which one end of a sharpening instrument or tool, such as, a file, stone, etc., is received while the other end is



held by the other hand of the operator and moved over the cutting edge of the blade to be sharpened or resharpened.

3,733,934

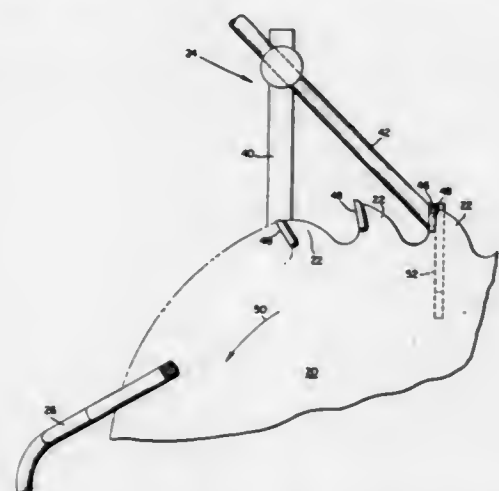
# BRAZING METHOD FOR CARBIDE TIPPED SAW BLADES

Norman A. Stevenson, 1632 East Merced Avenue, West Covina, Calif.

Filed June 7, 1971, Ser. No. 150,626

Int. Cl. B23d 65/00

U.S. Cl. 76-112



A machine for brazing carbide tips onto the cutting teeth of circular saw blades comprising a vertical saw support jig attached to a cabinet enclosing carbon arc brazing apparatus therein. A first electrode is attached to the saw which is urged in a direction so that a carbide tip disposed against a saw tooth is forced into engagement with a second (carbon) electrode. A clearance gauge assures proper lateral placement of the tip against the saw tooth. The carbon arc brazing apparatus includes a variable rheostat calibrated to show differing saw thicknesses, at indices where the brazing area is brought to desired proper temperature related to the indicated saw thickness. A timer thermostat is used in the brazing circuit to prevent excess heat in the brazing area. The method for brazing a carbide tip to a circular saw tooth edge includes placing the saw in a jig, inserting a carbide tip to be brazed between a carbon electrode and the saw tooth, retaining the tip against the tooth by weight of a brazing electrode attached to the saw outside of the brazing area, brazing by moving a silver solder rod about the junction of the tip and saw tooth, and trimming the brazed, tipped saw tooth to a cutting edge.

3,733,935

# TORQUE WRENCH WITH A NUT RUNNER

Hiroshi Tsuji, Chyofu-shi, Tokyo, Japan, assignor to Tonichi Manufacturing Co., Ltd., Tokyo, Japan

Filed May 24, 1971, Ser. No. 146,194

Claims priority, application Japan, Oct. 26, 1970, 45/93620

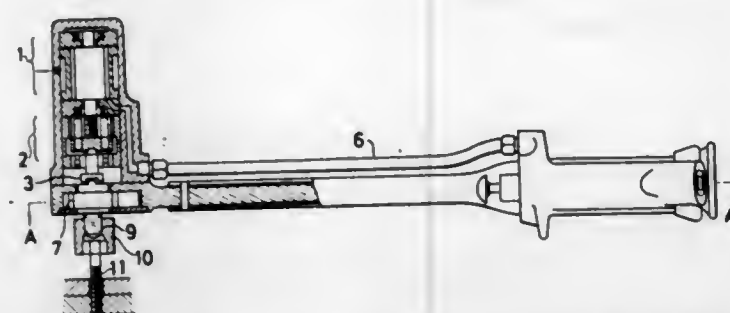
Int. Cl. B25b 13/00

U.S. Cl. 81-52.4

1 Claim

Torque wrench, characterized in provision of system for rotating a screw-fastening ratchet driven by power source in

combination with manually operative ratchet type torque wrench, said ratchet is driven at high speed in the movement of rotation by low torque exerted from said power source to be



effective enough for settling screw, subsequent thereto the settled screw is adapted to be fastened securely at a predetermined torque by manual operation of said torque wrench.

3,733,936

# MASTER RATCHET WITH QUICK ACTION DUAL DRIVE

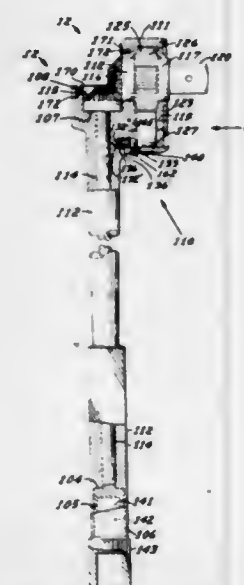
Wilford Flynn, R. R. 6, Bedford, Ind.

Continuation-in-part of Ser. No. 778,723, Nov. 25, 1968, abandoned. This application June 18, 1971, Ser. No. 154,513

Int. Cl. B25b 13/00

U.S. Cl. 81-58.1

1 Claim



A wrench having both a ratchet drive and a higher speed gear drive in which changes from ratchet to gear drive and vice versa can be quickly and easily affected.

3,733,937

# NON-SLIPPING POLYGONAL WRENCH

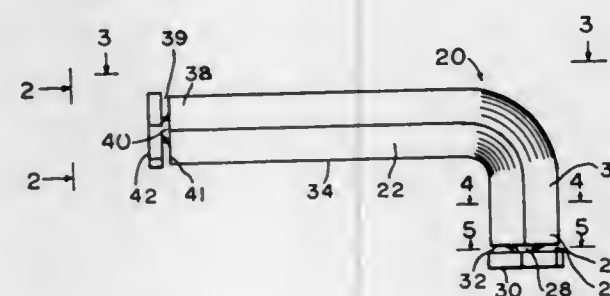
Frank G. J. Mezey, 115 Monroe Drive, Centerport, N.Y.

Filed June 28, 1971, Ser. No. 157,327

Int. Cl. B25b 13/48

U.S. Cl. 81-71

10 Claims



A wrench having a plurality of sides is formed with a head at one end for insertion into a socket of a screw or bolt having a

corresponding number of sides. A horizontally springy neck of the wrench is integral with a head and with a tip spaced axially from the head. The tip is offset circumferentially from the head approximately 5° to 10°. A similar head, springy neck and offset tip may be provided at the other end of the wrench. The wrench may be straight or L-shaped and have any number of sides greater than two.

3,733,938

# PLURAL BUNG TOOL

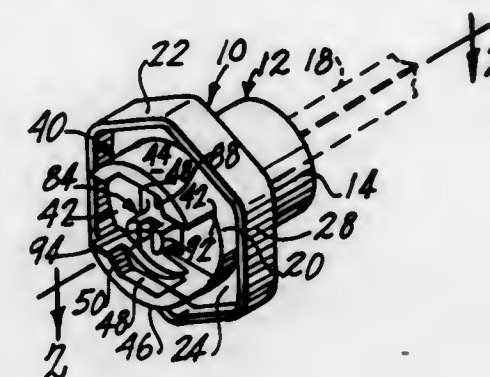
Bernard L. Smith, P. O. Box 10504, Atlanta, Ga.

Filed Mar. 8, 1972, Ser. No. 232,746

Int. Cl. B25b 13/02

U.S. Cl. 81-119

10 Claims



A plural bung tool for removing or replacing barrel bungs, comprising one unitary head having a socket or other standard fitting thereon for mounting on the shaft of a standard tool, including a compressed air driven tool or a manual wrench, and having a plurality of cavities and faces arranged to fit six or more existing bungs. The head includes a sleeve-like body near one end of which is mounted a hexagonal cavity collar for fitting the hexagonal bungs and within said hexagonal collar extending and protruding therefrom a second sleeve defining opposed jaws recessed to fit a smaller square or rectangular recessed bung fitting. The main body includes a passageway which is rectangular or square but not circular so that a spring biased bifurcated jaw travels therein to be pushed out of the way when fitting the plural tool second jaw collar to a bung. The bifurcated, sliding jaw arrangement is insertable inside the type of small bung fitting which has a cavity with opposed protrusions thereon and said second bifurcated jaw will also insert between projecting, parallel plates in another type of bung fitting. The second opposed jaw arrangement will fit over certain hexagonal bungs and some square or rectangular bungs. Thus, the single tool head fits any one of six or more existing bungs simply by inserting same thereon or thereinto as the case may be without further manipulative work.

## ERRATUM

For Class 82-24 A see:  
Patent No. 3,733,925

3,733,939

# APPARATUS FOR FORMING PRECISION SURFACES ON ENDS OF LARGE PIPES AND LIKE WORK PLACES

Joseph R. Paysinger, Ahwaz, Iran; Eugene F. Slms, and Jerome W. Nelson, both of Houston, Tex., assignors to CRC-Croose International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 743,566, July 9, 1968, Pat. No. 3,608,406. This application Oct. 14, 1970, Ser. No. 80,717

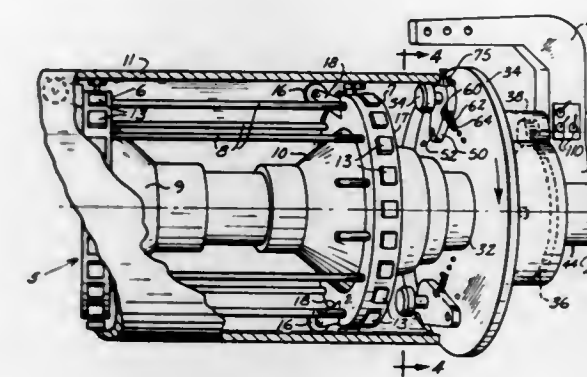
Int. Cl. B23b 5/16

U.S. Cl. 82-4 C

5 Claims

A machine and method for precision cutting or machining of annular ends of pipe in the field, e.g., for preparation of large pipe ends for welding girth joints, comprises a cage shaped double ended aligning clamp which axially aligns and

firmly supports a rotatable face plate. This plate carries multiple cutting tools and guide rollers, precision mounted on spring-biased pivoted arms which permit radially inward and outward motion of the tools and rollers with respect to the pipe end, to accommodate minor eccentricities in the work. The face plate is power driven around the axis of the clamp to carry out the machining operation. Each pivoted arm carries a cutter or equivalent tool, closely coupled with a precision guide roller which is also chamfered to slide into the pipe as



the supporting arm pivots radially inward against the force of strong spring backing means. Each arm is pivoted to the plate radially inside the tool to produce a couple or moment of force, thus augmenting the spring means to hold guide roller and tool radially outward against the work. Cutters may be alike or complementary to each other. Use of plural tools distributes strain and facilitates high precision operations with minimum driving force and low distortion of the work and mechanism.

3,733,940

# LATHES

Julius Harman, Baginton, and Michael Eric Norman, Holly Croft, both of England, assignors to Alfred Herbert Limited, Coventry, England

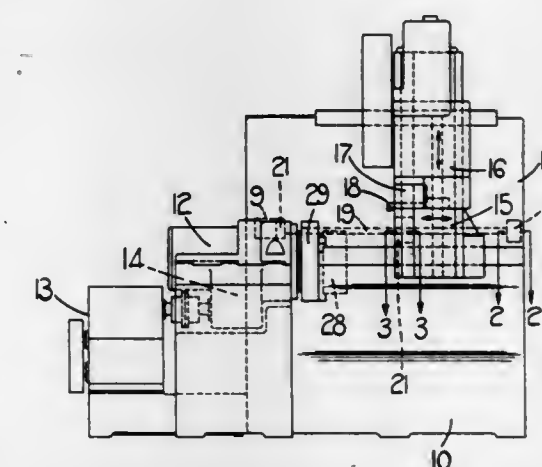
Filed Apr. 8, 1971, Ser. No. 132,529

Claims priority, application Great Britain, Apr. 10, 1970, 17,117/70

Int. Cl. B23b 21/00

U.S. Cl. 82-21 R

20 Claims



A lathe is provided in the feed drive to its saddle with a yieldable joint which absorbs shock loads. The joint may be incorporated in a nut assembly which is displaceable along a leadscrew and is connected to the saddle. The nut assembly comprises a housing, a pair of separate nut portions in the housing and prestressed resilient devices holding in position a pair of abutments through which axial thrust is transmitted from the nut portions to the housings.



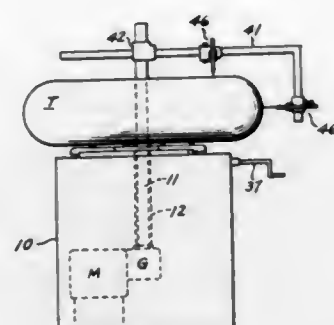
3,733,941

**APPARATUS FOR CUTTING USED PNEUMATIC TIRE CASING**

William J. Geyer, Jr., 172 Main St., Hellertown, Pa.  
Filed Jan. 3, 1972, Ser. No. 214,856  
Int. Cl. B23b 5/14

U.S. Cl. 82-59

8 Claims



A used pneumatic tire casing is fixedly supported from within and about a rotatable shaft. A cutter drive bar is attached to and rotates with the shaft. Cutters are attached to the cutter drive bar. With the tire casing so supported and the cutters moved to pierce the tire casing, the shaft is rotated. The cutter drive bar and cutters rotate with the shaft, sweep through 360° and cut the tire casing into a number of circular portions.

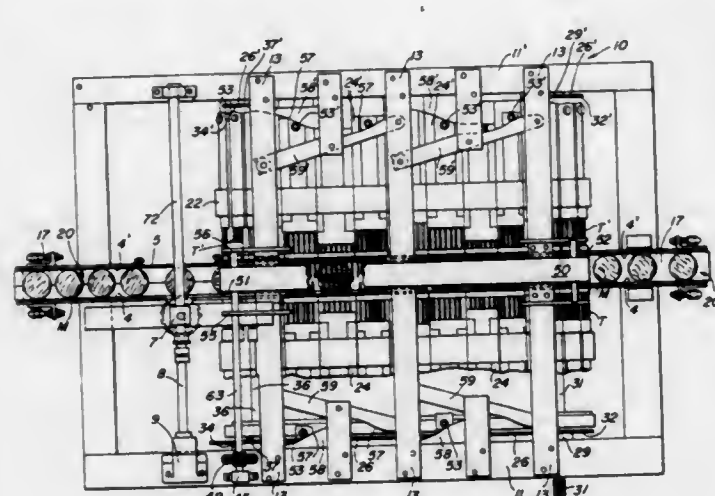
3,733,942

**MUFFIN PERFORATING MACHINE**

Eugene M. Noel, 42 Kingston Road, Newton Highlands, Mass.  
Filed Nov. 9, 1970, Ser. No. 87,893  
Int. Cl. B26d 3/08

U.S. Cl. 83-2

4 Claims



A muffin perforating machine of increased perforating capability having a muffin conveyor, a first muffin rotating or turning device for positioning the muffin carried by the conveyor for a first perforating operation, and a second perforating operation at a different part of the muffin rim, in which operations the tines penetrate slightly more than halfway through the muffin thereby providing a finished perforated product more suitable for marketing because it can be easily split manually from any direction by the ultimate consumer in preparation for toasting at the time of consumption.

3,733,943

**CUTTING METHODS**

John J. Sutyak, Pittsburgh, Pa., assignor to Mesta Machine Company, Pittsburgh, Pa.  
Continuation-in-part of Ser. No. 747,219, July 24, 1968, Pat. No. 3,657,953. This application Sept. 9, 1971, Ser. No. 179,041

Int. Cl. B23d 19/02

U.S. Cl. 83-7

17 Claims



A method of cutting thick plate material, said method comprising the steps of supporting said material on elongated cutting means co-extending with an intended cut in said material and aligned therewith, scoring said material along said cut to a depth at least equal to the surface hardness of said material, and cutting said material to a further depth along said scoring, said further depth being less than the thickness of said material.

A method of slitting thick plate material, said method comprising the steps of supporting said material on a pair of generally parallel knife edges co-extending with an intended cut and aligned therewith, scoring said material along each of said knife edges respectively, and slitting said material along each of said knife edges so as to coincide with said scoring.

Also disclosed is a method for countering diminishment of cutting forces from bowing of certain components of the cutting apparatus.

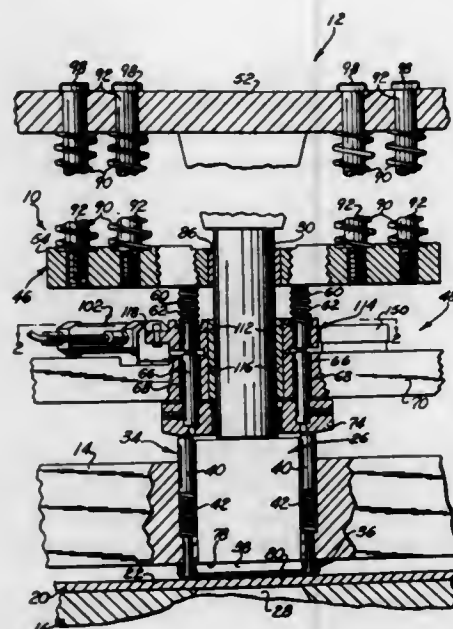
3,733,944

**SELECTIVE STRIPPER MECHANISM**

Eugene Lewis Dietrick, Norristown, and Joseph Anthony Linus, Levittown, both of Pa., assignors to The Warner & Swasey Company, Cleveland, Ohio  
Filed Oct. 12, 1971, Ser. No. 188,393  
Int. Cl. B26d 5/12, 7/02, 7/18

U.S. Cl. 83-62

18 Claims



An improved punch press includes a selectively operable stripper unit which presses a workpiece against a lower turret as a tool is retracted away from the workpiece by a ram. A transfer device transmits actuating forces to the stripper unit during an operating cycle of the punch press. To enable the

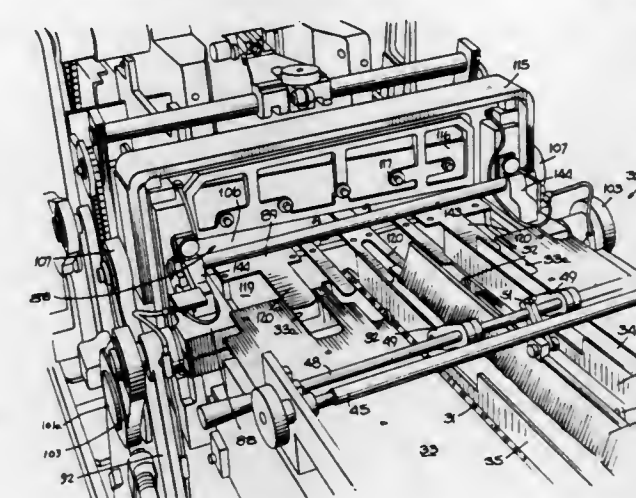
3,733,947

**BOOK TRIMMING MACHINE**

Robert A. Bryson, Easton, Pa.; Thomas C. Kennicott, Janesville, Wis., and Ernest J. Sarring, Fort Thomas, Ky., assignors to Harris-Intertype Corporation, Cleveland, Ohio  
Division of Ser. No. 737,969, June 18, 1968, Pat. No. 3,552,246. This application Aug. 25, 1970, Ser. No. 66,848  
Int. Cl. B65h 5/00

U.S. Cl. 83-280

7 Claims



The disclosure relates to a machine for performing trimming operations upon the front and side edges of a book as the book continues to advance through the machine. The machine includes a front edge trimming table which is reciprocated in a horizontal direction and receives a book from an infeed conveyor as the table moves in the direction of the conveyor. As the table continues to move in the direction of the infeed conveyor, the book is clamped to the table and the front edge of the book is trimmed. The machine further includes a side edge trimming table which is reciprocated in synchronism but substantially out of phase with the front edge trimming table. As the front edge table completes its motion in the direction of the infeed conveyor and as the side edge table is about to move in the same direction, the book having its front edge trimmed is advanced onto the side edge table. As the side edge table continues to move in the direction of the infeed conveyor, the book is clamped to the side edge table and the side edges of the book are trimmed. Toward the end of the forward motion of the side edge table, the book is released to a conveyor which advances it from the machine.

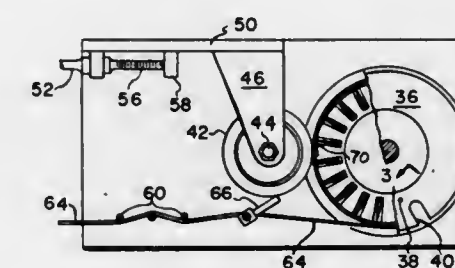
3,733,945

**METHOD AND APPARATUS FOR CUTTING AND REMOVING ELONGATED MATERIAL**

Charles Wayne Cook, Salisbury, Rowan, N.C., assignor to Fiber Industries Inc., Charlotte, N.C.  
Filed June 3, 1971, Ser. No. 149,682  
Int. Cl. B65h 51/16

U.S. Cl. 83-24

7 Claims



A method and apparatus is disclosed and claimed for cutting and removing elongated material by means of a plurality of knife edges and an overhead air jet. The cutting is achieved by applying a pressure to the inner layer of continuous filament forcing it against the knife edges and thereby cutting the filament wherein the air jet impinges downwardly upon the cut filament and causes it to be removed.

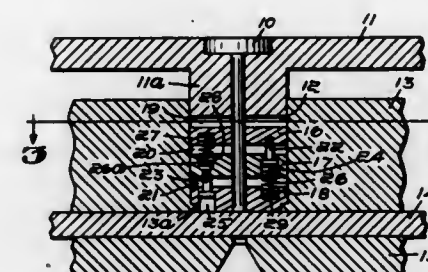
3,733,946

**SUPPORT ASSEMBLY FOR PUNCHES AND PISTON RODS**

Richard P. Davis, Sanbornton, N.H.  
Filed Feb. 16, 1971, Ser. No. 115,409  
Int. Cl. B26f 1/40

U.S. Cl. 83-129

10 Claims



A support assembly for punches or piston rods of small diameter relative to their required travel. A number of spaced rings or plates are mounted around the punch or rod, and laterally restrained, for example, by the stripper plate of a punching die. The spacing of the rings or plates is controlled and is less than the unsupported length relative to its diameter which the punch or rod will withstand without buckling. On the downstroke of the press, or working stroke of the piston, the rings or plates move together to allow the necessary travel, the sum of the lengths of the initial gaps between the rings or plates being at least equal to the required travel of the punch or rod.

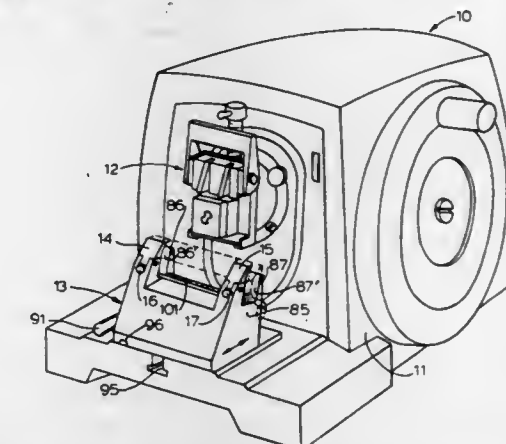
3,733,948

**SELF ALIGNING BASE CLAMP AND HOLDER FOR DISPOSABLE BLADE AND WATER BATH FOR MICROTOMES AND METHOD**

John E. P. Pickett, 3323 Pinafore Drive, Durham, N.C.  
Filed June 16, 1971, Ser. No. 153,781  
Int. Cl. B26d 4/00

U.S. Cl. 83-98

3 Claims



A thin, flexible and disposable blade for microtome cutting has a microtome quality cutting edge and is held by an im-



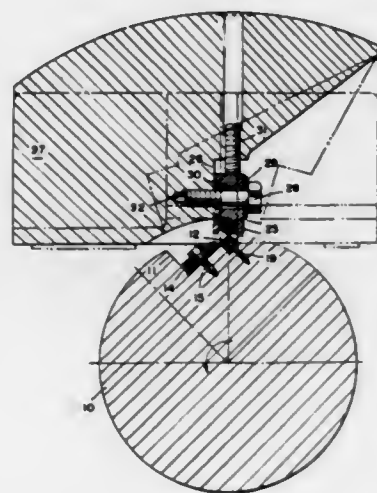
proved base clamp and blade holder structure which is adapted to flex, clamp and tension the disposable blade without vertical or tilt adjustment. A water trough may be secured to the blade holder to receive and float cut specimens directly from the blade. A method to perform corresponding steps is also disclosed.

**3,733,949**  
**NOISE REDUCTION STRIP FOR SHEAR CUT PERFORATOR**

John J. Bradley, Green Bay, Wis., assignor to Paper Converting Machine Company, Inc., Green Bay, Wis.  
Filed June 21, 1971, Ser. No. 155,145  
Int. Cl. B23d 25/12

U.S. Cl. 83-348

9 Claims

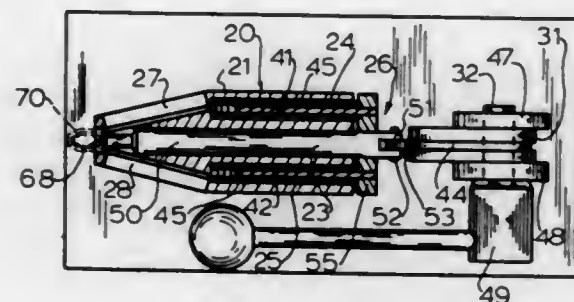


A shear cut perforator having an axially recessed bedroll equipped with resilient roll blades for engagement with and flexing by an anvil blade is provided with a resilient, compressible pad behind the flexing portion of the roll blade to reduce the noise level of the perforator.

**3,733,950**  
**APPARATUS FOR SLITTING AN ELECTRON MICROSCOPY TISSUE EMBEDDING CAPSULE CASING**  
Thomas D. Kinney, 3130 Devon Road, Durham, N.C., and John E. P. Pickett, 3323 Pinafore Drive, Durham, N.C.  
Filed Mar. 6, 1972, Ser. No. 231,972  
Int. Cl. B26d 7/06

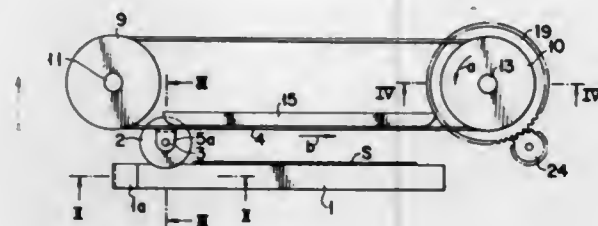
U.S. Cl. 83-425.3

2 Claims



A capsule case slitting device receives an embedded electron microscopy tissue capsule and forces the capsule with its case between oppositely spaced blades to impart longitudinal slits in the capsule case thereby enabling the embedded tissue specimen to be easily separated from its casing.

**3,733,951**  
**SHEET CUTTING APPARATUS**  
Sakae Fujimoto, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan  
Filed Apr. 27, 1971, Ser. No. 137,808  
Claims priority, application Japan, Apr. 30, 1970, 45/37002  
Int. Cl. B23d 19/00; B26d 5/08  
U.S. Cl. 83-484 10 Claims

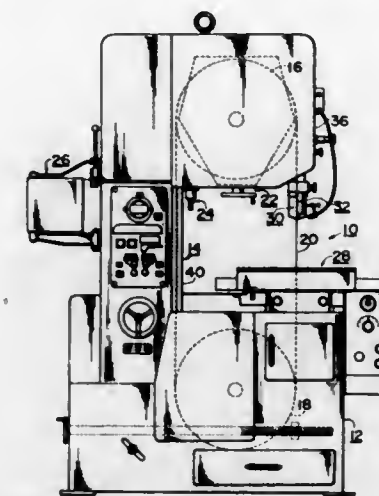


A cutter receptor extends transversely across the path of movement of sheet material to be cut, and an endless belt is trained over a pair of pulleys for movement adjacent and substantially parallel to the cutter receptor. A disk-shaped cutter is rotatably mounted on the endless belt and spring biased to press toward the cutter receptor to cut a predetermined length of sheet material during movement of the belt. One pulley is driven by a driving mechanism which is under the control of a control mechanism selectively operable to activate the drive mechanism to rotate the pulley to advance the cutter from a retracted starting position into rotating engagement with the cutter receptor and therealong to cut a length of sheet material, after which the rotation of the pulley is continued to return the cutter to its retracted starting position. In one embodiment of the invention, the driven pulley is fixed to a shaft on which there is rotatably mounted a gear. A coil spring has one end secured to the shaft and its other end secured to a housing rotatable with the gear, and a driving pinion meshes with the gear. The driven pulley is normally latched against movement but, when the latch is released, the spring rotates the driven pulley to drive the belt carrying the cutter. During the time that the pulley is latched against movement, the pinion rotates the gear to rewind the spring. Control elements are associated with the shaft and with the gear, and effect operation of a microswitch controlling energization of a motor for driving the pinion. In another embodiment of the invention, the driven pulley is rotated by an electric motor whose energization is controlled by control cams operatively associated with control switches.

**3,733,952**  
**AUTOMATIC CONTOUR MACHINE**  
Goro Fukugami, Sagami-hara-shi; Chiaki Tamura, Ono-shi; Masayuki Taguchi, Tokyo, and Kenichi Maekawa, Kasai-shi, all of Japan, assignors to Amada Company Limited, Isehara-shi, Kanagawa-ken, Japan  
Filed Feb. 12, 1971, Ser. No. 114,950  
Claims priority, application Japan, Feb. 18, 1970, 45/13467; June 17, 1970, 45/51849; June 17, 1970, 45/51884; June 23, 1970, 45/54060; July 22, 1970, 45/63527; Oct. 22, 1970, 45/104299; Dec. 3, 1970, 45/106337  
Int. Cl. B23d 53/06, 53/08; B27b 13/04  
U.S. Cl. 83-789 10 Claims

Contour machine in which a worktable is fixed, and enclosed wheels are provided for mounting a band saw, the machine being pivotable with respect to a base, and in which a rotary table, mounted on the worktable, may be automatically set into rotation in the forward or reverse direction or stopped through a curve-sensing guide mechanism. The machine body is pivotable with respect to the base in a plane perpendicular to the face of the band saw, together with upper and lower

housings which lodge wheels for guiding the band saw. The machine has means to provide an adjustable and reproducible relationship of the body with respect to the base, as well as means for immobilizing the pivoted machine body in various positions. In addition, with a view to attaining savings in man-

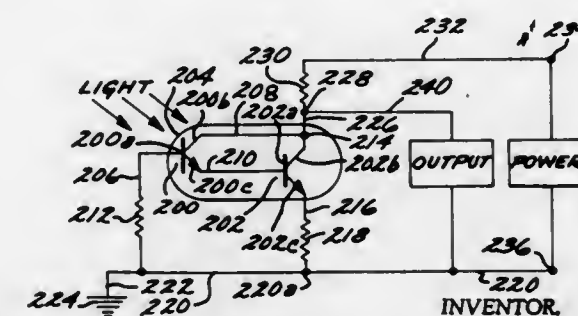


power and automation of operation, units are provided for indication of the saw tension, for bringing a saw-container housing to a saw-mounting position, for clamping the saw, for adjusting the relative distance between a workpiece and a saw-blade guide mechanism, and a unit for stopping the saw movement upon completion of the machining operation.

**ERRATUM**

For Class 83-474 see:  
Patent No. 3,734,150

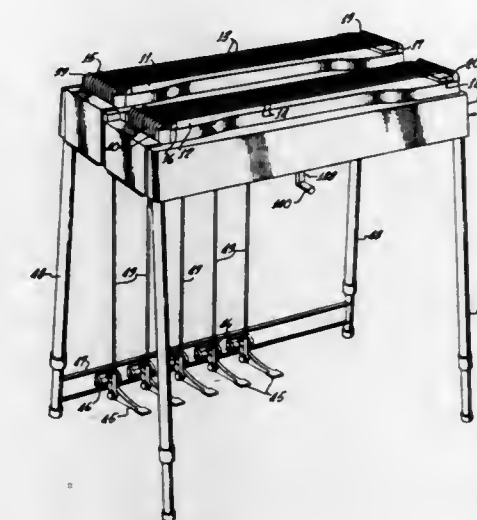
**3,733,953**  
**STRINGED MUSICAL INSTRUMENT WITH OPTOELECTRONIC PICKUP SOUND AMPLIFIER**  
Dennis A. Ferber, 11322 Donovan Road, Los Alamitos, Calif.  
Filed Dec. 30, 1971, Ser. No. 213,935  
Int. Cl. G10h 3/00  
U.S. Cl. 84-1.16 7 Claims



A stringed instrument, such as an acoustical guitar, is provided with a compact, battery powered sound amplification unit attached thereto in an arrangement including cooperating optoelectronic devices situated adjacent the instrument's strings. Each string intersects with a path of a light beam sent from a first light-emitting device toward a second light-detecting device so that vibration of a string modulates the intensity of light from the first device impinging on the second device to produce an electronic signal corresponding to the musical tone associated with any particular string vibration rate.

The unit can be affixed to an acoustical guitar and utilized to drive a speaker or equivalent acoustic transducer situated within the sound box of the guitar so as to cause the transducer to produce amplified musical tones corresponding to the musical notes played on the strings of the guitar. The source of electric power for operating this device shall be situated on or within the guitar to provide a self-contained device that is not dependent on a source of domestic electric power.

**3,733,954**  
**PEDAL GUITAR WITH SELECTIVE STRING CONTROLLING ARRANGEMENT**  
Grover G. Fields, Stanton, Calif., assignor to Columbia Broadcasting System, Inc., New York, N.Y.  
Filed June 2, 1969, Ser. No. 829,560  
Int. Cl. G10d 3/14  
U.S. Cl. 84-312 11 Claims



This invention provides an electric steel pedal guitar having two sets of horizontal strings, which at one end are extended downwardly over the end of the body of the instrument, engaging slides which are adjusted in position in vertical slots by means of threaded elements for thereby tuning the strings. The string tension is adjustable during playing of the instrument by a mechanism that includes pedals which, through rods, rotate bell cranks which pull on additional rods and levers to linearly move operating members having outward projections on the opposite sides of their end portions. These outward projections are engageable with the ends of two sets of levers which, in turn, pull triangular plates which, through rods, move bars carrying adjustable screws for engaging either of two levers mounted at the end of the instrument and supporting the ends of the strings. Inward movement of the bars when engagement is made with one lever of the set will cause the string tension to increase, while engagement with the other lever of the set will relax the string tension. A shifting mechanism actuated by an additional lever causes the support for the operating member to be pivoted, causing it to disconnect the levers used in moving the triangular plates for either set of strings, depending upon the direction of rotation of the shift lever, so that only one set of strings will be adjusted in tension during the playing of the instrument. A switching mechanism disconnects the pickup for the strings disconnected from the tension-adjusting mechanism.

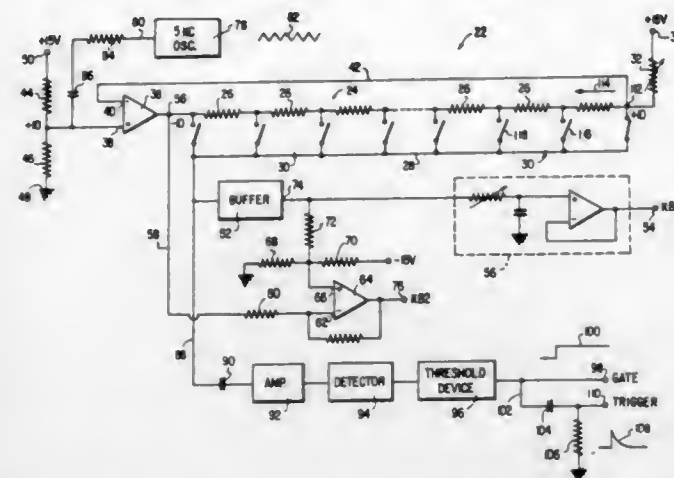
**3,733,955**  
**MUSIC SYNTHESIZER KEYBOARD CIRCUIT**  
Frederick G. Reinagel, Tonawanda, and Eugene M. Zumchak, Williamsville, both of N.Y., assignors to Venture Technology, Inc., Williamsville, N.Y.  
Filed Dec. 6, 1971, Ser. No. 205,245  
Int. Cl. G01h 1/00  
U.S. Cl. 84-1.01 20 Claims

A keyboard circuit for an electronic music generator, such as an electronic synthesizer. The circuit makes it possible to independently control the frequencies of two voltage controlled oscillators at the same time with a single resistance



string by sensing a change in potential across the entire string when a second key is depressed and summing this potential

cooperatively interfit with a respective recess. The recesses are of a predetermined depth with the devices being of a thickness as to project a distance outwardly from the surface



with the first note potential. Gate and trigger signals are provided for the two notes, one being generated by an AC signal superimposed on the string.

3,733,956

### SCALE FINGERING SLIDERULE

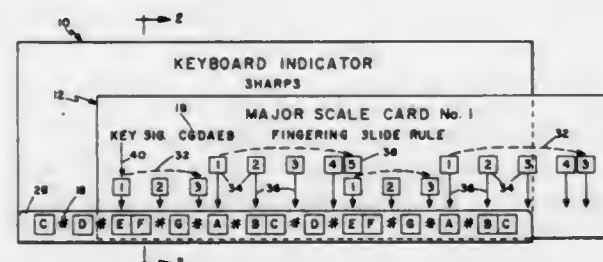
Verna M. Leonard, 6353 North Blackstone, Fresno, Calif.

Filed Aug. 13, 1971, Ser. No. 171,562

Int. Cl. G09b 15/02

U.S. Cl. 84-471

2 Claims



A scale fingering sliderule for showing the proper sequential fingering of the keys in various scales on a keyboard, the slide holder or body of the item being essentially an elongated panel, the lower edge of which fits behind the keys on the keyboard and is thereby supported in vertical position. The holder has chromatic scale indicia adjacent the lower edge portion to identify all the keys in the adjacent part of the keyboard, while a slider, as one of a set of sliders, on said panel, identifies the tones of at least one scale with the scale intervals and the proper fingering in ascending or descending scale progression. A plurality of sliders, for different scale progressions, are supported in channels provided on both sides of the holder, only one at a time being exposed on the front side of the holder in properly adjusted position relative to the aforementioned chromatic scale indicia on the holder to indicate the keys to be struck and the fingering sequence numerically.

3,733,957

### MUSIC TEACHING DEVICE

Mary Anne Peirano, and John F. Peirano, both of 1109 St. Agnes Avenue, Columbus, Ohio

Filed July 10, 1972, Ser. No. 270,091

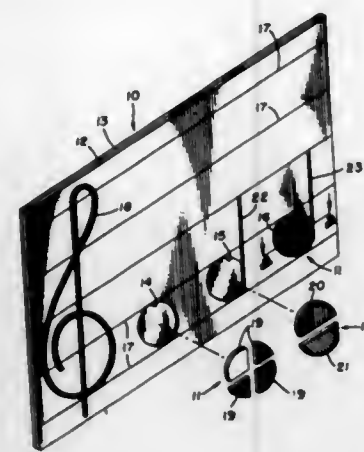
Int. Cl. G09b 15/02

U.S. Cl. 84-471

6 Claims

A teaching device for music is provided having a flat baseboard formed with a plurality of recesses and a like number of music symbol devices that are each removably insertible into a respective recess. The recess in the baseboard and the devices are configured so that each device will only

of the baseboard to facilitate removal after insertion in a respective recess. Arrangement of the recesses or configuration thereof and the devices form a musical notation system to aid in the teaching process.



3,733,958

### COLLAR ASSEMBLY FOR USE WITH A RIVET

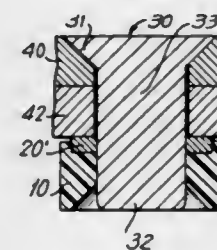
Glenn R. Willey, Santa Ana, Calif., assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Filed Dec. 10, 1969, Ser. No. 883,755

Int. Cl. F16b 19/04

U.S. Cl. 85-37

10 Claims



A breakable collar for use with a rivet and an associated metal collar comprises an annular body portion having a recess in one end face. The metal collar is carried in the recess and the resultant assembly is frictionally retained on the tail of the rivet with the metal collar bearing against the outer surface of an adjacent panel in which rivet is seated. When an axial force is applied to the rivet, the breakable collar splits or collapses so as not to interfere with the formation of the upset tail.

3,733,959

### EXPANSION ANCHOR

Artur Fischer, Althelmer Str. 219, D-7241 Tumligen, Germany

Filed July 30, 1971, Ser. No. 167,748

Claims priority, application Germany, Aug. 8, 1970, P 20 39 559.9; Sept. 3, 1970, P 20 43 620.8

Int. Cl. F16b 13/06

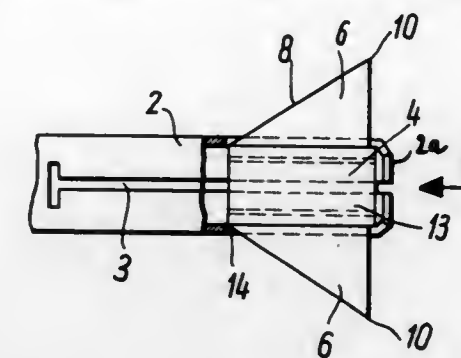
U.S. Cl. 85-75

9 Claims

An expansion anchor for use in a hole formed in a support of porous material. The anchor has a sleeve provided with two or more slots extending rearwardly from its front end, and an expander member for expanding the sleeve located entirely or in part in the latter and provided with at least two flat substantially triangular wings projecting radially outwardly beyond the circumference of the sleeve by a multiple of the diameter

of the latter in combination with twice the wall thickness of the sleeve. Outer edge faces of these wings diverge outwardly

and guide assemblies for the switches for attachment to the machine and utilizing a flexible rod for facilitating operation without precision mounting. The circuitry is mounted in a portable control panel or console and each of the limit switches may be plugged interchangeably into any of a plurality of sequence circuits. The speed and direction of motors ac-



from the axis of the sleeve in direction axially away from the trailing end of the sleeve and at an acute angle.

3,733,960

### ARTICLE HANDLING SYSTEM

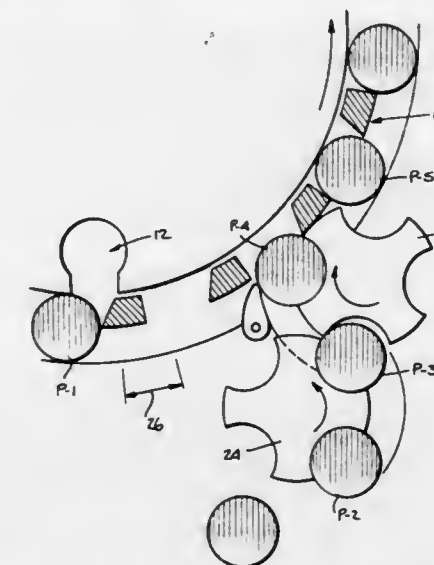
Eugene Ashley, Burlington; Francis L. Jarvis, Troy; Burton P. Clark, Shelburne; George E. Kontis, Essex Junction, and Paul A. Spoor, Jericho, all of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Nov. 23, 1971, Ser. No. 201,357

Int. Cl. F41d 9/00, 11/14

U.S. Cl. 89-33 MC

9 Claims



A battery gun has a stationary housing; a plurality of barrels disposed in an annular row and stationary with respect to said housing; each of said barrels having a respective chamber; feeding means for receiving a continuous and regular train of projectiles from a supply; intermediate means for receiving the train from said feeding means; and distributor means for receiving the train from said intermediate means for providing projectiles to said chambers; said intermediate means including means for sensing the presence of misfired projectiles in said chambers and for providing lacunae in the train of projectiles corresponding to such misfires, whereby no projectiles are provided to said distributor means for provision to chambers containing misfired projectiles.

3,733,961

CONTROL FOR MILLING MACHINES AND THE LIKE  
William B. Reynolds, Albuquerque, N. Mex., assignor to Automation Systems, Incorporated, Albuquerque, N. Mex.

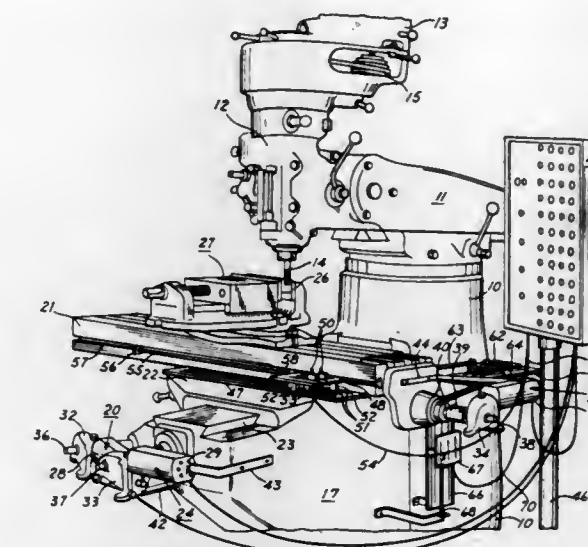
Filed Aug. 24, 1970, Ser. No. 66,195

Int. Cl. B23c 9/00

U.S. Cl. 90-21 R

15 Claims

An automatic control system for application to conventional machine tools utilizes readily adjustable limit switches



3,733,962

### SHEET METAL DEBURRING APPARATUS

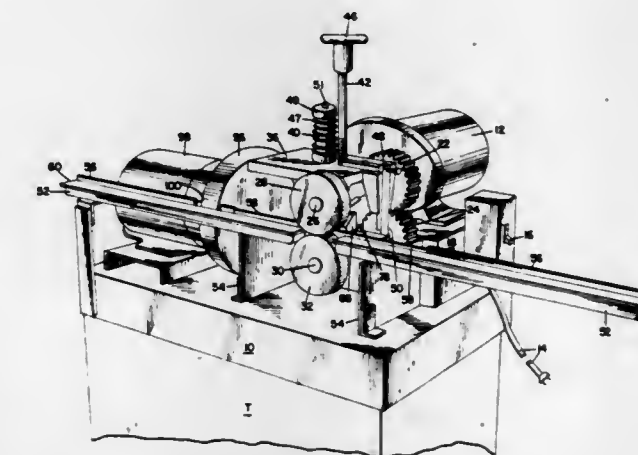
Tage G. Persson, Bloomfield, N.J., assignor to Falls Metal Works, Inc., Little Falls, N.J.

Continuation of Ser. No. 7,787, Feb. 2, 1970, abandoned. This application Nov. 22, 1971, Ser. No. 200,948

Int. Cl. B23d 1/26

U.S. Cl. 90-24 F

5 Claims



The present invention provides sheet metal deburring apparatus for removing burrs from the edge of a workpiece. The apparatus includes a base member which defines a path of travel for the workpiece, a pair of vertically aligned rollers for moving the workpiece along the path, and a cutting tool for removing burrs from the workpiece as it is moved along the path. The apparatus is particularly characterized by the fact that the cutting tool is positioned so that its cutting edge is disposed between the axes of the rollers in a vertical plane containing the axes of the rollers and within the path so that the cutting edge engages the workpiece at a point substan-



tially adjacent to the engagement of the workpieces by the rollers. The result of the positioning of the cutting tool in such a manner is that the workpiece is firmly gripped during deburring resulting in less chatter and a greatly improved and more efficient deburring apparatus.

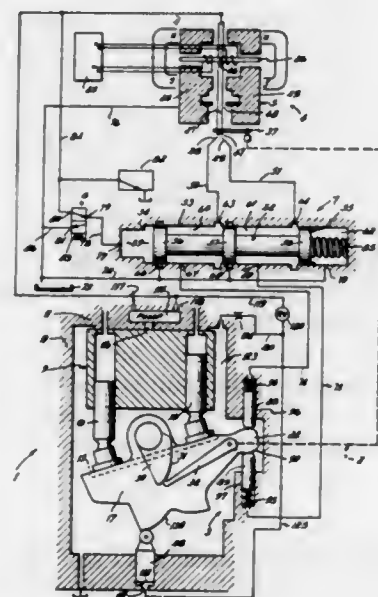
**3,733,963**  
**METHOD AND APPARATUS FOR CONTROLLING DISPLACEMENT OF A VARIABLE VOLUME PUMP OR MOTOR**

Charles A. Kubilos, Oxnard, Calif., assignor to Abex Corporation, New York, N.Y.

Filed Mar. 29, 1971, Ser. No. 128,733  
Int. Cl. F15b 13/02; F04b 1/26

U.S. Cl. 91-3

36 Claims



The displacement of a servoactuator, such as a variable volume piston pump or motor, is controlled by a servovalve of the jet discharge type having a movable jet tube which is responsive to an electrical input to establish a pressure differential between a pair of fluid lines in accordance with the magnitude of an electrical signal. The pressure differential is applied to operate opposed hydraulic motors which position the displacement changing means or hanger of the pump or motor. Hanger torque applied to the hanger by the inertia of the pump or motor pistons limits the capability of the servovalve to move the hanger under some performance conditions. To offset and neutralize this inertia torque, an auxiliary piston is operative to apply an opposing torque to the hanger of the pump or motor.

**3,733,964**  
**FLUID CONTROL SYSTEM**  
Ronald K. Schantz, Morton, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.

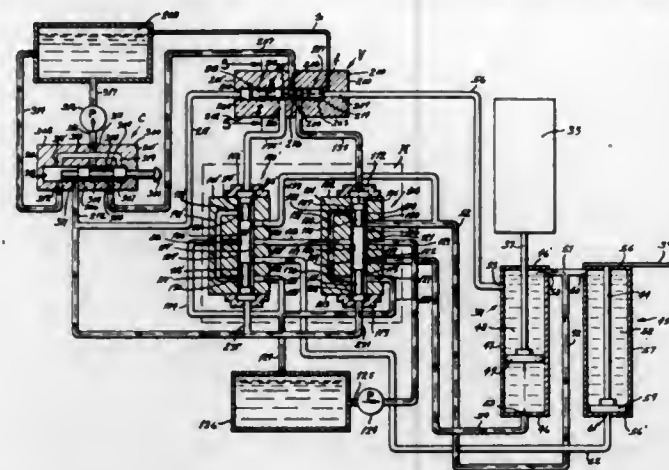
Filed Aug. 25, 1971, Ser. No. 174,595  
Int. Cl. F15b 11/16, 13/09

U.S. Cl. 91-412

6 Claims

A fluid control system for an elevating scraper incorporating a master control valve for selectively directing fluid to a floor gate cylinder and an ejector gate cylinder, and a pilot sequence valve for sequentially operating said master control valve to assure that fluid will be initially directed to the floor

gate cylinder and then subsequently to the ejector gate cylinder; there being a fluid line connecting the floor gate



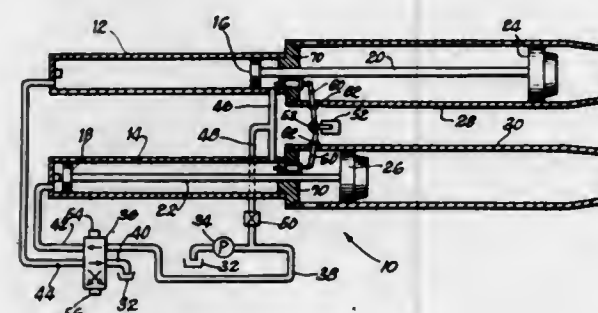
cylinder and the pilot sequence valve for passage of fluid to the latter after the floor gate has been fully extended.

**3,733,965**  
**CONTROL SYSTEM FOR FLUID CYLINDER**  
Bernard G. Braun, Watford, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed June 7, 1971, Ser. No. 150,458  
Int. Cl. F011 25/08; F15b 13/09

U.S. Cl. 91-275

5 Claims



A hydraulic control system for a power cylinder having a piston reciprocating therein and including the source of fluid under pressure, a reservoir, conduits connecting opposite ends of the cylinder to the source and the reservoir with a control valve in the conduits that has two positions for connecting the source to the respective ends of the cylinder.

The control system incorporates a switch cooperating with the valve and actuated by an actuator rod located in one end of the cylinder. The actuator rod is slidable in an opening in the end of the cylinder and has an end disposed in the path of the piston. A chamber is defined between the actuating rod and the opening and is placed in communication with the interior of the cylinder. The actuator rod has a first surface in the chamber that is opposed to the end surface of the rod with the first surface having a greater area than the area of the end surface so that the actuator rod is automatically maintained in a first position by the pressure of fluid in the cylinder and is moved to a second position when the piston approaches the end of the cylinder to actuate the switch and reverse the position of the valve.

**3,733,966**  
**HYDRAULIC POWER BRAKE BOOSTER**  
Arthur King Brown, Jr., South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

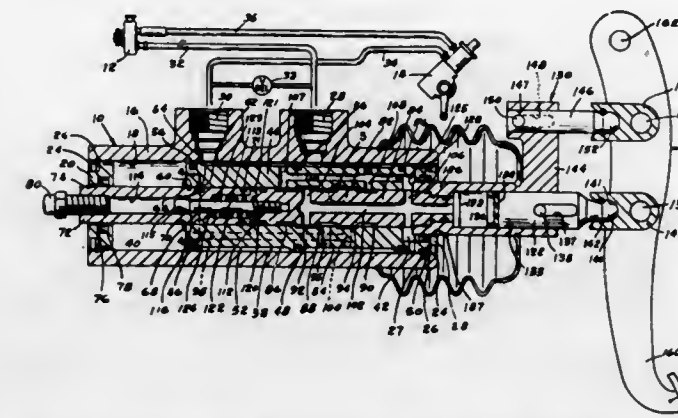
Filed Mar. 24, 1971, Ser. No. 127,684  
Int. Cl. F15b 13/16, 13/10, 15/17

U.S. Cl. 91-372

9 Claims

A hydraulic power brake booster which utilizes open center valve means positioned concentrically of the booster piston in

a manner to provide follow up action therebetween. The valve is equipped with a trim adjustment for regulating flow between the ports and to the respective ends of the booster piston. Operator-operated means including lever means is intercon-



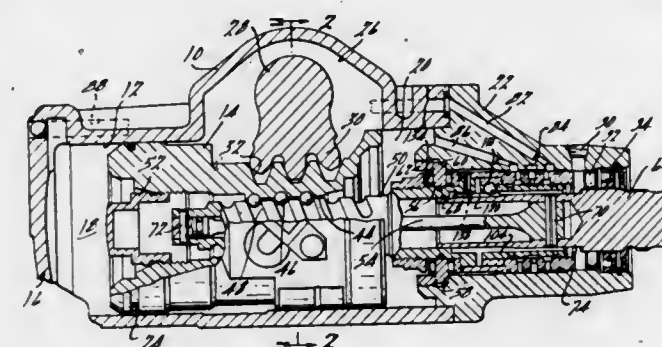
nected between the valve means and booster piston means to establish one ratio of lever to piston movement for power actuation and a different, higher ratio, of lever to piston movement for no-power.

**3,733,967**  
**POWER STEERING MECHANISM FOR AUTOMOTIVE VEHICLES**  
James J. Duffy, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 5, 1971, Ser. No. 131,307  
Int. Cl. F15b 9/10

U.S. Cl. 91-375 A

7 Claims



A valve mechanism for use with a concentric power steering gear for an automotive vehicle comprising a torque input shaft and a steering worm connected to the input shaft through a torsion bar that permits relative angular displacement of the input shaft with respect to the worm, a valve spool and a registering valve sleeve controlling pressure distribution to pressure movable portions of the steering gear when torque is applied to the input shaft and a mechanical connection between the sleeve and the worm which is adapted to accommodate for misalignment of the input shaft with respect to the axis of the worm.

**3,733,968**  
**BRAKE PEDAL TRAVEL LIMITER FOR HYDRAULIC BRAKE BOOSTER**  
Lloyd G. Bach, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

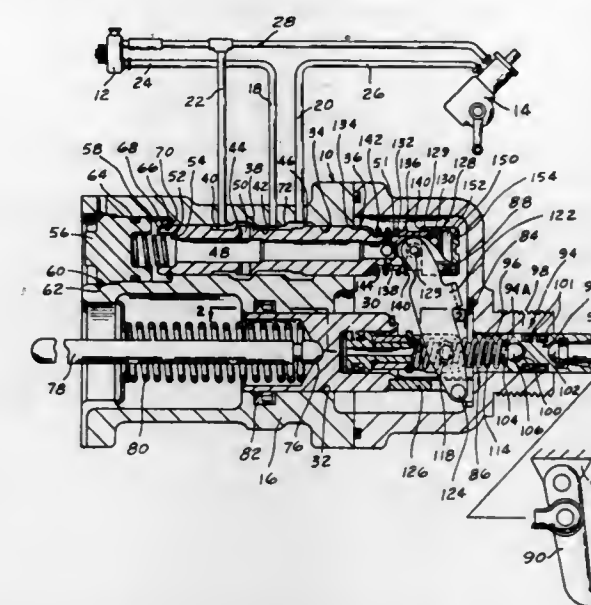
Filed Oct. 1, 1971, Ser. No. 185,612  
Int. Cl. F15b 13/10

U.S. Cl. 91-391 R

9 Claims

A hydraulic boost device for brakes having a housing with a bore therein in communication with an inlet and an outlet. A booster piston is slidably received in the housing so that one

end of the piston communicates with a pressure chamber which is in fluid communication with the bore. Valve means is slidably located in the bore for controlling fluid communication between the inlet, outlet and pressure chamber. Brake pedal operated means including a push rod and ratio changer levers are interconnected with the booster piston and the



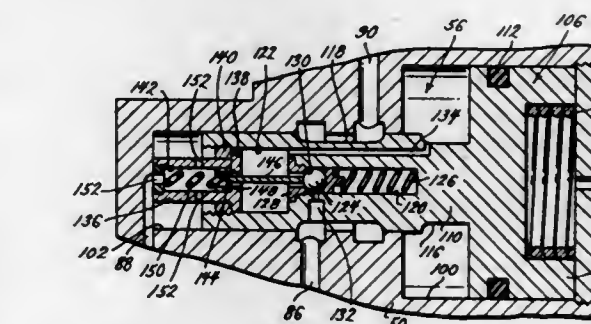
valve means so that brake pedal and push rod travel during a normal braking operation with hydraulic power assist will always be at some predetermined ratio to piston travel. Should a hydraulic failure occur in the boost device during a brake application, means effectively restricts push rod movement with respect to the booster piston thereby minimizing pedal travel.

**3,733,969**  
**HYDRAULIC SYSTEM**  
Robert S. Andrews, St. Peters, Mo., assignor to McDonnell Douglas Corporation, St. Louis County, Mo.

Filed Mar. 15, 1971, Ser. No. 124,327  
Int. Cl. F15b 13/042

U.S. Cl. 91-421

9 Claims



A hydraulic system has a high pressure supply line, a low pressure return line maintained at a pressure above the ambient pressure, and a plurality of subsystems connected between the supply and return lines. At least some of the subsystems individually include a selector valve and a hydraulically operated device. The selector valve is connected to the high pressure supply line and also to the return line, the latter connection being through a discharge line. The selector valve is also connected to the hydraulically operated device for diverting high pressure fluid thereto. A check valve is interposed in the discharge line for permitting fluid to flow from the discharge line to the return line, but not in the reverse direction, and consequently before fluid will flow past the check valve into the return line the pressure within the discharge line must equal that in the return line. Each subsystem of the foregoing nature further includes a shutoff valve which senses the return pressure in the discharge line and prevents high pressure fluid from being diverted to the



hydraulically operated device when the pressure in the discharge line falls off. Accordingly, should the discharge line or any line in common with it rupture, the shutoff valve will close and the subsystem will be rendered inactive, thus preventing the loss of hydraulic fluid through the rupture when an attempt is made to operate selector valve of the ruptured subsystem. A substantial loss of hydraulic fluid through the rupture would of course result in the failure of the entire hydraulic system.

3,733,970

# AXIAL PISTON MACHINE WITH ADJUSTABLE SWASH PLATE

Paul Bosch, Ludwigsburg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

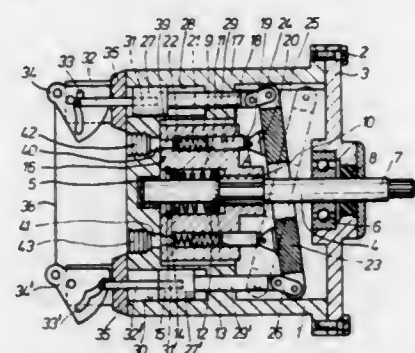
Filed July 20, 1971, Ser. No. 164,306

Claims priority, application Germany, July 29, 1970, P 20 37 635.6

Int. Cl. F01b 13/04

U.S. Cl. 91-506

15 Claims



An axial piston machine wherein the swash plate is held against rotation with the cylinder block and is tiltable to both sides of its neutral position by a mechanical, fluid-operated, electrical or electronic system. The swash plate is always tilted about an axis which intersects the axis of that piston in the cylinder block which is nearest to the valve plate to thus maintain the volumes of liquid-filled spaces between the pistons in their foremost positions and the valve plate at a minimum.

3,733,971

# FLUID CYLINDER

Masashi Sugimoto, Nagoya, Japan, assignor to Toyooki Kogyo Kabushiki Kaisha, Okazaki-shi, Aichi-ken, Japan

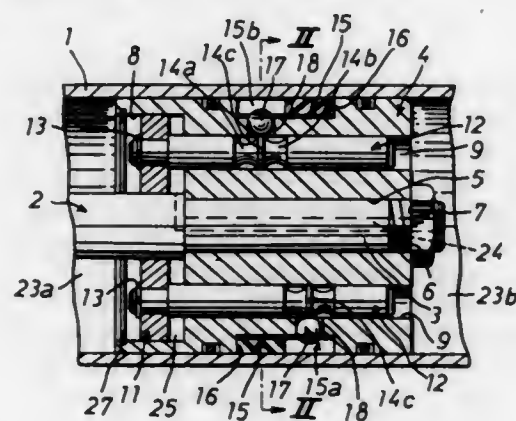
Filed Dec. 22, 1971, Ser. No. 210,708

Claims priority, application Japan, Dec. 28, 1970, 45/127991; Jan. 30, 1971, 46/3442

Int. Cl. F15b 15/26

U.S. Cl. 92-26

12 Claims



A pressure fluid cylinder having a tubular casing, a piston engaged reciprocally within the casing, two pressure chambers within the casing one on each side of the piston, a piston

rod connected to the piston, an annular brake band with radial self-returning force interposed between the outer wall of the piston and the inner wall of the casing, means operative only when in its neutral position to outwardly expand the brake band to frictionally engage the inner wall of the casing and to release the brake band when out of its neutral position, resilient means for normally conditioning the operating means to its neutral position, and pressure receiving means for moving the operating means out of its neutral position upon supply of fluid pressure into either of the two pressure chambers.

3,733,972

# SERVOMOTOR

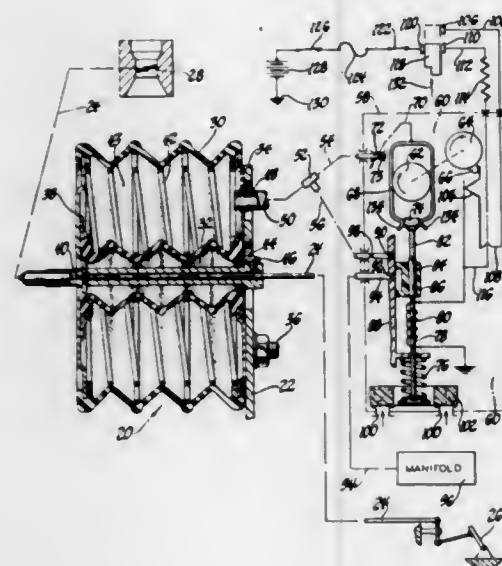
David D. Campbell, Lake Orion, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 849,321, Aug. 12, 1969, Pat. No. 3,603,425. This application Dec. 10, 1970, Ser. No. 96,740

Int. Cl. F01b 19/00; F16j 3/00

U.S. Cl. 92-37

1 Claim



A servomotor assembly having application in a vehicle cruise control system including an annular pleated bellows member having a fixed wall closing one end and a movable wall closing the other end defining a fluid pressure control chamber therein. A coil spring is disposed within the bellows member biasing the walls apart. The bellows member and the walls contain central openings receiving a control rod therethrough upon which is mounted a slidably adjustable stop member. The stop member is positioned for engagement by the movable wall during contraction of the bellows thereby actuating the control rod in accordance with the prevailing pressure fluid within the bellows member.

3,733,973

# PISTON, ESPECIALLY FOR COMPRESSION IGNITION ENGINES

Gunter Elsbett, and Ludwig Elsbett, both of Hippelstein, Germany, assignors to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft Werk Nürnberg, Nürnberg, Germany

Filed Feb. 18, 1971, Ser. No. 116,466

Claims priority, application Germany, Feb. 21, 1970, P 20 08 140.7

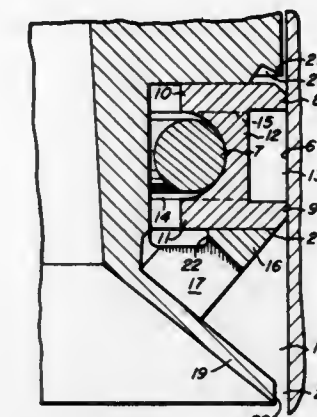
Int. Cl. F16j 1/08

U.S. Cl. 92-159

4 Claims

A piston, especially for compression ignition engines, which has piston rings fitted to the piston head and at least one radi-

ally sprung oil control ring in which the space at the back of the oil control ring is by at least one return flow system con-



nected with an annular space adjacent to the cylinder wall and divided from the interior of the cylinder.

3,733,974

# PISTON CYLINDER COMBINATION

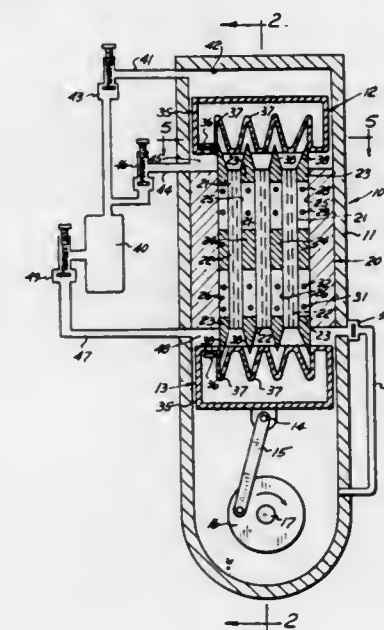
Mark Schuman, 101 G St. SW, Apt. A516, Washington, D.C.

Division of Ser. No. 861,256, Sept. 26, 1969, Pat. No. 3,583,155. This application Mar. 24, 1971, Ser. No. 127,600

Int. Cl. F16j 1/00

U.S. Cl. 92-172

12 Claims



A cylinder separated into two opposed portions interconnected by an elongated gas passageway which is constantly heated at one end and constantly cooled at its opposite end. Gas is forced back and forth through the passageway by a free piston arranged within the cylinder portion between the heated passageway end and adjacent cylinder end and by a driven piston, connected to a power take-off shaft and arranged in the opposite cylinder portion. The pistons have faces upon which are formed saw-tooth-like fins which mesh with corresponding fins formed in the cylinder at their respective passageway openings.

3,733,975

# CORNER BLOCK FORMING APPARATUS

Chris C. Terrasi, Grand Rapids, Mich., assignor to Stack-Pac Corporation, Grand Rapids, Mich.

Filed Jan. 3, 1972, Ser. No. 215,027

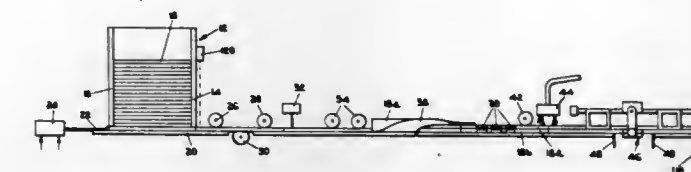
Int. Cl. B31b 1/12; B31d 1/00; B26d 3/06

U.S. Cl. 93-84 R

15 Claims

An apparatus for forming L-shaped corner posts having a hopper for dispensing seriatim multiple-ply boards of substan-

tially uniform thickness throughout, cutting means which form an elongated groove in the board, the groove penetrating all but one ply of the board and leaving a hinge between two unequal portions. Glue is applied to the uncut surface of the board and the unequal portions of the board are folded about



the hinge to form an L-shaped block. Squaring means align the cut edges of the unequal portions in a common plane while rollers compress the portions together so that uniformity of block shape is maintained. The L-shaped block has at least one of its surfaces sprayed with a protective coating and the block can then be cut into smaller lengths.

3,733,976

# INTERMEDIATE SUB-ASSEMBLY FOR USE IN MAKING COLOR PICTURE TUBES

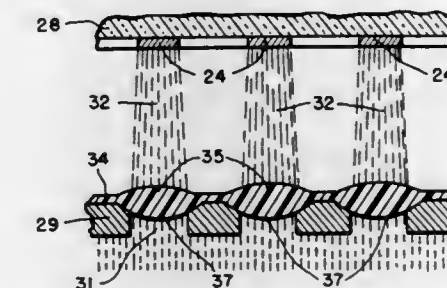
Leonard Detch, Skokie, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Division of Ser. No. 22,963, March 26, 1970. This application Oct. 12, 1971, Ser. No. 188,319

Int. Cl. G03

U.S. Cl. 95-1 R

1 Claim



An intermediate sub-assembly for manufacturing a color cathode-ray tube of the shadow mask type which comprises a shadow mask of opaque material provided with a plurality of apertures in a predetermined array and a corresponding plurality of optical lens elements directly supported by the shadow mask and individually in registration with a respective one of the apertures to provide for optical exposure through the shadow mask of image screen areas smaller than the apertures.

3,733,977

# PHOTOGRAPHIC TYPE-COMPOSING MACHINES

Grant T. Morgan, 809 S.E. 7th Avenue, Delray Beach, Fla.

Filed Sept. 10, 1971, Ser. No. 179,309

Int. Cl. B41b 17/32, 17/42

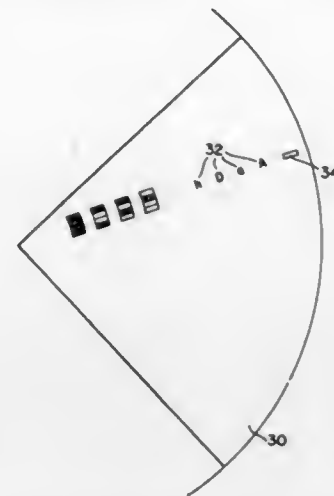
U.S. Cl. 95-4.5 R

4 Claims

A headline/display photocomposing machine having a rotatable character matrix disc, a flash lamp, focusing and size-changing optics, and a light-sensitive image-receiving surface. Each matrix character has an associated binary four bit code positioned on the disc representing the width value of the character. The elements or bits of each code are arranged serially (rather than parallel) so that the bits are sensed one after



another as they pass a sensing station. The control circuit of the machine recognizes the width codes in terms of their value



plus three, in order that a given binary four bit code may represent any standard character width value up to 18 relative units.

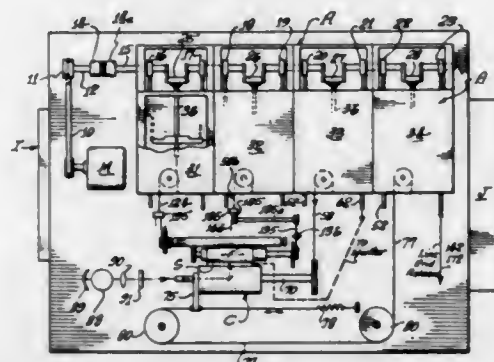
### 3,733,978 TYPE COMPOSER

Louis A. Spievak, 2905 Mandeville Canyon Road, Los Angeles, Calif.

Filed Sept. 5, 1967, Ser. No. 665,586  
Int. Cl. B41b 17/06

U.S. Cl. 95—4.5

9 Claims



The apparatus is designed to compose justified copy on a sensitized sheet or film exposed through a movable matrix to actinic rays which impress an image of the characters carried by the matrix onto the sensitized sheet material. Operation of the composer is in response to signals from a suitable source, typically a memory unit alone or a memory unit which is operated in conjunction with a keyboard to store one or more lines of type composition prior to justification of the lines. Provision is made for flexibility in operation and product output as well as accommodation to various allied equipment.

### 3,733,979 PHOTOCOMPOSING APPARATUS

Charles John England, Smallfield, England, assignor to The Monotype Corporation, London, England

Filed July 8, 1971, Ser. No. 160,847

Claims priority, application Great Britain, July 14, 1970, 34,069/70

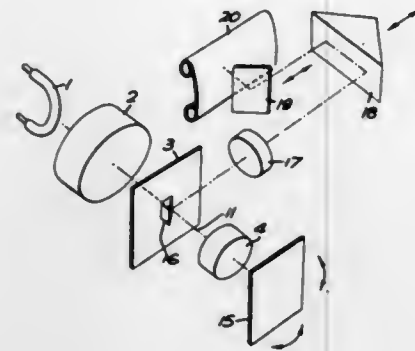
Int. Cl. B41b 17/12

U.S. Cl. 95—4.5

2 Claims

Photo-composing apparatus comprising a matrix of master characters, an optical system for forming a light beam bearing images of all the characters in the matrix, a lens for collimating the light beam, a second optical system for directing an

image of a selected master character on to a photo-sensitive member, and at least one rotatable scanning mirror disposed in the path of the collimated beam to direct a selectable portion of the collimated beam into the second optical system.



The second optical system includes a lens for forming a focused image of the characters in the matrix, in the plane of a mask which has an aperture sufficient to encompass the image of only one character.

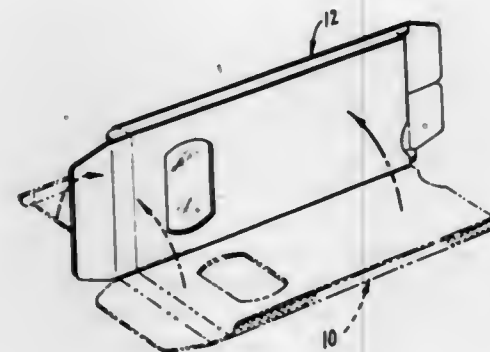
### 3,733,980

CARTON GLUING MACHINE AND METHOD  
Charles E. Palmer, and Stanley A. Peters, Somers, both of Conn., assignors to Palmer Machinery Development Corporation, Somers, Conn.

Continuation-in-part of Ser. No. 26,653, April 8, 1973, abandoned. This application Nov. 4, 1971, Ser. No. 195,599  
Int. Cl. B31b 1/56, 1/62, 49/02

U.S. Cl. 93—49 M

18 Claims



A novel carton forming apparatus has a travel path along which carton members move in rapid, continuous succession, when the machine is in operation. During such movement, intermittently movable means fold an entire longitudinal wall portion of the blank inwardly at substantially one time; means is also provided to effect contact between the wall portion so folded and a cooperating portion, in such a manner that substantially all of an area that has been rendered adhesive thereon is contacted and bonded at the same time. Novel feed mechanisms provide carton blanks in rapid succession to transport means of the machine, and novel folding mandrels and/or stationary mandrel elements may be used to effect the folding of the blanks. The invention also provides a method whereby cartons having a desirably rectilinear configuration can be formed at high production rates.

### 3,733,981

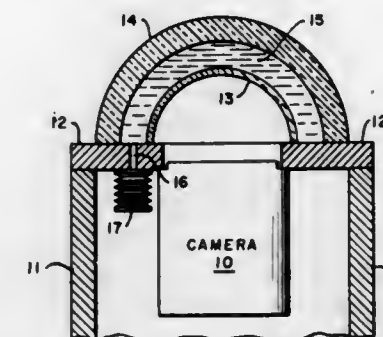
LENS PROTECTIVE SYSTEM FOR DEEP SEA CAMERA  
Chester L. Buchanan, Camp Springs, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 17, 1972, Ser. No. 272,244

Int. Cl. G03b 17/08

U.S. Cl. 95—11 UW

5 Claims



A lens arrangement for a camera useful in deep sea photography. An optical coupling fluid is provided between a protective window and the lens which absorbs the pressure to protect the lens thereby permitting the use of thinner lens materials.

### 3,733,982

MACHINE FOR PRODUCING SELF-OPENING ENVELOPES

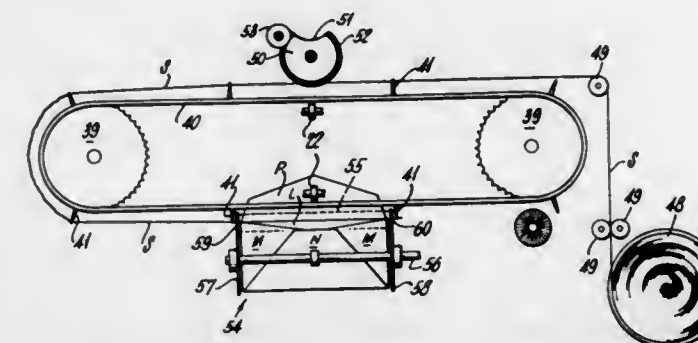
John Manolis, 308 West 94 St., New York, N.Y.

Continuation-in-part of Ser. No. 873,939, Nov. 4, 1969, abandoned. This application Sept. 3, 1971, Ser. No. 177,749

Int. Cl. B31b 1/90

U.S. Cl. 93—76

10 Claims



A machine for producing self-opening envelopes, feeds precut envelope blanks and advances them, transversely oriented, longitudinally along a path where successively: score lines are impressed in the blank to delineate the flaps from the front panel; the side flaps are folded and adhesive applied to its borders; the bottom flap is folded over the side flaps; a tear strip is advanced from a continuous length transversely across and above the envelope path and severed from the continuous length and depressed into engagement with an underlying envelope along a line delineating the front panel and closure flap; an adhesive having been previously applied to the tear strip; an adhesive is then applied to the closure flap border and the envelopes are then dried, closed and stacked. The tear strip applying mechanism includes a horizontal endless chain positioned above the envelope path and regularly spaced fingers depend from the chain and terminate in tear strip gripping notches. Transversely spaced severing blade and transfer fingers sever a length of tear strip from the conveyor fingers and transfer it to an underlying envelope.

### ERRATA

For Classes 95—1 R thru 95—4.5 see:  
Patents Nos. 3,733,976 thru 3,733,979

### 3,733,983

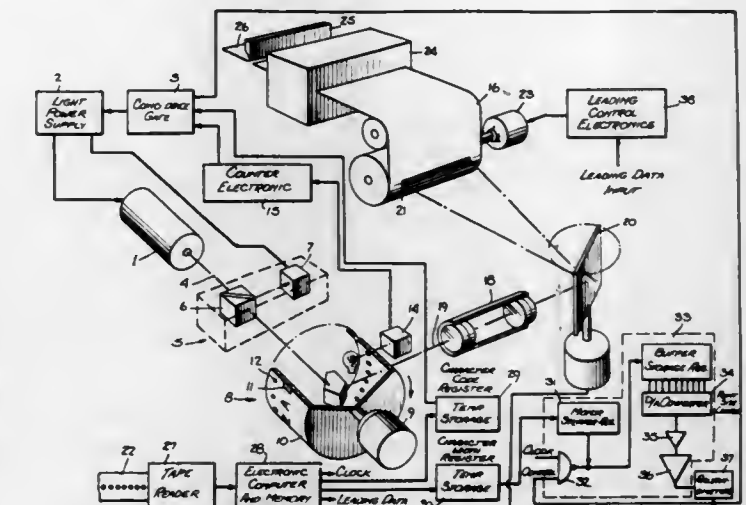
PHOTOGRAPHIC COMPOSITION SYSTEM USING A GALVANOMETER MOVEMENT  
David J. Sinnott, Ringwood, and Donald E. Alecci, Pine Brook, both of N.J., assignors to Star-New-Era, Inc., Hackensack, N.J.

Filed Feb. 9, 1971, Ser. No. 113,931

Int. Cl. B41b 15/00, 15/08, 17/10

U.S. Cl. 85—4.5 R

7 Claims



An improved photographic composition system utilizes a pulsed light source which projects a beam of light through a character information to produce an image which is reflected by a mirror onto a light sensitive sheet. The mirror is rotated by a galvanometer in response to electronic inputs so that the projected characters are properly spaced in accordance with their point sizes.

### 3,733,984

EXPOSURE CONTROL SYSTEMS FOR SINGLE REFLEX CAMERAS HAVING A DETACHABLE HOUSING

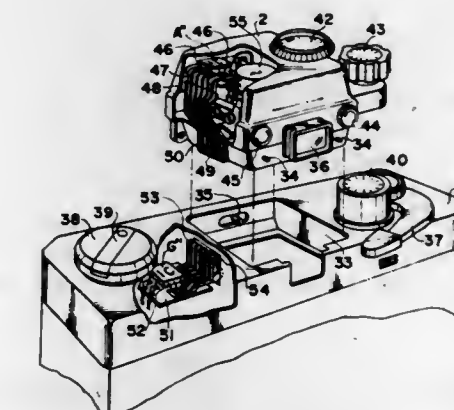
Kotaro Yata, Ikeda, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka-shi, Osaka-fu, Japan

Filed July 3, 1972, Ser. No. 268,375

Int. Cl. G03b 7/08, 19/12

U.S. Cl. 95—10 CT

5 Claims

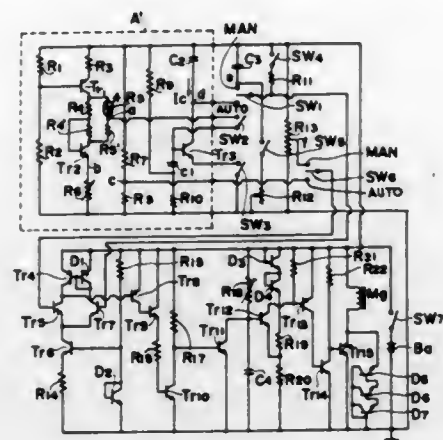


In a single lens reflex camera, an exposure control system for a photographic camera is so constructed that a housing having a pentagonal prism therein is attachable to and detachable from the camera body. A detecting circuit for detecting the brightness of an object through the objective lens in an exposure control circuit and a memory circuit are built-in to the housing and a portion of the circuitry thereof is made as an integrated circuit. In the camera body a portion of the



switching circuit for controlling the exposure of an electric shutter using the output of the detecting circuit as one input is built-in as an integrated circuit. The mounting of the pen-

the viewfinder lens system to introduce the light from the charge indicating lamp into the part of the field of view of the



tagonal prism housing onto the camera body causes the terminals of the detecting and memory circuit and the terminals of the switching circuit to connect with one another.

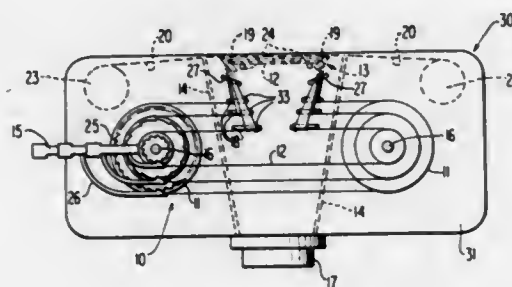
3,733,985

#### CAMERA FILM IMAGING DEVICE

Lester Gordon, 10 Louise Street, Lewiston, Maine  
Filed Dec. 17, 1971, Ser. No. 209,038  
Int. Cl. G03b 17/24

U.S. Cl. 95-1.1

8 Claims



Apparatus for printing an image upon a film negative in a camera is disclosed. The apparatus includes a series of tapes which carry figures to be recorded on the film by a portion of the light which enters the camera through the lens at the time a picture is taken and passes through the tapes to impinge upon the film. Either the tapes or the figures carried by the tapes can be transparent. The tapes are superimposed one upon the other in proximity to the film exposure area with spaces on the tapes to allow one or more figures carried by each of the tapes to be recorded simultaneously on the film.

3,733,986

#### DEVICE FOR ASCERTAINING CHARGING ON ELECTRONIC FLASH UNIT

Toshio Hayashi, Sahigaoka-Nakamachi; Keisuke Maeda, Osaka, and Yoshiharu Ohta, Hyogo, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan  
Filed Nov. 25, 1970, Ser. No. 92,773

Claims priority, application Japan, Dec. 9, 1969, 44/117282  
Int. Cl. G03b 17/20

U.S. Cl. 95-11 V

4 Claims

A device is provided with a light-transmitting rod for conducting light from a charge-indicating lamp on an electronic flash unit into the field of view of the camera viewfinder. One end of the light-transmitting member is positioned in front of

viewfinder outside of the scene-delineating frame, thereby to enable the operator to ascertain completion of charging while using the viewfinder.

3,733,987

#### DEVICE FOR FIRING FLASHLAMPS IN CAMERA

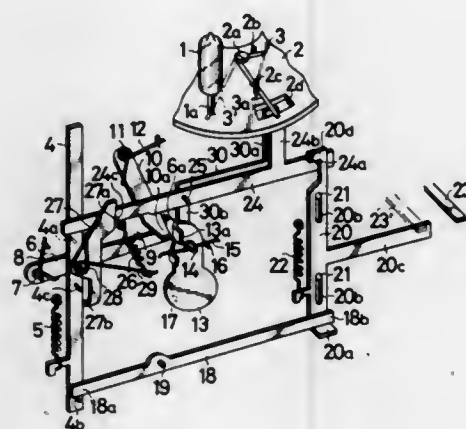
Akira Yamanaka, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed June 23, 1971, Ser. No. 155,743

Int. Cl. G03b 15/04

U.S. Cl. 95-11.5 R

15 Claims



A device comprises a changeover member disposed in operative relation to a shutter release member and adapted for a varying amount of movement in accordance with the need for flash photography, a detecting member whose operation is limited by the changeover member when a flash exposure is unnecessary and which detects the presence or absence of a striking member for firing a flashlamp when a flash exposure is required, and a locking member for interrupting the movement of the shutter release member in operative relation to the action of the detecting member when the detecting member detects that the striking member is not present at a predetermined tensioned position. Thus, when a flash picture is to be taken, the device prevents an exposure making operation which would otherwise be effected without firing of the flashlamp.

3,733,988

#### LIGHT MEASURING APPARATUS FOR A SINGLE-LENS REFLEX CAMERA

Lave Tenne, Norbyvallda, Sweden, assignor to Fritz Victor Hasselblad, Goteborg, Sweden

Filed June 21, 1971, Ser. No. 154,768

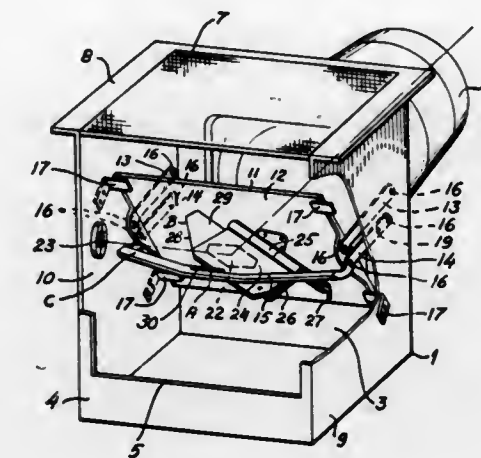
Int. Cl. G03b 19/12

U.S. Cl. 95-42

3 Claims

A single-lens reflex camera comprises an exposure meter disposed in the ray path of the camera. A portion of the view-

finder mirror surface is made partially specular to allow for the passage of the measuring light, and the viewfinder mirror holder on its rear side is provided with a folding deviating mirror to deflect the light in the direction of a measuring cell. The



motion of the deviating mirror which deflects the measuring light to a measuring cell disposed in a side wall of the camera housing is controlled by a parallel motion guide bar which is a part of the viewfinder mirror linkage.

3,733,989

#### AUTOMATIC FOCUSING ARRANGEMENT

Richard Wick, Alfred Winkler, and Bernhard Von Fischern, all of Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

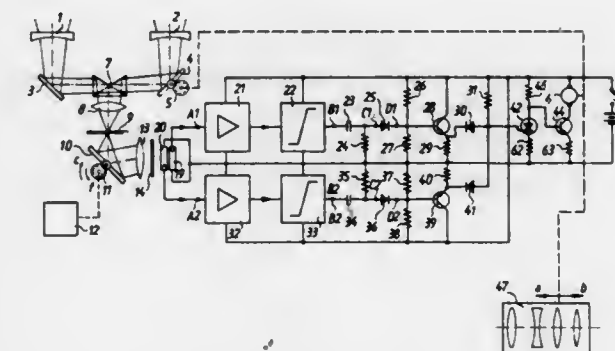
Filed Dec. 23, 1971, Ser. No. 211,373

Claims priority, application Germany, Dec. 24, 1970, P 20 63 705.2

Int. Cl. G03b 3/02

U.S. Cl. 95-44 C

13 Claims



A split image of a vertical edge of an object is formed by a standard range finder, the two half images coinciding in a vertical direction when the objective lens is properly focused. An oscillating mirror reflects light along a horizontal line including the top half image onto a first photocell and light along a horizontal line including the bottom half image onto a second photo-cell. The photocells thus emit a scanning signal when the respective half images are reflected thereon. A first and a second threshold circuit is responsive to these scanning signals and the outputs of the first and second threshold circuit are applied each to one input of an AND-gate, the output of which causes the motor positioning the objective lens to stop upon simultaneous receipt of the scanning signals.

3,733,990

#### PHOTOGRAPHIC FOCAL-PLANE SHUTTER

Rolf Noack, Dresden; Karl Kromer, Radebeul, and Paul Hillman, Dresden, all of Germany, assignors to Veb Pentacon Dresden Kamera- und Kinowerke, Dresden, Germany

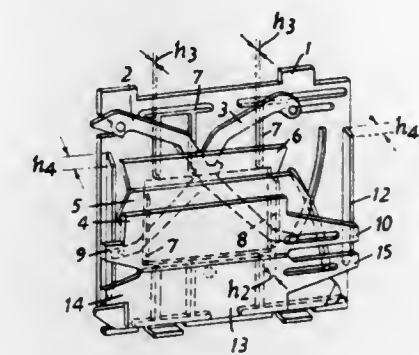
Filed July 19, 1971, Ser. No. 163,958

Claims priority, application Germany, Jan. 21, 1971, WP 152 632; Apr. 27, 1971, P 21 20 502.7; Great Britain, June 17, 1971, 28,512/71

Int. Cl. G03b 9/36

U.S. Cl. 95-55

2 Claims



The photographic focal-plane shutter has a base plate with an exposure aperture and is provided with a group of opening blades and a group of closing shutter blades. The blades are movable in planes lying parallel with the base plate. The opening shutter blade group is operated by levers which are pivoted in scissors fashion. The base plate is provided with guide skids extending from the base plate of which the opening and closing blades are guided. First and second additional skids extending from the base plate serve to guide a respective one of the levers. The skids and additional skids are of different height to effect spacing of the blades and levers from one another.

3,733,991

#### LENS SHUTTER

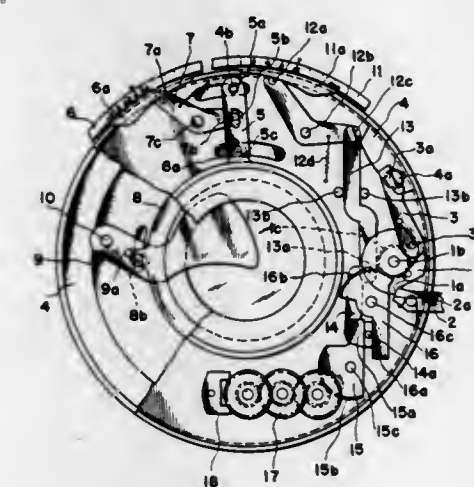
Tatsuo Kobayashi, and Masayuki Mino, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka-fu, Japan

Filed May 28, 1970, Ser. No. 41,195

Claims priority, application Japan, June 3, 1969, 44/43007  
Int. Cl. G03b 9/14

U.S. Cl. 95-63

6 Claims



In a camera lens shutter apparatus having an exposure time setting member, an exposure setting member, and shutter blades, and structure for opening and closing the shutter blades, a first control mechanism controls the speed of the shutter blades at a maximum aperture setting and a second control mechanism additionally controls the speed of the shutter blades so that the opening and closing time interval



thereof corresponds to a settable exposure time setting. A retarding mechanism is interlocked with the blade driving means for varying the opening and closing speed of the shutter blades in accordance with the setting of an exposure time setting member.

### 3,733,992 DEVICE FOR PROCESSING PHOTOGRAPHIC MATERIAL

Emile Frans Stievenart, Hoboken, and Herman Fernand Verbruggen, Berchem, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

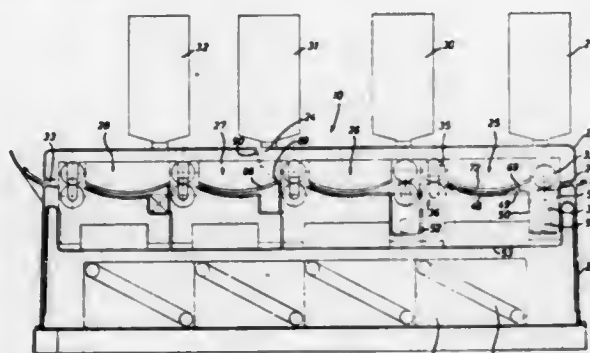
Filed Sept. 1, 1971, Ser. No. 177,022

Claims priority, application Great Britain, Feb. 19, 1971, 42,015/70

Int. Cl. G03d 3/12

U.S. Cl. 95—94 R

13 Claims



In a wet processing apparatus for photographic material wherein the material is guided at least partially through and out of a body of processing liquid by a guide plate having a grooved surface and extending upwardly from below the liquid level to an egress end above the liquid level, a plurality of openings are formed in the plate intermediate the liquid level and egress end, with each opening communicating with at least one groove, to permit the overflow of the liquid therethrough. Preferably, an anti-siphon passageway connects each such opening with the atmosphere.

### 3,733,993 APPARATUS FOR DEVELOPING PHOTOGRAPHIC MATERIALS

Daniel J. Lasky, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

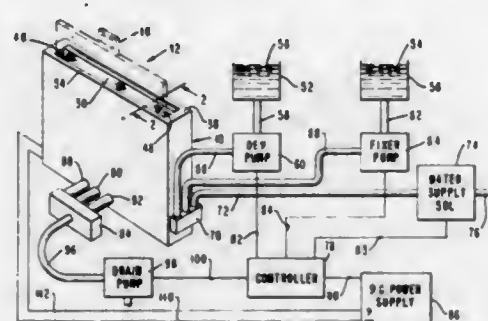
Division of Ser. No. 744,405, July 12, 1968, Pat. No.

3,615,515. This application June 30, 1971, Ser. No. 158,563

Int. Cl. G03d 3/04

U.S. Cl. 95—89 R

7 Claims



Photographic elements are immersion developed with image-dependent agitation of the developer relative to the element surface. Development releases negatively charged waste particles that congregate adjacent the image areas. A negatively charged electrode in the developer tank electrolyzes the developer releasing a uniform stream of fine hydrogen bub-

bles. This electrode is situated so that the bubbles gently scrub the face of the element, dislodging the waste particles. A positively charged electrode attracts the particles, permitting fresh developer to reach developing image areas.

### 3,733,994 APPARATUS FOR WASHING OF PHOTOGRAPHIC MATERIAL

Clarence J. Armstrong, Lowell, and Alvin Cronig, Lexington, both of Mass., assignors to Stek Corporation, Lexington, Mass.

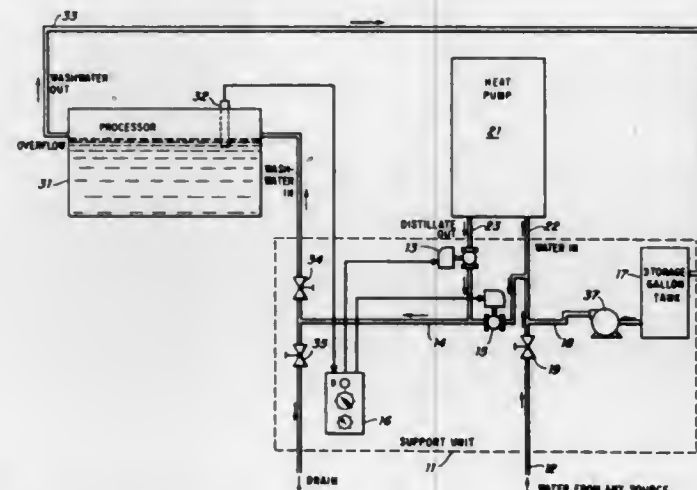
Division of Ser. No. 610,127, Jan. 18, 1967, Pat. No.

3,531,284. This application Sept. 16, 1970, Ser. No. 72,739

Int. Cl. G03d 3/02

U.S. Cl. 95—97

5 Claims



An apparatus for controlling the contamination level of photo wash water supporting an environment for ionic substitution of simple thiosulfate salts in the water with complex argento thiosulfates on the photographic emulsion surface. A water purifier is placed in closed loop with the wash tank to control the level of contamination.

### ERRATUM

For Class 95—11 UW see:  
Patent No. 3,733,981

### 3,733,995 SLOT DIFFUSER

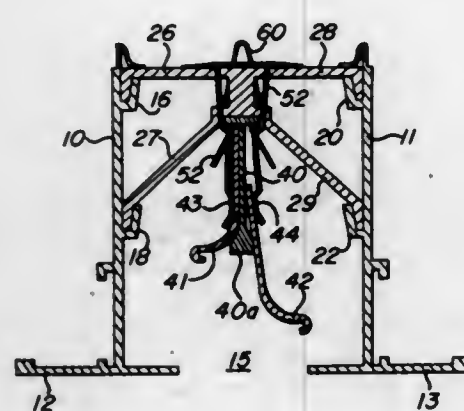
Carlton E. Brown, Tucson, Ariz., assignor to Lear Siegler, Inc./Krueger Division, Tucson, Ariz.

Filed Apr. 12, 1971, Ser. No. 133,292

Int. Cl. F24f 13/06

U.S. Cl. 98—40 D

4 Claims



A diffuser construction utilizing elongated parallel, spaced-apart side walls interconnected by a bridge member having extensions fitting into channels provided therefor in the side

walls. An intermediate wall is positioned an equidistance from the side walls and is held in firm abutting relationship with the bridge through the expediency of an assembly clip straddling the bridge and snapping the upper portion of the intermediate wall. Adjustable vanes slidably engage the surfaces of the intermediate wall and may be positioned to divert conditioned air passing downwardly between the side walls and out through a slot formed between the bases of the side walls.

### 3,733,996 VENTILATION DEVICE

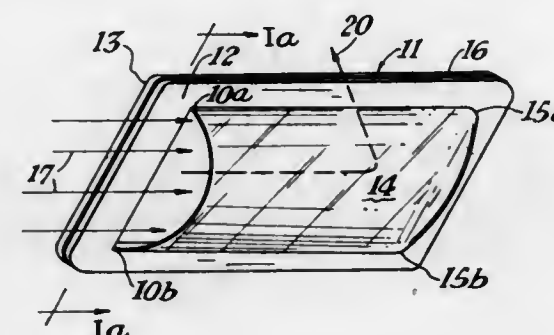
James E. Naccarato, 727 Broad Avenue, Belle Vernon, Pa., and David R. Farkas, 904 Monroe Avenue, McKeesport, Pa.

Filed Jan. 4, 1971, Ser. No. 90,168

Int. Cl. B60h 1/24

U.S. Cl. 98—2.12

11 Claims



This invention relates to a ventilation device which may be used in an aircraft window and which has an outer rigid portion peripherally surrounding at least a portion of an inner flexible portion and physically connected thereto. The inner flexible portion has at least one portion thereof having a lineal physical dimension greater than the distance between first points on the outer rigid portion where the flexible portion physically connects at the first points on the outer peripheral rigid portion. The inner flexible portion has a second portion thereof having a lineal physical dimension substantially equal to the distance between second points on the outer rigid portion where the flexible portion connects to the outer rigid portion. This structure thereby forms a flexible fluid medium ventilation device whenever the flow of the fluid medium is in the direction of the second points from the first points.

### 3,733,997 HOLD DOWN ATTACHMENT FOR A SKINNING MACHINE

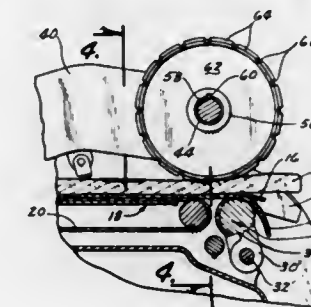
Donald L. Beasley, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed Feb. 8, 1971, Ser. No. 113,270

Int. Cl. A22c 17/12

U.S. Cl. 99—233.11

6 Claims



A hold down attachment for a skinning machine comprising a hold down roller means rotatably mounted above the feed roller and skinning blade of the skinning machine. The hold down roller means is comprised of a plurality of spaced apart

resilient rollers mounted on a driven shaft and adapted to engage the slab being skinned. The configuration of the resilient rollers is such that the slab is simultaneously stretched in two lateral directions as the slab is being skinned which maintains the bottom of the slab in a straight or horizontal condition as it engages the skinning blade. A modified form of the hold down roller means is also disclosed and comprises a plurality of spaced apart rollers, each of which are comprised of four spring loaded shoes extending outwardly from a central hub portion. The spring loaded shoes engage the slab being skinned and simultaneously stretch the slab in two lateral directions as the slab is being skinned to maintain the bottom of the slab in a straight or horizontal condition to achieve the same results as the first described embodiment.

### 3,733,998 PRESSURE COOKER

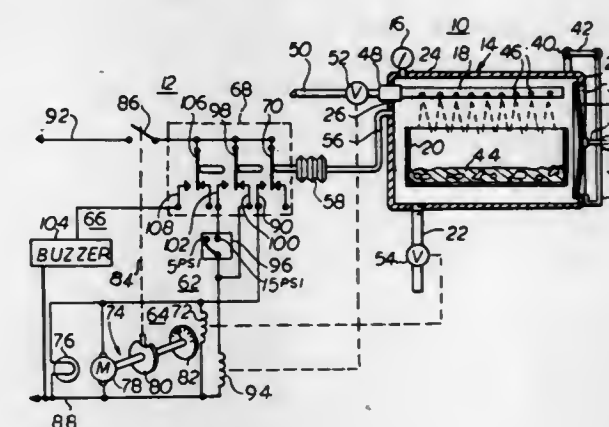
Alfred Vischer, Jr., Tucson, Ariz., assignor to Vischer Products Company, Chicago, Ill.

Filed Apr. 6, 1971, Ser. No. 131,639

Int. Cl. A47j 27/14

U.S. Cl. 99—330

8 Claims



To control the pressure in a steam cooker, a switch arm of a pressure actuated switch is normally closed to a first contact that is in series with and energizes the coil of a normally-closed, solenoid-operated valve to permit steam to enter the steam cooker. The switch arm breaks with the first contact at 5 psi in the steam cooker and makes with a second contact that is in series with a single-throw, single-pole manually-operated switch and with the coil of the solenoid-operated valve to hold the valve open when the manually-operated switch is closed so that the pressure in the cooker is maintained at 15 psi, the pressure of the steam source, and to close the valve when the manually-operated switch is open so that the pressure in the cooker is maintained at 5 psi.

### 3,733,999 BARBECUE SPIT AND DRIVE MECHANISM

Bernard J. Bernstein, 3629 North 5th Avenue, Phoenix, Ariz.

Filed Feb. 19, 1971, Ser. No. 116,996

Int. Cl. A47j 37/04

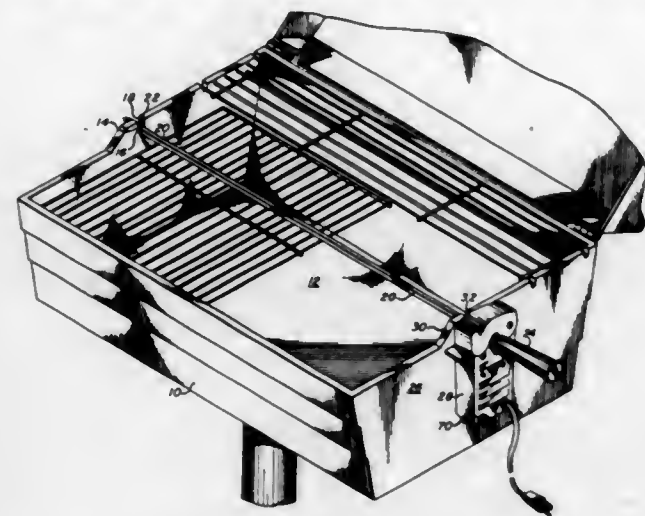
U.S. Cl. 99—337

2 Claims

A barbecue spit and drive mechanism having upwardly open concave cradle type bearings in which a spit is rotatably mounted; a rotary gear disposed on a spit and adapted to engage a motor driven gear when the spit is in said upwardly open concave bearings, whereby the loaded spit may be readily and conveniently moved vertically downward into engagement with said bearings and into driving relationship with said motor driven gear. The mechanism also includes a safety cover, for the gear on said spit, adapted to prevent rotation of



said gear on said spit when said cover is in open position relative thereto; and means operable by said cover adapted to



prevent rotation of said spit when said cover is in open position over said gear on said spit.

3,734,000

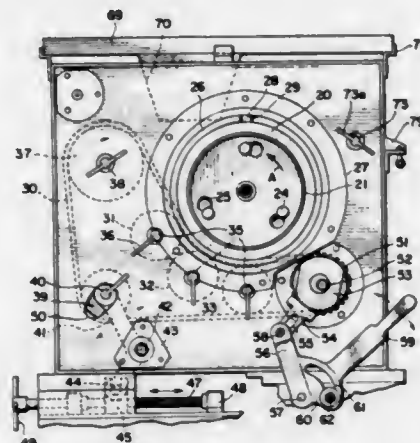
**MEAT PROCESSING AND SEPARATING APPARATUS**  
Otto Ziener, Toronto, Ontario, Canada, assignor to Allan John Lackstone and Adele Handelman

Filed June 24, 1971, Ser. No. 156,182

Int. Cl. B02b 7/04

U.S. Cl. 99—539

9 Claims



This specification discloses an apparatus for separating edible products such as meat, flesh or fish from bone, carcasses and the like, having a rotary drum with a large number of small holes or perforations therethrough, driven at a predetermined speed and a pressure belt, one side of which is pressed firmly into contact with the drum and is adapted to move in the same direction as the drum, and having a series of pressure rolls forcing the belt into engagement with the drum at spaced points therearound, and adjustment means for tensioning the belt to the tension most suitable for the particular product being processed, and having scraper means for scraping the bone and cartilage residue and other material adhering to the exterior of the drum, and rammer means for ramming the carcasses between the moving belt and drum.

3,734,001

**BASTING MATERIAL INJECTION SYSTEM**  
Marvin B. Poster, Rte. 1, Forest Hills, Harrisonburg, Va.

Filed June 8, 1971, Ser. No. 151,070

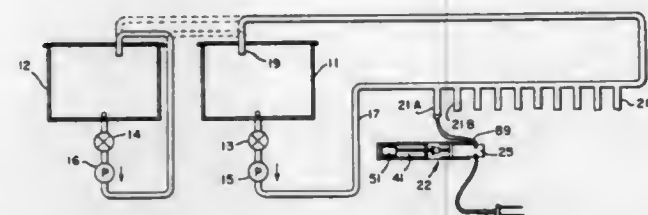
Int. Cl. A23b 1/16

U.S. Cl. 99—532

6 Claims

In the injection system disclosed herein, a precisely preselectable quantity of basting material is injected into the

flesh of a meat fowl by means of an injection cylinder, the stroke of which is precisely controlled by a pilot valve mechanism. The injection cylinder draws basting material



from a supply conduit through which the material is continuously circulated, assuring that suitably mixed basting material is continuously available.

3,734,002

**MEANS FOR PEELING PINEAPPLES**

Malcolm W. Loveland, Orinda, Calif., assignor to Atlas Pacific Engineering Company, Emeryville, Calif.

Division of Ser. No. 852,251, Aug. 22, 1969, Pat. No.

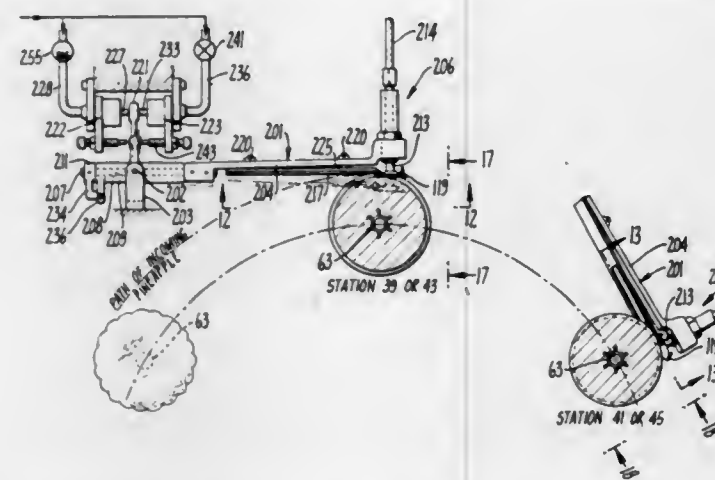
3,638,696, which is a continuation-in-part of Ser. No. 612,584, Jan. 30, 1967, Pat. No. 3,473,588. This application Jan. 25,

1971, Ser. No. 109,324

Int. Cl. A23n 7/00

U.S. Cl. 146—6

11 Claims



Means are provided for peeling and preparing pineapples with a minimum of hand labor and a maximum yield of fruit for canning and other uses.

3,734,003

**ONION PEELER**

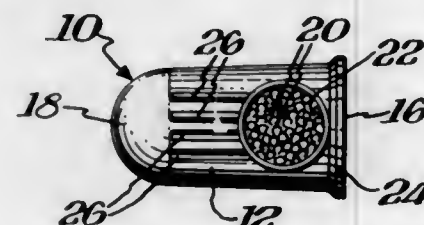
Samuel L. Gerson, Wilmington, Del., assignor to Restaurant Equipment Design Co., Wilmington, Del.

Filed Oct. 6, 1971, Ser. No. 186,850

Int. Cl. A47J 17/00

U.S. Cl. 99—588

10 Claims



Sharp abrasive particles are glued to an area near the base of an elongated rubber fingertip which has raised projections between the closed end of the tip and the sharp particles. The

sharp particles gouge ends of skin out of the onion, which are rubbed and stripped off by the projections. This operation is preferably performed under water to suppress annoying juices and odors.

3,734,004

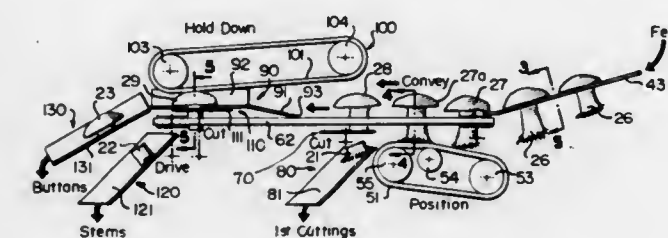
**AUTOMATIC MUSHROOM TRIMMING MACHINE**  
Anthony V. Losito, West Grove, Pa., assignor to Losito Mushroom Corporation, Toughkenamon, Pa.

Filed Oct. 19, 1970, Ser. No. 81,652

Int. Cl. A23n 15/04

U.S. Cl. 146—78 R

10 Claims



An automatic, in-line mushroom trimming machine is provided that includes improved means for sequential feeding of mushrooms, root removal, and bottom removal which are based upon movement and handling of mushrooms with foam-surfaced belts.

## ERRATUM

For Class 99—462 see  
Patent No. 3,733,702

3,734,005

**WASTE COMPACTING APPARATUS**

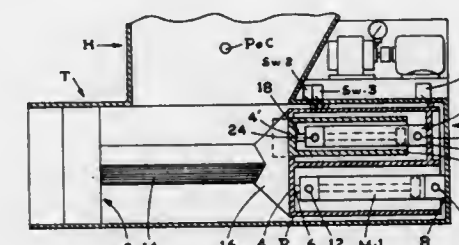
Rudl Richard Vogel, R.R. No. 1, Preston, Ontario, Canada

Filed Jan. 19, 1972, Ser. No. 219,032

Int. Cl. B30b 15/22

U.S. Cl. 100—52

8 Claims



Waste compacting apparatus comprising a hopper; a compaction tunnel communicating with the hopper and providing an outlet for waste deposited therein; a packer located and reciprocable through successive forward and return strokes to advance waste from the hopper into and through said compaction tunnel, a ram, forming part of said packer, normally telescoped therein and retractably extendible therefrom in the direction of reciprocation of said packer, the ram having a leading end which forms a small portion of that of the packer as a whole when the ram is telescoped therein; motor means for reciprocating said packer through successive cycles of operation respectively comprising forward and return strokes, a standard cycle of operations commencing at a lead-off position with the ram telescoped in the packer and re-cycling means, responsive to mechanical stalling of the packer in the forward stroke of a standard cycle of operations, for terminating the forward stroke, returning said packer to its lead-off position, and initiating a special cycle of operations comprising forward and return strokes in which the forward stroke is effected with the ram extended.

3,734,006

**WASTE DISPOSAL SYSTEM**

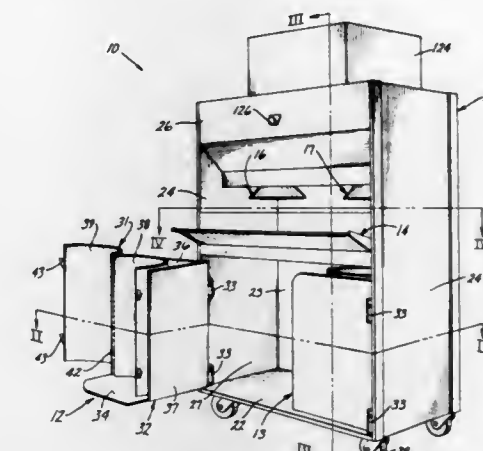
Ransom J. Hennells, Plymouth, Mich., assignor to Compactor Company, Inc., Belleville, Mich.

Filed Nov. 7, 1969, Ser. No. 874,940

Int. Cl. B30b 1/32

U.S. Cl. 100—53

21 Claims



A waste compactor comprising a cabinet having an extendible ram assembly mounted adjacent the upper end thereof and a swingable receptacle assembly positionable below the ram assembly. The receptacle assembly includes a platform hingedly mounted on the cabinet for horizontal swinging movement between a filling position wherein the receptacle is positioned directly under the ram, and an emptying position wherein the receptacle is swung outwardly from the cabinet to facilitate unloading of bags filled with compacted waste. The receptacle includes a first arcuate portion fixed to the swingable platform and a second arcuate portion hingedly connected to the fixed portion. The hinges connecting the platform to the cabinet include cam means for causing upward lifting of the platform away from the base of the cabinet as the platform is initially swung away from the filling position. Ram assembly includes a telescoping fluid pressure cylinder having a compacting shoe on the lower end thereof.

3,734,007

**CONVEYOR PRESS**

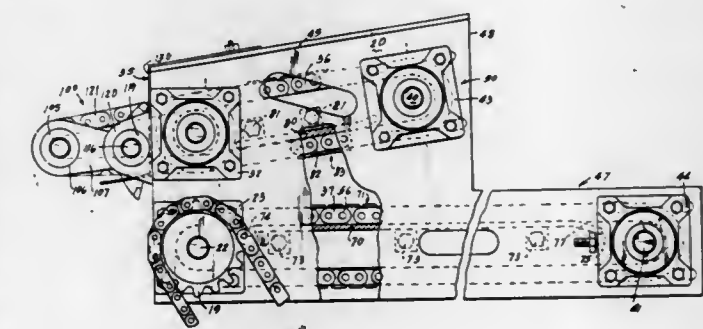
Gerhard J. Husen, Tacoma, Wash., assignor to Hygrade Food Products Corporation, Detroit, Mich.

Filed Mar. 1, 1971, Ser. No. 119,579

Int. Cl. B30b 5/04

U.S. Cl. 100—152

10 Claims



A conveyor for deformable items such as meat for use as an infed to a secondary device which concludes a lower conveyor bed for movement in a given direction with a support plate positioned under the product carrying surface and an upper conveyor inclined at an angle to the lower conveyor and moving therewith with a support plate under the product contacting surface, the lower conveyor extending beyond one end of the upper conveyor whereby a product may be placed on



the extension of the lower conveyor and moved in between the upper and lower conveyor where it will be contacted by both and compressed while being conveyed to the outlet end of the conveyor.

3,734,008

# ARRANGEMENT IN RECEPTACLES FOR RECEIVING MATERIALS, PARTICULARLY REFUSE

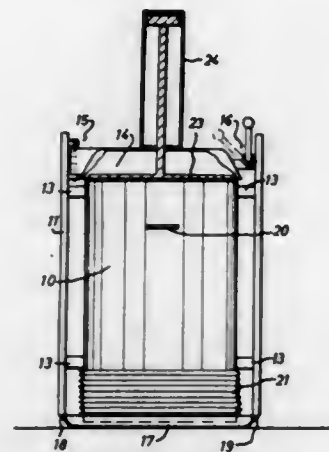
Olof Robert Wilhelm Akerberg, Storgatan 77, Vetlanda, Sweden

Filed Dec. 21, 1970, Ser. No. 99,959

Int. Cl. B30b 15/32

U.S. Cl. 100—218

2 Claims



A refuse receptacle that compacts the refuse deposited therein and places the compacted refuse in a bag or like container. The receptacle comprises a tubular element, a cover pivoted thereto and having a compressing mechanism including a pressure plate to be moved down into the tubular element, and a bottom plate from which the tubular element can be detached and moved axially. When the bottom plate is non-displaceably connected to the tubular element the refuse is compacted, and when the bottom plate is loosened from the tubular element the refuse is pushed out of the tubular element down into the bag which is loosely passed onto the tubular element and has its bottom supported on the bottom plate.

3,734,009

# COMPACTOR AND DRIVE ASSEMBLY

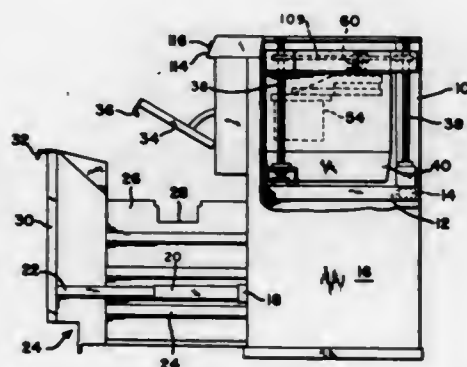
Einar O. Engerbreten, Troy, Ohio, assignor to The Hobart Manufacturing Company, Troy, Ohio

Filed Nov. 2, 1971, Ser. No. 194,891

Int. Cl. B30b 15/06

U.S. Cl. 100—229 A

12 Claims



A trash compactor including a housing, a trash receptacle movable into and out of the housing and a hollow ram which is vertically reciprocal into and out of the trash receptacle when the receptacle is positioned fully within the housing. The motor, drive sprockets, chains, etc. are all mounted on the ram structure, with the motor actually positioned within the hollow

ram to provide an exceptionally compact construction. The drive assembly drives three, triangularly oriented sprockets which are internally threaded and threadably engage stationary jack screws correspondingly positioned within the housing. Driving the three sprockets, therefore, causes the ram and drive assembly to move upwardly and downwardly on the stationary jack screws.

3,734,010

# HIGH SPEED NUMBER PRINTER

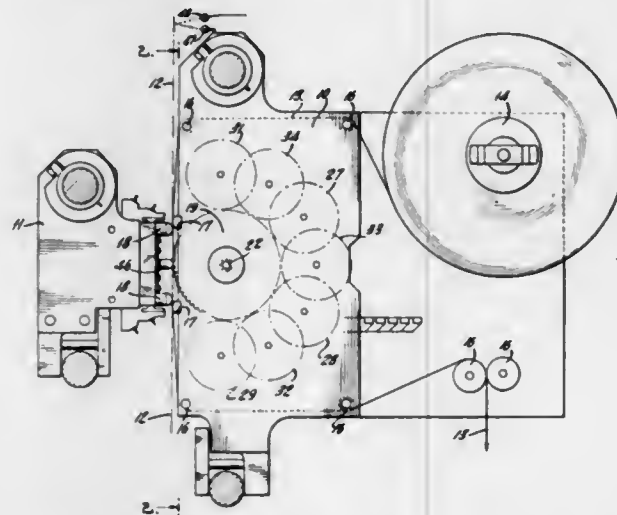
Richard L. Le Gault, Brooklyn, N.Y., and Per Lennart Andersson, Berwyn, Pa., assignors to Heller Roberts Instrument Corp., Brooklyn, N.Y.

Filed July 7, 1971, Ser. No. 160,343

Int. Cl. B41j 5/30

U.S. Cl. 101—79

24 Claims



A numbering station for a high speed printing machine is disclosed. The numbering station numbers a web moving through and being printed upon at other stations in the printing machine. At the numbering station a plurality of parallel numbering wheels, mounted on a common axis, are each individually positioned by a separate stepping motor in response to electric signals applied thereto. A ribbon passed between the numbering wheels and the moving web transfers ink to the web when a platen mounted in back of the web is periodically actuated.

The numbering wheels disclosed have numbers along a first sector of the periphery thereof and gear teeth along a second sector of the periphery thereof. The gear teeth are engaged by other gears each driven by one of the individual motors. Electrical signals are applied to the motors to move the numbering wheels to predetermined positions in response thereto. The numbers on the numbering wheels are arranged in an interlaced sequence to minimize the amount of travel necessary for consecutive numbering. A special stepping motor drive system is also disclosed which efficiently advances such numbering wheels.

3,734,011

# DOCUMENT ENCODING APPARATUS

Richard M. Williams, Livonia, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sept. 17, 1970, Ser. No. 72,921

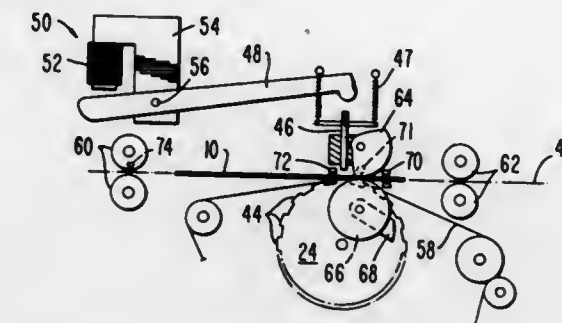
Int. Cl. B41l 47/46; B41l 13/48

U.S. Cl. 101—91

14 Claims

Apparatus for printing on unit records or documents of at least two different lengths as they are being rapidly conveyed along a path and being operable to enter printed data thereon in designated field areas of the documents regardless of the lengths thereof. Included is a printing or encoding station having a print wheel for entering data in the field areas of the documents as they pass therethrough and further having a first photodetector on the downstream side of the station for

sensing the leading edge of a document in the station and a second photodetector on the upstream side of the station for sensing the presence of the trailing portion of the document. Coupled to the photodetectors is an electrical control circuit which responds to the sensing of the leading and trailing portions of a document in the station for determining the distance from the leading edge of the document where data for the first of the several field areas will be entered thereon. Such distance determining means may be optionally controlled by a



manual switch when batches of similar length documents are conveyed through the encoding station or controlled automatically by a circuit provision cooperating with the photodetectors and capable of determining the lengths of the documents passing through the station and spacing the entry of the data on the documents in accordance therewith. A feature of the invention relates to a further provision for making a fine adjustment in the event the locating of the field areas on the documents deviate from prescribed specifications.

3,734,012

# SELECTIVE ROLLER INKER MEANS FOR HIGH SPEED SELECTIVE TYPE DRUM

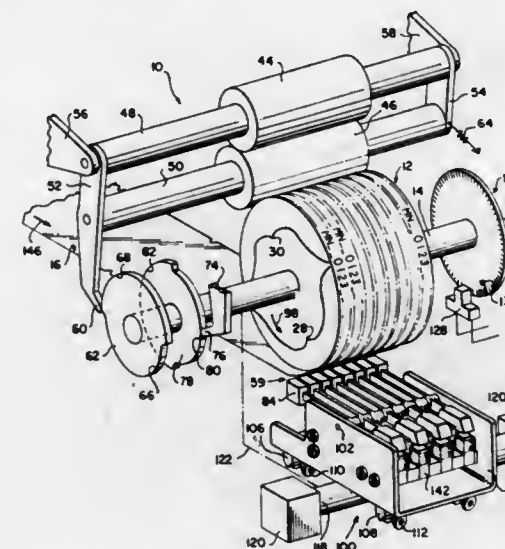
Orville C. Huggins, Centerville, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Aug. 2, 1971, Ser. No. 167,970

Int. Cl. B41j 27/14

U.S. Cl. 101—93 C

2 Claims



A printing apparatus for printing a color bar code and alpha-numeric on a label. The apparatus includes first and second groups of characters positioned on first and second portions, respectively, of a printing drum to form a ring of characters therearound. A first inking roll supplies a first ink to the first group of characters, and a second inking roll supplies a second ink to the second group of characters as the drum is rotated. A carriage having print hammers thereon is shifted slightly between first and second positions in timed relation with the rotation of the drum. Several rings of char-

acters composed of the first and second groups of characters are placed axially along the drum. The bars used for printing the color bar code are aligned in a shuttling pattern on the drum, with the long dimension of the bars being transverse to the rotating axis of the drum.

3,734,013

# MULTIPLE HAMMER MAGNETIC POLE PIECE BLOCK

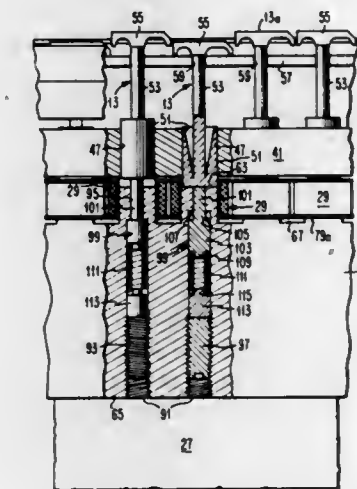
Karl Arnold Belser, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1971, Ser. No. 211,504

Int. Cl. B41j 9/38; H01f 7/04

U.S. Cl. 101—93 C

6 Claims



A print hammer actuating assembly for a high speed printer, wherein a one-piece magnetic block is secured to a first core structure to provide a second core unit which includes a multiplicity of integral pole pieces. The block is of elongated construction and it has a series of spaced apart projections extending transversely to its longitudinal axis to provide discrete pole pieces. A series of elongated bores extend transversely to the longitudinal axis of the block in alignment with each of the projections. A hammer actuator assembly is disposed in each bore. A bucking coil contiguously surrounds each of the projections to provide a series of selectively energizable magnetic fields for operating each hammer actuator. With such an arrangement, the single pole piece block may be readily manufactured and assembled, at reduced cost. In addition, the working distance between tips of hammers and the paper may be readily adjusted by means of a single operation, thus affording a considerable saving in field maintenance time.

3,734,014

# INKING ARRANGEMENT IN OFFSET PROOF PRESS FOR MULTICOLOR PRINTING

Osamu Oda, Kyoto, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Horikawa-dori, Kamigyo-ku, Kyoto, Japan

Filed Apr. 8, 1971, Ser. No. 132,412

Claims priority, application Japan, Aug. 20, 1970, 45/72343 Int. Cl. B41f 3/28, 3/42

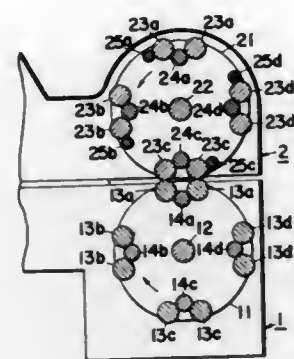
U.S. Cl. 101—186

8 Claims

An inking arrangement in an offset proof press for multicolor printing comprising a stationary inking unit and a carriage inking unit having plural groups of rollers, respectively, each roller group representing a particular color. Control



means are provided for selectively matching one roller group in the carriage inking unit with a predetermined roller group



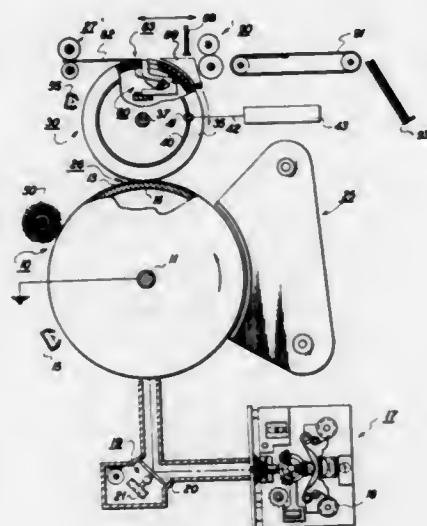
in the stationary inking unit, allowing a single proof press to print successively with two or more color inks by the cooperative control of these two inking units.

3,734,015

**SINGLE PASS DUPLEXING BY SEQUENTIAL TRANSFER**  
Thomas Camis, Fairport, and Steven A. Goss, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.  
Filed Dec. 23, 1970, Ser. No. 101,018  
Int. Cl. B41f 5/02

U.S. Cl. 101-229

3 Claims



Method and apparatus are herein disclosed for producing duplex copy. First and second toner images are sequentially formulated on a moving image retaining element. A biased transfer roll is arranged to move in contact with the image retaining element whereby the first image is electrically transferred and temporarily stored on the roll surface. A sheet of final support material is placed over the first image and the top side of the sheet brought into contact with the second image whereby the second image is transferred to the top of the sheet. Finally, corona is applied to the top of the sheet of a magnitude and polarity to cause the first image to be transferred from the roll surface to the sheet and the sheet removed from the roll.

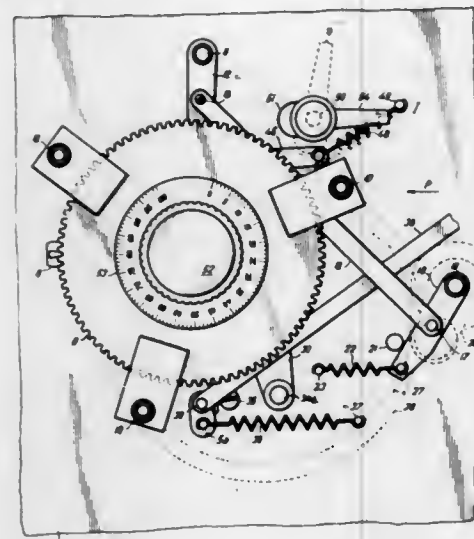
### 3,734,016 DEVICE FOR PRESELECTION OF THE NUMBER OF PRINTED PAPER SHEETS

Jaroslav Jiruse, Blansko, Czechoslovakia, assignor to Adamovske strojirny, Narodni podnik, Adamov, Czechoslovakia

Filed Dec. 21, 1970, Ser. No. 100,144  
Claims priority, application Czechoslovakia, Dec. 28, 1969, 8531/69

Int. Cl. B411 39/02, 39/14  
U.S. Cl. 101-232

9 Claims



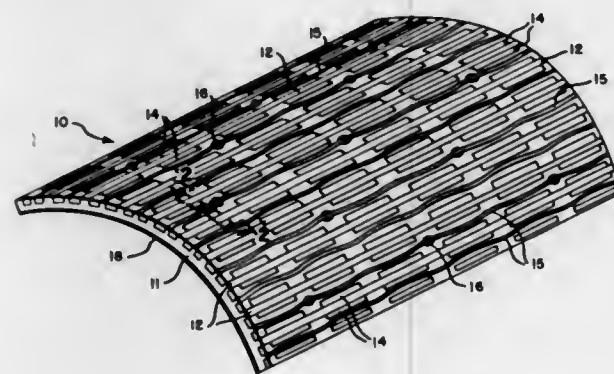
A printing press, having a pair of shiftable cylinders, a paper feed, means for operating said press and a control system. Apparatus for counting the printed paper sheets, including an escapement mechanism directly connected to the cylinders and means for setting the ratchet for a predetermined number of indexes. The ratchet being connected to the control system to regulate the same on completion of the printing of a predetermined number of sheets.

3,734,017

**MAGNETIC SUPPORT FOR FLEXIBLE PRINTING PLATE**  
James J. Trier, Elmhurst, and John H. F. Enz, Somerville, both of N.J., assignors to Wood Industries, Inc., Plainfield, N.J.  
Filed May 20, 1971, Ser. No. 145,433  
Int. Cl. B41f 27/02

U.S. Cl. 101-378

9 Claims



A curved support adapted to be mounted on a plate cylinder of a rotary printing machine for supporting thereon a flexible printing plate having a magnetizable metallic backing layer. The support has a metallic liner with magnetic elements thereon for holding a printing plate thereto. Circumferentially spaced metal bars extend over the length of the support and the spaces between the bars and magnetic elements are filled with a combination of a plastic resin and a hardener to envelope the liner, magnetic elements and the metal bars.

A method of making a support having a metallic liner therein utilized in holding a flexible printing plate to a printing cylinder involving the steps of affixing a plurality of first metal bars to the liner, positioning magnetic elements on the liner, positioning a plurality of second metal bars on the liner, and casting a plastic resin onto the liner to encase the magnetic elements and the metal bars.

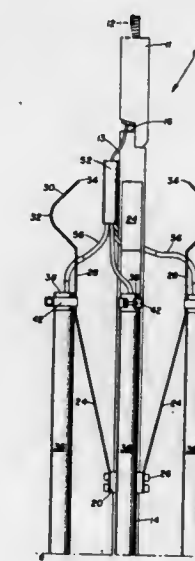
3,734,018

**EXPLOSIVE ASSEMBLY FOR RESTORING DAMAGED CASING**

Ernest Lee Gillingham, Arlington, Tex., assignor to Jet Research Center, Inc., Arlington, Tex.  
Filed July 26, 1971, Ser. No. 166,160  
Int. Cl. F42b 1/02

U.S. Cl. 102-20

9 Claims



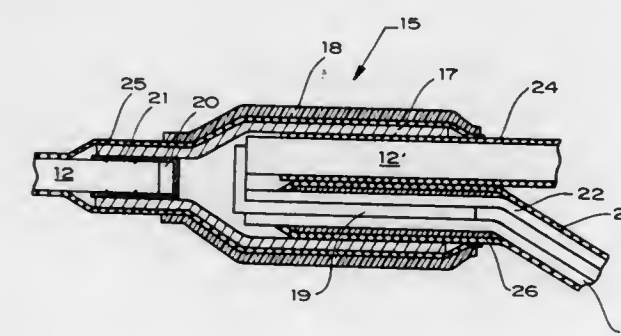
Disclosed herein is an explosive assembly for restoring collapsed or otherwise damaged oil well casing to its original shape. The assembly includes one or more elongated housings having shaped explosive charges within a carrier therefor and detonating components.

3,734,019

**VENT AND DESTRUCT SYSTEM**  
Albert W. Rentz; Lloyd J. Jackson; Robert C. Willard, and Vernon D. Burklund, all of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.  
Filed Sept. 29, 1971, Ser. No. 184,966  
Int. Cl. C06c 5/06

U.S. Cl. 102-27 R

3 Claims



A vent and destruct system for balloons and the like which utilizes pyrotechnic strands covered with tubes of braided copper wire to perform the functions of venting and destructing. The braided copper wire covering on the pyrotechnic strands provides a safety means by preventing static electricity from accidentally igniting the pyrotechnic strands when the system is being attached to a balloon or the like. When the

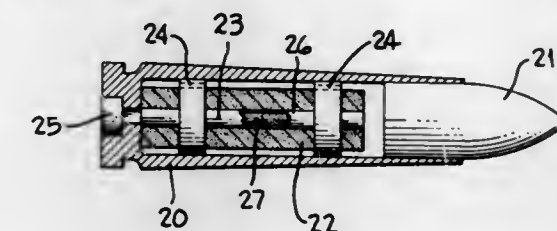
system is activated the tubes of braided copper wire are destroyed by the heat produced by the pyrotechnic strands.

3,734,020

**IGNITER FOR PROPELLING CHARGES**  
Thomas Q. Ciccone, Langhorne, and Martin Visnov, Philadelphia, both of Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.  
Filed Oct. 1, 1971, Ser. No. 185,495  
Int. Cl. F42b 5/02

U.S. Cl. 102-40

10 Claims



A small caliber ammunition cartridge case containing a molded propellant charge having an axial igniter extending longitudinally through a central passage in the molded charge in which complete breakup and consumption of the molded propellant charge is achieved and increased projectile velocity is obtained.

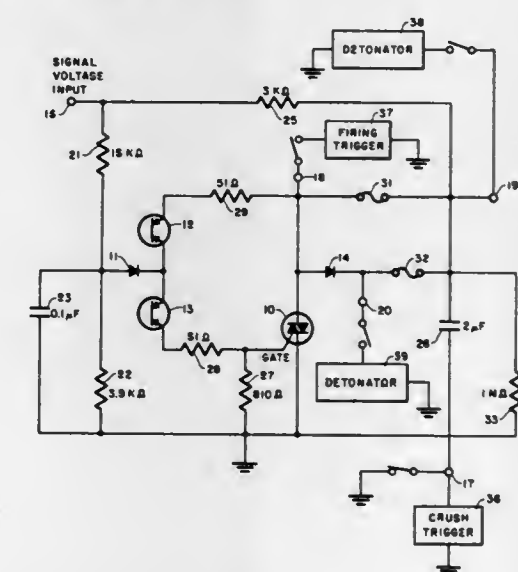
This invention relates to improved small arms cartridges having an axial-type igniter. The advantages of an axial type igniter including the achievement of more uniform ballistics and particularly more uniform projectile velocity in small arms ammunition have been disclosed in U.S. Pat. No. 3,103,884 to Ciccone and Scanlon. In this previous work, the axial igniter was a detonating type material and consequently an explosive train was required to operate or cause the axial igniter to function. A booster of PETN (penta erythritol tetranitrate  $C_5H_8(ONO_2)_4$ ) and lead azide was used between the primer and the igniter in order to assure combustion of the igniter.

3,734,021

**SOLID STATE FUZE SELECT CIRCUIT**  
Joe A. McKenzie, Riverside, and Charles E. Engel, Upland, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.  
Filed Sept. 16, 1969, Ser. No. 862,629  
Int. Cl. F42c 11/00, 15/40, 19/12

U.S. Cl. 102-70.2 R

3 Claims



A circuit arrangement using inexpensive electrical fuzes in a solid state circuit for selecting different combinations of



detonators by blowing different combinations of two fuzes depending upon the voltage and polarity of a signal applied thereto.

3,734,022

**SEQUENTIALLY INTERLOCKED ARMING DEVICE**

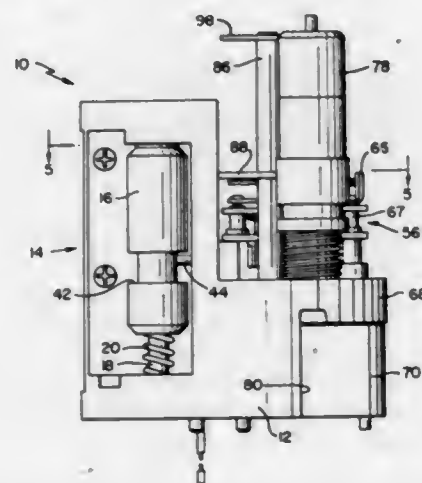
Russell E. Bowers, and Norman L. Warpenburg, both of Richmond, Ind., assignors to Avco Corporation, Richmond, Ill.

Filed June 21, 1971, Ser. No. 155,064

Int. Cl. F42c 15/24

U.S. Cl. 102-78

9 Claims



A sequentially interlocked arming device for providing the capability for the dudding of a fuze if arming events do not occur in the programmed sequence is disclosed. The sequentially interlocked arming device comprises a retardation sensor, timing delay, an out-of-line explosive train (slider), and an interlock lever which prevents the rotational movement of the slider into in-line position in the absence of a proper sequence of arming functions to prevent premature initiation of the fuze.

3,734,023

**FUSE FOR THE SAFE AND PRECISE DETONATION OF EXPLOSIVE PROJECTILES**

Paul Kaiser, Schramberg, and Rudolf Weber, Schramberg-Sulgen, both of Germany, assignors to Firma Gebrüder Junghans G.m.b.H., Schramberg, Germany

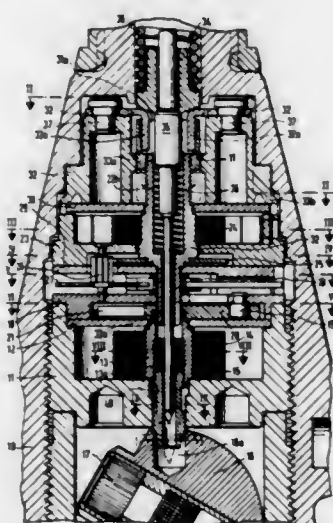
Filed Dec. 9, 1971, Ser. No. 206,295

Claims priority, application Germany, Dec. 15, 1970, P 20 61 765.6

Int. Cl. F42c 15/22

U.S. Cl. 102-79

15 Claims



A detonating fuse for a fired, spinning projectile, which fuse includes a primer-supporting rotor which is prevented from

being moved from a safety to a firing position by means of a spring-biased safety lever. The safety lever is prevented from swinging out, under the influence of centrifugal force, by means of a rotatable spring core member. The core member is locked against rotation by an anchor until the projectile is fired at which time the anchor is released and the core member is rotated in a predetermined angle by a draw spring to release the safety lever. Continued rotation of the core member releases a pair of swingable levers to enable a biasing means to push a firing pin into the rotor which has been moved to its firing position by centrifugal force. The core member and safety lever further include mutually engageable stops to prevent unintentional detonation during transport.

3,734,024

**POWDER PROPELLANT CARTRIDGE**

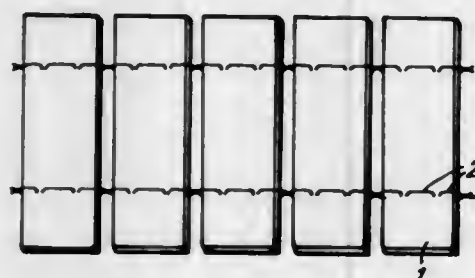
Henry Andersson, Timmermansvagen 7 G, 632 23 Eskilstuna; Goran Dahl, Alfens Vag 2, 653 45 Karlstad, and C. G. Arnell, Solrosgatan 12, 644 00 Torshälla, all of Sweden

Filed Oct. 12, 1971, Ser. No. 188,351

Int. Cl. F42b 1/00

U.S. Cl. 102-100

2 Claims



A powder propelling cartridge consisting of powder strips or rods uniformly arranged in a cartridge-casing. The strips or rods are connected to each other by threads or similar means which are applied perpendicularly to longitudinal axis the strips or rods so as to form a snow fence-like belt, which is coiled and inserted into the cartridge-casing.

3,734,025

**INTEGRATED METHOD AND APPARATUS FOR CONTINUOUS PASSENGER OR FREIGHT TRANSPORT**

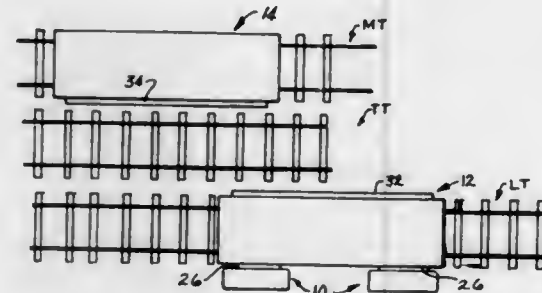
Richard E. Shoemaker, Sweetbriar Apts., Apt. M-3, Oregon Pike & Roseville Road, Lancaster, Pa.

Filed June 8, 1970, Ser. No. 43,991

Int. Cl. B61k 1/00

U.S. Cl. 104-88

12 Claims



Method and apparatus for continuous movement of passengers or containerized freight at a substantially uniform rate of speed over a roadbed, either rail or highway, comprising a completely integrated system of pick up and delivery service in designated, adjacent roadbed areas, of origin and destination trip recording, and of in motion side-by-side transfer of passengers or freight between transfer vehicles and through transport vehicles at any or all established service areas along the main roadbed.

3,734,026

**COASTER VEHICLE AND TRACKWAY**

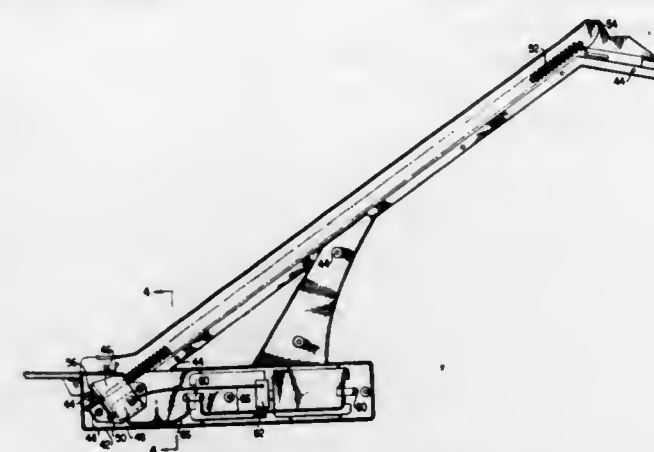
Makoto Saito, Tokyo, Japan, assignor to Tomy Company, Inc., Tokyo, Japan

Filed June 17, 1971, Ser. No. 154,067

Int. Cl. B61b 13/00; A63h 18/04

U.S. Cl. 104-167

9 Claims



An amusement device featuring a continuous trackway having a first end of lower elevation than a second end, a lift mechanism interposed between and connected to the ends of the trackway and including an elongated helical screw powered by a motor and extending upwardly from the first end of the trackway to the second end thereof and a coaster vehicle arranged to travel along the trackway and up the lift mechanism as the rotating screw continuously contacts one or more hooks depending from the vehicle urging the vehicle upwardly along the lift mechanism.

3,734,028

**GUIDED CAFETERIA HIGH CHAIR**

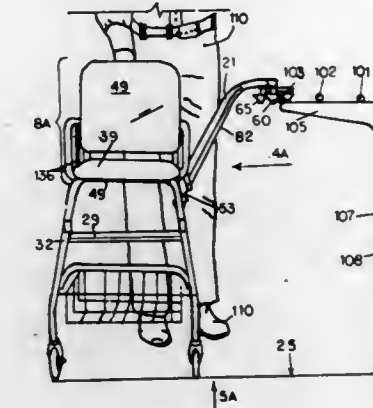
William D. Robertson, 4512 West Thrd, Amarillo, Tex.

Filed Jan. 7, 1972, Ser. No. 216,164

Int. Cl. B61k 13/00

U.S. Cl. 104-245

10 Claims



Wheeled cafeteria high chair is operatively connected to a guide assembly which in its operative extended position maintains the high chair in a path uniformly spaced away from a cafeteria serving table and its tray support and arranged to eliminate damaging mechanical shocks otherwise transmitted from an occupied moving child's high chair to the tray support of a cafeteria. In its retracted position the guide assembly does not interfere with the mobility of the high chair.

3,734,029

**RESILIENT RAILWAY VEHICLE TRANSMISSION**

John Henry Gooch, Goldsmiths, Albourn, Hassocks, Sussex, England

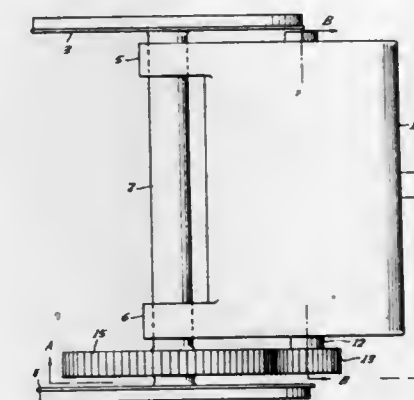
Filed Sept. 9, 1970, Ser. No. 70,854

Claims priority, application Great Britain, Sept. 22, 1969, 46,662/69

Int. Cl. B61c 9/32, 9/36, 9/40

U.S. Cl. 105-131

10 Claims



The invention provides a railway locomotive, a driving wheel of which has its axle propelled by an electric motor positioned with its centre of gravity to one side of the axle said motor being resiliently supported from a frame such as a bogey in which said axle is sprung mounted the drive shaft of said motor being constrained to remain always parallel to said axle and coupled thereto by gearing and with a torsionally flexible driving connection between said shaft and said gearing the arrangement being such that vertical displacement of said axle relative to said frame due to said wheel encountering a track irregularity may occur without linear displacement of the centre of gravity of the motor or rotational displacement of the drive shaft of the rotor of said motor.

3,734,027

**INTRA-FACTORY SYSTEM AND METHOD FOR UTILIZING POWERED AND FREE CONVEYOR SYSTEMS**

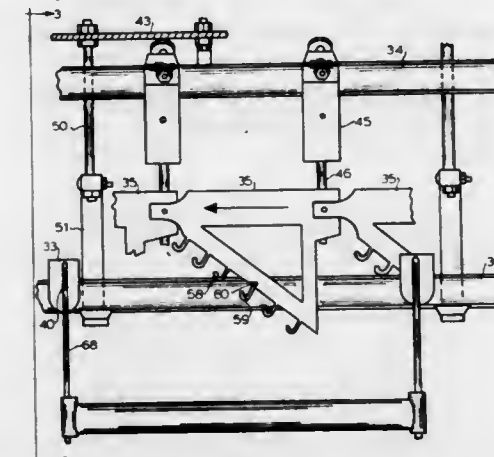
Paul L. Brummett, and Sigmund G. Isley, both of Smithfield, N.C., assignors to Amerel Company, Inc., Smithfield, N.C.

Filed Feb. 18, 1971, Ser. No. 116,493

Int. Cl. B65g 17/12, 17/42

U.S. Cl. 104-172 S

9 Claims



An intra-factory system and method adapted generally to conveying non-uniform articles but especially to garment manufacture and to conveying non-uniform, hanger hung garments such as coats, shirts, blouses, jackets and the like, are based on the employment of a powered, continuously moving, coding type, e.g. a "Railex" type, conveyor to intermittently and selectively engage and move garment loading trolleys which roll on an adjacent but completely separate non-powered, monorail, e.g. a "Speedrail" type, conveyor whereby manual pushing of the trolleys on the monorail between stations is eliminated without interfering with the normal coding, conveying, pickoff and loading operations on the powered conveyor.



3,734,030

**PNEUMATIC RAILWAY CAR SUSPENSION**

Ernst Florian Kreissig, Seuzach, and Karl Feuerlein, Winterthur, both of Switzerland, assignors to Sulzer Brothers, Ltd., Winterthur, Switzerland

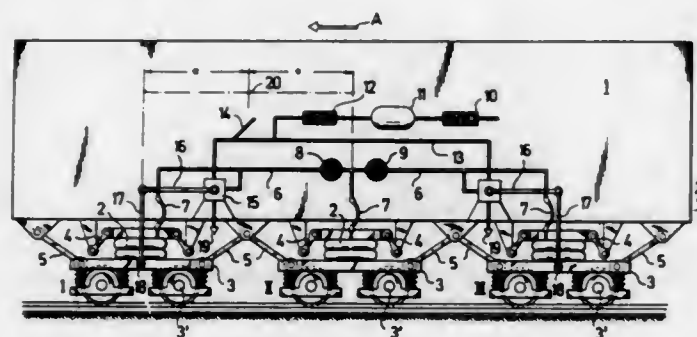
Filed May 12, 1971, Ser. No. 142,583

Claims priority, application Switzerland, May 13, 1970, 7080/70

Int. Cl. B61f 3/06, 5/10, 5/50

U.S. Cl. 105-164

7 Claims



The pneumatic springs of the resilient suspensions at each supporting position are interconnected via ducts and stop valves such that, with respect to the direction of travel, the two forward suspensions are coupled together to achieve an equalization of the supporting forces therebetween while the rear suspension remains independent of the coupling. The coupling is reversible by opening and closing of the stop valves when the direction of travel is reversed, so that the two forward suspensions in the reversed direction of travel are coupled together while the rear suspension is independent.

3,734,031

**CENTER BEAM RAILROAD CAR**

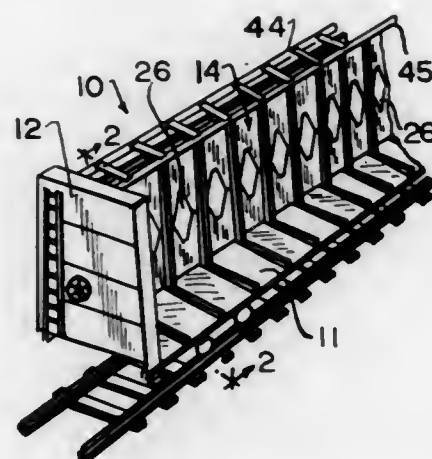
Ross W. Wagner, Homewood, Ill., assignor to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Filed July 19, 1971, Ser. No. 163,899

Int. Cl. B61d 17/00

U.S. Cl. 105-367

17 Claims



Disclosed is an improved open freight carrying railroad car of the center beam type. In addition to a lightweight center sill and side sills, it has cross-bearers supporting the floor and a vertical center beam joined at its bottom to the center sill and extending longitudinally the length of the car between bulkheads at each end of the car. The center beam has a top structure for aiding in transferring compressive forces between the bulkheads, and for storing tie-down gear, having a wide substantially horizontal metal plate chord joined centrally to, and extending the length of, the top of the center beam, and a horizontal structural stiffening member joined to each edge of the wide chord and extending the length of the center beam.

The stiffening members project upwardly to define opposing walls of a trough having the wide chord as the bottom. The wide chord and stiffening members resist compressive and lateral forces applied thereto in use of the car.

3,734,032

**STAND FOR BOOKS AND OTHER ARTICLES**

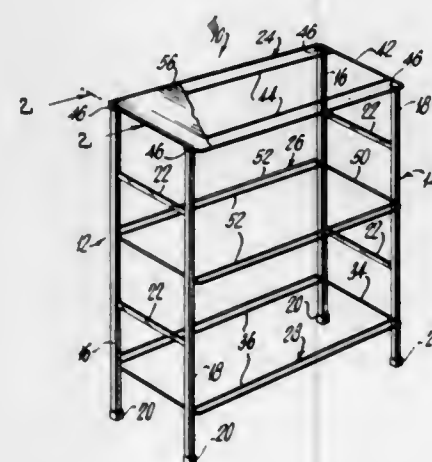
Joseph Kovacik, Ardsley, N.Y., assignor to National Wire Industries, Inc., Bronx, N.Y.

Filed Sept. 2, 1971, Ser. No. 177,404

Int. Cl. A47b 47/02

U.S. Cl. 108-111

3 Claims



A stand having at least two vertical end frames each having a pair of tubular legs with the tubular legs each having at least one opening along its length to receive hook shaped extensions on a lower shelf to be supported between the frames and an upper shelf having means engaging the upper ends of the legs to secure the frames in engagement with the lower shelf and form a rigid structure.

3,734,033

**KNOCK-DOWN DISPLAY STRUCTURE**

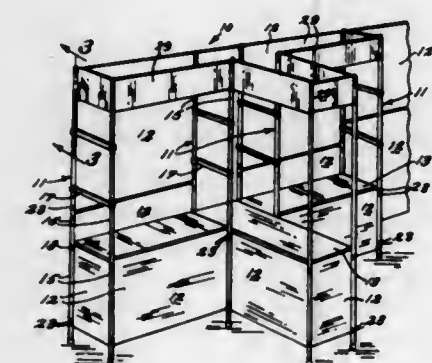
John G. Downing, c/o Downing Displays, 300 Genesee Street, Cincinnati, Ohio

Filed May 6, 1971, Ser. No. 140,862

Int. Cl. A47b 3/00

U.S. Cl. 108-111

3 Claims



There is disclosed a structure that may be readily set up or disassembled for transportation and which comprises three basic structural pieces interrelated by detachable connector means to form a variety of strong, self-supporting displays.

3,734,034

**KINDLING APPARATUS**

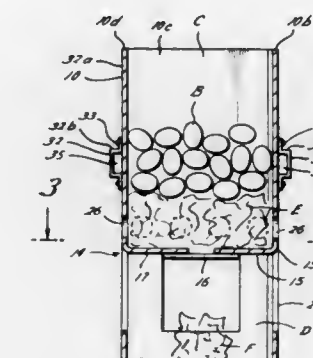
Oliver E. Fowler, 520 Camellia Drive, Lafayette, La.

Filed Sept. 7, 1971, Ser. No. 176,344

Int. Cl. F23q 13/00

U.S. Cl. 110-1 F

9 Claims



A new and improved apparatus for kindling charcoal with a very small fire including a removable handle for dumping kindled charcoal into a grill or brazier.

3,734,035

**METHOD AND A SIMPLE APPARATUS THEREFOR TO EFFICIENTLY DISPOSE OF LIQUID WASTES CONTAINING COMBUSTIBLE CARBONACEOUS MATERIAL**

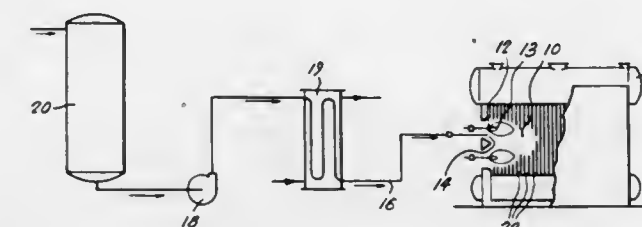
Fred Sparks Whitfield, Napanee, Ontario, Canada, assignor to Millhaven Fibres Limited, Montreal, Quebec, Canada

Filed June 21, 1971, Ser. No. 155,004

Int. Cl. F23g 7/00

U.S. Cl. 110-7 R

10 Claims



This invention relates to a method and a simple apparatus therefor to efficiently dispose of liquid wastes containing combustible carbonaceous material and water but being substantially free of substances yielding solid residue. This invention is preferably concerned with the disposal of liquid textile wastes. Broadly stated the method comprises: (a) heating at the temperature of its boiling point at atmospheric pressure a liquid waste containing combustible carbonaceous material and water, said liquid being substantially free of substances yielding solid residue; (b) simultaneously pressuring said liquid to maintain it in liquid state; (c) spraying into an open fire said heated liquid waste kept under pressure to flash out the liquid, thereby evaporating the water from said liquid and burning the combustible carbonaceous material. There is also provided a relatively simple incinerator for carrying out this method comprising: (a) an open fire furnace provided with a spraying nozzle, said nozzle spaced in relationship to said open fire, (b) a means to heat and pumping means to feed under pressure into said spraying nozzle a heated liquid waste of carbonaceous material containing water and yielding substantially no solid residue, to evaporate said liquid and to burn said carbonaceous material.

3,734,036

**PROCESS FOR DISPOSAL OF COMBUSTIBLE WASTE**

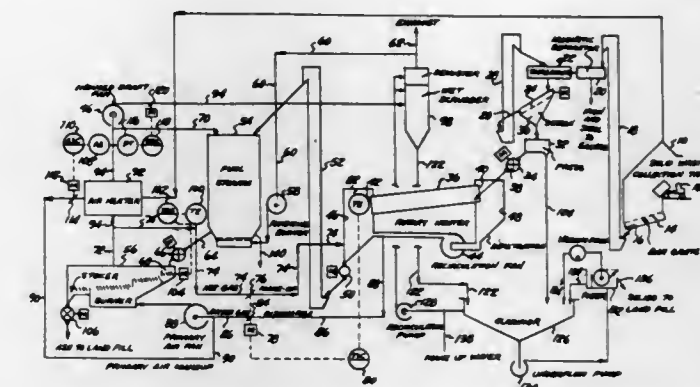
Ramon L. Abos, Ypsilanti, Mich., assignor to Hoad Engineers Incorporated, Ypsilanti, Mich.

Filed Mar. 30, 1972, Ser. No. 239,486

Int. Cl. F23g 5/04

U.S. Cl. 110-8 R

15 Claims



Combustible waste material is collected and processed into fuel after which the fuel is disposed of by incineration, the energy derived from combustion being utilized to convert additional waste material into fuel. Included in the process are the steps of shredding the waste material and passing the shredded material through a heating chamber wherein the waste material is contacted by hot exhaust gases at about 800°F from a combustion chamber to convert the shredded material to a charcoal-like fuel, conveying the fuel to a storage chamber, fluidizing and feeding the fuel to the combustion chamber, and incinerating the same to produce hot exhaust gases of about 1500°F, passing a sufficient portion of the hot exhaust gases to the heating chamber as make-up gases to maintain at about 800°F the temperature of the gases contacting the shredded material, and returning to the combustion chamber from the heating chamber a corresponding portion of discharge gases.

3,734,037

**SLAG REMOVAL MECHANISM WITH FLUID SEAL**

Johannes Josef Martin, Leopoldstrasse 248, Munich, Germany

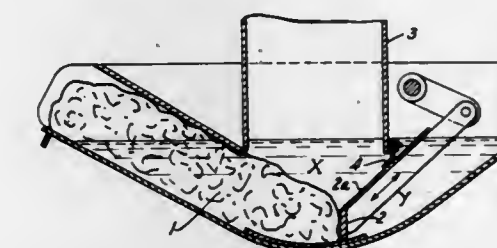
Filed July 26, 1971, Ser. No. 165,912

Claims priority, application Germany, Aug. 5, 1970, P 20 38 891.4

Int. Cl. F23j 1/00

U.S. Cl. 110-165 R

7 Claims



A slag removal mechanism for fire boxes or the like is comprised of a fluid-containing slag receptacle into which a slag-dispensing chute extends through which the slag is deposited in the receptacle. A reciprocable pusher member is disposed in the slag receptacle and extending into the fluid for pushing the slag through the fluid towards the receptacle opening. The open end of the slag-dispensing chute extends into the fluid in the slag receptacle and a sealing arrangement is provided between the open end of the chute and the reciprocating pusher member to prevent admixture of the contaminated fluid portion in which the slag is suspended with the clean fluid portion rearwardly of the pusher member to thereby prevent entrance of dirt into the pusher mechanism.



3,734,038

## STITCHING MECHANISM

Bunsaku Taketomi, 56-141 Aza-Ishikane, Oaza-Iwasaki, Nisshin-cho, Aichi-gun, Aichi-ken, Japan

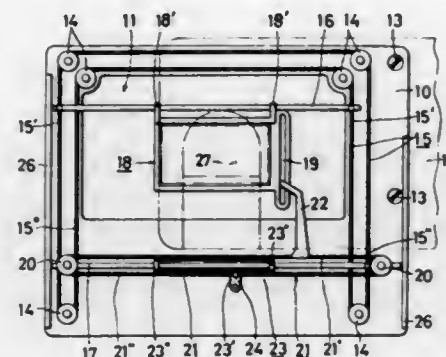
Filed July 22, 1971, Ser. No. 165,206

Claims priority, application Japan, July 31, 1970, 45/67463

Int. Cl. D05b 21/00

U.S. Cl. 112-121.15

7 Claims



A stitching mechanism mountable on the bed of an ordinary sewing machine in which a stitch frame is actuated two-dimensionally over a base plate having a window by a first endless string strung doubly on pulleys mounted on said base plate and a second endless string strung doubly on pulleys disposed so as to move with said first endless string and the movement of a tracing member connected to second endless string is transmitted to said stitch frame as a movement of the same magnitude but in the opposite direction.

3,734,039

## BLIND STITCH SEWING MACHINES

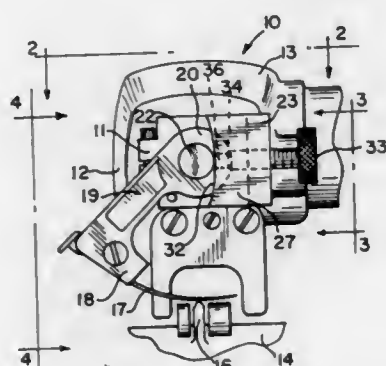
Jacob Krasnitz, 1739 W. Addison, Chicago, Ill.; Martin Krasnitz, 8024 Lyons, Chicago, Ill.; Ronald M. Spatzek, 1355 N. Sandbury, Terrace, Chicago, Ill., and Ronald H. Krasnitz, 7759 S. Shore Drive, Niles, Ill.

Filed Aug. 27, 1971, Ser. No. 175,618

Int. Cl. D05b 1/24

U.S. Cl. 112-176

4 Claims



An improvement in blind stitch sewing machines having a needle carrier supporting a curved blind stitch needle oscillatable through an arc to penetrate the work, which arc is closely adjacent other parts of the machine so that replacing or threading of the needle is difficult because of the limited space available. Means are therefore provided whereby the needle carrier is manually releasably carried on its shaft so that when it is necessary to replace or thread the needle it may be manually rotated on its shaft up out of the way of other parts of the machine where such work is easily accomplished.

The presser foot has a sole hinged on an intermediate support member which is pivoted on a main support member through a deformable parallelogram of links. The main support has a yoke and screw to clamp the presser foot to the presser bar. A paw may be rigidly fixed to the main support member to hold the fabrics to be sewn when the sole is released. The sole can be drawn in the direction of passage of the fabrics when urged towards the feed dog thereby preventing relative slippage of glossy or binding fabrics. A restoring device is coupled to the needle actuating mechanism to bring the sole back into a neutral position when released.

3,734,040

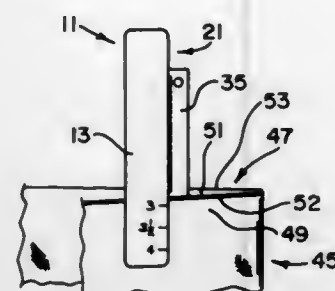
## SEWING GUIDE FOR PIN STRIP

Jack M. Lawson, 3161 Ashwood No. 3, Memphis, Tenn.

Filed Jan. 2, 1971, Ser. No. 194,847

Int. Cl. D05b 35/10

6 Claims



A device for use in the manufacture of the pleated upper section of a drapery panel which guides the inserting and positioning of a pin strip into a folded portion of the drapery heading and which guides the stitching of the pin strip onto the drapery heading. The guide device includes a base portion, upper and lower plate-like elements supported from the base portion and extending therefrom in parallel spaced apart relationship. The guide device further includes a rod also supported from the base portion and extending alongside of the lower plate-like element in parallel spaced apart relationship therewith.

3,734,041

## SEWING MACHINE PRESSER FOOT

Ramon Casas Robert, Geneva, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

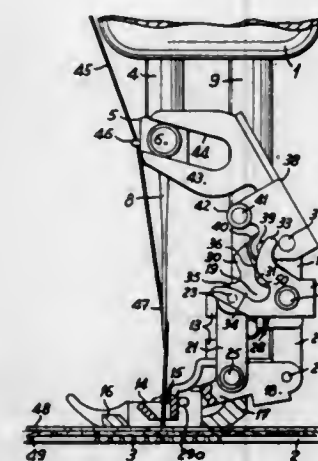
Filed Feb. 19, 1971, Ser. No. 117,004

Claims priority, application Switzerland, Mar. 6, 1970, 3302/70

Int. Cl. D05b 27/04

U.S. Cl. 112-212

9 Claims



3,734,042

## DOUBLE EXPANSION RECTANGULAR FORMING HORN

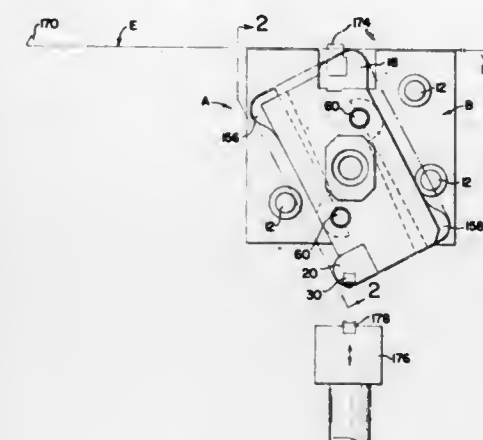
Eugene W. Henler, and Bernard K. Hook, both of Hastings, Mich., assignors to Gulf &amp; Western Industrial Products Company, Grand Rapids, Mich.

Filed May 24, 1971, Ser. No. 146,315

Int. Cl. B21d 51/26

U.S. Cl. 113-8

8 Claims



A rectangular forming horn for forming substantially rectangular can bodies includes a pair of diagonally opposite corners which are movable between a collapsed position and an expanded position. Expanding the diagonally opposite corners of the forming horn produces substantially rectangular can bodies with uniform corner radii and parallel sides.

3,734,043

## DRUM RECONDITIONING PROCESS

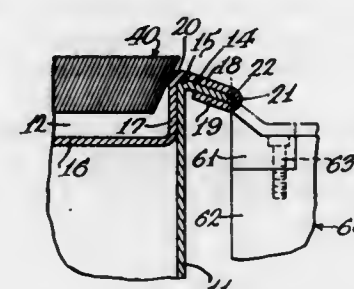
Morris Rosenbloom, Chicago, Ill., assignor to Doric Corporation, Oklahoma City, Okla.

Filed Mar. 1, 1972, Ser. No. 230,800

Int. Cl. B21d 51/38

U.S. Cl. 113-120 BB

10 Claims



A drum reconditioning method including the steps of removing a double seamed closure from a drum body side wall by wedging the closure flange structure to an acute angle with respect to the drum body, rotating the drum and cutting the portion of the closure flange that bridges the drum body flange, removing the closure and treating the interior of the drum body, and double seaming a new closure to the treated drum body.

3,734,044

## SEALED CONTAINER ASSEMBLY AND METHOD OF MAKING SAME

Richard W. Asmus, 3628 West 48 Street, and Andrew E. Jecker, 3610 West 49 Street, both of Cleveland, Ohio

Division of Ser. No. 719,301, April 8, 1968, Pat. No. 3,501,045. This application Dec. 22, 1969, Ser. No. 889,767

Int. Cl. B21d 51/00

U.S. Cl. 113-121 C

5 Claims

Easily opened sealed container comprising a rigid container body preferably having an opening provided with a beaded

edge, a rigid outer cover for the opening, the outer cover being readily releasably mechanically interlocked over the opening, an inner peelable sealing diaphragm equipped with an integral pull-tab engaged between said outer cover and said edge, and a plasticized resinous sealant adhering said



diaphragm to said edge. The sealant, preferably of a solventless heat-activated type, is characterized by relatively weak shear strength. The diaphragm is preferably cut from sheet material with areas to be cut from sheet "packed" to provide a quadrilateral "scrap" area from which an integral tab is formed.

3,734,045

## LOGGING BARGE

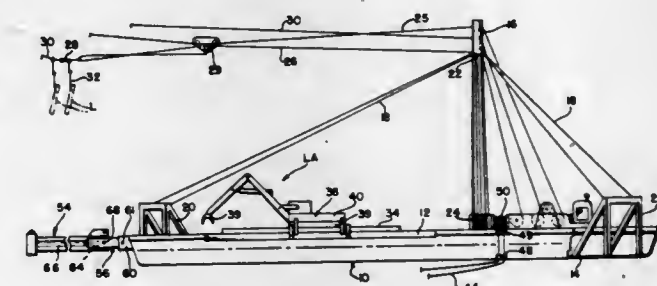
Kenneth C. Foreman, P.O. Box 271, Ketchikan, Alaska

Filed Nov. 12, 1971, Ser. No. 198,170

Int. Cl. B63b 35/02

U.S. Cl. 114-5 R

7 Claims



A logging barge is provided with a tower securely fastened to the barge by guy lines mounted to stanchions. Suitable rigging brings logs from the logging area to the barge. A grapple is slidably mounted on a track running between two bundling racks. A stiff leg is pivotally coupled to the barge and is also slidably coupled so that it may be drawn onto the barge for storage. A pair of waist lines are passed around blocks at the lower end of each side of the barge for anchoring the barge on shore.

3,734,046

## FLOATING DRY DOCK

Otto W. Schmidt, Leawood, and Richard O. Schmidt, Prairie Village, both of Kans., assignors to The Firmian L. Carswell Manufacturing Company, Kansas City, Kans.

Filed May 10, 1971, Ser. No. 141,865

Int. Cl. B63b 35/00

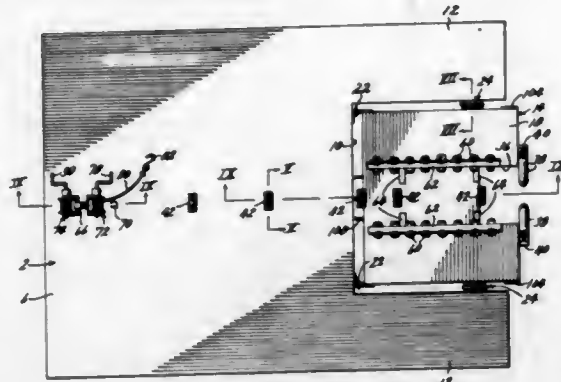
U.S. Cl. 114-0.5

8 Claims

A floating dry dock consisting of a buoyant platform having a section adapted to be pivoted downwardly to form a ramp extending at its free edge beneath the water level, and up which a boat may be pulled from the water to the platform, the ramp section having sufficient buoyancy to support the boat, or that portion of the boat weight eventually supported thereon, cable mechanism for pivoting the ramp section



downwardly against its natural buoyancy, cable mechanism for pulling a boat upwardly along the ramp section, locks for



holding the ramp section releasably in its elevated position, and supports on the platform and ramp section for carrying the boat.

3,734,047

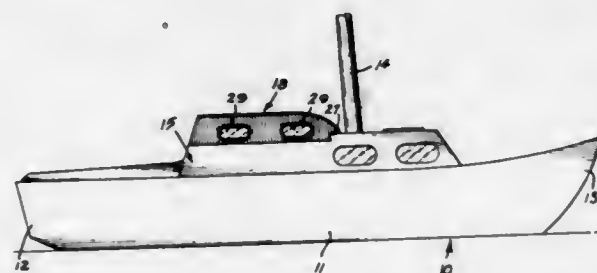
**DETACHABLE DINGHY OR TENDER FOR SAIL BOATS**  
James R. Burton, 6923 100th Avenue, Seabrook, Md.

Filed Apr. 28, 1971, Ser. No. 138,036

Int. Cl. B63b 35/00

U.S. Cl. 114-39

4 Claims



Detachable dinghy or tender for a sail boat that also serves as an integral portion of the trunk cabin of a sailing vessel or sail boat.

3,734,048

**AUTOMATIC HULL CLEANING SYSTEM**

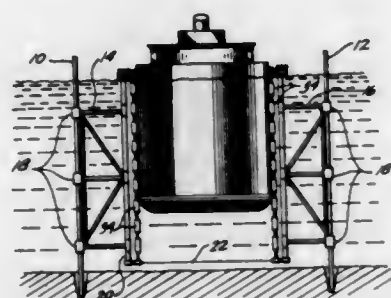
Randolph C. H. Michaelsen, Malibu, Calif., assignor to Global Marine Inc., Los Angeles, Calif.

Filed Oct. 1, 1970, Ser. No. 77,112

Int. Cl. B60s 3/02

U.S. Cl. 114-222

8 Claims



There is described apparatus for scrubbing the sides of a ship in which two pairs of vertical strings of rotary brushes are urged against the opposite sides of the ship as it passes through the apparatus. The rotary brushes in each string are linked by flexible or articulated shafts, permitting the string to deform to conform to the shape of the hull. A combination of weights associated with a pivoted frame supporting the strings of brushes, plus jets associated with the individual brushes, urge the brushes into contact with the sides of the ship.

3,734,049  
**HANDLE STRUCTURE**

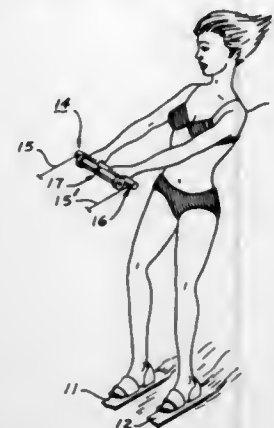
Jack M. Humbert, 7412 Cushman Court, Citrus Heights, Orangevale, Calif.

Continuation-in-part of Ser. No. 21,437, March 20, 1970, Pat. No. 3,626,892. This application Dec. 13, 1971, Ser. No. 207,402

Int. Cl. A63c 11/10

U.S. Cl. 115-6.1

6 Claims



A handle structure attached to the free end of a towline or rope to enable the same to be releasably gripped by one using the same. The handle structure is especially useful for water skiing, and it functions to augment or enhance the natural grip of the skier and to quickly release the grip when necessary. The handle structure may be in the form of a single unit sufficiently large to be gripped by both hands, and includes a hand-hold component adapted to be gripped by each hand of a skier. A compression member movable with respect to the hand-hold component and urged theretoward into compressive engagement with the fingers of a hand grips the same whenever a tensile force is applied to the towline. The compression member is segmented and includes independently rotatable sections rollingly engageable, respectively, with the fingers of the opposite hands to permit separate release thereof.

3,734,050

**PROPULSION APPARATUS FOR A SHIP**

Toshio Kitai, and Mitsuo Kitai, Nagoya, Japan, assignors to Kabushiki Kaisha Kitai Tekkosho, Minami-ku, Nagoya-shi, Japan

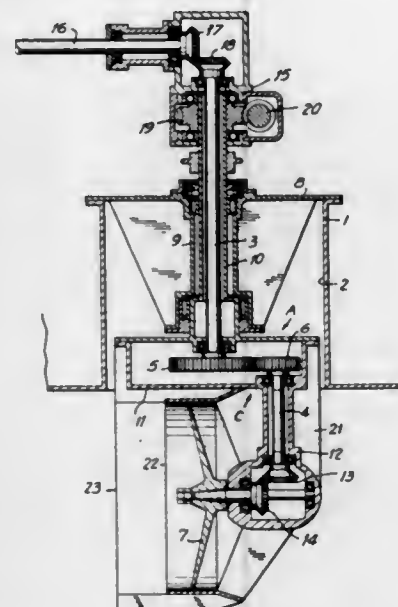
Filed Mar. 30, 1971, Ser. No. 129,380

Claims priority, application Japan, Apr. 2, 1970, 45/27420

Int. Cl. B63b 25/42

U.S. Cl. 115-35

8 Claims



A propulsion apparatus for a ship comprises an upper vertical drive shaft rotatable about a vertical central axis in a recess

in the bottom of the hull of a ship and a lower vertical drive shaft is drivingly engaged with the upper drive shaft by transmission gears and is angularly turnable around the upper drive shaft to turn therewith a propeller whose horizontal drive shaft is connected to the lower drive shaft through bevel gears. The lower drive shaft and propeller are both turnable about the upper drive shaft as a unit within a region circumscribed by the recess.

3,734,051

**VEHICLE WHEEL POSITION INDICATOR**

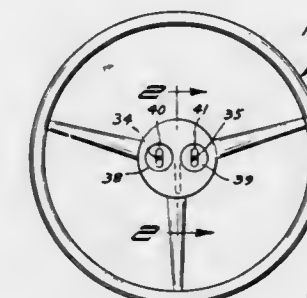
Eileen C. Dahl, 5024 Dupont Avenue South, Minneapolis, Minn.

Filed Aug. 5, 1971, Ser. No. 169,378

Int. Cl. B60q 1/42

U.S. Cl. 116-31

3 Claims



A directional position indicator for the front wheels of a vehicle consisting of a housing mounted on a steering wheel, a pinion gear journaled in said housing, a weighted arm extending radially of said gear and being integral therewith, a pair of gears journaled in said housing in opposed relation at either side of said pinion gear and said pair of gears respectively bearing indicia visible through said housing indicating the directional position of the front wheels of said vehicle.

3,734,052

**CASSETTE WITH INDEX MECHANISM FOR MAGNETIC TAPE DICTATING MACHINE**

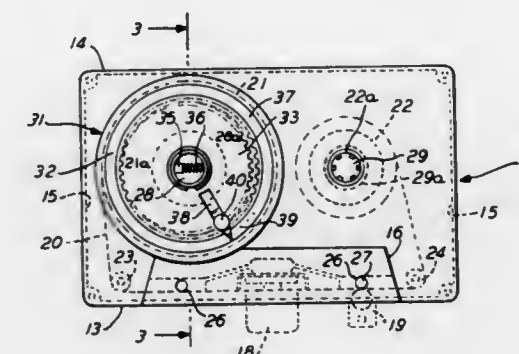
Edward Feldman, Teaneck, N.J., assignor to McGraw-Edison Company, Elgin, Ill.

Filed May 31, 1972, Ser. No. 258,311

Int. Cl. G01d 21/00

U.S. Cl. 116-114

7 Claims



A cassette for a magnetic tape dictating machine is provided with an index mechanism as a part thereof. The index mechanism comprises an index member bearing indicia and mounted concentric with the drive-spindle opening for one of the reels, preferably the supply reel, and a cooperating index pointer. Through a planocentric reducer coupled to the supply reel hub a movement of approximately one revolution is obtained between the index member and pointer responsive to a transfer of a full length of tape from one reel to the other.

3,734,053

**SOUND SIGNALING SYSTEM HAVING ADJUSTABLE HORIZONTAL DIRECTIVITY**

Robert J. Dodge, Houston, Tex., assignor to Automatic Power Division, Pennwalt Corporation, Houston, Tex.

Filed Mar. 15, 1971, Ser. No. 124,033

Int. Cl. B06b 3/00

U.S. Cl. 116-137

3 Claims



A sound signaling system is disclosed which includes a vertical frame having a plurality of sound baffles mounted on the frame in vertical alignment, and a plurality of sound transmitters each mounted on one of said baffles to form a vertical array of sound transmitters. Each of the sound transmitters is mounted on its respective baffle by a mounting means which permits the mouth of the sound generator to be adjusted with respect to the baffle from a first position in which the vertical array emits sound signals in a relatively narrow horizontal pattern to a second position in which the array emits such signals in a relatively broader horizontal pattern.

3,734,054

**MODERN DOOR KNOCKER**

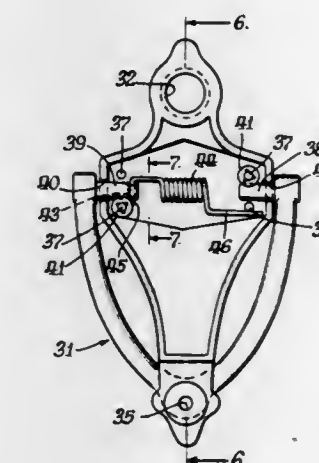
William J. Anderson, Taylorsville, Miss., assignor to Solar Hardware Corporation, Taylorsville, Mich.

Filed Dec. 8, 1971, Ser. No. 205,897

Int. Cl. G10k 1/34

U.S. Cl. 116-148

3 Claims



The hammer of a door knocker is biased outwardly from the mounting plate to facilitate the act of using the knocker.



3,734,055

**APPARATUS FOR OILING CONTINUOUSLY MOVING STOCK**

Stefan Glanzer, Linz, Austria, assignor to Vereinigte Österreichische Eisen- und Stahlwerke Aktiengesellschaft, Linz, Austria

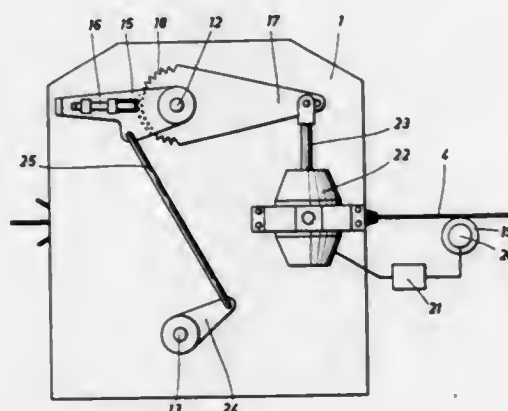
Filed Sept. 28, 1971, Ser. No. 184,490

Claims priority, application Austria, Oct. 20, 1970, A 9427/70

Int. Cl. B05c 5/00, 11/16

U.S. Cl. 118—8

9 Claims



Chamber-defining means define a closed chamber, a sealing inlet to and a sealing outlet from said chamber. Stock-feeding means are provided for continuously moving stock to be oiled through said inlet, chamber, and outlet along a predetermined path. A row of nozzles open in said chamber and are spaced apart transversely to said path and directed toward said path and operable to discharge an oil-air mixture toward said path. Each of said nozzles comprises a needle, which is displaceable to vary the rate at which said oil-air mixture is discharged from said nozzle. An oil conduit and a compressed-air conduit are connected to said nozzles. An automatic control system is provided to control the rate at which said oil-air mixture is discharged from said nozzles in proportion to the speed of travel of said stock in said chamber. Said control system comprises a sensing roller engageable with said stock and adapted to be driven thereby at a speed which is proportional to said speed of travel, a tachogenerator arranged to be driven by said sensing roller and to produce an output signal representative of said speed of travel, an actuator, a controller arranged to receive said output signal and to control the operation of said actuator in response to said output signal, and a linkage operatively connecting said actuator to said needles and arranged to displace said needles in response to a change of said speed of travel resulting in an operation of said actuator.

3,734,056

**INFRARED SPECTROSCOPY APPARATUS**

Stanley T. King, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 3, 1970, Ser. No. 195,439

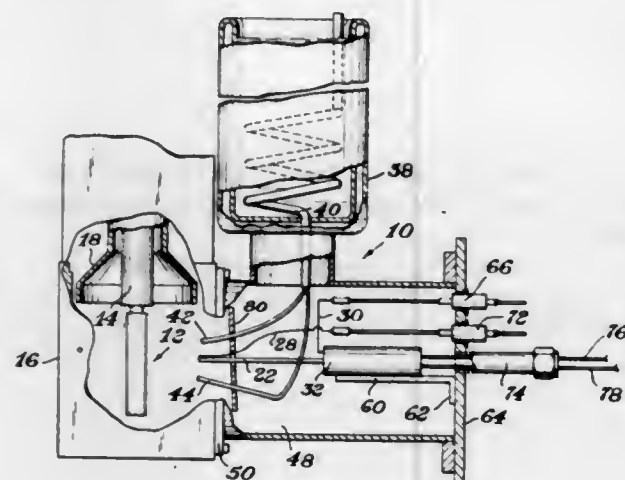
Int. Cl. C23c 13/12

U.S. Cl. 118—48

6 Claims

This invention relates to apparatus for use in isolating monomers of hydrogen-bonded organic compounds, liquids or solids at room temperature in a low temperature inert gas matrix. The apparatus comprises a refrigerated section having an infrared window, a second refrigerated section for pre-cooling the inert matrix gas and for receiving vaporized material to be deposited on the infrared window, the second section having matrix gas nozzles adjacent to a resistance

heated sample inserting nozzle entering the second section from an adjacent sample heating and valving section. The nozzle is coupled to a sealed sample container which is inserted in an electrically heated furnace disposed within the second section.



3,734,057

**PET TOILET**

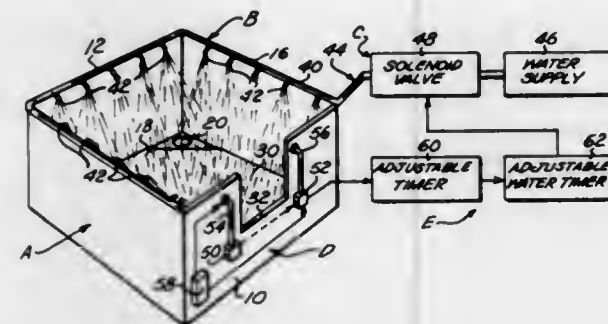
Gary Lee, 1850 Aldersgate Drive, Lyndhurst, Ohio, and Carl Tucker, 4041 Hinsdale Road, South Euclid, Ohio

Filed Sept. 1, 1971, Ser. No. 177,056

Int. Cl. A01k 29/00

U.S. Cl. 119—1

8 Claims



A pet toilet for receiving and then automatically flushing therefrom matter excreted by a pet. The toilet includes an enclosure having walls extending upwardly from a floor and having access means, such as an opening in a sidewall thereof, for a pet to enter and exit from the enclosure. A drainage outlet is provided in the floor and at least a portion of the upper surface of the floor is inclined downwardly toward the outlet. A flush system serves to spray water into the enclosure so that matter excreted therein by a pet is washed from the walls and floor of the enclosure so as to exit through the outlet. Water is supplied to the flush system from a suitable water source when a water supply valve is actuated. A photoelectric system serves to detect a pet entering the enclosure through the access thereto, and an electrical control responds to the photoelectric system for actuating the valve. The control circuit and photoelectric system are arranged so that the enclosure is flushed after the pet has exited. A water timer is provided for controlling the time duration that water is sprayed into the enclosure.

3,734,058

**TRANSPORTER FOR STRETCHER BORNE ANIMALS**

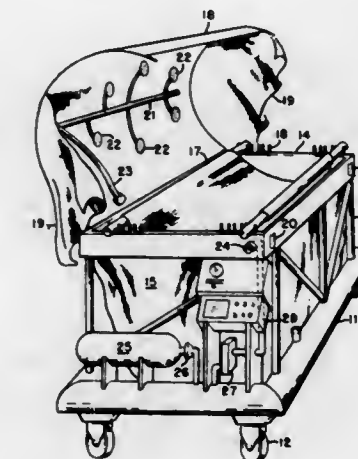
John D. Hightower, Kailua; Martin E. Conboy, Kaneohe, and Lawrence Phillips, Kailua, all of Hawaii, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 1, 1971, Ser. No. 176,955

Int. Cl. A01k 61/00

U.S. Cl. 119—3

6 Claims



A transporter comprising a tank containing a supply of fluid, a frame mounted on the tank and extending thereabove, stretcher supporting devices on the frame, and a canopy extending over it. A fluid distribution system is disclosed connected to the tank and is arranged to discharge its contents above a stretcher supported on the frame. An open fluid receiving receptacle is disclosed as extending below the stretcher and attached to the frame.

3,734,059

**RESTRAINING DEVICE FOR QUADRUPEDS**

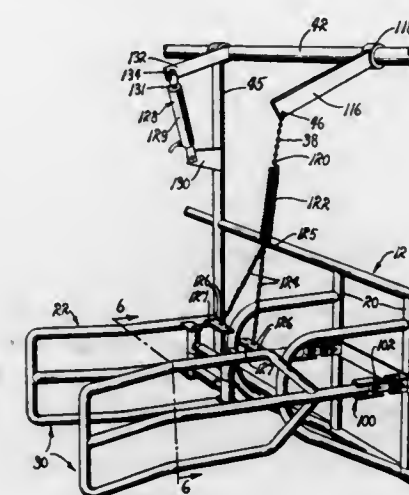
Antonio Rodriguez, 8302 18th Avenue, Lemoore, Calif.

Filed Mar. 4, 1971, Ser. No. 120,968

Int. Cl. A01j 01/00; A01k 01/00

U.S. Cl. 119—27

11 Claims



A restraining device for confining quadrupeds, particularly suited for use in restraining unruly animals, such as ill-tempered cows and the like, for various handling purposes, including facilitating milking operations. The device is characterized by a plurality of pairs of generally parallel restraining rails pivotally coupled to a manger of a type including a plurality of yokes for simultaneously receiving the heads of a plurality of animals to be restrained, and an actuator coupled therewith for imparting thereto a lifting force, whereby a simultaneous, pivotal repositioning of the rails between angularly spaced positions readily is accommodated for receiving and restrain-

ing the animals. The rails are mounted on the device to permit their substantially vertical oscillation about a horizontal axis, as well as their substantially horizontal oscillation about a vertical axis, whereby the rails pivot in orthogonally related planes.

3,734,060

**LIQUID SUPPLEMENT LIVESTOCK FEEDER**

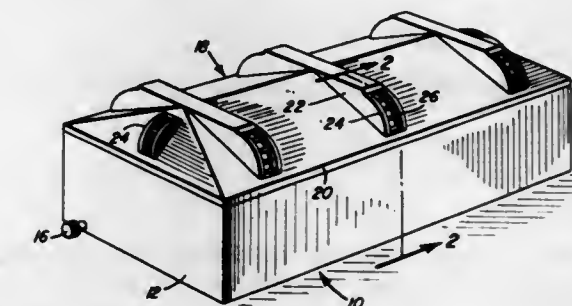
Roland B. Collison, 102 - 19th Drive, Norfolk, Nebr.

Filed May 3, 1971, Ser. No. 139,438

Int. Cl. A01k 5/00

U.S. Cl. 119—51 R

10 Claims



A liquid supplement feeder for livestock, and the like, said feeder having a plurality of licking chain assemblies, each assembly including a continuous multi-link chain, the lower portion of which dips into a tank or container of liquid supplement, and the top portion of which is slidably supported by a smoothly curved fiber glass channel where it is exposed to the livestock which lick the chain to derive liquid supplement therefrom. The licking action of the livestock places sufficient forces on the chain to advance it into the liquid supplement, thereby constantly replenishing the supplement which clings to the chain to provide a continuous supply of liquid supplement to the livestock.

3,734,061

**BIRD FEEDING DEVICE**

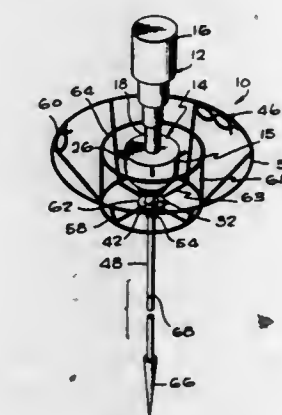
Dixie Valentine Kraus, 25000 Hawkbryn Avenue, Space 44, Newhall, Calif.

Filed Jan. 24, 1972, Ser. No. 220,331

Int. Cl. A01k 5/00

U.S. Cl. 119—52 R

7 Claims



The device comprises a generally vertically oriented feed dispenser, an elongated support member for the dispenser, a releasable connector interconnecting the support member and the dispenser, and a bird perch assembly encircling the feed dispenser.

The perch assembly includes a generally inverted frustoconical basket secured to the elongated support member and an inner ring supported within the basket at about the level of the dispenser. The releasable connector may include a



ball secured to the bottom of the basket and spring blades secured to the bottom of the dispenser which can releasably engage the ball.

3,734,062

**NON-SPILLING DISH FOR DOGS AND THE LIKE**

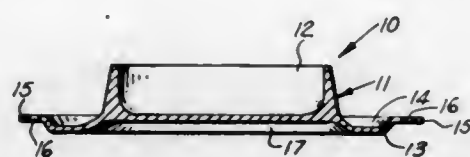
Jamie O'Hara, 3306 Deer Creek, San Antonio, Tex.

Filed Jan. 28, 1972, Ser. No. 221,546

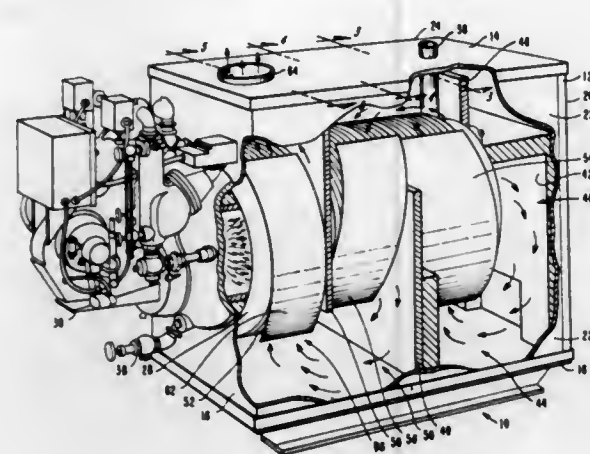
Int. Cl. A01k 05/00

U.S. Cl. 119-61

2 Claims



An animal feeding and watering dish device. This device consists primarily of a bowl like structure within integral and recessed flanging for catching food and water when the pet is being fed.



disposed fins can be subjected to substantial temperature variations without undue stressing of the boiler drum.

3,734,065

**FLUID HEATER**

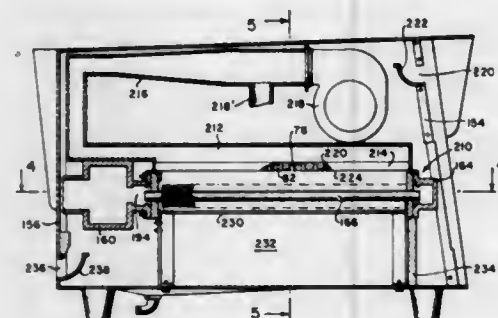
Edward A. Reid, Jr., and Robert G. Venendaal, both of Columbus, Ohio, assignors to Columbia Gas System Service Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 7,445, Feb. 2, 1970, Pat. No. 3,630,175. This application Dec. 27, 1971, Ser. No. 212,517

Int. Cl. F22b 21/26

U.S. Cl. 122-250 R

17 Claims



A fluid heater, particularly adapted for use with a swimming pool, has a powered gas burner therein for supplying high intensity heat to pool water flowing in a tubular heat exchanger adjacent the burner plate. The heat exchanger is arranged in a heater housing to define therewith a flow path adjacent the tubes for the products of combustion from the burner whereby heat by convection is supplied to the tubes from the exhaust gases. The input end of the heat exchanger includes a valve member adapted to maintain a predetermined rate of flow of water through the tubes and to bypass excess water back to the pool.

3,734,064

**BOILER**

Edward Cancilla, Los Angeles, and Bernard E. McClanahan, La Habra, both of Calif., assignors to Ace Tank and Heater Company, Santa Fe Springs, Calif.

Filed Aug. 16, 1971, Ser. No. 172,048

Int. Cl. F22b 7/00

U.S. Cl. 122-136 R

20 Claims

A boiler is disclosed in which hot flue gases generated by combustion within a furnace tube mounted in a liquid filled boiler drum are directed back and forth over different portions of the outside of the drum by an arrangement of partitions and baffles located within a housing containing the boiler drum. The resulting multi-pass design provides for substantially uniformly high flue gas velocity over a plurality of fins helically disposed along the length of the boiler drum on the

3,734,066

**THERMAL FLUID BOILER**

Marcel Scheyen, 26, Avenue de la Paix, Strasbourg, France

Filed July 1, 1971, Ser. No. 158,971

Claims priority, application France, July 1, 1970, 7024309

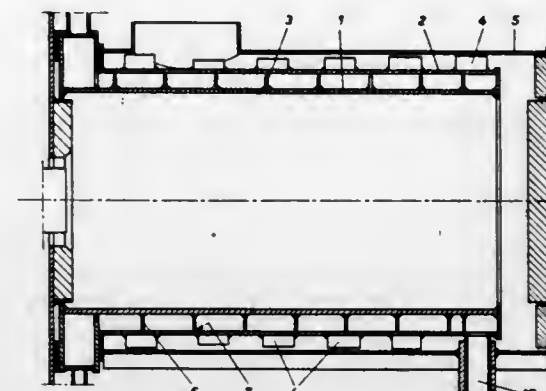
Int. Cl. F22b 23/06

U.S. Cl. 122-367 R

2 Claims

A thermal fluid boiler has a heating chamber consisting of two concentric walls. The inner wall has baffles secured

thereto in the shape between the inner and outer walls but such baffles are not in contact with the outer wall. The outer



wall has fins secured to the outside surface thereof and an outside jacket surrounds the outer wall.

3,734,067

**FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE**

Otto Glockler, 7253 Rennlingen; Hermann Schmid, 732 Goppingen, and Dieter Eichler, 7026 Bonlanden, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

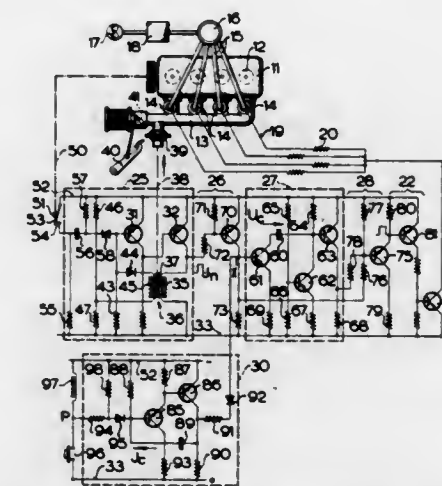
Filed Dec. 17, 1970, Ser. No. 99,139

Claims priority, application Germany, Jan. 22, 1970, P 20 02 667.9

Int. Cl. F02m 51/00; F02b 3/00

U.S. Cl. 123-32 EA

11 Claims



To extend the time of opening of fuel injection valves during starting, a timing circuit, having a time constant preferably between 5 and 30 seconds, and desirably about 25 seconds, is connected to the electronic control circuit controlling the opening times of the fuel injection valves. The timing circuit provides a decreasing signal to extend the time during which the injection valves are open from the time the starter switch is operated. Preferably, the fuel injection system includes a pulse duration multiplier circuit, having a multiplication factor varying between 1 and 5, and the timing circuit affects the multiplication factor.

3,734,068

**FUEL INJECTION CONTROL SYSTEM**

Junuthula N. Reddy, Horseheads, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 28, 1970, Ser. No. 101,896

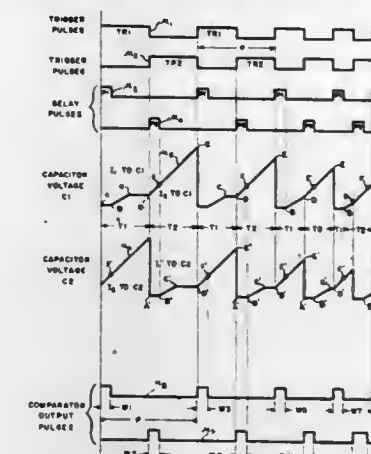
Int. Cl. F02d 5/00; F02m 51/00

U.S. Cl. 123-32 EA

20 Claims

An internal combustion engine fuel injection control system of the type having one or more electrically controlled fuel injector valves which are opened and closed as a function of rotation of each revolution of the crank shaft and/or the pressure in the engine intake manifold so that the open time of the fuel injector valves changes with variations in the speed of the crank shaft even if the pressure in the engine intake manifold

remains constant. This is accomplished by a control circuit that produces a periodic signal having periods and signal durations which are dependent upon the time required for the crank shaft to complete one revolution. Each signal generated during a revolution of the crank shaft includes a portion



wherein the magnitude of the signal increases at a constant rate. The constant rate at which the magnitude of the periodic signal increases remains the same regardless of the changes in the duration of the periodic signal.

3,734,069

**SYSTEM FOR PURIFYING THE EXHAUST GAS OF A TWO-CYCLE GASOLINE INJECTION ENGINE**

Yoshio Akiyama; Tadanori Sato, and Shinobu Koyama, all of Tokyo, Japan, assignors to Fuji Heavy Industry Co., Ltd., Tokyo-to, Japan

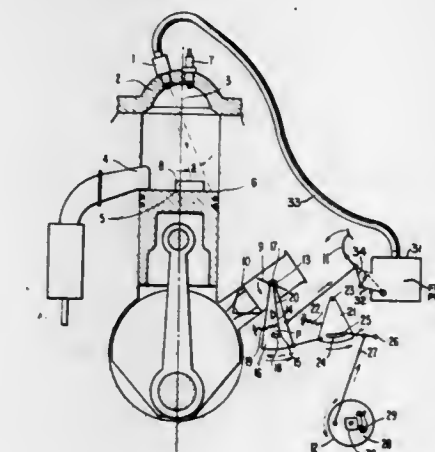
Filed Nov. 16, 1970, Ser. No. 89,729

Claims priority, application Japan, Nov. 14, 1969, 44/91253

Int. Cl. F02p 5/04

U.S. Cl. 123-32 SP

2 Claims



A system for purifying an exhaust gas of two-cycle gasoline injection engine has an automatic injection nozzle disposed relative to a cylinder displaced from the central axis of the cylinder toward the exhaust port to eject the gasoline in the direction intermediate the center of the piston crown when disposed at the bottom dead center point and the cylinder wall opposite the exhaust port and also against the scavenging gas stream flowing from the scavenging port to the cylinder head. The spray angle is selected in the range of 15° to 60°. The end of stationary injection timing is selected in the range from the bottom dead center to 30° after the bottom dead center, and its injection duration held to less than 1.5 millisecond. An injection pump completely shuts off the fuel during high speed-no load operations, and the throttle valve, accelerator pedal and ignition timing means are interlocked so that the throttle valve may not close less than a predetermined opening upon light load operation to maintain the idle speed of the engine. Its ignition timing is changed in response to the opening of the accelerator less than the predetermined opening in order to reduce the concentration of exhaust hydrocarbon and carbon monoxide.



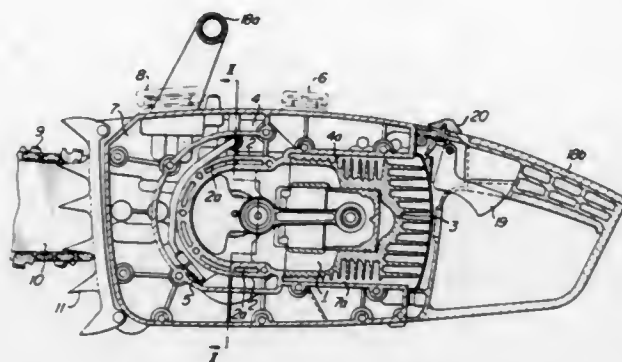
3,734,070

**ENGINE BODY CONSTRUCTION OF A CHAIN SAW**  
Torao Kobayashi, Tokyo, and Hiromasa Miyata, Mitaka, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan  
Filed Sept. 24, 1971, Ser. No. 183,346

Int. Cl. F01p 1/06; F02f 7/00

U.S. Cl. 123—41.31

1 Claim



In the construction of an engine body of a portable chain saw, a crank case, fuel tank and a lubricating oil tank are made integral. At least a part of the outside of the crank case is surrounded by the lubricating oil tank, and at least a part of the circumference of the latter is surrounded by the fuel tank. A partition wall between the crank case and the lubricating oil tank is provided with a double wall construction having therein a space which opens at either one or both sides thereof, whereby cooling air may be drawn through the inside of the space.

3,734,071

**V-TYPE RECIPROCABLE PISTON INTERNAL COMBUSTION ENGINE**

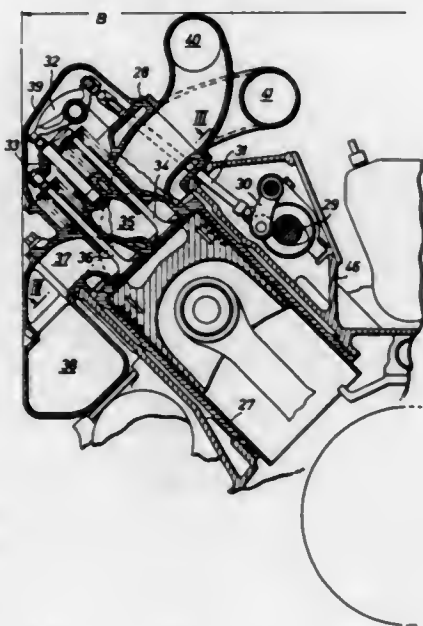
Hermann Mettig, Rodenkirchen, and Bernhard Medenus, Bensberg-Lustheide, both of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne-Deutz, Germany

Filed Aug. 10, 1970, Ser. No. 62,560

Int. Cl. F02b 75/22

U.S. Cl. 123—55 V

4 Claims



A V-type reciprocating piston internal combustion engine with valves in the cylinder heads, especially a supercharged

engine, having exhaust and air supply conduits and valve actuating devices all located within the lateral limits of the engine as determined by the outer limits of the cylinder heads and the rods of the valves therein.

3,734,072

**FUEL CONTROL MEANS FOR A MODEL ENGINE**  
Shoji Yamda, 1-3 Aza Toriyaba, Oaza Haguroshinden, Inuyama, Japan

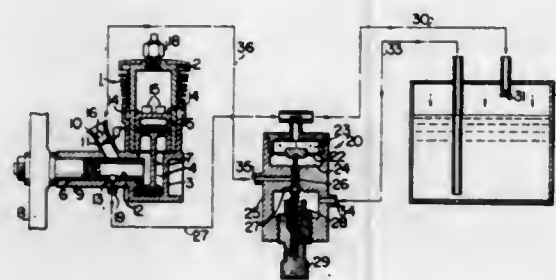
Filed June 16, 1972, Ser. No. 263,460

Claims priority, application Japan, Oct. 20, 1971, 46/96879

Int. Cl. F02b 33/04

U.S. Cl. 123—73 A

4 Claims



Fuel control means for a model engine in which intake air is pre-compressed in a crank chamber of the engine, said fuel control means comprising a pressure responsive fuel control valve provided between a fuel tank and fuel injection nozzle means of the engine, the pressure in the crank chamber being introduced into the valve so as to control its opening in accordance with the crank chamber pressure. The crank chamber pressure is also introduced into the fuel tank so that the fuel in the tank is forced under pressure through the pressure responsive fuel control valve into the engine.

3,734,073

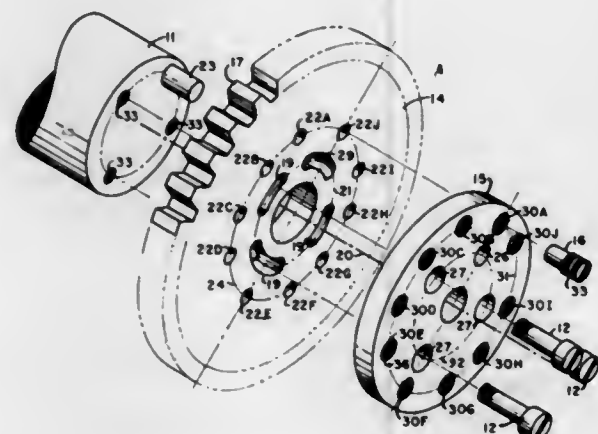
**ADJUSTABLE CAMSHAFT SPROCKET WHEEL**  
Robert L. Walter, 19361 Lake Chabot Road, Castro Valley, and Earl L. Kelly, 1826 Buena Vista, Livermore, both of Calif.

Filed June 1, 1971, Ser. No. 148,648

Int. Cl. F01f 1/34; F16h 35/06

U.S. Cl. 123—90.15

6 Claims



A timing sprocket for a camshaft is provided with a number of positioning holes equally spaced in a circle about its axis of rotation. A vernier plate connected to the camshaft is provided with alignment holes equally spaced in a corresponding

circle as the circle of positioning holes but at a slightly greater or lesser angle. Alignment of a positioning hole and an alignment hole using a positioning pin permits incremental rotational adjustment of the sprocket wheel relative to the camshaft for angular increments equal to the difference between the angles of the positioning holes and the angles of the alignment holes.

3,734,074

**OPPOSED PISTON TWO-STROKE CYCLE INTERNAL COMBUSTION ENGINES**

John Francis Butler, John William Jordan, and Finn Orbeck, all of Sunderland, England, assignors to Doxford and Sunderland Limited, Sunderland, England

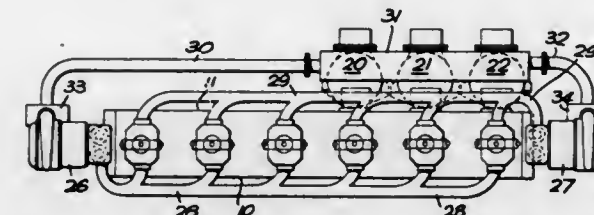
Filed June 18, 1971, Ser. No. 154,503

Claims priority, application Great Britain, June 19, 1970, 29,951/70

Int. Cl. F02b 37/04; F02d 39/04

U.S. Cl. 123—119 CB

3 Claims



A multi-cylinder, opposed piston, two-stroke cycle internal combustion engine, of the kind in which air is admitted to the cylinders under pressure through ports in the cylinder walls at or near the lower ends thereof (i.e. the ends nearest the crankshaft), and exhausted through ports in the cylinder walls at the other ends of the cylinders, has two exhaust driven turbochargers. The gases are exhausted from each cylinder through two sets of ports, the one set of ports for each cylinder being linked to one turbocharger and the other sets to the other turbocharger, so that each turbocharger is driven by approximately half the exhaust gases leaving the engine.

3,734,075

**BALL PROJECTING DEVICE**

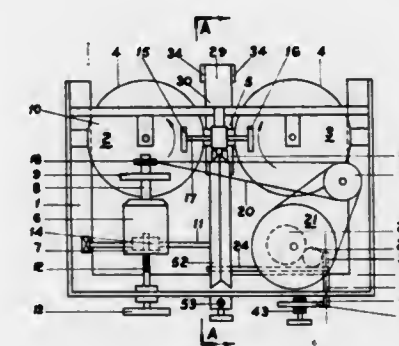
Philip Arthur Staples, 334 Delorme Road, Mondeor, Johannesburg, South Africa

Filed July 30, 1971, Ser. No. 167,604

Int. Cl. F41b 15/00

U.S. Cl. 124—1

7 Claims



The invention relates to a ball projecting arrangement wherein the balls may be projected from between the adjacent portions of the peripheries of a pair of wheels located in the same plane and driven to rotate in opposite directions. The adjacent portions of the peripheries of the wheels are spaced apart less than the diameter of a ball to be projected and the arrangement includes a variable speed ball feed supply

mechanism and a variably positioned and movable deflector plate located between and in front of the wheels relative to the direction in which the wheels are adapted to rotate. The positioning of the deflector plate is controlled by a set of rotating cams.

3,734,076

**HINGE STRUCTURE**

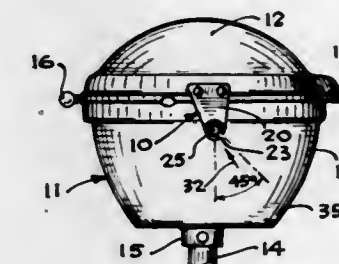
Walter Kiziol, Russell, Ill., assignor to Beatrice Foods Co., Chicago, Ill.

Filed May 12, 1971, Ser. No. 142,490

Int. Cl. A47j 36/00

U.S. Cl. 126—25 R

8 Claims



A hinge structure for a round cover member adapted to be utilized on a rounded base member in a manner such that the cover can be nested partially around the base and removed from the base only when the cover is in a substantially open position. The flange, forming part of the hinge, has an open slot disposed at a pre-determined angle and rests on a post member which is disposed on each side of the base and off-center to serve the dual function of positive opening and closing of the cover with retention of the cover through the inability of the flange to pass over the extended sidewall of the rounded base.

3,734,077

**HEAT-RETAINING FOOD SERVER**

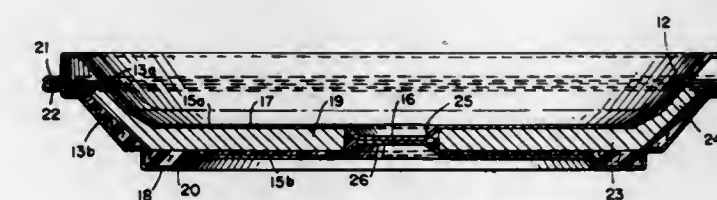
Charles P. Mordough, Evanston, and Alfred W. Neely, Northbrook, both of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Mar. 15, 1972, Ser. No. 234,945

Int. Cl. A47g 23/04

U.S. Cl. 126—246

10 Claims



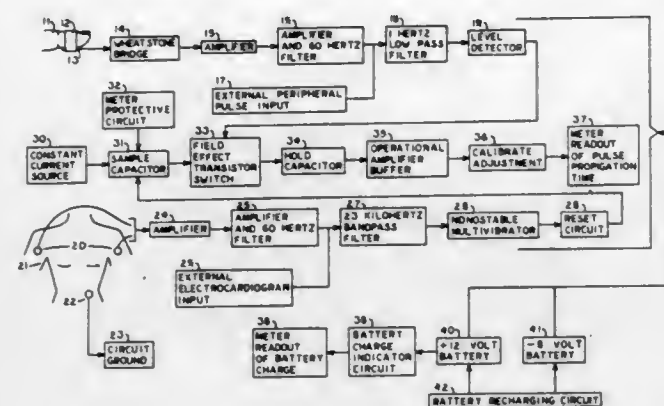
A hollow food serving dish having upper and lower metal shells with a heat-retaining pellet and a resilient cushioning element disposed therebetween. The shells are generally rectangular in shape, when viewed in elevation, and are hermetically sealed together only at their peripheral edges. Limited expansion is permitted upon heating, but the danger of bursting is avoided by reason of the configuration and construction of the dish.







system and the corresponding peripheral pulse detected by a pulse sensing system is disclosed. Further features include a battery supply with a charging circuit and battery condition in-



dicating means and a capacitor-type sample and hold circuit with constant current charging means and meter readout calibrated in pulse propagation time.

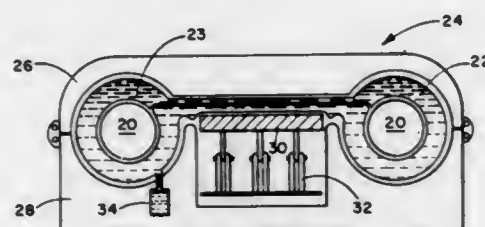
3,734,087

**EXTERNAL PRESSURE CIRCULATORY ASSIST**  
Harold S. Sauer, Carlisle; Nubar D. Hagopian, Bedford, and John M. Colman, Lexington, all of Mass., assignors to Medical Innovations, Inc., Waltham, Mass.

Filed Nov. 11, 1971, Ser. No. 197,824  
Int. Cl. A61b 7/00

U.S. Cl. 128-64

43 Claims



Improved external pressure circulatory assist device of the type which utilizes an electrocardiogram signal to facilitate synchronization of its pressure pulse with the heartbeat. The improvements include a more efficient and clinically suitable mechanical means to induce pressure variations in the legs of a patient, and an automatic control means to maintain the proper pressurization even during physiological changes in the limbs of the patient being treated, and control means to monitor and adjust the pressure wave to achieve the proper phasing of the pressure wave with the cardiac cycle during treatment of the patient.

3,734,088

**TRACTION SYSTEM HAVING INTERFITTING TONGUE AND NOTCH TRACTION PANELS**

Atlee Dee Tucker, Jr., 1339 East Coolidge, and Milton C. David, 1405 Ardmore Ave., both of Modesto, Calif.

Filed Mar. 15, 1971, Ser. No. 124,269

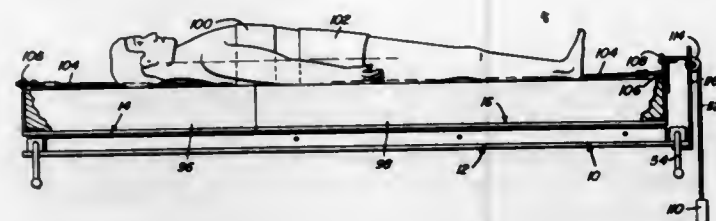
Int. Cl. A61b 1/02

U.S. Cl. 128-75

5 Claims

An elongated base mounting an aligned elevator and traction panel. The elevator is hinged to the base and operating components are mounted on the base for selectively vertically pivoting the elevator. The traction panel is mounted for longitudinal movement on the base and the base incorporates

operating components for effecting the longitudinal movement of the traction panel. The elevator and traction panel



mount patient engaging harnesses in a manner whereby longitudinal movement of the traction panel applies traction to the patient.

3,734,089

CONTRACEPTIVE DEVICE

Robert Gaud, 65 Boulevard du Chateau, 92 Neuilly-sur-Seine, France

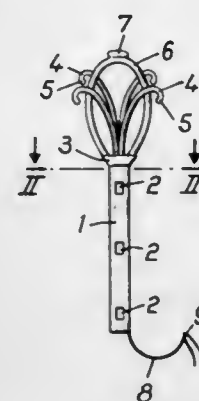
Filed Dec. 14, 1971, Ser. No. 207,768

Claims priority, application France, Dec. 15, 1970, 7045235

Int. Cl. A61t 5/46

U.S. Cl. 128-130

6 Claims



The present invention relates to a contraceptive device to be placed both in the uterine cavity and in the uterine neck and comprising on the one hand a hollow cylinder provided with one or more windows on its side wall and with a widening at its upper part and, housed in said tube by one of their ends, on the one hand two curved stems and a stem folded back on itself forming a loop, the summit of the loop being provided with an excrescence.

3,734,090

INTRA-UTERINE CONTRACEPTIVE DEVICES

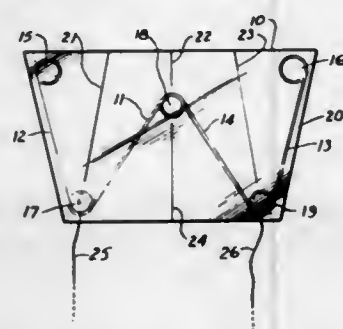
Frank Shubeck, 10 Lundy Lane, Larchmont, N.Y.

Filed Apr. 15, 1971, Ser. No. 134,162

Int. Cl. A61f 5/46

U.S. Cl. 128-130

17 Claims



An improvement in linear, compressible, uniplanar intra-uterine devices which comprises sealing the device in fixed

position between two layers of plastic membrane and then slitting the membrane to allow compression of the device, and, in particular, a W-shaped wire frame sealed in said slitted membrane.

3,734,091

**OXYGEN CONTROL SYSTEM WITH BLOOD OXYGEN SATURATION SENSING MEANS AND METHOD FOR CLOSED SYSTEM BREATHING**

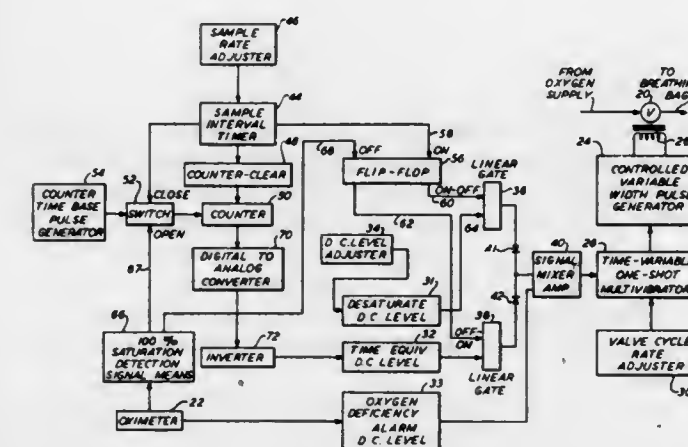
Ronald H. Taplin, Shirley, England, assignor to Airco, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 65,268, Aug. 19, 1970, abandoned, which is a continuation of Ser. No. 708,054, Feb. 26, 1968, abandoned. This application June 22, 1971, Ser. No. 155,547

Int. Cl. A61b 5/00

U.S. Cl. 128-142

10 Claims



The blood circulating in the body of the subject, e.g. in the ear pinna, is tested at suitable time intervals to detect supersaturation of oxygen, using an optical oximeter and a temporary oxygen-deficient (anoxic) breathing mixture in conjunction with a timing device to develop a signal which varies inversely with the time required for the anoxic mixture to bring the oxygen level in the blood down to saturation level, which signal is used to control the duty cycle of a valve in the line supplying oxygen to the user's breathing bag, so that between tests the user is provided with oxygen at a rate responsive to his breathing requirements to maintain his system close to 100 percent saturation in oxygen; an over-riding control being exerted by the oximeter to increase the flow rate of oxygen to the user immediately whenever the oximeter detects an oxygen level below saturation; the anoxic mixture being provided by temporarily reducing the flow rate of oxygen through the valve to a suitable low value.

3,734,092

MEDICAL RESPIRATOR

Barry John Kipling, Cambridge, England, assignor to U.S. Phillips Corporation, New York, N.Y.

Filed Feb. 8, 1971, Ser. No. 113,279

Claims priority, application Great Britain, Mar. 18, 1970, 13,064/70

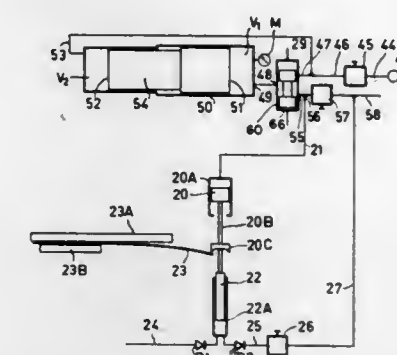
Int. Cl. A61m 16/00

U.S. Cl. 128-145.5

10 Claims

A liquid injector for medical respirators in which a predetermined quantity of patient gas is stored at higher than atmospheric pressure in a known volume during an expiratory period of a respiratory cycle and discharged to a patient during the next following inspiratory period of the cycle. The injector includes a movable member the displacement of which

from a datum position controls the quantity of liquid injected into the patient gas in each cycle. This displacement is directly



3,734,093

THERMAL EAR WAX EXTRACTING DEVICE

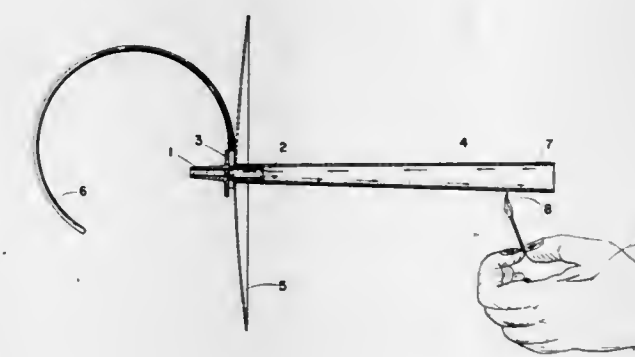
Torindo R. Paurice, Sanford, N.C., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Apr. 21, 1972, Ser. No. 246,128

Int. Cl. A61f 11/00

U.S. Cl. 128-184

4 Claims



A thermal ear wax extracting device comprises a tapered tubular seal unit adapted to be partially inserted into an ear of a patient. A tapered tubular heating unit many times longer than the seal unit is removably fitted onto the part of the seal unit adapted to extend outside the ear. The heating unit is adapted to burn slowly to provide heat at the seal unit. A shield is removably fitted onto the heating unit around the part of the seal unit adapted to extend outside the ear. The shield is interposed between the head of the patient and the heating unit.

3,734,094

MULTIPURPOSE ESOPHAGEAL INSTRUMENT

Teodoro A. Callinog, 320 E. North Avenue, Pittsburgh, Pa.

Filed June 21, 1971, Ser. No. 155,044

Int. Cl. A61b 5/04

U.S. Cl. 128-2.06 E

3 Claims

An instrument for integrated monitoring of a patient's physical condition includes a suction tube for insertion in his



esophagus, the tube being provided with an inlet in one end for stomach fluids and an outlet in its opposite end for connection to a suction machine. A portion of the tube is encircled by an acoustic tube that is spaced from it, although the inner end of the acoustic tube is sealed to the suction tube in a location adjacent to, but spaced from, the inlet end of the suction tube. The outer end of the acoustic tube has an opening through



which the suction tube emerges, and an outlet for connection to a sound-monitoring device. The inner end portion of the acoustic tube has lateral openings therein covered by diaphragm means. A plurality of spaced electrode bands encircle the acoustic tube adjacent the sleeve and are connected to wires extending outwardly along the acoustic tube and away from its outer end for connection to a heart-monitoring machine.

3,734,095

## FLUID INFUSION

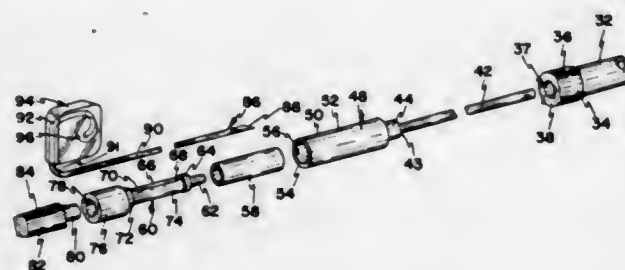
Louis S. Santomieri, 479 Oak View Drive, Vacaville, Calif.

Filed May 21, 1971, Ser. No. 145,657

Int. Cl. A61m 05/00

U.S. Cl. 128—214.4

20 Claims



A novel fluid infusion assembly and method, the assembly comprising a stylet catheter and associated novel guide core which carries a surmounting self-sealing penetrable jacket accommodating placement of a stylet needle within the catheter prior to venipuncture and removal of the stylet needle subsequent to venipuncture while a fluid delivery tube is continuously communicating fluid to the catheter. An improved fluid coupling is adapted to penetrate the jacket and guide core at selected locations to provide an alternate site for delivering fluid to the catheter or for delivering a plurality of fluids to the catheter simultaneously. The stylet needle has, at the curved terminal end thereof, an upstanding tab which novelly accommodates (1) aspiration of blood from the vein to a transparent portion of the tab, or (2) outflow of blood from the vein to a transparent portion of the tab by normal blood pressure and capillary action to evince a successful venipuncture. The method includes squeezing the tab prior to and during venipuncture and thereafter aspirating blood into the tab and also removing the stylet needle and penetrating the self-sealing jacket with a fluid connector.

3,734,096

## CONSTRUCTION FOR VENTED FECAL RECEPTACLES

Bluma Millenbach, 25 Roe Court, Islip, L.I., N.Y.

Filed July 21, 1971, Ser. No. 164,653

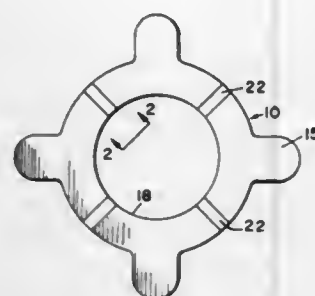
Int. Cl. A61f 5/44

U.S. Cl. 128—283

11 Claims

Receptacles constructed in accordance with certain principles are usable for anal ileostomy or colostomy purposes

wherein a plastic bag or vinyl, polyethylene, or the like is provided with a body attachment means having an open gap or gaps such as indentations which may provide contraction and expansion with a patient's sphincter and/or venting. Such indentations form vent passages in the ring face regardless of any need for expansion or contraction so that devices of similar construction can be used where no expansion is needed. For example, for infants or persons having extremely



loose or watery bowel movement and no sphincter expansion. Likewise constructions wherein expansion is not required are suitable for ileostomy or colostomy pouches applied to any required body area. In such instances, the rings can be constructed with one or more vent passages effected by gaps between the ends of adhesive members normally carried by the ring for adherence between the buttocks or to a body area. Modified gas escape vents are disclosed as variations of the invention.

3,734,097

## THERAPEUTIC ADHESIVE TAPE

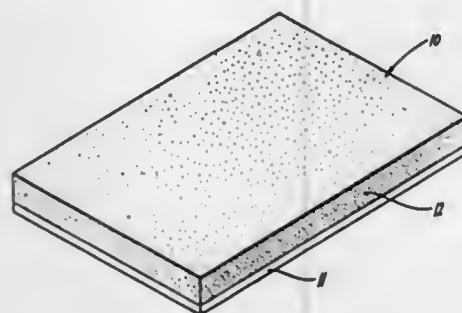
Alejandro Zaffaroni, Atherton, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 812,116, April 1, 1969, Pat. No. 3,598,122, and a continuation-in-part of Ser. No. 812,117, April 1, 1969, Pat. No. 3,598,123. This application Apr. 23, 1971, Ser. No. 136,981 The portion of the term of this patent subsequent to Aug. 10, 1988, has been disclaimed.

Int. Cl. A61f 7/02

U.S. Cl. 128—268

16 Claims



Adhesive laminate tape for the topical administration of controlled therapeutically effective quantities of drug selected from the group consisting of anti-neoplastic agents, folic acid antagonists and anti-mitotic agents for the treatment of skin lesions, comprising a backing member bearing a pressure-sensitive adhesive, the adhesive having distributed therein a means for metering the flow of a therapeutically effective amount of the drug to the lesions over a prolonged period of time.

3,734,098

## VENTED MEDICAMENT DISPENSING PACKAGE WITH SPACER

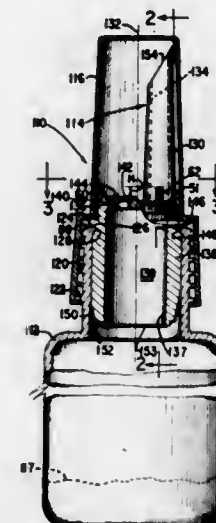
George H. Schneller, Devon; Ralph S. Levi; Howard J. Levin, both of Norristown, and Stephen W. Goodsir, King of Prussia, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 118,009, Feb. 23, 1971, which is a continuation of Ser. No. 814,424, April 8, 1969, abandoned, which is a continuation-in-part of Ser. No. 742,872, July 5, 1968, abandoned. This application Aug. 18, 1971, Ser. No. 172,805

Int. Cl. A61j 1/00

U.S. Cl. 128—272

6 Claims



The disclosure is directed to an improvement in a universal dispensing package for medicaments to be dissolved in a parenteral container prior to use. The package is made up of a container and a cap which has a hollow piercing device for dispensing medicament from the container into a closed system parenteral solution bottle, and second has a frusto-conical shank adapted to engage the interior surface of the neck of an open system parenteral solution container. A hydrophobic membrane filter is provided as a vent in the cap to relieve the vacuum to allow for dispensing of the medicament.

The present improvement comprises spacers, or studs, formed at the base of the piercing device to space the hydrophobic vent at a predetermined distance from the parenteral container when used in conjunction with a closed system parenteral solution bottle.

3,734,099

## POWERED SURGICAL CUTTER

Herman G. Bender, 5205 S.E. 37th Avenue, Portland, Oreg.; Robert N. Page, Route 1, Box 872, Beaverton, Oreg., and Leslie D. Wold, 539 S.W. 188th Avenue, Aloha, Oreg.

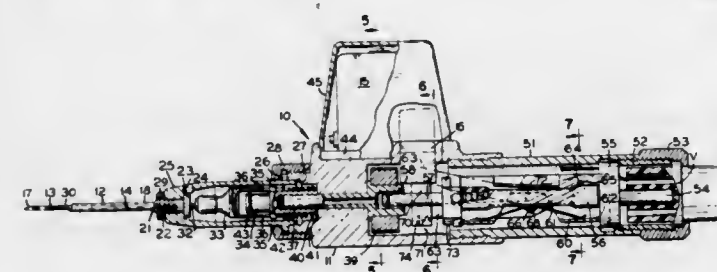
Continuation of Ser. No. 841,741, July 15, 1969, abandoned.

This application Apr. 7, 1971, Ser. No. 114,702

Int. Cl. A61b 17/32

U.S. Cl. 128—305

7 Claims



A powered surgical cutter with its own controlled vacuum system designed to clip tissue and remove each piece as it is

clipped through a vacuum line. The apparatus has an elongated external fixed tubular cutter interiorly of which a similar cutter rotates. The inner cutter is driven by a motor by means of a hollow drive shaft, the interior of which shaft is in communication with the interior of the inner cutter. Vacuum is supplied through the interior of the drive shaft to the interior of the cutter. Control means are provided whereby tissue drawn into an opening in the tubular cutter by the vacuum is sheared off by the rotation of the inner cutter inside and against the bore of the external cutter.

3,734,100

## CATHETER TUBES

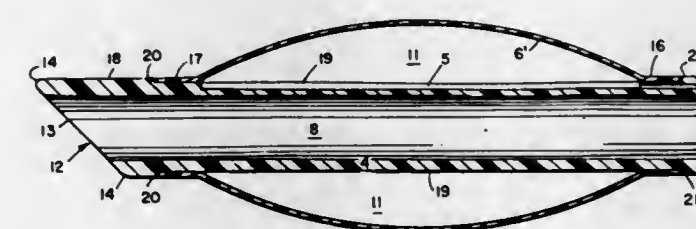
Robert D. Walker, Racine, Wis.; Seymour Bazell, Skokie, Ill.; Edward M. Goldberg, Glencoe, Ill.; and Ralph G. Ostensen, Morton Grove, Ill., assignors to MPC/Kurgisil, a joint venture of Medical Products Corp. and E. T. Manufacturing Co., Skokie, Ill.

Filed Mar. 29, 1971, Ser. No. 128,898

Int. Cl. A61m 25/00, 16/00

U.S. Cl. 128—351

11 Claims



Improved catheter tubes and their method of construction having a conformable balloon cuff of silicone rubber of low hardness, modulus, and stress values, and which results in less pressure necrosis and cuff failure in use. Specific examples include endotracheal tubes, Foley catheters, tracheostomy tubes, urethral catheters, and catheters for use in gastric, esophageal, pharyngeal, nasal, intestinal, rectalcolonic, choledochal, arterial venous, cardiac and endobronchial applications.

3,734,101

## GIRDLE WITH WAISTLINE AREA CONTROL

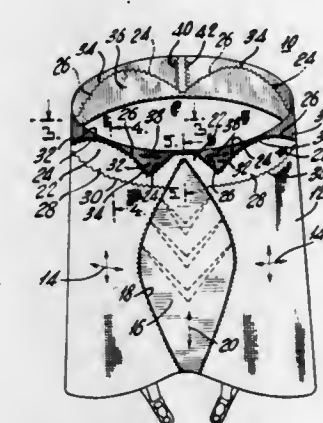
Jack J. LoCascio, Bayonne, N.J., assignor to International Playtex Corporation, New York, N.Y.

Filed Dec. 13, 1971, Ser. No. 207,495

Int. Cl. A41c 1/00

U.S. Cl. 128—533

20 Claims



A girdle is disclosed which provides for waistline area control and generally includes a body encircling and molding region terminating at an upper portion in a plurality of generally convergent marginal edges extending upwardly with respect to the body encircling region and inwardly with respect to each other to provide a plurality of open spaces between upwardly



projecting areas. A transversely extensible and preferably transversely elastic band of material is superimposed substantially circumferentially along the upper portion of the girdle. The band is secured to the upwardly projecting areas along the marginal edges of such projecting areas to provide zones of lesser modulus of elasticity between said upwardly projecting areas.

3,734,102

## DRIVE FOR ORBITING SIEVE OF COMBINE

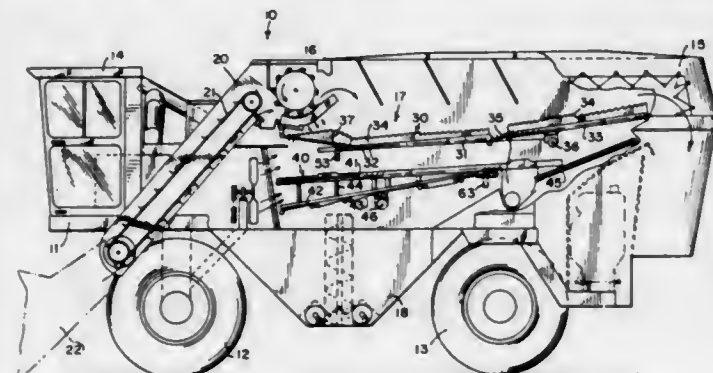
Stuart D. Pool, Crystal Lake, Ill., assignor to Bernard Mathews, Crystal Lake, Ill.

Filed Nov. 1, 1971, Ser. No. 194,238

Int. Cl. A01f 12/30

U.S. Cl. 130—26

3 Claims



A combine has an upper sieve and a lower sieve connected to each other at the front and rear ends by front and rear linkages. Each linkage has a rock lever, and two vertically extending links connected to the respective sieves. The rock lever is fulcrumed in walls of the combine casing. The rear end of the upper sieve is driven by a first crank and the front end of the lower sieve is driven by a second crank of less radius. The vertical crank motion of the rear end of the upper sieve is transmitted to the rear end of the lower sieve by the rear linkage, and the crank vertical motion of the front end of the lower sieve is transmitted to the front end of the upper sieve by the front linkage. The front end of the upper sieve has elliptical orbiting motion, and the whole of the lower sieve and a rear part of the upper sieve have circular orbiting motion.

3,734,103

## CONCAVE FOR COMBINES

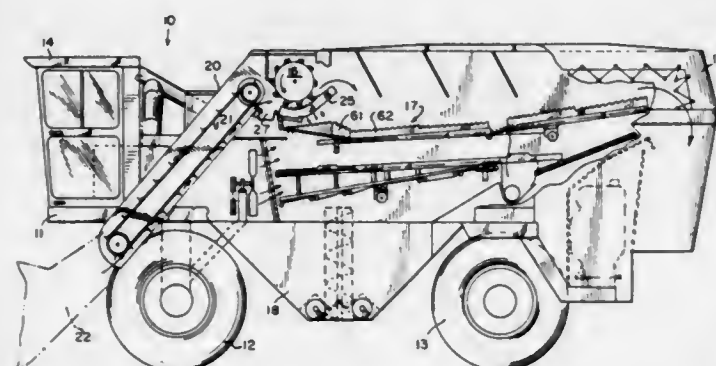
Bernard C. Mathews, P.O. Box 70, Crystal Lake, Ill.

Filed Dec. 13, 1971, Ser. No. 207,444

Int. Cl. A01f 12/28

U.S. Cl. 130—27 L

6 Claims



The concave has a removable blanking plate located beneath the concave bars. A transverse angle extending from one side plate to the other has horizontally and forwardly extending fingers which support the blanking plate so it can be

removed in the forward direction. The front concave bar extends downwardly to block removal in the forward direction. The front concave bar is removably screwed to a cross plate to permit removal of the blanking plate. Access is provided by a door in the casing walls. A flange on the blanking plate engages the front ends of the fingers to prevent rearward movement of the blanking plate.

3,734,104

## METHOD FOR EXPANDING TOBACCO STEMS

William Michaux Buchanan, and John W. Madures, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Nov. 4, 1971, Ser. No. 195,613

Int. Cl. A24b 03/18

U.S. Cl. 131—140 P

7 Claims

Expanded tobacco stems are produced having increased filling capacity. Rolled, crushed tobacco stems are cut to filler size and adjusted to a moisture content of about 24 to 60 percent by weight. The high moisture cut stems are subjected to hot gas containing at least 30 percent steam, whereby the moisturized stems are heated to about 250° to 750°F. for about 0.5 to less than 3 seconds. By this process, the filling capacity of the expanded cut stems is increased from 30 to 50 percent or more and the apparent density is materially reduced in comparison to that of an unexpanded control.

3,734,105

## CAPLESS WIG

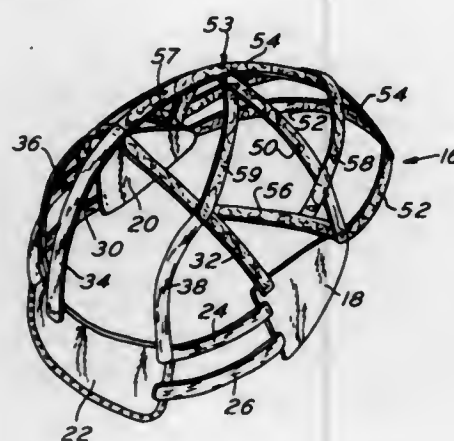
Marco Borghese, Ardmore, Pa., assignor to N. Wagman & Company, Inc., Philadelphia, Pa.

Filed Jan. 5, 1972, Ser. No. 215,600

Int. Cl. A41g 3/00

U.S. Cl. 132—53

7 Claims



A capless wig is disclosed having a skeleton defined substantially by non-elastic lace fabric strips and a plurality of substantially parallel elastic strips on the rear half of the skeleton. Each of said strips is stitched to a hair mounting strip spirally wound with respect to the skeleton.

3,734,106

## TOOTHBRUSH MOUTHWASH RINSE KIT

Eli Zimmerman, 159 West 76th St., Apt. 5A, New York, N.Y.

Filed Apr. 5, 1971, Ser. No. 131,275

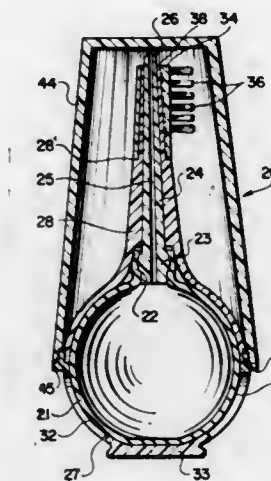
Int. Cl. A45d 40/00

U.S. Cl. 132—79 B

9 Claims

A combined toothbrush mouthwash rinser and tumbler kit that comprises a squeeze bottle, an adapter extendable over the squeeze bottle and connected to the open end of the same and this adapter including a skirted portion adapted to extend downwardly over the squeeze bulb with a bottom part basically connected thereto or with an opening permitting access to the squeeze bulb so that the rinser liquid can be forced out-

wardly therefrom. The adapter includes a support for a toothbrush element, which the element may include a stem or by which the toothbrush element may be slipped over the end of the adapter in a manner to keep the same from turning and held against axial displacement therefrom. A tumbler made of plastic to be tight fitted downwardly on to the skirted portion surrounding the squeeze bottle or directly on to the squeeze bottle according to the last form of the invention. This tumbler



makes for a sanitary kit and also serves to provide storage space for toothpaste and other brush elements of different bristle strength. The adapter may include valve arrangement and the stem may be releasably removable from the adapter and when tightened upon the same will close a valve surface on the stem upon it being brought against a valve extension on the adapter so that the outlet through the adapter is closed when the brush stem is tightened down upon the adapter.

3,734,107

## DENTAL FLOSS TOOTH CLEANING TOOL

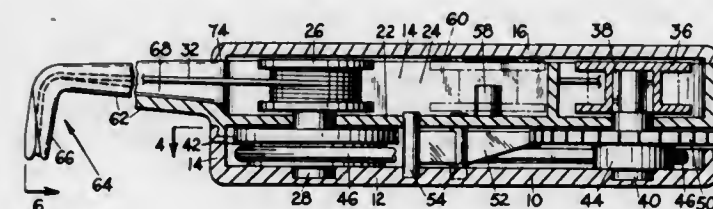
Irwin B. Thierman, 8817 N. Swenson St., Portland, Oreg.

Filed Nov. 12, 1971, Ser. No. 198,263

Int. Cl. A61c 15/00

U.S. Cl. 132—92 A

5 Claims



A tool for holding dental floss and being capable of being manipulated for cleaning interproximal areas between the teeth. The tool has a body member supporting a supply spool of dental floss and a take-up spool. A pair of arms project from the body member and have downturned fingers across which dental floss between the supply spool and take-up spool is stretched tightly. The dental floss being supported across the fingers can be worked between the teeth by suitable manipulation of the tool. The supply spool of dental floss and the take-up spool have a rotatable connection with each other such that when new dental floss is presented to the fingers such floss is simultaneously taken up and held tight.

3,734,108

## CLEANING DEVICES FOR CHEMICAL OR ELECTRO-CHEMICAL SURFACE TREATMENT PLANTS

Svante G. Almegard, Savedalen, and Harry A. H. Ericson, V. Frolunda, both of Sweden, assignors to Nordnero AB, Goteborg, Sweden

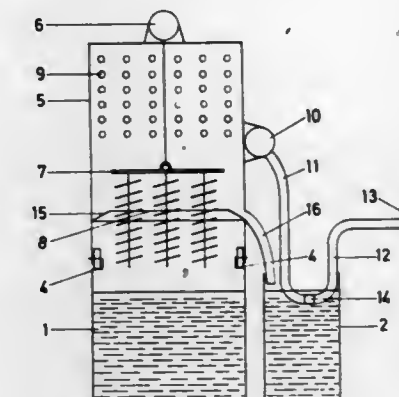
Filed Dec. 8, 1971, Ser. No. 206,015

Claims priority, application Sweden, Dec. 10, 1970, 16693/70

Int. Cl. B08b 3/02

U.S. Cl. 134—76

8 Claims



A cleaning device for chemical or electro-chemical surface treatment plants, comprising different treatment tanks into which the material to be treated is immersed, uses a movable spray booth which is transported to a preselected tank and stops in a position above said tank. The material having its treatment finished in said tank is lifted up through the bottom of said spray booth and is sprayed with cleaning liquid inside it.

3,734,109

## SPRAY CLEANING SYSTEM

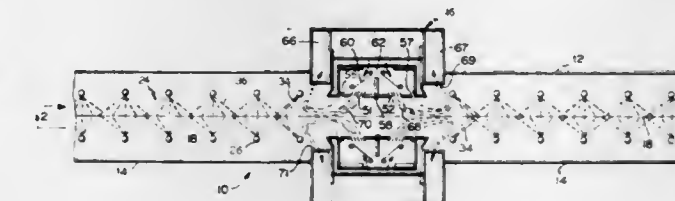
Phillip G. Hebner, 5430 West Marginal Way SW, Seattle, Wash.

Filed Mar. 8, 1971, Ser. No. 121,680

Int. Cl. B08b 3/02

U.S. Cl. 134—64

19 Claims



A spray cleaning system adapted to operate upon elements of extended length including a confined area having a path of travel along which the elements are conveyed, a plurality of spray stations each having spraying units aligned on either side of the path of travel, and a pneumatic isolating station positioned between successive spray stations to direct a flow of air upon the surfaces of the elements at a low velocity to prevent cross contamination between liquids sprayed in successive spray stations.

3,734,110

## PREFABRICATED STRUCTURE ADAPTED TO BE ATTACHED TO A VEHICLE TOP

Mark T. Burns, 4557 Alameda Drive, Fremont, Calif.

Filed Oct. 26, 1971, Ser. No. 192,418

Int. Cl. E04f 1/343

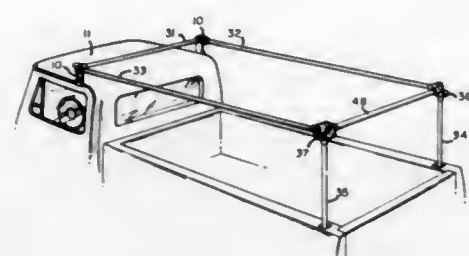
U.S. Cl. 135—1 A

1 Claim

Structures such as racks, shelters and the like which are adapted to be attached to a vehicle top are assembled with



corner members which are shaped to receive and grip different lengths of pipe. These structures are also provided to the main by upsetting the material of the main outwardly of the same into the through bore of a fitting attached to the



the vehicle top whereby the structures are readily attached to the top of a vehicle or to the side thereof.

3,734,111

## APPARATUS FOR IN-LINE MIXING OF FLUIDS

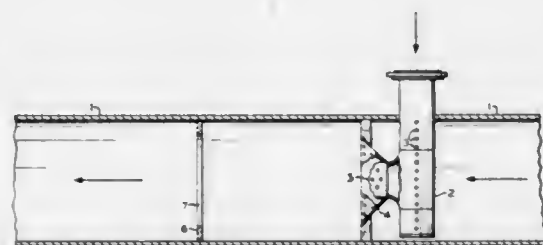
William A. McClintock, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 20, 1971, Ser. No. 209,575

Int. Cl. G05d 11/02

U.S. Cl. 137-3

6 Claims



A method and apparatus are provided for mixing a fluid traveling in a pipe section with a second fluid introduced into the pipe section by sparging the second fluid into the pipe section at points across the internal diameter of the pipe section, disrupting the flow through the pipe section with a perforated frusto-conical baffle coaxially aligned with the pipe section with its apex extending toward the means of sparging the second fluid, sparging additional second fluid downstream from within the throat of the frusto-conical baffle, and disrupting the flow within the pipe downstream of the frusto-conical baffle and sparging means with a line restriction extending from the pipe section sidewalls into the pipe section to create an orifice of smaller diameter than the pipe section inside diameter coaxially aligned with the pipe section.

3,734,112

## METHOD OF TAPPING A HOLE IN A MAIN THROUGH A FITTING

Robert R. Finney; Lawrence F. Luckenbill, both of Decatur, and Gerry E. Kissell, Charleston, all of Ill., assignors to Mueller Co., Decatur, Ill.

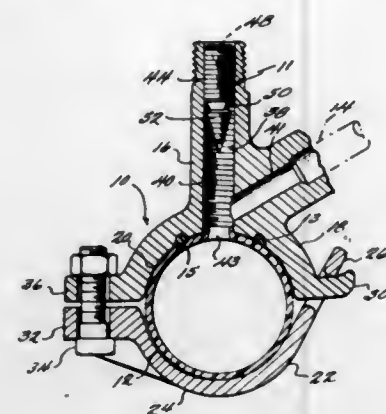
Division of Ser. No. 868,040, Oct. 21, 1969. This application Mar. 10, 1971, Ser. No. 122,986

Int. Cl. B23b 41/08

U.S. Cl. 137-15

4 Claims

A method for opening a flow-way in a main when a main is to be connected to a secondary main or service line. In opening the flow-way in the main, a perforator or tapping tool is utilized, which will progressively form the hole or aperture in



main, the upset material acting as a mechanical fastening means for increasing the resistance of a fitting to twist about the axis or center line of the main.

3,734,113

## ATTITUDE CONTROLLED VALVE

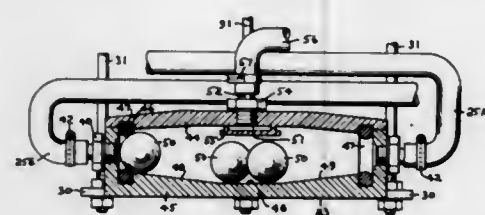
Bernard G. Madden, 860 Valley View Road, Flourtown, Pa. Division of Ser. No. 866,196, Oct. 14, 1969, Pat. No. 3,590,399

Filed June 24, 1971, Ser. No. 156,357

Int. Cl. E04h 3/19

U.S. Cl. 137-40

8 Claims



A flotation system including a plurality of gas/liquid ballast tanks secured to the underside of a platform and all connected to a novel gas distribution valve also secured to the platform which selectively delivers gas to the ballast tanks in such manner as to maintain the desired attitude of the platform within the liquid medium. The ballast tanks are open bottomed and function as air traps, the degree of flotation afforded to the platform being controlled by injecting or withdrawing air of other gas to respectively force water out from and take water in through the bottom of the tank and thereby control the displacement. The open bottom construction of the ballast tanks provides a self-limiting tilt feature to each tank because inclination of a tank above a predetermined critical angle causes air to spill out through the bottom and limit the flotation. The valve is a novel type of ball check valve and provides attitude control by automatically selectively controlling the ratio of gas to liquid within each ballast tank through the check ball feature, while elevation control is effected by simultaneously changing the ratio of gas to liquid in all ballast tanks. The control valve is formed with a plurality of ports spaced peripherally about the sidewall of the valve body. The upper surface of the valve body bottom wall is provided with a central horizontal platform region disposed at a level below that of each of the ports, from which the floor extends radially outward and slopes upward toward the ports. A plurality of spherical balls are seated on the central platform when the latter is in a horizontal position, and when the valve body is tilted are free to roll outward and block any of the ports disposed at a lower elevation than the central platform. The mechanism may be adjusted to provide a slope to the platform or other controlled device where such an arrangement is desired.

3,734,114

## ADJUSTABLE DAMPER VALVE

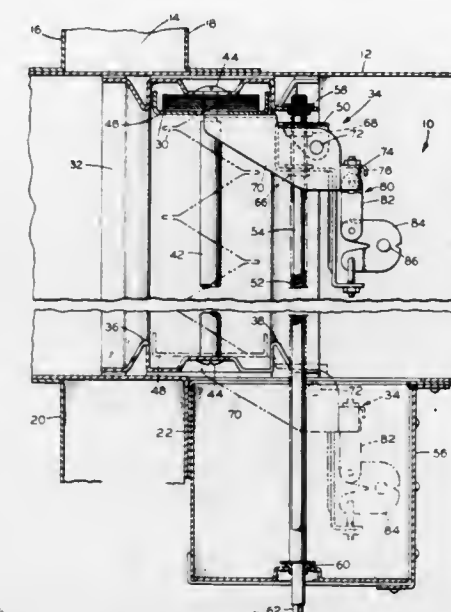
Leonard R. Phillips, Westfield, Mass., assignor to Sterling Radiator Company, Inc., Westfield, Mass.

Filed Jan. 5, 1972, Ser. No. 215,464

Int. Cl. F16k 17/40; E05f 15/20

U.S. Cl. 137-68

12 Claims



An adjustable damper valve having a housing forming an axially extending passageway utilizes a resilient metallic shutter containing a plurality of pleat-type folds to permit the shutter to expand transversely across the passageway and close a ventilating duct. An adjustable platform bearing a bracket that is pivotable into or out of engagement with the metallic shutter is mounted on a lead screw that may be rotated to adjust the transverse position of the bracket in the passageway and correspondingly limit the resilient expansion of the shutter across the passageway. The bracket is held in engagement with the metallic shutter by means of a frangible link which when broken permits the bracket to pivot relative to the adjustable platform and out of engagement with the shutter so that the shutter can completely close the passageway. Several frangible links responsive to different conditions are connected serially together to hold the bracket so that the shutter closes automatically when a condition to which any one of the links is sensitive is present.

3,734,115

## SPRING BIASED SAFETY VALVE

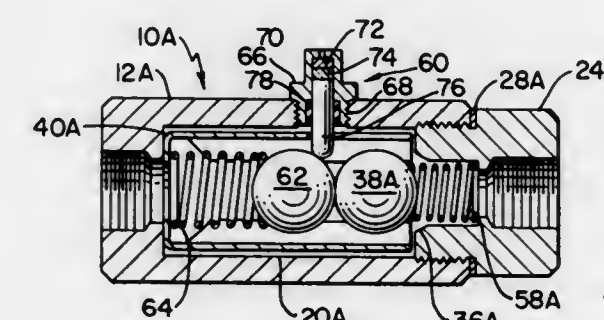
Jack A. McMath, Fort Thomas, Ky., assignor to Dover Corporation, New York, N.Y.

Filed Apr. 26, 1971, Ser. No. 137,171

Int. Cl. F16k 15/04, 17/30, 17/38

U.S. Cl. 137-73

9 Claims



A biased safety valve for preventing the flow of materials therethrough in the presence of predetermined conditions is

disclosed. Resilient means urges an outlet closure member upstream away from the outlet. When the predetermined conditions have been met, the closure member overcomes the resistance of the resilient means and is seated against the outlet to prevent further flow therethrough.

3,734,116

## BACK PRESSURE SENSITIVE SWITCH FOR A FLUERIC DEVICE

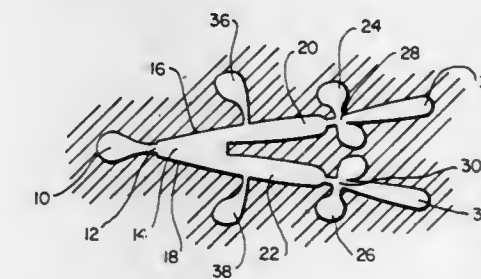
R. Pierce Trask, II, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 1, 1971, Ser. No. 177,033

Int. Cl. F15c 1/08

U.S. Cl. 137-836

5 Claims



A back pressure sensitive fluidic switching mechanism is disclosed. A fluidic device incorporating this mechanism will switch from one output receiver channel to another under the effect of back pressure produced by a control signal issuing from a control port disposed at, in, or near the output channel of the device. Decoupling vents are provided downstream of the control ports in each output receiver channel so as to insulate the device from the effects of load impedance. Operational stability may be achieved by the provision of side vents in conjunction with each control port such that the control signal, when applied, serves to block the vent.

3,734,117

## FLUID DIAPHRAGM MODULATOR

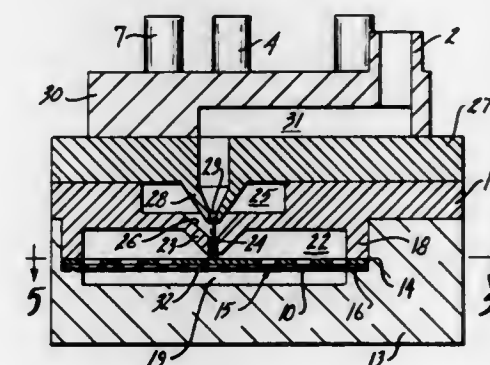
Louis D. Atkinson, New Berlin, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Nov. 18, 1970, Ser. No. 90,707

Int. Cl. G05d 16/00

U.S. Cl. 137-82

8 Claims



A pair of spaced and series connected nozzles terminate in a first coupling chamber with a flat spring-loaded diaphragm forming an outer wall. A second coupling chamber closes the spaces between the nozzles. The diaphragm is a common wall with an input chamber. A main fluid supply is connected to either the first coupling chamber or to the first nozzle and an output or a reference pressure means is correspondingly connected to the second coupling chamber. A supply to the nozzle establishes aspiration between the two nozzles with a resulting negative pressure level. A control input signal to the



input chamber moves the spring-loaded diaphragm toward the second nozzle with an increased pressure in the second chamber. Alternatively, the output is connected with the supply to the first chamber and the nozzles and second chamber are connected to references to establish unit gain and provide a repeater.

3,734,118

# FOLDABLE TOOTHBRUSH WITH PASTE SUPPLY: AND DISPENSER AND COVERING MEANS

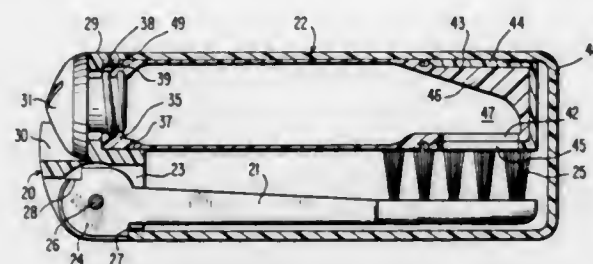
Frances B. Howard, 1011 College Street, Columbus, Miss.

Filed Nov. 26, 1971, Ser. No. 202,300

Int. Cl. A63h 27/00

U.S. Cl. 132-84

16 Claims



A folding toothbrush includes a brush element which is pivoted to a carrier member and shiftable on this member from non-use to use positions. The carrier member also forms the support and alignment means for a pliable receptacle for toothpaste having a discharge slot which registers with the brush head when the brush is in the completely folded non-use position. A cover member for the brush and receptacle in the non-use position serves as a handle when the brush is extended for use.

3,734,119

# APPARATUS FOR DETERMINING VISCOSITY

Derrick Albert Nudds, Brentwood, England, assignor to N. V.

Tools Limited, Brentwood, Essex, England

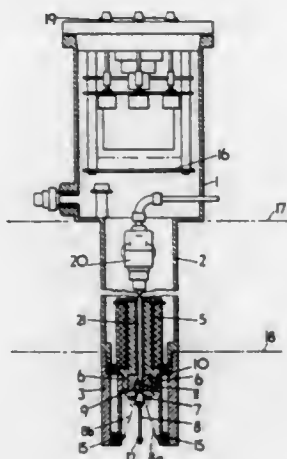
Filed Feb. 7, 1972, Ser. No. 224,031

Claims priority, application Great Britain, Feb. 8, 1971, 4,181/71

Int. Cl. G05d 24/02

U.S. Cl. 137-92

7 Claims



Apparatus for determining the viscosity of a liquid which includes a pivoted paddle or like member arranged to be immersed in the liquid and driven by means of an electromagnetic force acting upon the member, means for reversing the direction of the electromagnetic force each time the member reaches a predetermined point in each direction of its travel and thereby causing the member to be driven back and forth in the liquid, and means for introducing a further liquid into the said liquid in such a way that in passing to the liquid said further liquid serves to lubricate the pivot of the member.

3,734,120  
CONTROL MEANS FOR FLUID FLOW VALVES  
Alan Charles Rowe, East Chinnock, near Yeovil, and John Richardson Bennett, Yeovil, both of England, assignors to Normalair-Garrett (Holdings) Limited, Yeovil, Somerset, England

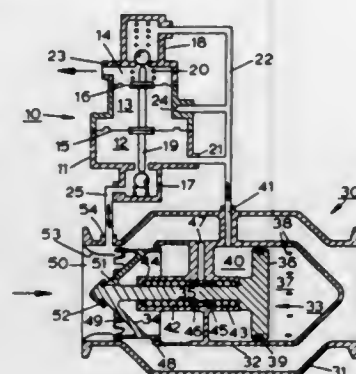
Filed Nov. 5, 1971, Ser. No. 195,992

Claims priority, application Great Britain, Nov. 20, 1970, 55,347/70

Int. Cl. F16k 31/12

U.S. Cl. 137-220

8 Claims



Control means for modulating the valve head of a fluid flow delivery valve to maintain substantially a desired flow condition. Pressure of the fluid flow being delivered operates pressure differential means which are arranged to regulate a pressure reducer through which fluid is supplied from upstream of the valve head to a datum pressure chamber. The valve head is responsive to pressure in the datum chamber and thereby is modulated by varying fluid flow delivery.

3,734,121

# FLUID FLOW VALVES

Alan Charles Rowe, East Chinnock, Near Yeovil, Somerset, and John Richardson Bennett, Yeovil, Somerset, both of England, assignors to Normalair-Garrett (Holdings) Limited, Yeovil, Somerset, England

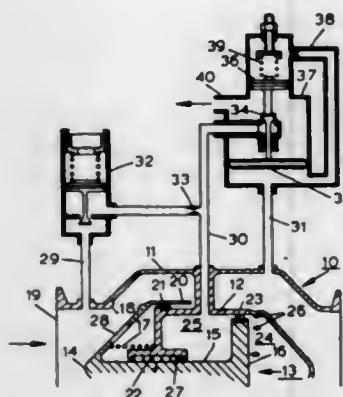
Filed Nov. 5, 1971, Ser. No. 195,993

Claims priority, application Great Britain, Nov. 20, 1970, 55,348/70

Int. Cl. F16k 31/12

U.S. Cl. 137-220

10 Claims



An in-line fluid flow valve in which the valve head is modulated to maintain substantially a desired delivery flow pressure by means of fluid from upstream of the valve head being reduced in pressure and fed to a datum pressure chamber operably associated with the valve head. The pressure being fed to the datum pressure chamber is regulated by means of a bleed valve which is itself regulated by variations of the delivery flow pressure.

3,734,122

# DENTAL COMPRESSED AIR/VACUUM APPARATUS

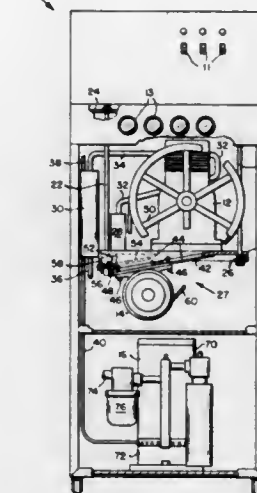
Leroy L. Cousins, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Feb. 14, 1972, Ser. No. 225,867

Int. Cl. F16k 49/00

U.S. Cl. 137-340

12 Claims



Disclosed is a combined water ring vacuum pump and compressor, both mounted in a single cabinet. The vacuum pump is mounted in the base of the cabinet, the compressor is mounted on a vibration insulated platform suspended from the top of the cabinet and the compressor drive motor is attached to the underside of the support platform. A water line connects the compressed air heat exchanger to the water ring vacuum pump, so that the water introduced into the vacuum pump is first used to cool the air from the compressor.

3,734,123

# CONTROL MEANS REGULATING A SUPPLY OF LIQUIDS

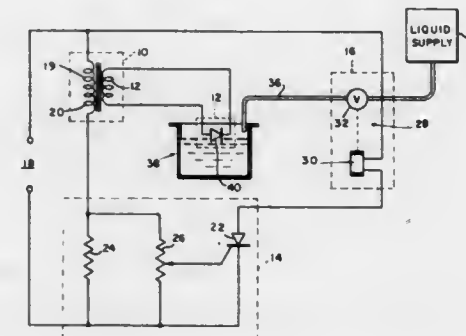
Daniel I. Pomerantz, Lexington, Mass., assignor to P. R. Malloy & Co. Inc., Indianapolis, Ind.

Filed July 14, 1971, Ser. No. 162,418

Int. Cl. G05d 9/12

U.S. Cl. 137-392

10 Claims



Liquid flow regulating means is responsive to a switching means, the switching means in turn being responsive to the amount of current flowing through a constant voltage source, the amount of current from the constant voltage source being controlled by a semiconductive current control means which is sensitive to the temperature differences produced by immersion in the liquid.

3,734,124

# STAGED THROTTLING FLOAT VALVE

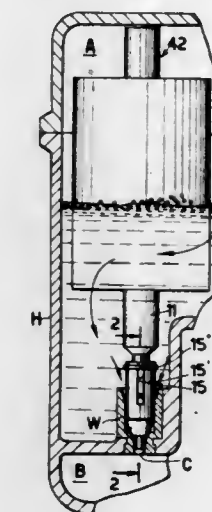
Paul Zanol, Muskegon, and Richard F. Shunta, Muskegon Heights, both of Mich., assignors to Bennett Pump Incorporated, Muskegon, Mich.

Filed July 19, 1971, Ser. No. 163,859

Int. Cl. F16k 31/18

U.S. Cl. 137-430

4 Claims



A throttling mechanism to be embodied as part of a float valve for controlling the flow through an orifice includes a stem portion having concentrically mounted thereon a primary throttling valve mechanism and a secondary throttling valve mechanism. As the buoyancy force of the float is increased, the primary valve opens to allow flow through the orifice to stabilize the position of the float valve. Additional buoyancy force acting on the float will cause the secondary throttling valve to open thereby enabling increased flow through the orifice. Under conditions of varying pressure differential, the float valve will tend to bob up and down adjusting the total flow area as required, to maintain a constant liquid level.

3,734,125

# PRESSURIZED CONTAINER DISPENSING VALVE HAVING EXCESSIVE PRESSURE SAFETY FEATURE

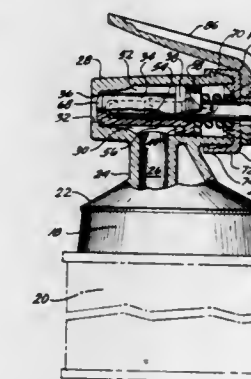
Roger K. Bruce, Mission Viejo; Werner Marhold, Huntington Beach, and Cecil F. Adickes, Playa Del Rey, all of Calif., assignors to Sterigard Corporation, Santa Ana, Calif.

Filed Feb. 10, 1971, Ser. No. 114,204

Int. Cl. F16k 31/14

U.S. Cl. 137-495

24 Claims



A one-piece molded plastic housing of a dispensing valve has a barrel for the valve's valving mechanism. The base is adapted to be pressure tightly attached to a dispenser. In order to maximize the number of valve housings produced in a given mold base, a base parting plane extends along the base's longitudinal axis slightly into the barrel. A transition parting plane extends from the terminus of the base parting plane at a slight angle from a normal to the base parting plane to meet a barrel parting plane close to the rear end of the barrel. An an-



nular external flange extends partly around the barrel and meets the barrel parting plane and terminates at the transition plane. With this parting plane pattern, a core pin for the barrel's bore can be carried by a mold half, thereby eliminating complicated and space consuming core pin ejection mechanisms. The valving mechanism includes a plug disposed in the barrel's bore for translation between a closed position and an open position. In the closed position, the plug seats on an interior seat of the barrel. This seat defines a line seal. The plug has a cupped seal with an annular flexible lip in engagement with a wall of the barrel's bore. A valve stem is attached to the plug by lock rings on the stem received in complementary recesses in an axial bore of the plug. The valve stem extends rearwardly through the barrel and past its end. A rear cap is attached to the barrel over the external flange and closes the rear end of the barrel's bore. An actuator is engaged to the stem and has a bearing point on the rear cap for pivotal movement to open the valve. The valve stem and plug are biased into their closed position by a spring bearing against the rear cap and the cup seal.

3,734,126

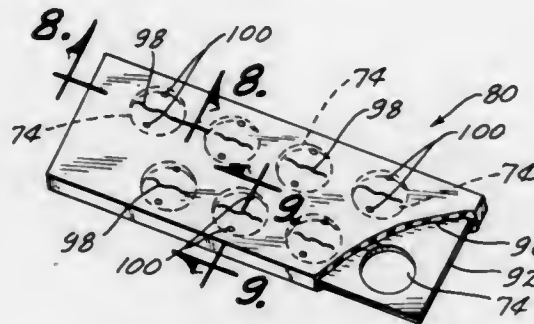
## LIQUID PRESSURE CONDITIONER

Donald F. Weaver, Box 208, Grove, Ark.

Continuation-in-part of Ser. No. 852,800, Aug. 25, 1969, abandoned. This application June 16, 1971, Ser. No. 153,739

Int. Cl. F16k 15/14

U.S. Cl. 137-512.15



A device including a chamber having inlet and outlet openings on opposite sides thereof, a baffle means disposed therebetween forming compartments. The baffle includes a rigid strengthening member embedded in resilient and pliable material. A plurality of normally closed large openings responsive to a predetermined pressure in either of the compartments are provided and include relatively smaller normally open flow-through openings on opposite sides thereof. The resilient and pliable material of the larger opening upon being displaced outwardly causes the smaller openings to be closed. The frame includes an opening registering with each group of openings including a larger opening and a pair of smaller oppositely disposed openings. The pressure conditioner unit may be used in a liquid distribution system wherein hot and cold water supplies are in communication with the inlet side of the pressure conditioner and means independent of a water heater is provided for drawing liquid from the cold liquid source at times and thereby varying the pressure within the heater container.

3,734,127

## STOPCOCK-JOINT ASSEMBLY

Joel L. Williams, 18 Lake St., Rt. 2, Box 136, Cary, and Vivian T. Stannett, 1105 Bancroft St., Raleigh, both of N.C.

Filed Dec. 27, 1971, Ser. No. 212,215

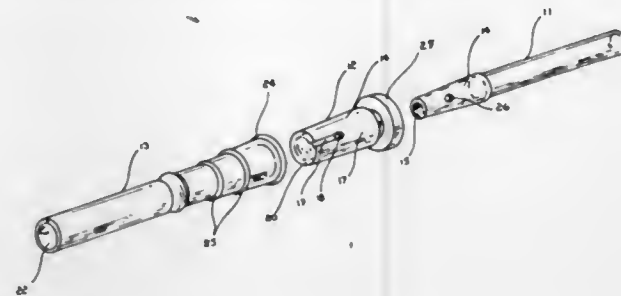
Int. Cl. F16k 45/00

U.S. Cl. 137-583

12 Claims

In abstract, a preferred embodiment of this invention is a combination stopcock-joint assembly used in laboratory work

and particularly suited for high vacuum sample testing. This assembly is formed of three parts; namely, the double round joint with a hole and channel, a female joint and a male joint



with a hole. When the two holes are aligned, a vacuum can be drawn through the joint but when the holes are misaligned a seal is formed.

3,734,128

## PNEUMATIC DUMP VALVE

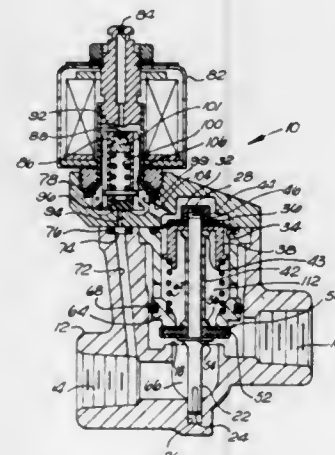
John P. Etcheverry, Sylmar, and James B. Doolittle, Burbank, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sept. 30, 1971, Ser. No. 185,235

Int. Cl. F16k 11/10

U.S. Cl. 137-596.2

6 Claims



A valve for controlling the flow of fluid from an inlet to an outlet of a valve body. The valve comprises a valve stem member having a diaphragm at one end of the stem. The stem passes through a central portion of the diaphragm and an outer edge surface of the diaphragm is secured to the valve body. A valve element is mounted on the stem in a plane perpendicular to the axis of the stem, with the stem passing through a central opening in the element. A valve seat is formed in the valve body with the valve element being movable between a first and second position, to permit the valve element to prevent or allow the flow of fluid from the inlet to the outlet, respectively. A pilot valve comprises a solenoid which has an opening which allows atmospheric pressure to be coupled to one side of the diaphragm. Further, energization of the solenoid causes a pilot valve element to close the solenoid opening and allow inlet pressure to be coupled to the one side of the diaphragm. Further, a check valve allows pressure in the outlet side of the valve to be released when the valve element seals the inlet from the outlet.

3,734,129

## HYDRAULIC CONTROL VALVE

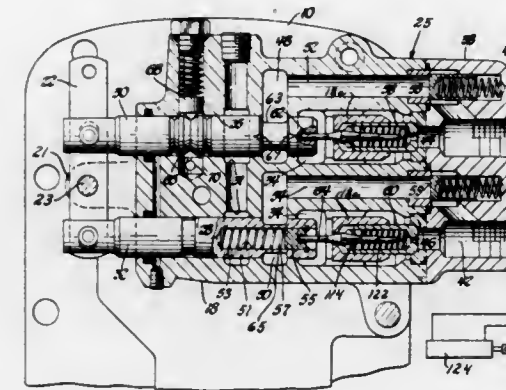
Jean Claude Van Dest, Westland, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Filed May 20, 1971, Ser. No. 145,355

Int. Cl. F16k 11/00

U.S. Cl. 137-596

7 Claims



A hydraulic directional valve system which may be used for controlling motor cylinders associated with a tractor or the like has paired sliding spool valves operated in opposite directions by a walking beam lever to control connection of an inlet and an outlet with either of a pair of motor ports. Slow rates of feed are obtained by metering the flow out of the motor port, whether induced by pump pressure or gravity. For this purpose, a pilot operated metering-out valve has its pilot controlled by the main spool to provide first a series of gradually increasing small openings and during final movement of the spool to cause instantaneous opening of a large pilot operated metering-out valve which opens in a direction opposite to the movement of the main spool. The system includes a pilot operated pressure relief valve which provides unloading of the supply pressure when all directional valves are in neutral, which provides also hydraulic detent release for the main spool during slow metering and when pressure builds up at the end of a motor stroke and which further provides overload relief at a still higher maximum pressure.

3,734,130

## FIRING VALVE

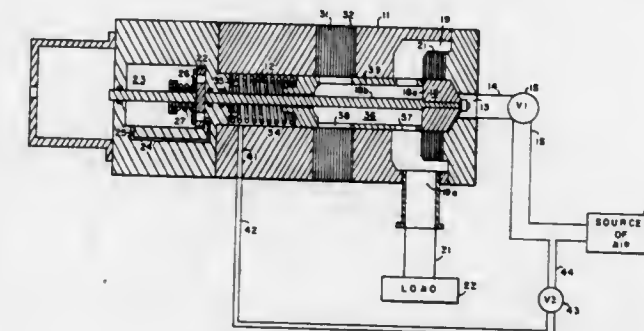
Paul F. Hayner, Lexington, Mass., and Edgar R. Bernier, Nashua, N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Apr. 3, 1972, Ser. No. 240,607

Int. Cl. F16k 11/00

U.S. Cl. 137-596.1

8 Claims



A firing valve for charging a load with compressed gas, such as air, is disclosed in which admission of compressed gas from a source to the valve displaces a piston against the restraint of a dashpot so as to open a passageway from the source to the load at a controlled rate. During charging, a second piston, slideable with respect to the first, is displaced to block a venting passageway but unblocks this passageway during retraction when the system is to be discharged.

3,734,131

## FLUID CONTROLLED LOGIC CIRCUITS

Simeon Lekarski, Saint-Cloud; Pierre Hardy, and Leon Hardy, Paris, all of France, assignors to Jean Gachot, Enghien-les-Bains, France

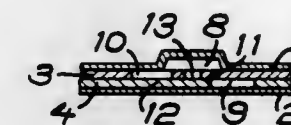
Filed Dec. 1, 1970, Ser. No. 93,968

Claims priority, application France, Feb. 12, 1969, 6941589

Int. Cl. F15c 3/04

U.S. Cl. 137-608

7 Claims



The invention relates to an improvement in fluid controlled logic circuits comprising a network of fluid circulation conduits and relays for carrying out the logic functions, wherein the circuits are constituted of stacked flat elements in which is made a network of fluid conduits, and which are shaped to constitute the movable members of the relays.

3,734,132

## SHUTTLE VALVE

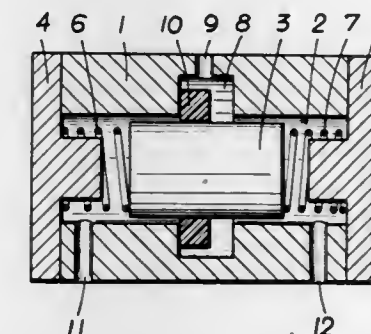
Herbert F. Kuhnelt, Vienna, Austria, assignor to Hoerbriger Ventilwerke Aktiengesellschaft, Vienna, Austria

Filed June 25, 1971, Ser. No. 156,621

Int. Cl. F16k 11/02

U.S. Cl. 137-625.49

6 Claims



A shuttle valve serving as a pneumatic selector switch for alternately directing incoming impulses from one input to two different outputs. The valve comprises a housing having a piston therein freely movable between two end positions, provided with a sealing ring and controlling the flow of fluid from the input to the outputs.

3,734,133

## DIVERTER PINCH VALVE

Robert K. Little, Mount Holly, and Edgar Barry Lincoln, Pennsauken, both of N.J., assignors to RKL Controls, Inc., Hainesport, N.J.

Filed Dec. 2, 1970, Ser. No. 94,413

Int. Cl. F16k 7/06, 11/14

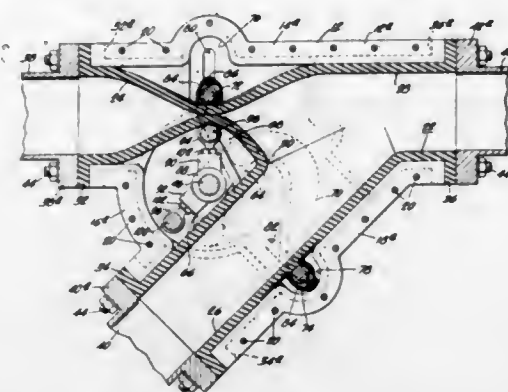
U.S. Cl. 137-636

14 Claims

A pinch type diverter valve including a hollow Y-shaped resilient valve body having a pair of angularly disposed leg portions. The valve body is disposed within a housing which includes means for selectively pinching the leg portions to control flow therethrough. The pinching means includes an outer pinch bar and an inner pinch bar arranged in substantially opposed relation adjacent each leg portion, and actuating means for selectively moving the inner and outer pinch



bars to provide a gas tight closure of one leg portion while at the same time providing a fully open passage within the other



leg portion. The pinch bars may also be disposed selectively at any desired intermediate position, permitting use of the valve as a mixing valve.

3,734,134

# **VALVE ARRANGEMENT HAVING TWO VALVES IN A COMMON HOUSING AND USE OF THE ARRANGEMENT IN A VAPOR GENERATING AND UTILIZING PLANT**

Ernst Vogell, Wiesendangen, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

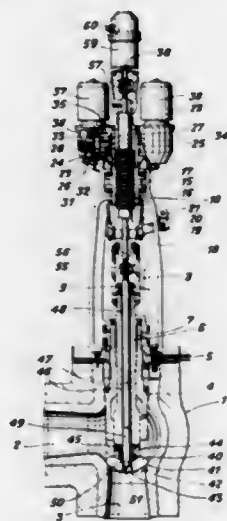
Continuation of Ser. No. 3,052, Jan. 15, 1970, abandoned.

This application Oct. 27, 1971, Ser. No. 193,224

Claims priority, application Switzerland, Jan. 28, 1969, 001240/69

Int. Cl. F16k 1/02

U.S. Cl. 137—637.2



The invention relates to a valve design wherein a smaller and a larger valve are placed in a common housing and arranged for independent operation, the smaller valve serving for regulating the flow of operating fluid therethrough and the larger valve affording full flow or no flow of operating medium therethrough. The invention also relates to the use of the valve arrangement in a steam or vapor generating plant for facilitating starting thereof.

3,734,135

# **HEAT EXCHANGER WITH INTERNAL TURBULATOR**

James A. Mosler, Racine, Wis., assignor to Modline Manufacturing Company, Racine, Wis.

Filed Sept. 3, 1971, Ser. No. 177,640

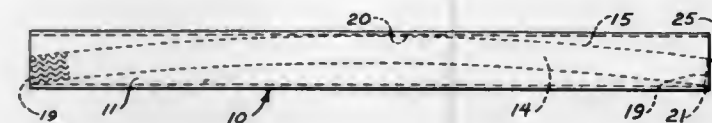
Int. Cl. F15d 1/02

U.S. Cl. 138—38

10 Claims

A tubular heat exchanger having a fluid flow tube with transverse minor and major dimensions and an elongated

agitator fin turbulator in the tube also having minor and major dimensions in which the minor dimension of the turbulator spans the minor dimension of the tube and the major dimension of the turbulator is less than the major dimension of the tube but with the turbulator in its major dimension contacting opposite sides of the interior of the tube in its major dimension



at contact areas spaced from each other along the length of the turbulator. In one preferred form the turbulator is bowed with the two ends of the turbulator in contact with one side of the tube relative to the major dimension, an intermediate point of the turbulator contacting the other side of the tube and the thickness or minor dimension of the turbulator extending across the minor dimension of the tube.

3,734,136

# **PIPELINE CONTENTS IGNITER**

Kenneth W. Lefever, Waterford, Va., assignor to Valdez-Lefever Artic Gas and Oil Transportation Corporation, Washington, D.C.

Filed Mar. 30, 1971, Ser. No. 129,548

Int. Cl. F161 55/00

U.S. Cl. 138—103

4 Claims



A pipeline for transmitting crude oil or the like is fitted with longitudinally extending igniters, each comprising a casing containing thermite packed about a phosphorus core. If a violent rupture of the pipeline occurs at least one igniter will also be ruptured, whereupon the phosphorus will ignite the thermite, which will in turn ignite the pipeline contents so that such will burn off rather than pollute streams and other features of the nearby area.

3,734,137

# **PIPELINE TRANSMISSION SYSTEM**

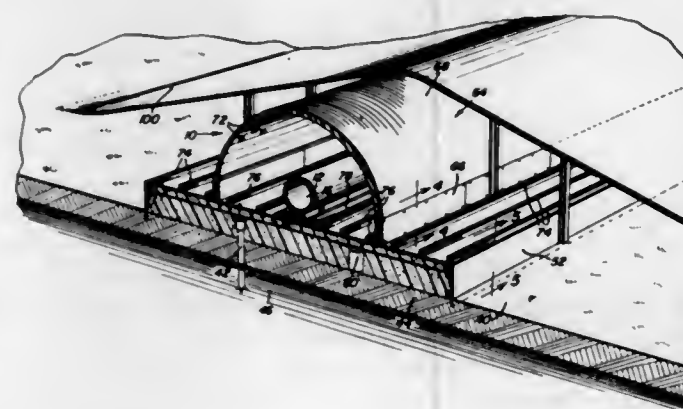
Robert L. Stanley, 819 Bowen, Longmont, Colo.

Filed Jan. 25, 1971, Ser. No. 109,512

Int. Cl. B61b 13/10

U.S. Cl. 138—105

9 Claims



An elongated oil or gas pipe mounted on an elevated platform insulated from the ground surface. The pipe is enclosed

within a full length insulated housing which contains service pipes, rails, and the like. At selected points along the system, game crossings are provided to enable a maintenance of the natural game paths and migratory patterns of the wildlife of the area.

3,734,138

# **OIL OR LIKE TRANSPORTATION SYSTEM AND PIPELINE SUPPORT**

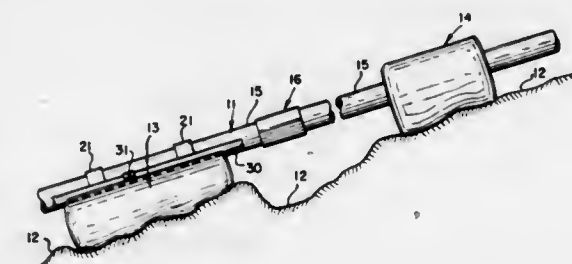
Byron T. Brown, 1818 S. 16th St., Phoenix, Ariz., and B. Stahmer, 902 D Street, Omaha, Nebr.

Filed Mar. 26, 1971, Ser. No. 128,468

Int. Cl. E02d 27/46; F161 3/00

U.S. Cl. 138—106

6 Claims



An oil or like pipeline system is supported upon randomly spaced pillars each comprising a rubber or like container filled with a fluidic material such as styrofoam, sand water or the like.

3,734,139

# **COMPOSITE THERMOPLASTIC STRUCTURE**

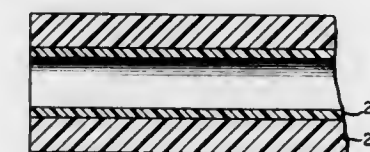
Dimitri P. Zafiroglu, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 820,028, May 21, 1968, abandoned, which is a division of Ser. No. 488,581, Sept. 20, 1965, Pat. No. 3,454,443. This application May 5, 1971, Ser. No. 140,547

Int. Cl. F161 9/12; B29c 27/20; B32b 31/26

U.S. Cl. 138—146

5 Claims



An article of manufacture comprising a substantially non-deformable cylinder of polytetrafluoroethylene and a substantially unperforated cylinder of a copolymer of tetrafluoroethylene and hexafluoropropylene uniformly bonded together to form an integral structure consisting entirely of the two polymers.

3,734,140

# **CROSS-RIFLED VAPOR GENERATING TUBE**

Hisashi Nakamura, Ibaragi, and Masatoshi Tanaka, Nishinomiya, both of Japan, assignors to Sumitomo Metal Industries Limited, Osaka, Japan

Filed July 1, 1970, Ser. No. 51,434

Claims priority, application Japan, July 2, 1969, 44/52752

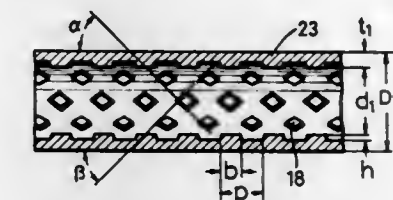
Int. Cl. F161 9/00

U.S. Cl. 138—177

4 Claims

A vapor generating tube of the two-phase type which is operated at a pressure between sub-critical and critical pressure of the vapor has a tube-like body through which fluid is passed. The inner wall surface of the tube is cross-rifled to provide a plurality of quadrilaterally shaped projections

uniform and regularly spaced along the cross-rifled axes. The minor inside diameter  $d_1$ , the projection height  $h$  of each projection, the projection pitch  $P$ , projection width  $b$ , and spiral



lead angle  $\alpha$  and  $\beta$  have the following relationships:  $P/h$  is from 5 to 4  $h/d_1$ , is from 0.005 to 0.08,  $b/P$  is in the range of 0.2 to 0.8, and the spiral lead angles  $\alpha+\beta$  are from 20° to 80°.

3,734,141

# **MECHANISM FOR PREPARING PREDETERMINED WEFT YARN LENGTHS IN A WEAVING MACHINE**

Hubert Peter van Mullekom, Deurne, Netherlands, assignor to N.V. Machinefabriek L. Te Strake, Deurne, Netherlands

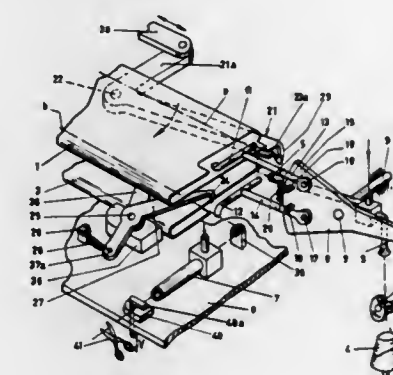
Filed Dec. 22, 1971, Ser. No. 210,729

Claims priority, application Netherlands, Dec. 28, 1970, 7018895

Int. Cl. D03d 47/34

U.S. Cl. 139—122 H

10 Claims



A mechanism for preparing predetermined weft yarn lengths in a weaving machine having continuous unwinding of the yarn from a stationary yarn spool, comprising two buffer stores positioned substantially parallel to each other, each adapted to receive a weft yarn length in the form of a loop, a loop fixation device and a yarn supply means movable with its discharge opening between two end positions, each situated in front of an entrance mouth of a store, the arrangement being such that the yarn supply means supplies a yarn length to the one and the other buffer store and that the loop fixation device is operated each time when the supply means is transferred from the one to the other end station for fixing the loop length received in the one buffer store, wherein the buffer stores are positioned with their planes containing the loops opposite to each other and that the yarn supply means is movable in a plane perpendicular to the loop planes and containing the paths for the ingoing loop legs in both stores, the loop fixation device comprising at each end station a means that is operated when the supply means moves towards the other end station in order to keep the loop leg delivered previously by the supply means to the relative buffer store in its place, while between both stores a transfer means is reciprocally movable in the transverse direction for catching the yarn portion which has been drawn by the movement of the supply means from the one to the other end station, between said stations and transferring it to a point adjacent to the paths for the outgoing loop legs in both stores.



3,734,142

## SHUTTLELESS LOOM

Raymond Dewas, 120 Boulevard de Saint-Quentin, 80 Amiens, France

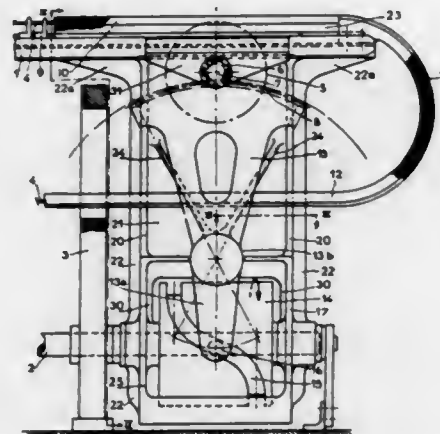
Filed July 15, 1971, Ser. No. 162,916

Claims priority, application Luxembourg, July 21, 1970, 61379

Int. Cl. D03d 47/12

U.S. Cl. 139—123

6 Claims



The complete assembly which comprises the body of the cam casing, the connection between the casing and the batten, the bearing which supports the pivotal shaft of the lever which carries the toothed sector as well as its connection with said casing and with the batten is constructed in the form of a one-piece unit, that is to say a single part.

3,734,143

## MEASURING AND LENGTH DETERMINING MEANS FOR WEFT YARN IN SHUTTLELESS LOOMS

Vladimír Svátý, Liberec, Czechoslovakia, assignor to Elitex, Zavody textilního strojírenství generalní ředitelství, Liberec, Czechoslovakia

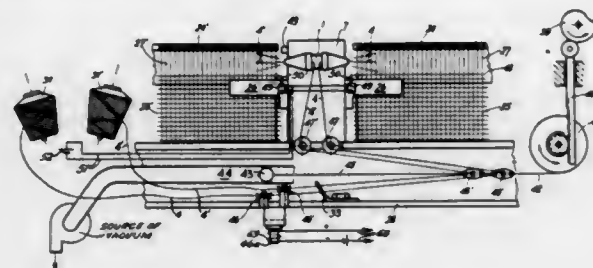
Filed Oct. 9, 1970, Ser. No. 79,478

Claims priority, application Czechoslovakia, Oct. 10, 1969, 6777/69

Int. Cl. D03d 47/30, 47/34

U.S. Cl. 139—127 P

8 Claims



A shuttleless loom having a pneumatic delivery means and apparatus for measuring and determining the length of weft yarn fed thereto. The apparatus is adapted to pull a length of yarn from a supply, in cyclic action and hold the same under tension while being fed to the pneumatic means.

3,734,144

## WEFT INSERTER DRIVE MEANS SAFETY DEVICE OF A SHUTTLELESS LOOM

Pierre Remond, Bourgoin-Jallieu, France, assignor to Ateliers Diederichs, Bourgoin-Jallieu, France

Filed Apr. 13, 1971, Ser. No. 133,607

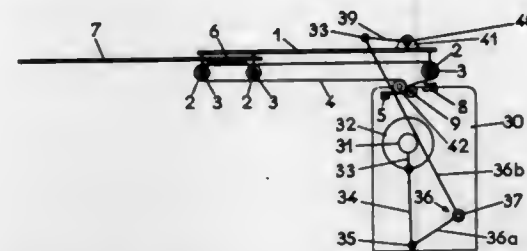
Int. Cl. D03d 51/18

U.S. Cl. 139—336

2 Claims

A weft inserter safety device and driving means for a shuttleless loom of the kind including at least one weft inserter

which is driven by a belt or like element which is fixed by its ends to stationary parts of the loom and which passes over rollers of the weft inserter, including a micro switch associated with the belt and with an electrical circuit including a relay and a cut-out. The micro switch serves, when rendered opera-



tive by malfunctioning of the belt, to interrupt the circuit and thus stop the loom. The cut-out is so arranged to require actuation after correction of the malfunctioning, requiring a re-setting operation of the electrical circuit before the loom can be re-started.

3,734,145

## APPARATUS FOR FORMING CONCENTRIC, MULTI-TURN, NESTED DYNAMOELECTRIC MACHINE FIELD COILS

Robert J. Eminger, and Clayton L. Tyson, both of Fort Wayne, Ind., assignors to Essex International, Inc., Fort Wayne, Ind.

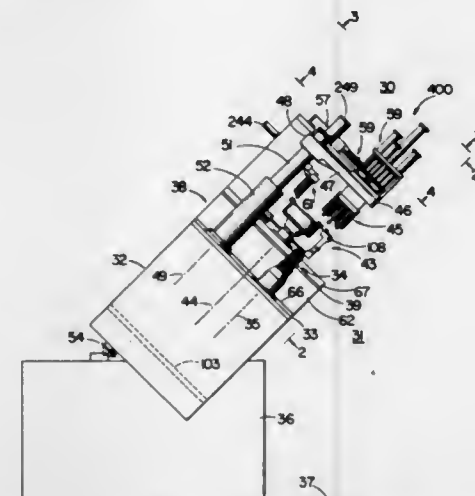
Division of Ser. No. 824,121, May 13, 1969, Pat. No.

3,631,591, which is a division of Ser. No. 640,156, May 22, 1967, Pat. No. 3,481,372. This application Apr. 20, 1971, Ser. No. 135,613

Int. Cl. B21f 3/04

U.S. Cl. 140—92.1

1 Claim



Apparatus for forming concentric, multi-turn, nested dynamoelectric machine field coils in which first and second concentric coil forms are provided each having first and second parts for respectively forming first and second opposite end portions of the first and second coils which are respectively connected by generally straight side portions. Each of the first parts comprises two elongated, spaced, parallel pins arranged to form generally straight first end portions of the respective coil, each of the second parts being laterally spaced from the respective first part thereby to form the side portions of the respective coil. Each of the second parts has a first section comprising two elongated, spaced, parallel pins spaced from the first section pins on the side thereof remote from the respective first part and parallel with the first section pins. The pins of each of the second parts are arranged in a pattern to form the second end portion of the respective coil with generally straight side sections respectively joined to the respective side portions and converging to and joining a generally straight end section parallel with the first end portion.

3,734,146

## METHOD OF WINDING HELICAL SPRINGS AND DEVICE FOR EFFECTING THE SAME

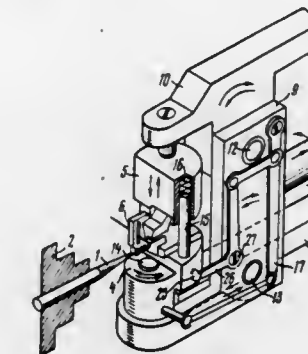
Ravil Nigametzhanovich Nazarov, ulista Gagarina, 63, kv. 36, and Rinad Fatkhrahmanovich Kavirov, ulista Saidasheva, 42, kv. 7, both of Kazan, U.S.S.R.

Filed Feb. 25, 1971, Ser. No. 118,636

Int. Cl. B21f 3/02

U.S. Cl. 140—71 R

6 Claims



The winding of helical springs is effected by bending successive portions of a wire by segments of a circle. In order to form the above segments, the successive portions of the wire are squeezed on a support, in which case the wire and the support are mutually rotated and displaced forward. The wire should be squeezed by striking the wire or subjecting the wire to impacts in the same place of the support.

The method is carried into effect by a device having a support and a striker reciprocating relative to the support. The striker is mounted with a gap relative to the support and the wire is fed into this gap during the operation of the device. Thus, the striker strikes the wire periodically to form the segments, from which the coils of the spring are then formed.

3,734,147

## MANUAL SYRINGE FILLING APPARATUS

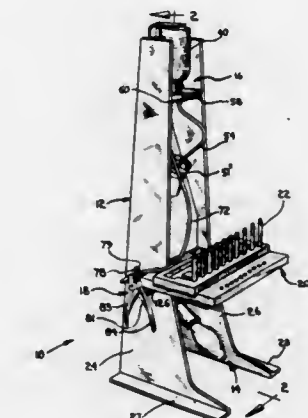
Robert A. Borutta, Maryland Heights, and Elmer A. Koenig, Kirkwood, both of Mo., assignors to Sherwood Medical Industries, Inc., St. Louis, Mo.

Filed Mar. 17, 1971, Ser. No. 125,269

Int. Cl. B65b 3/14

U.S. Cl. 141—27

4 Claims



A syringe filling apparatus consisting of an upright frame having a platform for supporting a tray adapted to hold a plurality of syringe cartridges in either a horizontal storage or vertical filling position, there being provided below the platform a manually operated squeeze bubble defining a pump for pressurizing a removable medicament unit. The medicament unit includes a flexible outlet tube from a disposable medicament bottle having a nozzle at the end of the tube. A pinch-type

handle valve is fixed to the end of the flexible outlet tube adjacent the nozzle that may be manually grasped and actuated to fill each of the cartridges supported on the tray on the work supporting platform.

3,734,148

## GRINDER

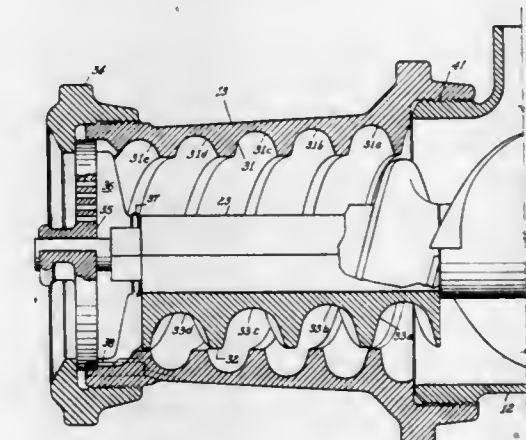
Wayne A. McCully, 918 East Franklin Street, Troy, Ohio

Filed Oct. 15, 1971, Ser. No. 189,524

Int. Cl. B02c 18/30

U.S. Cl. 241—82.1

16 Claims



A grinder having a pair of interconnected separated feed casings. One of the pair of casings (i.e. the inlet casing) is substantially cylindrical and is connected to the inlet hopper. The other casing (i.e. the outlet casing) tapers externally and in one sense internally from a relatively large diameter at the inlet end to a relatively small diameter at the outlet end. Each of the casings is fitted with an axial worm for advancing material such as for example meat supplied to the inlet casing through the inlet hopper and for moving it towards the outer end of the inlet and towards and into and through the outlet casing. The outlet casing is provided with an axial worm which moves the material through that casing to a cutting knife which is associated with a cutting die at the outer end of the outlet casing. There are means for simultaneously driving both of the worms as well as the cutting knife. The worms are both formed with a non-circular longitudinal opening such as a square opening or hexagonal opening or a half-round opening. A non-cylindrical shaft fits in the openings and extends through both worms for driving the worms. The cutting knife is also driven from the outlet casing worm. The two casings may be pivotally connected together or may be threadedly connected. The outlet casing is provided with at least one continuous internal spiral of which the flutes are progressively shallower from the inlet end to the outlet end (three spirals are shown). The worm in the outlet casing has flutes which decrease in depth progressively from the inlet end to the outlet end. However, the flutes in the worm can, if desired, be constant. An automatic shut-off of power may be provided which shuts off the motor whenever there is a no-load condition.

3,734,149

## REFUELING SYSTEM FOR AUTOMOBILES

William B. Hansel, Media, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

Filed Oct. 30, 1970, Ser. No. 85,563

Int. Cl. B65b 1/04

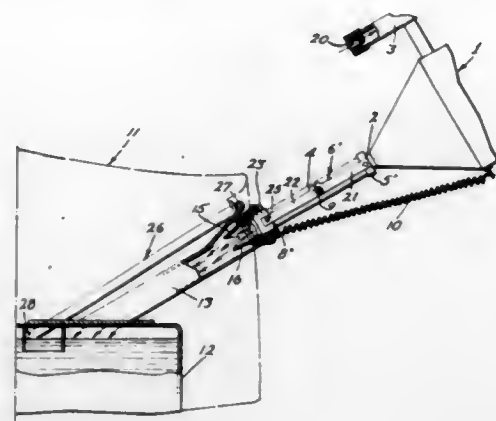
U.S. Cl. 141—350

3 Claims

A "tight-break" gravity refueling system for automobiles may include a normally closed valve in the fuel tank fillpipe which is opened by the insertion into the fillpipe of a rigid dispensing tube end, a portable fuel receptacle having a rigid



dispensing tube end and equipped with a self-closing valve, workpiece and a workpiece support for positioning a workpiece along an edge of the table top, the tools being positiona-



tank and mounted on the automobile rear deck. Another type of fuel level indicator, mounted on the fuel tank, may be alternatively used.

3,734,150

## SIGNAL CONTROLLED TRIMMING DEVICE

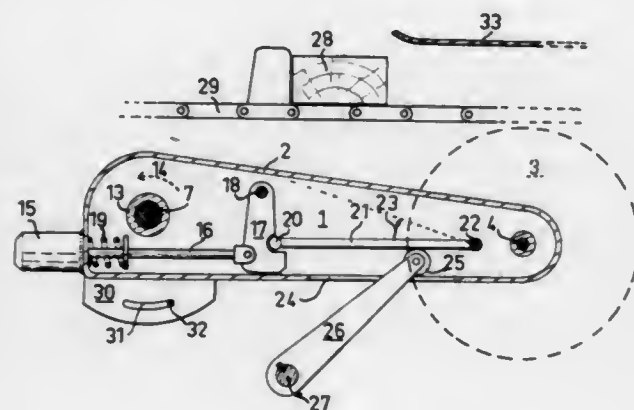
Bo F. Holmberg, Box 20, Hammar, and Nils Erik Hellstrom, Strandvagen 21, both of Nyland, Sweden

Filed Sept. 1, 1971, Ser. No. 177,015

Int. Cl. B27b 5/06

U.S. Cl. 83-474

1 Claim



Lumber cutting device having plurality of selectively operable saw units each including an arm carrying the saw at one end and being swingable about a shaft at its other end. The shaft is motor-driven and a transmission is provided between the saw and the shaft. The saw units are located beneath a conveyor for the lumber and means are provided for selectively raising a desired saw unit into cutting relationship. Each saw unit has a signal operable latch means cooperating with lifting means designed to raise a given saw unit only when its latch means is set in an active, fixed state.

3,734,151

## PORTABLE WORKBENCH

Harold O. Skripsky, 4296 Fox Meadow S. E., Cedar Rapids, Iowa

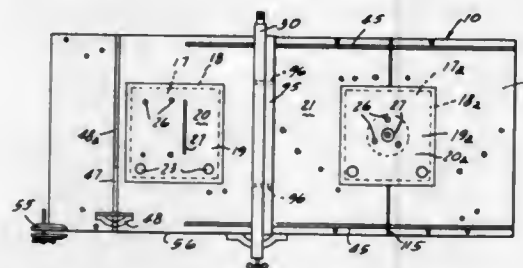
Filed Sept. 21, 1970, Ser. No. 73,717

Int. Cl. B27c 9/00; B27b 5/16

U.S. Cl. 144-1 R

3 Claims

A portable collapsible workbench having openings through the top to receive tool base plates, the workbench having associated therewith workpiece fence guides for aligning the



ble to move a workpiece across the operative part of the tool or to move the operative part of the tool across the workpiece.

3,734,152

## METHOD AND APPARATUS FOR HARVESTING TREES

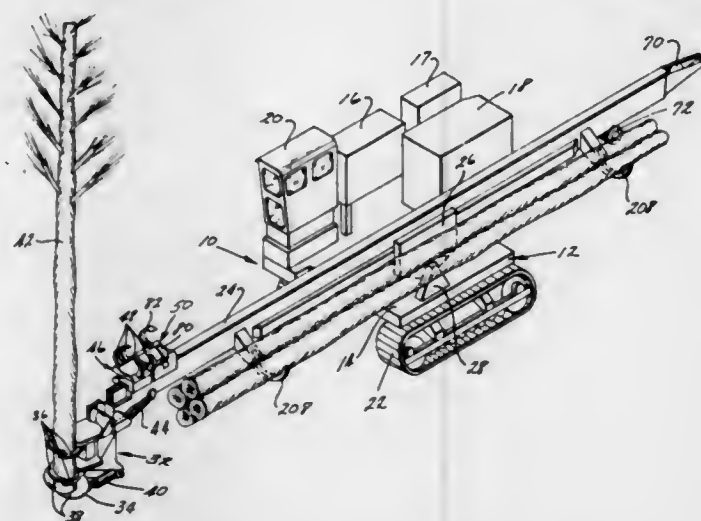
Dean W. Shields, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 24, 1969, Ser. No. 887,903

Int. Cl. A01g 23/08

U.S. Cl. 144-3 D

20 Claims



A novel combination delimber and top shear utilized as an integral part of tree harvester. The tree harvester incorporating the delimber and top shear unit of this invention includes a horizontally oriented mast which is mounted on a mobile vehicle. A butt shear and felling grapple are pivotally mounted at one end of the mast and are adapted to grasp and sever a standing tree and pivot it to a substantially horizontal position overlying the mast where it is grasped and securely held by a transfer grapple. The novel combination delimber and top shear unit, which includes a pair of delimber arms and a pair of top shear blades, is mounted for longitudinal movement on the top of the mast and is adapted to be driven along the tree to strip all limbs from the tree and also to remove the top portion of the tree at either a predetermined length or diameter. After the tree has been delimbed and topped, it is dropped by the transfer grapple into collection arms positioned at intervals along the mast and adapted to hold a large number of delimbed and topped trees to be transported by the tree harvester to a collection point where the trees are deposited in a stack.

3,734,153

## AUTOMATIC CABINET MAKING TOOL

James C. Reed, 5750 W. Pierson, Phoenix, Ariz.

Filed Dec. 17, 1971, Ser. No. 208,760

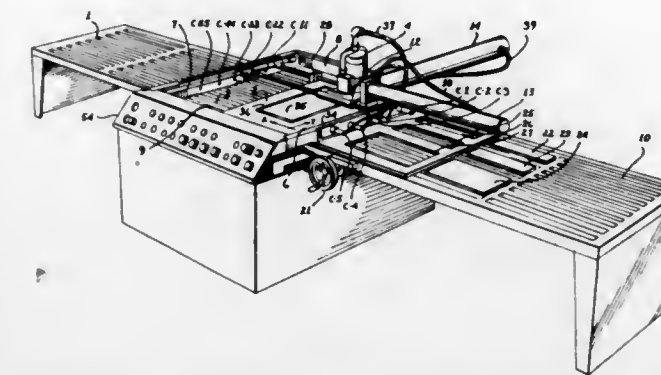
Int. Cl. B27c 5/02; B27m 3/18

U.S. Cl. 144-326

12 Claims

Method and apparatus are disclosed for cutting one or more apertures in a cabinet front blank. The cutting operation is

performed by a router selectively extending into and out of the cabinet front blank. The movement of the router in the X and Y axes is controlled by air operated mechanisms. A plurality of mechanical switches responsive to movement and position of the router provide feedback signals to a pneumatic control



system. The control system also processes command signals from manual controls, which command signals provide direct control over the cutting operation of the router. The number, size and spatial relationship of the apertures may be programmed by the manual controls.

3,734,154

## DISPOSABLE BAG WITH SELF-CLOSING VALVE

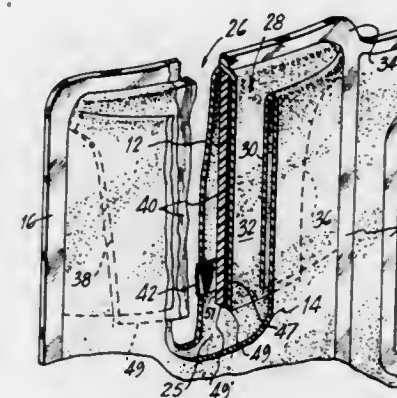
Edgwin R. Polk, Fords, N.J., assignor to Packaging Associates, Inc., Elizabeth, N.J.

Filed Apr. 23, 1971, Ser. No. 136,978

Int. Cl. B65d 33/16

U.S. Cl. 150-9

13 Claims



A disposable enema bag has an extension for use in filling the bag and a self-closing valve therefor. The valve includes a tube and a semi-rigid panel attached at diametrically opposed portions of the tube with a flexible band secured at its opposite ends to the panel for bowing the panel and urging it into engagement with the tube to hold the opposed interior surfaces of the tube in fluid tight engagement.

3,734,155

## MULTIPLE POCKET CARD HOLDER

Hanns G. Stenger, 70-11 34th Avenue, Jackson Heights, N.Y.

Filed Jan. 25, 1971, Ser. No. 109,155

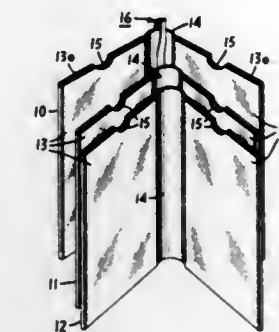
Int. Cl. A45c 11/18

U.S. Cl. 150-39

5 Claims

A multiple pocket card holder is provided having means wherein a plurality of card holding members can be nested one within the other within a cover member and firmly and securely retained in this relationship by means of a clip member which frictionally engages flexible hinge members of the card holders between the legs of the clip member. The clip member is formed to provide an elongated line of contact

between portions of its opposing legs which engage the flexible hinge members and is of resiliently deformable material so



that the elongated line of contact is maintained as the clip member slidably engages one, two or more of the flexible hinge members.

3,734,156

## SELF LOCKING NUTS

Albert Beard, Pembroke, Wales, assignor to Firth Cleveland Extrusions Limited, Pembroke, Pembrokeshire, Wales

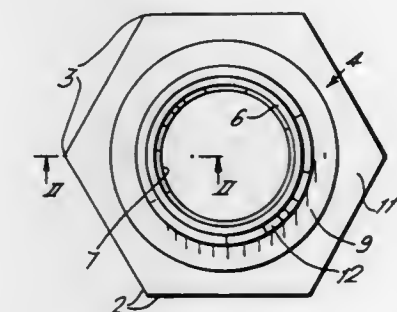
Filed June 15, 1970, Ser. No. 46,436

Claims priority, application Great Britain, June 16, 1969, 30,455/69

Int. Cl. F16b 39/284

U.S. Cl. 151-21 B

4 Claims



An all-metal self locking nut with a polygonal nut body, a crown extending from the non-bearing end of the nut body, and a screw-threaded bore extending through the nut body and crown. The crown has a frustoconical surface defined by a straight line revolved around the axis of the nut at a predetermined angle to that axis and extending from the side of the nut body to a region at or near the emergent periphery of the nut bore at the crown. This frustoconical surface is interrupted by an annular ledge or recess preferably produced by an axial punch prior to the threading of the nut bore, and having a flat base extending in a plane parallel to the bearing end of the nut body and perpendicular to the axis of the nut and an inner surface at right angles to the flat base. Subsequent to the threading of the bore, it is deformed inwardly within the crown by symmetrically arranged indentations in the region of the annular ledge or recess. Each of the indentations has in axial section a surface inclined to the nut axis at an angle smaller than the said predetermined angle of the frustoconical surface. The indentations may be produced by an axial die having a plurality of strike surfaces for formation of the indentations with intermediate relieved portions.

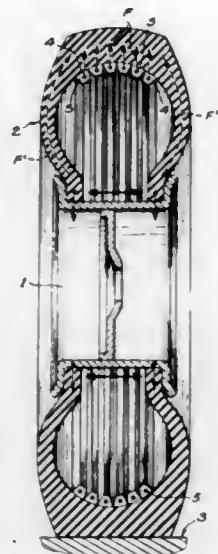


### 3,734,157 VEHICLE TIRE

V. Alfredo Roque, Apartado: 952, Managua, Nicaragua  
Filed June 17, 1970, Ser. No. 46,846  
Int. Cl. B60c 3/00, 9/22

U.S. Cl. 152-354

4 Claims



A vehicle tire having annular wire or rod strengthening contained in a plurality of separate ridges on the inner surface of the casing.

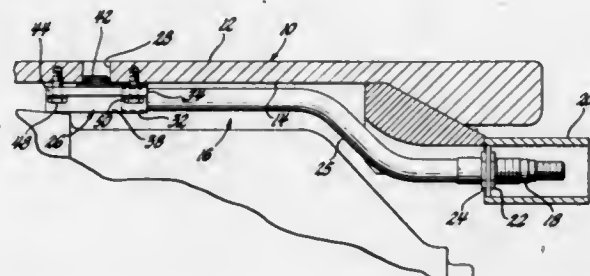
### 3,734,158

VALVE STEM ASSEMBLY FOR A TUBELESS TIRE RIM  
Frank C. Bennett, and Gerardus L. Felix, both of London, Ontario, Canada, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 4, 1971, Ser. No. 186,034  
Int. Cl. B60c 29/00

U.S. Cl. 152-427

2 Claims



A valve stem assembly for use with a vehicle rim which supports a tubeless pneumatic tire. The rim includes a cylindrical body portion having an outer face for supporting the tire and has a valve stem hole through which pressurized air is directed for inflating the tire. The valve stem assembly includes an adapter which is mounted to the inner face of the rim and includes externally accessible fasteners so that the adapter can be removed from the rim and rotated 180° without removing the tire from the rim.

### 3,734,159

#### TIRE CHANGING DEVICE

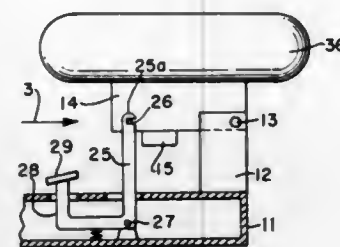
William L. Schultz, Box 485, and Matthew Schultz, Box 241, both of Red Lake Falls, Minn.  
Division of Ser. No. 726,414, May 3, 1968, Pat. No. 3,543,829.  
This application Aug. 31, 1970, Ser. No. 68,340  
Int. Cl. B60c 25/00

U.S. Cl. 157-1

1 Claim

A pivoted component is mounted on a base and carries an hydraulic motor and a gear train. The component is swung

vertically to receive a tubeless tire and wheel and is then swung horizontally for tire removal and replacement thus ob-



viating the lifting on and off the relatively heavy tire and wheel assembly.

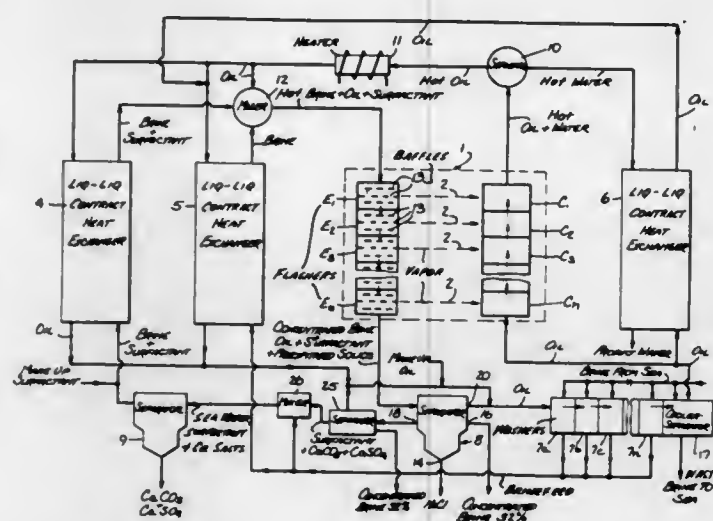
### 3,734,160

#### FLASH EVAPORATION USING SURFACE ACTIVE AGENT AND IMMISCIBLE LIQUID

Asriel Osdor, Tel Aviv, Israel, assignor to Hydro Chemical & Mineral Corp., New York, N.Y.

Filed May 15, 1970, Ser. No. 37,530  
Int. Cl. B01d 1/00; F26b 7/00; B01d 3/00, 3/10; C02b 1/04  
U.S. Cl. 159-47 R

29 Claims



Flash evaporation from a mixture of a solution to be vaporized, a heat transfer liquid immiscible in the solution and a surface active agent capable of reducing interfacial tension between the solution (the dispersed phase), and the heat transfer liquid (the continuous phase), most of the surface active agent being salted out of the solution as the solution reaches higher concentrations but which agent is kept in dispersed suspension in the heat transfer fluid by agitation of the mixture, such suspension serving to maintain reduction of interfacial tension between the concentrated solution dispersed within the heat transfer liquid, and recovery thereafter of the surface active agent for reuse in the process.

### 3,734,161

#### DOOR CONSTRUCTION

Ernest E. Pierce, 9525 Whitlock Trail, Dallas, Tex.  
Filed Aug. 26, 1970, Ser. No. 67,024  
Int. Cl. E06b 9/08

U.S. Cl. 160-133

19 Claims

An overhead door construction comprising a flexible door mounted on a spring loaded rotatable drum such that the door may be moved to open and close the opening. The door is constructed of panels having edges hingedly connected together, ends of the panels being locked together with keys and being slidable through a guide channel lined with sound deadening

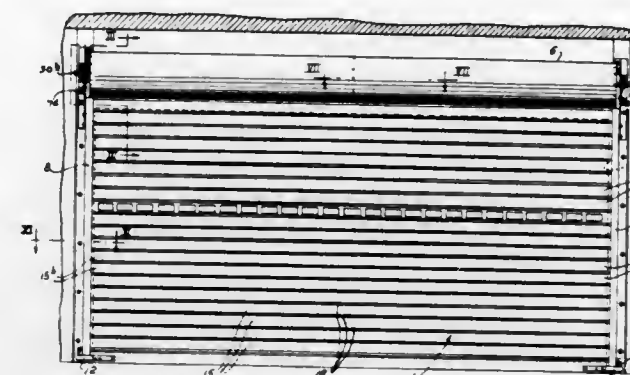
### 3,734,163

#### SAND MOLD FORMATION

Sam Larkin, 254 Beach 140th Street, Belle Harbor, N.Y.  
Continuation-in-part of Ser. No. 114,993, Feb. 12, 1971. This application May 19, 1971, Ser. No. 144,823  
Int. Cl. B22c 15/02, 25/00

U.S. Cl. 164-187

10 Claims



outward into sealing relation with the wall adjacent the top of the door. Wind locks prevent lateral deflection of the door.

### 3,734,162

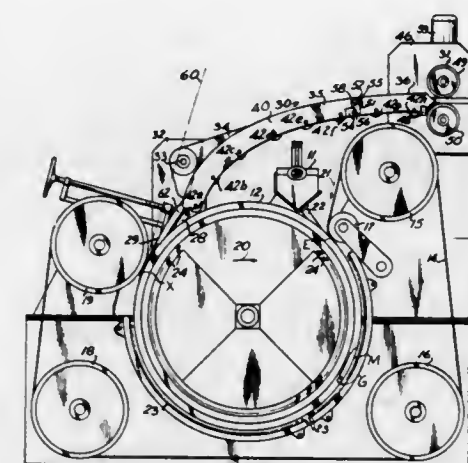
#### METHOD OF CONTINUOUSLY CASTING METALS

Enrique C. Chia; George C. Ward, and George E. Lenaeus, all of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

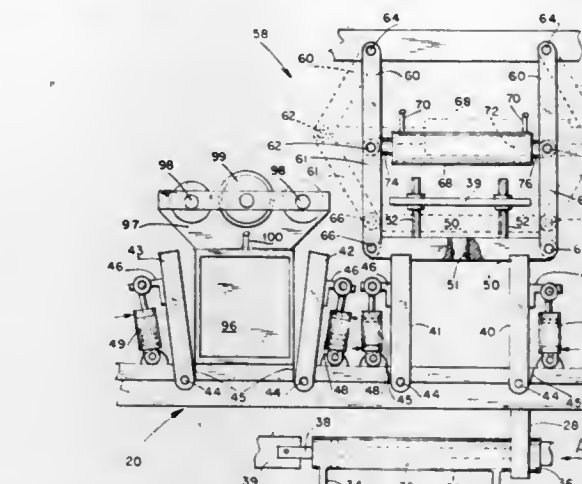
Continuation of Ser. No. 737,719, June 17, 1968, abandoned.  
This application May 17, 1971, Ser. No. 144,408  
Int. Cl. B22d 11/06

U.S. Cl. 164-87

13 Claims



A method of using a continuous casting machine having a casting wheel with a groove closed by a band to form a casting mold in which a conveying means conveys cast metal between the casting mold and a substantially horizontal path in a manner that reduces voids in the cast metal, that reduces the concentrations of dissolved gases in the cast metal, that increases the production rate of the casting machine, and that facilitates the initial removal of the cast metal from the casting mold while at the same time providing for convenient and efficient pouring of molten metal into the casting mold. Specifically, a conveying means is positioned and shaped to place the cast metal leaving the casting mold in a predetermined arcuate path which provides for relatively little vertical displacement of the cast metal above the casting wheel, which extends the length of the portion of the circumference of the casting wheel which may be used as the casting mold, which is a path into which cast metal leaving the casting mold will initially pass with a minimum of manual guidance, and which provides for the passage of the cast metal over pouring apparatus used for pouring molten metal into the casting mold.



Apparatus for forming sand molds comprising an elongate bed. The bed includes adjacent and partially enclosed receptacles for alternately receiving sand. A top cover plate is used for partially further closing the receptacles alternately. The top cover plate is operatively associated with the receptacles for alternately adjusting the configuration of the latter respectively from that configuration for operating on the sand disposed therein to form a mold to that configuration for releasing the mold so formed therein. A pair of opposing yet cooperable pattern plates are shiftably supported for entering together into each of the receptacles respectively, in opposing relation, to compact the sand disposed in the latter. A pair of mold ejectors are also utilized for entering into the receptacles alternately and ejecting the mold so formed in the latter along a pair of parallel endless lines in opposing directions. The elongate bed is reciprocable longitudinally over a plurality of selected positions such that the pattern plates and ejectors can be aligned properly opposite selected of the receptacles alternately in operative association with the latter.

### 3,734,164

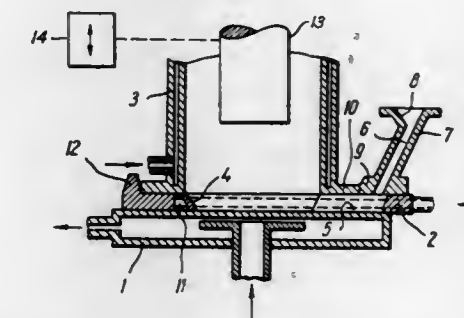
#### INSTALLATIONS FOR THE ELECTROSLAG REMELTING OF METALLIC CONSUMABLE ELECTRODES

Jury Vadimovich Latash; Boris Izrailevich Medovor, both of Kiev; Semen Abramovich Leibenzon, and Gary Petrovich Kaganovsky, both of Zaporozh'ye, all of U.S.S.R., assignors to Institut Elektrosvarki Imeni Patona, Kiev, U.S.S.R.

Continuation of Ser. No. 669,608, Sept. 21, 1967, abandoned.  
This application July 16, 1971, Ser. No. 163,466  
Int. Cl. B22d 27/02

U.S. Cl. 164-252

21 Claims



Apparatus and method for the electroslag remelting of metallic consumable electrodes comprising a bottom plate, a



discrete slag inlet means disposed on said bottom plate and a hollow mold disposed on the latter, said slag inlet means establishing fluid flow communication between said mold and an access port outside of said mold into which slag may be poured. A bottom pour apparatus useable in the foregoing. A removable slag inlet conduit in fluid-flow communication with the slag inlet in said slag inlet means.

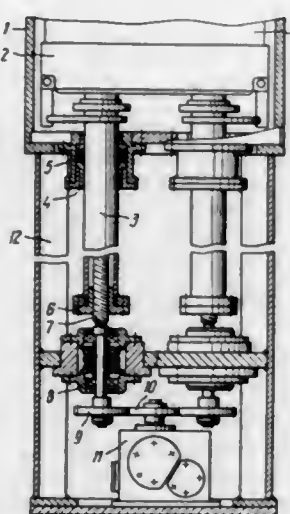
### 3,734,165 INGOT EXTRACTING DEVICE

Konstantin Trofimovich Nautny, ulitsa Krasitskogo, 17, kv. 2; Viktor Iosifovich Lakomsky, ulitsa Bastionnaya, 10, kv. 30; Anatoly Ivanovich Chvertko, bulvar Lesi Ukrainki, 2, kv. 36, all of Kiev; Semen Yakovlevich Shekhter, ulitsa Brestskaya, 15, kv. 18; Alexandr Mikhailovich Reznitsky, ulitsa Kirova, 2, kv. 18, both of Kommunarok Voroshilovgradskoi oblasti, and Viktor Romanovich Pilipchuk, ulitsa Mashinostroitel'naya, 12, kv. 4, Kiev, all of U.S.S.R.

Filed Dec. 15, 1971, Ser. No. 208,085  
Int. Cl. B22d 11/08

U.S. Cl. 164—274

2 Claims



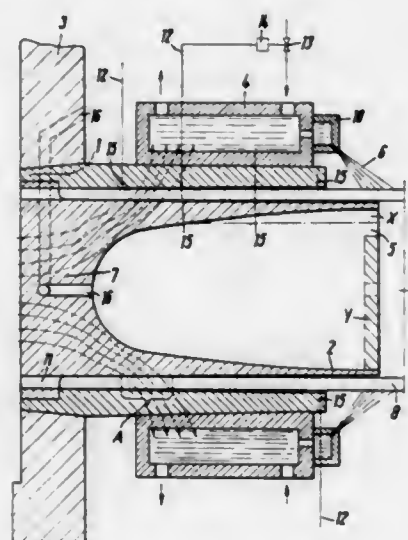
A device for extracting ingots from molds of plasma-arc furnaces in which a dummy bar is secured on at least two rods located symmetrically relative to a center of its cross-section.

**3,734,166  
APPARATUS FOR CONTINUOUSLY CASTING TUBES**  
Alfred J. Werthli, Poststrasse 15, 8406 Winterthur, Switzerland  
Filed Aug. 6, 1970, Ser. No. 61,701  
Claims priority, application Switzerland, Aug. 8, 1969, 12261/69

Int. Cl. B22d 11/12

U.S. Cl. 164—283

14 Claims



In apparatus for the continuous casting of tubing the core mandrel is hollowed for a portion of its length with the wall

thickness of the hollowed portion progressively decreasing in the direction of withdrawal of the cast tube. The shape of the hollowed portion can be varied to control the flow of heat through the mandrel to produce the desired effect on the solidification process. A cooling fluid can be supplied to the mandrel cavity, if desired.

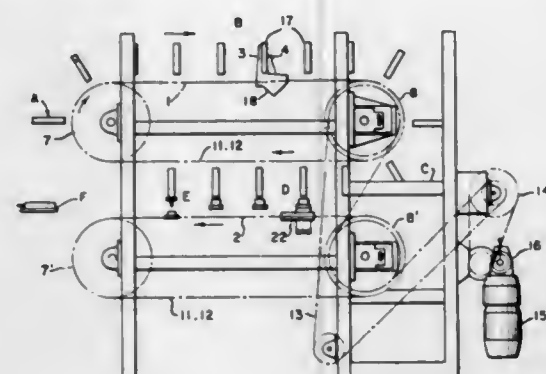
### 3,734,167 APPARATUS FOR ARRANGING AND SOLDERING TOGETHER ELECTRODE SETS FOR LEAD ACCUMULATORS

Tor Axel Odman, Stockholm, Sweden, assignor to Aktiebolaget Tudor, Stockholm, Sweden

Filed Dec. 13, 1971, Ser. No. 207,336  
Int. Cl. B22d 17/24, 19/00

U.S. Cl. 164—324

12 Claims

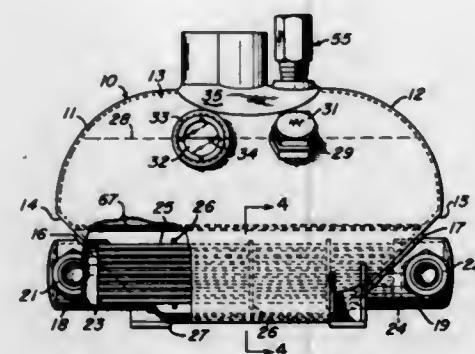


Apparatus for producing finished plate sets constituting a cell in a lead-acid accumulator. Positive and negative plate electrodes and separator sheets, in proper sequence and number, are fed in at station A, arranged and adjusted positionally relative to one another at station B, and inverted so that the plate lugs are fluxed at station C. The lugs are inserted into mold troughs carried by a lower chain system at station D, and the pole bridges with connecting terminals or external terminal posts formed integrally therewith during the travel to station E, after which the mold troughs are removed and the finished plate set is removed as a sub-assembly at station F.

**3,734,168  
WATER OR LIKE BOILER**  
Raymond S. DeGroote, Centerville, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio  
Filed Dec. 3, 1971, Ser. No. 204,553  
Int. Cl. F28d 11/00

U.S. Cl. 165—11

7 Claims

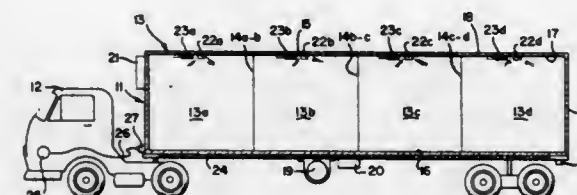


A water boiler type cooling device in which provision is made for continuing operation of the device despite temporary inverted attitude or negative gravity conditions of operation. Continuous venting without loss of liquid is provided for as well as means continuously to present liquid for vaporization at heated surfaces.

**3,734,169  
SPRAY REFRIGERATION SYSTEM FOR LOW  
TEMPERATURE-SENSITIVE PRODUCT**  
Henry Joseph Falk, Grand Island, N.Y., assignor to Union Carbide Corporation, New York, N.Y.  
Filed Jan. 27, 1972, Ser. No. 221,316  
Int. Cl. F25b 29/00

U.S. Cl. 165—28

13 Claims

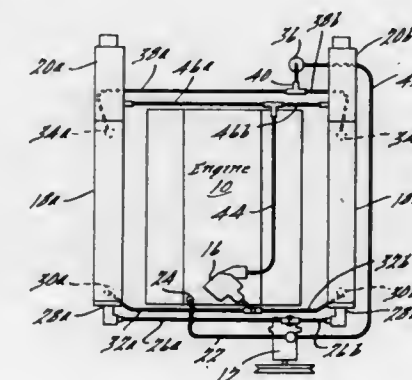


A system for spray refrigeration of low temperature-sensitive products at optimized slightly above freezing temperature, but avoiding freeze damage at sub-freezing ambient temperatures, by introducing external heat in response to sensing of the ambient temperature.

**3,734,170  
MARINE ENGINE COOLING**  
John G. Pace, Port Huron, Mich., assignor to Chrysler Corporation, Highland Park, Mich.  
Filed Mar. 24, 1971, Ser. No. 127,489  
Int. Cl. F28f 27/02

U.S. Cl. 165—51

5 Claims



Improved water jacketed manifolds for marine engine cooling systems of the type wherein heated water which has circulated through an engine cooling system for cooling purposes is mixed in the improved engine exhaust manifold water jacket according to this invention with raw, relatively cool water to controllably cool the manifold and avoid condensing water from the exhaust gases flowing through the exhaust manifold.

**3,734,171  
COIL FOR AIR DUCT INSTALLATION**  
Roland A. Ares; Russell H. Bullard, and Ernest L. Spear, all of Wilmington, N.C., assignors to The Singer Company, New York, N.Y.

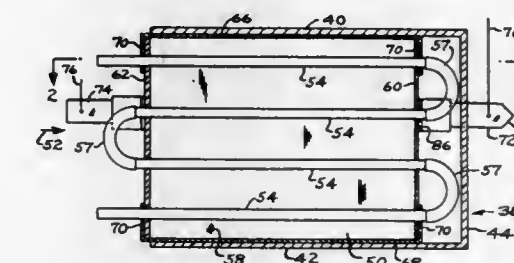
Filed Apr. 19, 1971, Ser. No. 134,952  
Int. Cl. F24h 3/02; F16l 3/00

U.S. Cl. 165—54

12 Claims

A cartridge-type heat exchange coil installed in a conventional air duct by way of a single side opening in the duct wall so that the coil rigidly positions itself within the duct cavity. The coil preferably has certain arms extending from its ends to

provide duct-side piercing, positioning, and suspending. The arms are disposed outside the duct when the coil is in-



stalled, such that wires or straps can be attached to the arms to suspend the coil without appreciably loading or stressing the duct.

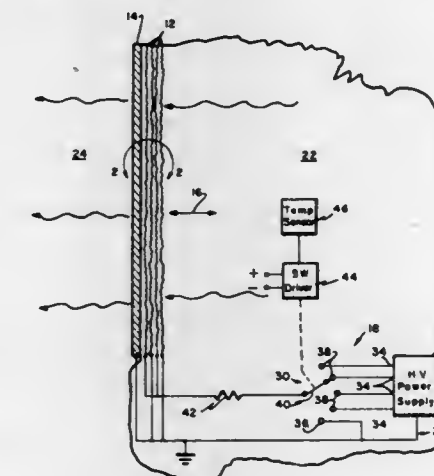
### 3,734,172 ELECTROSTATIC CONTROL METHOD AND APPARATUS

Richard P. Clifford, Newport Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jan. 3, 1972, Ser. No. 214,900  
Int. Cl. F28f 13/00, 27/00

U.S. Cl. 165—96

8 Claims



An electrostatic control method and apparatus wherein a potential difference is impressed across two or more electrically conductive members which are electrically isolated from one another to provide the adjacent members with opposite electrical polarity and thereby create an electrostatic force urging the members together against the resistance of an opposing resilient force. The potential difference is adjusted to effect relative positioning of the members through a range of positions under the conjoint action of the electrostatic force and the opposing force. The disclosed inventive embodiment is a thermal barrier composed of multiple thermal insulating layers which are electrostatically positioned to regulate the thermal conductance of the barrier.

**3,734,173  
ARRANGEMENT FOR TRANSMITTING HEAT**  
Konrad Gustav Moritz, 741 Reutlingen, Germany, assignor to Messerschmitt-Bölkow-Blohm, GmbH, München and Dr. K. H. Hocker, Stuttgart-Valhingen, Germany, part interest to each

Filed Nov. 20, 1969, Ser. No. 878,280

Claims priority, application Germany, Jan. 28, 1969, P 19 04 105.5

Int. Cl. F28d 15/00

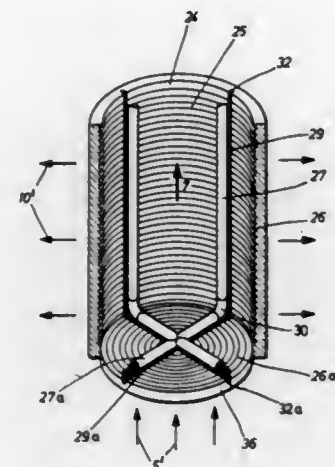
U.S. Cl. 165—105

13 Claims

An arrangement for transmitting heat using a tubular member defining a chamber in which an evaporator and



wetting liquid substance and at least one capillary body for conducting the liquid substance are present includes an inner wall having grooves defined therealong which extend cross-wise to the direction of flow of the liquid in the capillary body. The capillary body or wick may be in the form of a narrow meshed wire netting and the arrangement advantageously includes one or more capillary webs which touch the evaporable



liquid present in the grooves of the chamber wall. The capillary body is advantageously formed as a tube or jacket, for example, from a single piece of a wire netting or of a metal sheet provided with capillary passages. The capillary tube may be formed of a plurality of segments or partial wall areas which are joined together over the capillary webs which extend from the tubes out to the grooves of the wall of the chamber.

3,734,174

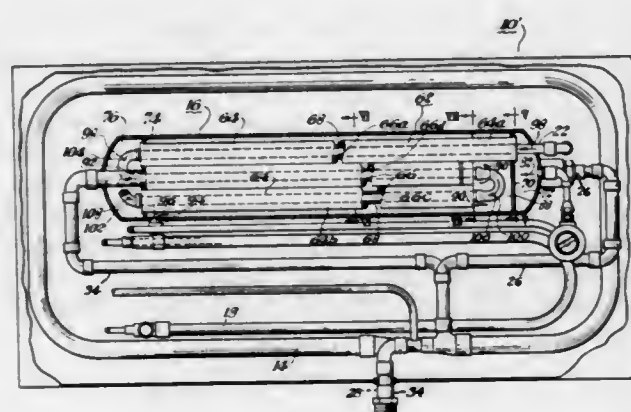
## HEAT EXCHANGER FOR COMPRESSED AIR

Alden T. Bloxham, Bridgeville, Pa., and Harry C. Fischer, Royal Oak, Md., assignors to Kellogg-American, Inc., Oakmount, Pa.

Division of Ser. No. 784,597, Dec. 18, 1968. This application Sept. 16, 1970, Ser. No. 72,716  
Int. Cl. F28d 7/10; F28f 1/20

U.S. Cl. 165-154

13 Claims



A heat exchanging structure for an evaporator and the like comprises a plurality of sheath tubes and a plurality of inner tubes inserted respectively and spacedly within the sheath tubes. A flow arrangement connects one group of the group of sheath tubes and the group of inner tubes in series and at least some of the other group of tubes in parallel.

In another such structure, inner and outer tubes are mounted in tube-in-tube relation, and at least one of the tubes include heat transfer spines.

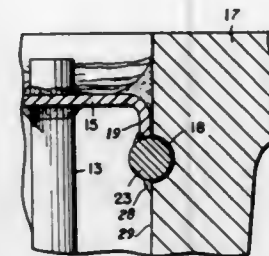
3,734,175  
HEAT EXCHANGER

Donald W. Christensen, Racine, Wis., assignor to Young Radiator Company, Racine, Wis.

Filed Aug. 30, 1971, Ser. No. 175,991  
Int. Cl. F28f 9/16

U.S. Cl. 165-158

5 Claims



Apparatus, and method, pertaining to bonding tube-supporting plates to the end hubs of what commonly is designated as "Fixed Tube Bundle Heat Exchangers." A shell surrounds a tube bundle having a header plate at each end. The header plates are bonded to the ends of the shell by method and means of a snap ring anchored in the shell, with the plate on the snap ring. A ring of bonding material is then fused to the circumference of the plate at the shell interior and on the ring.

3,734,176

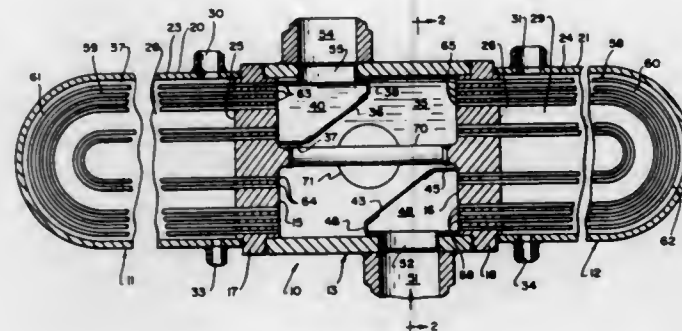
## HEAT EXCHANGER ASSEMBLY HAVING A COMMON FLUID BOX

Waldo W. Hagnauer, 910 Keith Avenue, Waukegan, Ill.

Filed Apr. 16, 1970, Ser. No. 29,065  
Int. Cl. F28f 9/02

U.S. Cl. 165-158

10 Claims



A plurality of heat exchanger units are joined together by a connecting member in an end to end relation. A fluid box is formed between the units by the walls of the connecting member and the tube sheets of the joined units. The fluid box serves as a passageway to conduct the heat exchange fluid between heat exchanger units. A tie-bar connected to the tube sheets of the individual heat exchanger units assists in containing the bending stresses exerted on the tube sheets by the pressure of the exchange fluid.

3,734,177

## HEAT EXCHANGER

Louis Bellovary, and Al O. Popma, both of Union Grove, Wis., assignors to Modine Manufacturing Company, Racine, Wis.

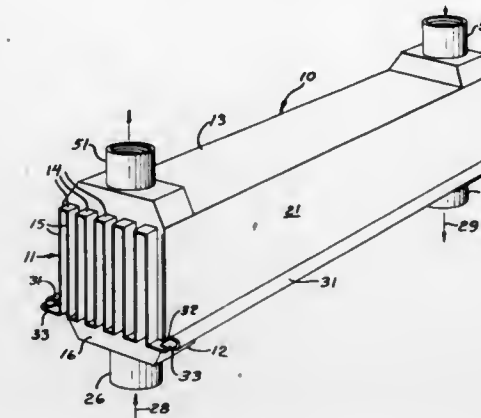
Filed Feb. 4, 1972, Ser. No. 223,464  
Int. Cl. F28f 3/00

U.S. Cl. 165-166

10 Claims

A heat exchanger for exchange between first and second fluids such as motor oil lubricant and liquid coolant in which a baffle sheet of serpentine cross section separates these fluids for heat transfer through the sheet between the fluids, a pair of end plates on opposite ends of the exchanger each having

spaced fingers with edge areas joined to the baffle sheet sealing the end spaces between the sides of the folds forming the serpentine section with the end plates being parts of a first enclosing casing for the first fluid and with all seams joining the



baffle sheet, first enclosing casing and the end plates being located at the exterior of the heat exchanger for ready inspection of the seams which are preferably formed by brazing and ready accessibility to the seams to make any necessary leakage repairs.

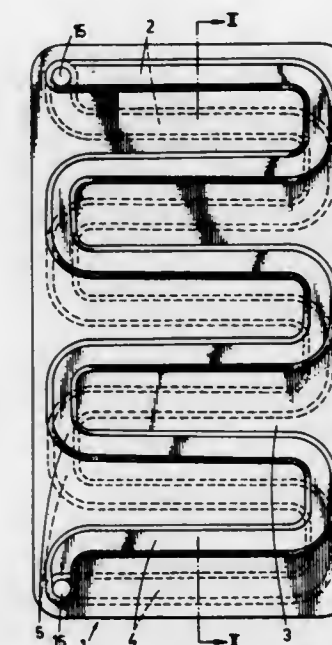
3,734,178  
HEAT EXCHANGER

Edmond Soudron, Ans, Belgium, assignor to Etablissements Thomas Defawes, Rocour-Lex-Liege, Belgium

Filed May 26, 1971, Ser. No. 147,079  
Int. Cl. F28a 3/12

U.S. Cl. 165-170

4 Claims



A heat exchanger, such as a boiler, comprising a nest of tubes travelled by a heat-bearing fluid, said tubes being branched on a starting header and on a return header of fluid, as well as a heat source for heating said fluid, this nest of tubes comprising ribbed elements, the ribs of which form communicating channels for the fluid and comprised of panels applied the one against the other and each presenting a ribbed profile, wherein the ribs of the panels forming each of the elements extend as serpentine, the ribs of one panel being offset with respect to the ribs of the other panel.

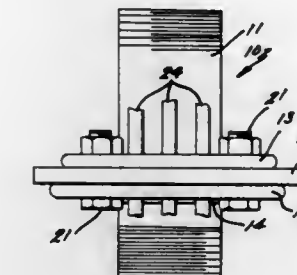
3,734,179  
WELL PACKER & PUMP APPARATUS

William L. Smedley, 245 Graham Road NW, Grand Rapids, Mich.

Division of Ser. No. 844,333, July 24, 1969, Pat. No. 3,647,230. This application June 18, 1971, Ser. No. 154,464  
Int. Cl. E21b 43/00

U.S. Cl. 166-106

3 Claims



The disclosure is of a seal to be used in a well immediately above a pump and at or below the normal level of the water in the well casing to prevent the movement of water and air downwardly past the seal into the area of the pump. The seal is designed to permit the necessary service connections to be passed through it and then adjusted to tightly seal about these connections before installation of the seal in the well.

3,734,180

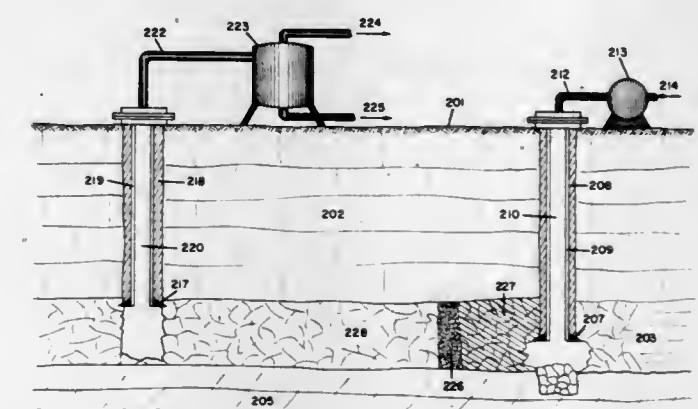
## IN-SITU GASIFICATION OF COAL UTILIZING NON-HYPERSENSITIVE EXPLOSIVES

Vaughan W. Rhoades, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

Division of Ser. No. 50,790, June 29, 1970, abandoned. This application Aug. 27, 1971, Ser. No. 175,549  
Int. Cl. E21b 43/24, 43/26

U.S. Cl. 166-259

3 Claims



Two or more wells are drilled into a coal seam. The wells are completed so as to isolate all other strata from the coal seam and a radially extended horizontal fracture is directed by introduction of a non-hypersensitive explosive under hydraulic fracturing conditions so as to connect the wells communally. The explosive is ignited so that a horizontally and vertically directed fracture network is formed within the coal system. A combustion front is ignited and propagated through the fractured network to produce combustible gases and coal tar liquids.



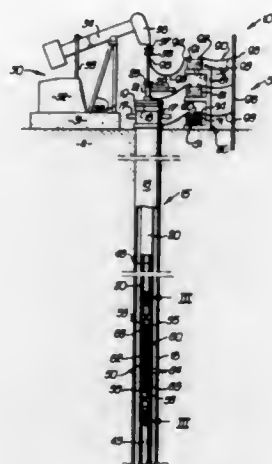
3,734,181

**CORROSION REDUCING APPARATUS FOR A PRODUCING OIL WELL OR THE LIKE**

Donald U. Shaffer, 8545 La Sierra Avenue, Whittier, Calif.  
Filed Mar. 25, 1971, Ser. No. 127,921  
Int. Cl. E21b 43/00

U.S. Cl. 166—244 C

9 Claims



The corrosion reducing apparatus for a producing oil well has the positive terminals of three substantially discharged batteries connected respectively to the pump rod, the casing head, and the casing of the oil well; and has the negative terminals of the batteries connected to a rod driven into the ground. The pump rod is provided with a split zinc jacket around the short tube between pup joints, and a latch-on bow spring around the jacket to secure the jacket to the rod for insertion into a tube in the well whereupon the bow spring engages the tube to electrically connect the rod to the tube.

3,734,182

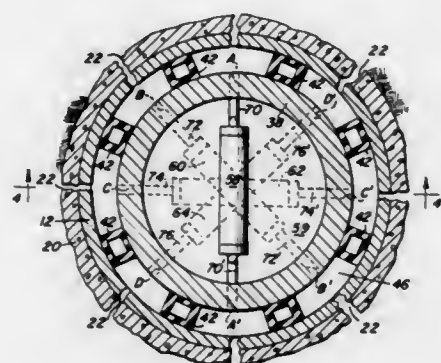
**METHOD FOR LOCATING OIL AND GAS FIELD BOUNDARIES**

Herbert G. Warren, Butte, and Ronald D. Ragland, Billings, both of Mont., assignors to Cardinal Petroleum Company, Billings, Mont.

Filed May 7, 1971, Ser. No. 141,314  
Int. Cl. E21b 47/06

U.S. Cl. 166—254

2 Claims



A method and apparatus for detecting the presence, direction of and the distance to barriers in underground oil and gas fields by directional flow data.

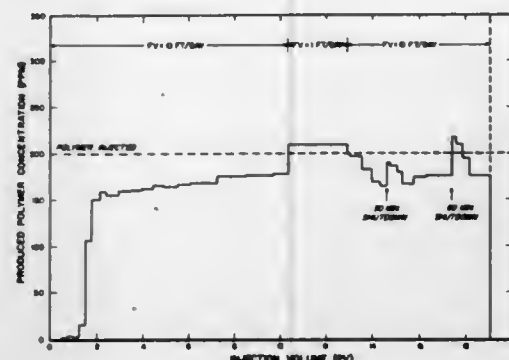
3,734,183

**POLYMER FLOODING OBTAINED BY PULSE INJECTION**

John S. Rhudy, Denver; James H. Fullinwider, Adams, and David J. Ver Steeg, Arapahoe, all of Colo., assignors to Marathon Oil Company, Findlay, Ohio  
Filed June 24, 1971, Ser. No. 156,273  
Int. Cl. E21b 43/22

U.S. Cl. 166—263

10 Claims



Secondary and tertiary recovery of crude oil via polymer injection is improved by injecting the polymer in a pulsating manner. This intermittently relieves the formation injection pressure, thereby releasing polymer entrapped in the sandstone matrix. This released polymer is effective in helping maintain mobility control throughout the completion of the polymer flood.

3,734,184

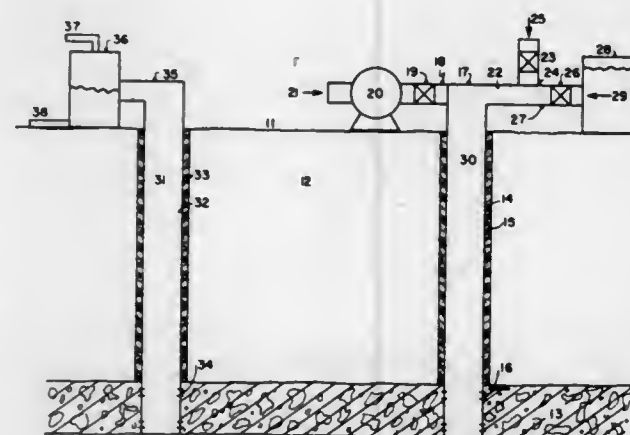
**METHOD OF IN SITU COAL GASIFICATION**

J. O. Scott, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed June 18, 1971, Ser. No. 154,371  
Int. Cl. E21b 43/24, 43/26

U.S. Cl. 166—259

9 Claims



A method for distilling coal in situ through gasification to recover hydrocarbons and a calorific value gas by treating a rubblized bed of coal underground. A rubblized bed of coal is produced from the surface through wells or shafts sealed to convey fluids under high pressure to or from the coal bed. Superheated steam is injected into the chamber while volatized hydrocarbons and gaseous reaction products are simultaneously withdrawn. Subsequent to the removal of the volatile hydrocarbons, air is injected so as to initiate combustion of the remaining char and increase the chamber temperature to from about 1200°F. to about 2000°F. Air injection is then suspended with water or low temperature steam being introduced into the hot char in order to form superheated steam which is withdrawn and injected into a new rubblized chamber of coal to repeat the process.

3,734,185

**USE OF WATER-EXTERNAL MICELLAR DISPERSIONS IN OIL RECOVERY**

Stanley C. Jones, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio  
Division of Ser. No. 22,080, March 23, 1970, which is a continuation-in-part of Ser. No. 693,125, Dec. 26, 1967, Pat. No. 3,506,071. This application, Ser. No. 194,564  
Int. Cl. E21b 43/16, 43/22

U.S. Cl. 166—273

24 Claims

Secondary-type crude oil recovery is effected by injecting into a subterranean formation 1–20 percent formation pore volume of a water-external micellar dispersion of hydrocarbon and petroleum sulfonate dispersed in water and displacing it through the formation to recover crude oil therefrom.

3,734,186

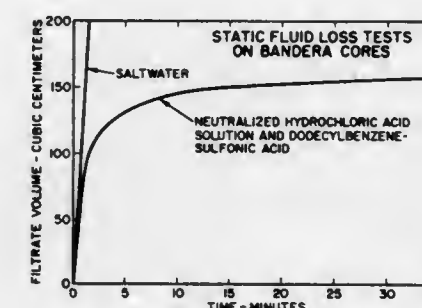
**METHOD FOR ACIDIZING SUBTERRANEAN FORMATIONS**

Bert B. Williams, Houston, Tex., assignor to Esso Production Research Company, Houston, Tex.

Filed Mar. 25, 1971, Ser. No. 127,897  
Int. Cl. E21b 43/27

U.S. Cl. 166—282

15 Claims



A method for acidizing a carbonate formation surrounding a well wherein a treating fluid containing an acid which on reaction with the carbonate rock forms a soluble salt and an organic acid which on reaction with the carbonate rock forms an insoluble salt is injected into the formation. An afterflush fluid is then injected into the formation to remove the insoluble salt.

3,734,187

**OIL RECOVERY WITH SULFOMETHYLATED POLY (LOWER ALKYL VINYL ETHER/MALEIC ANHYDRIDE)**

Charles J. Norton, and David O. Falk, both of Denver, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Dec. 20, 1971, Ser. No. 210,203  
Int. Cl. E21b 43/22

U.S. Cl. 166—275

7 Claims

Poly(lower alkyl vinyl ether/maleic anhydride) copolymer is dissolved in ammonium hydroxide and reacted simultaneously with formaldehyde and sodium sulfite, e.g., for 10 hours at 50°C. to produce an improved thickening agent for secondary recovery of petroleum. Optionally the reaction with formaldehyde or with sodium sulfite can be omitted.

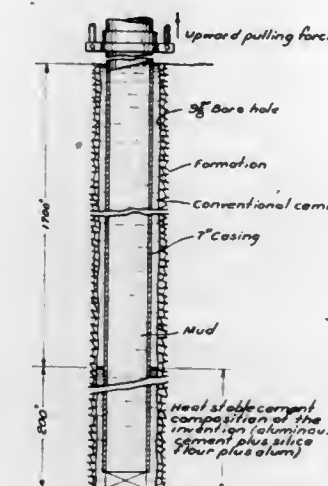
3,734,188

**WELL CEMENTING AND STIMULATION METHOD**

Roland L. Root, Tulsa, and Louis H. Eilers, Inola, both of Okla., assignors to The Dow Chemical Company, Midland, Mich.  
Division of Ser. No. 42,758, June 2, 1970, Pat. No. 3,620,785.  
This application Apr. 29, 1971, Ser. No. 138,473  
Int. Cl. E21b 33/14, 43/24

U.S. Cl. 166—292

5 Claims



An hydraulic cement composition comprising an aluminous cement and an alum and method of cementing comprising admixing said composition with water and emplacing it in a geologic formation via a well penetrating the formation.

3,734,189

**HYDRAULIC FRACTURING PROCESS USING A TEMPERATURE-INVERTED FRACTURING FLUID**

William B. Gogarty, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jan. 3, 1972, Ser. No. 215,095  
Int. Cl. E21b 43/26, 43/27

U.S. Cl. 166—308

15 Claims

Oil-external surfactant mixtures useful for fracturing subterranean formations, especially formations containing water-sensitive clays, and which are characteristic of exhibiting a viscosity increase on temperature increase are obtained by mixing 25–95 percent by volume hydrocarbon, 1–70 percent by volume aqueous medium, at least about 3 percent by volume surfactant and optionally about 0.01–20 percent by volume cosurfactant and/or 0.001–5 percent by weight electrolyte (based on the aqueous medium). In addition, the surfactant mixture can contain silica flour, viscosity-increasing agent, propping agents, etc.

3,734,190

**METHOD OF INCREASING CAPACITY IN A WELL**

William L. Smedley, 245 Graham Road NW, Grand Rapids, Mich.

Division of Ser. No. 844,333, July 24, 1969. This application  
June 18, 1971, Ser. No. 154,461  
Int. Cl. E21b 43/00

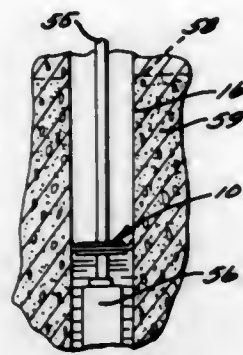
U.S. Cl. 166—315

2 Claims

The disclosure is of a seal to be used in a well immediately above a pump and at or below the normal level of the water in the well casing to prevent the movement of water and air



downwardly past the seal into the area of the pump. The seal is designed to permit the necessary service connections to be



passed through it and then adjusted to tightly seal about these connections before installation of the seal in the well.

3,734,191

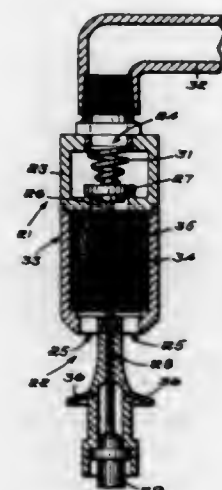
## FIRE EXTINGUISHING SYSTEM

Wilfred V. Johnson, Oxford, and Raymond E. Shea, Holden, both of Mass., assignors to U.S. Fire Control Corp., Oxford, Mass.

Filed Nov. 15, 1971, Ser. No. 198,673  
Int. Cl. A62c 35/22

U.S. Cl. 169-5

18 Claims



Disclosed is an automatic fire extinguishing system with a temperature controlled sprinkler head assembly. Included within the head is a reservoir containing a chemical fire extinguishing agent that combines with fluid flowing therethrough to form a medium with superior fire extinguishing qualities. A valve within the sprinkler head automatically and repeatedly opens in response to conditions associated with a fire and closes in response to a change in those conditions.

3,734,192

## TEMPERATURE CONTROL TERMINAL UNIT

Frank James Dean, Jr., Kansas City, Mo., assignor to Temp-master Corporation, Kansas City, Mo.

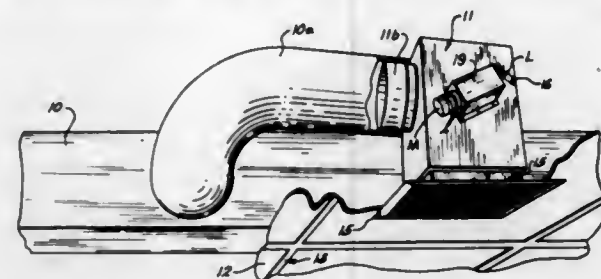
Filed Aug. 8, 1969, Ser. No. 848,496  
Int. Cl. B60h 1/00

U.S. Cl. 165-39

5 Claims

A temperature control terminal unit includes a single-blade volume damper that is positionable by a motor driven operator in accordance with the temperature setting on a thermostat. The volume damper reduces the volume of air delivered to the area being conditioned as the temperature within same approaches a desired value. The unit is further characterized by its ability to utilize the proper volumetric proportions of air

for either heating or cooling without upsetting the balance of air in the system and may include a remote supplementary



heating source energizable in accordance with the damper position.

3,734,193

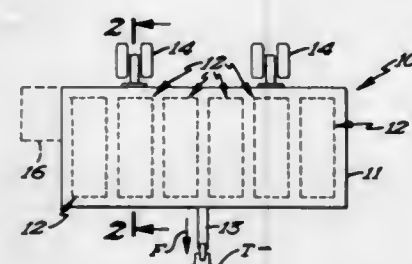
## SUGAR BEET HARVESTER

Erwin P. Molnau, deceased, late of Chanhassen, Minn., and by Margaret L. Molnau, administratrix, Route 5, Box 171, Excelsior, Minn.

Filed Sept. 20, 1971, Ser. No. 181,972  
Int. Cl. A01d 25/04

U.S. Cl. 171-57

7 Claims



A beet harvesting machine with inclined rotary beet-digging points traveling beneath the ground surface for uplifting beets from the ground; inclined screws behind the points receiving, elevating and conveying the beets rearwardly; rotary helicoidal rods above the screws guiding the beets rearwardly; ground travel wheels supporting the digging points at desired depths of penetration; release gates adjacent the screws; and drive means for the screws and rotary helicoidal rods.

3,734,194

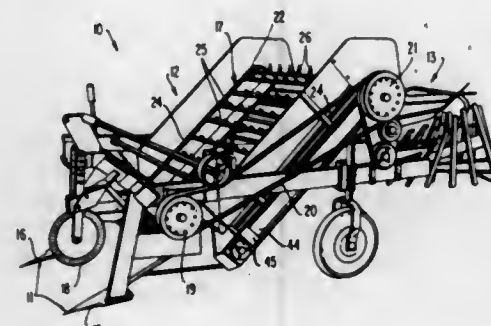
## PEANUT SHAKER DIRT REMOVER

Carroll J. Whitfield, Columbus, Ga., assignor to Kelley Manufacturing Company, Tifton, Ga.

Filed June 1, 1971, Ser. No. 148,404  
Int. Cl. A01d 17/08

U.S. Cl. 171-101

4 Claims



A peanut shaker for use with plows and an inverter for harvesting peanuts, wherein mature peanut laden plants are simultaneously removed from adjacent rows of plants in the ground, elevated above the ground, shaken to remove the dirt

from the plants, and deposited back on the ground in a wind row. The shaker comprises a conveyor with rattler bars movable up an inclined path to move the plants from the plows to the inverter. Rattler bar elevating wheels are located between the upper and return flights of rattler bars and are arranged to be engaged by the rattler bars moving in the upwardly inclined direction of the upper flight so that the rattler bars and the plants carried thereby are jarred in an upward direction causing the dirt to be removed from the peanut plants.

3,734,195

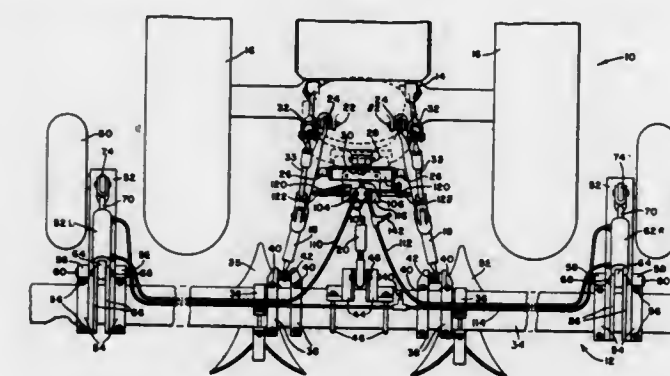
## SIDE DRAFT CONTROL SYSTEM FOR A TRACTOR AND EARTH-WORKING IMPLEMENT

John Isaac Central, Moline, Ill., assignor to Deere & Company, Moline, Ill.

Filed May 17, 1971, Ser. No. 143,939  
Int. Cl. A01b 63/112

U.S. Cl. 172-7

15 Claims



A side draft control device for wide implements automatically adjusts implement wheels to raise the high draft side of the implement and lower the low draft side of the implement to maintain a balanced draft load on the tractor and an average working depth of the implement. The system uses lateral movement of the draft links to operate a control valve which selectively and alternately interconnects the cylinders for the implement wheels with the tractor hydraulic pump and reservoir.

3,734,196

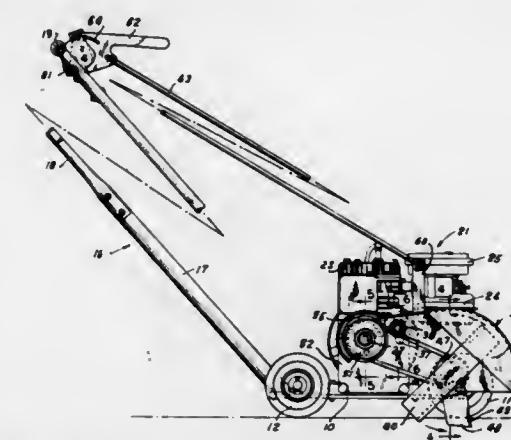
## LAWN EDGER

Elmus F. Mangum, 200 N. Ravinia, Dallas, Tex.

Filed Sept. 3, 1971, Ser. No. 177,770  
Int. Cl. A01d 35/00

U.S. Cl. 172-16

9 Claims



A frame, supported by front and rear wheels, has a gasoline powered motor rigidly mounted thereon with a horizontal drive shaft. The cutter carriage is in the form of a base plate rotatably supported on the motor drive shaft for vertical oscillating movement. The cutter blade is secured to a driven shaft rotatably supported at the front of the carriage about a

horizontal axis disposed generally in the vertical plane of the front wheel axis. A carriage guide finger prevents engagement of the cutter blade with the edge of a pavement. The edger is maneuvered by a handle attached to the frame; and control means, operated at the handle, provide for positioning the height of the cutter blade relative to the supporting frame.

3,734,197

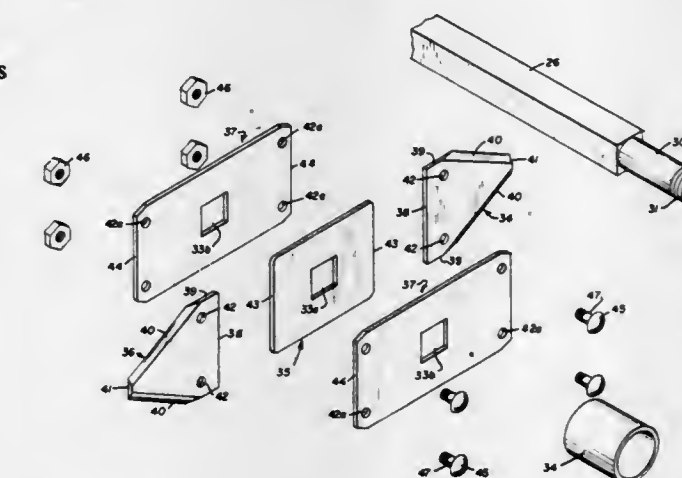
## KNIFE STRUCTURE FOR A KNIFE REEL

Claude D. Zehrung, Jr., Englewood, Colo., assignor to Rental Equipment Manufacturing Co., Englewood, Colo.

Filed July 22, 1971, Ser. No. 165,235  
Int. Cl. A01b 45/02

U.S. Cl. 172-21

7 Claims



A knife structure for the knife reel of a turf conditioning apparatus which is mounted upon a square sectioned reel shaft. The knife structure uses replaceable sickle blades. The base of each blade is abutted against an end of a rectangular spacer plate so that the two blades extend from the plate in spaced opposition. A cover plate at each side of the spacer plate overlies the spacer plate and the base edge of each of the blades so that the spacer plate and the base portions of the blades are sandwiched between the cover plates. Holes at each end of the cover plates register with holes at the base of the cutter blades to receive bolts, and the assembly is secured together by tightening these bolts with nuts. A square opening extends through the cover plates and the spacer plate at the center of the knife structure, this opening fitting securely upon the square shaft. Tubular spacers threaded upon the shaft hold the assembly in position.

3,734,198

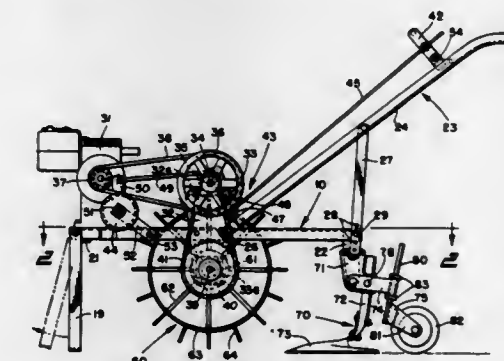
## POWER PLOW

Stephen N. Coleman, 101 Lakeview Drive, Dothan, Ala.

Filed Jan. 6, 1971, Ser. No. 104,238  
Int. Cl. A01b 69/00

U.S. Cl. 172-258

4 Claims



A power plow for producing a single furrow having a traction increasing drive wheel, a caster for aid in steering and varying furrow depth and a support stand for machine storage.



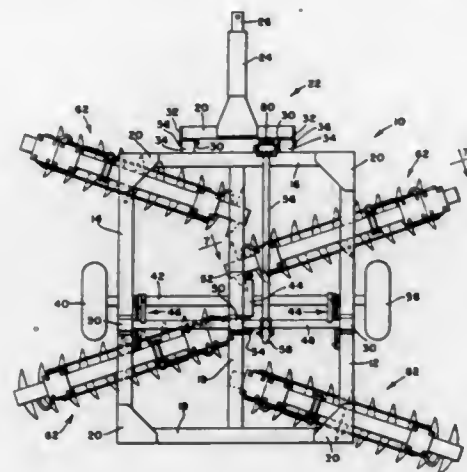
3,734,199

**DISK HARROW WITH DISK GANGS SPACED LONGITUDINALLY AND OVERLAPPED TRANSVERSELY TO FORM A RIDGE-FREE CENTER**  
William Sadayuki Tsuchiya, and Thomas Burton Adams, Jr., both of Moline, Ill., assignors to Deere & Company, Moline, Ill.

Filed Feb. 8, 1971, Ser. No. 113,456  
Int. Cl. A01b 23/04

U.S. Cl. 172-551

4 Claims



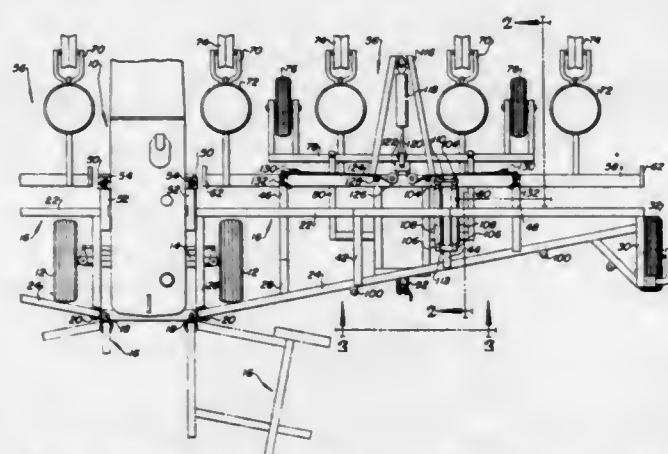
A disk harrow having a forwardly diverging pair of front disk gangs, the innermost disks of which are spaced longitudinally and overlapped transversely to form a ridge-free center furrow as the harrow is advanced forwardly, and a rearwardly diverging pair of rear disk gangs, the innermost disks of which are positioned adjacent to the opposite sidewalls of the center furrow formed by the front disks and spaced longitudinally to deflect soil into and thereby fill the furrow first from one side and then from the other as the harrow is advanced. The front pair of gangs are mounted on the harrow frame to yield inwardly upon striking a stump, rock, or similar obstruction, and the rear pair of gangs are mounted on the frame to yield outwardly upon striking such an obstruction.

3,734,200

**HITCH ARRANGEMENT FOR FRONT MOUNTED AGRICULTURAL IMPLEMENT**  
Russell A. Miller, R.R. 2, Mendon, Ill.  
Filed June 25, 1971, Ser. No. 156,677  
Int. Cl. A01b 59/046, 63/106

U.S. Cl. 172-298

5 Claims



A front mounted hitch arrangement for a row crop tractor having a pair of outrigger frames pivotally mounted to be swung about a vertical axis from a working position to an over the road transport position. Pull type planter units are hitched to each outrigger frame by a pin and slot type hitch which provides for correct positioning of the planter units for planting

and also for over the road movement. Roller type guides between the planters and frames prevent lateral sway while permitting vertical movement of the planters while traversing uneven terrain. A hydraulic cylinder and cable arrangement raises the planters off the ground to be supported by the outrigger frames during over the road transport.

3,734,201

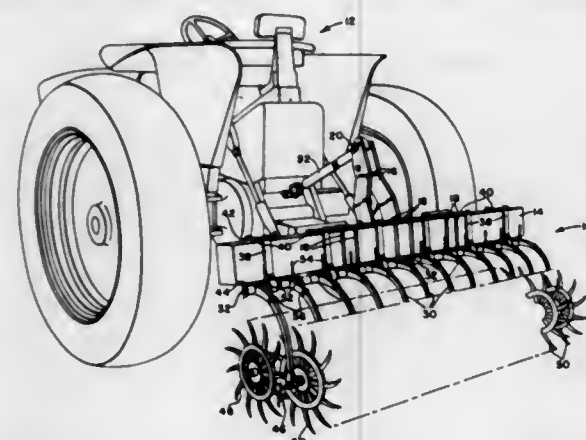
ROTARY HOE

Richard David Zaun, Des Moines, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 19, 1970, Ser. No. 81,851  
Int. Cl. A01b 21/02

U.S. Cl. 172-551

17 Claims



A plurality of transverse pairs of front and rear hoe wheels are individually mounted on a toolbar by spaced support arms and walker arms. The support arms are pivotally connected to the toolbar and extend rearwardly and downwardly therefrom and are normally urged downwardly by springs acting between the support arms and toolbar. The walker arms are pivotally mounted on the lower end of the support arms and rotatably carry a hoe wheel at each end. The structure permits the weight of the toolbar to be transferred to the rotary hoe wheels to provide a substantially constant and equal weight or downward force on each independent hoe wheel.

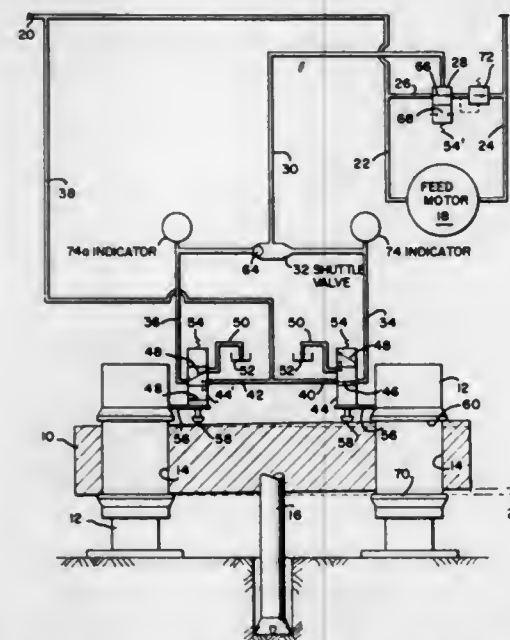
3,734,202

AUTOMATIC FEED CONTROL SYSTEM

Laszlo Gyongyosi, 137 Grove Avenue, Clarksburg, W. Va.  
Continuation-in-part of Ser. No. 63,524, Aug. 13, 1970, abandoned. This application Mar. 12, 1971, Ser. No. 171,268  
Int. Cl. E21c 5/11

U.S. Cl. 173-4

25 Claims



Excess feed pressure provided by the system raises a portion of the drilling machine from the ground and causes a sliding

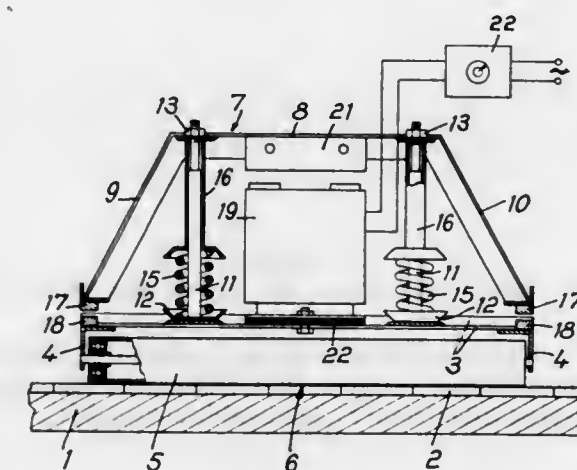
movement of a jack leg within a machine support frame. With jack leg movement, a sensor valve plunger closes on the frame, and the sensor valve controlled by the frame-engaging plunger in turn actuates a valve in the pressured fluid feed line to shunt the feed away from the feed motor. Excess feed pressure, capable of tilting the machine — to the jeopardy of the machine and its operator — is automatically attenuated in immediate response to a feed-reactive displacement of the machine.

3,734,203

**MACHINE FOR STRIKING FLOOR COVERINGS**  
Lysiane G. Gelin, 31 Avenue Kennedy, and Sylvette M. Garigue, 20 Rue L. Blanc, both of Narbonne, France  
Filed Dec. 22, 1971, Ser. No. 210,746  
Claims priority, application France, Dec. 23, 1970, 7047653  
Int. Cl. E04f 21/20

U.S. Cl. 173-24

5 Claims



This invention relates to a machine for striking floor coverings constituted by a chassis comprising two lateral stringers, a bridge disposed transversely to said chassis, means for abutment on the floor fixed to said lateral stringers, these means enabling the said floor to be struck and said chassis to be rendered horizontally movable, of at least one electromagnet composed of coils and moving elements, said coils being fixed to said chassis and said moving elements being integral with said bridge on whose ends two hammers are disposed, which strike vertically and periodically each of said stringers and at least two helical springs disposed between said chassis and said bridge in order to return said latter to its original position.

3,734,204

DRILLING ATTACHMENT

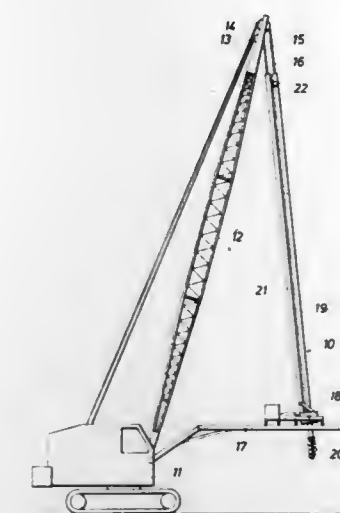
James L. Wallace, College Station, Tex., assignor to R. B. Butler, Inc., Bryan, Tex., a part interest  
Filed Apr. 28, 1971, Ser. No. 138,167  
Int. Cl. E21b 7/02

U.S. Cl. 173-43

12 Claims

In accordance with an illustrative embodiment of the present invention, a drilling attachment for use in conjunction with a crawler or a truck mounted crane includes a frame assembly pivoted at one end to the crane at the base of the boom and extending horizontally outwardly, a drilling unit on the frame assembly and including a drilling rotary mounted for pivotal rotation about a horizontal axis that is transverse with respect to said frame assembly, and a lead beam for supporting the frame assembly and drilling unit from the boom of the

crane, said lead beam being attached at right angles to said drilling rotary and arranged to tilt in reaction to changes in



boom angle and to pivot said drilling rotary to establish a desired drilling angle.

3,734,205

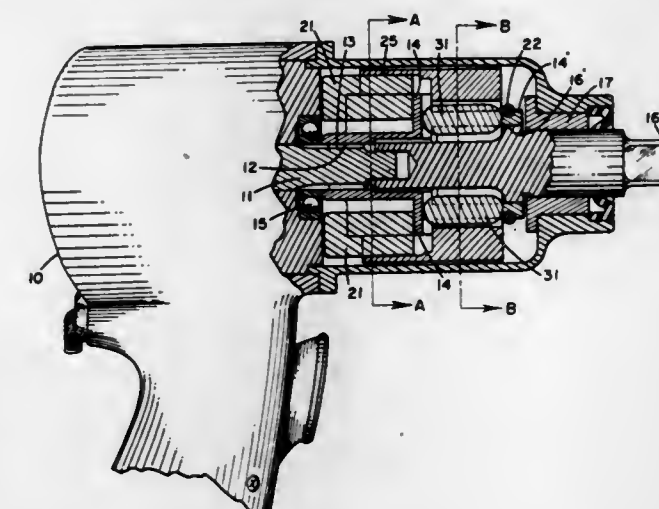
**ROTARY POWER TOOL WITH CENTRIFUGAL COUPLING MEANS**

Spencer B. Maurer, 13753 County Line Road, Chargin Falls, Ohio

Filed June 4, 1971, Ser. No. 149,930  
Int. Cl. B25b 19/00

U.S. Cl. 173-93.5

6 Claims



This invention pertains to a rotary impact power tool, such as a wrench, and novel centrifugal coupling means therefor, wherein a motor drives a cage member which mounts an impact element between an outside positioned hammer member and an inside positioned output shaft having an impact-receiving jaw. Centrifugal means mounted between the cage member and the hammer member is operative periodically to force the hammer member ahead of the cage member to cause an impact blow.

3,734,206

POWER-OPERATED HAMMER

Anthony Edward Walter Last, Stowmarket, England, assignor to The British Steel Piling Company Limited, Ipswich, Suffolk, England

Filed Apr. 29, 1971, Ser. No. 138,439  
Claims priority, application Great Britain, May 4, 1970, 21,277/70

Int. Cl. E02d 7/12

U.S. Cl. 173-137

12 Claims

A power-operated hammer has a fluid-pressure piston and cylinder arrangement for generating the working impulses.



The top of the piston fits an upper part of the cylinder to seal off a space such that the volume of the sealed space increases as the piston makes a return movement and a partial vacuum



is created so that the resultant air pressure acting on the piston accelerates the reversal of its movement and increases the cycle frequency.

3,734,207

**BATTERY POWERED ORTHOPEDIC CUTTING TOOL**

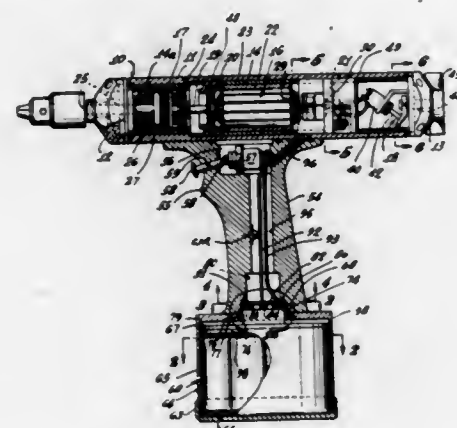
Meyer Fishbein, 12020 Saltair Place, Los Angeles, Calif.

Filed Dec. 27, 1971, Ser. No. 212,484

Int. Cl. A61b 17/32

U.S. Cl. 173-163

8 Claims



The invention provides a surgical electric power drill with self-contained batteries suspended from the butt end of a pistol grip handle in such an arrangement as to counter-balance the drill against top heaviness and toppling moments by locating the center of mass of the drill assembly within the pistol grip handle.

3,734,208

**WELL DRILL TRANSFER MECHANISM**

George E. Otto, Torrance, Calif., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.

Filed Aug. 19, 1971, Ser. No. 173,197

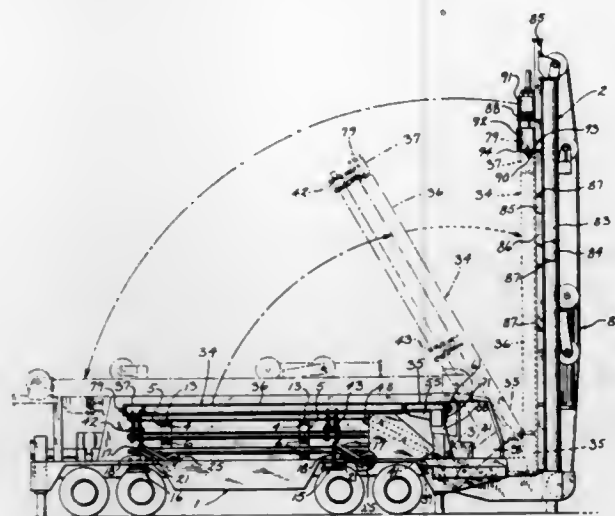
Int. Cl. E21b 19/14

U.S. Cl. 175-52

5 Claims

A mast extends vertically from the front of a truck, and supports a drive unit which operates to simultaneously drive a drill pipe and casing segment into a well. Drill pipe segments each with a surrounding casing segment are carried in a three tiered storage rack located along the right side of the truck. A selected drill-casing segment is discharged from the storage rack onto a pair of carriages which lift the selected drill-casing

segment to a position where it is picked up by a transfer arm. The transfer arm is pivotally attached to the front of the truck and hydraulically actuated to lift the drill-casing segment to a



vertical ready station alongside the mast. The transfer arm is then rotated by a hydraulic motor mounted at its base, swinging the drill-casing segment from the ready station to a drive position over the well where it is connected to the drive unit.

3,734,209

**WELL DRILLING ROD AND CASING ASSEMBLING METHOD**

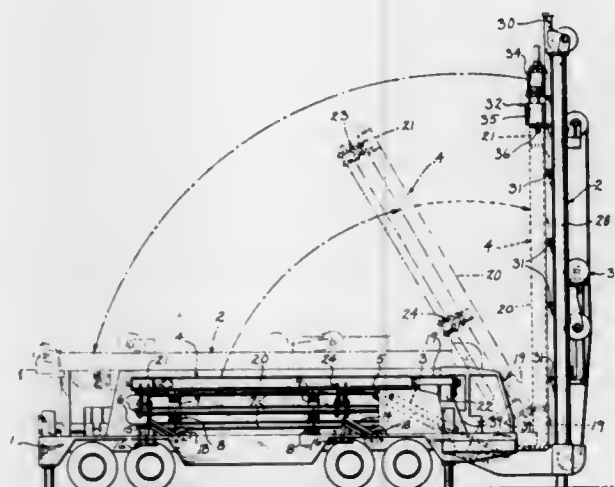
Albert C. Halsch, Greendale; Ralph L. Perlewitz, Milwaukee, both of Wis., and George E. Otto, Torrance, Calif., assignors to Bucyrus-Erie Company, South Milwaukee, Wis.

Filed Aug. 20, 1971, Ser. No. 173,522

Int. Cl. E21b 3/02

U.S. Cl. 175-57

9 Claims



A mast extends vertically from the front of a truck, and supports a drive unit which operates to rotate a drill, to grasp a casing segment, and to simultaneously drive them into a well. Drill pipe segments each with a surrounding casing segment are carried in a storage rack located on the truck, from which they are selected and lifted by a transfer arm to a vertical ready station alongside the mast. In subsequent steps, the upper ends of the drill segment and the surrounding casing segment are attached to the drive unit, their lower ends attached to the drill pipe and casing segment in the well, and then driven downward. In addition to applying a downward feed on the drill string and casing, the drive unit vibrates the casing to speed its insertion into the well.

3,734,210

**CARRIER MOUNTED DRILLING UNIT**

Giles H. Wilderman, Calgary, Alberta, Canada, assignor to Kenting Drilling Ltd., Calgary, Alberta, Canada

Filed Apr. 20, 1971, Ser. No. 135,603

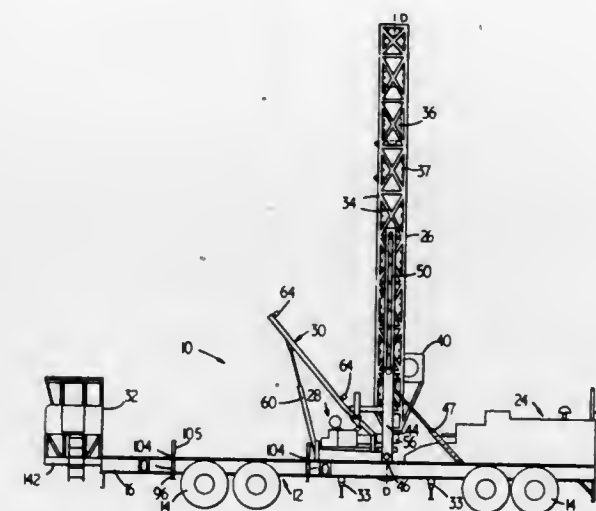
Claims priority, application Canada, June 15, 1970, 085475

Int. Cl. E21b 19/14

U.S. Cl. 175-85

26 Claims

U.S. Cl. 175-85



Improvements in apparatus for drilling wells. The apparatus is particularly suitable for drilling exploration holes or shallow production holes up to about 2,500 or 3,000 feet in depth. The drilling unit is readily transportable from one site to another and is capable of carrying, on racks provided for the purpose, all the drill pipe required for the drilling of relatively shallow production holes or exploration holes. The drilling unit, including the drill pipe racks, is preferably arranged such that a major portion of the weight of the complete drilling unit including a full complement of drill pipe supported on the drill racks is available to produce downward thrust of the drill bit when drawdown forces are being applied to the drill string. The power source, the drive train and the propulsion wheels are located adjacent one end of the chassis thereby leaving the central region of the chassis free of drive train components and the like. It is in this central region that the drill mast and its associated equipment is located. An operators' station is mounted on the chassis and means are provided to support the station for movement from a first position for transportation of the drilling unit wherein the operators' station overlies a portion of the racking area to a second operating position displaced outwardly of the racking area whereby a ready access may be had to the latter for addition or withdrawal of drill stem as the case may be. The apparatus also includes means for adding and withdrawing sections of drill pipe to and from the drill string including a pipe handling arm adapted to grasp and wing individual pipe sections between a generally upwardly directed position at or in the mast and a lower generally horizontal position. The apparatus includes storage means for the sections of drill pipe having a bed for supporting a plurality of layers of generally horizontally disposed pipe sections, the layers being in generally vertically stacked relation. Means are provided for raising or lowering the bed of the pipe storage means thereby to raise or lower the layers of pipe sections supported thereon to enable one of said layers to be positioned adjacent the lower generally horizontal position taken by the pipe handling arm. Means are provided for individually transferring the sections of pipe from the storage means at the level of said pipe layer to the pipe handling arm for engagement thereby and vice versa.

3,734,211

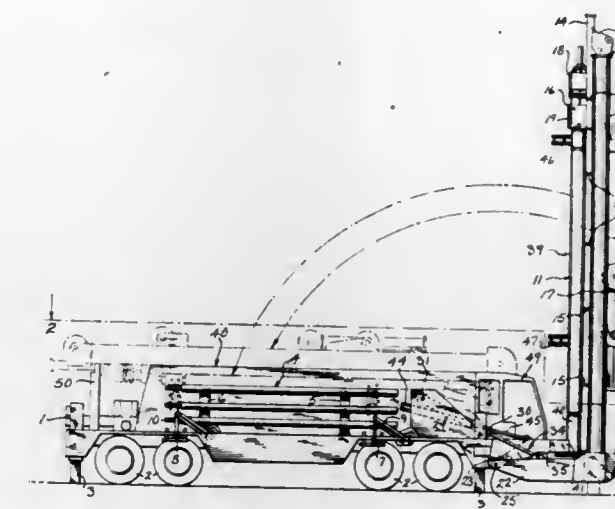
**MOBILE DRILLING UNIT**

Albert C. Halsch, Greendale; Ralph L. Perlewitz, Milwaukee, both of Wis., and George Otto, Torrance, Calif., assignors to Bucyrus-Erie Company, South Milwaukee, Wis.

Filed Aug. 20, 1971, Ser. No. 173,519

Int. Cl. E21b 15/00, 19/14

10 Claims



A mobile truck has a storage rack on the right hand half of the truck bed containing a selection of drill pipe and casing segments extending the length of the truck. On the truck bed along its left hand side is a house containing the machinery necessary to propel the truck and to provide hydraulic power to operate the various motors on the drilling rig. An operator's cab extends forward from the truck bed directly in front of the machinery house. A drill mast having a platform extending perpendicular from its lower end is pivotally connected to the front right side of the truck. A transfer arm is also pivotally attached to the front right side of the truck and is hydraulically operated to transport drill pipe and casing segments from the storage rack to a vertical drilling position underneath a drive unit on the mast. The mast is hydraulically operated between an upright drilling position and a horizontal travel position.

3,734,212

**WELL DRILL AND CASING DRIVE UNIT**

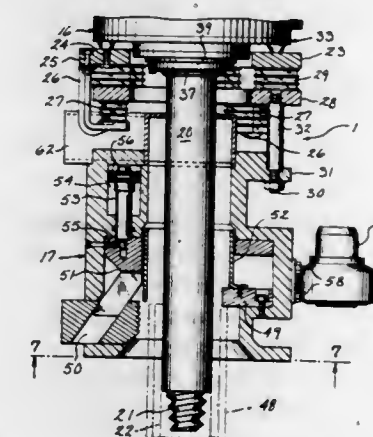
Ralph L. Perlewitz, Milwaukee, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.

Filed Aug. 20, 1971, Ser. No. 173,523

Int. Cl. E21b 3/02

U.S. Cl. 175-171

5 Claims



A drive unit attaches to the mast of a drilling rig and operates to simultaneously drill the well and insert a casing. Drill pipe segments are rotated by a spindle extending down from a rotary drive section which contains a hydraulic motor and transmission. A power chuck surrounds the spindle and operates to grasp and hold the upper end of the casing seg-



ment that surrounds the drill. The power chuck is resiliently mounted underneath the rotary drive section and includes a vibrator which when actuated aids insertion of the casing.

3,734,213

# ROTARY CUTTER FOR EXCAVATION, ESPECIALLY FOR USE WITH RAISE BORING AND TUNNEL BORING MACHINES

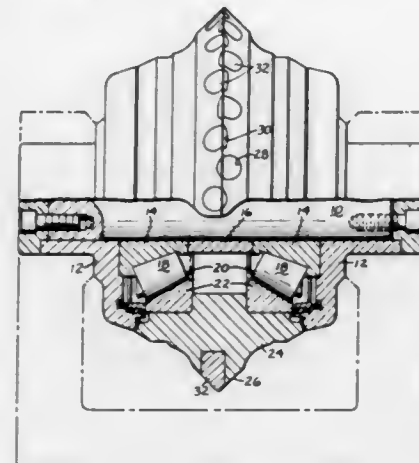
Robert D. Goodfellow, Bedford, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Feb. 2, 1971, Ser. No. 111,923

Int. Cl. E21b 9/22; E21c 13/01

U.S. Cl. 175-374

3 Claims



The specification discloses a rotary cutter in which a central support is mounted in a yoke or other supporting structure and which central support rotatably carries a cutting element having a central annular rib in which is mounted hard wear resistant inserts, such as cemented metal carbide inserts.

3,734,214

# HEAD FOR HORIZONTAL BORING

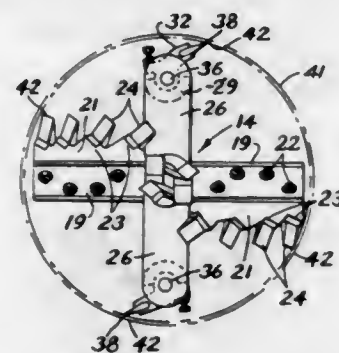
John G. Benetti, Cupertino, and Walter L. Sturgeon, Los Altos, both of Calif., assignors to Pengo Corporation, Sunnyvale, Calif.

Filed Sept. 24, 1971, Ser. No. 183,326

Int. Cl. E21b 9/00

U.S. Cl. 175-384

4 Claims



A head for an auger for horizontal earth boring has four point support which assists in keeping the hole round and in line. The boring head, attached to the working end of an auger shaft has two opposed boring arms formed with tooth holding sockets for replaceable digging teeth and also for a pilot bit. To the rear of the arms is an expansion tooth head having opposed arms intermediate the boring head arms. These arms carry on their outer ends holders for expansion teeth which pivot outward when the auger is rotated in one direction and inward when the auger is reversed. The expansion teeth and outermost boring head teeth are 90° apart and hence the head is supported so that its tendency to bore a hole which is elliptic toward the bottom is overcome. Further, adjustment is provided for the maximum extent of outward pivoting of the expansion tooth holder for different casing wall thicknesses.

# 3,734,215 CONTINUOUS FLOW SCALE WITH ALTERNATING VOLUMETRIC MEASURING AND WEIGHING CHAMBERS

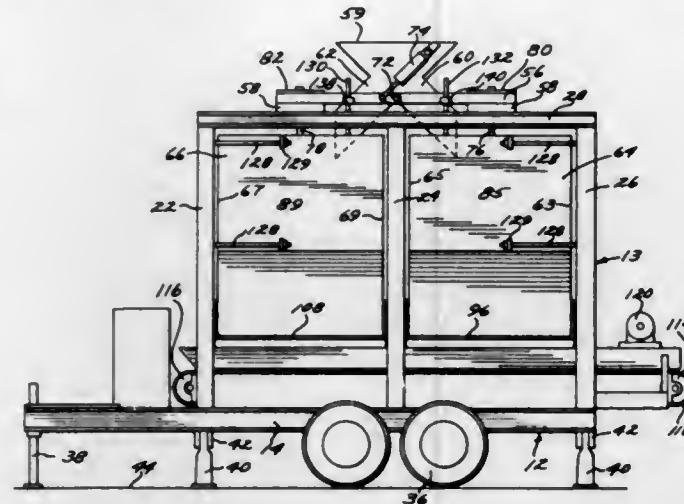
James M. Smith, Golden, Colo., assignor to The Great Western Sugar Company, Denver, Colo.

Filed May 2, 1972, Ser. No. 249,733

Int. Cl. G01g 13/22

U.S. Cl. 177-59

4 Claims



Weighing feeder type apparatus which comprises two containers from one of which material is discharged while the other is charged and automatic control means responsive to the charging of a predetermined volume of material to cause the charging action to be shifted from it to the now empty container and to discharge the filled one.

3,734,216

# WEIGHING DEVICE

Kjell Helge Nordstrom, and Rune Nils Allan Flinth, both of Vasteras, Sweden, assignors to Conrail AB, Vasteras, Sweden

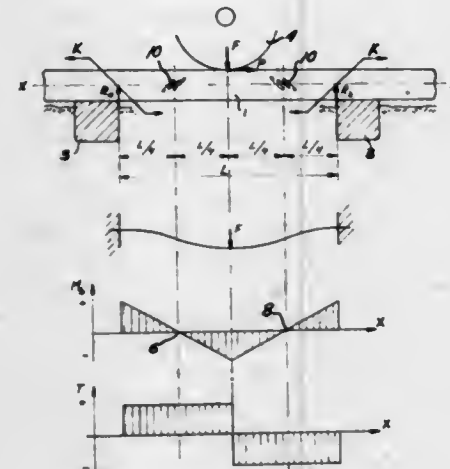
Filed Sept. 16, 1971, Ser. No. 181,031

Claims priority, application Sweden, Sept. 21, 1970, 1803/70

Int. Cl. G01g 19/08, 21/22, 31/4

U.S. Cl. 177-136

19 Claims



A weigh device for static or dynamic weighing of railway guided vehicles comprising a weigh rail fixedly supported at both ends and strain gages positioned on the rail a predetermined distance apart and arranged such that the gages are essentially insensitive to bending moments and sense the strain in the rail in proportion to the shear forces imposed on the rail when a load is applied to the weigh rail.

3,734,217

# WEIGHING DEVICE

Rune Nils Allan Flinth; Nils Boran Ahl; Lars Herbert Larsson, and Kjell Helge Nordstrom, all of Vasteras, Sweden, assignors to Trancon AB, Vasteras, Sweden

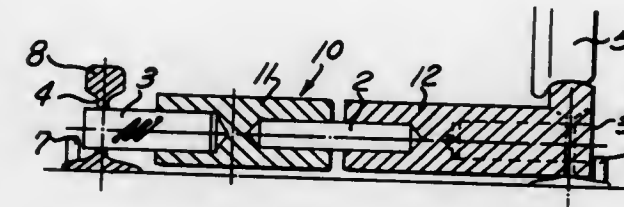
Filed Sept. 16, 1971, Ser. No. 181,171

Claims priority, application Sweden, Sept. 21, 1970, 12804/70

Int. Cl. G01g 21/22

U.S. Cl. 177-163

22 Claims



A device for static or dynamic weighing of railway guided vehicles comprising a vehicle engaging platform adapted to engage the wheels of the vehicle and a plurality of load sensing devices supporting the platform on the rails with a portion of the supporting platform replacing a portion of the rails.

3,734,219

# STEERING SYSTEM FOR SNOWMOBILES AND THE LIKE

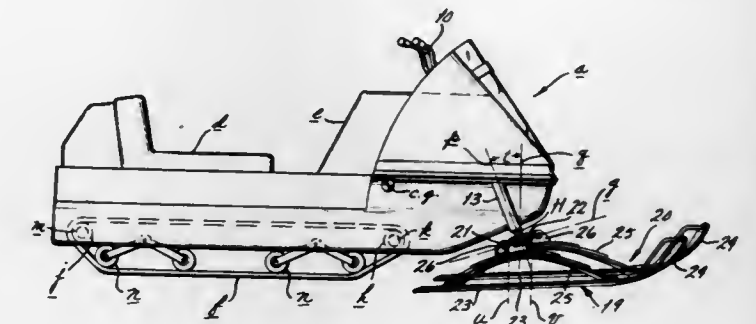
Frank G. Christensen, Don Mills, Ontario, and Rafael T. Wulff, Bramlea, Ontario, both of Canada, assignors to Zeverly L. Lapin, Los Angeles, Calif., a part interest

Filed Aug. 11, 1971, Ser. No. 170,762

Int. Cl. B62m 27/02

U.S. Cl. 180-5 R

7 Claims



A steering system, uniquely suited for snowmobiles, banks the vehicle inward on turning, lessens destabilizing forces acting aft of the center of gravity, and affords steering stability to bring the vehicle out of turns.

3,734,220

# SELF-PROPELLED PLATFORM TOWER HAVING MECHANICAL AND HYDRAULIC SUPPORTING MEANS

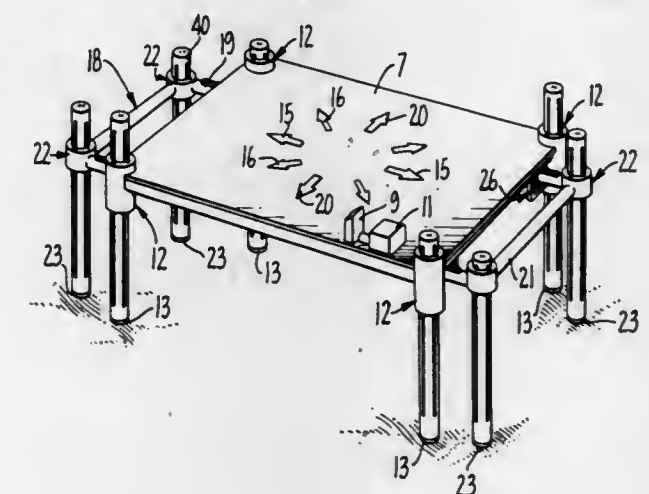
Richard H. Smith, 411 Brannan St., San Francisco, Calif.

Filed Jan. 7, 1972, Ser. No. 216,102

Int. Cl. B62d 57/02

U.S. Cl. 180-8 E

4 Claims



This invention relates to a deck or work platform of improved design supported so that it can be moved into a selected direction over the ground, both under water and on land. It may be used on the sea bottom, particularly at an offshore location and it may also be used on tundra, muskeg, swampy locations and the like. The improved tower of the present invention has combined mechanical and hydraulic support means and normally the hydraulic means would be used when moving the tower from one place to another while the mechanical support means would ordinarily be used after the tower was in a desired location.

3,734,218

# BALANCE

Walter Kupper, 8606 Greifensee, Switzerland, assignor to Mettler Instrument AG, Greifensee, Switzerland

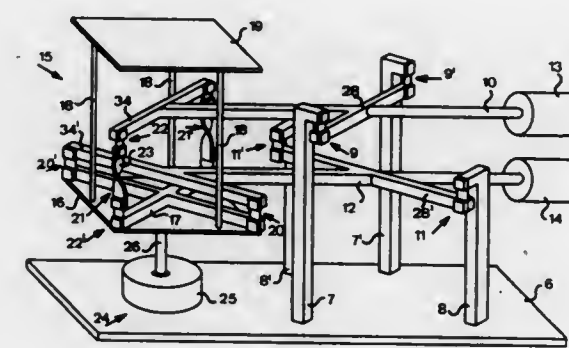
Filed Sept. 25, 1972, Ser. No. 291,758

Claims priority, application Switzerland, Dec. 21, 1971, 18608/71

Int. Cl. G01g 1/34, 7/00, 21/24

U.S. Cl. 177-203

9 Claims



A single-pan analytical balance having two beams mounted spacedly one above the other in main bearings whose normally horizontal axes perpendicularly intersect each other. One arm of each beam carries a counterpoise whereas the other arm is secured to a hanger assembly carrying a top-loading weighing pan by hanger bearings whose pivot axes are parallel to the corresponding main bearings. The bearings consist essentially of flexible metal ribbons. An electromagnetic device acting on the hanger assembly permits weighing by compensation in a known manner.



3,734,221

## ENDLESS TRACK VEHICLE

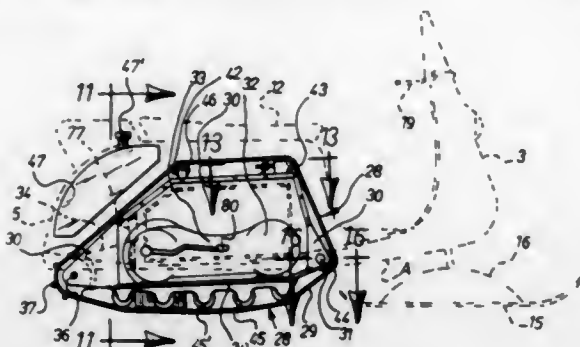
Richard L. Labelle, 405 Wood St., Sherbrooke, Quebec, Canada

Filed June 4, 1971, Ser. No. 150,155

Int. Cl. B62m 27/02

U.S. Cl. 180-5 R

31 Claims



An endless track motor vehicle, more particularly a snowmobile, in which the engine and the transmission are surrounded by the endless track belt and the resulting assembly movably mounted within the vehicle chassis and suspended by spring and shock-absorbing means. The vehicle is also provided with a specially designed ski and with means to maintain the track bottom run in a curved shape to provide greater ease in steering, especially on a hard surface. The vehicle is much safer to operate than conventional snowmobiles, because the rubber endless track shields the passenger from the engine and associated moving parts, and because the vehicle has a lower center of gravity, effectively separates the gasoline reservoir from the engine and has its engine located behind and below the passengers, whereby the latter are not subjected to toxic exhaust gases. The snowmobile also has greater maneuverability, can be easily converted into a vehicle for summer use and can be easily taken apart for repair and the like.

3,734,222

## INERTIAL ENERGY SYSTEM FOR VEHICLES

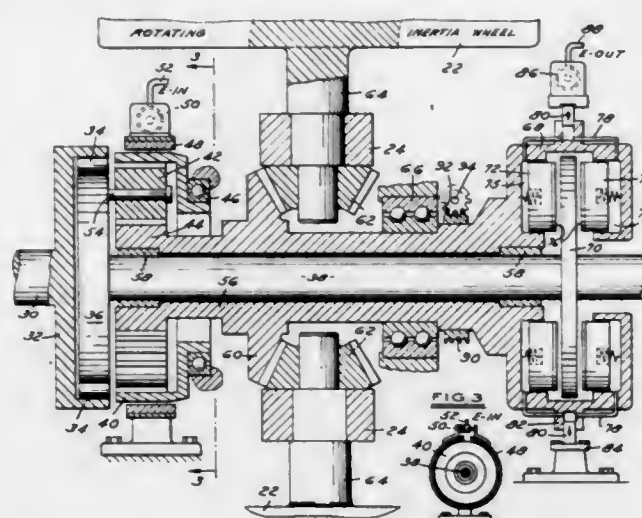
John Bardwick, III, 1733 West Ridge, Ann Arbor, Mich.

Filed Dec. 9, 1970, Ser. No. 96,460

Int. Cl. B60k 9/04

U.S. Cl. 180-54 R

17 Claims



An inertial flywheel system for vehicles which includes clutch means for introducing energy to the flywheel from an engine or from a coasting or decelerating vehicle, and clutch means for transferring the stored energy to the vehicle on demand. A system of control is incorporated in the brake pedal, clutch pedal, accelerator and engine manifold. The control system operates the clutches in a manner which allows stored energy to be utilized to supplement the power plant of the

vehicle and allows the kinetic energy normally lost in braking to be transferred instead to the flywheel. A speed control system transfers the braking function to the normal vehicle brakes when the quantity of stored energy reaches a predetermined maximum.

3,734,223

## VEHICLE FRAME AND INTERCHANGEABLE COMPONENTS

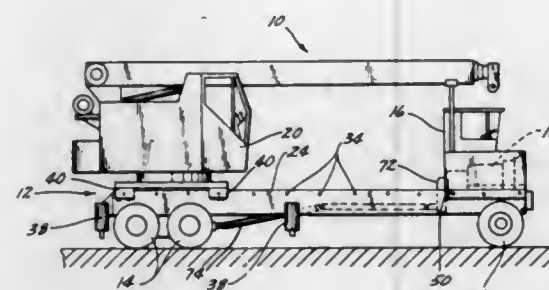
Leonard E. Anderson, Box 31, Roland, Iowa

Filed June 29, 1971, Ser. No. 157,984

Int. Cl. B60k 5/10

U.S. Cl. 180-64 L

4 Claims



The present invention includes an elongated wheel-supported frame having forward and rearward ends. A motor unit is mounted on the frame by means of a bracket which slidably connects the unit to the frame for selective sliding movement forwardly and rearwardly on the frame. Locking pins are provided for locking the motor unit against sliding movement on the frame. Other brackets are slidably mounted on the frame for movably mounting other working components to the frame.

3,734,224

## LOAD HANDLING VEHICLES

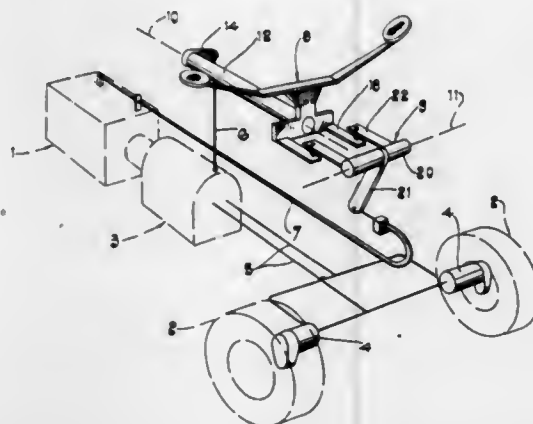
John Warrender Franklin, 14, Daintree Croft, Coventry, England

Filed Mar. 19, 1971, Ser. No. 126,066

Int. Cl. B60k 17/10

U.S. Cl. 180-66 R

7 Claims



In a vehicle, primarily a load handling vehicle such as a fork lift truck, having a prime mover and ground-engaging wheels driven through a variable ration hydraulic transmission, a transmission ratio control is linked with a power output control of the prime mover to provide automatically an increase of the power output of the prime mover when the transmission ratio is varied to accelerate the vehicle. The transmission ratio control is operatively connected with a foot-operated rocker and the latter is linked with the power output control in a manner which provides an adjustable degree of lost motion so that the transmission ratio control is actuated before the power output control.

3,734,225

## HYDROSTATIC DRIVE FOR A MOTORCAR

Walter Kobald, Stuttgart-Feuerbach, and Eckehart Reichel, Gerlingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

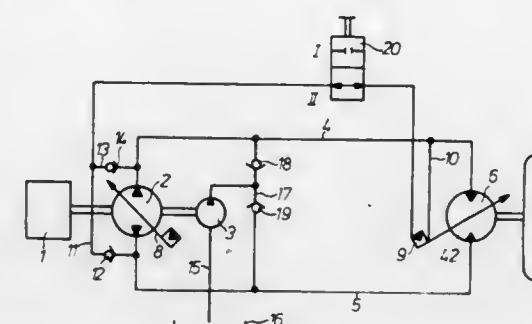
Filed Apr. 5, 1971, Ser. No. 131,152

Claims priority, application Germany, Apr. 4, 1970, P 20 17 771.3

Int. Cl. B60k 17/16

U.S. Cl. 180-66 R

7 Claims



A hydrostatic drive for a motorcar includes a transmission having a driven pump, a hydraulic motor, and first and second conduits connecting the same so that the first conduit has high pressure while the pump is driven by a prime mover, and has low pressure when the car rolls downward on a slope. Pressure responsive means are influenced by the high pressure in the first conduit to adjust the control means of the hydraulic motor, but stop adjustment of the control means when the car rolls, and is braked by the transmission.

3,734,226

## AUXILIARY ELECTRIC MOTOR DRIVE FOR POWER STEERING PUMP

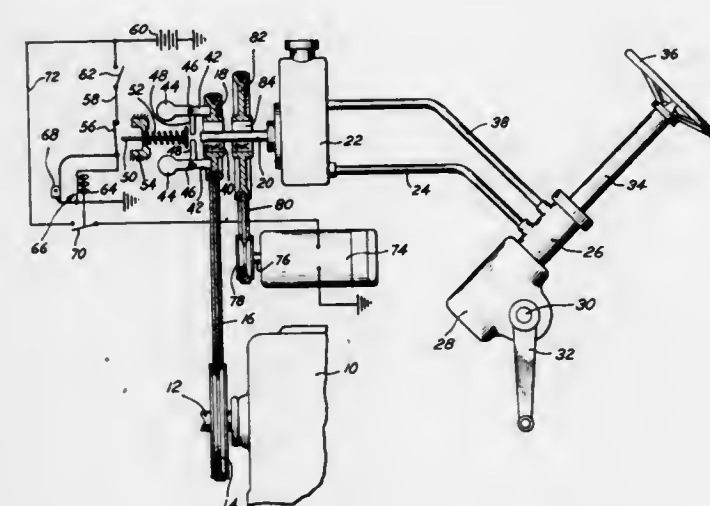
Stanley I. MacDuff, Daytona Beach, Fla., assignor to The Bendix Corporation, South Bend, Ind.

Filed June 25, 1971, Ser. No. 156,720

Int. Cl. B62d 5/06; 180 79.2 R; 60 525; 6

U.S. Cl. 180-79.2 R

5 Claims



In a vehicle having hydraulic power assisted devices such as power steering or a hydraulic power brake booster, an auxiliary pump drive comprising an engine driven belt drive including an over-running clutch connected to the pump, an electric motor driven belt drive including a second over-running clutch connected to the pump, and control means including the vehicle ignition switch and a switch operated by a centrifugal switch operating means mounted on and rotated by the engine driven pump pulley.

3,734,227

## STEERING GEAR OF FOUR-WHEEL TRACTOR

Grigory Tsai, "Kirda", Saima ulitsa Sadovaya, 10, kv. 12; Richard Fedorovich Perikov, "Kirda", Saima ulitsa Sadovaya, 13, kv. 4, both of Yangijul Tashkentskoi oblasti; Mikhail Stepanovich Pak, 4 Mikroralon, 42, kv. 56, Frunze; Saidikarim Sultanov, "Kirda", Saima ulitsa Tsentralnaya, 9, Yangijul Tashkentskoi oblasti; German Ivanovich Grishenkov, "Kirda", Saima ulitsa Samarkandskaya, 72, kv. 9, Yangijul Tashkentskoi oblasti, and Kuchkarali Tulaganovich Shakirov, "Kirda", Saima ulitsa Sadovaya, 7, Yangijul Tashkentskoi oblasti, all of U.S.S.R.

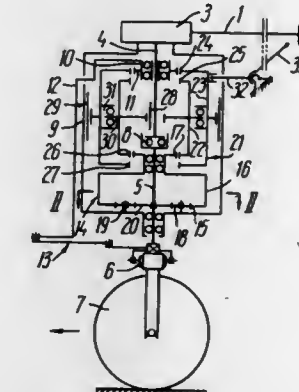
Filed Jan. 13, 1972, Ser. No. 217,520

Claims priority, application U.S.S.R., Jan. 29, 1971, 1613167

Int. Cl. B62d 5/06

U.S. Cl. 180-79.2 R

1 Claim



A steering gear wherein the steering shaft is alternately connected via a hydraulic servo unit and a shift coupling with a steering linkage and with a gear speed reducer installed on a shaft articulated to the front axle of the tractor.

The drive shaft is installed in the housing coaxially with a shaft connected with the front axle. The drive shaft carries a gear rigidly connected with the pitman arm while the other shaft carries a planetary speed reducer with an external gear. The shift coupling consists of two coaxial sleeves provided with gear rims at the end and interconnected for joint axial movement. The inner sleeve is installed on the drive shaft and meshes alternately with said gears while the outer sleeve is connected to the housing with a freedom of axial movement and meshes with said gears for alternate locking of the front axle and steering linkage.

3,734,228

## STEERING MECHANISM FOR A ROAD VEHICLE

Charles Rivoller, 77-Cesson, France, assignor to Societe Anonyme D.B.A.

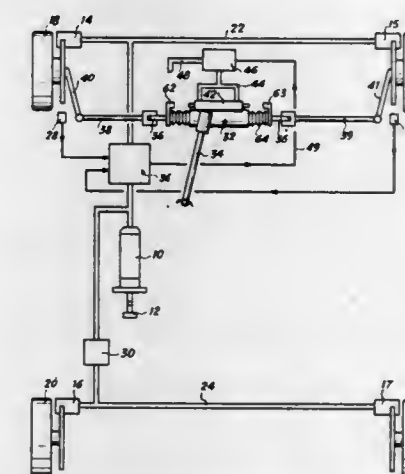
Filed Apr. 5, 1971, Ser. No. 131,199

Claims priority, application France, Apr. 17, 1970, 7013961

Int. Cl. B62d 15/00

U.S. Cl. 180-82 R

4 Claims



Wheel angular displacement limiting device for a road vehicle adapted to normally limit the front vehicle wheel max-



imum angular displacement upon severe braking actuation. Angular displacement limiting means are provided between a movable portion of the steering gear and a relatively fixed portion of the vehicle, and are actuated in function with a predetermined variable condition according to the vehicle braking to counteract a relatively large displacement of said movable portion of the steering gear upon severe braking actuation.

3,734,229

## VEHICLE CONTROL SYSTEM

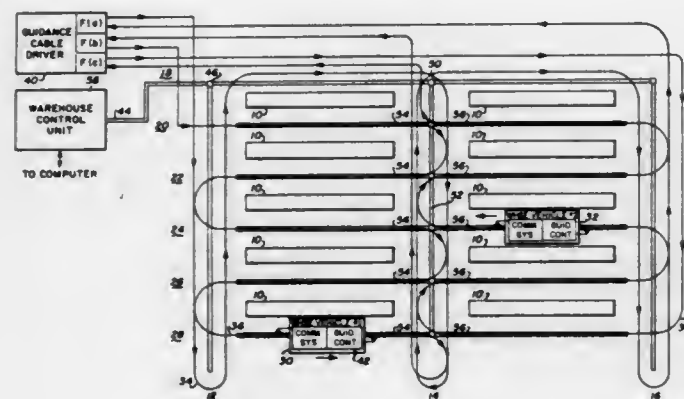
Donald T. Comer, Los Gatos, Calif., assignor to Mobility Systems, Inc., Santa Clara, Calif.

Filed Apr. 11, 1969, Ser. No. 815,467

Int. Cl. B62d 5/04

U.S. Cl. 180-98

4 Claims



A vehicle control system for supplying vehicle control data or other communicative data to a plurality of vehicles which are constrained to transit a predetermined network of travel paths. An array of twin lead conductors are disposed beneath the surface of the travel paths and form a distributed antenna network. Vehicles passing along the transit paths are equipped with transmitting apparatus which uses the antenna network as a communicative medium for providing two way communication between a stationary control unit and the vehicle carried mobile control units. An array of single conductors is also disposed along the travel paths and are energized with a low frequency AC signal for developing magnetic fields which are detected by a vehicle carried guidance control unit for guiding the vehicle along a particular path.

3,734,230

## EMERGENCY STOP SWITCH MEANS FOR A MOBILIZED SLEDGE OR THE LIKE

Yoshiyuki Tanaka, No. 9, 14, 1-chome Sakasagawa, Takarazuka, Japan

Filed Mar. 22, 1971, Ser. No. 126,635

Claims priority, application Japan, Dec. 17, 1970, 45/114378

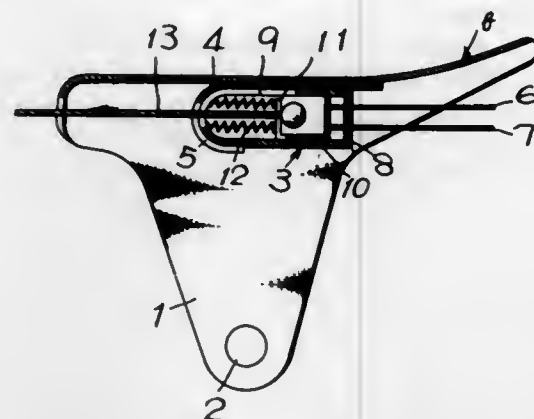
Int. Cl. B60k 27/00

U.S. Cl. 180-99

4 Claims

An emergency stop switch means to be used for a mobilized sledge or the like in which said means includes a throttle lever for operating a carburettor and mounted on a handle portion, said throttle lever being provided with a contact point wherein

it is short-circuited to stop the rotation of an engine in the manner that in an emergency said contact point is closed



merely by releasing said lever thereby to stop the rotation of an engine.

3,734,231

## TRANSPORT MEANS OR VEHICLE, OR A FLUID BED

Robert De Vries, 2 Valeriusstraat, Hague, Netherlands

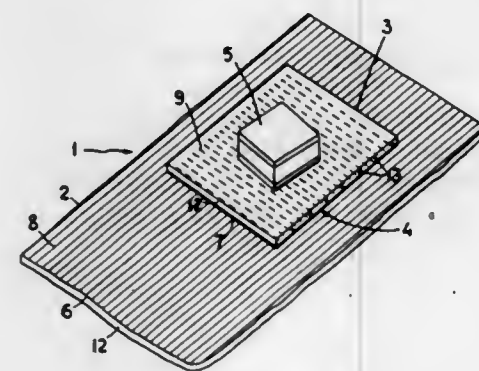
Filed Mar. 10, 1971, Ser. No. 122,873

Claims priority, application Netherlands, Mar. 16, 1970, 7003680

Int. Cl. B60v 1/04; B65g 7/06

U.S. Cl. 180-125

1 Claim



A vehicle comprising a bottom plate adapted to be supported on a gas cushion, said bottom plate having a flat bottom surface and series of grooves therein, the grooves of each series being substantially parallel to each other, and said series extending at an angle to each other, whereby all the grooves are in open connection with each other when a gas cushion is to be formed between said bottom plate and a flat supporting surface under it to facilitate the initial raising of the vehicle.

3,734,232

## APPARATUS FOR SEISMIC WAVE DETECTION

Floyd Shepherd, Jr., Bartlesville, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed Sept. 10, 1970, Ser. No. 70,974

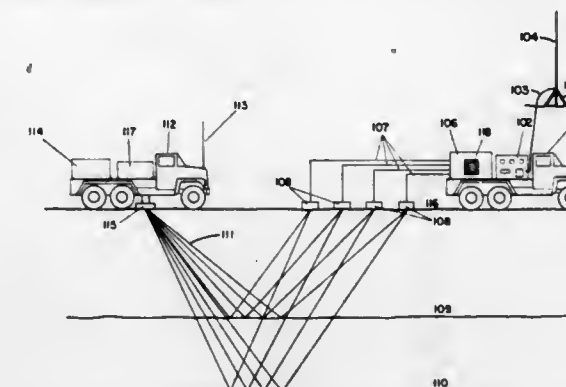
Int. Cl. H01g 1/32; G01v 1/00

U.S. Cl. 181-5 VM

5 Claims

Noise in the continuous transmitting and recording of seismic signals produced by radio frequency and other transmitter interference appearing on the seismic amplifiers is reduced by removing the sending antenna from the recording vehicle, such that the antenna is placed a predetermined distance from the recording vehicle. This improvement upon

the transmitting-receiving apparatus reduces the noise interference to an insignificant level and allows exact recordation



of seismic data in continuous transmitting and receiving equipment.

3,734,233

## SONIC LOGGING APPARATUS

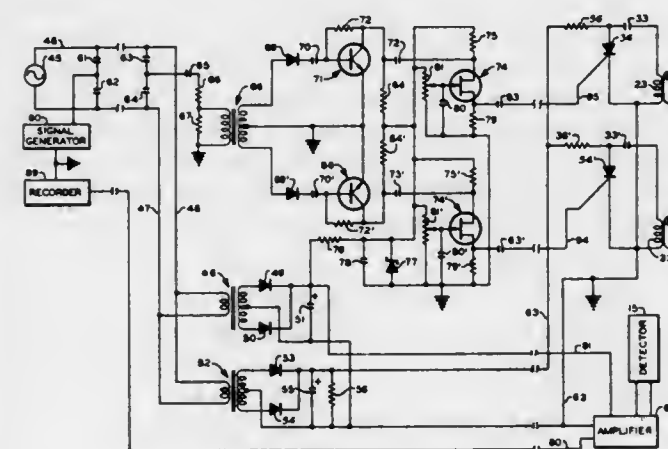
Bruce F. Wiley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 1, 1969, Ser. No. 862,849

Int. Cl. G01v 1/40

U.S. Cl. 181-5 AG

5 Claims



Acoustical logging apparatus having two signal generators and a receiver carried by an elongated housing in spaced relationship. The generators comprise coils mounted on magnetostrictive members. The connecting leads are disposed outside the coils to avoid stray signals being induced.

3,734,234

## SOUND ABSORPTION STRUCTURE

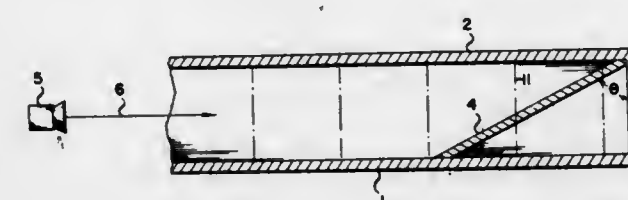
Leslie S. Wirt, Newhall, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Nov. 8, 1971, Ser. No. 196,616

Int. Cl. E04b 1/82

U.S. Cl. 181-33 G

43 Claims



A sound absorbing structure, generally comprising a honeycomb-like cellular layer, an impermeable backing closing one end of the cells, a permeable facing covering the other

end of the cells, and oblique porous or permeable partitions having a specified flow resistance in each cell, for providing controlled acoustic absorption over a wide range of frequencies and having a minimum ability to wick and retain liquids. The operation of the structure is relatively independent of the materials from which it is made, and may for example be fabricated entirely from metal. It is particularly suitable for sound attenuation in jet engines and other adverse environmental conditions requiring sound absorptive panels, baffles, duct liners, and duct splitters.

3,734,235

## COLLAPSIBLE SAWHORSE

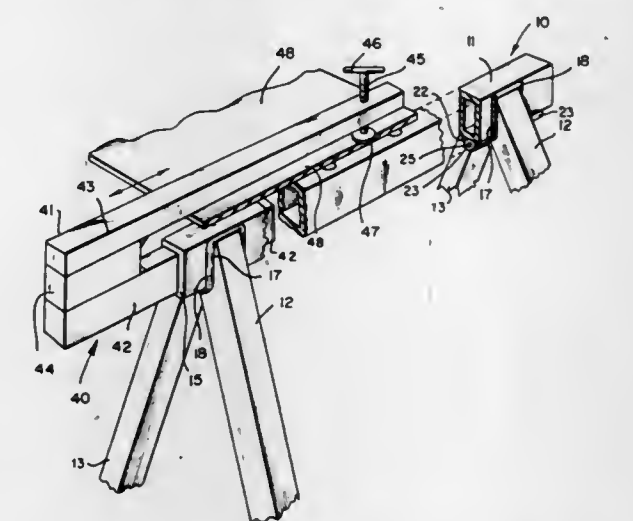
John E. Lanier, Miami Beach, Fla., assignor to Lanier Enterprises, Inc., Cocoa, Fla.

Filed Apr. 16, 1971, Ser. No. 134,807

Int. Cl. B25h 1/06, 1/08

U.S. Cl. 182-153

13 Claims



An elongate beam having a pair of generally parallel legs extending transversely from opposite beam ends, and an additional pair of legs each hinged to the beam adjacent one end thereof for swinging movement between collapsed and set-up positions.

3,734,236

## ADJUSTABLE LADDER PLATFORM

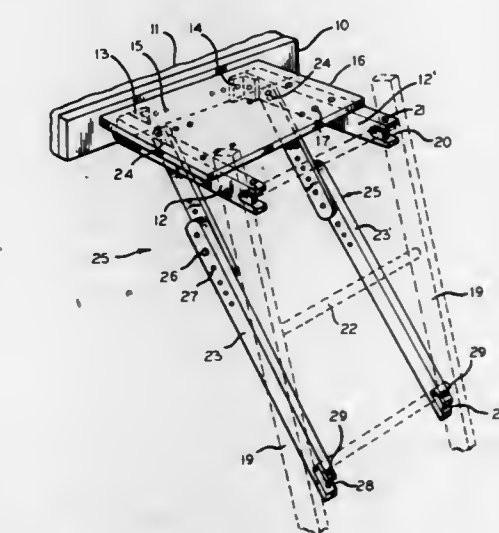
Gerald Houtler, 9708 W. Thurston Avenue, Milwaukee, Wis.

Filed Dec. 16, 1971, Ser. No. 208,592

Int. Cl. E06c 7/16

U.S. Cl. 182-121

5 Claims



A stand off platform is attached to the top of a ladder to hold it away from an adjacent wall. The platform supports tools, paint cans, and the like. A suitable cushion on the edge of the platform keeps it from marring the wall.



### 3,734,237 LADDER

Charles I. Howard, Mercer Island, Wash., assignor to Howard Manufacturing Company, Kent, Wash.

Filed Mar. 16, 1971, Ser. No. 124,773

Int. Cl. E06c 1/08, 7/08

U.S. Cl. 182-216

11 Claims



Disclosed is a strong, lightweight, electrically nonconductive ladder having two slotted wood side rails spanned by tubular metal rungs. Each rail comprises two parallel wood slats oriented perpendicular to the plane of the ladder and spaced apart in the plane to the ladder by spaced, thin, rectangular wood chocks adhesively bonded in face to face relation to the slats. Tensioned tie rods extending through the rungs compressively hold the rungs socketed anti-rotationally in and between the side rails in an integral structure resistant to racking, bending or torsional strain.

### 3,734,238

#### ELEVATOR INSTALLATION WITH SEALED PASSENGER PASSAGEWAY

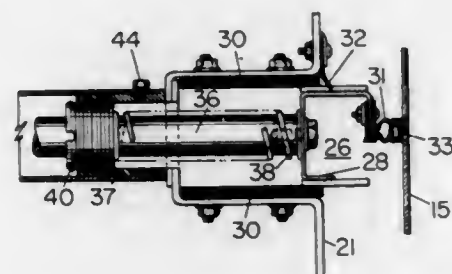
Anthony Vincent Secresty, Parma, and Edward Benedict Grabowski, North Olmstead, both of Ohio, assignors to Otis Elevator Company, New York, N.Y.

Filed Aug. 16, 1971, Ser. No. 172,104

Int. Cl. B66b 9/00

U.S. Cl. 187-1

8 Claims



An elevator installation in which the passenger passageway between the car and a building landing is effectively sealed on both sides and the top and bottom against the entrance of wind and precipitation if subject to any. The seals for the top and bottom are retractable and include magnetized gaskets. Those for the sides are non-retractable and include baffles which present tortuous paths to the passage of wind and precipitation, if any.

### 3,734,239 SELF STORING VEHICLE LOADING PLATFORM

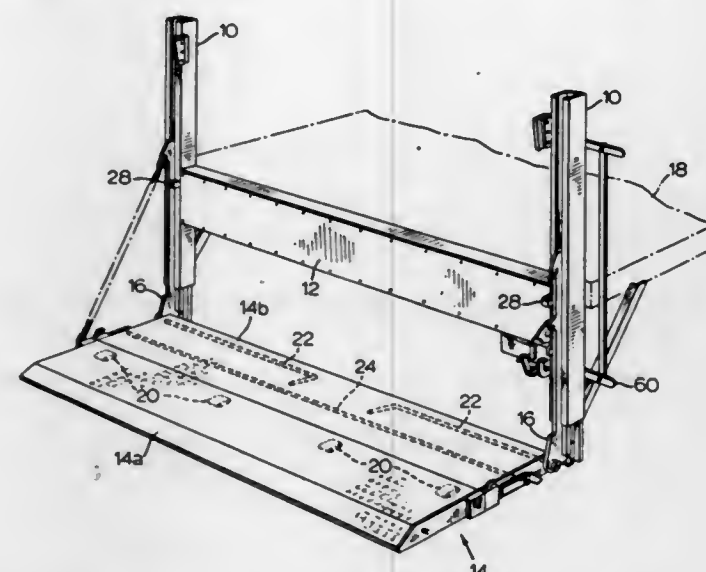
Paul H. Martin, Toronto, Ontario, and William C. McKee, Willowdale, Ontario, both of Canada, assignors to Diesel Equipment Limited, Leaside, Ontario, Canada

Filed Dec. 1, 1971, Ser. No. 203,787

Int. Cl. B60p 1/44

U.S. Cl. 187-9

8 Claims



A powered tailgate for a vehicle, the tailgate being of the type that can be raised and lowered when it is in either a horizontal plane or a vertical plane and being formed of two parts connected together along a horizontal hinge line so that the two parts may be folded together for compact storage when the tailgate is not required. It includes several locking devices for bracing the tailgate when the two parts are in alignment, and for holding the two parts together and tight against the vehicle when the tailgate is in the folded condition.

### 3,734,240

#### SAFETY LOCK FOR PORTABLE LIFT MECHANISM

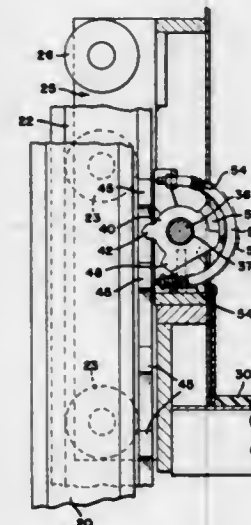
Alexander Reuben Tang, Mervue, Galway, Ireland, assignor to Crown Controls Limited, New Bremen, Ohio

Filed Apr. 13, 1972, Ser. No. 243,775

Int. Cl. B66b 5/16

U.S. Cl. 187-89

3 Claims



A portable lift truck has a vertically movable load receiving carriage which is driven up and down by a power drive mechanism, such as a hydraulic cylinder and chains connecting a cylinder to the lift carriage. In the event of a malfunction of the lift mechanism, such as due to chain breakage or a major hydraulic failure, the lift mechanism is prevented from

free falling beyond a predetermined speed. Equally spaced stop lugs on the mast are engaged by an arm on a rotatable stop member which is spring loaded to dump rotation of the stop member when the arm engages the stop lugs. If the relative speed between the stop lugs and the rotatable member substantially exceeds the maximum rate of movement obtainable from the drive mechanism, the spring damping will not react fast enough to prevent an interference lug on the rotatable stop member from jamming into the path of one of the stop lugs, thus locking the lift mechanism against further movement before it achieves any excessive speed.

### 3,734,241 DRIVE ON NO SLIP BLOCK

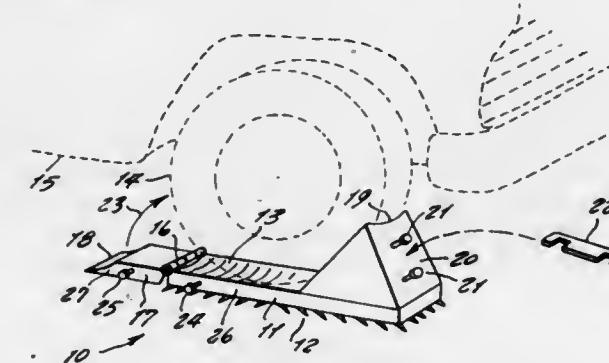
Chester A. Hale, Yucaipa, Calif.

Filed Aug. 30, 1971, Ser. No. 176,183

Int. Cl. B60t 3/00

U.S. Cl. 188-32

1 Claim



A chock for an automobile wheel so to prevent the vehicle from rolling, the device consisting of an elongated plate the under side of which have teeth for firmly holding against the ground, the upper side of the plate having a concave channel upon which the wheel rolls, one end of the plate being connected by a hinge to a gang plank block, the opposite end of the plate having a stop block mounted there upon and against which the automobile wheel abuts after which the gang plank block is upwardly pivoted against the wheel and secured by a brace to prevent the wheel from rolling off again.

### 3,734,242

#### ANNULAR, ANTIPODAL, RELATIVELY-SEPARABLE BRAKE

Hermann Klaue, Tour D'Ivoire 24e, Montreux, Switzerland

Filed Apr. 15, 1971, Ser. No. 134,270

Claims priority, application Germany, Apr. 18, 1970, P 20 18 928.4; July 28, 1970, P 20 37 273.0; Sept. 7, 1970, P 20 44 241.5; Sept. 7, 1970, P 20 44 240.4; Oct. 8, 1970, P 20 49 459.1

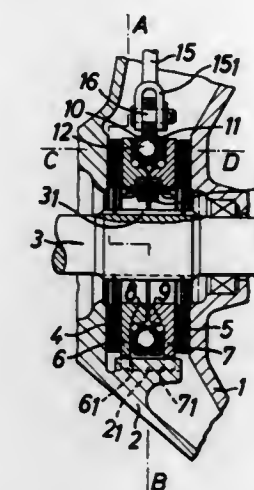
Int. Cl. F16d 55/04

U.S. Cl. 188-71.4

9 Claims

A brake assembly comprising brake plates, each having a brake lining of friction material at least on one side thereof, and each adapted for mounting on a shaft or axle to be braked so as to be rotatable jointly with said shaft or axle and movable towards or away from one another, brake operating rings disposed between the brake plates and mounted so as to be movable towards or away from one another and a ball or roller and ramp mechanism disposed between the brake rings said mechanism being operable to cause movement of the brake rings in directions opposite to one another so that each brake ring contacts an adjacent brake plate and moves the same in a

direction towards an adjacent stationary member and bring the brake lining of each said brake plate into contact with a



braking surface of the stationary member to effect a brake operation.

### 3,734,243

#### COMPOSITE CALIPER FOR A DISC BRAKE

Jean-Claude Giraudon, Ponthierry, France, assignor to Societe Anonyme D.B.A.

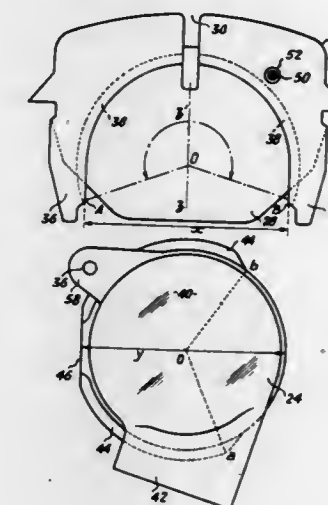
Filed Mar. 18, 1971, Ser. No. 125,654

Claims priority, application France, Mar. 25, 1970, 7010686

Int. Cl. F16d 65/32

U.S. Cl. 188-72.4

5 Claims



A disc brake for an automotive vehicle in which a two-piece caliper assembly is used. The first piece is the caliper body including the bridge portion that straddles the disc and is secured to a pair of arms that extend outwardly from the bridge portion, thereby forming a U-shaped member presenting an open-end between the arms. The second piece is a brake actuator including piston means slidable in a cylinder having circular lugs that are received in circular grooves formed in the arms.

### 3,734,244

#### ROLLER SKATE BRAKE FOR BEGINNERS

Robert L. Roddy, Route 3, Box 922, Boring, Oreg.

Filed Aug. 9, 1971, Ser. No. 170,237

Int. Cl. F16d 63/00

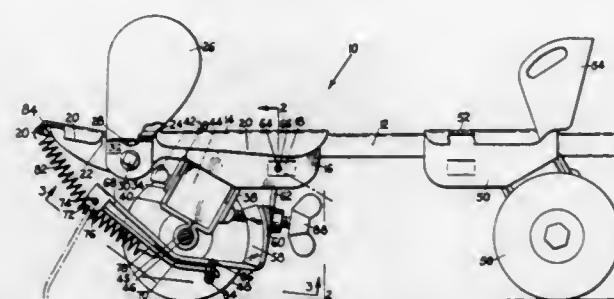
U.S. Cl. 188-83

1 Claim

A roller skate brake controlling the free running speed of the skates to assist beginners in obtaining balance and agility on the skates. For this purpose, friction brake pads are



secured on a body member pivotally attached at one of its ends to the roller skate wheel supporting frame. The body member has a releasable lever connected to one end of a tension spring. The other end of the spring is connected to the skate frame, and such spring is arranged to urge the friction brake pads toward a braking engagement with the wheels. An adjusting screw is mounted in the body member and has en-



gagement at one end with a skate portion for varying the extent of application of the brakes. The extent of braking to be applied to the wheels is pre-set by the beginner for the purpose of controlling the free running speed as desired. A plurality of spring connecting holes are provided in the lever to adjust the operating strength of the spring. In a modified form of the invention, the spring having the adjustment is connected directly to the body member.

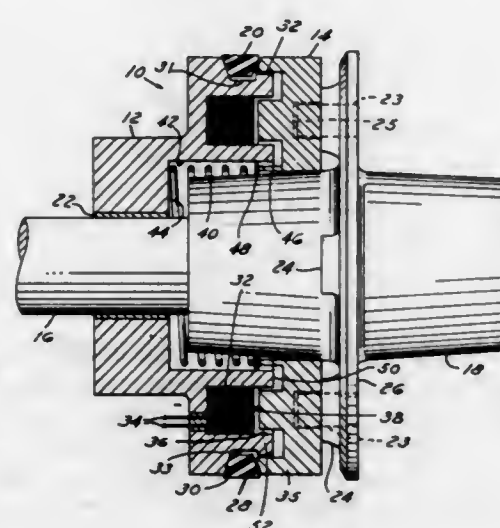
### 3,734,245 ELECTRIC BRAKE

Harold C. Hubbard, Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Oct. 1, 1971, Ser. No. 185,664  
Int. Cl. F16d 65/34

U.S. Cl. 188—163

11 Claims



A vehicle electric brake with stationary and axially moveable cores providing a V-shape annular recess receiving an endless belt providing a friction liner releasably urged into firm frictional engagement with the cores by an electromagnet mounted in the stationary core. The moveable core is mounted on a wheel hub for rotation therewith and axial movement with respect to the fixed core to engage the belt between the cores and thereby restrain rotation of a wheel on the hub to stop the vehicle.

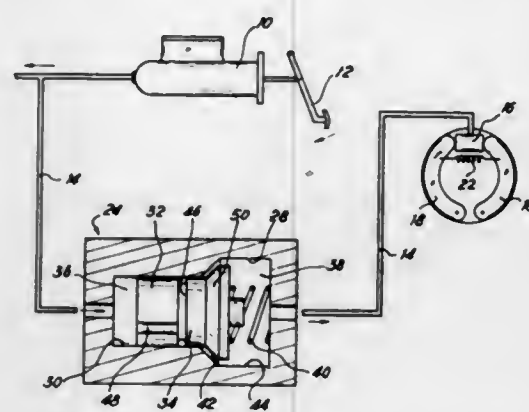
### 3,734,246 HYDRAULIC BRAKE AUTOMATIC ADJUSTER

Pierre Montjourides, Saint-Maur, France, assignor to The Bendix Corporation, South Bend, Ind.

Filed June 23, 1971, Ser. No. 155,962  
Claims priority, application France, June 25, 1970, 7023565

Int. Cl. F16d 65/74  
U.S. Cl. 188—196 A

2 Claims



This invention relates to a hydraulic brake automatic adjuster adapted to provide the proper clearance in released position between rotatable and nonrotatable braking surfaces, and particularly to keep to a substantially predetermined value the volume of braking liquid necessary to operate at least one brake actuator whatever the wear of the friction element connected thereto.

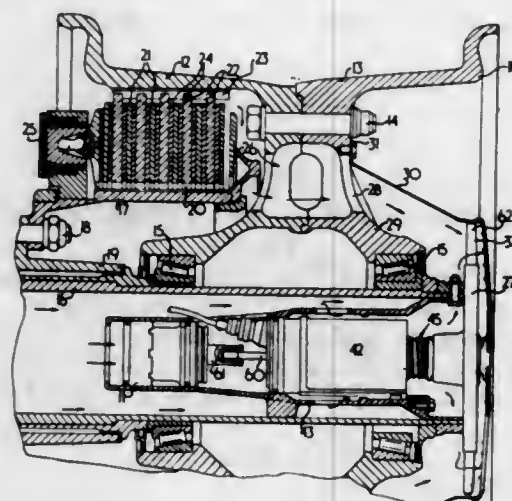
### 3,734,247 AIR COOLED BRAKE ASSEMBLY

Stanley G. Buckley, Erdington, Birmingham 24, England, assignor to Dunlop Holdings Limited, London, England

Filed Nov. 19, 1971, Ser. No. 200,351  
Claims priority, application Great Britain, Nov. 25, 1970, 56,002/70

Int. Cl. F16d 65/78  
U.S. Cl. 188—264 A

11 Claims



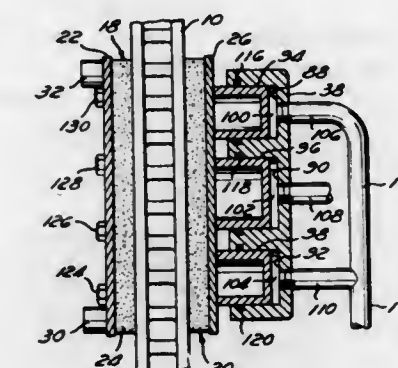
A wheel brake assembly comprising a wheel detachably mounted on an axle, a brake assembly disposed between the wheel rim and the axle, and an air impeller carried by and rotatably supported or a support member carried by the wheel, the arrangement being such that when the wheel and support member are assembled on the axle the impeller is rotatably drivable through a friction drive mechanism to pass a current of air through the brake assembly. Of which the following is a specification.

### 3,734,248 FLOATING CALIPER ASSEMBLY FOR DISTRIBUTION OF BRAKE SHOE THRUST IN DUAL HYDRAULIC BRAKE SYSTEM

Clarence C. Fay, 17211 Edgewater Drive, Lakewood, Ohio  
Filed Dec. 1, 1971, Ser. No. 203,696

Int. Cl. B60t 11/20  
U.S. Cl. 188—345

4 Claims



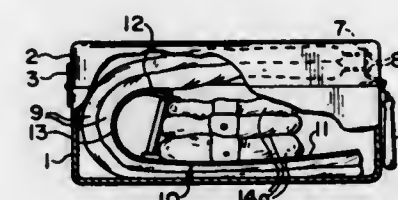
There is provided an improved floating caliper assembly for disc brakes which is especially adapted for use in dual hydraulic brake systems having first and second independent hydraulic subsystems, and which assembly is characterized by a stationary adaptor including guide means, a floating caliper mounted on the guide means, the caliper including a housing portion having at least three isolated cylindrical bores open at one end and disposed on parallel axes and a disc-spanning arm portion having a free distal extremity. A piston is mounted in each of the cylindrical bores and defines an internal variable volume hydraulic fluid chamber with the housing. The outer ends of the pistons extend beyond the housing. A first disc brake shoe is provided for coaction with one side of a disc and mounted on the free extremity of the disc-spanning arm. A second disc brake shoe is positioned for coaction with the opposite side of the disc and guided by the guide means for abutting coaction with the outer faces of the pistons. Introduction of fluid into the variable volume hydraulic fluid chambers causes the brake shoes to move in opposition to each other and clasp the disc therebetween for braking action. Means are provided for introducing fluid from separate hydraulic subsystems into the variable volume chambers in such a way that in the event only one subsystem is operative, the distribution of thrust through the caliper assembly is uniform.

### 3,734,249 SUITCASE DIVIDER

Ted Wilt, 1410 Hinman Avenue, Evanston, Ill.  
Filed Sept. 3, 1971, Ser. No. 177,556

Int. Cl. A45c 5/12  
U.S. Cl. 190—41 B

5 Claims



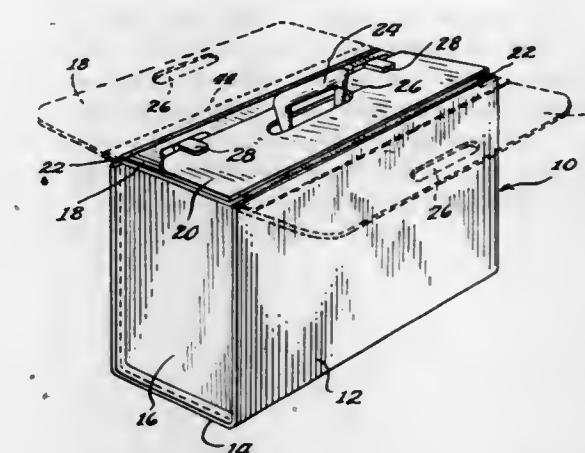
A divider for a suitcase for preventing suits and other normally hanging garments from becoming wrinkled comprises a U-shaped flexible wall member which establishes a gentle fold for the garments when the suitcase is closed. The base portion of this member contains offset apertures which frictionally engage the garments to prevent their sliding out of position during transit, and the roundness of the apex portion is controlled by a directing strut to assure the effectiveness of the divider regardless of the degree of loading of the suitcase.

### 3,734,250 CARRYING CASE WITH FREELY HINGED CLOSURE

Mandel A. Doppelt, 7218 Kedvale Avenue, Lincolnwood, Ill.  
Filed May 17, 1971, Ser. No. 144,010

Int. Cl. A45c 3/00  
U.S. Cl. 190—48

6 Claims



A carrying case with a freely hinged closure or flap wherein the hinge member which connects the closure flap to the side wall of the carrying case is formed of a strip or strips of flexible material with a longitudinal member, preferably circular in cross-section, longitudinally secured to the strip intermediate the opposite longitudinal edges of the strip wherein the strip forms a pair of hinge segments, with the longitudinal member forming a hinge line, with one segment connected to the side of the case and the other segment connected to the flap to provide a hinge member whereby the closure flap or flaps may be positioned in open position outwardly of the open end of the bag so as not to interfere with the opening and provide a maximum open surface for access into the interior of the bag. The longitudinal member may be rigid or may be flexible.

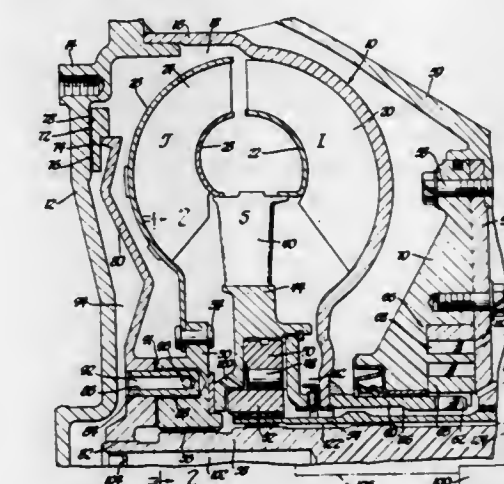
### 3,734,251 HYDRODYNAMIC UNIT WITH MECHANICAL DRIVE CLUTCH

Robert E. Annis, Howell, and Forrest R. Cheek, Detroit, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 18, 1971, Ser. No. 200,007  
Int. Cl. F16d 39/00

U.S. Cl. 192—3.3

5 Claims



This hydrodynamic unit has a friction clutch that is selectively engageable to establish a mechanical power path through the unit to improve power transmission efficiency under predetermined operating conditions. A clutch control chamber is automatically hydraulically connected to the torus chamber of the unit by special valve means to reduce clutch capacity to a point where the clutch does not transmit ap-



preciable torque in response to the transition from an engine drive condition to an overrun condition. With clutch capacity so reduced the backlash in the drive unit is effectively dissipated by the fluid in the unit and is not transmitted mechanically to the engine.

3,734,252

# IMPROVEMENTS IN AND RELATING TO FORWARD/REVERSE GEAR TRANSMISSIONS

Karl Gustav Ahlen, Stockholm, Sweden, assignor to S.R.M. Hydromekanik AB, Stockholm, Vallingby, Sweden

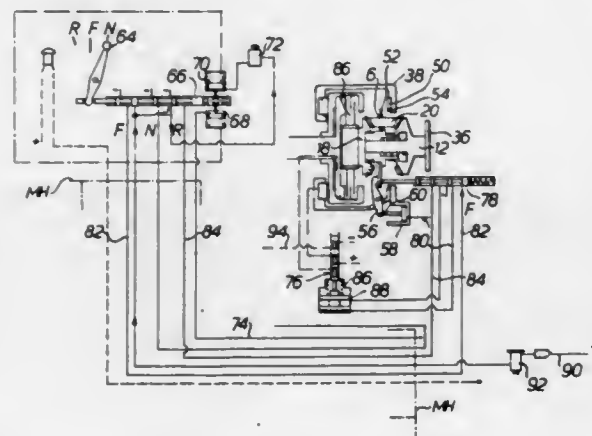
Filed May 10, 1971, Ser. No. 141,633

Claims priority, application Great Britain, Jan. 27, 1971, 52,632/71; Italy, Oct. 27, 1970, 7059 A/70

Int. Cl. B60k 21/00

U.S. Cl. 192—3.52

16 Claims



A forward/reverse gear transmission of the planet gear type including input and output members and a planet gear carrier and constructed to provide forward, reverse and release operation. The gear comprises a first, second and third coupling of which the first serves to connect and disconnect the input member and a driving source, the second serves to connect and disconnect the input and output members and the third clutch serves to selectively hold the planet gear carrier against rotation. The gear also includes a control means for allowing engagement of the first coupling only when the second clutch effects drive between the input and output members or when the third coupling holds the planet gear against rotation. Moreover, the gear includes means for controlling engagement of said second and third couplings so that only one of said couplings is engaged at any one time.

3,734,253

# OVERLOAD APPLIED NO-BACK BRAKES

Piero Derossi, 55 Corso Giovanni Lanza, Torino, Italy

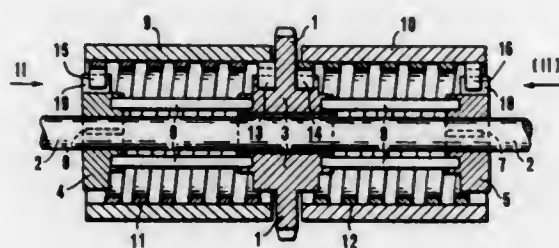
Filed Feb. 17, 1971, Ser. No. 116,022

Claims priority, application Italy, Mar. 7, 1970, 67774 A/70

Int. Cl. B60t 7/12

U.S. Cl. 192—8 C

7 Claims



A device intended for transmitting from a driving shaft to a driven member, in a bi-directional and non-reversible way, a limited torque, wherein said driven member, rotatably mounted on the driving shaft, is braked at rest by a bi-directional logarithmic brake, suppression means provide for

suppressing the braking action upon rotation of the driving shaft, a torsion balance is provided for transmitting a torque under angular displacement from the driving shaft to the driven member, and reinstatement means reinstate said braking action when said angular displacement overcomes a pre-determined limit angle.

3,734,254

# STEPPING MOTOR WITH AUTOMATIC BRAKE

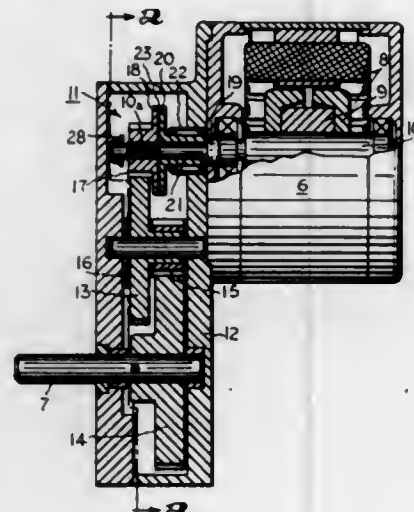
Florian F. Yanikoshi, Braintree, Mass., assignor to Sigma Instruments, Inc., South Braintree, Mass.

Filed Dec. 10, 1971, Ser. No. 206,626

Int. Cl. B60t 7/12; F16d 67/02

U.S. Cl. 192—16

1 Claim



A motorized drive which will reliably turn a loaded output shaft in one direction and mechanically brake the shaft against all but intended reverse rotations includes an electromagnetic stepping motor having a threaded armature shaft carrying a pair of clutch discs, one of which is geared with the output shaft and is threadably separable from and unitable with the other on the armature shaft, and a one-way brake of the over-running clutch type which unidirectionally holds the other brake disc in relation to the motor stator or frame structure.

3,734,255

# FRICTION COUPLING, PARTICULARLY FOR THE COLLECTING REEL OF A CINEMATOGRAPHIC PROJECTOR OF THE LIKE

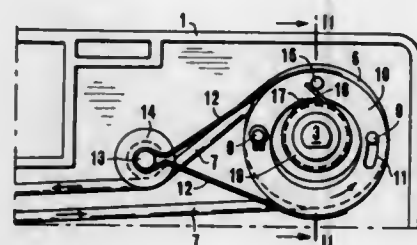
Enrico Ferraris, Turin, Italy, assignor to Officine Precisioni Luserna S.p.A., Turin, Italy

Filed Sept. 10, 1971, Ser. No. 179,489

Int. Cl. F16d 7/02, 41/20

U.S. Cl. 192—36

6 Claims



An automatic friction coupling to be mounted between a driving member and a driven member, particularly the collecting reel of a cinematographic projector, wherein a slightly braked ring connected to the driving member is oscillable between two limit positions and carries an entrainment member suitable to engage in one of said limit positions, and to disengage in the other of said limit positions of the ring, with a tang of a resilient wire wound onto a shaft connected to

the driven member, thus entraining the driven member with a limited torque, in one direction of rotation, while leaving free said driven member in the opposite direction of rotation.

3,734,256

# TORQUE TRANSMITTING DEVICE

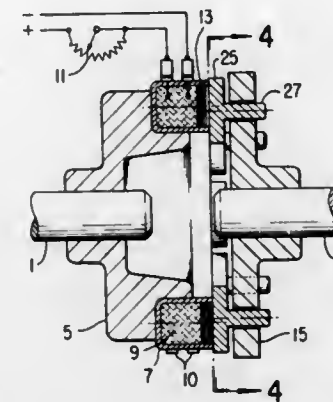
William H. Compton, and John B. Desch, both of Brecksville, Ohio, assignors to Comptrol Incorporated, Cleveland, Ohio

Filed Dec. 6, 1971, Ser. No. 204,884

Int. Cl. F16d 27/07

U.S. Cl. 192—84 A

13 Claims



A magnetic friction device for transmitting torque from one to the other of spaced apart, relatively rotatable, axially aligned members. One of the members carries a circular band of friction material concentric with the axis of rotation of the member. Cooperating therewith, carried by the other member, are a plurality of axially movable segments or planets, each having a flat face adapted to engage the face of the circular band of friction material. Additionally, the planets may be rotatably journaled in said other member and so disposed relative to the band of friction material that engagement therewith and relative rotation of the members causes each planet to rotate about its axis. Each planet is axially moved into engagement with the band of friction material by a controllable magnetic force applied to all of the planets to thereby transmit torque from one member to the other.

3,734,257

# METHOD AND APPARATUS FOR TORQUE SHARING

Peter De Hertel Eastcott; William Albert Messervy, and William Albert Wyeth, all of Peterborough, Ontario, Canada, assignors to Canadian General Electric Company Limited, Toronto, Ontario, Canada

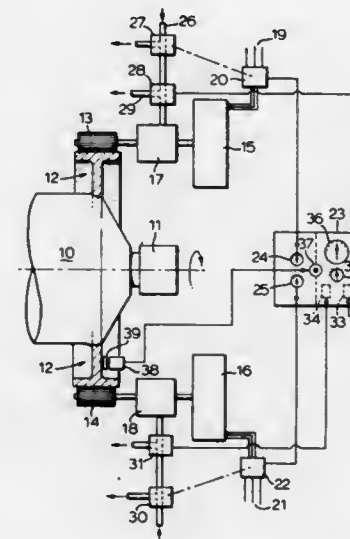
Filed June 14, 1971, Ser. No. 152,617

Claims priority, application Canada, Oct. 2, 1970, 094619

Int. Cl. F16d 25/10

U.S. Cl. 192—87.13

11 Claims



A preferred embodiment of the invention has two like synchronous motors coupled to drive a common load, each

motor through an air actuated friction clutch. In starting the drive, the motors are first brought up to synchronous speed unloaded, and the clutches are then engaged by applying pressurized air to them at a rate controlled to load the motors as equally as possible. Once the drive is in operation, the pressure of the air in both clutches is relieved simultaneously for a very short duration of time depending on the motor loads, the clutch for the more heavily loaded motor for the longer time and the clutch for the more lightly loaded motor for the shorter time. This allows both clutches to slip for short times in which the clutch for the more heavily loaded motor slips a little longer than the clutch for the more lightly loaded motor. As a result, load is transferred from the more heavily loaded motor to the more lightly loaded motor. If necessary, the pressure relieving cycle is repeated a number of times until the motors share the load.

3,734,258

# COUPLING WITH QUICK RELEASE VALVE

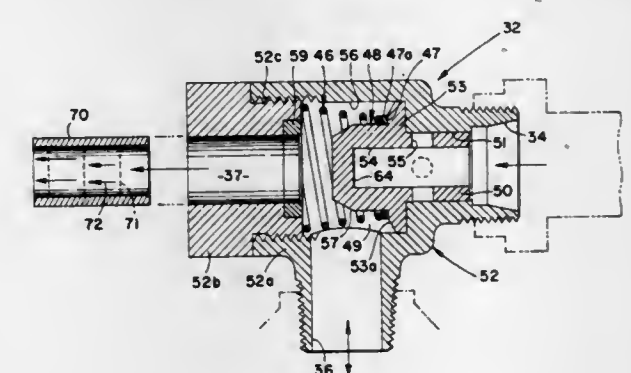
Elwood L. Roob, Parma, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 24, 1971, Ser. No. 127,691

Int. Cl. F16d 25/04

U.S. Cl. 192—88 B

6 Claims



A drive for transmitting torque from a driving to a driven member includes an inflatable member which is adapted to connect the driving and driven members when inflated by a fluid under pressure. The drive includes a valve assembly having an inlet connected to a fluid supply, a first outlet in communication with the inflatable member and a second outlet for venting the inflatable member. The valve assembly has a movable one-piece valve member which has a first position for restricting fluid flow between the inlet and the first and second outlets while providing for fluid communication between the first and second outlets. When fluid is supplied under pressure to the inlet, the valve member has a surface area against which the fluid acts to move the valve member from the first position to a second position. In the second position, the valve member restricts fluid flow between the first and second outlets while providing for fluid communication between the inlet and the first outlet which effects inflation of the inflatable member, resulting in the driving and driven members being drivingly connected thereby. A muffler may be utilized in connection with the second outlet to control the level of noise associated with the operation of the valve.

3,734,259

# LIQUID COOLED CLUTCHES

Herbert Edward Ashfield, Meltham, England, assignor to David Brown Tractors Limited, Huddersfield, England

Filed July 2, 1971, Ser. No. 159,305

Claims priority, application Great Britain, July 10, 1970, 33,566/70; Feb. 15, 1971, 4,685/71

Int. Cl. F16d 13/72

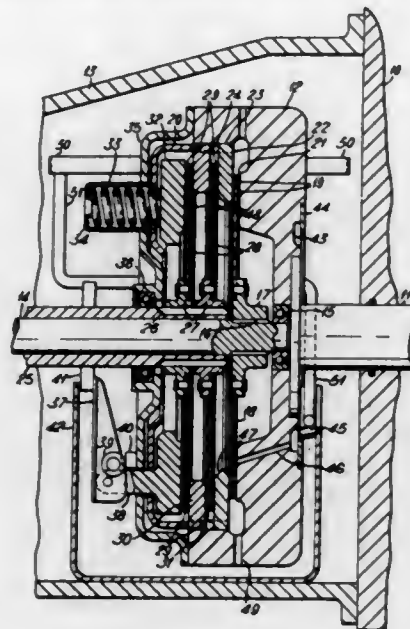
U.S. Cl. 192—113 B

18 Claims

An engine/clutch combination has an engine driven flywheel on which is mounted a clutch mechanism for disen-



gagably connecting the flywheel to a shaft. A clutch housing, the lower portion of which forms a sump containing oil, envelops the flywheel and clutch mechanism and has a trough within it forming a well which accommodates the lower portions of said flywheel and clutch mechanism. An aperture is formed in the trough for allowing oil to flow from the sump to



an annular groove formed in that face of the flywheel remote from the clutch, from which it flows via a passage in the flywheel remote from the clutch, mechanism and thence to the trough. The oil is flung out of the trough by the rotation of the flywheel and clutch mechanism, collected by a gutter in the upper part of the clutch housing and made available for recirculation.

3,734,260

# STRIP METAL DIMENSION SENSING DEVICE FOR METAL WORKING MACHINES

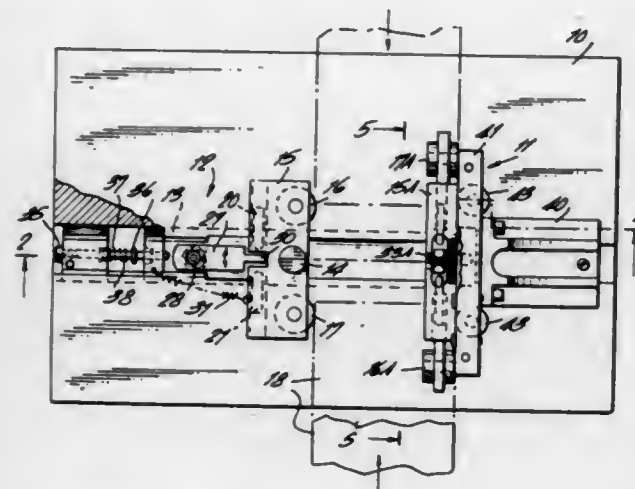
Herbert Kroeck, 90 B Dale Street, West Babylon, N.Y.

Filed Nov. 15, 1971, Ser. No. 198,683

Int. Cl. F16d 71/00; B65h 25/14

U.S. Cl. 192—127

9 Claims



A device for sensing the dimensions of a metal strip as it is fed into a metal working machine such as a punch press and thereby controlling the press to prevent damage. Two sensing blocks, one for thickness and one for width, are pivotally mounted on a settable slide and include two rollers which make mechanical contact with the metal strip as it is fed through the device. If the strip is wider or thicker than the set dimensions, the block is rocked through an angle. By gear means, the angle is multiplied and applied to a contact means which closes an electric circuit and stops the metal working machine.

# NOTE ACCEPTOR CONTROLLED TICKET DISPENSER

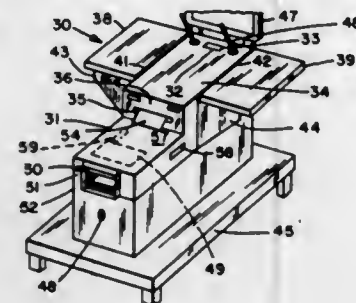
Donald R. Richer, Manchester, N.H., assignor to Granite State Machine Company, Inc., Manchester, N.H.

Filed Jan. 21, 1971, Ser. No. 108,431

Int. Cl. G07b 5/02

U.S. Cl. 194—4 F

10 Claims



An automatic ticket dispenser, especially for the sale of lottery tickets, includes a continuous web of tickets, drive track perforated on one side edge only, and advanced one ticket length beyond a cutting station within a locked cabinet, with each insertion of an acceptable paper note by an automatic note acceptor. The control circuit causes a pivoted knife to cut off each individual and successive ticket at the cutting station for gravity fall down a chute and out of a dispensing slot. A spring biased tension bar assures a clean shear and endless chain friction pads prevent ticket drag. Hold down clamps oppose lift-off effect of the upward moving knife.

3,734,262

# TYPEBAR GUIDE AND REPULSER DEVICE

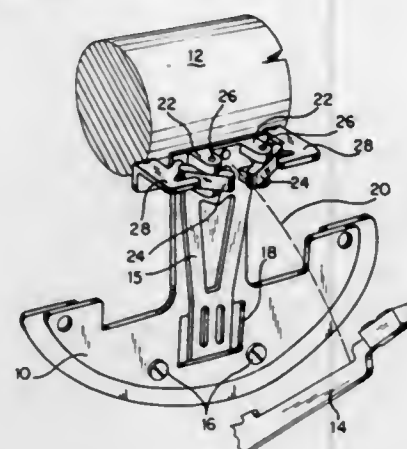
Peter A. Doll, Dryden; Samuel D. Cappotto, Syracuse; Herrick R. Diamond, and Ernest F. Lohr, both of Homer, all of N.Y., assignors to SCM Corporation, New York, N.Y.

Filed May 5, 1971, Ser. No. 140,419

Int. Cl. B41j 25/22

U.S. Cl. 197—43

8 Claims



A typebar guide and repulser device is disclosed comprising a cantilevered leaf spring and two spaced guide dogs having opposing surfaces mounted adjacent the cantilevered leaf spring. Means are also disclosed for converging the two opposing guide dog surfaces towards one another upon depression of the cantilevered leaf spring.

3,734,263

# REVOLVABLE STATION FOR PROCESSING A MOVABLE PROCESSION OF FACTORY-WORK PIECES SUCH AS ANIMAL CARCASSES

Arthur A. Dirks, 5357 North 47th Street, Omaha, Nebr.

Filed July 2, 1971, Ser. No. 159,209

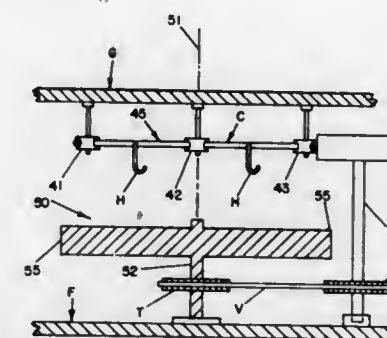
Int. Cl. B23q 7/02

U.S. Cl. 198—19

14 Claims

There is provided novel revoluble processing stations adapted for use within assembly-line type factory installations

wherein a procession of factory-work pieces, such as animal carcasses, carried at selected intervals along a movable conveyor are brought consecutively alongside a series of processing stations. In the meat processing plant situation, a continuously movable elevated conveyor-line passes substantially arcuately alongside each rotatable processing station and at a desired velocity synchronization therewith whereby operating personnel positioned upon the rotatable dressing station might perform their appointed tasks upon the continu-



ously movable procession of animal carcasses in an exceedingly proficient and rapid manner. The novel rotatable dressing station herein might also include one or more stationary platforms in conjunction therewith whereby operating personnel might take more effective advantage of the dressing station rotatable portion. More sophisticated embodiments of the novel dressing station herein include for the rotatable portion, a plurality of elevations therefor and pivotally connected separable chordal sections for more efficient and versatile utilization of the novel dressing station.

3,734,264

# CONVEYOR-MAGAZINE ADAPTED FOR BEING INTERPOSED BETWEEN A FOLDING MACHINE AND STATIONS WHERE SUBSEQUENT OPERATIONS ARE EFFECTED

Gunter Stumpf, 7421 Mehrstetten, Kreis Munsingen, Germany

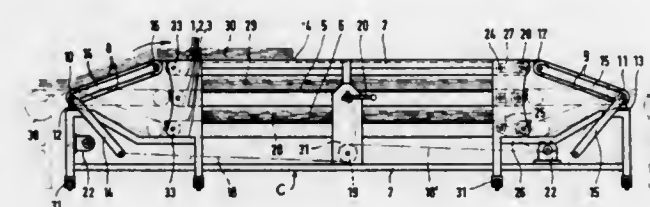
Filed July 19, 1971, Ser. No. 163,685

Claims priority, application Germany, Aug. 21, 1970, P 20 41 686.8

Int. Cl. B65g 47/00

U.S. Cl. 198—20 T

7 Claims



At the outlet of a folding machine, there is positioned a magazine conveyor apparatus for receiving "packages" of stacked material from the folding machine to hold such packages and selectively deliver the same for subsequent operations on the packages. The magazine conveyor apparatus comprises a plurality of magazine conveyor belts arranged one above the other and pivotal conveyor belts at opposite ends of the apparatus respectively for delivering a package to a selected magazine conveyor belt and removing a package from a selected belt.

3,734,265

# FEED MECHANISM

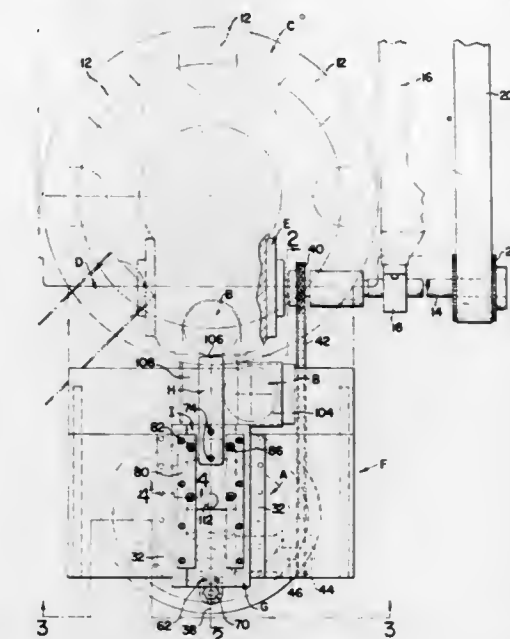
Arthur Thomas Mueller, Hastings, Mich., assignor to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Filed July 16, 1971, Ser. No. 163,320

Int. Cl. B65g 47/00

U.S. Cl. 198—24

14 Claims



A reciprocating workpiece feed mechanism includes a slide mounted for forward and rearward reciprocating movement along a longitudinal axis. A workpiece engaging finger is movably mounted on the slide for movement along said longitudinal axis between a forward workpiece engaging position and a rearward inoperative position. A releasable holding device releasably holds the finger in its forward position during reciprocating movement of the slide. The releasable holding device is operative for automatically releasing the finger for movement to its inoperative position under action of a predetermined force applied to the finger acting along said longitudinal axis during forward movement of the slide.

3,734,266

# TRANSFER STATION

Roger Despres, Saclay, France, assignor to Compagnie Generale D'Automatisme, Paris, France

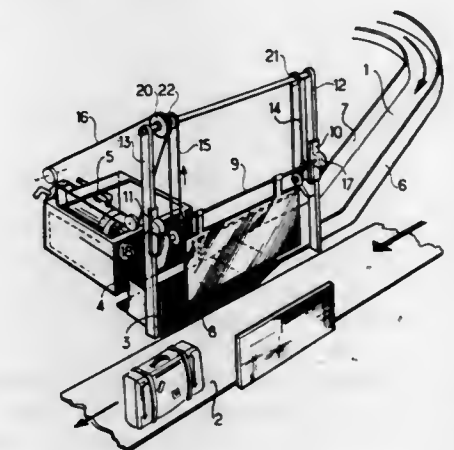
Filed July 28, 1971, Ser. No. 166,848

Claims priority, application France, July 29, 1970, 7028021

Int. Cl. B65g 47/00

U.S. Cl. 198—24

3 Claims



A transfer station comprising a ram operable to push an article from a first conveyor to a second conveyor which is parallel to the first one at least in the station. A partition is



disposed between the conveyors and is mounted for vertical sliding movement in response to movement of the ram, and for pivotal movement about a substantially horizontal axis. An assembly is selectively operable to lock the partition in its vertical position.

3,734,267

## ARTICLE STORING AND RECIRCULATING DEVICE

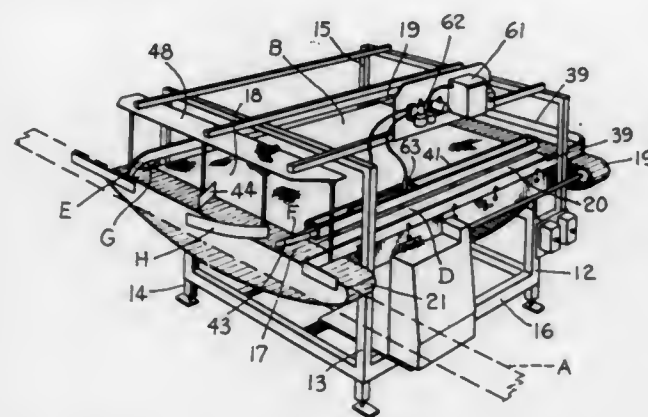
Joseph Tice, 502 Poinsettia Drive, Simpsonville, S.C.

Filed Sept. 30, 1971, Ser. No. 185,116

Int. Cl. B65g 47/26, 43/08

U.S. Cl. 198—30

7 Claims



An apparatus for transferring and accumulating articles being moved along a main conveyor. A recirculating conveyor is carried adjacent the main conveyor for receiving the articles from the main conveyor responsive to overloading. Means are provided for automatically returning the articles to the main conveyor when the overloading ceases. A pivotal member is provided adjacent the main conveyor for feeding the articles being returned to the main conveyor into vacant spaces between the articles traveling on the main conveyor. The recirculating conveyor includes belts which are beveled on the edge so as to provide a smooth transfer from a belt traveling in a direction normal thereto.

3,734,268

## LID ORIENTING ASSEMBLY

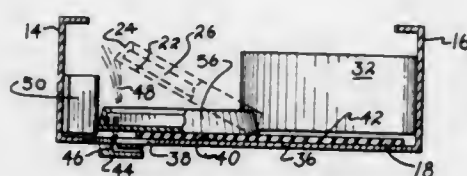
Philip M. Burger, Lawrence, and David E. Carson, Wichita, both of Kans., assignors to Carson &amp; Burger, Incorporated, Lawrence, Kans.

and a continuation-in-part of Ser. No. 39,847, May 22, 1970, abandoned. This application Aug. 19, 1971, Ser. No. 173,081

Int. Cl. B65g 7/00

U.S. Cl. 198—33 AD

9 Claims



An assembly for use in connection with machines for manufacturing, conveying, stacking, and packaging lid-like articles having a top portion and a peripheral skirt defining a hollow therewithin, the assembly orienting the articles so that, as they move to a point of delivery they are all in a skirt-up position. The assembly presents a first station having an upstanding wall which shifts the articles laterally toward a second station which has an air nozzle directing a stream of air upwardly to flip only the skirt-down articles over into a skirt-up position on the conveyor for movement to a point of delivery. A guide at the second station cooperates with the first wall and the conveyor to position the articles in the desired overlying relationship to the air nozzle so that only the skirt-down articles are flipped.

3,734,269

## ROD CONVEYOR CLEATS

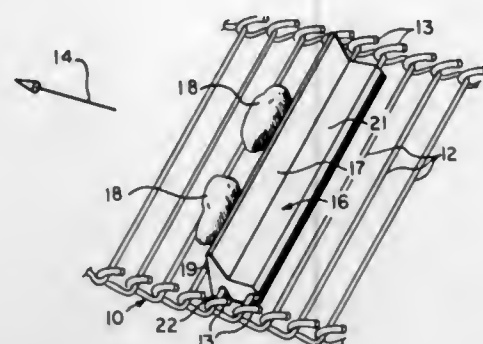
Earl W. Ross, La Canada, Calif., assignor to Tatch-A-Cleat Products, Pasadena, Calif.

Filed Mar. 20, 1972, Ser. No. 235,978

Int. Cl. B65g 15/30

U.S. Cl. 198—197

7 Claims



A conveyor cleat releasably attachable to a rod conveyor has a cleat blade for retaining goods during conveyance, a cleat base attached to the cleat blade base, and a pair of flexible lips for releasably retaining adjacent conveyor rods. The lips are integral with the cleat base and define rod-receiving channels which have channel openings facing in a direction opposite to the direction of travel of the conveyor cleat. The lips also provide the corresponding channels with closed channel bottoms located ahead of the corresponding conveyor rod as seen in the direction of travel of the cleat.

The cleats according to the subject invention are easily and economically manufactured, preferably by extrusion, are readily attached to rod conveyors without the use of any special tools or clamping devices, securely maintain themselves in position during travel, and are nevertheless easily removed after use without disassembly or prolonged downtime of the conveyor.

3,734,270

## CONVEYOR BELT

Patrick Foody, Highway 17, Hudson, Quebec, Canada

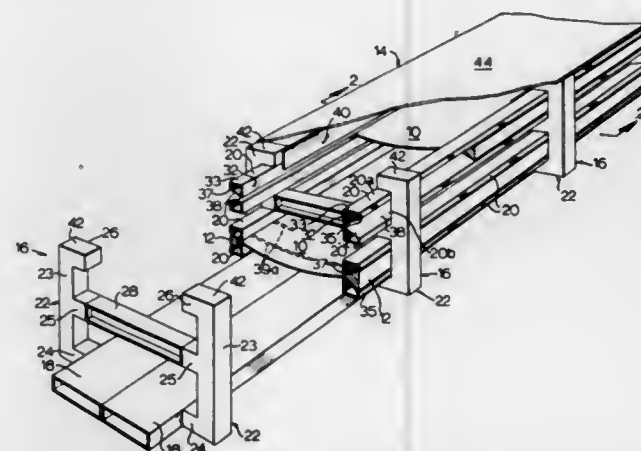
Filed July 19, 1971, Ser. No. 163,624

Claims priority, application Great Britain, July 24, 1970, 36,125/70

Int. Cl. B65g 15/00

U.S. Cl. 198—184

12 Claims



Apparatus is disclosed for conveying bulk material, comprising a conveyor belt having integral ribs along its edges, and a frame which supports elongated rib chambers in which the ribs may slide longitudinally as the conveyor belt moves. In a preferred embodiment surfaces of the ribs are supported for frictionless movement by an air film maintained between the ribs and portions of the rib chambers defined by air-permeable sheet material through which pressurized air is passed.

3,734,271

## BAND CONVEYER ON AN AIR CUSHION

Anatoly Alexandrovich Dolgolenko, ulitsa professora Kachalova, 6, kv. 7; Pavel Pavlovich Onokhov, ulitsa Trefoleva, 6/30, kv. 6; Jury Meerovich Makhov, 8 Sovetskaya, 17/19, kv. 16, and Alexandr Markovich Gudovich, ulitsa V. Alexeeva, 20/24, kv. 25, all of Leningrad, U.S.S.R.

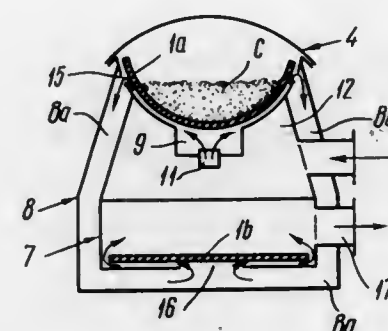
Filed Mar. 1, 1972, Ser. No. 230,601

Claims priority, application U.S.S.R., May 3, 1971, 1649562

Int. Cl. B65g 15/08

U.S. Cl. 198—184

3 Claims



The conveyor comprises a continuous band whose operating and idle strands are moved in separate closed troughs interconnected by air-supply pipe lines to successively form an air cushion under both strands of the band with the aid of one fan.

3,734,272

## PROTECTIVE ENCLOSURE FOR BICYCLE

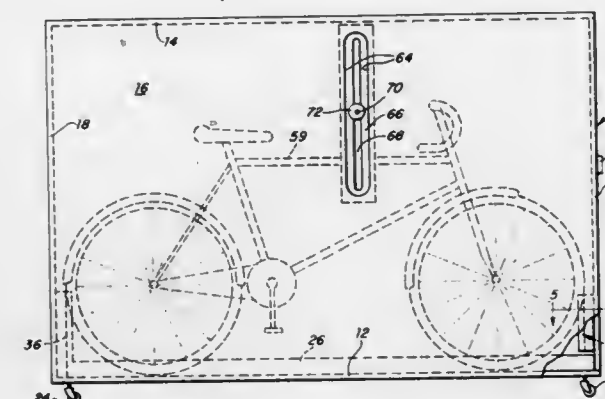
Ralph W. Galen, 26 Marrett Road, Lexington, Mass.

Filed June 30, 1971, Ser. No. 158,445

Int. Cl. B65d 85/00, 85/68

U.S. Cl. 206—1 R

13 Claims



An enclosure suitable for use as a storage locker or shipping container for a bicycle includes a container having a door at one end; a channel on its bottom wall for guiding the wheels of a bicycle as it is rolled into the container; wheel-engaging channels on the door and other end wall for supporting the bicycle in an upright position and a retaining device mounted for vertical movement on the side walls for engaging the frame to restrain it against lateral motion. The position of the restraining device is adjustable from the exterior of the container by locking knobs located in recesses in the side walls so as not to project beyond the surfaces thereof.

3,734,273

## HEAT-SHRINKING PACKAGE USING FOAMED PLASTIC SHEET

Hirosaki Watanabe, Suzuka-shi, Japan, assignor to Asahi-Dow Limited, Tokyo, Japan

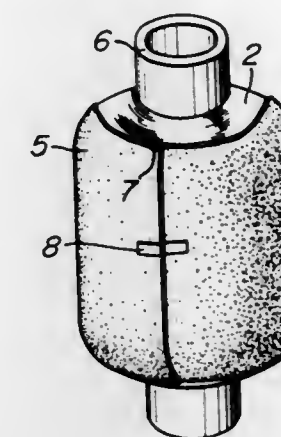
Filed Sept. 14, 1970, Ser. No. 71,754

Claims priority, application Japan, Sept. 24, 1969, 44/75286

Int. Cl. B65d 85/30, 85/35, 81/14

U.S. Cl. 206—46 FC

10 Claims



A packaged product of an article, which is liable to be marred on the surface or which is not allowed to form even a slight disorder on the surface, and a process for producing the said packaged product. The packaged product is obtained by use of a relatively soft foamed plastic, which can protect the surface of the packaged article more successfully than in the conventional heat shrinking packaging process using a film or in the conventional packaging process using a foamed plastic without heat-shrinking. The packaging process of the present invention has not only overcome the drawbacks of the said two processes but also provided unexpected effects.

3,734,274

## FOIL PACKAGE

Horst Korner, Munich, Germany, assignor to Gervais AG, Munich, Germany

Continuation of Ser. No. 823,866, May 12, 1969, abandoned.

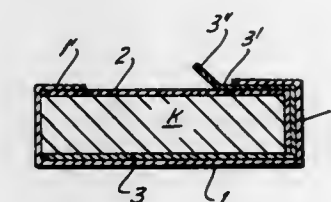
This application May 18, 1971, Ser. No. 144,102

Claims priority, application Germany, Aug. 20, 1968, P 17 86 115.3

Int. Cl. B65d 85/74, 85/76

U.S. Cl. 206—46 F

8 Claims



A foil package for polygonal objects having two opposite sides and a plurality of edge faces connecting the same. A first foil member overlies one of the opposite sides. A second foil member overlies the other of the opposite sides and at least one of the edge faces. A cup-shaped third foil member overlies the other side and all of the edge faces exteriorly of and in surface-to-surface contact with the second foil member. The second and third foil members are connected to one another.

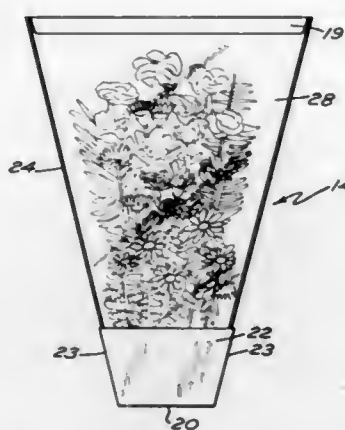


3,734,275

**DISPLAY AND SHIPPING CONTAINER FOR FLOWERS**  
Oliver W. Greene, III, 101 Glen Rock Road, West Kingston, R.I.

Filed Feb. 9, 1972, Ser. No. 224,844  
Int. Cl. B65d 5/44, 25/54

U.S. Cl. 206—45.31



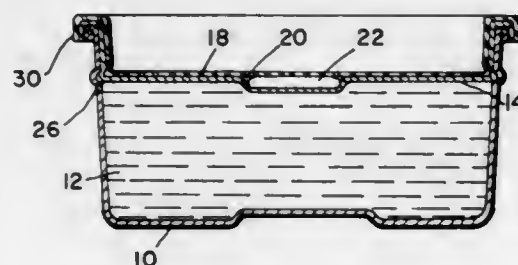
A display and shipping container for flowers having a body integrally formed of a relatively rigid sheet material. The top wall, bottom wall, and side walls are hingedly attached to the rear wall which is shaped in the form of an inverted trapezoid. The front wall is hingedly connected to the front edge of said bottom wall and is also in the shape of an inverted trapezoid but one whose height is substantially less than that of said rear wall to thereby form an open window in the front of said container. Spaced upwardly from the bottom of said rear wall, a flap is formed by an incision therein completely through the thickness of the rear wall with the flap being hinged at its bottom to allow it to be folded rearwardly to function as a stand or brace. The flap also provides access means for watering flowers already packaged in said container and additionally the flap may be folded forwardly to aid in fixedly positioning said flowers within said container.

3,734,276

**PACKAGE FOR PROVIDING A PACKAGED PRODUCT**  
Herbert M. Bank, Owings Mills, Md.

Filed Nov. 13, 1970, Ser. No. 89,298  
Int. Cl. B65d 65/18, 41/24, 41/18

U.S. Cl. 206—47 R



A package for retailing comestible products comprises a conventional wide-mouth container having a beaded rim fitted and sealed with a loose sheet of heat shrink film. This permits a shopper to feel the consistency of the product in the container before purchase while retaining sanitary conditions. Furthermore, the film can be made air tight if desired and will materially increase the shelf life of perishable products such as cottage cheese. A lid may also be applied to the rim over the film as a further protection against damage to the film from handling and to form with the film a pocket for holding promotional items such as surprises, favors, advertising material, etc. The looseness in the film is achieved by placing a holding form on the film against the rim and along part of the inner wall of the container while the film is being subjected to

heat shrink temperatures at the external rim adjacent portion thereof. The film substantially conforms to the internal surface of the lid and forms a gasket between the lid and the container.

3,734,277

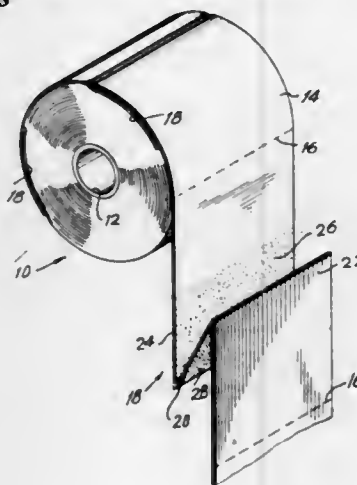
**TOILET PAPER ROLL HAVING A CLEANSING COMPOSITION**

Brian D. Bucalo, 155 Roberts Street, Holbrook, N.Y.  
Filed Nov. 15, 1971, Ser. No. 198,551

Int. Cl. A47k 7/03, 10/16

U.S. Cl. 206—58

4 Claims



A roll of toilet paper which has web portions where the web is folded upon itself and provided with an inner film of cleansing composition and an outer barrier layer so that the film of cleansing composition cannot spread through the convolutions of the roll while at the same time the folded web portions will become unfolded during unwinding of the roll to expose the cleansing composition. After the film of cleansing composition and barrier layer are respectively deposited at opposite faces of the web at preselected areas therealong the web is folded upon itself at the areas where the film of cleansing composition is located and then the film of cleansing composition at each folded web portion is frozen to retain each web portion in its folded condition during winding of the web into a roll.

3,734,278

**CONTAINER PACKAGE**

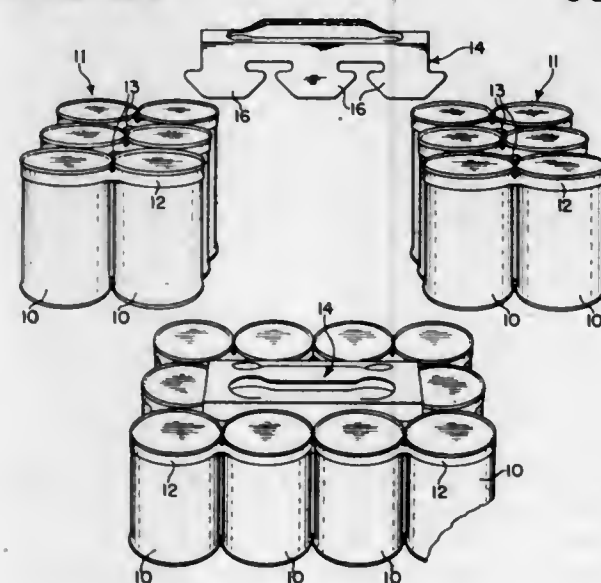
James E. Kerrigan, Arlington Heights, and Mindaugas J. Klygis, Evergreen Park, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 1, 1971, Ser. No. 185,515

Int. Cl. B65d 25/22, 71/00, 85/62

U.S. Cl. 206—65 S

8 Claims



A portable container package of a relatively large number of containers comprising the combination of certain carriers

3,734,281

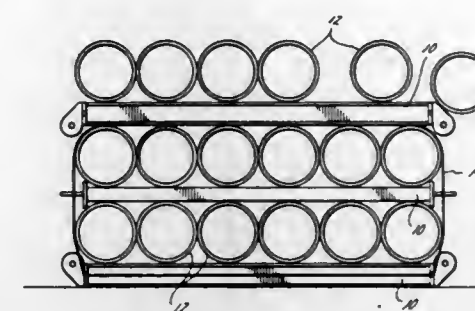
**PIPE PALLET**

James E. Armstrong, 19811 White Dove Trail, Crosby, Tex.  
Filed Dec. 15, 1971, Ser. No. 208,280

Int. Cl. B65d 71/04; B65g 1/14

U.S. Cl. 206—65 B

3 Claims



A rack of pipe composed of a plurality of pipe rack elements on which pipes are laid, with another plurality of pipe rack elements on top of the first layer of pipe and a second layer of pipe on top of these. The pipe rack elements have stops on the ends which in one position, prevent the pipes from rolling off of the rack elements, and in another position allow the pipes to roll off.

3,734,279

**DISPLAY TRAY**

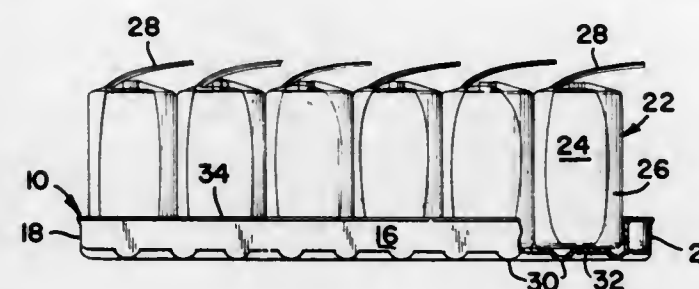
James G. Fisher, Jr., Asheboro, N.C., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 30, 1971, Ser. No. 158,403

Int. Cl. B65d 71/00

U.S. Cl. 206—65 R

4 Claims



A display tray for a plurality of articles each having a projection extending therefrom, said tray having a boss in at least one of its walls maintaining the articles in arrangement such that no protrusion extends beyond said wall.

3,734,280

**SHIPPING CONTAINER FOR SUPPORTING AND PROTECTING A PLURALITY OF ARTICLES**

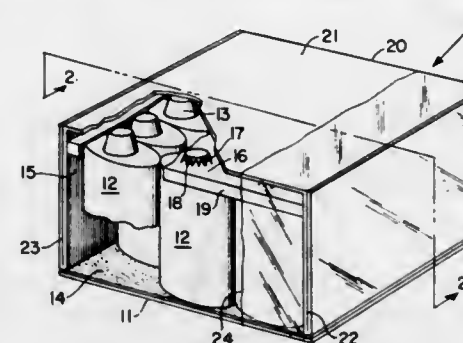
John S. Amneus, Woodlawn, and Malcolm H. Thomas, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 20, 1971, Ser. No. 209,717

Int. Cl. B65d 81/00, 85/62

U.S. Cl. 206—65 R

8 Claims



The disclosure is directed to a shipping container or package that is particularly adapted for enclosing and protecting a plurality of individual articles, preferably plastic bottles or the like. The generic concept contemplates providing a base or tray member having its support surface coated with a pressure sensitive adhesive. An array of bottles is placed on the tray so that their bodies are in contacting relationship in the area of their greatest cross-sectional dimension. The bottles are immobilized at their bases by adherence to the adhesive coating on the tray support surface. The upper ends of the bottles are immobilized for lateral movement by the provision of suitable means, such as an immobilizing spacer, sheet member or the like, which retains the upper portion of the bottles in their proper relative relationship with respect to the tray member. An essentially U-shaped cover member is placed over the tray member and bottles such that its ends are supported by the tray member whereupon a shrinkable plastic film is fitted over the entire assemblage and thereafter shrunk to hold the several elements of the combination in rigid assembled relationship.

3,734,282

**COMBINATION TRAVEL BAG AND RECHARGER FOR PORTABLE BATTERY-OPERATED ELECTRIC APPLIANCE**

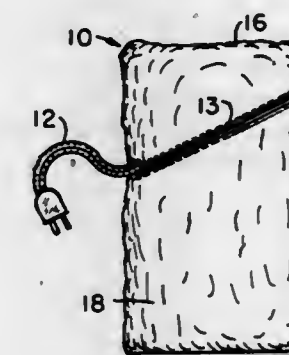
Jerome I. Rebold, Timonium, Md., assignor to Leonard Bloom, Baltimore, Md., a part interest

Filed May 25, 1971, Ser. No. 146,662

Int. Cl. B65d 85/54

U.S. Cl. 206—17.5

1 Claim



A travel and tote bag is provided for a portable compact battery-operated electrical appliance, such as an electric douche. The battery in the electric douche is recharged by means of a recharger built into the base portion of the bag. At least the top portion of the bag is formed from a relatively soft substantially pliable opaque material, whereby the electric douche and its accessories, such as a nozzle, a hose, one or more disposable bags, and douche concentrates may be stored within the bag, unobtrusively, and shielded from external view. Access to the bag is provided by suitable means, such as a zippered closure. An electric cord is electrically connected to the recharger, internally of the bag, and is likewise stored within the bag. The electric cord may extend beyond the bag, with the bag being substantially closed, thereby hiding the contents of the bag even during recharging. The entire bag is small, compact and lightweight, attractively styled for the feminine market, and may be conveniently carried about or casually thrown into an overnight travel bag or cosmetic case.



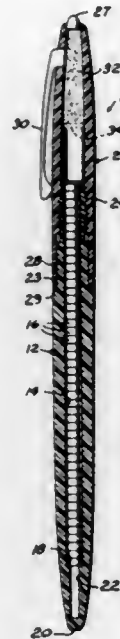
3,734,283

## POCKET TABLET DISPENSER

Clarence C. Simmons, P.O. Box 826, Lawton, Okla.  
Filed Sept. 8, 1971, Ser. No. 178,661  
Int. Cl. B65d 83/04

U.S. Cl. 206—42

1 Claim



A pair of elongated tubular members, each having one closed end and an inside diameter slightly greater than tablets to be contained, are removably connected together at their other ends to form a convenient pen-like container readily carried vertically in a pocket and held in place by an ordinary pocket clip.

3,734,284

## DISPLAY CARTON WITH INTERNAL SUPPORT

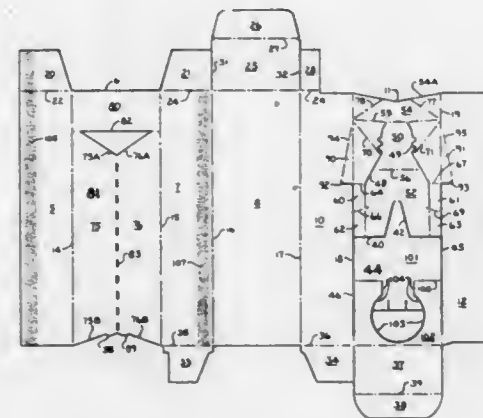
Joseph F. Schilling, Palos Hills, Ill., and Robert Richard Bottomley, New Lenox, both of Ill., assignors to Champion International Corporation, Hamilton, Ohio

Filed Jan. 7, 1972, Ser. No. 216,138

Int. Cl. B65d 5/50

U.S. Cl. 206—45.14

7 Claims



A shadow box with an internal object-supporting cradle that is formed from a support panel. The cradle is formed by articulated members which in turn are derived from the support panel by suitable cuts and scores. The entire shadow box is made of one piece of foldable material such as paperboard or the like.

3,734,285  
ATTACHMENT FOR YARN APPARATUS FOR  
AUTOMATICALLY FORMING A FISHERMAN KNOT OR  
THE LIKE

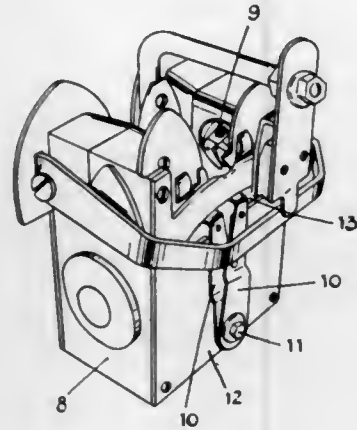
Pietro Messa, via Gasparo da Salo 126, Salo, Italy

Filed Feb. 22, 1972, Ser. No. 227,997

Claims priority, application Italy, March 25, 1971, 5126 A/71  
Int. Cl. A01d 59/04

U.S. Cl. 289—2

3 Claims



An attachment for yarn apparatus for automatically forming a Fisherman Knot, which attachment eliminates the necessity of clean-up operations due to dust collecting inside the working parts thereof, by providing the yarn-spreading elements on the outer surface of the attachment's front wall body, by providing the yarn-blocking rod on the inner surface of the attachment's rear wall body, and by rendering the attachment operationally independent of the yarn apparatus itself.

3,734,286

## ARTICLE HANDLING APPARATUS

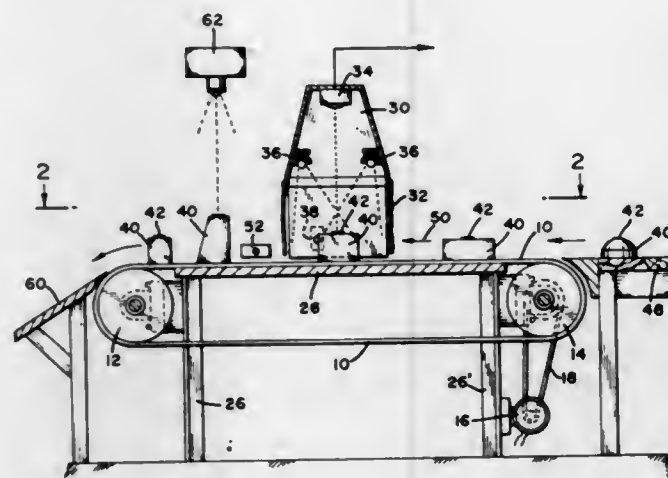
Luther G. Simjian, 7 Laurel Lane, Greenwich, Conn.

Filed Dec. 27, 1971, Ser. No. 212,432

Int. Cl. B07c 5/16

U.S. Cl. 209—121

15 Claims



Articles provided with code indicia are exposed serially to a sensing means disposed in a chamber. The sensing means provide indicia responsive signals to a computing means where the information provided is processed, such as for inventorying, counting, price computation purposes, etc. Image recording means are provided for producing a documentary record of each article as such article is conveyed along a predetermined path past the sensing means. Means are present to divert an article from said predetermined path if the sensing means produce a spurious signal upon sensing said code indicia.

3,734,287

## AIR CLASSIFIER ASSEMBLY

Heinz Jager, Bochum, Germany, assignor to WEDAG Westfalia Dinnendahl Gropel Aktiengesellschaft, Bochum, Germany

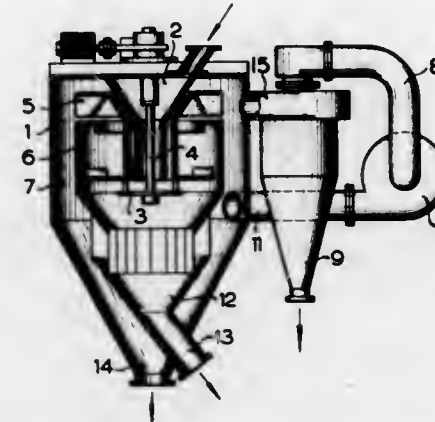
Filed Jan. 20, 1970, Ser. No. 4,280

Claims priority, application Germany, Jan. 25, 1969, P 19 03 743.5

Int. Cl. B07b 7/10

U.S. Cl. 209—139 A

2 Claims



Air classifier assembly for sizing particulate material includes a sizing chamber, a rotary distributor plate located in a lower portion of the sizing chamber for flinging particulate material supplied to the plate into the sizing chamber, a substantially cylindrical fine-particle separating chamber coaxially surrounding the sizing chamber and communicating therewith through an opening in the upper portion thereof, ventilating means located in the separating chamber for drawing into the separating chamber fine particles from the particulate material in the sizing chamber, ventilating means and a fine-material separator located externally to the separating chamber, the externally located ventilating means having a suction line connected to the fine-material separator and therethrough to an upper portion of the separating chamber and a compression line connected tangentially to the separating chamber.

3,734,288

## DISCHARGE DEVICE FOR THE BOTTOM FRACTION AT A VORTEX TYPE SEPARATOR

Karl Arvid Skardal, Artillerigatan 48, 114 45 Stockholm, Sweden

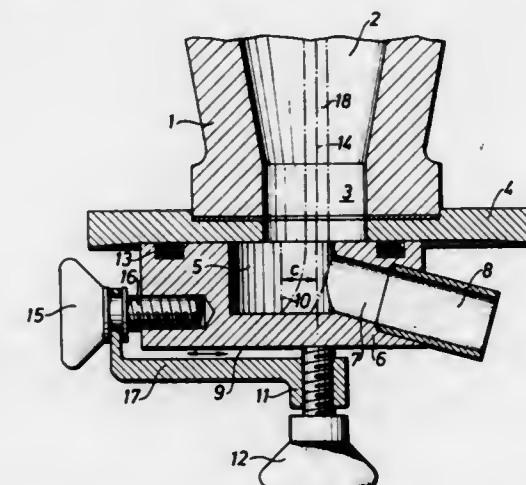
Filed Mar. 11, 1971, Ser. No. 123,280

Claims priority, application Sweden, Mar. 12, 1970, 3314/70

Int. Cl. B04c 5/14

U.S. Cl. 209—211

9 Claims



A device is provided for discharging the heavy bottom or reject fraction from a vortex type separator. The device com-

prises a vortex chamber disposed underneath the bottom fraction outlet of the separator with the axis of symmetry of the vortex chamber parallel to the axis of symmetry of the bottom fraction outlet. The vortex chamber is provided with a stationary outlet port for the reject fraction, located in the circumferential wall of the vortex chamber or in the bottom of the vortex chamber close to the circumferential wall thereof. The vortex chamber is displaceable relative to the bottom fraction outlet in a direction perpendicular to the axis of symmetry of the vortex chamber. By displacing the vortex chamber relative to the bottom fraction outlet of the separator it is possible to vary the flow volume of the bottom fraction being discharged through the outlet port of the vortex chamber.

3,734,289

## APPARATUS FOR SEPARATING PRODUCTS

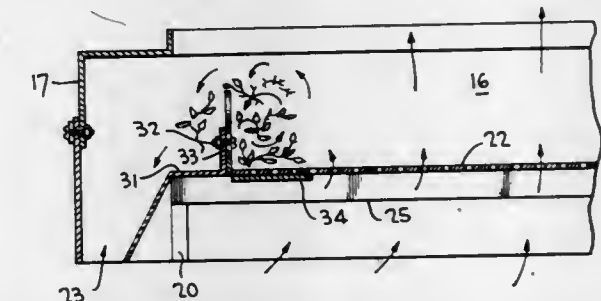
Lawrence Pearman, Post Office Box 521 Ocilla Highway, Tifton, Ga.

Filed Aug. 24, 1971, Ser. No. 174,362

Int. Cl. B03b 3/12

U.S. Cl. 209—467

5 Claims



Apparatus for separating light from heavier products lying on a shaking table wherein a vacuum pressure is applied to draw off the light products, the table including an air shelf disposed beneath a perforated table bed at the end thereof at which the light products are concentrated during vibration of the table, thereby insuring a complete separation at said end of the light from the heavier products whereby said light products may be conveniently drawn off from said table bed.

3,734,290

## LATCH MECHANISM

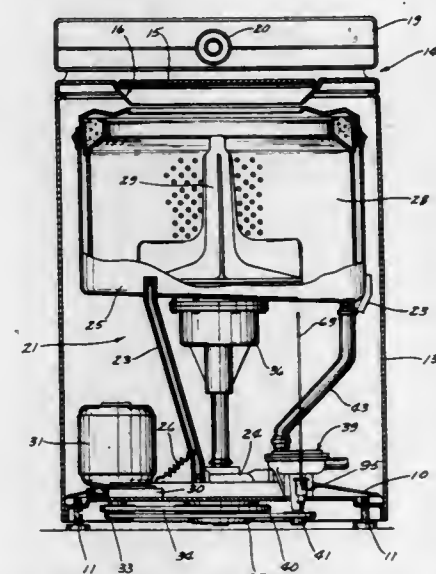
Robert B. Nelson, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Oct. 20, 1971, Ser. No. 190,775

Int. Cl. B04b 7/06

U.S. Cl. 210—146

12 Claims



A system for latching the access door of a rotatable apparatus includes a normally disengaged rotation sensor opera-



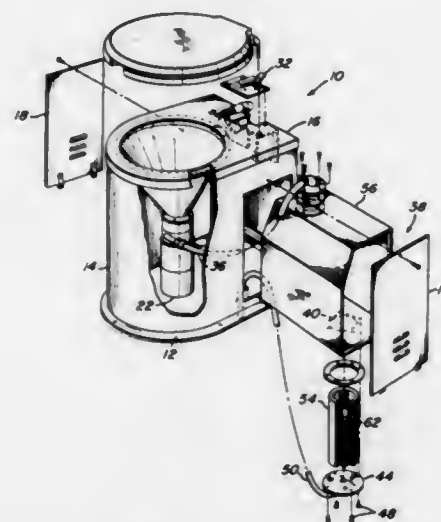
tively connected to a door latch mechanism. The rotation sensor is actuated to a sensing condition by a latch mechanism responsive to an attempt to open the door and in turn controls the latch mechanism to prevent opening of the door when the rotatable apparatus is rotating. The latch mechanism includes a pivotally mounted assembly movable as a unit when there is no rotation to permit opening of the door. A latch pawl included in the assembly is separately and pivotally movable responsive to the sensing of rotation to prevent opening of the door.

3,734,291

**WASTE TREATMENT SYSTEM**

Scott M. Schondelmyer, Dayton, Ohio, assignor to Dayton Manufacturing Company, Dayton, Ohio  
Filed Apr. 29, 1971, Ser. No. 138,430  
Int. Cl. C02c 5/02

U.S. Cl. 210-152



A self-contained waste treatment system includes a bowl for receiving liquid and solid wastes and a macerator associated with the bowl for macerating the solid wastes and pumping the resulting mixture of liquids and divided solids to a receiving tank. An upstanding, tubular filter is mounted in the receiving tank and surrounds an opening in a bottom wall of the tank. Within the tubular filter a tubular magazine is positioned having a closed upper end, an open lower end and a series of openings through a lower section of its side wall. The magazine is also provided with a nipple at its lower end which is received in an outlet from the receiving tank and a filter pad is received in the magazine and lies across its open lower end. A stack of chemical additive tablets, such as calcium hypochlorite, are received in the magazine with the lower most tablet resting upon the filter pad. With this construction the mixture of liquid and solid wastes pumped to the receiving tank are separated by the tubular filter with the solids being retained in the receiving tank and the liquids passing through the filter to the tubular magazine. As the liquids enter the magazine through the opening in the lower end thereof pressure in the magazine builds up, preventing the magazine from being flooded. The chemical additive tablets in the magazine therefore, are dissolved sequentially from the bottom of the stack as the liquid passes through the filter and out the discharge opening in the receiving tank.

3,734,292  
**FUEL PUMP**

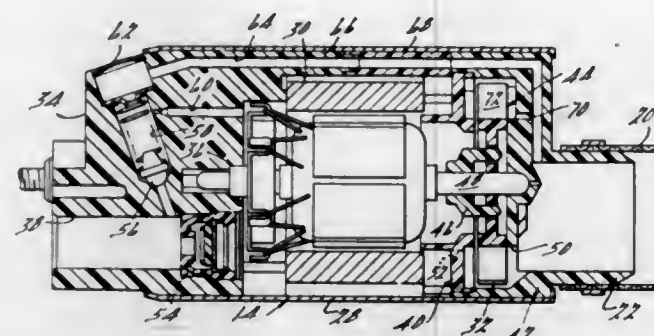
Rupert B. Bell, 15318 Mack Avenue, Grosse Pointe, Mich.  
Filed Nov. 18, 1970, Ser. No. 90,661  
Int. Cl. B01d 35/02

U.S. Cl. 210-172

3 Claims

A vehicle fuel system including a fuel tank pick up filter adapted to remove water and other foreign material, a fuel pump having a continuous flow therethrough and providing

fuel to the carburetor at a desired pressure, and bypass passage means permitting the recirculation of fuel by said pump bypassing said filter thereby enabling the latter to be



1 Claim

self-cleaned by the wave action and sloshing of fuel in the fuel tank. The pump is an electric pump having an internal bypass passage bypassing the filter.

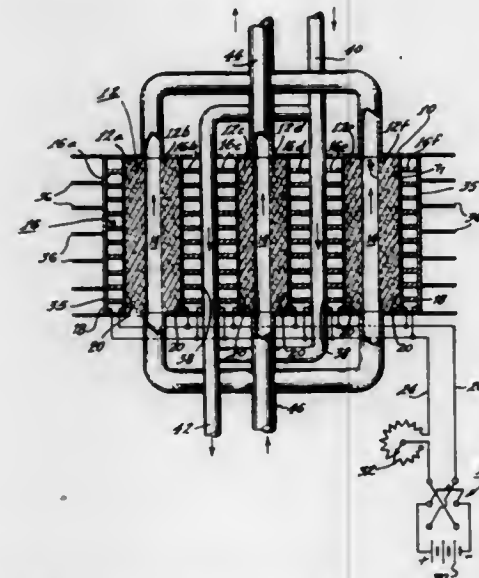
3,734,293

**THERMOELECTRIC ADSORBER**

Edward G. Biskis, Borough of Emmaus, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.  
Continuation of Ser. No. 740,791, May 16, 1968, abandoned, which is a continuation of Ser. No. 524,550, Feb. 2, 1966, abandoned. This application Mar. 4, 1970, Ser. No. 15,319  
Int. Cl. B01d 53/04

U.S. Cl. 210-185

2 Claims



A gas purification system of the adsorption type is disclosed wherein peltier type thermoelectric modules are employed with the adsorbent material so as to cool the adsorbent and eliminate unfavorable temperature gradients in the adsorber during the adsorption cycle, as well as heat the adsorbent during the regeneration cycle.

3,734,294

**POLLUTANT RECOVERY SYSTEM**

James J. Zerbe, 2323 5th Avenue, San Rafael, Calif.  
Filed Jan. 15, 1971, Ser. No. 106,844  
Int. Cl. E02b 15/04

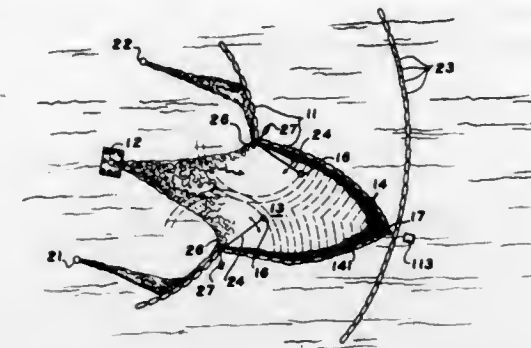
U.S. Cl. 210-242

10 Claims

A system is described for removing a pollutant from the surface of water wherein the pollutant is confined to a recovery area and is directed to a recovery station by a plurality of linked booms. A particulate, floatable sorbent material is continuously distributed over the pollutant confined in the recovery area as it moves to the recovery station. The sorbent material is distributed in sufficient quantity to adsorb substan-

tially all of the pollutant prior to its arrival at the recovery station. At the recovery station, recovery means are employed

enough to retain the desiccant and large enough to permit free flow of refrigerant into the bag for access to the desiccant contained therein. That portion of the bag which occupies the



for removing the sorbent material and the adsorbed pollutant from the water surface.

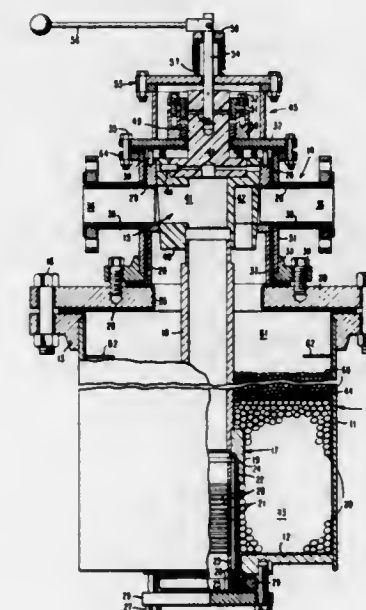
3,734,295

**SELF-CLEANING FILTER ASSEMBLY**

Frank T. Smith, 2521 Bona Road, and Robert D. Smith, 2407 Klingman Drive, both of Wilmington, Del.  
Continuation-in-part of Ser. No. 853,321, Aug. 27, 1969, abandoned. This application Aug. 30, 1971, Ser. No. 175,922  
Int. Cl. B01d 29/08

U.S. Cl. 210-278

20 Claims



Disclosed herein is a filter assembly which can be cleaned by a fluidizing backflow, comprising: a container; a hollow drain structure disposed near the base of said container and having a plurality of openings; a support bed of support particles surrounding the drain structure to a height above the openings therein which equalizes the pressure drop between the top of the support bed and the drain structure over the entire upper surface of the support bed; and a filter bed of filter particles, disposed over the support bed.

3,734,296

**REFRIGERANT DRIER**

Robert H. Proctor, Richmond, and Ralph J. Kombol, Connersville, both of Ind., assignors to Philco-Ford Corporation, Philadelphia, Pa.

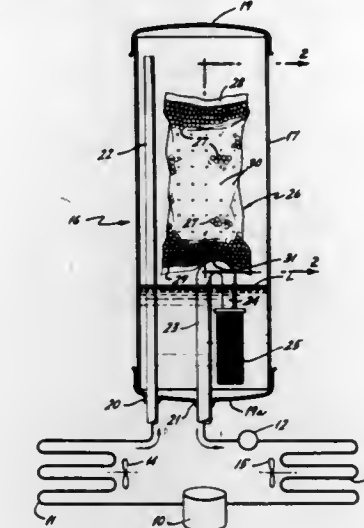
Filed May 27, 1971, Ser. No. 147,350

Int. Cl. B01d 27/02

U.S. Cl. 210-288

7 Claims

A refrigerant receiver-drier having a sealed desiccant-containing bag made of material through which refrigerant fluid will not flow, but provided with a plurality of apertures small



lower part of the receiver-drier, when the latter is in use, is free of apertures and defines a sump which receives and traps desiccant fines which gravitate to the bottom of the bag.

3,734,297

**MODULE FOR REVERSE OSMOSIS APPARATUS**

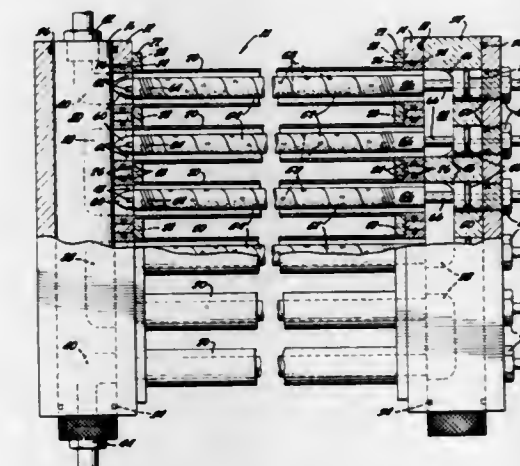
William K. Windle, Encinitas, Calif., assignor to Universal Water Corporation, San Diego, Calif.

Filed Feb. 2, 1972, Ser. No. 222,750

Int. Cl. B01d 31/00

U.S. Cl. 210-321

4 Claims



A module useful in reverse osmosis apparatus contains a number of semipermeable membrane elements each enclosed in an individual pressure resistant tube. End members holding the ends of the pressure tubes in a ladder-like configuration, contain removable plugs having channels for directing liquid flow between the ends of pressure tubes. Plugs providing series, parallel or series-parallel flow through the pressure tubes may be inserted in the end members.

3,734,298

**DEVICE FOR DIALYSIS**

Gerhard Riede, Eslov, and Olov Hagstrom, Lund, both of Sweden, assignors to Gambro AG, Bern, Switzerland  
Filed Nov. 12, 1971, Ser. No. 198,276

Claims priority, application Sweden, Nov. 17, 1970, 15512/70

Int. Cl. B01d 31/00

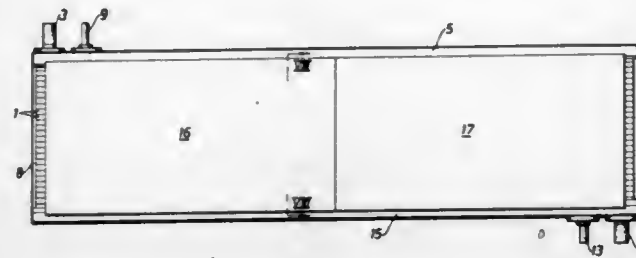
U.S. Cl. 210-321

9 Claims

A dialysis device particularly for use in purification of blood is comprised of a plurality of spacer plates and pairs of inter-



mediate membranes. The surfaces of the plates are configured in such manner that channels for purification liquid are formed between them and the membranes, and channels for the blood which is to be purified through dialysis are formed



between the membranes in each pair. The assembly of spacer plates and membranes are pressed together between a pair of clamping plates by means of clamping rails which extend along and engage grooves provided along the sides of the clamping plates.

3,734,299

### AUTOMATIC CONTINUOUSLY BACKFLOW WASHING-TYPE FILTER

Jiro Akiyama, Yokohama, Japan, assignor to Kanagawa Kiki Kogyo Co., Ltd., Yokohama-shi, Japan

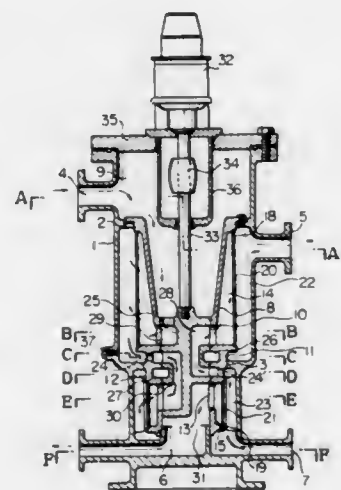
Filed Dec. 20, 1971, Ser. No. 209,557

Claims priority, application Japan, Dec. 28, 1970, 45/132035

Int. Cl. B01d 29/38

U.S. Cl. 210—333

1 Claim

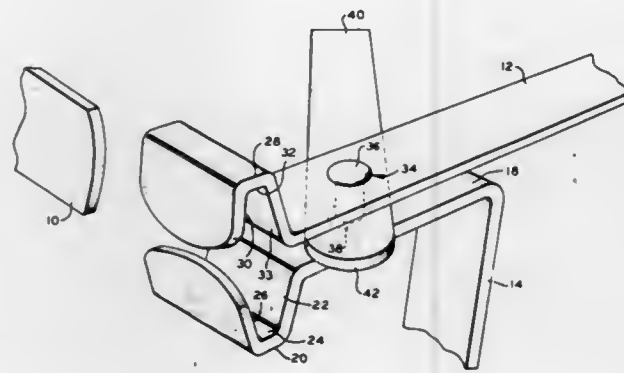


An automatic continuously backflow washing-type filter comprising a primary filtering unit, a substantial area portion of which is employed to primarily filter a charge of oil to be filtered, a filtrate accumulation chamber for accumulating and supplying a substantial portion of the filtrate from said primary filtering unit to a consuming device and recycling the remaining minor portion of the filtrate as a backflow washing oil which automatically washes the primary filtering unit incrementally, and a secondary filtering unit for filtering said backflow washing oil after the washing of the primary filtering unit and containing foreign matter therein which was separated from the original charge of oil, the secondary filtering unit being also incrementally and automatically washed while filtering the backflow washing oil from the washing operation through the primary filtering unit.

3,734,300  
SUPPORT FOR SUSPENDED FILES  
Rex D. Carter, Clovis, Calif., assignor to Sheller-Globe Corporation, Toledo, Ohio  
Continuation-in-part of Ser. No. 13,644, Feb. 24, 1970, abandoned. This application July 15, 1970, Ser. No. 55,099  
Int. Cl. A47I 5/10

U.S. Cl. 211—177

10 Claims



A support frame assembly for suspended files which is comprised of a minimal number of components and may be readily assembled by the user without the need of special tools wherein camming means are employed to selectively engage and disengage support rail elements with the associated support frames.

3,734,301

### MERCHANDISE DISPLAY DEVICE

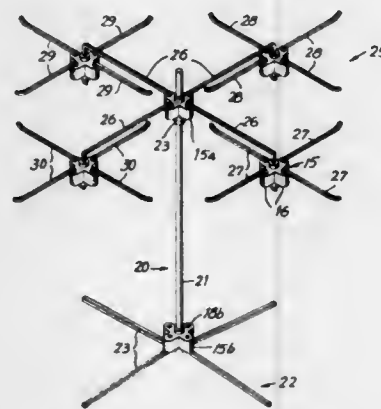
John Rastocny, Cliffside Park, N.J., assignor to Diro Industries Corp., Union City, N.J.

Filed Aug. 31, 1971, Ser. No. 176,605

Int. Cl. A47I 5/02, 5/10

U.S. Cl. 211—177

1 Claim

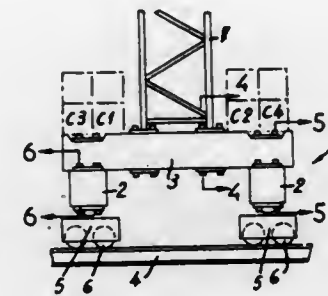


A merchandise display device comprising an array of multi-branch display racks with rotatable and stationary components. A post, a multi-legged stand and a plurality of radial display branches are held in assembled relation by a plurality of connectors of identical construction. Each connector has an axial bore and a plurality of circumferentially positioned apertured portions, said branches being supported by said apertured portions, one of said connectors being rotatably mounted upon said post, another serving as the fixed juncture between said post and said stand.

3,734,302  
TRAVELING MONOTOWER CRANE BASE  
Pierre Durand, Lyon, France, assignor to Societe Anonyme Richier, Paris, France  
Filed June 4, 1971, Ser. No. 150,125  
Claims priority, application France, June 5, 1970, 7020649  
Int. Cl. B66c 5/00

U.S. Cl. 212—1

6 Claims



The base according to this invention for a traveling monotower crane consists only of lower and upper concrete beams, whether reinforced or prestressed, assembled to one another and to the tower and carrier trucks of the crane, by means of tie-rods extending vertically therethrough in order to impart a high strength to the assembly and improve the stability of the tower. The tie-rods extend preferably through guide tubes embedded in the concrete and the nuts provided at the ends of these tie-rods bear against the concrete faces through the medium of stress-distributing plates. The tower may preferably be mounted adjacent one end of the upper beams, in order to increase the useful radius of the crane and therefore its working efficiency measured in tons/meter (FIG. 7).

3,734,303

### TRAVEL CYLINDER AND GRIPPER ACTUATOR WITH TRIPLE GUIDE RODS

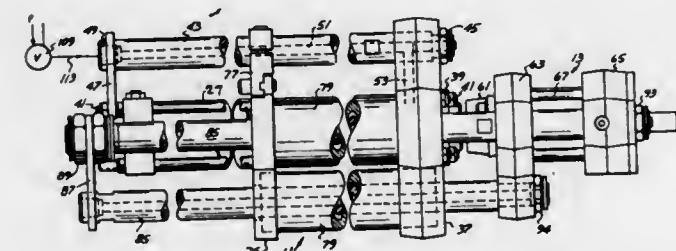
Leland F. Blatt, 790 Shoreham Road, Grosse Pointe Woods, Mich.

Filed Feb. 24, 1972, Ser. No. 228,849

Int. Cl. B66c 1/42

U.S. Cl. 214—1 BB

11 Claims



A material handling device of increased rigidity and carrying capacity which includes a travel cylinder assembly and actuator for a workpiece gripper. A hanger supports spaced bushing plates mounting parallel spaced bushings containing housings to slidably receive three guide rods. Two, thereof, are arranged laterally and a third therebetween and below. The one ends of the guide rods are bracketed together. The other ends of the guide rods are secured to the gripper actuator and movable therewith on activation of the travel cylinder.

A modification provides for successive locating feed of the gripper actuating assembly with actuation of the gripper jaws thereafter. A further modification includes a further guide or carrier rod mounting the jaw actuating assembly for a more extended locating feed preceding actuation of the jaws.

### 3,734,304 MACHINE FOR HANDLING AIRCRAFT BRAKE ASSEMBLIES

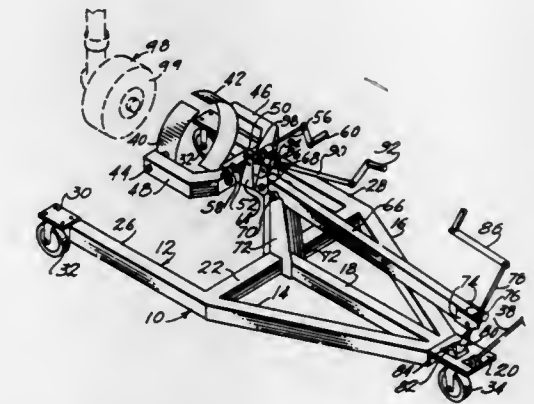
Julian C. Cabaniss, Route 1, Box 152 Island Shoals Road, Henry County, near McDonough, Ga.

Filed Dec. 28, 1970, Ser. No. 101,790

Int. Cl. B65g 7/08

U.S. Cl. 214—1 BD

13 Claims



Especially suited for one mechanic handling heavy disc brake assemblies, such as those removed from wheels of aircraft, the present apparatus comprises a wheeled frame which is controlled manually by a tongue. The frame supports a projecting clamp structure comprising a pair of clamps mounted in a clamp frame for complete rotation therein to be positioned on the brake assembly to lift and remove same and to lift and install same. The clamps are supported on clamp arms which are pivoted on a support means which is mounted on a horizontal pivot on the frame. The entire clamp frame is controlled in an arcuate vertical position by a long mechanical screw member between the frame and the support as is the clamping action of the bands. Thus the mechanic can position and orient the clamps on the brake assembly. Further positioning of the bands vertically is accomplished by means of another mechanical screw between the frame and the clamp support frame. In another form, the clamps and positioning thereof are operated hydraulically instead of mechanically.

3,734,305

### WORKPIECE MANIPULATING APPARATUS AND TURNING SPOOL THEREFOR

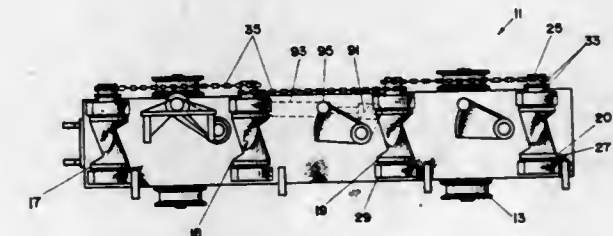
John L. Parrls, Knoxville, Tenn., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Feb. 12, 1971, Ser. No. 114,932

Int. Cl. B65g 7/00

U.S. Cl. 214—1 QG

23 Claims



In an apparatus for manipulating an elongated workpiece, a plurality of spools are transversely mounted along the length



of a fixture for rotation about spaced axes. Each spool includes a peripheral work-engaging surface which is contoured so as to cause the workpiece to turn about an axis in a plane substantially normal to the axis of rotation of the spool as the spool is rotated.

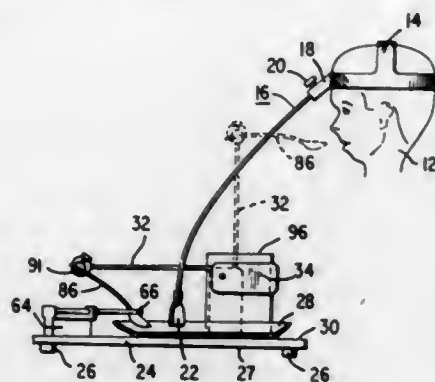
3,734,306

**SELF-FEEDING DEVICE FOR HANDICAPPED PERSONS**  
William Henry Morewood, 18 Laning Avenue, Pennington, N.J.

Filed Feb. 16, 1972, Ser. No. 226,912  
Int. Cl. A47g 21/08

U.S. Cl. 214-1 T

6 Claims



A self-feeding device is operated by an electric motor that is energized through a switch adapted to be activated by a wand attached to a handicapped operator who need only be able to control the motion of his head and neck. The device comprises a spoon clamped to a first shaft that is mounted for rotation adjacent one end of a tubular arm. The electric motor is coupled to a second shaft, fixed adjacent to the other end of the tubular arm, to reciprocate the arm over a 90 degree angle, between horizontal and vertical positions. Cams are provided so that each time the switch is actuated the arm rotates 90°. A link, disposed within the tubular arm, has one end coupled to the first shaft through a crank and the other end pivoted so that the spoon can be disposed within a dish at an angle of less than 180° to the horizontal, whereby food may be pushed, via the wand, from the dish onto the spoon when the arm is in a horizontal position. The spoon is automatically rotated to a substantially horizontal position when the arm is moved to a vertical position.

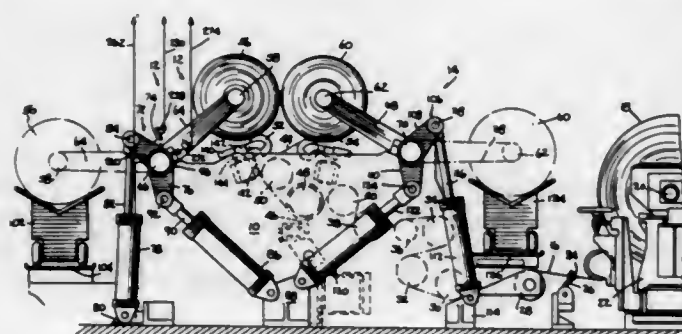
3,734,307

**APPARATUS FOR HANDLING REWIND ROLLS**  
Gerrit Degelleke, Parsippany, and Robert E. Bush, Morris Plains, both of N.J., assignors to Midland-Ross Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 41,904, June 1, 1970, abandoned. This application Feb. 17, 1972, Ser. No. 227,042  
Int. Cl. B65h 19/30

U.S. Cl. 214-1 BD

8 Claims



This invention relates to apparatus for handling rewind rolls during their buildup at the outer end of rewind arms on a re-

wind machine, thence for thence for pivoting the rewind arms and the rewind rolls to an unloading position convenience for removal.

3,734,308

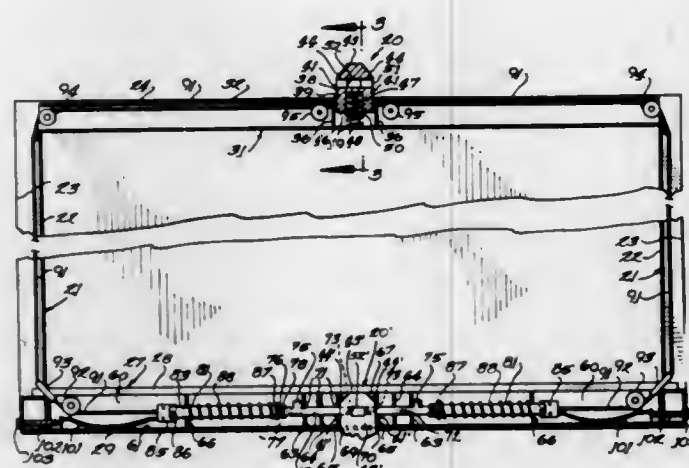
**APPARATUS FOR SECURING AND LOCKING FREIGHT CONTAINERS IN STACKED RELATIONSHIP**

Francis J. Pasternack, P.O. Box 752, 605 N. Wolf Road, Hillside, Ill.

Filed Jan. 27, 1972, Ser. No. 221,347  
Int. Cl. B65g 1/14

U.S. Cl. 214-10.5 R

10 Claims



Apparatus for use with freight container for effecting the automatic securement and locking thereof in vertically stacked relationship, along with being used to secure such containers to the carrying surface of railroad flatcars, trailer chassis, ship decks and the like. The apparatus is in the form of a locking device including a pin vertically projecting from the top surface of a container and reciprocally movable between its projecting position and a position depressed inwardly of the container approximately flush with the top surface of the container, a pin receiving aperture in the bottom surface of the container in a position for receiving a pin from another container, a locking mechanism mounted inside the bottom surface of the container and adjacent the pin receiving aperture and movable between an operative position wherein it would engage a pin from another container when projecting therein, and an inoperative position where it would not engage any pin contained therein or would disengage from any pin previously retained therein; the pin and locking mechanism of a container being interconnected such that when the pin is in the position projecting above the container then the locking mechanism is in its operative position to engage and lock any other container pin inserted therein, and when the pin is in the depressed position then the locking mechanism is in an inoperative position so as not to engage any other pin inserted therein or to disengage and release any pin previously secured and locked therein.

3,734,309

**DOUBLE STACK INTERLOCKING TRAYS**

Robert F. Bateman, St. Paul, Minn., assignor to Plastics, Inc., St. Paul, Minn.

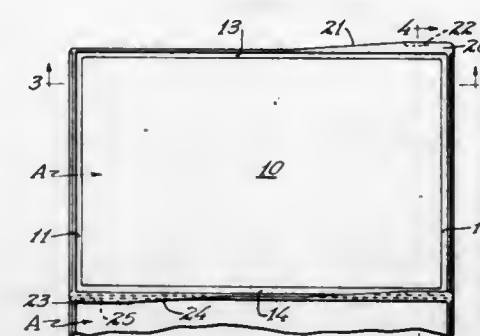
Filed Nov. 27, 1970, Ser. No. 93,070  
Int. Cl. B65g 1/14

U.S. Cl. 214-10.5 R

11 Claims

Serving trays of generally rectangular form are constructed

to interlock along adjacent edges as the trays are moved together. The trays also stack and nest together. One corner of be sorted automatically in the marshalling area. Information regarding the articles to be picked, their location within the



3,734,310

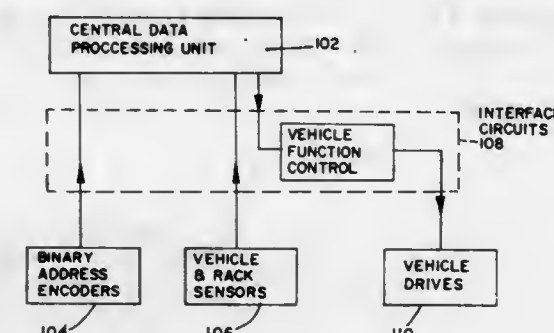
**STACKER CRANE CONTROL SYSTEM**

Howard F. Miller, Frederick, Md., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Aug. 12, 1970, Ser. No. 63,051  
Int. Cl. B65g 1/06

U.S. Cl. 214-16.4 A

20 Claims



Loads are transferred between stations by horizontal and vertical movement of a pallet table on an elevator mechanism carried by a vehicle from which the table is horizontally extended and retracted when aligned with a preselected storage rack. A computer is interconnected with motion propelling and controlling apparatus on the vehicle through interface circuitry to process command data from an input library and vehicle position, motion data and rack condition from sensors to produce the movement desired for effecting load transfers.

3,734,311

**WAREHOUSE APPARATUS AND METHOD WITH ARTICLE LABEL PRINTING MEANS**

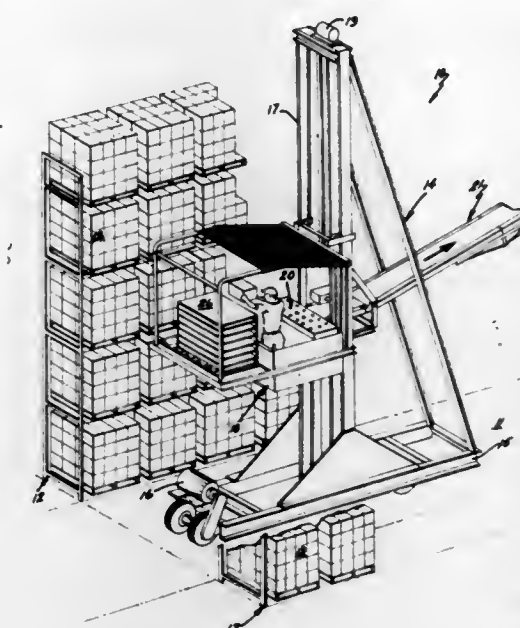
Gerald F. Thompson, and Richard R. Ridenour, both of Grand Rapids, Mich., assignors to Rapistan Incorporated, Grand Rapids, Mich.

Continuation-in-part of Ser. No. 811,533, March 28, 1969, abandoned. This application Aug. 20, 1971, Ser. No. 173,560  
Int. Cl. B65g 1/06

U.S. Cl. 214-16.4 A

29 Claims

A system for picking and marshalling articles in a warehouse having a plurality of article storage racks. The system includes a picking unit which moves along the racks and an operator thereon removes articles selectively therefrom. The picking unit includes a printer for printing labels and an applicator for applying them automatically to the article selected. The unit includes, additionally, a system for placing a destination code on the articles so that they can



3,734,312

**STEEL BAR STORAGE RACK UNIT AND COOPERATING LIFTING DEVICE**

Donald E. Hickinbotham, Stockton, Calif., assignor to Hickinbotham Bros. Ltd., Stockton, Calif.

Filed Jan. 31, 1972, Ser. No. 222,137  
Int. Cl. B65g 1/06

U.S. Cl. 214-16.4 A

12 Claims



A pigeon-hole type rack unit having individual racks in vertical stacks, and a cooperating, transitionally suspended lifting device; the racks being adapted for the reception and storage—for wholesale—of relatively small gauge, elongated steel bars in heavy, standard mill bundles of predetermined length; and said rack unit and lifting device being of a construction such that the racks—successively upward from the lowermost one in a given stack thereof—can each be loaded by said device with a bundle of such bars, and thereafter—when desired—any bundle in a rack of such stack, and again by said device, can be lowered to a rack (when empty) therebelow and without removing such bundle, or any others, from the rack unit.



3,734,313

**BULK BIN LEVEL INDICATOR**

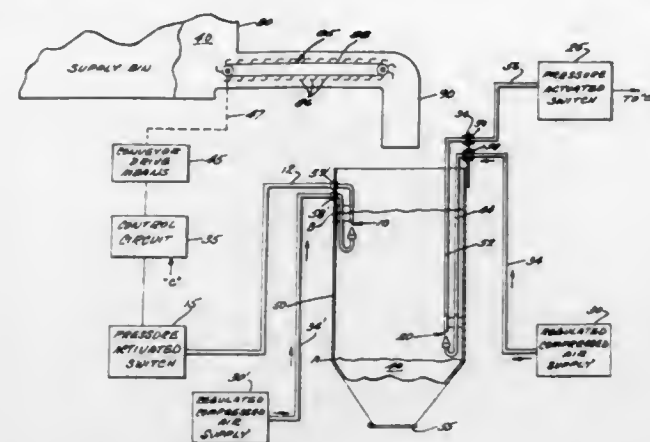
Donald E. Gauthier, Spring Lake, and William V. Jones, Muskegon, both of Mich., assignors to Donald Engineering Company, Inc., Grand Rapids, Mich.

Filed June 10, 1971, Ser. No. 151,777

Int. Cl. B65g 65/32; G01f 23/14; H01h 35/34

U.S. Cl. 214-17 CA

17 Claims



The present invention provides a level indicator for indicating the level of bulk materials such as molding sand which are stored in a bin. The indicator employs a pneumatically operated sensor having a J-shaped output tube which is mounted in the bin to supply a stream of air to an input tube across a gap between the J-shaped output tube and the input tube when no bulk material is present at the level of the indicator. When the bulk material is present at the level of the indicator, it obstructs the gap between the output and input tubes. This causes a pressure change at the input tube which can be detected by suitable means coupled to the input tube to provide a control signal. The control signal can be utilized in conjunction with filling apparatus to automatically refill the bin when the level falls below a predetermined level at which an indicator is installed. A second level indicator can be installed near the top of the bin to provide a control signal which will automatically stop associated filling apparatus when the bulk material has reached the level of the second indicator and the bin is filled.

3,734,314

**METHODS OF AND APPARATUS FOR TRANSFERRING BODIES**

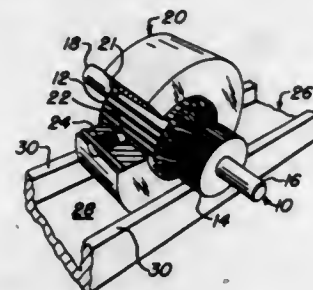
Philip H. Zepp, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio

Filed Sept. 3, 1970, Ser. No. 69,369

Int. Cl. B65g 67/00

U.S. Cl. 214-38 R

13 Claims



Methods of and apparatus for transferring bodies between work stations by supporting each body in a circular transfer member which rolls under the influence of gravity between work stations along a downwardly inclined track. Means are provided for inserting and removing a body from its transfer member at a work station and means are also provided for elevating each member to compensate for the vertical component of gravitational movement thereof along the downwardly inclined track.

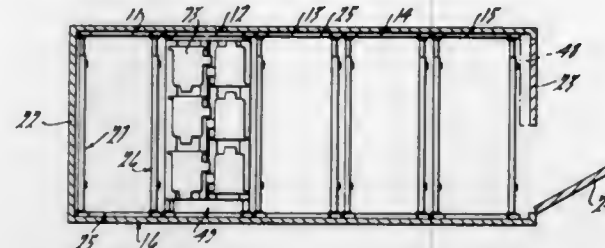
3,734,315  
**MEANS FOR TRANSPORTING PALLETIZED LOADS**  
Wayne H. James, Detroit, Mich., assignor to Palmer-Shile Company, Detroit, Mich.

Filed July 8, 1970, Ser. No. 53,194

Int. Cl. B65g 67/02

U.S. Cl. 214-38 CC

6 Claims



A collapsible pallet rack for mounting in a container, comprising end frames connected by tiers of front and rear telescoping beams. Pallets are detachably mounted on these beams by latches which are released in response to the presence of a fork lift.

3,734,316  
**APPARATUS FOR CONTROLLING DIRECTION OF MOVEMENT OF REFUSE BODY COMPACTING AND UNLOADING BLADE**

Stanley W. Worthington, 824 Clough, Waterloo, Iowa

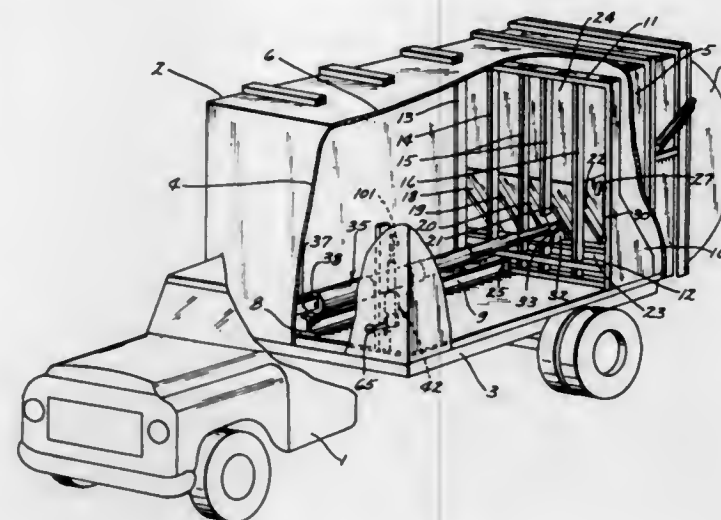
Continuation of Ser. No. 54,982, July 15, 1970, abandoned.

This application Oct. 26, 1971, Ser. No. 192,587

Int. Cl. B65f 3/00

U.S. Cl. 214-82

13 Claims



The invention relates to a valve arrangement including a spool mounted within the valve body and positionable among first, neutral and second positions for controlling the passage of fluid through the valve; a detent mechanism for releasably holding the spool in a position subsequent to manual movement of the spool to the position; a plunger within the valve body and axially associated with the spool for relative movement therewith, the plunger subject to movement in relation to the position of a force applying member movable between two positions; a pair of oppositely acting springs axially interposed within the valve body between the spool and the plunger for biasing the plunger toward a neutral position; and fluid pressure means operable in response to the member being resisted by a predetermined resistance to release the detent mechanism whereby automatic positioning of the plunger for controlled movement of the member is obtainable.

3,734,317

**REFUSE COLLECTING VEHICLE**

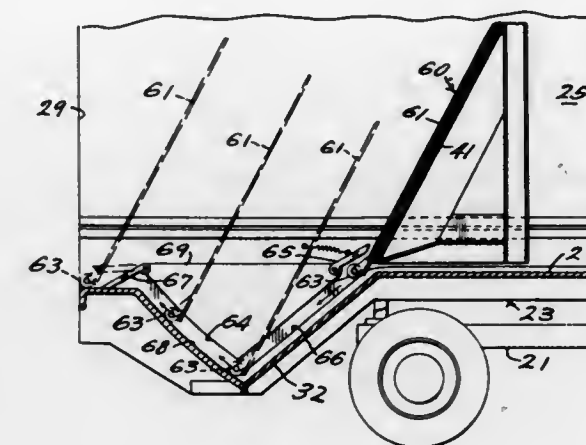
William A. Herpich; Glenn S. Park, both of Gallon, Ohio, and George W. Palmer, Durant, Okla., assignors to Peabody Gallon Corporation, Gallon, Ohio

Division of Ser. No. 28,566, April 15, 1970, Pat. No. 3,661,281. This application Dec. 29, 1971, Ser. No. 213,627

Int. Cl. B65f 3/00

U.S. Cl. 214-83.3

4 Claims



This invention relates to a rear end loader type of refuse collecting vehicle. There is no tailgate and the loading hopper, rather than being in the tailgate, is in the rear of the vehicle body. A packing blade moves refuse from the hopper into the forward portion of the body and in one embodiment may be reversed to sweep refuse from the hopper to a point exterior of the vehicle. A longitudinally movable ejector panel is mounted transversely of the body. During the discharging of refuse from the open rear end of the body the packer blade is in an elevated position and the refuse is discharged by the ejector panel between the elevated packer blade and the hopper. In some embodiments an auxiliary floor is provided in the hopper.

3,734,318

**GARBAGE COLLECTION VEHICLE**

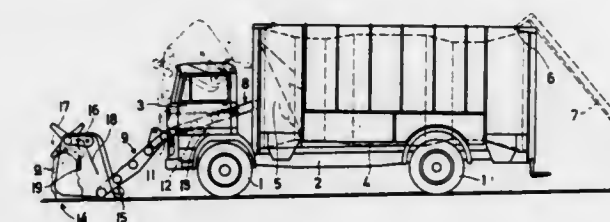
Johann Kraus, Kissing, near Augsburg, Germany, assignor to Keller & Knappich GmbH, Augsburg, Germany

Continuation-in-part of Ser. No. 821,354, May 2, 1967, abandoned. This application Mar. 31, 1971, Ser. No. 129,732

Int. Cl. B60p 1/36; B65g 65/20

U.S. Cl. 214-83.14

3 Claims



A garbage collection vehicle having a conveyor means mounted on a cantilever arm which is secured adjacent to the driver's cab of the vehicle, for transporting disposable garbage containers from ground level to a garbage collection receptacle mounted on the rear of the vehicle. A disposal frame is mounted on the front end of the cantilever and includes guiding means mounted on the frame for guiding the containers into the disposal frame, and a cross wheel rotatably mounted on the frame for engaging and pushing the containers onto the conveyor means.

3,734,319

**METHOD AND DEVICE FOR DETACHABLE COUPLING TOGETHER OF IMPLEMENT AND VEHICLE**

Knut Olov Frisk, Gavle, Sweden, assignor to AB Tico, Gavle, Sweden

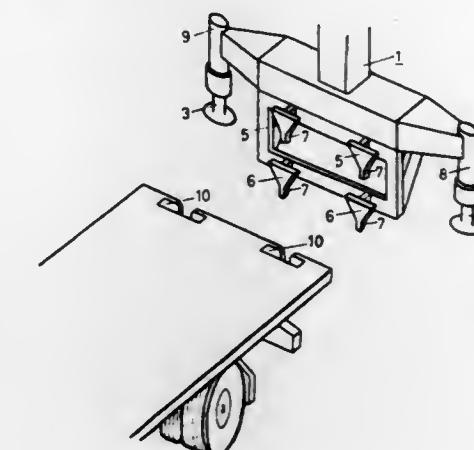
Filed Dec. 16, 1970, Ser. No. 98,707

Claims priority, application Sweden, Dec. 23, 1969, 17915/69

Int. Cl. B60 1/64

U.S. Cl. 214-131

5 Claims



Method of detachably coupling together a loading implement with coupling means and supporting legs, and a vehicle, said coupling means being essentially in a vertical direction detachably couplable in self-centering engaging means located on the vehicle, the method consisting in the vehicle being driven up to the implement set up on the supporting legs, that coupling and engaging means are brought into a roughly precentred starting coupling position, that the coupling means on the implement are raised or lowered, with the aid of the supporting legs, relative to the engaging means for effecting the coupling, said means being automatically centered in relation to one another, brought into engagement and detachably held together.

3,734,320

**SUPPORT MEANS FOR BOOM RAM**

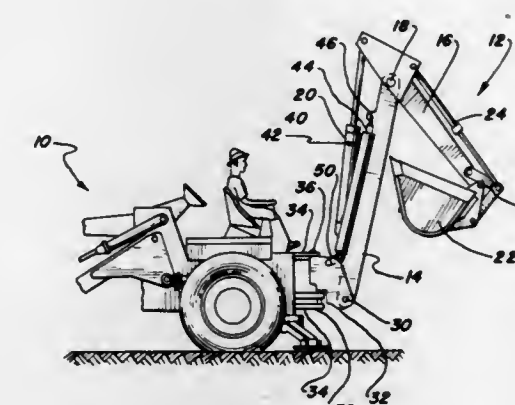
Philip D. Redenbarger, Centerpoint, Ind., assignor to J. I. Case Company, Racine, Wis.

Filed Jan. 12, 1972, Ser. No. 217,341

Int. Cl. E02f 3/00

U.S. Cl. 214-138 R

11 Claims



The invention relates to an improved support means for a boom ram that swings a boom about a horizontal pivot axis on a support. The support means consists of a link pivoted on the support with the cylinder of the ram pivotally carried by the link. The support has first and second spaced stops located in the pivotal path of movement for the link. Releasable lock means are carried by the frame and cooperate with the link to hold the boom ram in a desired position.



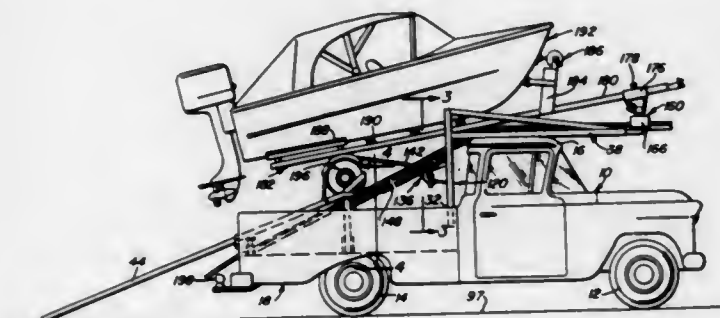
maintain the link in engagement with either of the stops defining first and second positions for the link. In one position, the longitudinal axis of the boom is at all times located rearwardly of a vertical plane extending through the boom pivot, while in the second position, the longitudinal axis is located forwardly of the vertical plane when the ram is fully retracted to define a transport position for the boom.

3,734,321

**TRUCK LOAD BED BOAT LOADER AND CARRIER**  
Delmer B. Long, 3021 N.E. Johnson Street, and Lewis E. Shelton, 3010 N.E. Johnson Street, both of Roseburg, Oreg.  
Filed Jan. 13, 1970, Ser. No. 2,583  
Int. Cl. B60r 9/00

U.S. Cl. 214-450

16 Claims



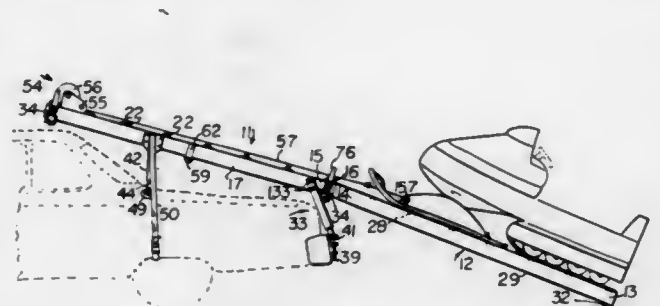
A ramp structure for support from the rear load carrying portion of a truck and including opposite side elongated and forwardly and upwardly inclined boat trailer wheel ramps and a center inclined guide rail along which a follower guidingly engaged therewith is movable. Removable inclined rearward wheel ramp extensions are provided for the rear ends of the wheel ramps and include rear end portions for support from the ground while the follower includes structure for removably coupling the front end of a boat trailer tongue thereto. Further, the ramp structure includes a forward elevated portion thereof from which a winch assembly is supported and the winch assembly includes a winch line for attachment to a rear portion, such as the axle assembly of a boat trailer.

3,734,322

**FREIGHTING FRAMES FOR AUTOMOBILES**  
Wilfred Vallancourt, 363 North Street, Sault Saint Marie, Ontario, Canada  
Filed July 14, 1971, Ser. No. 162,363  
Int. Cl. B60r 9/00

U.S. Cl. 214-450

12 Claims



A freighting frame which is capable of being mounted upon an automobile having a rear bumper and a rear deck comprises two telescopically nested rectangular elongate half-frames, one of which is a mounted half-frame, the other being withdrawable on rollers. By resting one end of the withdrawn half-frame on the roadway and pin-joining its forward end to the mounted half-frame an incline is provided along which heavy articles may be slid to load them. Each half-frame com-

prises a pair of longitudinal side beams having vertical webs and horizontal upper flanges spaced by transverse bars. The mounted half-frame is carried on a pair of rear posts fixed to the webs and adjustable in length and pivotally secured on bumper brackets, and also carried by an intermediate pair of posts standing on resilient suction-cup feet adjacent the rear window. When in the transport mode the nested half-frames have their upper flanges clampedly interlocked at each end to rigidify the composite side beams so formed, permitting very light sheet metal construction — e.g., aluminum alloy — to safely carry larger loads at high vehicle speed.

3,734,323

**SPARE TIRE LIFT AND HOLDER FOR A PICKUP TRUCK AND THE LIKE**

Wayne E. Price, 401 S. Chickasaw, Pauls Valley, Okla., and William L. Waldrup, Route 4, Elmore City, Okla.  
Filed Feb. 22, 1972, Ser. No. 227,853  
Int. Cl. B62d 43/04

U.S. Cl. 214-451

6 Claims



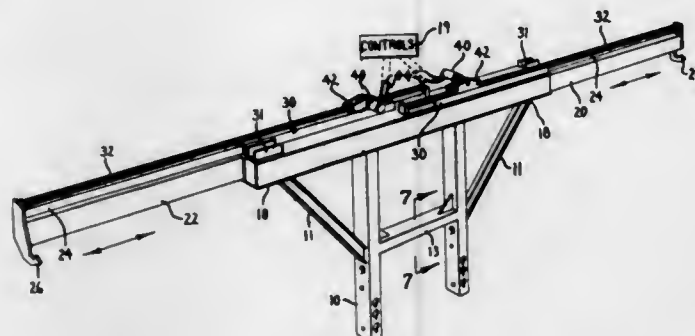
A crank rod extends horizontally through the rear bumper and a pair of body frame members which are spaced apart a distance less than the diameter of the spare tire. A cable is secured, at one end, to the crank rod between the pair of frame members and is removably connected at its other end to the wheel of a spare tire. Rotation of the crank rod winds the cable therearound by a cable guide means and lifts the wheel and tire assembly to a horizontal stored position in which the tire resiliently abuts the depending limit of the pair of frame members. Ratchet means, engaging the outwardly disposed end of the crank rod, locks or releases the crank rod.

3,734,324

**CONTAINER HANDLING FRAME**  
Peter D. Lynch, Portland, Oreg.; Dempsey R. Oldfield, Half Moon Bay, Calif., and Donald K. Zifka, Mill Brae, both of Calif., assignors to Hyster Company, Portland, Oreg.  
Filed Aug. 5, 1970, Ser. No. 61,284  
Int. Cl. B66f 9/14

U.S. Cl. 214-621

1 Claim



A frame for handling cargo containers is disclosed. A vertical member of the frame is mounted on the carriage of an industrial lift truck having an extensible mast. The housing at the upper end of the vertical member contains a pair of transversely extensible arms. Powered by a pair of hydraulic motors, these arms may be moved inwardly or outwardly along their longitudinal axis by the truck operator so as to position each arm to engage the upper corner fittings of a cargo container from one side. When thus positioned and engaged, the frame and truck may lift and move the cargo container.

3,734,325

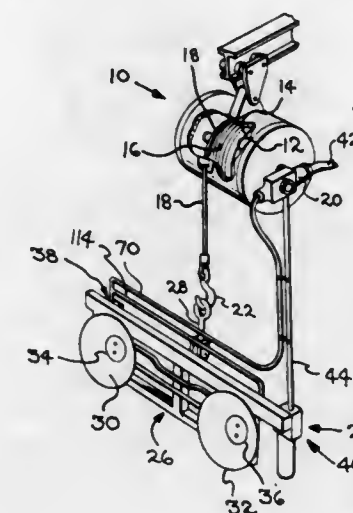
**SAFETY INTERLOCK FOR FLUID-OPERATED, LOAD-HANDLING APPARATUS**

Charles W. Stone, Garden City, Mich., assignor to D. W. Zimmerman Mfg., Inc., Madison Heights, Mich.  
Filed Mar. 31, 1971, Ser. No. 129,863  
Int. Cl. B66c 1/02

U.S. Cl. 214-658

5 Claims U.S. Cl. 214-730

16 Claims



Load-handling apparatus is provided which includes a safety interlock to prevent the disengagement of a load when the apparatus is in an operative condition to balance or raise the load. The apparatus includes a fluid-operated hoist and a fluid-operated, load-engaging unit. A blocking valve is provided which is responsive to pressure of fluid for the hoist, which valve presents the load-engaging unit from disengaging the load when the pressure is at least equal to a predetermined value which is usually sufficient to at least balance the load.

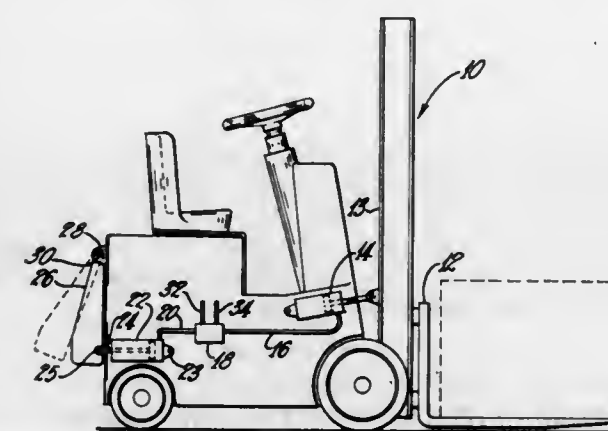
3,734,326

**VARIABLE CAPACITY LIFT TRUCK**  
Ernst S. Esser, Levittown, Pa., assignor to Eaton Corporation, Cleveland, Ohio

Filed July 15, 1971, Ser. No. 162,894  
Int. Cl. B66f 9/20

U.S. Cl. 214-674

6 Claims



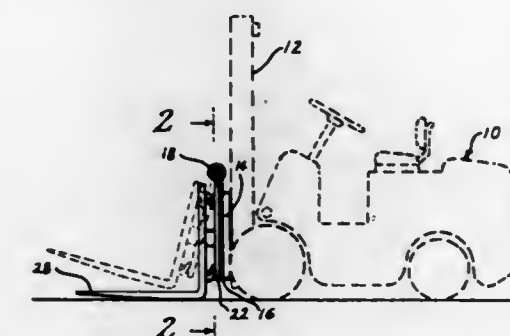
An industrial truck includes a shiftable counterweight for stabilizing the truck under various loading conditions. Means are provided for automatically shifting the counterweight in response to the load being supported by the lifting mechanism of the industrial truck and wherein the magnitude of counterweight movement is proportional to the magnitude of said load to thereby automatically position the counterweight for balancing the load.

910 O.G.-45

3,734,327

**LIFT TRUCK SIDE SHIFTING MEANS**

William R. Ellis, Jr., 1056 Woodview Drive, Memphis, Tenn.  
Continuation of Ser. No. 847,145, Aug. 4, 1969, which is a continuation-in-part of Ser. No. 591,759, Nov. 3, 1966, abandoned. This application Apr. 5, 1971, Ser. No. 131,422  
Int. Cl. B66f 9/14



A side shifting means for lift trucks utilizing the horizontal support bar of shaft type fork mountings both as the support member for the forks and as the piston-cylinder for lateral shifting of the forks. By so doing, this allows the forks to pivot about the horizontal support bar and allows the front plate to be lifted upwardly for maintenance, without disengaging the piston from the remainder of the side shifting structure and reduces the load center loss.

3,734,328

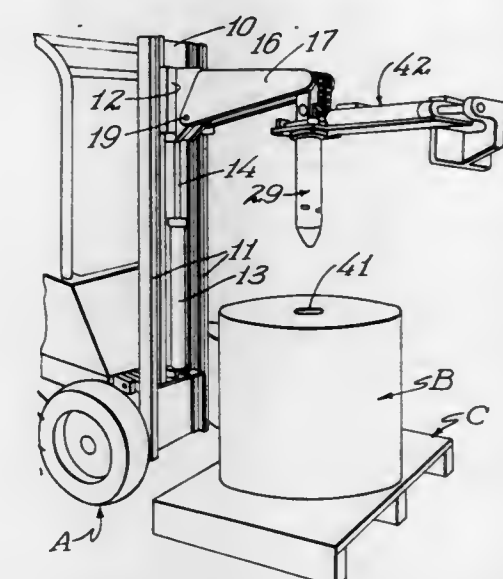
**ROLL LIFTER**

Herbert Francis Dalglish, 284 Cherokee Avenue, St. Paul, Minn.

Filed Jan. 6, 1972, Ser. No. 215,753  
Int. Cl. B66c 1/54

U.S. Cl. 214-652

10 Claims



Apparatus to lift a roll of material or other object having a central opening comprising a probe designed to engage the inside walls of the center aperture of the roll which probe is pivotally mounted on an articulated bracket. The probe is held in position by a chain passing over the articulated bracket. As the bracket is pivoted upwards the probe is caused to pivot downward into a vertical position. In another embodiment a hydraulically actuated clamp is incorporated onto the probe so as to grasp the roll from the outside in conjunction with the internally grasping probe.



3,734,329

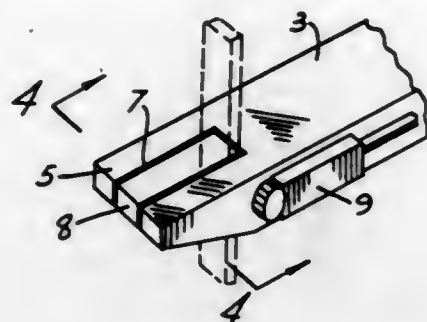
## FORK LIFT TRUCK TINES

Leonard Greick, 12/37 E. Rosencrans Avenue, Space No. 35, Norwalk, Calif.

Filed Mar. 6, 1972, Ser. No. 232,008  
Int. Cl. B66f 9/06

U.S. Cl. 214-750

2 Claims



Each of a pair of auxiliary members is pivotally mounted in a channel formed at the free end of a corresponding one of the pair of lift members of a fork lift truck for movement in planes substantially perpendicular to the plane of the lift members. Control devices on the lift members position the auxiliary members in a selected one of a position coplanar with the lift members, a position extending above the plane of the lift members substantially perpendicularly thereto and a position extending below the plane of the lift members substantially perpendicularly thereto.

3,734,330

## CHILD PROOF BOTTLE CAP

William E. Danner, 2 Drummond Street East, Perth, Ontario, and Laurence J. Ilmes, 7 Feldbar Court, Willowdale, Ontario, both of Canada

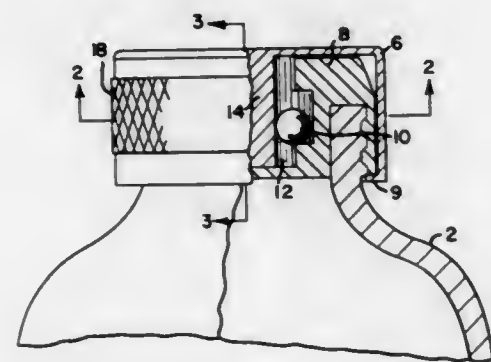
Filed Nov. 22, 1971, Ser. No. 200,918

Claims priority, application Canada, Sept. 24, 1971, 123,624

Int. Cl. B65d 55/02

U.S. Cl. 215-9

5 Claims



A screw-top closure for bottles is provided which must be turned upside down to be unscrewed. When the right way up the closure — which is constructed so as to fit a standard glass bottle and is complete in itself, requiring no modification or addition to the bottle or its screw-top — can be screwed up but can be turned endlessly without unscrewing. This is achieved by a two part construction having an inner shell with the screw thread on it and an outer shell for manual operation. The two are connected together by a ball bearing; the outer shell has an internal land which drives the ball bearing. It is only when the bottle is upside down and the outer shell is rotated anti-clockwise that the ball bearing finds a land to drive the inner screw thread containing shell.

3,734,331

## SAFETY CAP

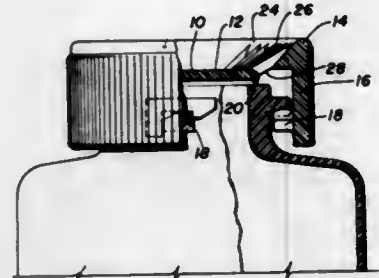
Amedeo P. De Felice, 251 Florence Street, Leominster, Mass.

Filed Aug. 13, 1971, Ser. No. 171,469

Int. Cl. B65d 55/02

U.S. Cl. 215-9

5 Claims



A safety cap for bottles or other containers, said cap comprising a base, an integral skirt of plastic, said base having a connecting peripheral portion that inclines upwardly with respect to the skirt, and a bottle mouth seal, said skirt having means to lock the cap to the bottle mouth upon depression of the skirt and rotation of the cap, the connecting peripheral being flexible and resilient and comprising essentially a series of alternate depressions and ridges, of grooves and lands, and said depressions or grooves may provide thin diaphragm-like solid portions or alternatively apertures.

3,734,332

## SAFETY CLOSURE

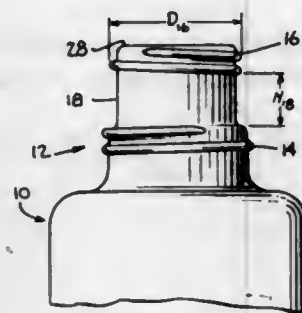
Norman H. Grulich, 800 Longview Road, Knoxville, Tenn.

Filed Dec. 1, 1971, Ser. No. 203,785

Int. Cl. B65d 55/02

U.S. Cl. 215-9

6 Claims



A dual thread neck and cap safety closure for a container to prevent opening of the container by children yet facilitate opening the container by adults. The neck has at least two spaced apart threads, one clockwise and one counter-clockwise. The cap has a corresponding clockwise thread and a corresponding counterclockwise thread.

3,734,333

## COMPOSITE CAP WITH PULL-OUT PANEL

George J. Foss, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Apr. 2, 1971, Ser. No. 130,591

Int. Cl. B65d 43/02

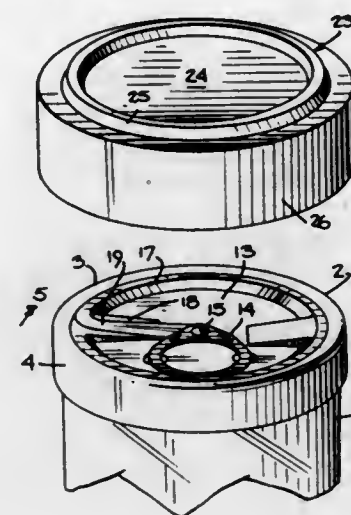
U.S. Cl. 215-46 A

18 Claims

A composite cap is disclosed which has an inner metal cover for sealing a container having a beaded mouth and which is adapted to receive an outer cap-like resealing plastic cover which snaps over the metal cover. The metal cap shell has a depending skirt which is fastened to the container bead. A tear-out panel is provided for removing the central portion of the metal cover. The tear-out panel is defined by a rip tab

which encircles the closure cover along a generally circular line at the container rim so that the tear-out panel leaves an opening providing full access to the contents of the container.

locking flange means is provided for securing one end of the cover section to the base section, and releasable locking



The rip tab includes portions on a recessed center panel as well as on the raised edge of the cap shell and extends along an inclined connecting ramp between the two levels.

3,734,334

## COMBINATION LINER AND LID FOR WIREBOUND CONTAINER

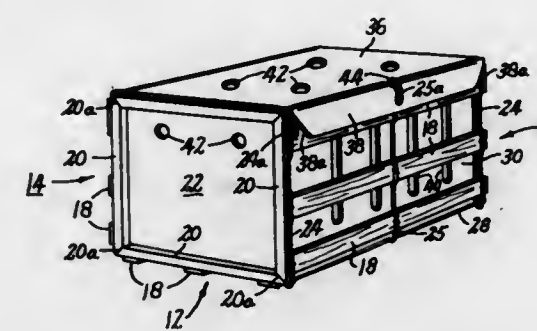
Joseph McCrea, Rockaway, N.J., assignor to Rockaway Corporation, Rockaway, N.J.

Filed Mar. 23, 1971, Ser. No. 127,282

Int. Cl. B65d 25/14

U.S. Cl. 217-3 R

5 Claims



For an open-topped wirebound container of the type having integral end panels of foldable sheet material, a drop-in insert of foldable sheet material divided by score lines into three sections which line the front, bottom and rear sides of the container, a hinged lid which covers the top of the container and a closure flap which extends over the upper portion of the front side. The lid may be secured by a loop fastener on the end of an intermediate binding wire which is extended through a central opening at the dividing line between the lid and closure flap and is bent down against the outer surface of the flap.

3,734,335

## LOCKING CABINET ASSEMBLY

Dale Lincoln, Lafayette, Calif., assignor to Syston-Donner Corporation, Concord, Calif.

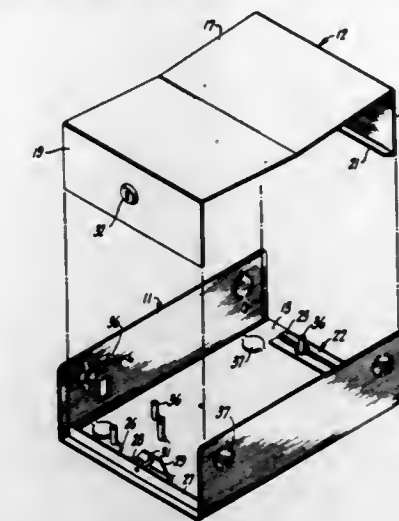
Filed June 28, 1971, Ser. No. 157,338

Int. Cl. B65d 7/00, 55/02

U.S. Cl. 220-4 R

10 Claims

Locking cabinet assembly comprising generally U-shaped base and cover sections disposed in opposite attitudes. Inter-



means is provided for locking the other end of the cover section to the base section.

3,734,336

## THERMALLY INSULATED PORTABLE CHEST

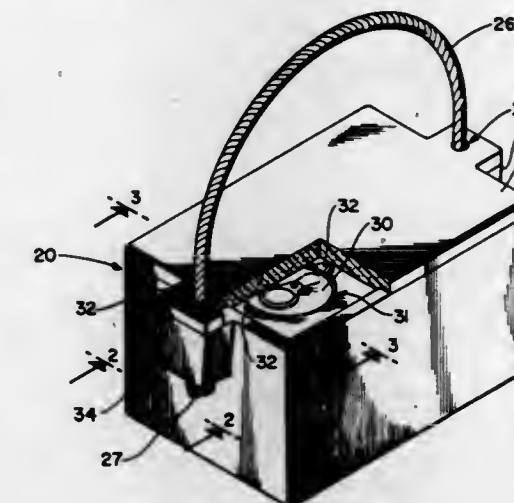
Norman N. Rankow, 1120 Benmore Avenue, Franklin Square, N.Y., and Jack Sloane, 25 Michael Road, Syosset, N.Y.

Filed May 19, 1970, Ser. No. 38,790

Int. Cl. B65d 1/24

U.S. Cl. 220-21

6 Claims



A thermally insulated portable chest made from a rigid plastic foam and designed to hold a plurality of containers in the thermally insulated environment. The chest has a base member provided with a plurality of cavities defining compartments for snugly accommodating the several containers. A removable cover is adapted to fit over the compartments and containers therein to thus provide a thermally insulating seal. A handle member passing through the cover, is attached to the base member and is used as a carrying support for the portable chest.

3,734,337

## SPIN CENTRIFUGE BASKETS

William H. Garrison, Richmond, Va., assignor to American Spin-A-Batch Company, Richmond, Va.

Continuation-in-part of Ser. No. 183,539, Sept. 24, 1971, Pat.

No. 3,699,918, which is a division of Ser. No. 771, Jan. 5,

1970, abandoned. This application Oct. 13, 1971, Ser. No.

188,738

Int. Cl. B65d 25/06

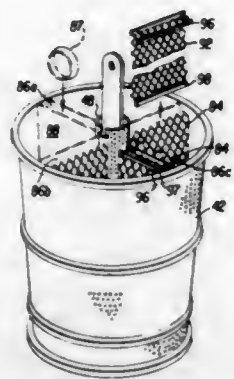
U.S. Cl. 220-22

21 Claims

A perforate spin basket is compartmented by perforate walls extending radially from the axial center thereof. Com-



partment volume is modified by a plate member disposed within a selected compartment and attached to one of said



walls. Means are provided for lifting tilting and inverting the basket.

3,734,338

## CAN END WITH NONDETACHABLE TAB

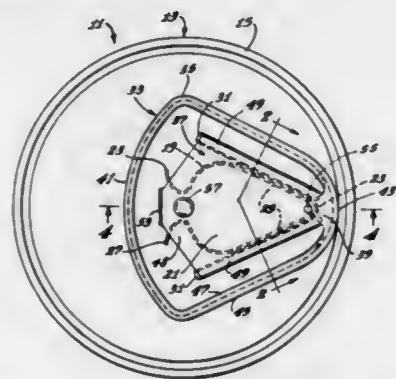
James R. Schubert, Dayton, Ohio, assignor to Ermal C. Frazee, Dayton, Ohio

Filed May 13, 1971, Ser. No. 143,129

Int. Cl. B65d 17/20

U.S. Cl. 220-54

14 Claims



An easy opening container wall comprising a container wall of sheet material, a line of weakness in the container wall defining a tear portion partially removable from the container wall, a tab attached to the tear portion to initiate removal of the tear portion and a guard carried by the tab for hindering contact with the relatively sharp edge portion of the tear strip caused by the rupture of the sheet material.

3,734,339

## GASOLINE DISPENSING NOZZLE

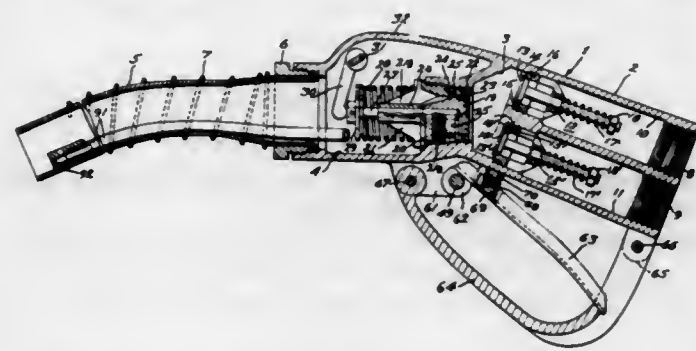
Elnar T. Young, Newtown Square, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Sept. 21, 1971, Ser. No. 182,410

Int. Cl. B67d 5/08

U.S. Cl. 222-56

8 Claims



A gasoline dispensing nozzle has a poppet-type shutoff valve which is operated by means of a rotary shaft sealed into the

nozzle housing, the rotary shaft being rotated through a mechanical linkage which is coupled between the said shaft and a manual operating handle. Automatic shutoff of the gasoline flow is effected by means of a diaphragm which is mechanically coupled to the aforementioned linkage and which moves in response to a pressure differential produced when a tank into which the gasoline is being dispensed becomes "full."

3,734,340

## CONTAINERS AND LINERS FOR USE IN COMPACTING SYSTEMS OR THE LIKE

Amos D. Ippolito, Brooklyn, and William Y. L. Ma, Yonkers, both of N.Y., assignors to Environmental Pollution Research Corporation, New Hyde Park, N.Y., by said Ippolito

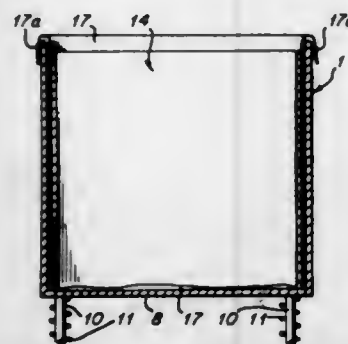
Continuation-in-part of Ser. No. 847,567, Aug. 5, 1969,

abandoned. This application Aug. 13, 1971, Ser. No. 171,711

Int. Cl. B65d 25/14

U.S. Cl. 220-63 R

13 Claims



A container for use with a compacting system includes spring loaded retractable wheel mechanism on the bottom thereof to facilitate handling of the container. The wheels are automatically retracted during the compaction operation due to the pressure of compaction. A liner to enable disposable bags to be more expeditiously used is preferably square in shape and is fabricated of plastic material or the like. Located between the liner and an outer container is a disposable bag. After compaction is complete a portion of the container is swung open and the liner deforms due to residual compression force in the compacted material. This releases the compacted material from the liner and enables the liner to be easily lifted out, the result being that the compacted material remains in the disposable bag, the liner having protected the bag during compaction.

3,734,341

## NESTABLE AND STACKABLE CONTAINER

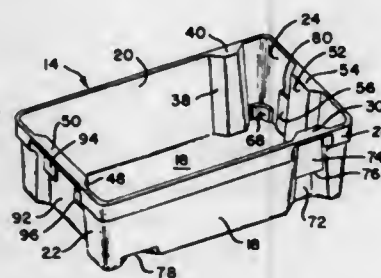
Alvin W. Levenhagen, Linesville, Pa., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed July 12, 1971, Ser. No. 161,621

Int. Cl. B65d 21/04

U.S. Cl. 220-97 D

9 Claims



An open top integral container capable of being either nested or stacked with another similar container. The container has a substantially horizontal bottom and four substantially upright sides. Each of the sides are connected to the bottom and to two other of the sides. First means are formed on

the interior surfaces of the sides to support the similar container when the similar container is received within the container in either a nested or a stacked position. Second means are formed along the exterior surfaces of the sides for being contacted by the similar container to support the container when the container is received within the similar container in either a nested or a stacked position. Thickened reinforcing means are located at strategic positions on the container structure to reinforce the container against damage caused by both externally originating impacts occurring during container handling and by loading forces caused when the containers are stacked with high weight density loads or are nested many times high in large load producing columns.

3,734,342

## BOX ENCLOSURE FOR ELECTRICAL CIRCUITS

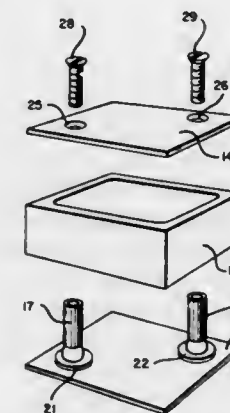
William L. Patterson, Berlin, Mass., assignor to Adams-Russell Co., Inc., Waltham, Mass.

Filed July 9, 1971, Ser. No. 161,053

Int. Cl. H02g 3/10

U.S. Cl. 220-3.94

2 Claims



A box enclosure for electrical circuits formed of a unitary rectangular side wall and top and bottom cover plates. A pair of tubular internally threaded rivets are fastened through the bottom cover plate at diagonally opposite corners, the upper plate having holes through it at the corresponding corners and being fastened in place by screws engaging the internally threaded rivets.

3,734,343

## EASY-OPEN COMPOSITE CONTAINER

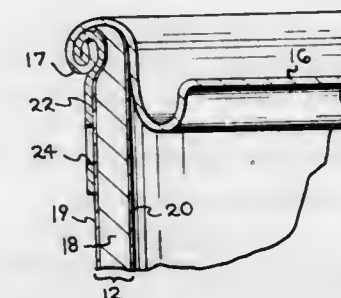
Edwin D. Griffith, Pemberville, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed June 21, 1971, Ser. No. 155,315

Int. Cl. B65d 43/02

U.S. Cl. 220-47

1 Claim



An easy-open composite container is provided and comprises a composite can body, a pair of metal ends, and an opening tab (either plastic, metal, or a combination of materials) which are combined in such a manner so as to facilitate opening of the composite container by pulling up on the open-

ing tab. One of the metal end components is thereby completely removed from the composite container body by the upward force exerted on the opening tab. The opening tab is mechanically joined to the metal end component by double seaming or other process. The metal end component may be easily reapplied to the fiber can body for continued packaging of the contents therein by forcing the end closure back into compression fit engagement with the fiber can body.

3,734,344

## COIN OPERATED ARTICLE VENDING MACHINE

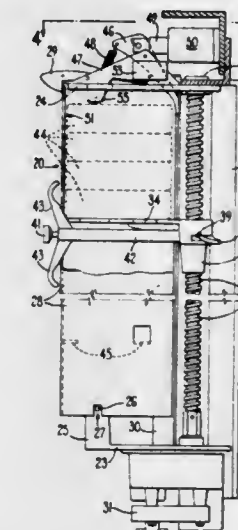
Edward Lindell Teichelman, Norman Park, Brisbane, Queensland, Australia, assignor to Self Serving Pty. Ltd., Newmarket, Brisbane, Queensland, Australia

Filed June 25, 1971, Ser. No. 156,816

Int. Cl. G07f 11/00

U.S. Cl. 221-14

3 Claims



A coin-operated vending machine has a cabinet with a delivery compartment and containing a series of dispensing units, each having a magazine to contain a stack of articles to be vended supported by a platform which is elevated by an electric drive, interrupted when the top article is raised to a discharge station at a top outlet from the magazine. An ejector operates on prepayment of coins and operation of a selector switch to eject the top article from the selected magazine to the delivery compartment.

3,734,345

## PRODUCT VENDING APPARATUS

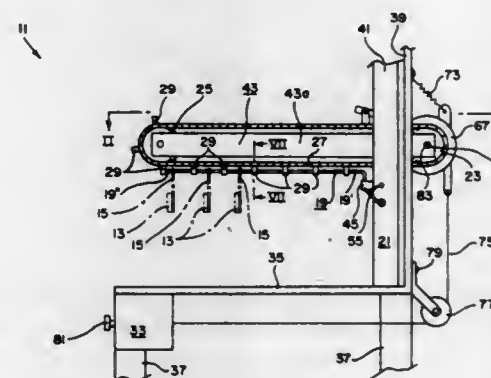
Lue O. Garner, 1698 N.E. 175th Street, North Miami Beach, Fla.

Filed June 2, 1971, Ser. No. 149,240

Int. Cl. B65g 15/00

U.S. Cl. 221-81

9 Claims



A coin-operated device for vending a product which typically is packaged on a card having a hole adjacent one edge



thereof so the card may normally be conveniently suspended and/or displayed on a hook arrangement. The device includes a horizontally positioned rod for holding a plurality of the cards, i. e., the rod extends through the hole in each card and is suitably supported by a frame member, sprocket and chain structure conveniently fitted to the frame structure and juxtaposed above the rod so that the lower flight thereof is parallel thereto, a plurality of fingers attached to the chain at uniform intervals thereon and arranged to jut outwardly therefrom to overlap the rod in turn, drive structure selectively driving the sprocket and chain structure, and coin operated structure which engages and operates the drive structure cyclically for remotely indexing the fingers, thus causing them to eject the cards singularly off one end of the rod. The cards are then intended to be delivered in a typical vending machine manner, e. g., gravitate through suitable chutes, etc., to facilitate ease in assuming possession by the purchaser.

3,734,346

### LOCK BLOCKING DEVICE FOR VENDING MACHINE CLOSURES

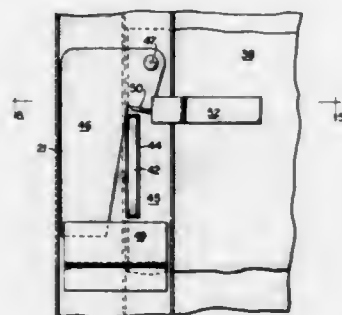
Thomas O. Yingst, Conway, Ark., assignor to Polyvend, Inc., Conway, Ark.

Filed Aug. 25, 1971, Ser. No. 174,794

Int. Cl. A471 1/00

U.S. Cl. 221-101

8 Claims



A gravity operated, lock blocking device for one door of a pair which is disabled upon the closing of the second door.

3,734,347

### BOBBIN DISPENSER

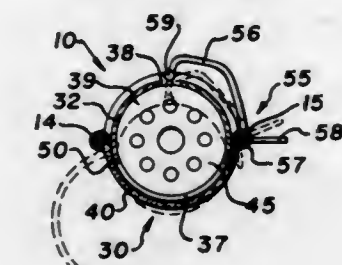
Helen Dunbar, 6755 Fraser Street, Vancouver 15, British Columbia, Canada

Filed May 13, 1971, Ser. No. 143,040

Int. Cl. B65g 59/00

U.S. Cl. 221-134

2 Claims



A dispenser for storing and dispensing sewing machine bobbins, the device having flexible side walls which define an in-feed-outfeed front opening for the bobbins as well as a rear slot through which an ejecting arm can be entered. The dispenser has an ejector mechanism which can be actuated to enter the slot and exert pressure on a bobbin to thrust it out of the in-feed-outfeed opening against the light resistance offered by the flexible side walls.

### 3,734,348 METHOD OF EXPELLING LIQUID PROPELLANT FROM A STORAGE TANK IN A LIQUID ROCKET

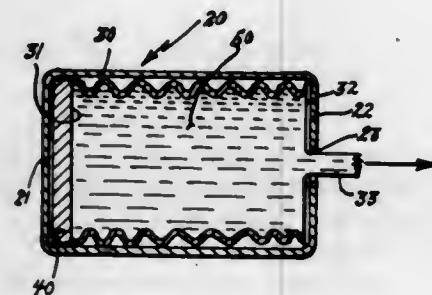
Howard M. White, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 23, 1971, Ser. No. 183,184

Int. Cl. G01f 3/20

U.S. Cl. 222-1

2 Claims



A bellows of "55-Nitinol" metal within a liquid propellant storage tank in a liquid rocket is used to expel liquid propellant from the storage tank for use in the liquid rocket. The "55-Nitinol" bellows is deformed, while at a temperature below the transition temperature of the "55-Nitinol," from the fully expel natural and normal position to the position necessary to permit filling of the storage tank with the liquid propellant. After the storage tank has been loaded with the liquid propellant, and when it becomes necessary to use the liquid propellant, the "55-Nitinol" bellows is heated to a temperature above the transition temperature of the "55-Nitinol." As a result, the "55-Nitinol" bellows returns to the fully expel natural and normal position and, thereby, expels the liquid propellant from the storage tank for use in the liquid rocket.

3,734,349

### CIGARETTE GAS LIGHTER

Jean Gaston Tricot, 53, Rue du Val d'Osne 94, Saint-Maurice, France

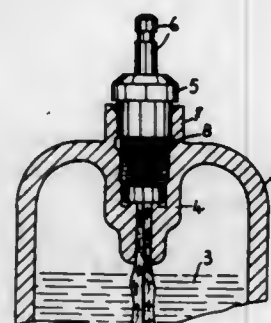
Filed Feb. 11, 1971, Ser. No. 114,572

Claims priority, application France, Feb. 12, 1970, 7005085

Int. Cl. F23d 3/00

U.S. Cl. 222-

1 Claim



Cigarette gas lighter body with a tapped well for engagement with a screw-threaded valve body. The lighter body has, above and around the tapped well, a neck formed by an outer extension with a cylindrical bore and, at the base thereof, an inner groove imparting radial elasticity to the neck.

3,734,350

### COLLAPSIBLE TUBE METERING CLOSURE

Neil S. Waterman, Stamford, Conn., and Stanley F. Lachowicz, New Britain, both of Conn., assignors to Atlantic Design & Development Corporation, Stamford, Conn.

Filed Aug. 16, 1971, Ser. No. 171,813

Int. Cl. B65d 35/40

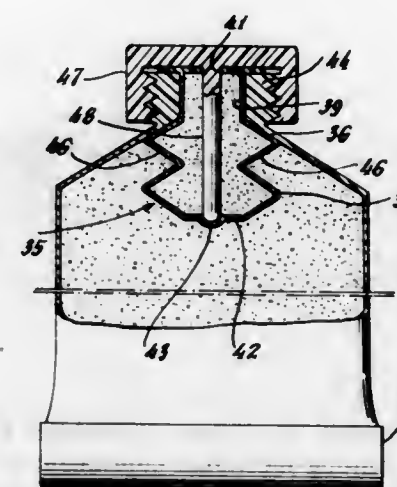
U.S. Cl. 222-92

8 Claims

A movable plastic insert installed within the neck of a collapsible metal tube is engaged by an inwardly extending

protrusion on the underside of a screw cap and is downwardly displaced within the top of the tube when the cap is screwed onto the tube end. Upon removal of the screw cap subsequent manual pressure applied to the collapsible tube body forces a

the dispensing cylinder. In a second position of the control valve, the dispensing cylinder forces a charge outwardly



limited amount of the contents, between the movable insert and the top of the tube out through the tube opening while the movable member moves upwardly to close the opening and prevent excess material from being extruded.

3,734,351

### PRESS FOR A DEFORMABLE BAG

Jean Joseph Gaudin, Bordeaux-Cauderan (Gironde), France, assignor to LABAZ, Paris, France

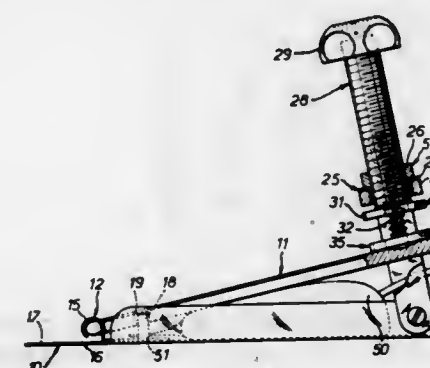
Filed July 26, 1971, Ser. No. 166,112

Claims priority, application France, Aug. 3, 1970, 7028554

Int. Cl. B65d 35/28

U.S. Cl. 222-103

4 Claims



A press for a deformable bag, particularly a blood bag, has two flaps articulating on a common hinge and urged together by pressure means to clamp a bag placed between them. Associated with the pressure means are control means adapted to make a determined pressure threshold perceptible to an operator.

3,734,352

### DISPENSING SYSTEM

Dan W. Dooley, Lake Oswego, Oreg., assignor to Kenneth E. McCarthy, Portland, Oreg.

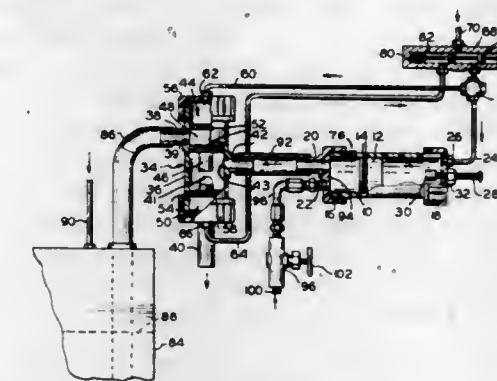
Filed Sept. 11, 1970, Ser. No. 71,399

Int. Cl. G01f 11/06

U.S. Cl. 222-148

6 Claims

A dispensing system for viscous substances includes a pneumatically operated dispensing cylinder and a pilot-operated spool valve which are both controlled by a common control valve. In one position of the control valve, a substance to be dispensed is forced through the pilot-operated spool valve into



through the pilot-operated valve, which is controlled for providing an outlet for the dispensed substance.

3,734,353

### ACTUATOR OVERCAP

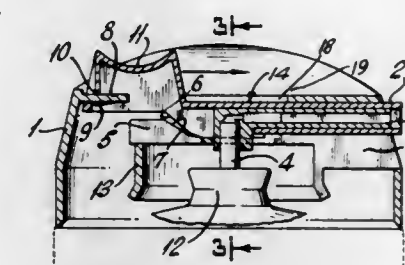
Dudley F. McIlhenny, New York, N.Y., assignor to Clairol Incorporated, New York, N.Y.

Filed July 13, 1971, Ser. No. 162,102

Int. Cl. B67d 5/32

U.S. Cl. 222-153

7 Claims



An actuator overcap for an aerosol container including an actuator member having an elongate spout slidably receiving an elongate nozzle which communicates with a valve stem extending from the aerosol container, the actuator member being slidable in a top portion of the overcap between an inoperative position with the spout withdrawn into the overcap to inhibit dispensing from the aerosol container, and an operative position with the spout extending from the overcap to permit movement of the valve stem to dispense material from the aerosol container.

3,734,354

### CHILD PROOF OVERCAP AND ACTUATOR FOR AN AEROSOL CAN

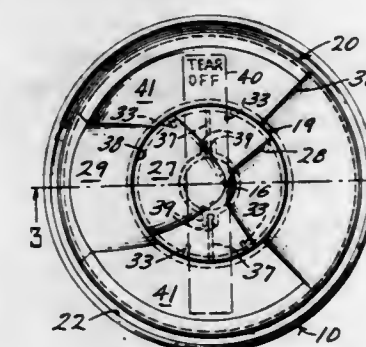
Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed May 31, 1972, Ser. No. 258,354

Int. Cl. B65d 83/14

U.S. Cl. 222-153

3 Claims



A child-proof overcap and valve actuator for an aerosol can of the conventional type which has a central valve stem and an



annular valve seam at the upper end of the can. The overcap and valve actuator are telescoped and have similarly contoured finger recesses and spray discharge openings extending across their tops. The valve actuator fits over a standard valve button and is rotatable relative to the overcap. The valve can be actuated by pressing down on the actuator to depress the valve button and the valve stem. The actuator and overcap have cooperating elements which prevent depression of the actuator when the two are in one relative angular, "locked" position and resilient means to bias them into the locked position. In order to discharge the contents, the user must rotate the actuator relative to the overcap in order to disengage the cooperating elements. Upon release of the actuator, the resilient means return it to the locked position.

3,734,355

# APPARATUS FOR FEEDING ARTICLES AT CONSTANT RATE

Harumi Yamada, Kashihara, Japan, assignor to Koyo Lindberg Hevi Duty Company, Limited, Osaka, Japan

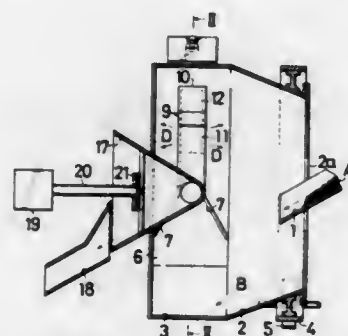
Filed Aug. 10, 1971, Ser. No. 170,506

Claims priority, application Japan, Aug. 14, 1970, 45/71646

Int. Cl. B67d 5/64

U.S. Cl. 222-167

3 Claims



A rotatable drum for receiving articles to be measured out is formed with a recess defined by an outwardly jutting wall of the drum and a passage communicating with the recess. A measuring section includes an independent compartment within the drum formed with a window and has a measuring member whose position is adjustable with respect to the window to control the volume of the articles to be determined by the measuring section. Due to the rotation of the drum, the articles are collected in the recess and then carried through the passage to the measuring section, where the measuring member receives the articles at the adjusted position and permits a constant amount of the articles to be sent into the compartment. An excess amount of the articles are sent back to the interior of the drum through the window. The articles in the compartment are then sent out of the drum by way of a delivery path.

3,734,356

# DIRECT TRANSFER SEEDER

Richard L. Morine, Mentor, and James J. Hokes, Lakewood, both of Ohio, assignors to Fedco, Inc., Mentor, Ohio

Filed June 28, 1972, Ser. No. 267,117

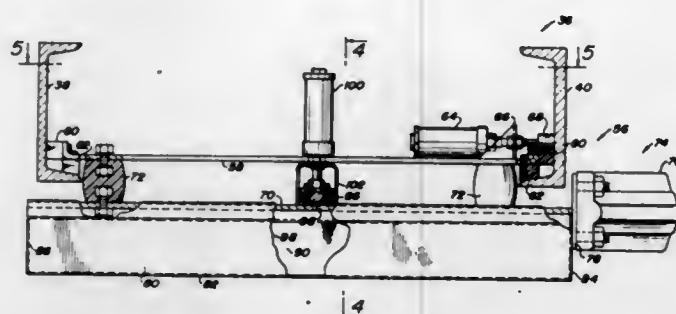
Int. Cl. B65g 3/12

U.S. Cl. 222-199

13 Claims

The specification and drawings disclose an apparatus particularly suited for dispensing material such as seeds and the like. The disclosed embodiment comprises an elongated generally horizontally extending main frame adapted to be positioned over the path of movement of the surfaces on which the material is to be deposited. Carried by the main frame are a plurality of hopper assemblies each including a

downwardly facing wall open in a pattern corresponding to the surfaces on which material is to be deposited. Reticulated means such as wire mesh are connected across the open pattern. Each of the hopper assemblies are carried from the main frame by support means including connecting means for



3,734,357

# PORTABLE HOLDER FOR PRESSURIZED CONTAINERS

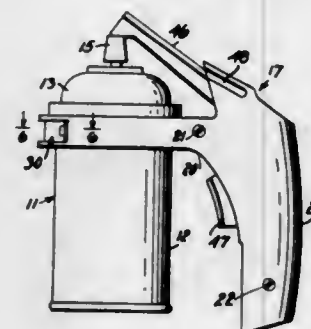
Nello Batistelli, Downey, and James P. S. Adams, Palos Verdes Estates, both of Calif., assignors to said Batistelli by said Adams

Filed Sept. 10, 1971, Ser. No. 179,405

Int. Cl. B05b 11/00

U.S. Cl. 222-323

3 Claims



A combined holder and control device for a pressurized fluid container having a control valve for controlling discharge of the fluid, comprising a member having two parts fastened together to form a handle, the parts having flexible facing semi-circular arms which together are adapted to fit over a beaded formation on the container and a clamping device for flexing the arms inwardly to grip the container, together with an actuating arm operable by squeezing the handle to actuate the valve.

3,734,358

# MEANS FOR APPLYING SUCTION HAVING AUTOMATIC CUTOFF OF DISPLACEMENT VOLUME

John A. Bergeron, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed July 27, 1971, Ser. No. 166,520

Int. Cl. G01f 23/04

U.S. Cl. 222-326

3 Claims

A device is described herein for successively applying pressure and suction to a volume in flow communication

therewith. The device is preferably applied to introducing liquid into and permitting the drainage of liquid from, the in-

vent passage and hole diametrically opposite to smooth the flow of the liquid contents of the container when pouring or drinking, if potable, with a snap-on perimeter featuring a serrated edge for ease in grasping to dial, snap-on or snap-off or follow CLOSE arrows when dialing full or partial flow or clo-



3,734,359

# LIQUID CONTAINER DISPENSING CLOSURE

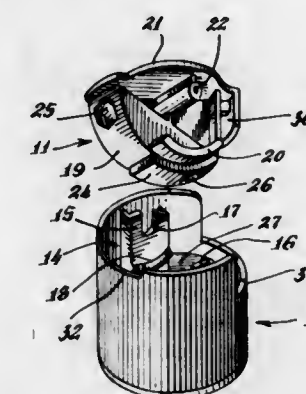
Nell S. Waterman, Stamford, Conn., assignor to Atlantic Design & Development Corporation, Stamford, Conn.

Filed Oct. 27, 1971, Ser. No. 193,024

Int. Cl. B67d 3/00

U.S. Cl. 222-484

5 Claims



A bottle cap for the controlled dispensing of liquid contents is fabricated from two molded plastic parts, one being a cap member for sealing engagement with the lip of a bottle, and the other being a pivotal cover member mounted in the cap and which pivots with snap action into either closed or open positions by the simple application of finger pressure to the rear portion of the cover member. A semi-soft resilient plastic material is molded into one of the abutting arcuate surfaces, either of the pivotal closure member or of the bottle engaging cap member, to effect a high pressure seal therebetween in the closed position. An orifice in the cap is aligned with a spout opening in the cover when in the open position, and is sealed when the cover is closed.

3,734,360

# INSTANT DIAL-A-FLOW CAP

Roland Clough Brown, 425 Stratford Court, Del Mar, Calif.

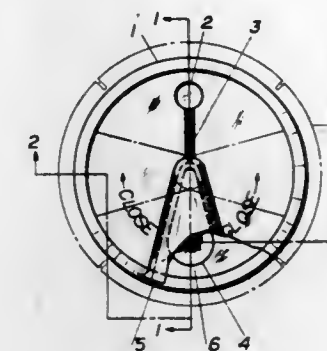
Filed June 21, 1971, Ser. No. 154,794

Int. Cl. B67d 3/00

U.S. Cl. 222-537

1 Claim

An instant dial-a-flow geometrically-shaped cap for liquid containers consisting of a molded spout in one sector with a



3,734,361

# POURING SPOUT LOCK

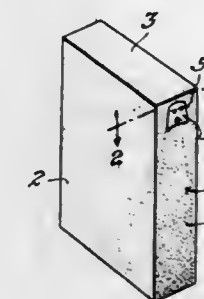
Henry J. Brucker, Summit; Robert J. Brucker, Basking Ridge, and Milton H. Klausmann, Mendham, all of N.J., assignors to Seal-Spout Corporation, Liberty Corner, N.J.

Filed Nov. 1, 1971, Ser. No. 194,117

Int. Cl. B65d 47/00

U.S. Cl. 222-556

6 Claims



A pouring spout formed with a body and side walls is hinged at one end to one end of a discharge aperture in a package wall and swingable selectively in opposite directions to open and close the aperture, respectively, and a safety lock includes either stop lugs on the spout side walls which engage said package end wall and to limit the opening of the spout, or notches in the edges of said side walls, with which are coactive a locking element on the package actuatable to lock the spout or to release the spout respectively upon application and release of pressure on the side walls of the package, or upon limited sliding of the spout in a plane parallel to the plane of said end wall, or upon movement of the locking element relative to the spout.

3,734,362

# DRESSMAKING FORMS

Eric Richard Arthur, 94 Baston Road, Hayes, England

Filed Aug. 26, 1971, Ser. No. 175,080

Claims priority, application Great Britain, Aug. 26, 1970, 41124/70; Sept. 2, 1970, 41932/70

Int. Cl. A41h 5/00

U.S. Cl. 223-68

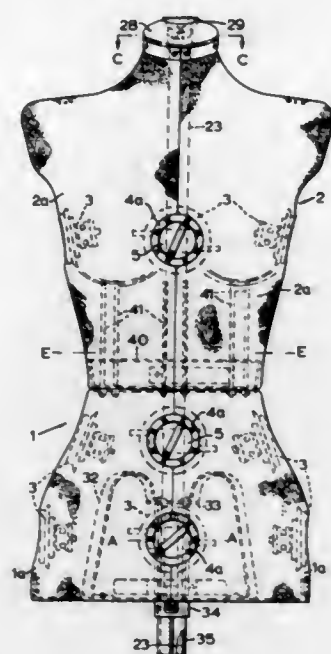
2 Claims

A dressmaking form comprising neck, bust, waist and hip portions, each of said portions consisting of a plurality of sec-



tions which are radially adjustable to increase or decrease the overall circumferential size of the portion by moving setting

destructure for supporting said plates in an operative inclined position, such understructure lying in flat collapsed relation-



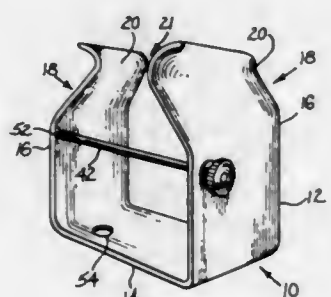
mechanism against appropriate dials, the waist and hip portions being relatively adjustable vertically to allow for different depths of waist sizes.

### 3,734,363 BOOT JACK DEVICE

Walter Dorwin Teague, Jr., Tweed Boulevard, Nyack, N.Y.  
Filed June 16, 1971, Ser. No. 153,532  
Int. Cl. A47J 51/02

U.S. Cl. 223-116

14 Claims



A boot jack is disclosed which is formed from a generally U-shaped frame member having a bight portion which defines a pedal or stirrup member at the base of the frame and a pair of spaced generally upstanding leg members which extend therefrom. The leg members each have a free end portion and define a space therebetween above the pedal for receiving the rear portion of a boot and shoulder means are formed at the free end portions for engaging the boot inserted in the space between the free end portions to facilitate removal of the boot from the foot of a wearer.

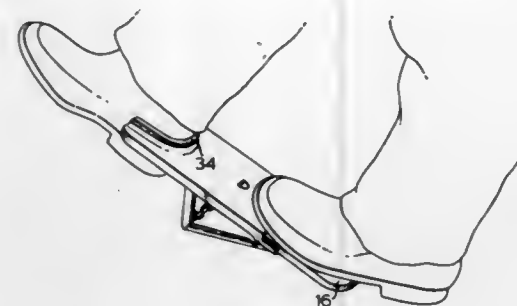
### 3,734,364 BOOTJACK

Nicholas Mayer, 86 Grenfell Street, Oshawa, Ontario, Canada  
Filed May 19, 1972, Ser. No. 255,008  
Int. Cl. A47J 51/02

U.S. Cl. 223-116

4 Claims

A simultaneously collapsible and extensible bootjack comprises in combination a heel accommodating plate and a stabilizing plate, the two being in slidable relationship, and an un-



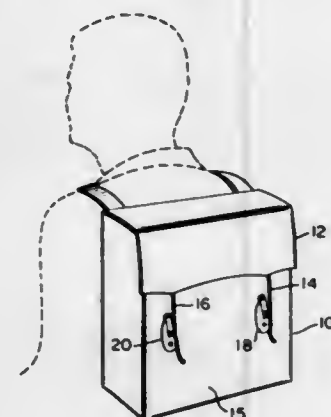
ship against the plates when these are in optimum overlapping relationship, the understructure being hingedly connected to the said plates.

### 3,734,365 BACK PACK AND FASTENER

Donald H. Sprecker, 291 Prospect Street, Northampton, Mass.  
Filed Feb. 10, 1972, Ser. No. 225,182  
Int. Cl. A45F 3/00

U.S. Cl. 224-8 R

5 Claims



A back pack having a closure flap with at least one fastening line attached thereto is engaged on a fastening means attached to the back of the back pack for closing and securing the flap thereof. The fastening means has an elongated body member secured at one end thereof to the back pack, and a post located near the second end of the body member which is secured thereto and to the back pack, with the post and body member forming a pulley-like element with the body member adapted to receive the line and place tension thereon when the line is pulled over the post. An ear protruding from the second end of the elongated body member and extending toward the first end thereof forms a notch with the body member which is adapted to receive and wedge therein the line which holds the flap closed under tension.

### 3,734,366 PACK FRAME

Thomas E. Wood, 3863 42nd N.E., Seattle, Wash.  
Filed Feb. 11, 1972, Ser. No. 225,467  
Int. Cl. A45F 3/00

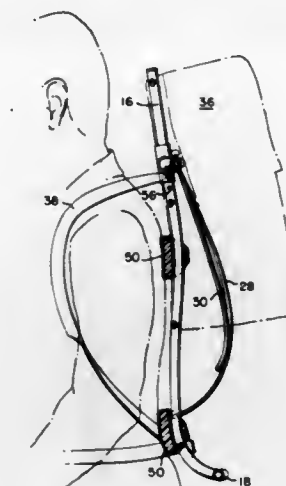
U.S. Cl. 224-25 A

9 Claims

A lightweight pack frame constructed of rigid polyvinyl chloride or like material including in one embodiment a molded U-shaped major support member, the legs of the "U" being joined by a curved, transverse extending support member which is adjustably mounted thereon to allow the size of the pack frame to be changed. A pair of flexible rods are end mounted to extend between the lower portion of the U-

shaped major support member and the transverse support member such that they are bowed outwardly from the plane of

for maintaining a constant tension on the tape while recording, reproducing or erasing. A resiliently mounted pulley is



the U-shaped support member to springingly hold a pack bag mounted on the frame away from the wearer's back.

### 3,734,367 CANOE CARRIER

William S. Jackson, 308 Packard Road Apt. No. 1, Ann Arbor, Mich.

Filed Jan. 25, 1972, Ser. No. 220,584  
Int. Cl. A45F 3/15

U.S. Cl. 224-25 A

10 Claims



Apparatus to be worn by an individual for carrying a canoe in an inverted position and simultaneously to be used for carrying a pack. The apparatus comprises a pack carrier adapted to be strapped to the back of the individual, and includes arms pivotally connected to the lower portion of the pack carrier and having attachment means at the distal ends of the arms for attachment to a transverse strut of the canoe. The pack carrier has second attachment means for pivotally supporting a second strut of the canoe.

### 3,734,368 MAGNETIC TAPE RECORDER WITH CONSTANT TAPE TENSION

Stefan Kudelski, Ch. de la Croix, 1052 Lemont-sur-Lausanne, Switzerland

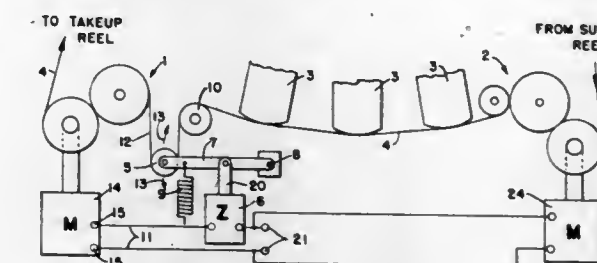
Filed Nov. 26, 1971, Ser. No. 202,478  
Claims priority, application Switzerland, Nov. 27, 1970, 17582/70

U.S. Cl. 226-44

Int. Cl. B65h 25/04

11 Claims

A magnetic tape recorder having a tape tension regulator



coupled to an impedance in the motor input circuit so that a displacement of the pulley controls the speed of the motor.

### 3,734,369 WELDING FILLER MATERIAL FEED APPARATUS

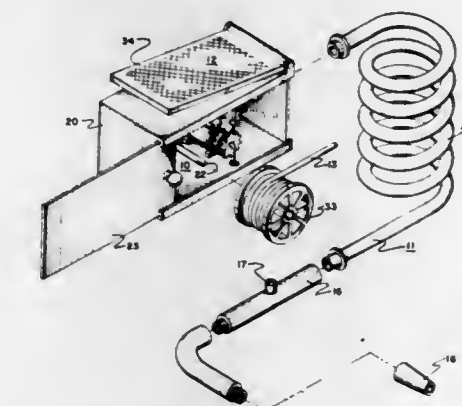
Robert P. Johnson, 7237 South 129th Street, Seattle, Wash.

Filed Nov. 1, 1971, Ser. No. 194,296

Int. Cl. B65h 17/20

U.S. Cl. 226-134

2 Claims



The welding filler material feeding apparatus of the present disclosure comprises a filler wire guide, a driving box, and electric control means to selectively control the flow of material from the driving box. The filler wire guide includes a flexible conduit provided at one of its terminal ends with a rigid barrel and a tip on the rigid barrel, the tip being tapered toward its terminal end opposite the barrel engaging end. The driving box is attached at one of its terminal ends to the terminal end of the flexible conduit. The drive box includes a drive means comprising a motor having a motor wheel with a concave curved groove and suitable spur gear-like teeth at one of its terminal ends and having an idle wheel provided parallelly directly over the motor wheel, with a concave curved groove and a complementary set of spur gear-like teeth operable to engage the motor wheel gear teeth; and a spindle operable to receive a spool of filler wire disposed in the box.

### 3,734,370 ACCUMULATOR FOR STRIP-LIKE MATERIAL

Charles Storer Shumaker, Pittsburgh, Pa., assignor to United Engineering and Foundry Company, Pittsburgh, Pa.

Filed Oct. 28, 1971, Ser. No. 193,328

Claims priority, application Great Britain, Dec. 30, 1970, 61,703/70

U.S. Cl. 226-119

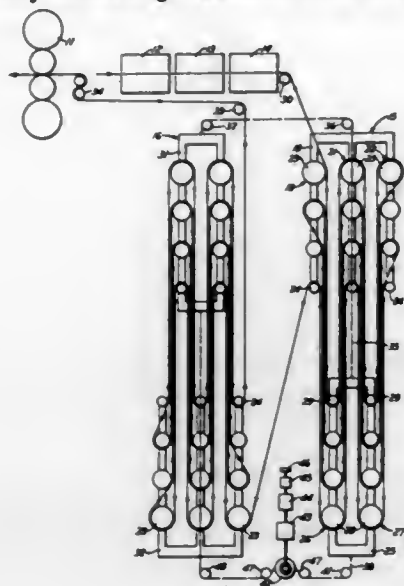
Int. Cl. B65h 17/42

3 Claims

The disclosure this invention relates to an accumulator for strip-like material, such as steel sheet gauge stock issuing to a strip processing apparatus. The accumulator is shown located before a rolling mill and comprises two independent, but cooperative units, each including three stationary vertical spaced-apart rows of strip supporting rollers between which



rows may be located two movable similar rows of strip supporting rollers; the rollers of the stationary rows varying in progressively increasing diameters from the side adjacent the



movable rolls and the rollers of the movable rows having rollers complementary to the rollers of the stationary rows, but whose diameters vary progressively in a reverse order.

3,734,371

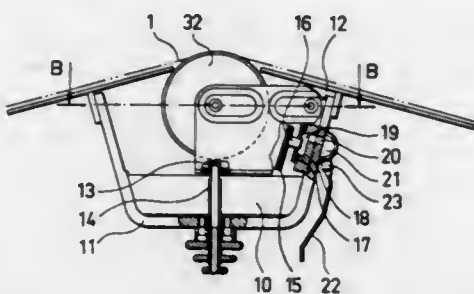
#### DEVICE FOR REGULATING THE TENSION OF A MOVING WEB

Gerhard Walter Dorfel, Weilheim-Teck, Germany, assignor to Ahlstrom A. Osakeyhtiö, Noormarkku, Finland  
Filed June 28, 1971, Ser. No. 157,485

Claims priority, application Finland, June 30, 1970, 1846/70

Int. Cl. B65h 23/08

U.S. Cl. 226—109



An equalizer which includes several rollers placed next to each other on one side of the web in the transversal direction of the web, the rollers being attached with bearings between the branches of bearing forks which can be essentially fitted perpendicular and adjusted in relation to the web, and possibly also including a spreader, fitted in front thereof is disclosed.

3,734,372

#### APPARATUS FOR FOLDING FLEXIBLE SHEET

Takeshi Ebisu, Matsubara-Kudaru Manahon-Bushi, Kyoto, Japan

Filed Nov. 29, 1971, Ser. No. 202,818

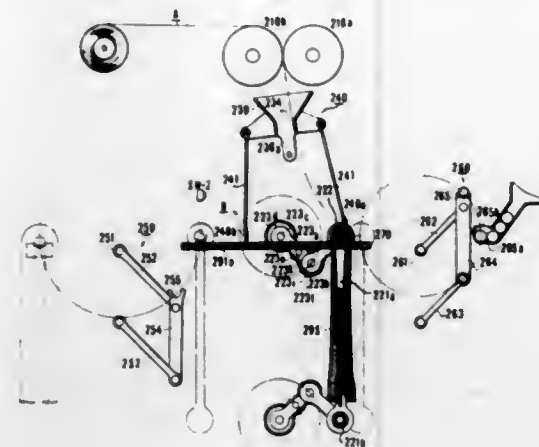
Claims priority, application Japan, Nov. 30, 1970, 45/106191; Nov. 30, 1970, 45/106192; Dec. 29, 1970, 45/125816; Mar. 16, 1971, 46/14287

Int. Cl. B65h 45/20

U.S. Cl. 226—114

An apparatus for folding a belt-like flexible sheet comprises a feeder for downwardly feeding said flexible sheet, a plurality

of sheet-hanging members, an actuator for reciprocatingly moving one of said sheet-hanging members across a vertical plane along which the flexible sheet is fed so that the sheet is folded in zigzag with the folded portions thereof supported to the sheet-hanging member at the central position of a folding



3,734,373

#### CARTRIDGE TAPE RECORDER/REPRODUCER STRIPPER ASSEMBLY

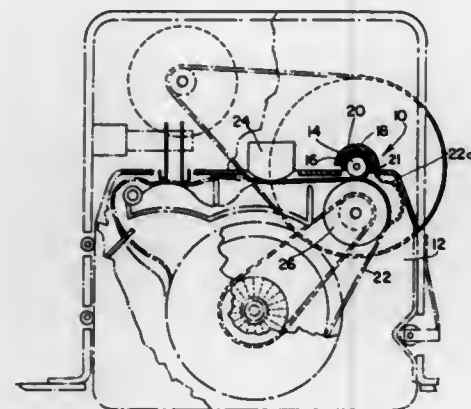
Donald J. Dattilo, Mount Prospect, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Feb. 19, 1971, Ser. No. 116,933

Int. Cl. B65h 23/04

U.S. Cl. 226—196

3 Claims



A stripper assembly for maintaining a minimum clearance between the capstan shaft and stripper edge in a cartridge tape recorder and/or reproducer, which includes a body having resilient fingers or annular base portions for connecting the stripper member in spaced relation to the capstan shaft. A projection on the wall of the body engages the capstan shaft support to hold the stripper member in a fixed position with respect to the capstan shaft. The annular base portions or fingers include bearing members for a close running fit with said capstan shaft.

3,734,374

#### GUIDE ASSEMBLY

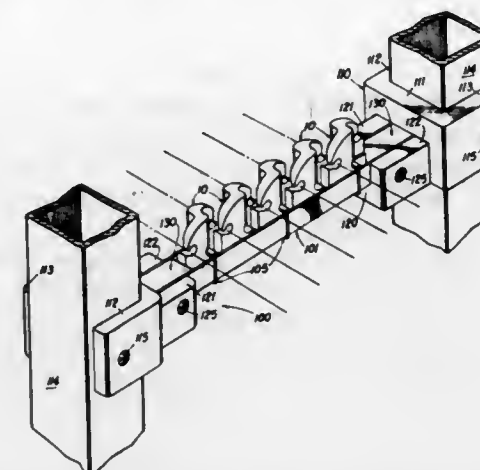
Cooper Perry, Roanoke, Ala., assignor to Batson-Cook Company, West Point, Ga.

Filed Jan. 17, 1972, Ser. No. 218,381

Int. Cl. B65h 23/32

U.S. Cl. 226—199

19 Claims



An assembly for use in guiding continuous lengths of material, the assembly being constructed of a plurality of guide members, each having an integrally formed body defining oppositely directed material guiding notches. The guide members are constructed so that the two oppositely directed notches are located in spaced parallel planes, and detailed in location relative to each other when assembled whereby one material guiding notch of one guide member is coaxially aligned with an oppositely directed material guiding notch of an adjacent guide member to define a material guiding passageway. The two aligned notches are axially spaced relative to each other to define a material threading passageway which communicates with and is angularly disposed relative to the material guiding passageway to permit a length of material to be inserted into or removed from the material guiding passageway. The guide members also include formed surfaces adapted to interlock with complementary surfaces on adjacent guide members when supported in an assembled juxtapositioned relationship with each other. A channel-shaped support member is provided for supporting the guide members in transverse alignment and in juxtaposition relative to each other so that the formed surfaces are in interlocking relationship. Spacer means is operatively associated with the channel-shaped support member so that the guide members can be transversely adjusted to a selected set position and can be spaced relative to each other to permit selected guide members to be independently added or removed.

3,734,375

#### FASTENER INSERTING MACHINE

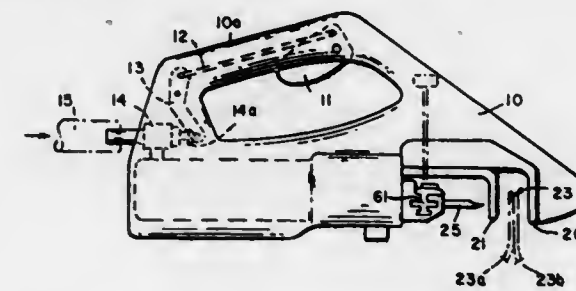
Arnold R. Bone, Needham, and Ronald W. Krohn, Marlboro, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed May 27, 1971, Ser. No. 147,529

Int. Cl. B65c 7/00

U.S. Cl. 227—67

25 Claims



A machine for inserting an attachment member having a filament with a head on either end through an opening in an

article, said machine including a clamp for holding the article, a needle for penetrating through the article and having a slot for permitting a head of the filament to slide therethrough, a rod for pushing the head through the needle and an indexing mechanism for positioning the attachment member in front of the needle, the indexing mechanism having a wheel with teeth, an indexer member for engaging the teeth to rotate the wheel, a holder member for engaging the teeth to prevent the wheel from rotating and a release rod and connecting member for moving the holder rearward and causing the indexer member to pivot away from the teeth of the indexer wheel.

3,734,376

#### WALL FRAME CONSTRUCTION APPARATUS

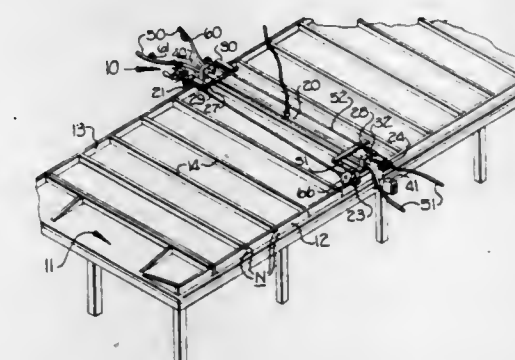
William D. Abernathy, Route 2, Vale, N.C.

Filed Feb. 16, 1971, Ser. No. 115,463

Int. Cl. B27l 7/02

U.S. Cl. 227—111

7 Claims



Rough wall frames for building erection are constructed by a nailing apparatus which is supported on an elongate plate and elongate sole which are to form a portion of the rough wall frame. The nailing apparatus supported on the plate and sole is moved therealong while driving nails through the plate and sole into the ends of studs positioned therebetween, thereby securing the plate, sole and studs together into the wall frame.

3,734,377

#### PART FEEDING ATTACHMENT FOR FASTENER DRIVING TOOLS

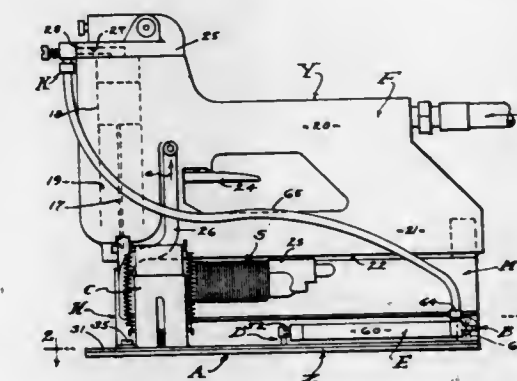
Ben Munn, 8218 Delongpre Avenue, West Hollywood, Calif.

Filed July 19, 1971, Ser. No. 163,665

Int. Cl. B27l 7/02

U.S. Cl. 227—120

20 Claims



A part feeding attachment combined with a fastener driving tool to advance one part at a time into position to be embraced and/or pierced by a fastener delivered by said tool; especially for pneumatically powered tools driving staples and the like and to advantageously utilize exhaust air to effect automatic operation; the attachment being universally adaptable to tools of varied type and of different manufacture, and characterized by its light weight and minimized space requirements.

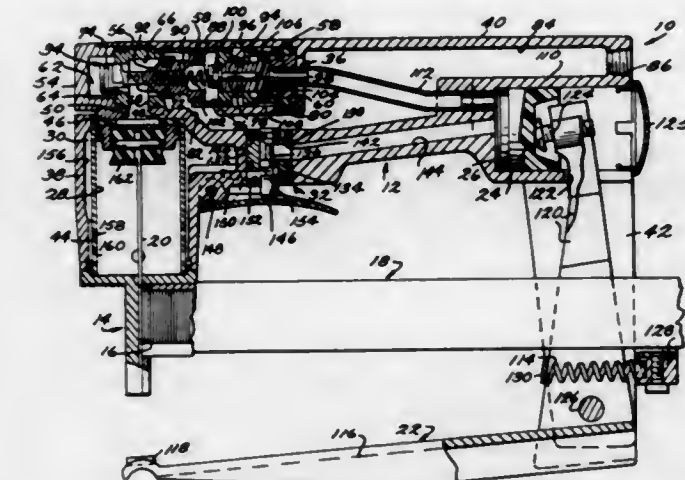


3,734,378

**PNEUMATICALLY ACTUATED STAPLING PLIER**  
Joseph A. Rice, Swansea, Mass., and Edward I. Fisher,  
Westerly, R.I., assignors to Textron Inc., Providence, R.I.  
Filed Sept. 2, 1971, Ser. No. 177,370  
Int. Cl. B27I 7/08

U.S. Cl. 227-124

9 Claims



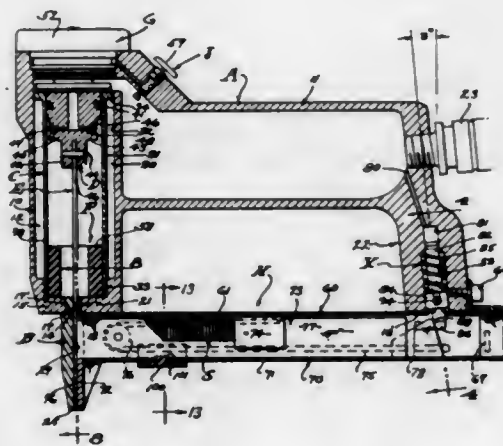
A pneumatically actuated stapling plier device including a generally L-shaped cylinder member actuated by a piston mounted in cylinder positioned in the rearward end of the tubular part of the housing structure defining the handle portion thereof, the arrangement of the clincher member and its driving piston rendering the device less bulky and easier to handle and eliminating external connecting rods heretofore provided which are subject to damage during use. The device includes a sequencing valve operable to sense predetermined pressure conditions established in the clincher cylinder by the operation of a manually actuated valve to sequentially operate a main valve controlling the communication of reservoir pressure with the drive cylinder thereby insuring a sequential cycle of operation of the clincher arm and staple driving element in which the workpiece is compressed prior to the driving and clinching of the staple therethrough.

3,734,379

**AIR BIASED MAGAZINE LOCK AND GUIDEWAY CLOSURE FOR FASTENER DRIVING TOOLS**  
Richard E. Powers, San Marino, Calif., assignor to Powers Wire Products Co., Inc., El Monte, Calif.  
Filed May 21, 1971, Ser. No. 145,755  
Int. Cl. B27I 7/08

U.S. Cl. 227-127

14 Claims



An air lock and positioning device for the magazine slide and guideway closure of a fastener driving tool, the advantageous features thereof being a substantial reduction in

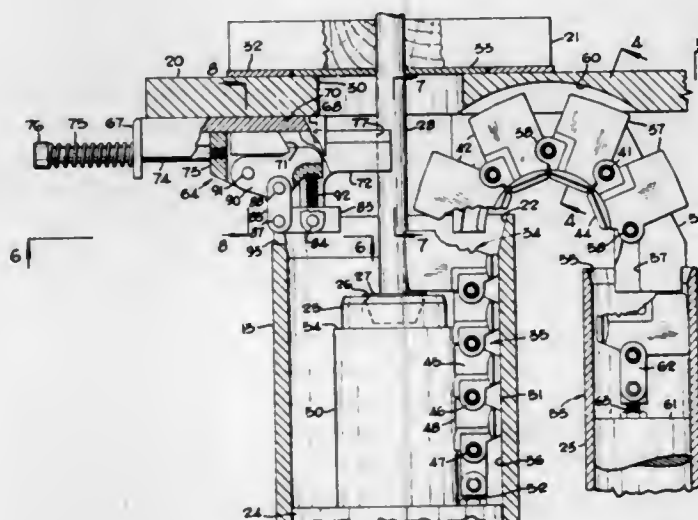
size accompanied by improved locking action and increased safety, whereby readjustment of the magazine slide and guideway closure is continuously affected during operation so as to assure tightness and consequent accurate guideway dimensions, and all of which is accomplished with few and easily formed parts.

3,734,380

**MACHINE FOR DRIVING MINE ROOF PINS**  
Gerald W. Elders, 10 Hillcrest, Christopher, Ill.; Thomas E. Schneider, deceased, late of 601 E. Park St., DuQuoin, Ill. (Thomas R. Schneider, administrator), and John R. Alongi, 350 E. Main St., DuQuoin, Ill.  
Continuation-in-part of Ser. No. 846,795, Aug. 1, 1969. This application Oct. 6, 1971, Ser. No. 186,848  
Int. Cl. B25c 7/00

U.S. Cl. 227-140

18 Claims



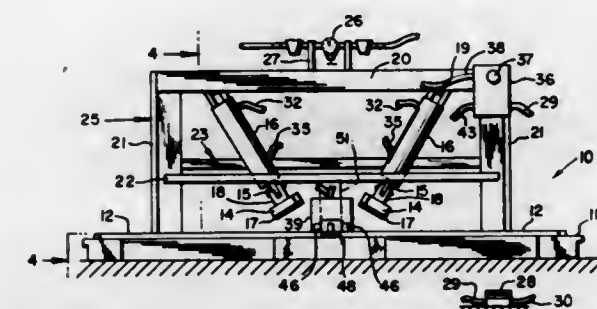
A machine for driving mine roof pins having a pin-centering support extending along a cylinder and supported by a piston so as to move with the piston when the piston drives the pin along the cylinder and into a mine roof, the pin-centering support engaging the pin to guide and support the pin after the pin is driven, and moving laterally out of the cylinder as it disengages from that portion of the pin about to enter the mine roof. The pin-centering support includes a plurality of support lengths engaging the side of the pin about the pin periphery, each support length having a plurality of interengaging, relatively movable support members. A secondary power mechanism is operatively connected to the support lengths for urging the support lengths back into the cylinder incident to retraction of the piston. Each support length engages the pin with substantially no relative movement therebetween and moves relative to the cylinder as the pin is driven by the piston means. In one embodiment, the support lengths are spaced substantially equidistantly about the pin periphery, and adjacent support members of each support length have substantially continuous and aligned pin-engaging surfaces to provide a substantially continuous, longitudinal support for the pin. Further, adjacent support members of the support lengths are pivotally interconnected to provide chains. A receiving assembly is provided to guide the support as it moves laterally from the cylinder. An auxiliary support selectively engages the side of the pin about the pin periphery in the region unsupported by the primary pin-centering support near the top of the cylinder and selectively disengages from the side of the pin and out of the path of the piston means to enable complete insertion of the pin by the piston.

3,734,381

**APPARATUS FOR ADHERING AND INTERLOCKING MITERED MOLDING STRIPS TO A PANEL**  
Henry L. Blevio, 1 Diamond Road, Danbury, Conn.  
Filed Mar. 10, 1971, Ser. No. 122,944  
Int. Cl. B27I 7/02

U.S. Cl. 227-148

4 Claims



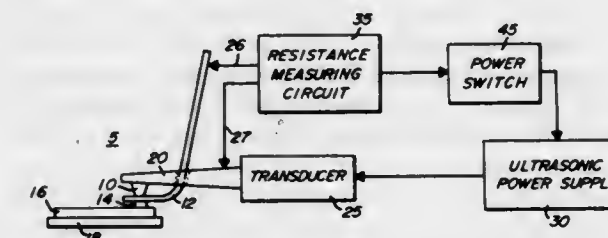
The machine operates upon a pair of mitered molding strips positioned on a flat base against guide rails at right angles to each other, to force their mating edges together and maintain them so while a clamp nail is driven into the juxtaposed strip ends to interlock the strips, thus forming an L-shaped member. A second L-shaped member is similarly formed of a second pair of mitered strips. To form a frame per se, each L-shaped member has one strip thereof positioned against one of the rails and the operation is repeated to interlock the juxtaposed ends of the two members. Finally, the two members which are interlocked at one end are withdrawn and reinserted after turning through an angle of 180 degrees, to interlock the opposite juxtaposed ends, thus completing the frame. To secure the two L-shaped members to a rectangular panel, they are fitted against the panel edges and with the panel between them the operations of interlocking the opposite ends of the members is repeated.

3,734,382

**APPARATUS FOR CONTROL OF WELDING APPARATUS**  
Keith G. Spanjer, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.  
Filed Apr. 3, 1972, Ser. No. 240,442  
Int. Cl. B23k 5/20

U.S. Cl. 228-1

2 Claims



A system for improving the quality of a bond obtained from an ultrasonic welding apparatus includes a resistance measuring circuit for monitoring the electrical resistance between the wire to be bonded and the bonding head. The welding apparatus is automatically de-activated upon an increase in said resistance, the increase being indicative of bond formation. De-activating the bonding apparatus immediately following bond formation prevents the application of further ultrasonic energy from weakening the bond.

3,734,383

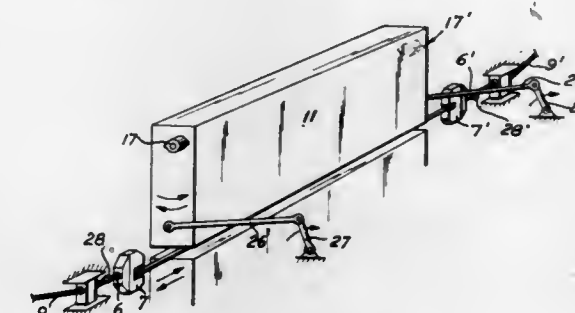
**APPARATUS FOR MANUFACTURING WELDED WIRE MESH BY FRICTION WELDING**  
Klaus Ritter; Josef Ritter; Gerhard Ritter, and Gott Hans, all of Graz, Austria, assignors to Firma EVG Entwicklungs-U. Verwertungsgesellschaft m.b.H., Graz, Austria  
Filed Apr. 5, 1971, Ser. No. 130,973

Claims priority, application Austria, Apr. 7, 1970, A 3181/70

Int. Cl. B23k 27/00

U.S. Cl. 228-2

11 Claims



In a process for manufacturing welded wire mesh by friction welding the longitudinal wires of said mesh are held stationary at predetermined distances apart and a transverse wire is subjected to tension and caused to oscillate at high frequency and small amplitude in the direction of its own length and is thrust against said longitudinal wires during said oscillation at the crossing points to produce frictional heat in the crossed wires, said oscillation is interrupted upon attainment of welding temperature whereby said crossed wires are welded together, and said thrust is relaxed after cooling and hardening of said welds and the mesh is advanced a step corresponding to the predetermined transverse wire spacing.

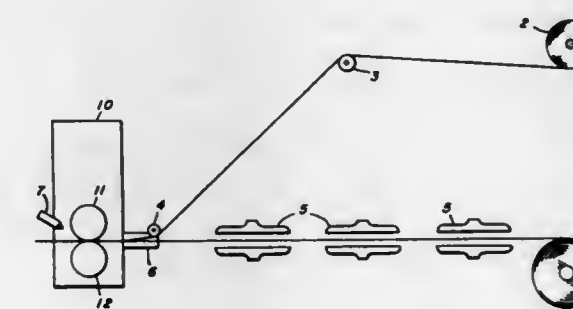
3,734,384

**APPARATUS FOR ROLL PRESSURE BONDING**  
Larry M. Kozak, Tarentum, and Raymond L. Southern, Lower Burrell, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 824,205, May 13, 1969, Pat. No. 3,632,034. This application June 11, 1971, Ser. No. 152,318  
Int. Cl. B23k 1/00

U.S. Cl. 228-4

10 Claims



The application describes a method and apparatus for roll pressure bonding a plurality of stripes to a substrate. Through unique roll arrangements and designs, stripes of controllable thickness are produced, as conditions which cause non-uniform roll pressures are eliminated. Furthermore, these unique roll arrangements and designs protect the substrate in the areas between the stripes from surface damage such as roll scratching. Additionally, novel means are provided which both guide and heat the materials.



3,734,385

# **APPARATUS FOR SIMULTANEOUSLY BONDING A PLURALITY OF WIDTHS OF STRIPING MATERIAL TO A SUBSTRATE**

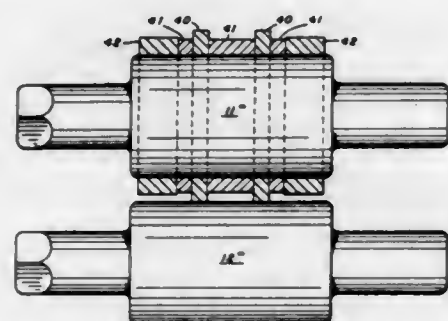
Larry M. Kozak, Tarentum, and Raymond L. Southern, Lower Burrell, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 824,205, May 13, 1969, Pat. No. 3,632,043. This application June 11, 1971, Ser. No. 152,317

U.S. Cl. 228-4

Int. Cl. B23k 1/00

10 Claims



The application describes a method and apparatus for roll pressure bonding a plurality of stripes to a substrate. Through unique roll arrangements and designs, stripes of controllable thickness are produced, as conditions which cause non-uniform roll pressures are eliminated. Furthermore, these unique roll arrangements and designs protect the substrate in the areas between the stripes from surface damage such as roll scratching. Additionally, novel means are provided which both guide and heat the materials.

3,734,386

# **WIRING APPARATUS WITH WIRE PATH FORMING MEANS**

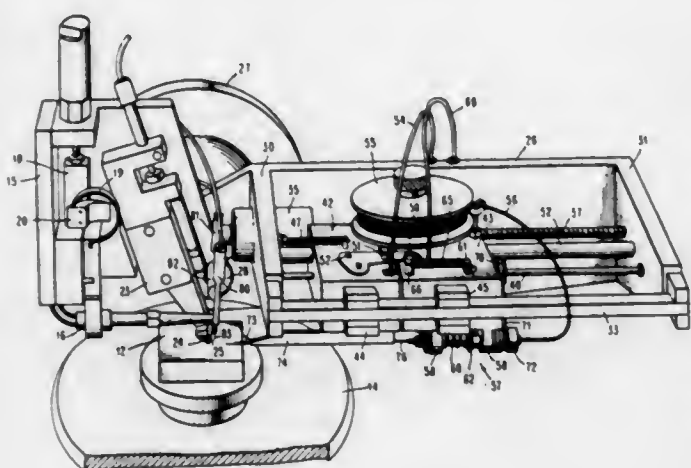
Herbert K. Hazel, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1971, Ser. No. 158,344

Int. Cl. B23k 1/20

U.S. Cl. 228-5

6 Claims



Improved apparatus for bonding a wire between two conductive pads on a circuit module is disclosed. Means is provided for bending the wire to conform to a predetermined path from the first bonding site to the second. The bends are unsupported and the wire feed is arranged to supply additional wire to the module without disturbing a previously formed bend.

3,734,387

# **TANK FABRICATION SYSTEM**

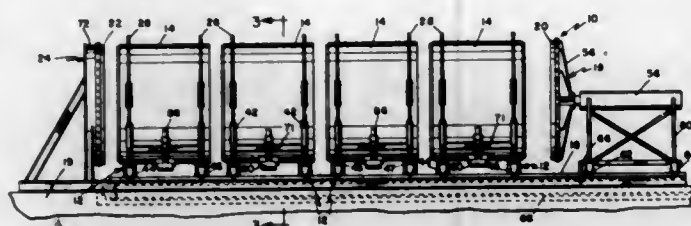
Alfred L. Sannipoli, Escondido, Calif., assignor to Lyco Manufacturing, Inc., Escondido, Calif.

Filed May 18, 1971, Ser. No. 144,532

Int. Cl. B23k 5/00

U.S. Cl. 228-6

1 Claim



A system and method of fabricating tanks comprising a plurality of carriages mounted on tracks and supporting tank sections and a chain drive mechanism for forcing the tanks into contacting relationship. Also included is a hydraulic ram for applying further contacting pressure so that intimate contact is established between adjacent sections. If the sections are supplied with the flanges, flanges are forced within the flange receiving portions of adjacent sections. The carriages contain provision forcing the tank section to assume a more perfectly circular, cross-section and for rotating the entire assembly after it is structurally joined by a series of tack welds. The final seam weld is made with an automatic welder over the entire circumference of the joint between each adjacent section as the tank is rotated.

3,734,388

# **OPENING MEANS FOR TETRAHEDRAL CONTAINER**

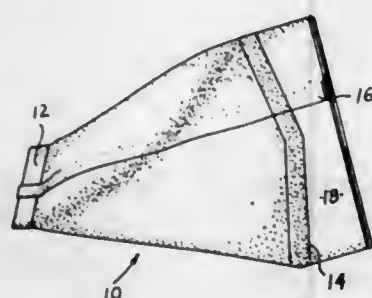
Arthur W. Hopkins, Stonebridge Road, Cornwall, N.Y.

Filed Mar. 8, 1972, Ser. No. 232,751

Int. Cl. B65d 83/00, 17/00

U.S. Cl. 229-7

16 Claims



A tetrahedral shaped container is provided with a pair of tabs at one end. By pulling apart the tabs, an opening is formed at one end. The end seal at the tab end of the container is critically shaped so as to provide for the combination of ease of opening, strong seal which will not prematurely open or leak, and which will not distort the configuration of the container. The seal shape must deviate from a straight line normal to the longitudinal axis of the container by an extent great enough to permit the opening force to be applied to only a small region of the seal, but by an extent small enough to minimize distorts in the container.

3,734,389

# **PACKAGE CORNER POST**

Philip H. Brown, Zionsville, Ind., assignor to Inland Container Corporation, Indianapolis, Ind.

Filed Apr. 15, 1971, Ser. No. 134,375

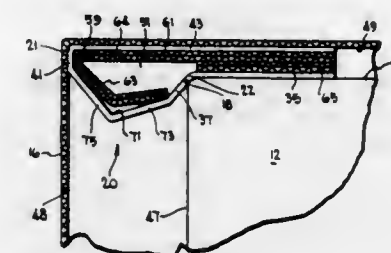
Int. Cl. B65d 25/16

U.S. Cl. 229-14 C

11 Claims

In a container for a bulky and heavy article generally cubic in shape, a vertical corner post for cushioning and protecting a

vertical edge of the article. The corner post has a cross-section in the shape of the numeral 4 and is positioned such that a recess engages an adjacent outer edge of the article and a vertex of the post extends into an adjacent inner corner of the



container. An hypotenuse panel of the post has a score line along its length which permits the hypotenuse panel to fold outwardly at the score line upon application of an extreme or repeated lateral compressive force to cushion the article against the force.

3,734,390

# **FRONT-OPENING CARTON WITH UNIQUE END FLAP ARRANGEMENT**

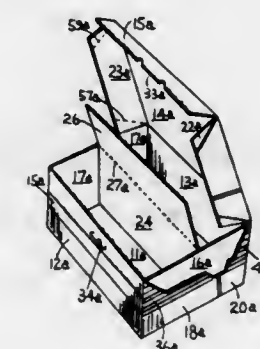
Kenneth T. Buttery, Kalamazoo, and Richard G. Haas, Parchment, both of Mich., assignors to Brown Company, Kalamazoo, Mich.

Filed May 3, 1971, Ser. No. 139,657

Int. Cl. B65d 5/48, 5/54

U.S. Cl. 229-27

30 Claims



A front-opening, rectangular paperboard carton including top, bottom, front wall, rear wall and end walls, together defining an enclosure and provided with a unique end flap arrangement which facilitates reclosure. An upstanding divider separating the enclosure into a plurality of compartments is also disclosed. At least one compartment may be provided with a removable cover panel, if desired.

3,734,391

# **CARTON WITH SHORTENED WEB CORNERS**

Guelfo A. Manizza, Blauvelt, N.Y., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Jan. 25, 1971, Ser. No. 109,260

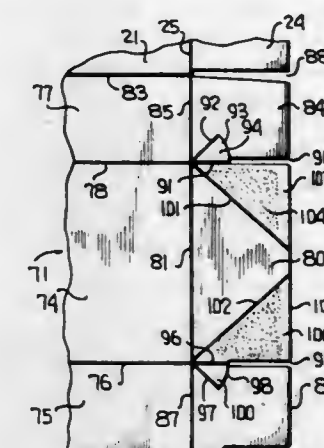
Int. Cl. B65d 5/22, 5/24

U.S. Cl. 229-31 R

16 Claims

This disclosure relates to a collapsible carton having a leak-proof corner wherein the web or gusset defining the corner is foreshortened whereby the necessary seal adjacent the base of the carton is provided and at the same time the flap may be securely secured in place in conventional manners. Furthermore, where desired, the carton may be constructed so that

the walls may be folded into superimposed relation with respect to the base and wherein hinging of the carton is in the



area of the flaps so that the necessary hinge lines do not undesirably detract from the appearance of the carton.

3,734,392

# **MULTI-WALL CONTAINER**

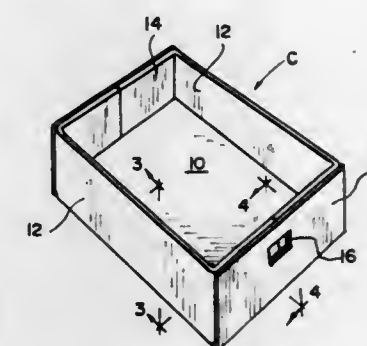
Frank E. Clark, Orinda, Calif., assignor to Container Corporation of America, Chicago, Ill.

Filed June 3, 1971, Ser. No. 149,605

Int. Cl. B65d 5/22

U.S. Cl. 229-34

1 Claim



A container formed of paperboard and having a single-ply bottom wall, double-ply side walls, and triple-ply end walls with hand holes which may also serve to provide interlocking engagement with a container cover.

3,734,393

# **WIDE MOUTH TUBULAR CONTAINER CONSTRUCTION**

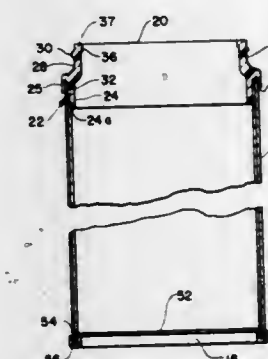
Paul W. Stump, North Olmsted, Ohio, assignor to Clevelak Corporation, Cleveland, Ohio

Filed July 29, 1971, Ser. No. 167,417

Int. Cl. B65d 5/64

U.S. Cl. 229-43

1 Claim



A wide mouth, screw top, end member for a tubular container, and a fiber board tubular container incorporating said



end member, a jar lid, and a bottom closure. The end member includes a peripheral groove formed by concentric flanges, and a mouth-forming flange that extends in the opposite direction from that in which the groove opens and which is offset inwardly from the groove yet is large with respect to the container diameter, is externally threaded and terminates in a flat annular surface of increased width. The inner flange forming the groove is substantially greater in length axially of the member than the outer flange and the bottom of the groove has a diminished cross sectional area. The tubular container is formed of body plies and includes a foil liner ply that provides a metal-to-metal seal along a lap seam.

3,734,394

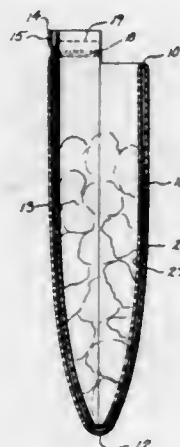
**FLEXIBLE PACKAGE WITH DOUBLE LAYERED WALLS**  
David Francis Dooley, Deerfield, Ill., assignor to Milprint, Inc., Milwaukee, Wis.

Filed Aug. 12, 1971, Ser. No. 171,225

Int. Cl. B65d 31/00

U.S. Cl. 229—55

1 Claim



A package having front and back panels each formed of a double layer construction in which the space between the inner and outer layers of each panel is circumscribed by marginal seams so that material introduced into the package through an open end cannot be deposited in the space between the inner and outer layer of each panel.

3,734,395  
BAG

Amir Erk, Grossdornberg; Ottomar Tessmann, and Klaus Schirrich, both of Bielefeld, all of Germany, assignors to Fischer & Kreck KG, Bielefeld, Germany

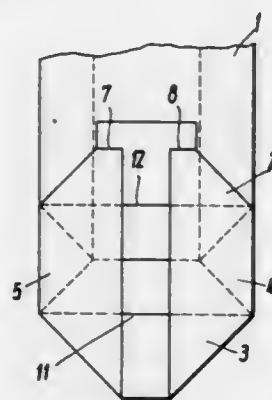
Filed May 26, 1971, Ser. No. 145,085

Claims priority, application Germany, May 29, 1970, P 20 26 330.3

Int. Cl. B65d 33/00

U.S. Cl. 229—58

10 Claims



A bag has side walls and a flat bottom having lateral folds and corner folds. An insert of thermally insulating material is

located in the flat bottom extending underneath the corner folds and having folded lateral portions which extend beyond the lateral folds but not beneath the corner folds. The folded portions of the bottom are bonded, adhesively or by heat-bonding if the bottom is of requisite heat-bondable material.

3,734,396

**TICKET ENVELOPE**

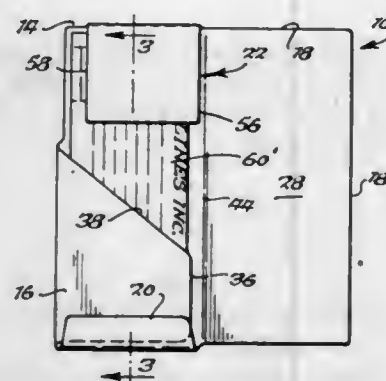
Harold L. Cowan, Williamsville, N.Y., assignor to Franklin-Cowan Paper Co., Inc., Buffalo, N.Y.

Filed Jan. 8, 1971, Ser. No. 104,901

Int. Cl. B65d 27/00

U.S. Cl. 229—68 R

5 Claims



In a ticket envelope having a front panel, a rear panel folded over the front panel and a bottom flap secured to the rear panel to form a ticket-receiving pocket, an upper flap is detachably secured to the front panel along a perforated line and is foldable in overlying relation to the front panel. The upper flap functions as a boarding pass and assures retention of the ticket in the pocket.

3,734,397

**SUPPORT AND DISPLAY CARTON FOR PARABOLIC LAMP**

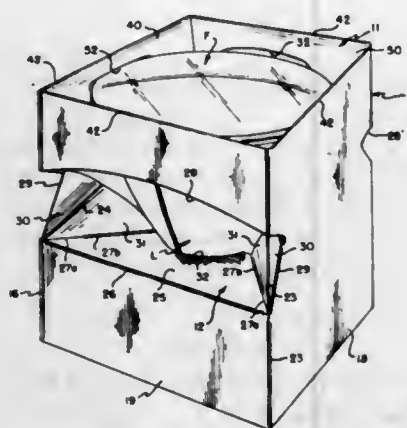
Raymond A. Cote, Charlotte, N.C., assignor to Rexham Corporation, New York, N.Y.

Filed Mar. 25, 1971, Ser. No. 128,084

Int. Cl. B65d 5/10

U.S. Cl. 229—39 B

4 Claims



An open-ended carton sleeve for packaging a parabolic lamp bulb is disclosed herein. The sleeve includes a pair of yoke-like platforms suspended centrally therein from hinged gusset flaps extending inwardly from opposite side walls and a mitered frame-like structure of folded shadow panels at the upper edges of the sleeve. The bulb is supported, cushioned, and displayed in the sleeve by the frame and the platform structures.

3,734,398

**BASKET CENTRIFUGE WITH MATERIAL REMOVING MEANS**

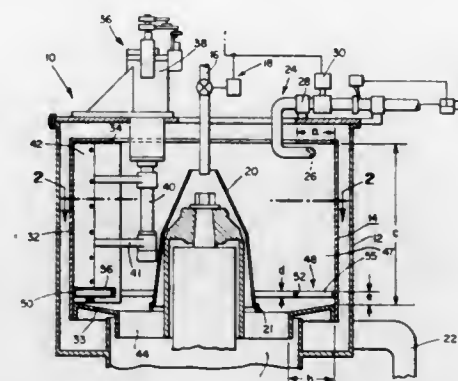
Frederick Walker Keith, Jr., Gladwyne, and Robert Edward Krause, Philadelphia, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Feb. 26, 1971, Ser. No. 119,247

Int. Cl. B04b 1/00

U.S. Cl. 233—3

11 Claims



A basket centrifuge is provided with an improved arrangement of radially extending accelerator vanes to improve flow orientation, reduce turbulence, and in general improve the effectiveness of the centrifuge apparatus when concentrating sludge. The improved arrangement of accelerator vanes is located in an end portion of the centrifuge bowl, and extends outwardly from a point located between the feed outlet means and the overflow lip. The basket centrifuge may also be provided with a knife blade for removing solids which have accumulated against the inner peripheral wall of the centrifuge bowl, the knife blade cooperating with the accelerator vanes so that it can be moved outwardly to contact the peripheral wall.

3,734,399

**DIFFERENTIAL SCROLL DRIVE**

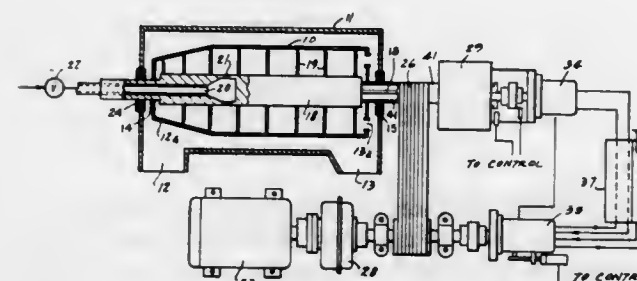
David C. Oas, Pittsfield, Mass., assignor to Beloit Corporation, Beloit, Wis.

Filed May 28, 1971, Ser. No. 147,796

Int. Cl. B04b 1/00

U.S. Cl. 233—7

9 Claims



A driven centrifuge mechanism for separating intermixed liquids and solids including a hollow bowl supported for rotation about an axis with a smaller inner diameter at one end and a larger at the other end and a helical conveyor scroll extending through the center for moving solids to a solids opening at one end of the bowl and a liquid opening at the other end of the bowl and a drive at one end of the bowl connected to the bowl and to the scroll for driving the bowl off a main drive motor at a constant speed and for varying the speed of the scroll relative thereto with the main drive motor driving a hydraulic pump which drives a hydraulic motor and through a differential gear means drives the scroll with the speed between the hydraulic pump and motor variable so as to be able to control the speed of the scroll.

3,734,400

**PROCESS FOR THE PREPARATION OF DRY THERMOPLASTIC SYNTHETIC RESIN POWDERS FROM LIQUEFIED GAS SUSPENSIONS**

Kurt Pfeiffer; Johannes Dietrich; Karl-Heinz Schonberg, and Gunter Beckmann, all of 4370 Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

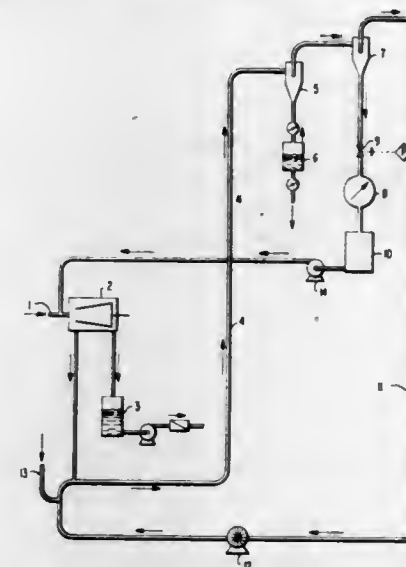
Filed Dec. 15, 1971, Ser. No. 208,065

Claims priority, application Germany, Dec. 17, 1970, P 20 62 192.5

Int. Cl. B04b 15/02

U.S. Cl. 233—11

15 Claims



A process and apparatus for obtaining dry thermoplastic synthetic resin powders from suspensions of powdery polymers in liquefied gases by centrifuging such a suspension to remove a majority of the liquefied gas, drying the resultant moist powder with a superheated gaseous current of the liquefied gas, and introducing the gaseous entrained powder into a first cyclone to obtain a dry thermoplastic synthetic resin powder as the bottoms product. The top of the first cyclone is connected to a second cyclone which separates the incoming mixture into a light phase and a heavy phase. The light phase is heated and then recycled as the super-heated gaseous current of liquefied gas to dry the previously noted moist powder. The heavy phase is condensed and recycled back to the incoming suspension to form a closed system. The amount of heavy phase is dependent upon the superatmospheric pressure of the system as regulated by a valve adjacently connected to the bottom of the second cyclone.

3,734,401

**CENTRIFUGAL SEPARATOR**

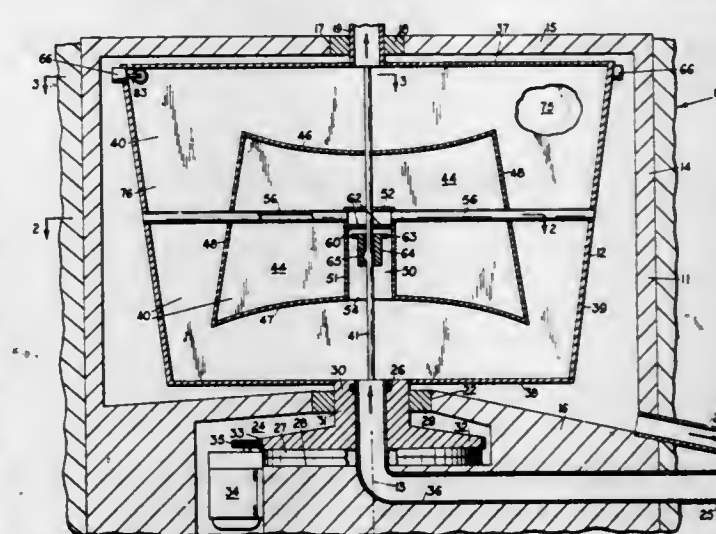
David Frewen, 2766 Alder, Eugene, Oreg.

Filed July 29, 1970, Ser. No. 59,088

Int. Cl. B04b 11/00

U.S. Cl. 233—20 R

8 Claims



A centrifugal separator including a rotatable housing having plural, separate fluid channels therein defined between a plu-



ality of vanes secured longitudinally within the housing. The housing has an inlet pipe at one end for admitting fluid material to be processed, and an outlet pipe at the other end for evacuating the processed material. The cross-sectional areas of the fluid channels are designed to be progressively larger toward the outlet end of the separator to facilitate separation of the material being processed. Numerous valve-controlled discharge openings are provided in the housing near the outlet end for exhausting the separated material. The discharge valves are sensitive to the specific gravity of the separated material so that they exhaust only material having a specific gravity above a predetermined level. An air vent is provided within the rotatable housing, controlled by float means, to exhaust air trapped within the housing.

3,734,402

## VAPOR GENERATOR

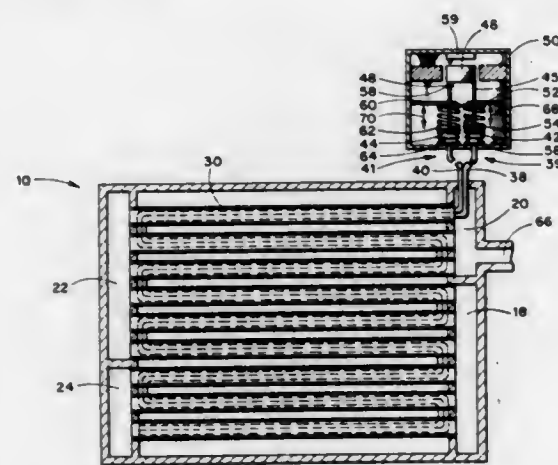
Dean T. Morgan, Sudbury, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed Oct. 18, 1971, Ser. No. 189,949

Int. Cl. F22b 37/47

U.S. Cl. 236—21 B

11 Claims



A vapor generator for a Rankine cycle engine includes an elongated heat exchange tube for conducting engine working fluid therethrough. A temperature-responsive mechanism extends along the heat exchange tube for sensing the average temperature along its length and also the temperature at any segment of its length. The temperature-responsive mechanism produces a signal from which operation of the vapor generator heat source is influenced as function of either one or both of these temperature conditions.

3,734,403

## THERMOSTATIC VACUUM VALVE

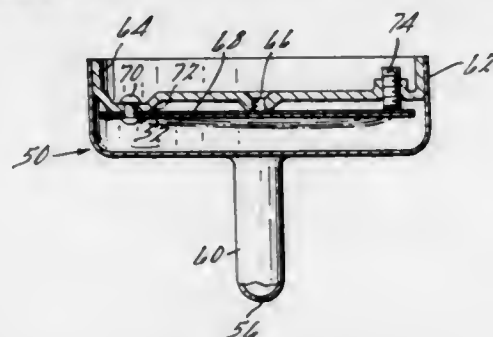
Robert W. Eshelman, 341 Riverview, Ann Arbor, Mich., and Waysl Ohar, 1909 Ivywood Drive, Ann Arbor, Mich.

Filed Sept. 17, 1971, Ser. No. 181,498

Int. Cl. G05d 23/275

U.S. Cl. 236—87

9 Claims



A temperature responsive vacuum modulating valve having an enclosed bimetal temperature sensitive element supported at both ends for improved operation and calibration, the overall valve design exhibiting improved thermal responsivity.

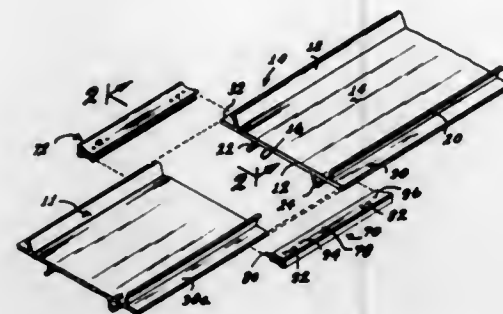
3,734,404  
TRACK SYSTEM FOR TOY VEHICLE  
William R. Baynes, Palos Verdes Peninsula, and Elliot Handler, Los Angeles, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 27, 1970, Ser. No. 92,999

Int. Cl. A63h 19/30

U.S. Cl. 238—10 E

13 Claims



A track system including a reversible track section having two different running surfaces to handle different scale toy vehicles and a track section connector for connecting abutting track sections along projections protruding from guide flanges of the track sections.

3,734,405

## THERMOSTATICALLY OPERATED BY-PASS VALVE

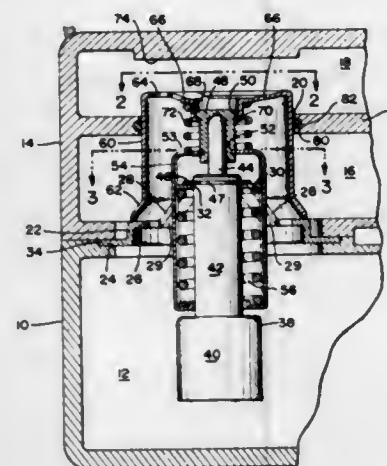
Joseph P. Wagner, 136 Surburban Road, Knoxville, Tenn.

Filed June 1, 1971, Ser. No. 148,675

Int. Cl. F01p 7/02

U.S. Cl. 236—34.5

5 Claims



A thermostatically operated by-pass valve for controlling a flow of fluid to a pair of conduits, includes a piston stem member having an outer end and a sleeve valve element having a central opening and adapted to control the flow of fluid to the conduits and an elongated cup-shaped element slidably disposed within the central opening of the sleeve valve element and adapted to engage interiorly a substantial portion of the outer end of the piston stem member, wherein the ratios of the diameters of the piston stem member and the cup-shaped member to the diameter of the sleeve valve element are relatively large, to thereby minimize rocking of the sleeve valve element in order to reduce wear of the sleeve valve element and its seal.

## ERRATUM

For Class 238—10 E see:  
Patent No. 3,734,404

3,734,406  
METHOD AND APPARATUS FOR PRODUCING A FLAT  
FAN PAINT SPRAY PATTERN

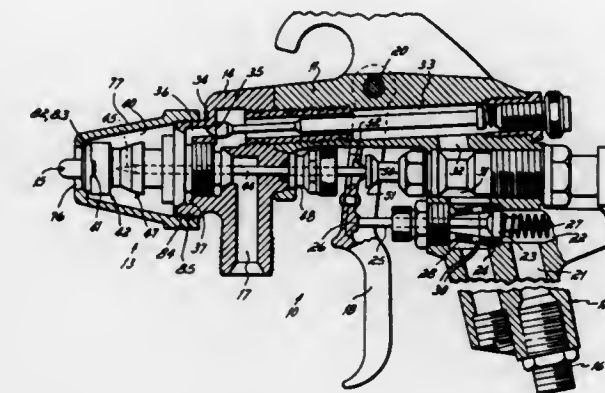
Peter W. Runstadler, Jr., Hanover, N.H.; Eric T. Nord, Oberlin; Donald R. Hastings, Elyria; Samuel R. Rosen, Lorain; Don R. Scarbrough, Elyria, and Frederick R. Wilhelm, Avon Lake, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed July 30, 1971, Ser. No. 167,695

Int. Cl. A01n 17/02; B05b 7/04

U.S. Cl. 239—8

30 Claims



A method and apparatus for spraying a coating material such as paint, in a flat fan pattern. In the gun a stream of paint under a relatively low pressure is caused to flow in an annular film. Streams of gas at a slightly higher pressure are directed against the paint film so that the gas is sheared into microbubbles which are entrained in the paint stream to form a froth. The froth flows through a chamber in which the bubbles disperse uniformly in the paint and is then discharged through a narrow slit nozzle effective to give it a fan shape. As the froth is released to atmospheric pressure, the microbubbles of air expand rapidly and rupture, causing the paint to disintegrate into finely atomized drops. The apparatus includes a cooperating orifice plate and collar which define a thin annular paint flow channel; and a plurality of air injection channels which intersect the paint flow channel. Air is introduced through these channels and is directed against the paint film. In the preferred gun, the nozzle includes a hemispherical endwise portion provided with an elongated discharge slot. A protuberance or ball is disposed within the nozzle and deflects the froth so that the froth passes through a relatively narrow passageway between the ball and nozzle. A modified gun includes a conventional airless flat fan orifice; and does not utilize an internal ball.

3,734,407

## DUAL SPRAY AND RECIRCULATION SYSTEM

Albert F. De Stefano, Jr., Philadelphia, Pa., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed July 30, 1971, Ser. No. 167,699

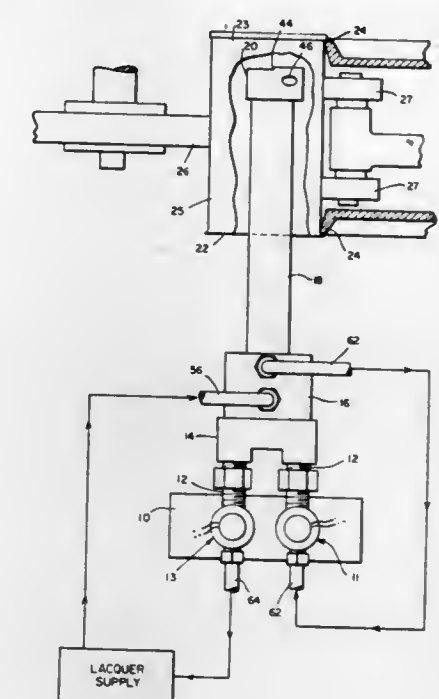
Int. Cl. B05b 1/24, 9/00

U.S. Cl. 239—13

14 Claims

An electrically operated solenoid actuated spray system for coating the insides of cans with lacquer or other coating substance. A nozzle extension adapted to extend into cans includes concentric chambers allowing hot lacquer to constantly recirculate by flowing through the nozzle extension to the nozzle tip and back again. Separate tubes are provided within the inner concentric chamber to transport the lacquer to dual no-

zle spray outlets. Even though lacquer may remain in these tubes for periods of time when there are breaks in can produc-



tion, the recirculating lacquer will keep the lacquer in the tubes hot and ready to be used thus preventing improper application when can coating resumes.

3,734,408

## VANDAL-PROOF DRINKING FOUNTAIN

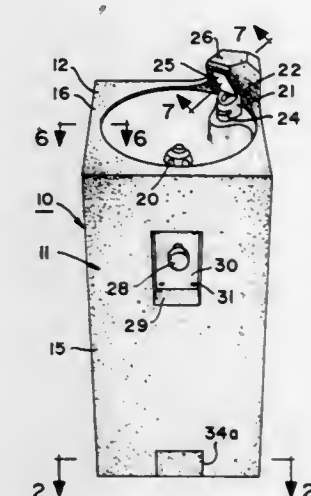
Allen C. Wright, Moraga, Calif., assignor to Haws Drinking Fountain Company, Berkeley, Calif.

Filed May 21, 1971, Ser. No. 145,757

Int. Cl. E03b 9/20; A47k 1/04

U.S. Cl. 239—29

12 Claims



A drinking fountain of the type having a valve-controlled nozzle structure through which water is discharged along an upwardly and inwardly oriented trajectory toward the center of a bowl having a discharge outlet or drain connected to waste. The fountain is substantially vandal proof, and in this respect has a pedestal anchored to a floor or platform by fastener structure concealed within the interior of the pedestal after anchorage is effected. The bowl of the fountain and control valve therefor are recessed so that prying-type implements cannot be inserted between either such component and respectively underlying surfaces of the pedestal, and the shield that extends upwardly in somewhat overlying relation with the nozzle outlet is covered by a guard that seats the shield therein so as to protect the same from impact blows.



3,734,409

## STEAM/WATER MIXING VALVE

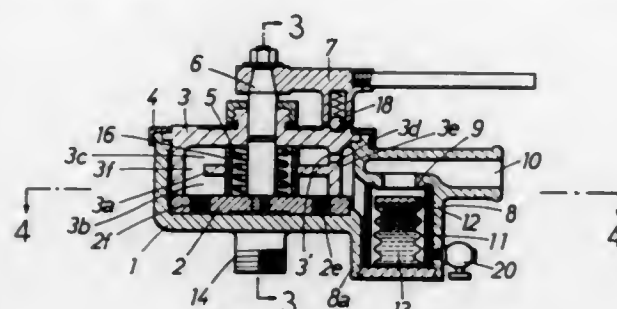
Masao Okada, Nishinariiku, Osaka, Japan, assignor to Masao Okada, Nishinariiku, Osaka City and Masao Nozawa, Ryugasaki-shi, Ibaraki Pref., Japan

Filed Apr. 14, 1972, Ser. No. 244,109

Int. Cl. G05d 11/16, 23/13

U.S. Cl. 239—99

2 Claims



A valve having a porous disc and a handle, where the rotation of former by manipulation of the latter initially opens a water inlet to a given extent and then opens a steam inlet gradually up to a given extent so as to introduce cold water and steam into a mixing chamber at given rates, respectively, delivering hot water of desired temperature instantly and continuously through a tap.

3,734,410

## PULSATING SPRAY HEAD

Leonard Bruno, Farmingdale, N.Y., assignor to Stanadyne, Inc., Windsor, Conn.

Continuation-in-part of Ser. Nos. 15,719, March 2, 1970,

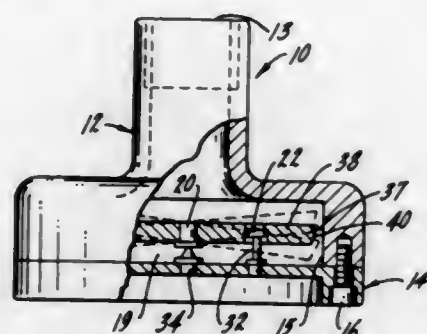
abandoned, and Ser. No. 125,093, March 17, 1971,

abandoned. This application Sept. 30, 1971, Ser. No. 185,271

Int. Cl. B05b 1/34

U.S. Cl. 239—102

13 Claims



A spray head which attaches to a shower or hose to provide a pulsating spray. An oscillating plate installed in the spray head provides the pulsations in the fluid flowing through the spray head.

3,734,411

## AIR BRAKE FOR JETS

Konrad Wolf, and Hermann Barmbold, both of Bremen, Germany, assignors to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Germany

Filed May 21, 1971, Ser. No. 145,780

Claims priority, application Germany, June 6, 1970, P 20 27 882.4

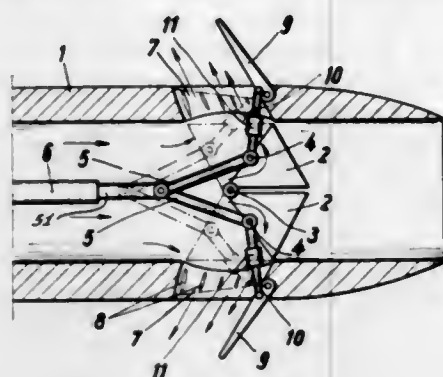
Int. Cl. B64c 15/04

U.S. Cl. 239—265.29

4 Claims

Brake system for aircraft in cooperation with a thrust producing jet engine exhaust nozzle, using at least one thrust reversing deflector having selective position in the flow path of the nozzle for thrust reversal and for flow-through without

thrust reversal, a flap is disposed and connected to the deflector to serve as jet flow guide vane, when extended, for the reversed stream of gases as resulting from thrust reversing



position of the thrust reversing deflector. Additionally, the flap is independently extendible while the deflector remains in flow through position, to serve as air brake.

## ERRATUM

For Class 241—82.1 see:  
Patent No. 3,734,148

3,734,412

## METHOD AND ARRANGEMENT FOR PERFORMING LOW-TEMPERATURE GRINDING OPERATIONS IN A VIBRATING MILL

Helmut Haas, Cologne, and Helmut Siedler, Essen, both of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Köln and Air Products GmbH, Düsseldorf, Germany

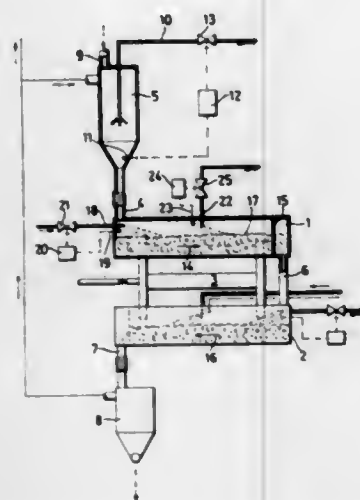
Filed Dec. 14, 1971, Ser. No. 207,912

Claims priority, application Germany, Dec. 16, 1970, P 20 61 837.5

Int. Cl. B02c 17/06, 23/00, 25/00

U.S. Cl. 241—15

6 Claims



Low-temperature grinding operations are performed in the horizontal and longitudinal tubular grinding chambers of a vibrating mill by introducing the material to be ground at one end of the grinding chambers introducing at least at one point of the grinding chambers adjustable amounts of a refrigerant—for example liquid nitrogen—above the surface of the material to be ground in the grinding chambers, and arranging a thermometer probe at each point of introduction at a point spaced ahead of the points of refrigerant introduction when considering the direction of travel of the material to be ground lengthwise in said grinding chamber, said thermometer probe being used for adjusting the amount of refrigerant introduced into said grinding chamber to maintain the temperature in the latter at a predetermined level.

3,734,413

## FLUIDIZED BED JET MILL

Fritz W. Kaiser, Hammel Near Augsburg, Germany, assignor to Alpine Aktiengesellschaft, Augsburg, Germany

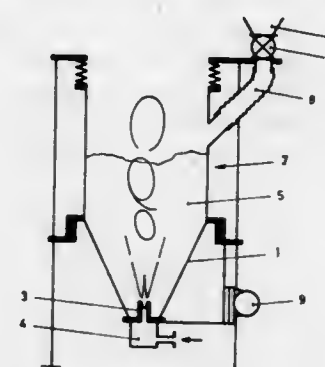
Filed Apr. 21, 1971, Ser. No. 135,919

Claims priority, application Germany, Aug. 14, 1970, P 20 40 519.0

Int. Cl. B02c 19/06

U.S. Cl. 241—39

10 Claims



The method and apparatus disclosed relates to an improved jet mill in which the material to be ground is fed into a chamber or zone containing a jet that emanates from a nozzle with high velocity, the material being in the state of a compact bed and the outlet of the nozzle being located beneath the surface of the bed. The bed is preferably a "moved compact bed" arranged so that the material to be ground is fed sideways into the jet. A sifter or classifier for the coarse and fine material produced in the grinding operation is arranged above the bed of material in the grinding chamber or zone. The compact bed of material may be moved in a variety of ways, and the volume occupied by it is filled up to the greater part with compact granular material. This could be defined as the ratio of wholly occupied volume to the volume of the compact matter, or by the term "compact current" as commonly employed in the pneumatic transportation art.

3,734,414

## DEVICE FOR CRUSHING HOT FURNACE DISCHARGE MATERIAL, PARTICULARLY HOT ALUMINA

Horst Weigel; Otto Wilbertz; Theo Manshausen, and Alfred Kryczun, all of Cologne, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

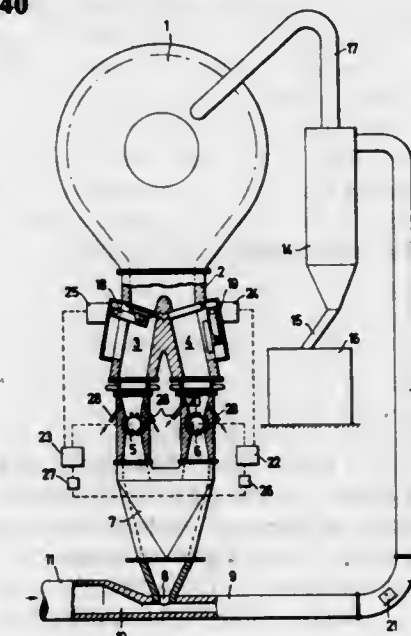
Filed Sept. 7, 1971, Ser. No. 178,269

Claims priority, application Germany, Sept. 18, 1970, P 20 46 136.3

Int. Cl. B02c 25/00

U.S. Cl. 241—40

12 Claims



A device for crushing hot alumina is arranged between the discharge aperture of a calcining furnace and the charging

aperture of a cooler and comprises a primary crushing roller arranged in a vertical discharge channel between the ends thereof and a pneumatic crushing means connected to the lower end of said discharge channel, whereby the outlet of said pneumatic crushing means is connected with a separator which in turn is connected with said cooler.

3,734,415

## APPARATUS FOR THE PREPARATION OF SOLID INTERMEDIATES OF POLYADDITION RESINS IN THE FORM OF CONNECTED PIECES USEFUL FOR BREAKING AND GRINDING

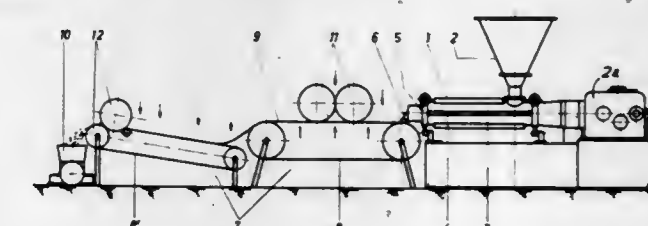
Peter Franz, Mumpf, and Andreas Maier, Pratteln, both of Switzerland, assignors to Buss A.G., Basel, Switzerland

Division of Ser. No. 856,336, Sept. 9, 1969, Pat. No. 3,643,874. This application Nov. 24, 1971, Ser. No. 202,027

Int. Cl. B02c 19/00

U.S. Cl. 241—65

1 Claim



Apparatus for the preparation of polyaddition resins, including means for proportioning and feeding base compositions in a mixing and kneading machine, mixing them with simultaneous heating or cooling, in a solid and/or liquid state, plasticizing and homogenizing the compositions, expelling resin mix through a heated die onto a cooling belt, solidifying and preforming the resin mix into loosely connected small pieces, and breaking up as well as grinding the preformed pieces of the resin mix. Optionally crushing may be performed before the breaking and grinding step.

3,734,416

## WASTE FOOD DISPOSER MOUNTING ASSEMBLY

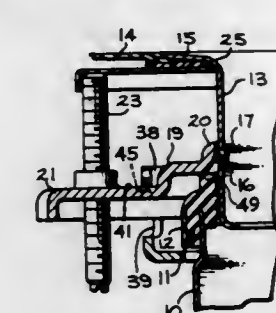
Lauren W. Guth, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Aug. 26, 1970, Ser. No. 67,107

Int. Cl. B02c 18/42

U.S. Cl. 241—100.5

7 Claims



A sink mount support assembly for a waste food disposer includes a pair of annular members having means thereon to enable engagement of the members, one with the other, when the members are brought together in axial alignment and one of the members is rotated with respect to the other. The means of engaging one of the members to the other provides a first holding position whereby the disposer is suspended beneath the sink but may be axially rotated to complete the plumbing connection thereto. A second locked position is provided whereby the disposer is fastened firmly to the sink drain sleeve



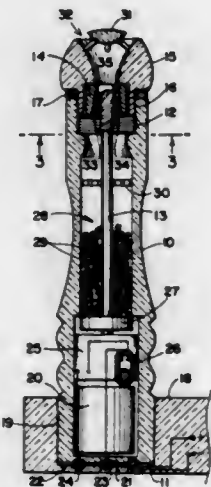
and prevented from thereafter rotating relative thereto. The means of engaging the two annular members of the sink mount support assembly is a quick connect arrangement requiring only that the rotatable annular member be manually driven in rotation a relatively short distance to complete the procedure of mounting a disposer to a sink drain sleeve, and it is a quick disconnect assembly inasmuch as the rotatable member may be thereafter manually driven to rotate in a direction opposite to the connecting rotation to free the disposer unit from the drain sleeve.

### 3,734,417 ELECTRIC PEPPER MILL

John Duncan Russell, Malibu, and Neil E. Carter, Santa Ynez, both of Calif., assignors to John Duncan Russell and Neil E. Carter, Los Angeles, Calif., part interest to each  
Filed July 20, 1971, Ser. No. 164,339  
Int. Cl. A47j 42/06

U.S. Cl. 241-168

7 Claims



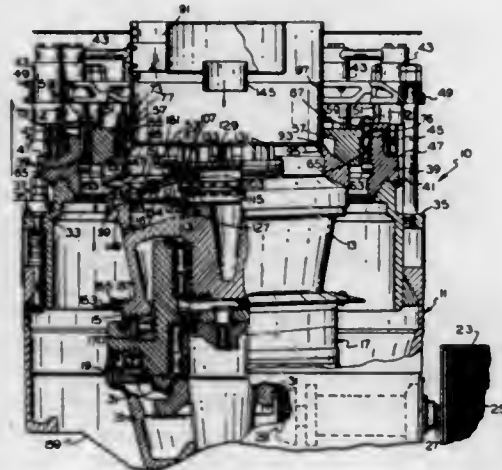
An electric cordless pepper mill is provided in the form of an elongated body having a base incorporating batteries, a motor, and a gear reduction means for operating a rotor grinder disposed in the top portion of the body. A tilt switch is incorporated so that the motor is only operated when the body is tilted to position the top lower than the base, the ground pepper passing from the top of the body.

### 3,734,418 SANDCONE CRUSHER

Louis W. Johnson, 3440 Franklin Boulevard, Eugene, Oreg.  
Filed May 13, 1971, Ser. No. 143,142  
Int. Cl. B02c 2/04

U.S. Cl. 241-207

15 Claims



A crusher has a crusher head that is gyrated relative to a crusher bowl. The crusher head supports an annular mantle

held by a mantle washer and a clamping plate clamped to a self-tightening nut by a clamping plate bolted to the nut. The washer covers a drained chamber in the crusher head and has drain holes for water from an annular recess formed by the inner edge of the mantle and the washer. A distributor plate having pickets covers the clamping plate and is positioned below a center distributing hopper in a larger hopper having a lining outwardly set back from an inwardly extending protective flange of a bowl liner. Self-locking pins lock eyebolts to the bowl liner and the eyebolts secure the bowl liner to a clamp bar through self-aligning washers. The clamp bar is bolted by fluted bolts to a bonnet secured to a bonnet support by holddown cylinders. A skirt on the crusher head overhangs a cam and thrust bearing structure mounting the cam and the crusher head.

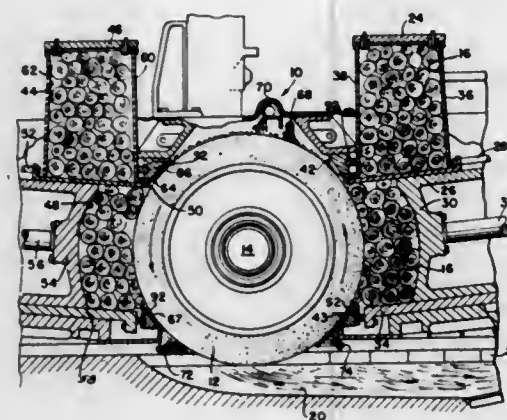
### 3,734,419 FINGER BARS FOR PULPWOOD GRINDERS

George W. Cryderman, Thunder Bay, Ontario, Canada, assignor to Koehring-Waterous, Ltd., Brantford, Ontario, Canada

Filed May 24, 1971, Ser. No. 146,351  
Int. Cl. B02c 7/00

U.S. Cl. 241-282

7 Claims



A pulpwood grinder including a power driven pulpstone, a pocket adapted to receive a supply of wood to be processed from which the wood is urged against the pulpstone and a finger bar positioned in close proximity to the pulpstone, the finger bar having spaced, angled fingers angled relative to the pulpstone rotational axis for directing pulp laterally toward the axial ends of the pulpstone, the spaces between the angled fingers providing restricted openings which hinder movement of slivers and other debris to facilitate further grinding action thereon and enhanced reduction to pulp.

### 3,734,420 ARRANGEMENT FOR DRIVING OF SHUTTLELESS COIL WINDING MACHINES OF CLOSED CORES

Bobuslav Vavrinec, Prague, Czechoslovakia, assignor to Tesla, Narodni podnik, Praha, Czechoslovakia

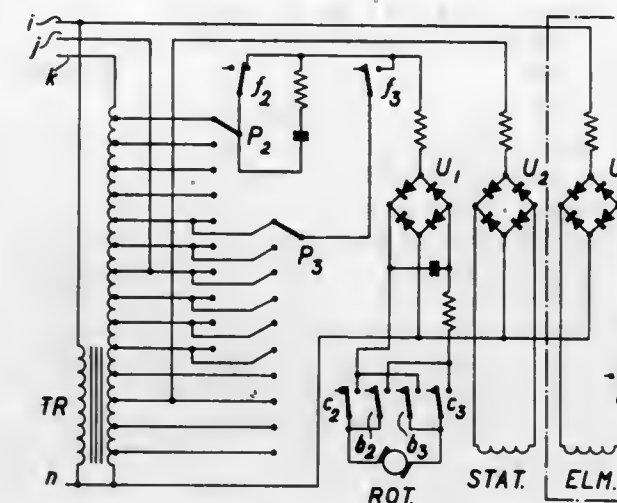
Filed Mar. 27, 1970, Ser. No. 23,407  
Int. Cl. H01f 41/08; B65h 81/02

U.S. Cl. 242-4A

6 Claims

Shuttleless coil winding machines for winding of coils on closed cores particularly of miniature cores, require a quick speed reduction in the course of tightening a newly wound-on

turn in order to prevent breaking of the conductor. Means controlled by a cam, driven in synchronism with the winding



means are provided, which cause a speed reduction of the electric driving motor by counter-current at preselected reduced supply voltage.

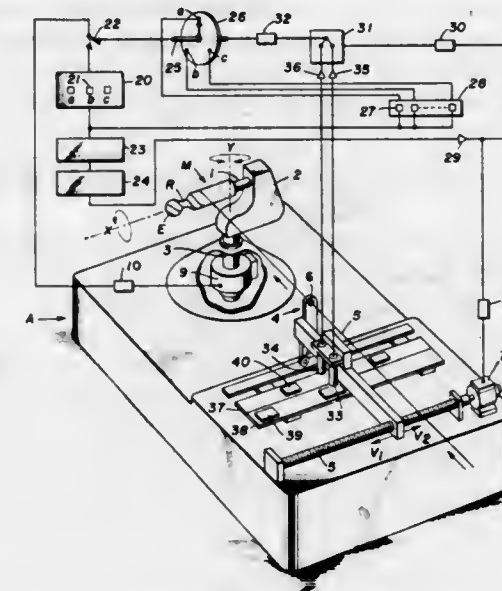
### 3,734,421 MULTIPLE RATIO SELECTOR SYSTEM

Harald Karlson, Santa Monica; William B. Goldsworthy, Palos Verdes, and Tim T. Hegyl, Hawthorne, all of Calif., assignors to Goldsworthy Engineering, Inc., Torrance, Calif.

Filed Apr. 12, 1971, Ser. No. 133,061  
Int. Cl. B65h 81/08

U.S. Cl. 242-7.21

9 Claims



A multiple ratio selector system for use in filament winding systems of the type where filaments from a traversing feeding eye is wound about a rotatable mandrel. The ratio selector system includes a pair of photo sensitive diodes which move with the feeding eye and detect the presence of positionally located photo reflective surfaces during their traversing movement with the feeding eye. On each occasion where a reflective surface is detected by one of the photo sensitive diodes, a position signal is generated and a direction mechanism permits passage of the position signal corresponding to the direction of movement of the proper photo sensitive diode. This position signal operates a stepping switch driver which, in turn, causes the rotation of a stepping switch. A multiple ratio selector is connected to the various outputs of the stepping switch and in turn drives the traversing feeding eye through a servo valve.

### 3,734,422 APPARATUS FOR MONITORING YARN AT WINDERS

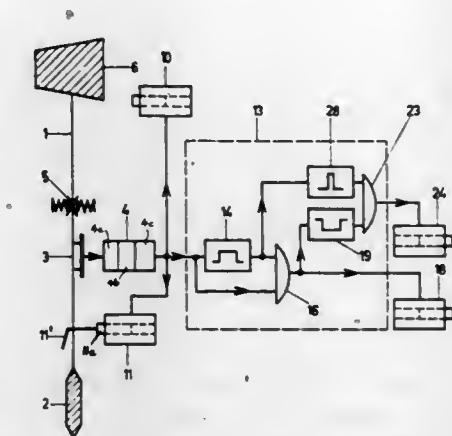
Erich Loeple, 8625 Zollikerberg, Switzerland, assignor to Aktiengesellschaft Gebrüder Loeple, Wetzikon, Switzerland  
Filed May 17, 1971, Ser. No. 143,777

Claims priority, application Switzerland, May 28, 1970, 8011/70

Int. Cl. B65h 63/00

U.S. Cl. 242-36

11 Claims



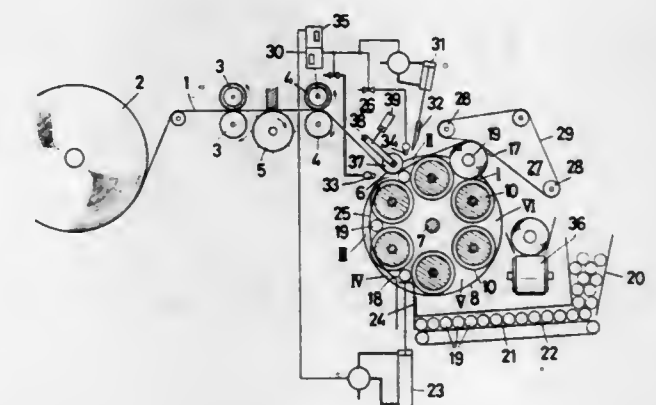
An apparatus for monitoring a yarn at a winder which comprises a tribo electrical transducer for determining the presence of a stationary yarn, an interrogation mechanism operably associated with the yarn, and means for actuating the interrogation mechanism when the speed of travel of the yarn has fallen below a predetermined boundary value so that the interrogation mechanism can generate a relative movement between the transducer and the yarn which is sufficient to produce a response signal by the transducer.

### 3,734,423 METHOD AND APPARATUS FOR CONTINUOUSLY PRODUCING SMALL DISPENSING ROLLS OF SHEET

Hiroshi Kataoka, 5-8, Asahi 1 chome, Iyomishima, Japan  
Continuation-in-part of Ser. No. 757,229, Sept. 4, 1968, abandoned. This application Sept. 2, 1970, Ser. No. 68,873  
Claims priority, application Japan, Sept. 4, 1968, 43/757229

U.S. Cl. 242-56 A  
Int. Cl. B65h 19/26

2 Claims



A method of and an apparatus for continuously producing small dispensing rolls of sheet in strips of small thickness, of such material as paper, film of synthetic resin, wafer, aluminum foil or the like, each roll including a required amount of such sheet of small thickness wound on a core.



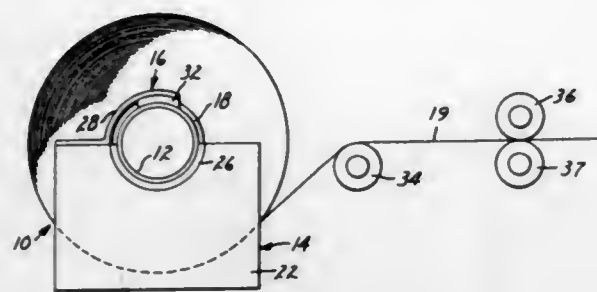
3,734,424

## WEB TENSIONING SUPPORT

John W. Ulseth, Saint Paul, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.  
Filed May 13, 1971, Ser. No. 142,948  
Int. Cl. B65h 23/06

U.S. Cl. 242-75.4

4 Claims



A web tensioning support for a roll of sheet material to permit the sheet material to be withdrawn from the roll by a generally uniform force. An arbor is formed to support the roll of sheet material for rotation therewith and the arbor is supported for rotation by an arbor support and brake which frictionally engages the arbor along a surface area spaced from the axis of the arbor. A constant braking torque is applied to the arbor to counterbalance the decrease in the force required to withdraw the sheet material from the roll against the frictional force applied by the arbor support and brake as the roll of sheet material is depleted.

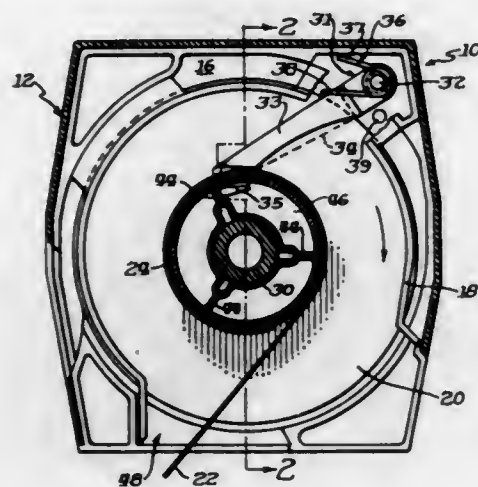
3,734,425

## MECHANICAL FILM SENSOR

Elmer C. Henriksen, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Nov. 16, 1971, Ser. No. 199,224  
Int. Cl. B65h 59/38; G03b 1/04; G11b 15/32  
U.S. Cl. 242-187

4 Claims



A film handling apparatus for a movie projector includes a cartridge supporting a reel of film and a mechanical film sensor. The sensor includes a film follower member integral with a reel blocking member for engaging and blocking rotation of a reel when the film follower senses a predetermined amount of film on the reel hub thereby providing film tension for actuating an automatic rewind mechanism in the projector.

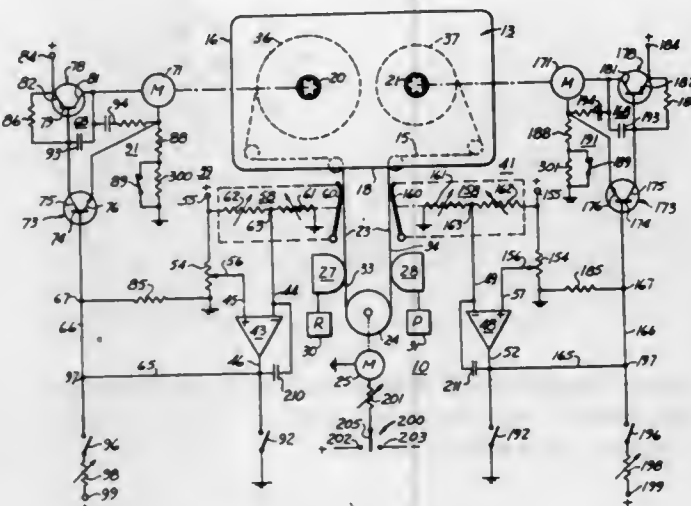
3,734,426

## TAPE TENSION CONTROL IN TAPE RECORDERS

Peter A. Howes, La Verne, and Eugene A. Cooper, Placentia, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Apr. 15, 1971, Ser. No. 134,172  
Int. Cl. B65h 59/38; G03b 1/04; G11b 15/32  
U.S. Cl. 242-190

32 Claims



Magnetic tape recorders, or other apparatus utilizing an information recording tape, include equipment for forming a length of the recording tape into a loop and for placing a portion of the loop in driving engagement with the capstan. The loop is tensioned during its formation and placement onto the capstan. The tape recorder may also include equipment for sensing the tape tension, for providing a signal indicative of the sensed tape tension, and for controlling the tape tension in response to the latter signal. Typically, a closed-loop servo system including the recording tape is provided. A feedback factor in this servo system may be modified to effect a desired tape tension at instances when the servo system operates in an open-loop mode.

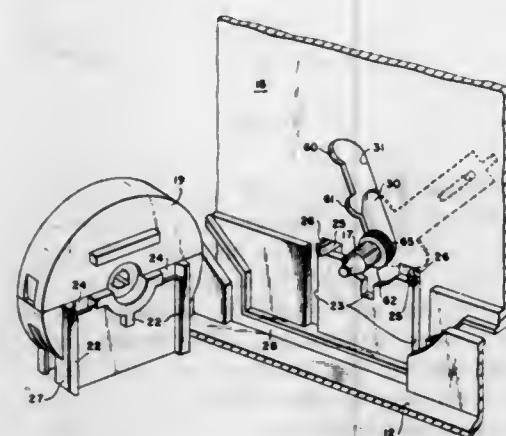
3,734,427

## ADJUSTABLE SPINDLE ARM FOR MOTION PICTURE PROJECTORS

Allan M. Palmer, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 6, 1970, Ser. No. 61,554  
Int. Cl. G03b 23/02  
U.S. Cl. 242-197

8 Claims



A motion picture projector provided with means for supporting film supply cartridges of different film capacities with the rotational axes of their film supply reels at respective different predetermined positions includes a supply reel support spindle carried by an arm which is angularly adjustable about

3,734,430

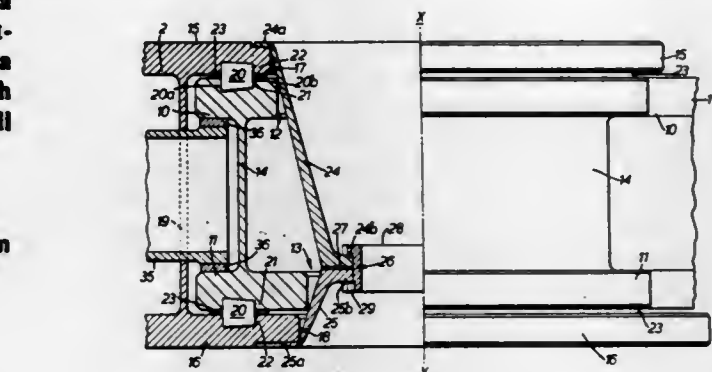
## AIRCRAFT HAVING VARIABLE SWEEP-BACK WINGS

Stephen Ransom, Saint Anne-On-Sea, Lancashire, England, assignor to British Aircraft Corporation Limited, London, England

Filed Mar. 3, 1970, Ser. No. 24,414  
Claims priority, application Great Britain, Mar. 7, 1969, 12,302/69

Int. Cl. B64c 3/40

7 Claims



A wing pivot assembly for an aircraft with variable-sweep-back wings, which comprises a pair of lugs secured to a wing and a cooperating pair of apertured lugs secured to the fuselage of the aircraft, the fuselage lugs lying between and close to the wing lugs. Both pairs of lugs are formed with coaxial central apertures, and the outer portions of the adjacent lugs are formed with opposed circular grooves coaxially surrounding the apertures, in which grooves are housed bearing rollers by which the upper wing lug is journaled on the upper fuselage lug, and the lower wing lug is journaled on the lower fuselage lug. The grooves may either be of trapezoidal section, for use with tapering rollers, or they may be of V-section for use with cylindrical rollers whose axes are radial and are inclined in alternately-opposed directions. A clamping device in the form of a pair of flanged rings whose outer flanges are engaged with the two wing lugs, the rings being drawn together by a nut-and-bolt device at their adjacent inner flanges to apply an axial clamping thrust to the pivot assembly.

3,734,428

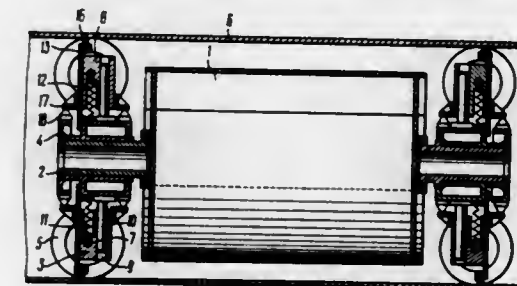
## CARRIAGE FOR CONTAINERS

Adolf Moritsovich Alexandrov, Federativny prospekt 6, korpus 3, kv. 8; Yuriy Abramovich Isimbler, Sojuzny prospekt 10, kv. 261; Alexandr Alexandrovich Lachinov, ulitsa Zhivopisnaya 12, kv. 19; Vladimir Efimovich Aglitsky, Zatseskiy val 6/13, kv. 61; Ilya Solomonovich Kantor, ulitsa Malo-Maskovskaya 31, kv. 45, and Yuriy Arnoldovich Topolyansky, ulitsa Matveevskaya 10, korpus 4, kv. 233, all of Moscow, U.S.S.R.

Filed May 20, 1971, Ser. No. 145,302  
Int. Cl. B65g 51/06

U.S. Cl. 243-33

1 Claim



A carriage for containers transported along a tube under the gas pressure action, wherein running wheels are mounted on the hubs with the possibility of radial motion, while the disk receiving the pressure of a stream of gases flowing along the tube is composed of separate movable sector elements independently sealed between one another. Each sector element is connected to a wheel for common displacement therewith in a radial direction.

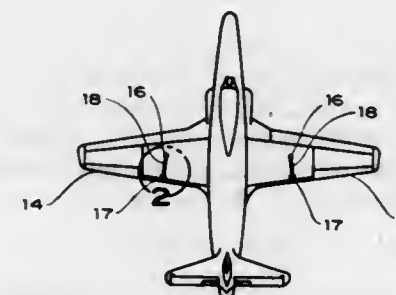
3,734,429

## TARGET AIRCRAFT FLIGHT TERMINATION SYSTEM

Lloyd J. Holt, Ridgecrest; Harry L. Myers, and Gordon F. Zurn, Jr., both of China Lake, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 16, 1971, Ser. No. 163,227  
Int. Cl. B64c 39/00; C06c 5/04  
U.S. Cl. 244-1 R

6 Claims



A remote controlled destruct system for aircraft or the like having fuel cells within critical structures. The filler cap in at least one fuel cell is replaced by a unique explosive device connected to remotely controllable firing means.

3,734,431

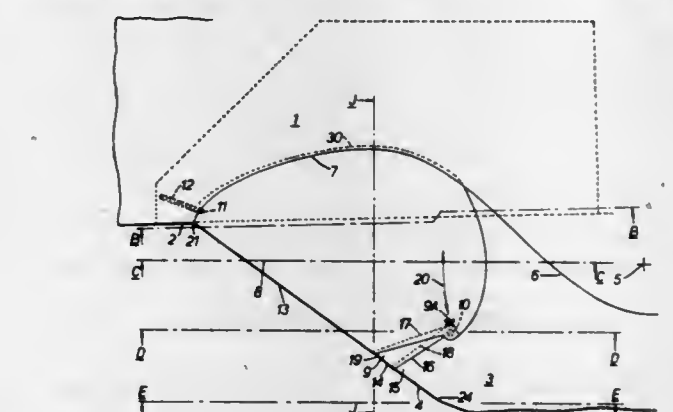
## VARIABLE-GEOMETRY AIRCRAFT

Arthur Neville Rhodes, and Denis Edward Blackburn, both of Fulwood, Preston, England, assignors to British Aircraft Corporation Limited, London, England

Filed May 25, 1970, Ser. No. 51,400  
Claims priority, application Great Britain, May 27, 1969, 26,813/69

Int. Cl. B64c 3/56

4 Claims



A variable-sweep-back-wing aircraft, each wing of which is provided in the junction between its leading edge and the



fuselage with a wing root member formed in two portions, namely a nib lying adjacent to the fuselage and an eyelid lying intermediate between the nib and the wing, the nib and the eyelid both being pivoted to the wing about a common pivot which is parallel to the main wing pivot, and each being movable relatively to the wing and to the other, the nib and the eyelid together forming a continuation of the leading edge of the wing when the wing is in its fully-swept-back position, and the nib and the eyelid both lying wholly within the fuselage contour when the wing is in its outspread position of minimum sweep-back. The nib is also pivoted to the fuselage at a point spaced from its common pivot to the wing, by means of a pivot pin slidable in a track in the fuselage. During forward pivotal movement of the wing from its fully-swept-back position towards its outspread position, the initial movement of the wing causes the eyelid to pivot as one with the wing, while the nib is pivoted relatively to the wing and to the fuselage by the movement of the wing so as to partially enter the fuselage, while during continued pivotal movement of the wing in the same direction both the nib and the eyelid are carried into the fuselage by virtue of their connection to the wing.

3,734,432

## SUPPRESSION OF FLUTTER

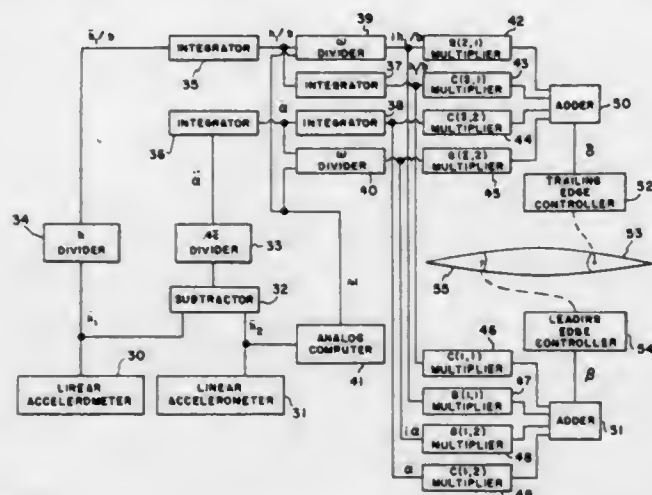
George M. Low, c/o National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 25, 1971, Ser. No. 127,915

Int. Cl. B64c 13/18

U.S. Cl. 244-77 G

5 Claims



An active aerodynamic control system to control flutter over a large range of oscillatory frequencies unaffected by mass, stiffness, elastic axis, or center-of-gravity location of the system, mode of vibration or subsonic Mach number consisting of one or more pairs of leading edge and trailing edge hinged or deformable control surfaces, each pair operated in concert by a stability augmentation system. Torsion and bending motions or deflections of the fluttering member are sensed and converted by the stability augmentation system into leading and trailing edge control surface deflections which produce lift forces and pitching moments to suppress flutter.

3,734,433

## AUTOMATICALLY CONTROLLED TRANSPORTATION SYSTEM

Robert G. Metzner, 916 North Fonthill Road, Beverly Hills, Calif.

Continuation-in-part of Ser. No. 676,594, Oct. 19, 1967, Pat. No. 3,537,401. This application Apr. 10, 1970, Ser. No. 27,354

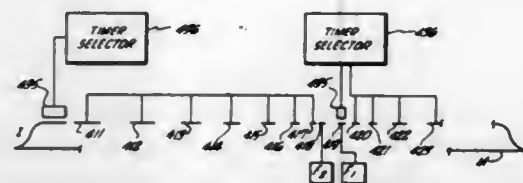
Int. Cl. B611 23/00

U.S. Cl. 246-1 R

8 Claims

A transportation system is disclosed in which vehicles travelling along a track or roadway are automatically spaced

in response to timing and speed controlling systems so as to assure proper spacing of intersecting vehicles. Vehicles energize



timing elements which apply signals to the vehicles to accelerate or decelerate them to achieve predetermined, desired speeds.

3,734,434

## CONTROL OF MULTIPLE HIGHWAY CROSSINGS

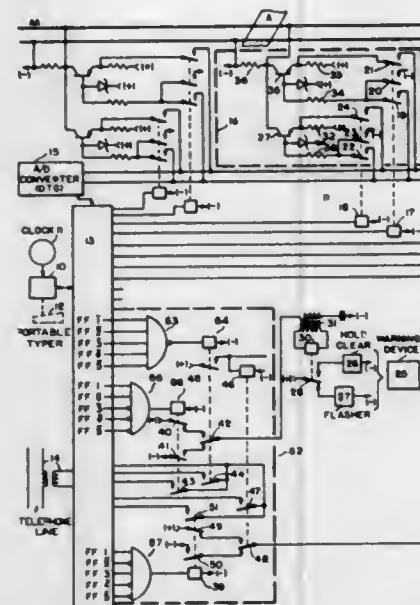
Willis R. Smith, Rochester, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed June 14, 1971, Ser. No. 152,848

Int. Cl. B611 29/32

U.S. Cl. 246-125

7 Claims



The apparatus controls operation of highway warning devices at a plurality of crossings in accordance with the approach of a railroad vehicle and includes a computer for calculating a uniform warning time for each crossing in response to signals received from the crossings. There is means responsive to computer control at each crossing for imposing on the rails a read and check signal at different times in accordance with a selected computer sequence. Receiver means is responsive to the received signal associated with the read and check signals from each crossing and has an output feeding the computer for providing digital intelligence signals with respect to the difference between the received signals. Means at the computer compares the intelligence signals with anticipated responses relative to the associated crossing and other relevant crossings and provides output signals in accordance with the comparison, while means responsive to the comparison means activates the warning device at each crossing a uniform time before the approach of the vehicle.

3,734,435

## BOTTOM BRACE FOR HAMMER LEADS FRAME

Leonard L. Frederick, 15 Crestview Terrace, Whippany, N.J.

Filed May 11, 1971, Ser. No. 142,182

Int. Cl. E02d 7/14, 13/04

U.S. Cl. 248-2

15 Claims

A pile driving machine having a boom and a leads frame universally pivotally connected thereto adjacent the upper

end thereof and a positioning and an adjustment securing frame having longitudinally adjustable side legs, each individually pivotally connected adjacent and opposite the lower side portions of said boom and to the lower side portions of said leads frame, and said side legs being each individually extendable on each side of their joint pivotal connection



whereby of said legs adjacent will effect movement of said leads frame to or from said boom and whereby relative extension of either of said legs will effect desired lateral movement of said leads frame on its universal pivotal connection with the boom. The power means for effecting the above desired adjustments are effected by means on said X-frame.

3,734,436

## CLIP FOR ATTACHING POWER DUCTS TO T-BARS

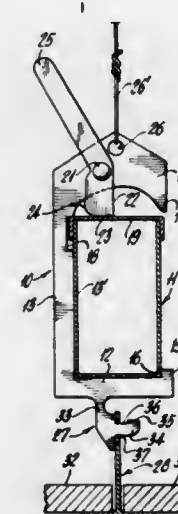
Milton Liberman, 65 Seawane Road, East Rockaway, N.Y.

Filed June 24, 1971, Ser. No. 156,322

Int. Cl. F16l 3/00

U.S. Cl. 248-58

4 Claims



A clamp for supporting prewired ducts above a drop ceiling, the clamp having means for attachment to a supporting surface and to structural members of the drop ceiling and means for releasably engaging and supporting a prewired duct.

3,734,437

## TELESCOPE MOUNTING FOR GUNS

Ralph H. Underwood, 6825 S. Pennsylvania St., Littleton, Colo.

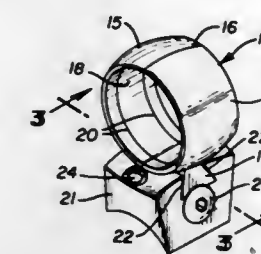
Filed June 24, 1971, Ser. No. 156,229

Int. Cl. F41g 1/38

U.S. Cl. 248-205 R

5 Claims

Telescope mounting for guns which comprises a pair of rigid half ring members designed to embrace and surround a



extends across the meeting edges of the pair of rigid half rings, characterized by the absence of protruding or externally exposed fastening means.

3,734,438

## APPARATUS FOR MOUNTING A TRANSFORMER

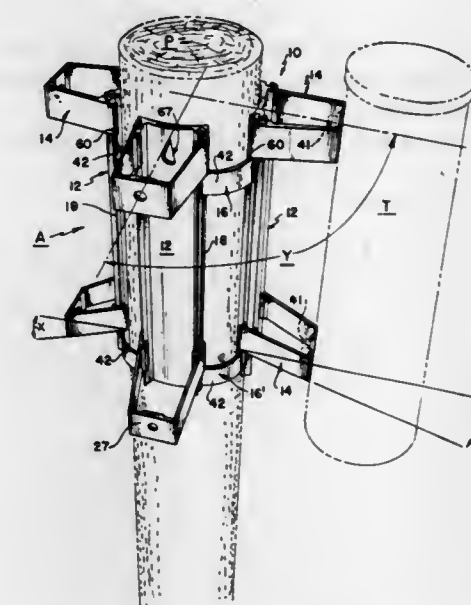
Leon F. Kautz, Hayward, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Sept. 24, 1971, Ser. No. 183,526

Int. Cl. F16m 13/02

U.S. Cl. 248-221

10 Claims



Improved apparatus for mounting one or more transformers, in cluster fashion, about an upstanding pole support and the like. The apparatus is generally comprised of at least one support-engaging bearing plate, a transformer mounting bracket slidably connected to the bearing plate and an adjustable link subassembly slidably and pivotally interlocked to the bearing plate for facilitating unitized handling and quick emplacement of the bearing plate about a pole as well as for providing fine and extensive adjustment of the emplaced bearing plate about the pole.

3,734,439

## BEVERAGE CONTAINER RECEPTACLE AND CLAMP

Donald E. Wintz, St. Paul, Minn., assignor to Aladdin Manufacturing Company, Minneapolis, Minn.

Filed Oct. 22, 1971, Ser. No. 191,616

Int. Cl. F16m 13/02

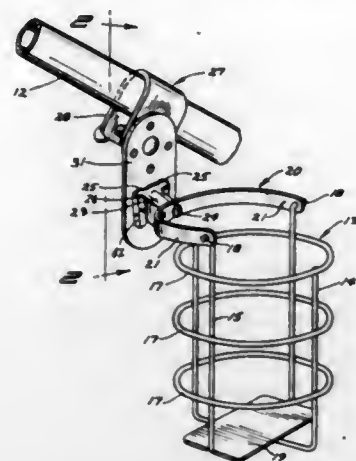
U.S. Cl. 248-224

11 Claims

A device for holding beverage containers, such as cans, bottles and glasses, in an upright position, mountable on an inclined tubular section such as a golf cart handle or a boat railing. A beverage container receptacle is detachably connected by clip means to angularly adjustable clamp means of the invention. The clamp is adjustable to mount on a tubular



section of any given angular inclination, while clip means are rigidly secured relative to the clamp and depend downward therefrom, thereby maintaining the beverage container recep-



tacle in a generally vertical orientation. The beverage container receptacle is free swinging relative to the clip means, so that upon jarring or tilting of the tubular section, the receptacle will tend to maintain a vertical orientation.

3,734,440

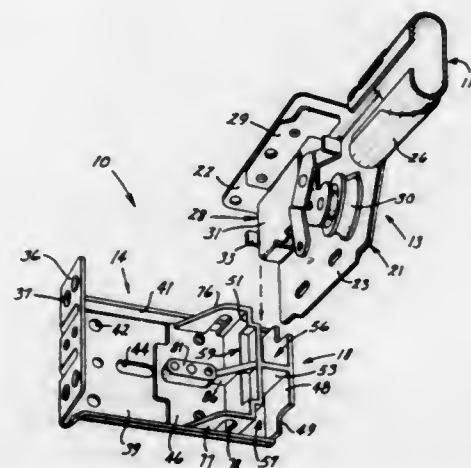
## FIXTURE FOR TRAVERSE ROD

John J. Hoare, Sturgis, Mich., assignor to Kirsch Company, Sturgis, Mich.

Filed July 20, 1972, Ser. No. 273,375  
Int. Cl. A47h 1/10

U.S. Cl. 248-265

9 Claims



A universal fixture for alternately supporting either end of a traverse rod is a molded plastic monolith. The fixture is usable with an end adapter of the kind having a substantially L cross-section trim portion and a substantially rectangular coupler behind and below the forward and upper elements of the trim panel and carrying a rearwardly extending tab. The fixture is adapted to be mounted upon a bracket having a forwardly extending arm. The fixture comprises a substantially planar base mountable on the bracket arm and spaced upstanding walls on the base centrally connected by a baffle and defining upwardly and downwardly opening channels alternately usable for receiving the coupler of end adapters on opposite end of the rod, the coupler being receivable within the upwardly opening one of the channels. A step on one such wall remote from the base provides an abutment for the tab of the end adapter to prevent longitudinal movement of the coupler out of the channel. Means are provided for rigidifying the walls and connecting the fixture to the bracket and end adapter trim panel.

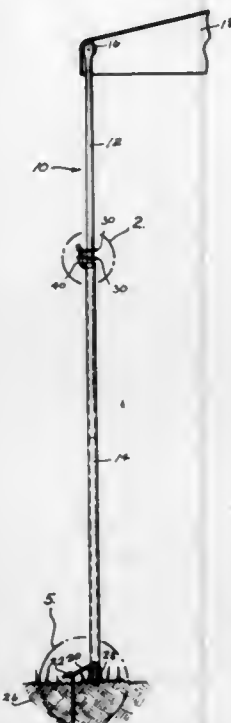
3,734,441  
TELESCOPIC SUPPORT AND IMPROVED MEANS OF LOCKING THE SAME

Philip G. Lux, Elkhart, Ind., assignor to Lux Company, Inc., Elkhart, Ind.

Filed Sept. 9, 1971, Ser. No. 178,930  
Int. Cl. F16m 13/00

U.S. Cl. 248-354

8 Claims



A telescopic support in which a pair of spring biased lock plates serve to prevent extended or retracted movement of an inner telescopic member relative to an outer telescopic member. The lock plate biasing spring is laterally spaced from the inner telescopic member and engages the lock plates to normally urge the plates into a tilted locked relationship.

3,734,442

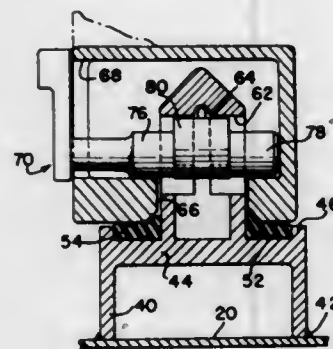
## CONTAINER FASTENER MEANS

Thomas T. Lunde, 1045 Sansome Street, San Francisco, Calif.

Filed Mar. 1, 1971, Ser. No. 119,785

Int. Cl. A62b 35/00; B65J 1/22; B61d 17/00  
U.S. Cl. 248-361

9 Claims



A fitting extends through the bottom access opening into the cavity of a corner casting on a container. The fitting has a bore formed through the upper portion thereof which is axially aligned with the side access opening of the corner casting. A fastener pin extends through the side access opening and said bore. The fastener pin includes at least one cam surface thereon whereby upon rotation of the pin the fitting and the corner casting are urged in opposite directions to firmly clamp the fitting to the corner casting.

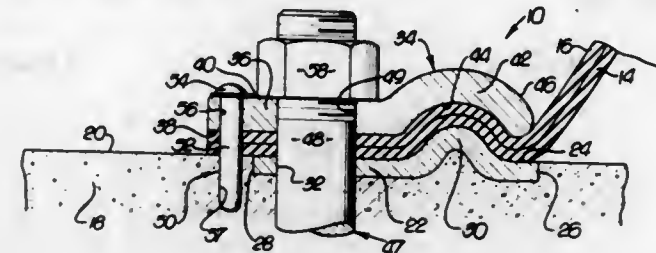
3,734,443  
ANCHORING MECHANISM FOR FLEXIBLE SHEET STRUCTURES

Ernest T. Fukuda, 2040 W. 30th St., Los Angeles, Calif.

Filed Apr. 1, 1971, Ser. No. 130,203  
Int. Cl. E04b 1/56

U.S. Cl. 248-361 R

3 Claims



A device for anchoring flexible sheet structures on a solid mass including a plate member mounted in the mass with its opposite end regions representing exposed surfaces coplanar with the mass and said plate having an intermediate section with a configuration offset from the plane of said surfaces all presenting an upper surface. A clamp adapted to be located from said plate and having an engagement surface coinciding with the profile of the upper surface of the plate and anchor means extending from said mass through said plate and said clamp adapted to retain flexible sheet structures between said plate and said clamp.

3,734,444

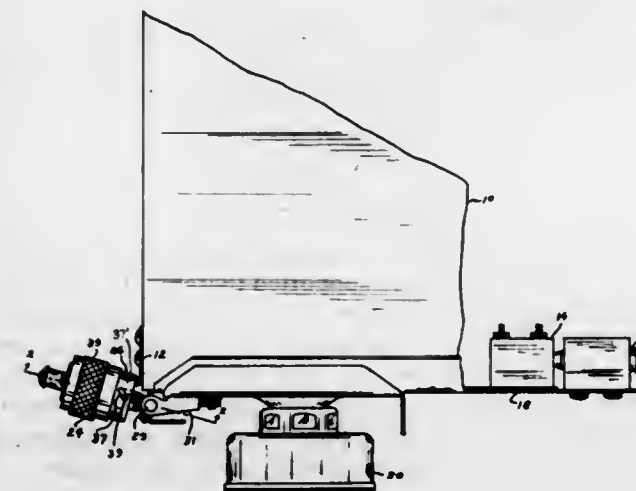
## SAFETY LOCKING DEVICE FOR AIRBORNE SHOCKMOUNTS

Robert E. Thorngate, Kettering, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 8, 1971, Ser. No. 151,048  
Int. Cl. B65d 45/24

U.S. Cl. 248-361 R

2 Claims



A safety locking device for securing electronic apparatus to airborne shockmounts having a cone washer for engaging a hook on the electronic apparatus. The cone washer is slidably supported on a hold down screw having flat sides which conform to flat sides of the cone washer to prevent rotation of the cone washer on the screw. A two part nut has a plurality of slots for engaging a plurality of pins on the cone washer, and a spring for maintaining the pins engaged in the slots. One part of the two part nut engages the threads on the hold down screw, and a second part is for turning the first part on the screw. Pins on the first part of the two part nut engage slots on the second part with a loose fit, to permit limited relative rotation between the two parts of the two part nut.

3,734,445

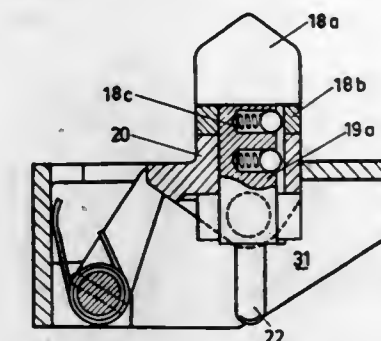
## RETRACTABLE PIVOT BOLT ARRANGEMENT

Hans Werner, Stieglitz-Strasse 13; Baldur Koschinat, Schallbenstrasse 19, and Otto Vormbaum, Siemens-Strasse 2, all of 6078 Neu-Isenburg, Germany

Division of Ser. No. 870,590, Sept. 3, 1962, Pat. No. 3,643,906. This application Sept. 24, 1971, Ser. No. 183,606  
Int. Cl. A62b 35/00

U.S. Cl. 248-361

7 Claims



A pivot bolt arrangement for securing a container having socket-type openings to a housing mounted on a chassis frame support is arranged to be retracted into the housing when not in use. The housing forms a hollow or open space into which the bolt is retracted. The bolt extends upwardly through an opening in the top of the housing with its head resting on a collar. When the bolt extends through the socket-type opening in the container, it can be pivoted relative to the collar for securing the container to the housing. A pivot handle is attached to the bolt for rotating it and for retracting it into the housing.

3,734,446

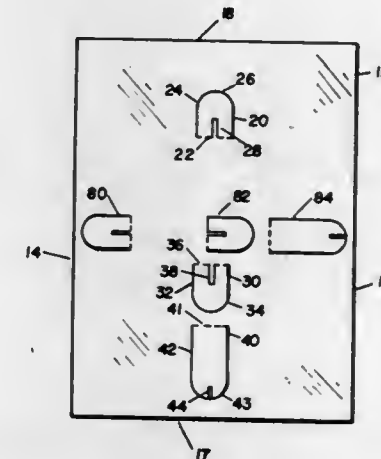
## FRAME BACK AND EASEL ASSEMBLY

William J. Crosson, Pittsburgh, Pa., assignor to Cities Service Company, New York, N.Y.

Filed Sept. 3, 1971, Ser. No. 177,768  
Int. Cl. E47b 97/04

U.S. Cl. 248-460

6 Claims



A novel picture frame back and easel combination comprising a flat back having three erectable cutouts linearly arranged in combination with an easel support. The combination comprises a back, a pair of erectable parallel spaced tabs each with a slit on their base and a finger also erectable in line with the tabs, parallel thereto and having a slit at the tip. An easel is combined with the back and comprises a leg having a flat elbow shaped joint, the joint having a flat surface approximating the distance between the tabs, and an upper rounded extension with a hook end, and a lower quadrant which are inserted into the tab slots.



3,734,447

**REAR VISION MIRROR CONSTRUCTION**

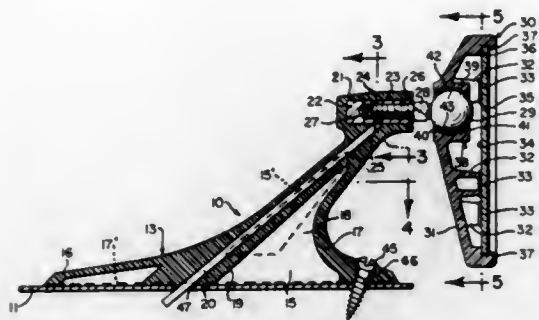
Ronald C. Perison, Sr., East Aurora, N.Y., assignor to Standard Mirror Company, Inc., Buffalo, N.Y.

Filed Apr. 20, 1970, Ser. No. 29,789

Int. Cl. B60r 1/06

U.S. Cl. 248—481

15 Claims



A rear view mirror construction including a molded plastic base member having a metal pin embedded therein with a portion of the pin protruding beyond the base member for insertion into an aperture in the side of a vehicle and a fastener member spaced from the pin and extending through the base member for attachment to the vehicle, a ball carried by the base member, and a molded plastic mirror case supporting a mirror and pivotally mounted on the ball by means of a socket having bosses therein which are shrunk into engagement on the ball for providing a tight fit therewith.

3,734,448

**QUICK CHANGE INDICIA FOR PATTERNS AND THE LIKE**

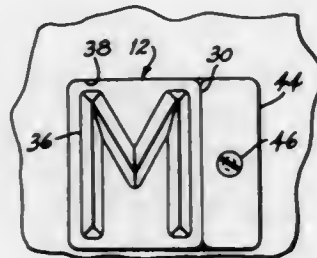
Gerald R. Rusk, and Robert E. Koch, both of Toledo, Ohio, assignors to The Freeman Supply Company, Toledo, Ohio

Filed Apr. 29, 1971, Ser. No. 138,715

Int. Cl. B41b 11/52, 11/58, 11/60

U.S. Cl. 249—103

8 Claims



A quick change indicia display for patterns and the like having a base plate whose top surface is stepped down at one end, and which has a longitudinally extending keyway proceeding therefrom towards the opposite end. The sidewalls of the keyway adjacent the stepped down portion are parallel, and the indicia are formed on the top surface of indicia plates adapted to overlie the entire width of the base plate. The indicia plates have projections on the bottom thereof which extend down into the keyway and which have a longitudinal extent that is a fraction of that of the indicia plate; so that the indicia plate can be slid to a position overlying the parallel sidewall portion of the groove in the base plate and removed. The combined assembly above described is recessed into a pattern or the like, so that the indicia carried by the indicia plate will become an imprint in the molds produced therefrom.

3,734,449

**METAL MOLD FOR INJECTION MOLDING**

Moriyuki Itou, Iwatsuki-shi, Saitama-ken, and Takashi Aoba, Ageo-shi, Saitama-ken, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

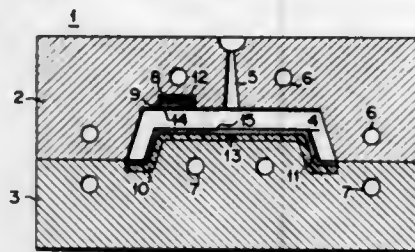
Filed Aug. 6, 1971, Ser. No. 169,785

Claims priority, application Japan, Oct. 14, 1970, 45/101398

Int. Cl. B29c 1/02

U.S. Cl. 249—114

2 Claims



A metal mold for the injection molding, characterized in that a plastic piece being lower in thermal conductivity than the base metal of said metal mold is provided to form at least a part of the inside of said metal mold, and that a metal plating layer is deposited on the exposed surface of said plastic piece.

3,734,450

**FORM FOR MOLDING A BORE IN CONCRETE**

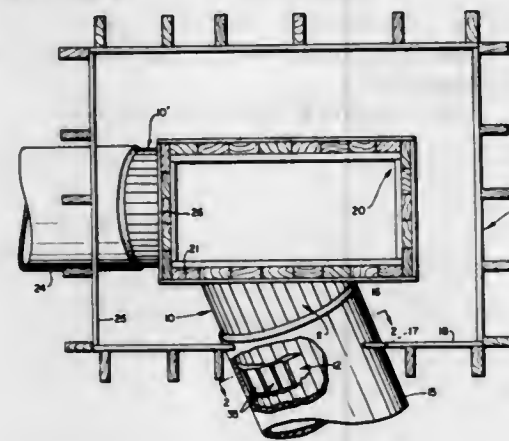
George W. Lengel, RFD No. 1, Pine Grove, Pa.

Filed Oct. 28, 1971, Ser. No. 193,271

Int. Cl. B22c 9/24

U.S. Cl. 249—146

4 Claims



An expansible cylindrical form for mounting partially in the end of a pipe or conduit and supported thereby. An expander, detachably mounted in the form, maintains the form distended and thereby clamped to the pipe while concrete is poured around said pipe end and the part of the form projecting therefrom, to form a bore in the concrete, when set, constituting a continuation of the pipe bore. The form is composed of staves which can be detached readily from one another and from the pipe bore and the concrete bore after removal of the expander. The exposed ends of the staves can be cut off at a desired angle relative to the axis of the pipe to abut flush against an inner mold wall, the plane of which is not at a right angle to the pipe axis.

3,734,451

**PANEL FOR CONCRETE WALL FORMS**

Thomas W. Tierney, Independence, Mo., assignor to T-W-T Properties, Kansas City, Mo.

Continuation-in-part of Ser. No. 843,883, June 4, 1969, abandoned. This application Apr. 19, 1971, Ser. No. 135,123

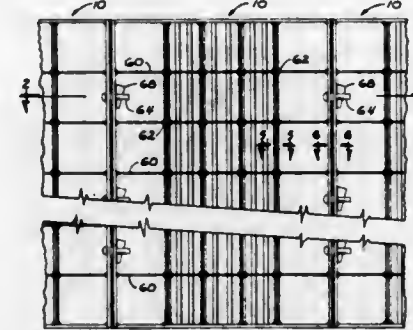
Int. Cl. E04g 11/08

U.S. Cl. 249—192

4 Claims

A concrete wall form utilizes a plurality of interconnected, unitary metal panels. Each panel is comprised of one or more

extruded; channel-shaped intermediate sections and an extruded, channel-shaped end section at either end of the intermediate section. Each section has a pair of spaced flanges separated by an integral connecting portion and the flanges of adjacent sections are disposed in abutting relationship. To as-



sure planar alignment of the connecting portions of the sections each abutting pair of flanges is provided with a V-shaped projection and a complementally configured recess. The projection is self-centering in the recess and accommodates a degree of mismatching between the two abutting sections. The aligned, abutting sections are held as a unitary assembly by a plurality of connecting bars which extend transversely of the longitudinal dimensions of the sections and intersect the flanges. The bars are welded to the sections in a manner to assure that no distortion of the aligned connecting portions takes place during the welding operation.

3,734,452

**DEVICE FOR FORMING AND HANDLING CONCRETE PIPE**

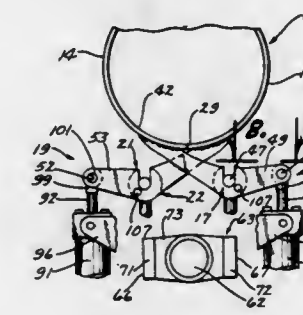
Richard P. Marsh, 103 Maple Street, Vernon, Mich.; Ralph E. Whannel, 1101 Rachael, Waterloo, Iowa, and Julius C. Basso, Owosso, Mich.

Filed Nov. 20, 1970, Ser. No. 91,513

Int. Cl. B28b 13/06

U.S. Cl. 249—171

4 Claims



This disclosure relates to a device for forming and handling concrete pipe which is suitable for attachment to a vehicle having a lifting mechanism. The device comprises a concrete pipe mold formed in hingeably attachable, longitudinal sections and a mold handling apparatus, attachable to the lifting mechanism of the vehicle, for handling the mold and for stripping the mold from the concrete pipe. The mold is stripped from the concrete pipe by rotating two of the longitudinal mold sections about the hinges outwardly of the concrete pipe.

3,734,453

**TIE ROD ASSEMBLY**

Allen N. Bailey, 1607 South Locust Street, Denver, Colo.

Filed Dec. 18, 1970, Ser. No. 99,479

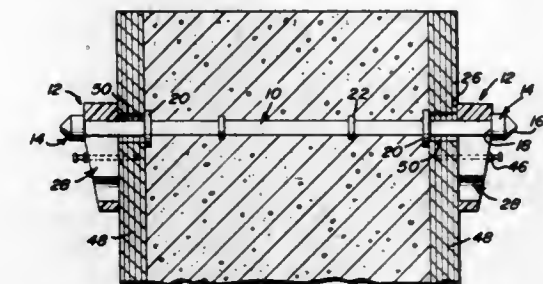
Int. Cl. E04g 17/06

U.S. Cl. 249—213

1 Claim

A system for maintaining laterally spaced form boards for the reception of a concrete pour wherein the tie is of a non-

conductive material and H-shaped in cross-section, the opposed brackets being specifically configured so as to bear



directly against and provide the sole support for the opposed form boards.

3,734,454

**CLIP FOR SECURING HOT TOP LINING SLABS**

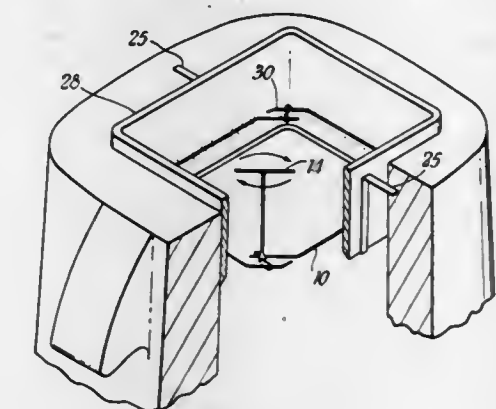
Walter A. McCray, Berea, Ohio, assignor to Fosco International Ltd., Birmingham, England

Filed June 9, 1971, Ser. No. 151,499

Int. Cl. B22d 7/10

U.S. Cl. 249—202

4 Claims



A clip for holding a hot top liner in place within a hot top casing. The clip has an annular, preferably rectangular, configuration, and includes at least one deformable section so that the size of the annulus may be changed. For example, the annulus may be formed of two L-shaped members arranged to form a rectangle, each end of each member being deformed inwardly at a 45° angle, and with adjacent end portions of the two L-shaped members overlapping each other in spaced apart relationship. A deformable link is attached to each of the adjacent end portions of the two L-shaped members, and is oriented at an angle of less than 90° relative to the end portions.

3,734,455

**SAFETY DEVICE FOR A FLUID CYLINDER VALVE ACTUATOR**

Paul J. Natho, Houston, and Felix J. Vicari, Longview, both of Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Sept. 21, 1971, Ser. No. 182,345

Int. Cl. F15b 13/10; F16k 31/143

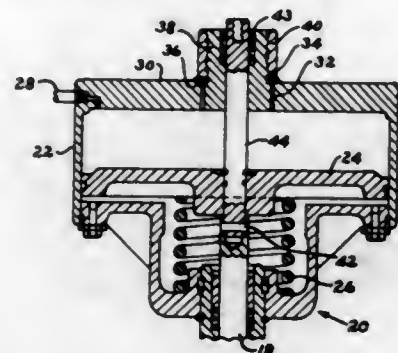
U.S. Cl. 251—62

3 Claims

A remotely controlled fluid pressure actuator has a valve stem extending through the actuator cylinder and a threaded projection on the top of the cylinder. The cylinder has venting ports adapted to be closed by an O-ring when the latter is pressed down by a sleeve on the threaded projection. An auxiliary override for local operation of the valve is adapted to be connected to the threaded projection in place of the sleeve. The auxiliary override cannot be screwed down far enough to



hold the O-ring closed, so that the cylinder is vented to prevent remote operation of the valve while the auxiliary over-



ride is attached and necessitating removal of the auxiliary override before the actuator can again be placed in normal service.

3,734,456

## VALVE WITH AXIAL SCREW ASSEMBLY

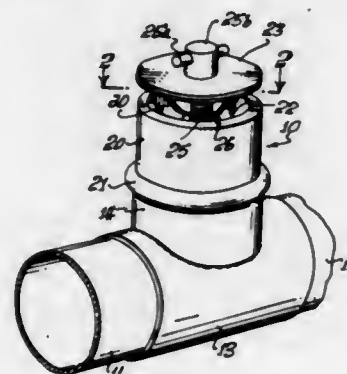
Andre J. Varrin, Oregon City, and William L. McCarter, Portland, both of Oreg., assignors to Pan American Enterprises, Portland, Oreg.

Filed June 9, 1972, Ser. No. 261,364

Int. Cl. F16k 1/02

U.S. Cl. 251-145

3 Claims



A valve of the irrigation riser type, intended primarily for discharging irrigation water, under low pressure head, in controlled volume, in an annular discharge stream. The valve consists of a typical riser cylinder, with an inwardly folded annular shoulder at the upper end, and a disk closure plate adjustably supported above the annular shoulder by means of an axial screw threadably received in a spider in the interior of the riser cylinder. The spider is comprised of an assembly of several identical spider arm segments, extending outwardly and upwardly from the center of the riser cylinder, and an internally threaded bushing which is retained in place within said assembly of spider arm segments. Preferably, the riser cylinder and the spider arm segments are ferrous and welded, while the bushing is a corrosion-resistant non-ferrous material.

3,734,457

## PRESSURE BIASED BUTTERFLY VALVE SEAL

William N. Ross, St. Cloud, Minn., assignor to DeZurik Corporation, Sartell, Minn.

Continuation-in-part of Ser. No. 104,280, Jan. 6, 1971, abandoned. This application Feb. 22, 1972, Ser. No. 228,204

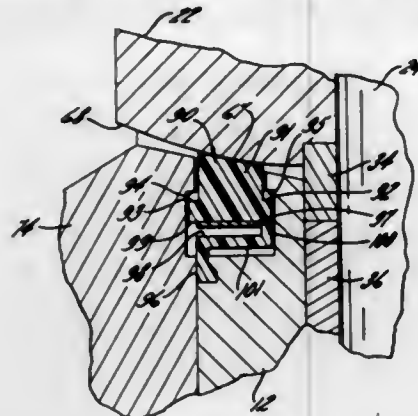
Int. Cl. F16k 1/228

U.S. Cl. 251-173

17 Claims

A resilient seal ring is located in a stepped, annular groove in a valve body with a portion of the ring extending radially inwardly into the flow passageway and a peripheral web of the ring extending radially outwardly into the deeper portion of the groove. One or more metal hoops encircle axially extending shoulders on the ring to take up the primary hoop stresses

imparted to the ring by the valve closure member. In the preferred embodiment the ring is made of a fluorinated hydrocarbon polymer and an annular spring engages one side of the web portion of the ring to provide a secondary seal with



the groove. Pressure entering the groove urges the spring and the web portion axially into more positive engagement with one another and urges the ring radially into more positive engagement with the closure member.

3,734,458

## GATE VALVE

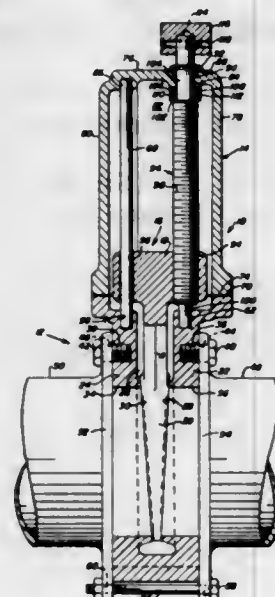
John D. Tricini, Greensburg, and Edward L. Schmitt, Pittsburgh, both of Pa., assignors to Kerotest Manufacturing Corp., Pittsburgh, Pa.

Filed May 11, 1971, Ser. No. 142,185

Int. Cl. F16k 31/50

U.S. Cl. 251-267

8 Claims



The gate valve has a body portion with coaxial inlet and outlet openings in the side walls and valve body chamber with opposed converging valve seats. A wedge member has a body portion with a depending wedge shaped gate portion that is movable vertically into a valve chamber within the body portion to control the flow of fluid through the valve body portion. A cover member is secured to the upper face of the valve body and has an elongated chamber communicating with the valve chamber in which the wedge member moves vertically. A guide pin and valve stem are positioned within a cover chamber in spaced parallel relation to each other and on opposite sides of the longitudinal axis of the gate portion of the wedge member. The wedge member body portion has a longitudinal passageway on one side of the gate portion through which the guide pin extends. The wedge member body portion has a second vertical threaded passageway on the other side of the wedge member gate portion through which the threaded valve stem extends. Rotation of the valve stem moves the wedge member vertically within the chamber of the cover in a manner that the gate portion of the wedge control the flow of

fluid through the valve body chamber. The valve body, because of the offset stem configuration, is relatively short in length and may be positioned between closely adjacent pipe flanges.

3,734,459

## HANDLE AND TRIGGER CONSTRUCTION

William D. Sauerwein, Joppa, Robert A. Meloni, Baltimore, and Harvey J. Walter, Joppatown, all of Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

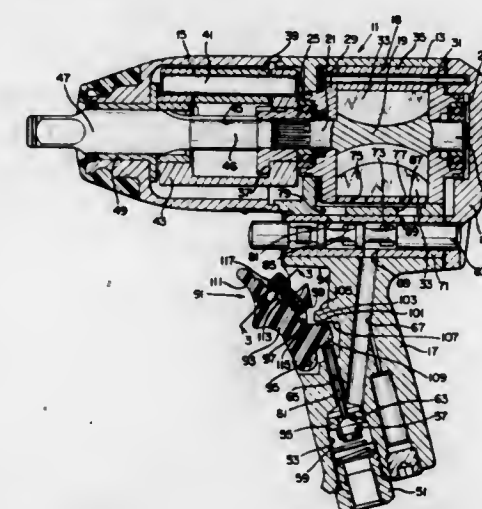
Division of Ser. No. 65,954, Aug. 21, 1970, Pat. No. 3,666,027.

This application Feb. 28, 1972, Ser. No. 229,774

Int. Cl. F16k 51/00

U.S. Cl. 251-285

4 Claims



A portable tool including a housing having a rotary pneumatic motor disposed therein and coupled to a tool spindle. Compressed air is delivered to the motor by conduit means which includes passage means in a handle dependent from the housing. A throttle valve is disposed within the handle and is controlled by a trigger pivoted upon the handle. The trigger and handle are provided with novel adjustable stop means to limit trigger movement.

3,734,460

## AUTOMATIC SETTING MOTION-SENSING CONTROL DEVICE

Frederick C. Clarkson, Jr., 126 Johnson Street, Niagara-on-the-Lake, Ontario, Canada

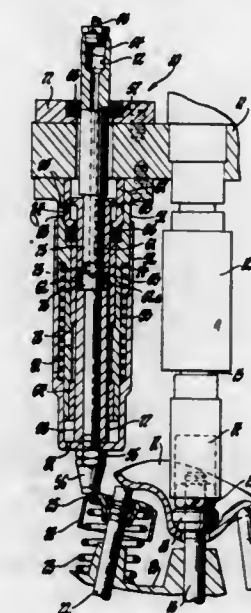
Division of Ser. No. 45,290, June 11, 1970, Pat. No. 3,695,362.

This application Mar. 10, 1972, Ser. No. 233,503

Int. Cl. F16k 1/32; B23q 5/00

U.S. Cl. 251-321

3 Claims



An automatic setting motion-sensing control device in the form of a sensing air valve which closes and sets its initial mea-

surement point upon engagement with a workpiece and then opens upon a predetermined movement of the workpiece, relieving air pressure in the line. The resultant pressure drop is picked up by a pneumatic relay to stop the operation of a motion causing device operating on the workpiece.

3,734,461

## GATE VALVE WITH THIN WALLED HUBS

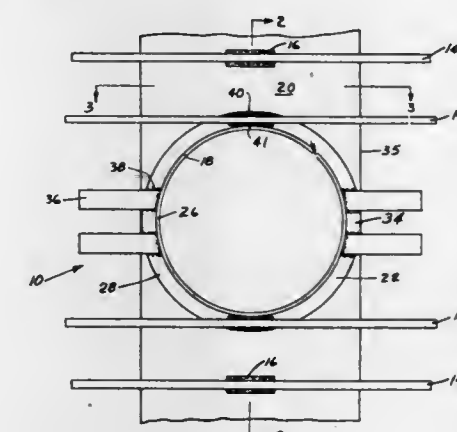
Harry Fred Burger, San Francisco, Calif., assignor to Walworth Company, Bala Cynwyd, Pa.

Filed Sept. 3, 1971, Ser. No. 177,608

Int. Cl. F16k 27/00

U.S. Cl. 251-366

7 Claims



A gate valve body structure with a body tube of rectangular cross-section having flat side and end wall plates. Thick reinforcing plates are welded around the openings in the end walls, and tie plates are extended across the side walls and secured between lateral portions of the reinforcing plates. Tubular pipe sections with relatively thin walls are welded to and around circular openings in the reinforcing plates to form hubs. The tie plates may be formed from the circular portions removed from a plate to accommodate the hubs and end plate openings. Hoop-like reinforcing ribs embrace the body tube, with the pair adjacent the top and bottom portions of the reinforcing plates being secured thereto.

3,734,462

## APPARATUS FOR SPREADING APART ELECTRIC POWER CABLE WIRES

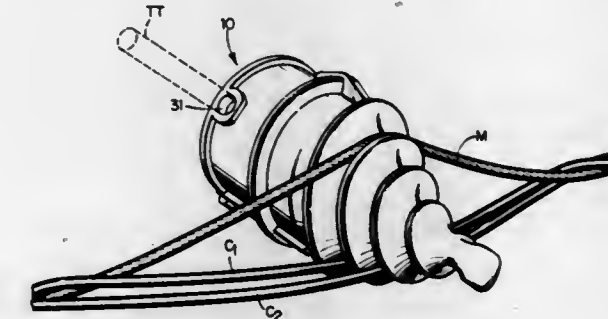
Harry Boone Slade, Amherst, N.H., assignor to Hendrix Wire and Cable Corp., Milford, N.H.

Filed Nov. 11, 1971, Ser. No. 197,740

Int. Cl. B60p 1/00

U.S. Cl. 254-1

7 Claims



Wedge-like, spiral threaded tool for separating wound together aerial electric power cable wires by inserting and rotating therebetween to spread the wires apart into a position in which they can be individually manipulated.



3,734,463

**CHAIN SNUBBING AND POLE-GRIPPING DEVICE FOR POLE-RAISING APPARATUS**

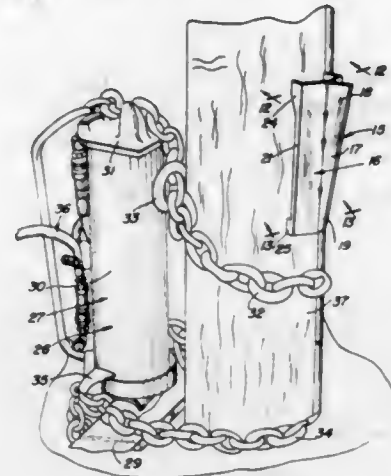
Dennis J. Enright, 1706 Happ Road, Northbrook, Ill.

Filed Feb. 7, 1972, Ser. No. 224,201

Int. Cl. E21b 19/00

U.S. Cl. 254-30

11 Claims



A chain-snubbing and pole-gripping device for a pole-raising apparatus for raising wooden and other electric power line poles, telephone poles and the like, out of the ground, without substantial damage to the pole, embodying a toothed chain-snubbing and pole-gripping member which is adapted to be driven partially into the body of a wooden pole, somewhat above the ground level. In the use of the chain-snubbing and pole-gripping device, a flexible means, preferably in the form of a flexible chain member, encircles the pole and extends over the chain-snubbing and pole-gripping device, and fluid power-operated means in the form of a hydraulic or pneumatic piston-cylinder device is provided for raising the flexible chain member, thereby causing the flexible chain member to grip the chain-snubbing and pole-gripping device and thus raise the pole a predetermined increment. The operation may be repeated by removing the chain-snubbing and pole-gripping device from the pole and relocating it on the pole at a lower level until the pole is completely raised out of the ground in successive increments.

3,734,464

**CONTROL SYSTEM FOR MULTI-STAGE LIFT**

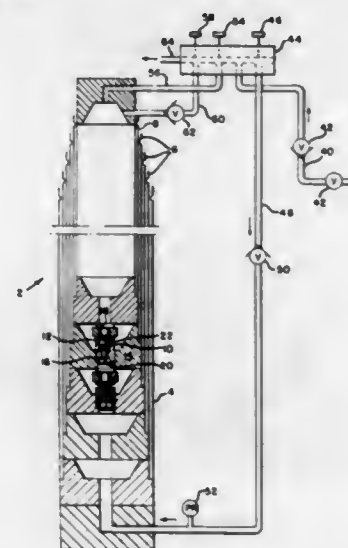
Sherman W. Bushnell, Jr., 1214 East Hamlin No. 4, Seattle, Wash.

Continuation-in-part of Ser. No. 889,235, Dec. 30, 1969, abandoned. This application Nov. 17, 1971, Ser. No. 199,566

Int. Cl. B66f 3/24

U.S. Cl. 254-93 R

10 Claims



A compressible fluid operated multi-stage telescopic hoist for operating to a given load limit. The hoist has a plurality of

stages progressing from a base stage of largest cross section to a top stage of smallest cross section. The bottom stage together with a predetermined group of intermediate stages comprises a bottom set of stages and the remainder of the intermediate stages with the top stage comprise a top set of stages. A supply means is interconnected with said stages for selectively supplying a compressible fluid at a predetermined pressure well above the minimum pressure required and the fluid is introduced to the hoist whereby the bottom set of stages is more rigid and at a higher pressure than the superposed column of the top set whenever the hoist assembly is extended beyond said bottom set. The hoist further includes vent means for selectively venting said sets whereby the pressure in the bottom set is maintained at least as high as the pressure at the top set while the hoist assembly is being retracted.

3,734,465

**TRAVELING JACK ASSEMBLY**

Thomas N. Patchen, 325 Carolyn Street, Auburn, Calif., and

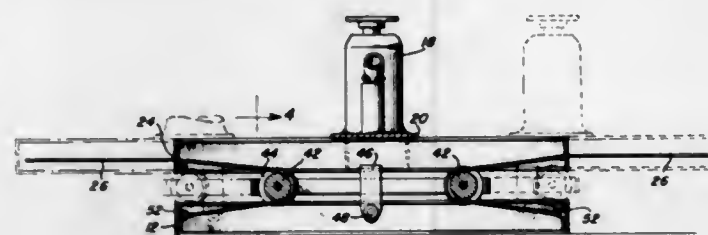
Roy R. Patchen, 3742 Ardley Avenue, Oakland, Calif.

Filed July 19, 1971, Ser. No. 163,718

Int. Cl. B66f 3/00

U.S. Cl. 254-84

12 Claims



A traveling jack assembly comprising a movable jack carriage support frame mounted above a support base of similar size and configuration with an intermediate roller assembly therebetween, such that longitudinal movement of the roller assembly through a distance on the support base produces twice the longitudinal movement of the jack carriage. The roller assembly is manipulated by way of a pair of cables or belts extending through openings in each end wall of the jack carriage, and the jack carriage is provided with a downwardly extending interlock, or connecting frame, having a pair of wheels which engage a guide channel in the support base.

3,734,466

**LIFT DEVICE FOR VARIABLY DISPLAYING AND FACILITATING REPAIRS OF VEHICLES SUCH AS SNOWMOBILES**

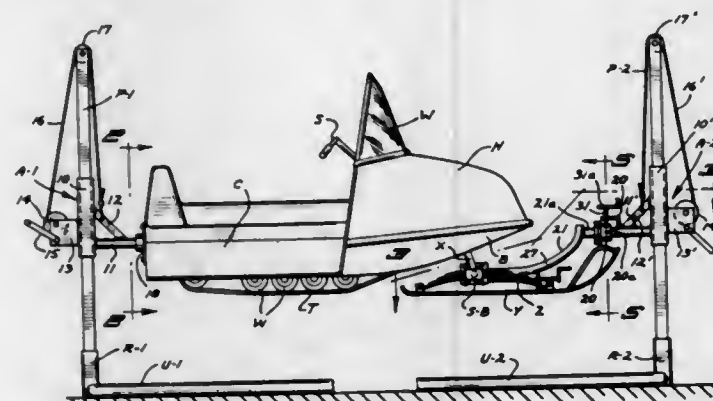
Merle C. Mason, Route 2, Spicer, Minn.

Filed July 12, 1971, Ser. No. 161,750

Int. Cl. B66f 7/00

U.S. Cl. 254-89

6 Claims



A lift device for variably supporting vehicles such as snowmobiles to facilitate display and repair thereof, employs a pair

of rigidly supported, upstanding mounting posts variably spaced apart distances to longitudinally accommodate vehicles varying in length. An adjustable supporting assembly is slidably mounted on each of said posts, one assembly being constructed for interconnection with the rear part of the vehicle on a horizontal axis which is substantially in alignment with the longitudinal center of gravity of the vehicle. The second supporting assembly, slidably adjustable on the second post fixedly carries a trunnion-like horizontal member for rotative interconnection and support of a forward hub member of a laterally adjustable unit. Said unit is constructed for lift-interconnection with conventional elements of a number of vehicles varying in width, and which elements are conventionally disposed below the front of the body and adjacent the sides thereof. The said forward hub of the adjustable unit in use will also be disposed substantially in alignment with the longitudinal center of gravity of the vehicle. With such rotative support connections substantially aligned with center of gravity the vehicle, when elevated to a desired position for viewing or repair may be angularly swung to numerous positions along the center of gravity line, even to an inverted position and positive locking means are provided for retaining the hub and vehicle in any one of a number of desired positions.

3,734,467

**WIRE WALL PARTITION**

Robert G. Weeden, Woodbridge, Ontario, Canada, assignor to

Anthes Equipment Ltd., Port Credit, Ontario, Canada

Filed May 19, 1971, Ser. No. 144,773

Int. Cl. E04b 17/04

U.S. Cl. 256-65

2 Claims



A wire wall partition made up of sections and uprights. Each of the sections has a pair of upright members and a pair of horizontal members forming a generally rectangular framework. Each of the members defines a slot for receiving a thickened peripheral portion of a wire mesh so that the members can be slid onto the mesh and once in position, clamped in place using corner brackets. Further brackets are provided for attaching each section to the uprights which may be attached permanently to a floor and ceiling or alternatively be of a type having a compression spring to permit frictional engagement of the upright between floors of a building under construction.

3,734,468

**MIXING DEVICES**

David Chung-Hsun Cheng, Letchworth, England, and John

Brian Davis, Dumfries, Scotland, assignors to National

Research Development Corporation, London, England

Filed Feb. 2, 1971, Ser. No. 112,010

Claims priority, application Great Britain, Feb. 3, 1970, 5,225/70

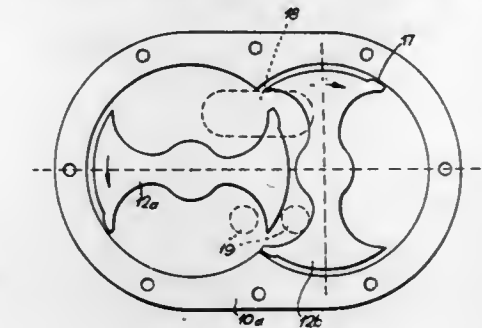
Int. Cl. B01f 7/16

U.S. Cl. 259-6

10 Claims

A mixing device is proposed comprising a chamber defined by two circular cylindrical lobes in part overlapping parallel

relation. Each lobe houses a similar rotor rotatable about the lobe axis, the rotors being maintained in a predetermined intermeshing contra-rotating relation. Each rotor has like symmetrical section along its length defined by a pair of radial arms. Each arm has concave sides, with adjacent ones of these sides merging into convex axial portions, and radially outer peripheries which pass closely adjacent the lobes surfaces. This geometry defines leading and trailing peripheral tips



whereby each leading tip wipes its lobe and a trailing tip side of the other rotor, each trailing tip wipes the leading tip side of the other rotor, and each arm periphery rolls around an axial portion of the other rotor. Material to be mixed is charged and discharged axially for batch or continuous operation, and the rotors can provide a screw action for the latter operation. Similar arrangements involving more lobes in the chamber, and/or more arms for each rotor, can be evolved.

3,734,469

**REACTOR VESSEL AND UP-DOWN MIXER**

Arnold M. Goldstein, Whippany; Edward Effron, Springfield,

and Jack M. Hochman, Boonton, all of N.J., assignors to

Esso Research and Engineering Company, Linden, N.J.

Filed Dec. 31, 1970, Ser. No. 103,181

Int. Cl. B01f 7/16

U.S. Cl. 259-8

2 Claims



A mixer comprising sets of multi-bladed 45° axial impellers for providing substantially perfect mixing in a cylindrical reactor vessel having an L/D ratio greater than one. A first set of impellers located closest the impeller shaft pump downward while a second set of impellers located outwardly from the first set of impellers pump upward enhancing the flow along the vessel walls.

3,734,470

**POLISHING APPARATUS**

Manfred Dreher, Engelsbrand, Neuenburg, Germany, assignor to

Dr. Ing. Manfred Drescher KG, Engelsbrand, Germany

Filed Sept. 8, 1971, Ser. No. 178,632

Claims priority, application Germany, June 16, 1971, P 21 29 840.8

Int. Cl. B01f 9/04

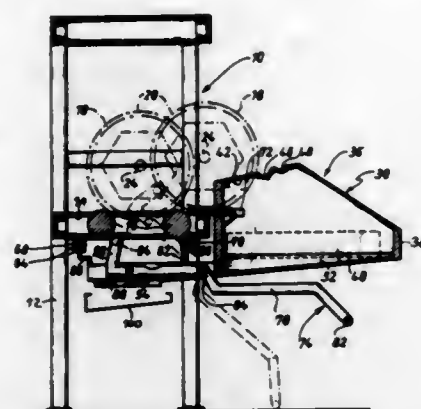
U.S. Cl. 259-89

9 Claims

A frame mounting a pair of rotatable rollers forming a seat for a cylindrical drum container. Means for receiving the



drum after mixing and means for lifting the drum from the rollers into the receiving means with the axis of the drum maintained in parallel relationship to the axis of the rollers.



3,734,471

### DEVICE FOR CONTINUOUS MIXING OF SOLIDS WITH LIQUIDS

Kasper Engels, 68 Mannheim 31, Germany, assignor to Firma Dräswerke GmbH, Speckweg, Germany

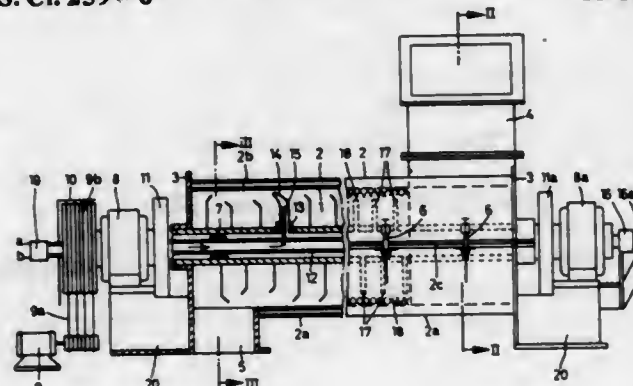
Filed Aug. 31, 1971, Ser. No. 176,534

Claims priority, application Germany, Nov. 24, 1970, P 20 57 594.4; Mar. 23, 1971, P 21 13 960.6

Int. Cl. B01f 7/04

U.S. Cl. 259-6

18 Claims



A method and device for uniformly wetting wood chips with glue in which the wood chips are propelled along a helical path with the glue being applied by centrifugal action concentrically and radially in finely dispersed form.

3,734,472

### SCREW EXTRUDER

Harald Strohmeier, 8605 Kapfenberg, Austria, assignor to Gebr. Bohler & Co. AG., Kapfenberg, Austria

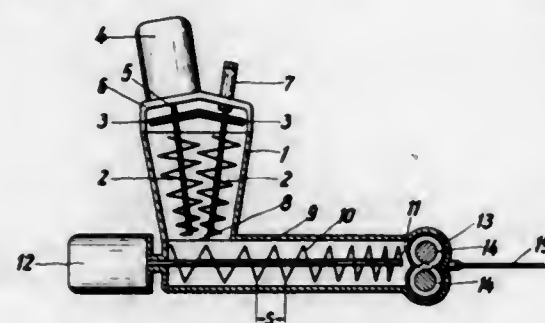
Filed Feb. 3, 1971, Ser. No. 112,384

Claims priority, application Austria, Feb. 10, 1970, 1174/70; Feb. 10, 1970, 1172/70

Int. Cl. B01f 7/08

U.S. Cl. 259-192

2 Claims



The screw extruder serves to form a coating on welding electrodes and comprises a feed hopper, two feeder screws,

which are disposed in the feed hopper and mesh with a backlash, a precompacting screw, which is disposed below the feed hopper, a first housing surrounding said precompacting screw, two high-pressure screws, which mesh substantially without backlash, and a second housing surrounding the two high-pressure screws. The feeder screws are operable to deliver coating composition to the precompacting screw and the latter is operable to deliver coating composition to the two high-pressure screws.

3,734,473

### AIR VALVE TYPE CARBURETOR

Hisanori Moriya, and Yukio Hosho, both of Katsuta-shi, Japan, assignors to Hitachi Ltd., Tokyo, Japan

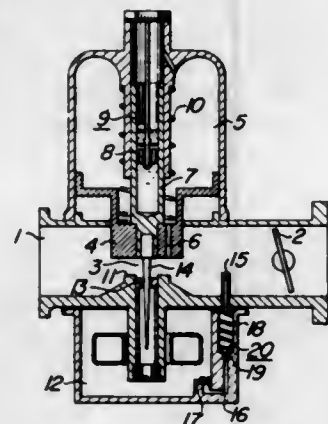
Filed Jan. 5, 1971, Ser. No. 104,007

Claims priority, application Japan, Jan. 16, 1970, 45/3832

Int. Cl. F02m 9/06, 7/06

U.S. Cl. 261-44 R

19 Claims



An air valve type carburetor in which a nozzle is disposed in an air passage between an air valve and a throttle valve, and said nozzle is communicated with a float chamber through a passage with a check ball disposed therein, whereby at the time of acceleration fuel is injected from the nozzle by making use of a negative pressure appearing in the vicinity of said nozzle.

3,734,474

### CARBURETOR FOR INTERNAL COMBUSTION ENGINES

Pier Luigi Olati, 27010 Santa Cristina Bissone, Pavia, Italy

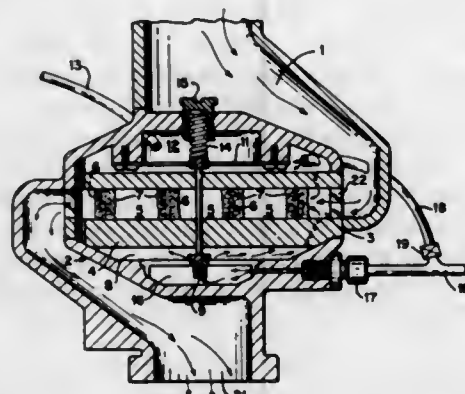
Filed Oct. 30, 1970, Ser. No. 85,571

Claims priority, application Italy, Oct. 31, 1969, 32453 A/69

Int. Cl. F02m 17/28

U.S. Cl. 261-95

6 Claims



A very fine subdivision of the gasoline in a carburetor and complete combustion are achieved by means of a microporous body, prepared from sintered granulated iron. The microporous body is placed in a tank which is connected with a suction duct for the flow of air. The microporous body is longitudinally crossed by a slot, provided with cylindrical columns made of porous materials. The microporous body and the columns are soaked in gasoline. The gasoline flows

through a hole, the opening of which is regulated by the vertical oscillatory motion of a conical needle, the motion being provided by a diaphragm and by an adjustable spring. On the opposite side of the suction duct, is a gate constituted of two bulkheads, the opening and closing of which are controlled by the accelerator. Air touches the surface of the columns on which are formed microscopic myriads of gasoline drops and a fine mist is formed.

3,734,475

### LIQUID-SOLID REACTION APPARATUS

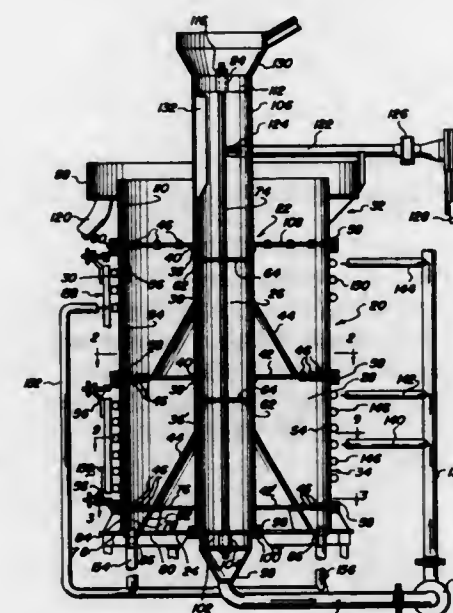
Thomas Valle, P.O. Box 331, Carbondale, Colo.

Filed Jan. 31, 1972, Ser. No. 222,154

Int. Cl. C22b 15/12

U.S. Cl. 266-12

8 Claims



Liquid-solid reaction apparatus for carrying out a continuous flow process, as for example, the production of copper by the reaction of dilute copper sulfate liquors with iron in the form of finely divided powders or particles. A liquid-solid slurry is introduced at a controlled rate into the upper end of a vertical tube which extends coaxially through a cylindrical chamber. The flow of slurry from the lower end of the tube is divided and passed through a plurality of individual coils wound about the exterior of the outer chamber. The flow of slurry from the coils is recombined at the lower end of the chamber and passed upwardly through the annular flow passage defined between the outer side of the inlet tube and the inner wall of the chamber. The slurry is discharged from an outlet at the upper end of the chamber. During its flow through the central tube and chamber, the slurry is subjected to agitation to maintain the slurry in a thoroughly mixed condition. The external coils are likewise distorted or compressed at spaced locations to establish a turbulent slurry mixing action to the slurry as it passes through the coils.

3,734,476

### CUTTING TORCH

Allen L. Holzman, Palo Alto, Calif., assignor to United Aircraft Corporation, East Hartford, Conn.

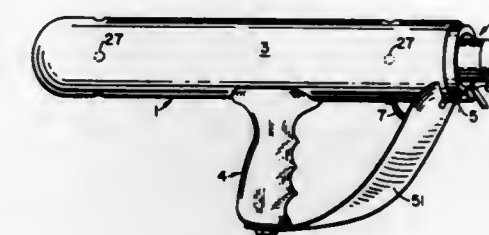
Filed Sept. 13, 1971, Ser. No. 179,891

Int. Cl. B23k 7/00

U.S. Cl. 266-23 R

10 Claims

A method for cutting metal is disclosed in which a fuel and an oxidizer are burned within a combustion chamber at higher than ambient pressures to produce a gas stream comprising an oxidizer-rich core surrounded by a fuel-rich sheath. This gas stream is caused to impinge upon a body of metal to be cut at approximately sonic velocities by passing the gas stream through a choked nozzle arranged with respect to the combustion chamber so that the oxidizer-fuel orientation in the gas stream is maintained. Portable hand-held apparatus for



3,734,477

### GUIDE FOR CUTTING TORCH

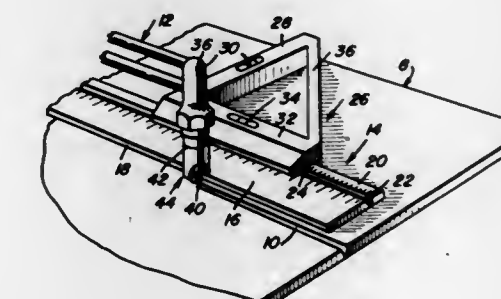
Nick Enfantino, 1723 Willon St., San Jose, Calif.

Filed July 19, 1971, Ser. No. 163,768

Int. Cl. B23k 7/10

U.S. Cl. 266-23 M

2 Claims



A readily applicable and removable supporting and steady-ing guide for use on the flame emitting tip of a manually manipulatable cutting torch. The torch and tip are conventional. The guide comprises a split expansible and contractible brass or equivalent collar herein defined as an adapter and whose lower edge is provided with a pair of diametrically opposite depending selectively usable legs for supportively elevating, gauging and steadying the height of the flame tip. These legs are circumferentially separated by diametrically opposite clearance notches.

3,734,478

### HYDROPNEUMATIC SHOCK ABSORBING ARRANGEMENT FOR AUTOMOTIVE VEHICLES OR THE LIKE

Manfred Lohr, 5868 Letmathe, Germany, assignor to Hoesch Aktiengesellschaft, Dortmund, Germany

Filed June 11, 1971, Ser. No. 152,268

Claims priority, application Germany, June 13, 1970, P 21 22 651.7; June 13, 1970, P 20 29 351.0

Int. Cl. B60g 11/56

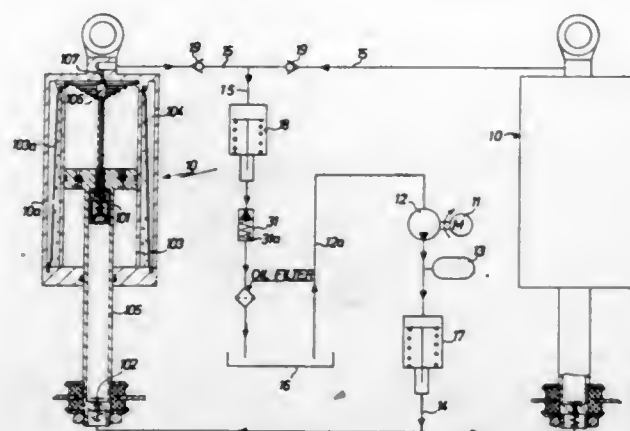
U.S. Cl. 267-34

22 Claims

A shock absorbing arrangement for use in automotive vehicles has several self-levelling hydropneumatic struts, a pump and an accumulator for pressurized hydraulic fluid, a tank for hydraulic fluid, and two mechanically operating delay units the first of which delays the expansion of struts to their normal length and the second of which delays the contraction of struts to their normal length. The first delay unit is installed in a con-



duit which connects the pump and the accumulator with inlets provided in the piston rods of the struts and the second delay generally of the class of rare earth metal oxides in an oxygen deficient condition. Also, the second layer may be yttrium



unit is installed in a conduit which connects the outlets of the struts with the tank.

3,734,479

### HOLLOW VESSEL WITH ANNULAR EXTERNAL SUPPORT RING

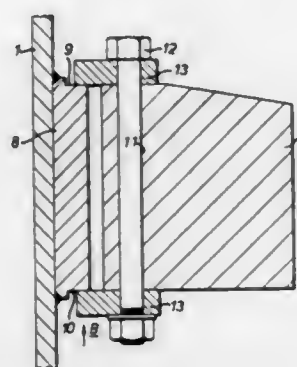
Donald Alan Atkinson, Teesside, England, assignor to Ashmore, Benson, Pease & Company Limited, Stockton-on-Tee, Teesside, England

Filed Jan. 19, 1972, Ser. No. 218,939

Int. Cl. F27b 7/22

U.S. Cl. 266—36

9 Claims U.S. Cl. 269—228



A hollow vessel, conveniently a converter for use in a steel making process, has at least one annular ring surrounding it. The ring is removably secured to the wall of the vessel by pairs of clamping members attached to either the ring or the vessel and clamped on to opposed surfaces on the vessel or the ring respectively. Removable keys extending substantially parallel to the axis of the vessel and positioned between the clamping members and projections on the vessel reduce angular movement between the vessel and ring almost to zero.

3,734,480

### LAMELLAR CRUCIBLE FOR INDUCTION MELTING TITANIUM

Charles A. Zank, Bowie, and Richard L. Helferich, Crownsville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

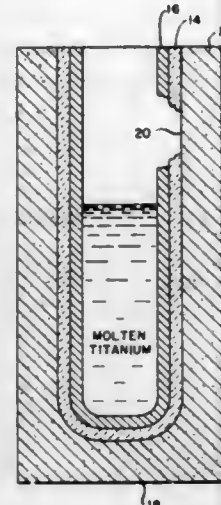
Filed Feb. 8, 1972, Ser. No. 224,537

Int. Cl. F27b 14/10

U.S. Cl. 266—39

4 Claims

A lamellar crucible for induction melting titanium has an outer graphite shell closed at one end to form inner and outer surfaces. A first layer generally of the class of refractory metals or of beryllium oxide covers the inner surface of the shell to limit carbon contamination. A second layer is preferably oxygen deficient yttrium oxide and may also be



oxide or the rare earth metal oxides. The second layer covers the first layer to limit reactivity with the molten titanium.

3,734,481

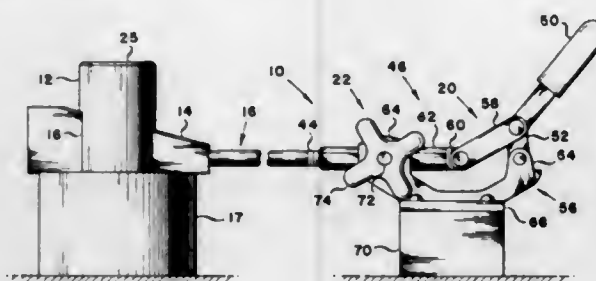
### ADJUSTABLE WEDGE ASSEMBLY

Michael Surwill, Burbank, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Nov. 16, 1970, Ser. No. 89,844

Int. Cl. B25b 1/14

15 Claims



A wedge assembly adjustable from a remote position from the wedge, for supporting forgings undergoing machining on a worktable or for other purposes. A riser member slidably mounted in a body member is supported by a wedge seated on the body member and disposed in a slot in the riser. The wedge is longitudinally displaceable through the slot by a push-pull rod whose one end is connected thereto. At the other end of the rod, remote from the riser, a toggle arrangement for axially displacing the rod and a stem-and-handle means for locking the rod at a particular displacement is provided. The body member supporting the wedge and riser is securable to the worktable under a portion of the forging or other workpiece desired to be held during machining or during other operations on a workpiece. The load of the forging or workpiece passes directly through riser, wedge and body member to the worktable, while the remotely positioned stem-and-handle and toggle arrangement facilitate the proper positioning for the wedge prior to work on the workpiece. Proper elevation of the riser member to contact the forging avoids excessive lifting of the forging or workpiece. The problem of excessive lifting exists with use of conventional jacks, resulting in an out-of-tolerance condition upon removal of the machined element from the worktable. However, use of plurality of these assemblies avoids such problem.

### ERRATUM

For Class 267—34 see:  
Patent No. 3,734,478

3,734,482

### DEVICE FOR FIXING A LEAF SPRING

Michel Duchemin, 59 Lambres les Douai, France, assignor to Ressorts Du Nord S.A., Douai, France

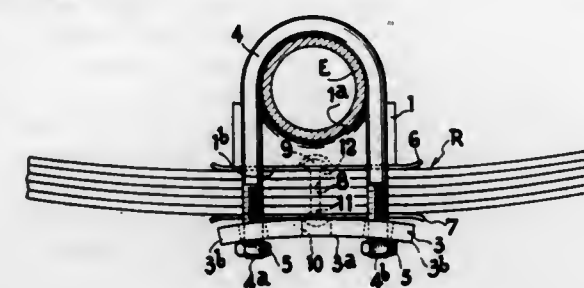
Filed Apr. 29, 1971, Ser. No. 138,698

Claims priority, application France, Apr. 29, 1970, 7015651

Int. Cl. F16f 1/26

U.S. Cl. 267—52

9 Claims



A device for fixing a leaf spring to an axle of a vehicle. The device comprises two clamping elements between which the spring is clamped by two U-shaped fixing members tightenable by nuts screwed thereon. One of the clamping elements is a resiliently-yieldable plate which has a bent shape in the free state so that it is applied against the spring throughout its surface area after the fixing members are tightened. In this way, the spring is prevented from bending in its center part (weakened by openings for assembly members) and wear, produced by rubbing along the ends of the clamping elements, is markedly reduced.

3,734,483

### RECOVERABLE SHOCK MOUNTS

John Adams, Watford, England, assignor to S.G. Brown Limited, Watford, England

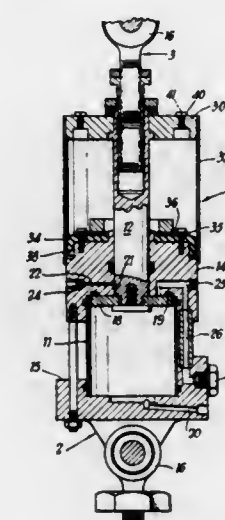
Filed May 10, 1971, Ser. No. 141,701

Claims priority, application Great Britain, May 12, 1970, 22,947/70

Int. Cl. F16f 5/00

U.S. Cl. 267—65

17 Claims



A recoverable shock mount for mounting gyroscope and like apparatus against shock comprises a cylinder connected to the vessel or other support for the apparatus, and containing a face seal plate connected to the apparatus by a piston rod. Fluid normally urges the plate against one end of the cylinder with a force in moderate excess of that required for support, but after displacement under shock restores the plate under a lower excess force. The mount may be responsive to compressive or tensile shock or to both. A plurality of the mounts may be interconnected so that all collapse in response to the collapse of one, to preserve the apparatus against tilt.

3,734,484

### TORSIONAL VIBRATION DAMPER

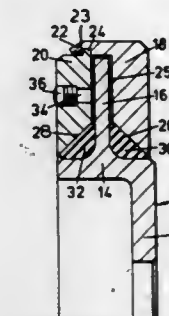
Jeffrey Hall, Huddersfield, England, assignor to Houdaille Industries Inc., Buffalo, N.Y.

Filed Apr. 2, 1971, Ser. No. 130,736

Int. Cl. F16k 7/00

U.S. Cl. 267—137

6 Claims



The invention relates to a torsional vibration damper comprising a hub member, an inertia member comprising at least two parts and being disposed about a peripheral portion of the hub member to define a cavity and a viscous fluid disposed in said cavity, each of said two parts of the inertia member being cut away in a region adjacent the hub member, and an elastic tuning element formed from a high resilience, low hysteresis material located in each said cut away portion in such manner that each said elastic element is under both axial and radial compressive stress to locate positively said inertia member both axially and radially relative to said hub member, and also acts as a seal between said hub member and said inertia member whereby to seal said viscous fluid in said cavity.

3,734,485

### HOLD-DOWN DEVICE FOR SHEARS IN PARTICULAR FOR BAR STOCK SHEARS

Siegfried Klaus, Ennepetal, Germany, assignor to Paul Ferd Peddinghaus, Gevelsberg, Germany

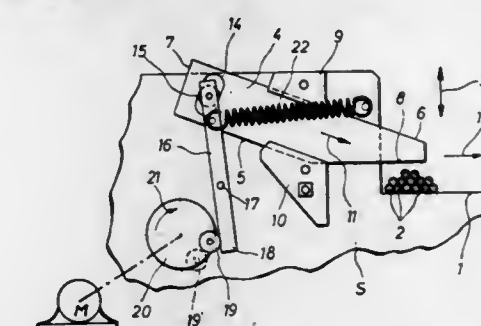
Filed May 11, 1971, Ser. No. 142,274

Claims priority, application Germany, May 14, 1970, P 20 23 517.0

Int. Cl. B23q 3/02; B26d 7/02

U.S. Cl. 269—137

6 Claims



A device for holding work pieces to be cut on supporting means of shears, which includes a holding member guided so as to be continuously inclined toward said supporting means and to be movable simultaneously along the inclination of said holding member and toward a work piece supporting horizontal surface of said supporting means while eccentric means periodically withdraw said holding means from said supporting means.

3,734,486

### MIXING BOARD

Wallace E. Peacey, 145 Favinger Road R.D. 2, Pottstown, Pa.

Filed Sept. 10, 1971, Ser. No. 179,467

Int. Cl. A47j 43/00; A61c 19/02

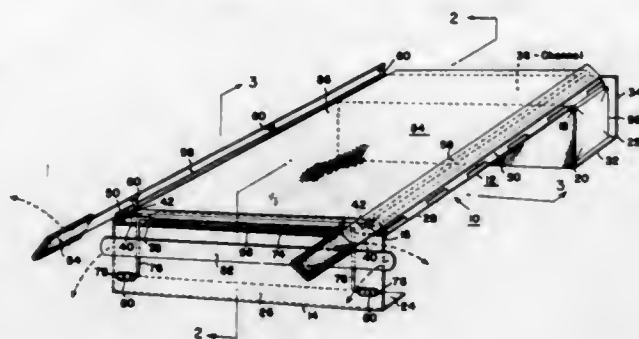
U.S. Cl. 269—302.1

15 Claims

A board on which a batch of materials may be mixed, e.g., plastic materials used in automobile body repair work, is pro-



vided with means for cradling a box of wax paper, which may be drawn from the roll thereof in the box forwardly over the board. The board is provided with means for drawing the wax



paper taut across the mixing board and for releasably securing the opposite sides of the sheet of wax paper and the leading end thereof to the board.

#### ERRATUM

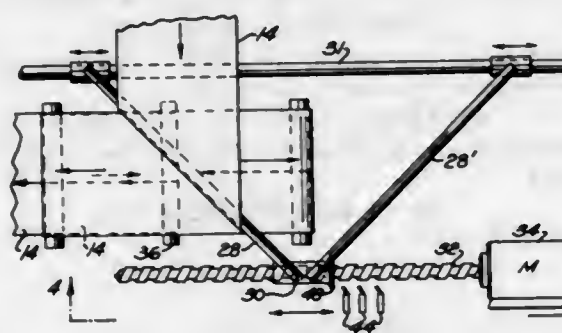
For Class 269-228 sec:  
Patent No. 3,734,481

3,734,487

**AUTOMATIC RIBBON ASSOCIATING APPARATUS**  
Ernest H. Treff, Groton, Conn., assignor to Harris-Intertype Corporation, Cleveland, Ohio  
Filed Dec. 31, 1970, Ser. No. 103,021  
Int. Cl. B65h 39/00

U.S. Cl. 270-52

14 Claims



An improved ribbon associating and interleaving apparatus for web fed printing presses which provides automatic positioning of the slitter wheels, turner bars and compensator rolls for predetermined interleaving patterns. A control circuit enables the operator to dial the desired pattern and a visual display of the pattern dialed facilitates webbing of the ribbons. A system both for fixed ribbon width folders and for variable ribbon width folders is disclosed.

3,734,488

**MECHANISM FOR SUCCESSIVELY DELIVERING SHEET ARTICLES FROM A STACK**

Warren W. Hannon, and Charles N. Hannon, both of Olathe, Kans., assignors to said Warren W. Hannon, by said Charles N. Hannon, Olathe, Kans.

Division of Ser. No. 751,011, Aug. 7, 1968, Pat. No. 3,608,891, which is a continuation-in-part of Ser. No. 665,540, Sept. 5, 1967, abandoned. This application Nov. 2, 1970, Ser. No. 86,283

Int. Cl. B65h 3/30, 3/42, 39/02

U.S. Cl. 270-58

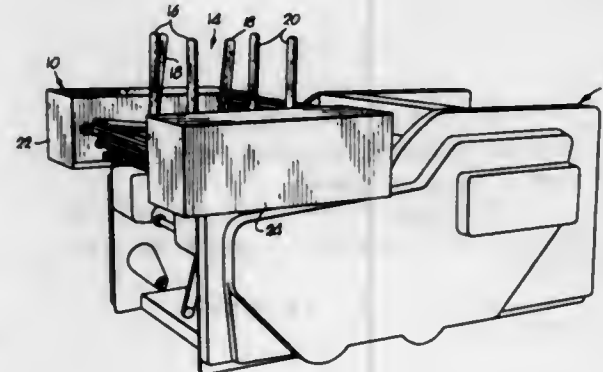
14 Claims

Bottom delivery feeders are employed in conjunction with a newspaper folding and wrapping machine and serve to sequentially feed sections of a newspaper into the machine for collation with the main body of the newspaper. One, two or

three of such feeders of varying design may be used with the folding and wrapping machine in various operational configurations, depending upon the nature of the sections to be collated with the main newspaper.

One feeder embodiment is particularly adapted to feed multileaved newspaper sections from a stack thereof. A hopper receives the stack of newspaper sections, a shelf beneath the stack being utilized to support the trailing edge portion of the lowermost section. A pair of stationary fingers supports the leading edge portion and feeding is effected from the bottom of the stack by a plurality of oscillatory grippers which frictionally engage the lowermost section and withdraw the leading edge portion thereof from between the next to the lowermost section and the support fingers. The trailing edge portion of the lowermost section is then withdrawn by pinch rollers which receive the leading edge portion upon return movement of the grippers as the same are continuously oscillated to provide sequential feeding. In a modified form of this embodiment, a single, reciprocable support finger is employed and is particularly adapted for use in the feeding of thin supplements with a hard edge at the fold only.

A second feeder embodiment is particularly suited for the feeding of tabloid size sheets which require folding prior to collation with the main newspaper. The same basic operational principles are employed in the withdrawal of the leading edge portion of the lowermost sheet from the hopper. How-



ever, continuously rotating grippers are used in conjunction with a roller against which force is applied by the grippers to pinch the loop (formed upon withdrawal of the leading edge portion) between the grippers and the roller to guide the same into a delivery conveyor that transports the withdrawn sheet in folded form to the folding and wrapping machine. The feeders of the first and second embodiments may both be mounted on the machine and used singly depending upon the nature of the paper to be fed. When the feeder of the first embodiment is in operation, the sections being fed therefrom are conveyed through the other feeder, the operating components of the latter being adapted to assist in the conveying of the sections to the folding and wrapping machine. When it is desired to employ such other feeder to feed tabloid sheets to the machine, it operates in the normal manner and the first feeder is inoperative at this time.

A top delivery feeder for sequentially delivering wrappers to the folding and wrapping machine operates in conjunction with either of the above feeders and employs a plurality of rotary grippers which are brought into frictional engagement with the uppermost wrapper of a stack thereof during each revolution of the grippers. The grippers are driven by a common shaft but are coupled with the shaft in a manner to permit the grippers to rotate ahead of the shaft free of the latter as each wrapper is advanced from beneath the grippers by a conveyor that receives the leading edge of each wrapper as it is fed from the stack.

3,734,489

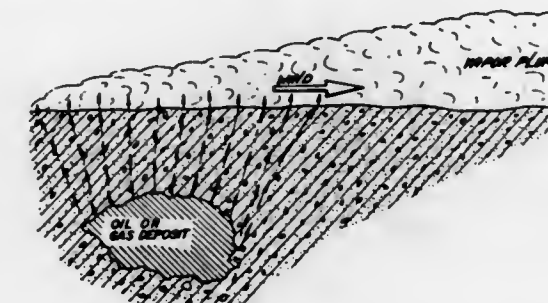
**METHOD OF PROSPECTING FOR HYDROCARBONS**  
George H. Milly, Potomac, Md., assignor to Geomet Mining and Exploration Company, Rockville, Md.

Continuation-in-part of Ser. No. 804,219, March 4, 1969, Pat. No. 3,609,363. This application May 13, 1971, Ser. No. 143,107

Int. Cl. G01v 9/00

U.S. Cl. 73-23

13 Claims



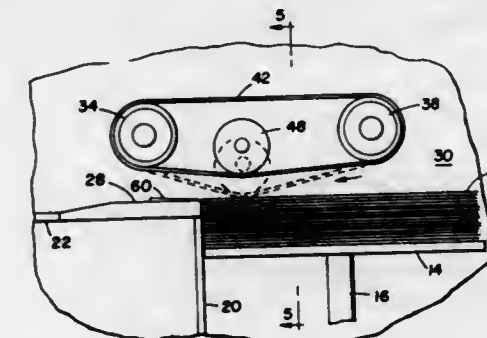
Prospecting, particularly prospecting for hydrocarbons such as oil and gas on the basis of the mobile gaseous phase of hydrocarbons which diffuses through the earth's structure and becomes windborne.

3,734,490

**DOCUMENT FEEDING MECHANISM**  
James D. Parks, P. O. Box 30, Iowa City, Iowa  
Filed Nov. 29, 1971, Ser. No. 202,936  
Int. Cl. B65h 3/04, 9/16

U.S. Cl. 271-34

6 Claims



An apparatus for successively feeding documents, such as sheets or cards, edgewise from a stack of the documents. A flexible belt movable about a pair of spaced-apart wheels overlies the stack of documents with the belt normally moving above the top document in the stack. An idler wheel is positioned between the wheels inside of the belt's path and is movable up and down to force the belt downward to engage the top document in the stack and move it edgewise from the stack.

3,734,491

**MOVABLE GAP-CONTROL DEVICE**  
Jack Beery, Farmington, and William B. Templeton, Howell, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 17, 1971, Ser. No. 143,756

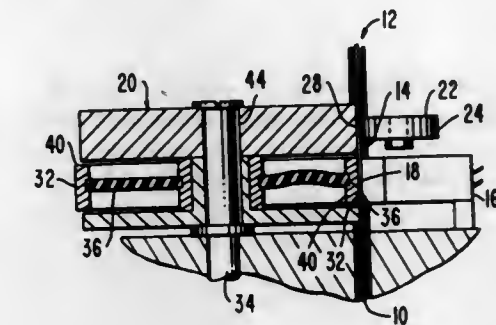
Int. Cl. B65h 5/06

U.S. Cl. 271-51

12 Claims

A device for uniformly urging a transported paper sheet or the like into contact with a processing element where a sheet-bearing surface formed by the periphery of a rotatable resilient member is positioned in contact with the processing element. Driving means frictionally coupled to the resilient member urges the contacting portion of the sheet-bearing surface in the direction of sheet transport but a frictional restraint between the processing element and the sheet-bearing surface

holds the resilient member rotationally motionless until such time as a document is transported therebetween. Upon this occurrence the frictional force imparted to the resilient

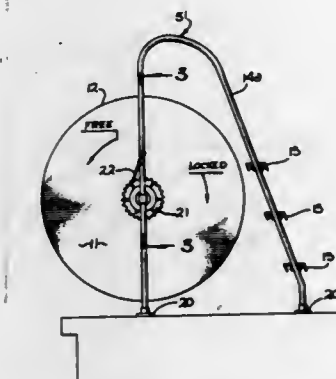


3,734,492

**ROTARY POOL SLIDE WITH ONE-WAY BRAKE**  
Jay M. Hartstein, 18557 Asuncion St., Northridge, Calif.  
Filed Aug. 7, 1972, Ser. No. 278,488  
Int. Cl. A63g 31/00

U.S. Cl. 272-1 B

9 Claims



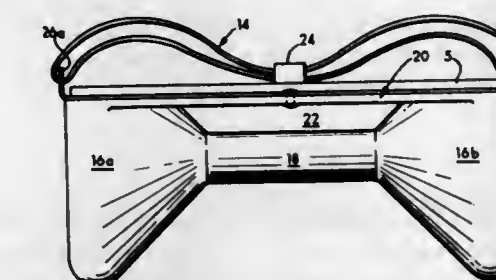
A pool entertainment device having a wheel large enough to allow a person to sit or stand on its rim wherein the wheel is supported for rotation along side a pool is disclosed. The wheel may be mounted by stairs which are connected to the frame supporting the wheel. A brake allows the wheel to turn in only one direction such that a person on the wheel may ride only towards the pool.

3,734,493

**SIT-UP EXERCISE APPARATUS**  
John Hasekian, 108 Putman St., Watertown, Mass.  
Filed Nov. 12, 1971, Ser. No. 198,348  
Int. Cl. A63b 11/00

U.S. Cl. 272-84

7 Claims



A multipurpose weighted exercising device which comprises: a dumbbell having a short connecting element, the element secured to weighted elements at each end of the connecting element; a platform parallel to the connecting element, the platform having each end secured to one end of the



weighted elements of the dumbbell; and a U-shaped restraining strap secured at each end of the platform and in the middle of the platform to permit the insertion of the user's feet between the U-shaped strap elements and the platform.

3,734,494

## SWINGING EXERCISING DEVICE

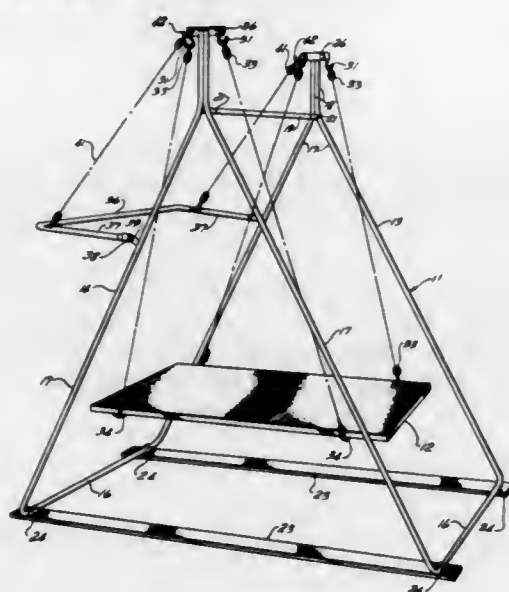
John W. Sellner, 11150 Tujunga Canyon Boulevard, Tujunga, Calif.

Filed Nov. 25, 1970, Ser. No. 92,612

Int. Cl. A63b 21/00

U.S. Cl. 272—58

19 Claims



A versatile exercising device having a base and swinging body supporting member attached to the base is provided in practice of this invention. In one embodiment the base is in the form of a tubular frame having similar rectangular frame members pivotally interconnected along one edge so as to pivot between a closed position with the frame members parallel to each other, and an erected position wherein the frame members are spread to form a triangular base and an apex at the pivotally interconnected edges. Thus, a transverse bar extends across the base at the apex. An elongated body supporting member is connected adjacent the apex by links so as to hang with its mid-point approximately below the apex. Four links from approximately the apex to respective points on each side and remote from the middle of the body supporting member permit it to be swung in the direction of its length, transverse to the bar at the apex. The links are of a sufficient length that an occupant on the body supporting member can reach the apex bar or side edges of the frame members with a hand or a foot for propelling the body supporting member in a swinging manner. A horizontal bar transverse to the direction of swinging is connected to one of the frame members so as to be above and adjacent one end of the body supporting member so that an occupant can reach it with a hand or foot for exerting propulsive force. In one embodiment the body supporting member is rigid. In another embodiment the body supporting member is rigid transverse to its length and elastically flexible along its length for flexing the body of an occupant. In another embodiment a triangular base folds for storage around pivots interconnecting frame members at the lower end.

3,734,495

## A SEAT AND LEG OPERATED LOAD LIFTING DEVICE

Donald E. Nist, Pasadena, and Jay H. Quartz, Mar Vista, both of Calif., assignors to Whittaker Corporation, Los Angeles, Calif.

Filed Oct. 26, 1971, Ser. No. 192,420

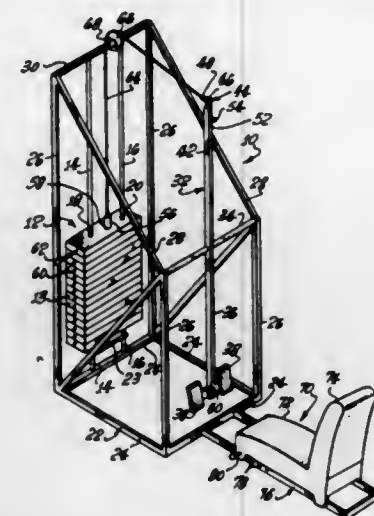
Int. Cl. A63b 23/04

U.S. Cl. 272—58

3 Claims

An improved weight training device particularly adapted for exercise of the lower limbs includes a simple lever to the lower

end of which are connected foot pedals. The lever is pivoted at about its midpoint and is telescopically extendable. The upper end of the lever is connected via a cable or chain to the upper end of a weight stack. Movement of the upper end of the lever



by corresponding movement of the lower end of the lever in the opposite direction is accomplished by pushing against the foot pedals, so as to raise or lower the weight stack. The device includes a seat positioned a suitable distance from the foot pedals on the side opposite the stack.

3,734,496

## STABILIZED TRAMPOLINE

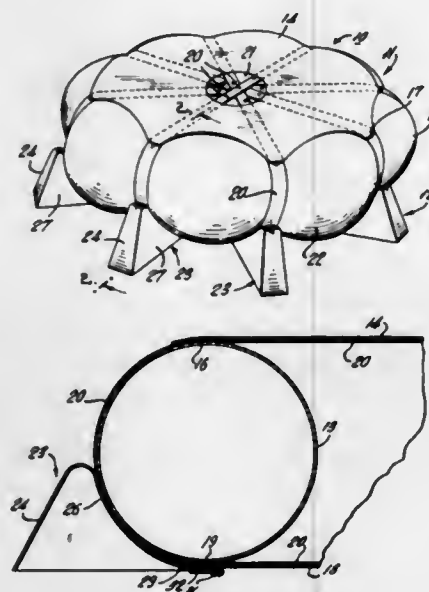
Herbert Rubin, New York, N.Y., assignor to New York Toy Corporation, New York, N.Y.

Filed Sept. 18, 1970, Ser. No. 73,400

Int. Cl. A63b 5/00

U.S. Cl. 272—65

9 Claims



A trampoline includes an inflated elastomeric toroid, such as a tire inner tube, provided with taut top and bottom webs interconnected by straps extending between the webs about the tube outer surface. A stabilizer against tipping is separably associated with the trampoline and extends around the tube outer underface. Examples of stabilizers are circumferentially spaced hollow stackable wedge shaped foot pieces separably connected at their inner ends to the bottom web and engaging the tube underface, diametric cross-bars sandwiched between the tube and bottom web and projecting beyond the tube, outwardly directed loops secured to the bottom webs and holding stabilizing members below the tube outer face, and a narrow inflated torus underlying the tube inner under face.

3,734,497

## APPARATUS FOR SIMULATING CROSS-COUNTRY DRIVING CONDITIONS

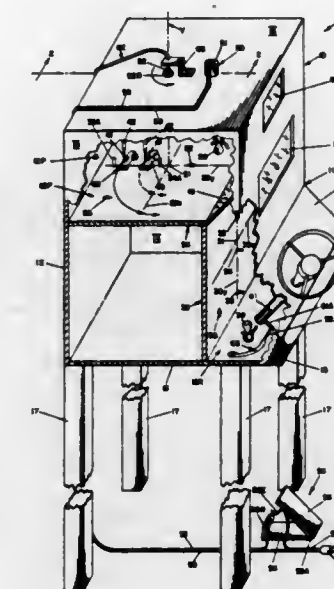
Richard L. Brown, Bellevue, Nebr., assignor to Midway Manufacturing Company, Schiller Park, Ill.

Filed Jan. 14, 1972, Ser. No. 217,795

Int. Cl. A63I 9/14

U.S. Cl. 273—1 E

15 Claims



There is disclosed herein apparatus enabling an externally positioned operator to peer forwardly toward a light transmissive mirror located within and generally sub-dividing an upright hollow housing into a pair of internal chambers, a miniature vehicle in a first chamber is adapted to travel in angular paths of remotely controlled selectable radii through a first chamber environment which is an inverse mirror-image superimposition by said mirror of a diorama located in the housing second chamber. The apparatus also preferably includes a rollable vehicle remaining in contact with a moderately contoured shelf in the first chamber, remotely controlled speed control means for the annularly movable vehicle, means to sense and record proximity between the vehicle and selected first chamber environmental features, attractive lumination for the vehicle and the diorama while the shelf member remains relatively visually subdued, and sophisticated means for varying the vehicle's radial position so as to tax the operator's depth perception and coordination.

3,734,498

## SOFT BALL WITH INTERNAL DRAG

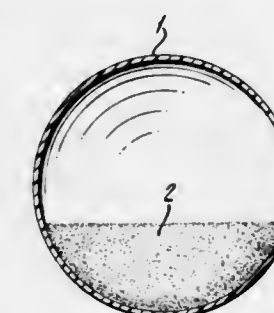
William K. Seleresen, Erie, Pa., assignor to Louis Marx & Co., Inc., New York, N.Y.

Filed Aug. 17, 1971, Ser. No. 172,531

Int. Cl. A63b 37/10

U.S. Cl. 273—63 E

3 Claims



A soft ball has an outer shell of a resilient polymeric material and is partially filled with a fine, dry, granular solid. When rolled on a hard surface the drag of the granular solid and the work of flexing the shell slow the ball and bring it to a stop

after rolling a relatively short distance. The intent is to simulate the roll of a hard Bocce ball on a yielding surface such as a lawn. The outer diameter of the soft ball may be about 3 3/4 inches, the thickness of the shell may be from 0.050 to 0.080 inches, and the weight of the soft ball may be about 12 ounces.

3,734,499

## RACKET WITH RESILIENT SURFACE

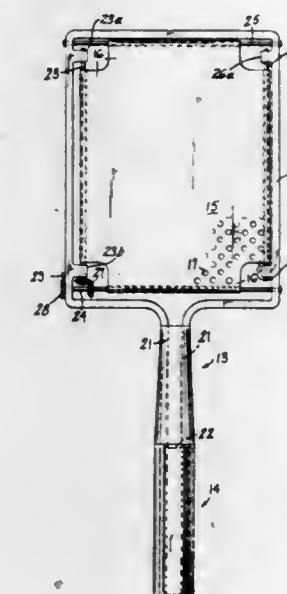
Frederick A. Goldstein, 30 Fountain Terrace, New Haven, Conn.

Filed Dec. 28, 1971, Ser. No. 212,979

Int. Cl. A63b 51/12

U.S. Cl. 273—73 E

6 Claims



A game racket, such as a tennis racket, in which the game ball contact surface is a resilient membrane such as plastic film. The membrane is tensioned in several directions at once by spindles on the edge of the racket head, the spindles being connected by bevel gears and rotated by a ratchet wheel and pawl.

3,734,500

## COMPETITIVE VEHICLE DEMOLITION GAME

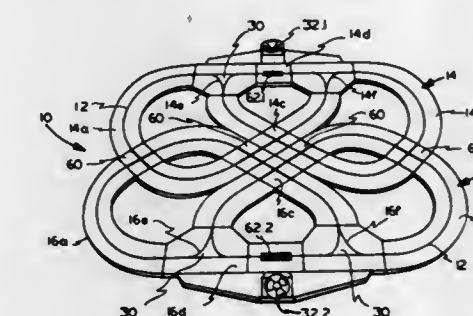
Julius Cooper, New Hyde Park, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.

Filed Nov. 10, 1970, Ser. No. 88,436

Int. Cl. A63I 9/00

U.S. Cl. 273—85 R

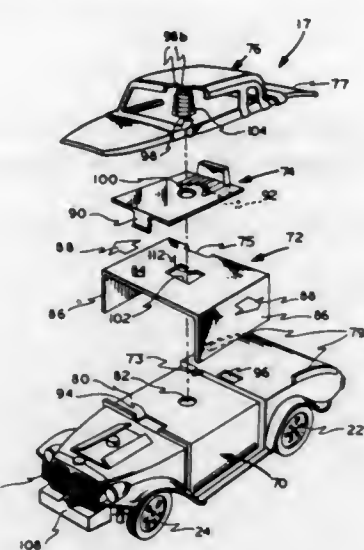
15 Claims



Toy cars operate on independent roadways having multiple intersection points. Switches are provided for steering each vehicle toward or away from the intersections to control the time of entry of the cars into the intersections. Each car comprises a plurality of releasably assembled body elements held in assembled condition by a latch including a depending post attached to the roof element and extending through an opening in a web member. A tooth on the post and a tooth extending into the opening of the web member interengage to hold the post down against the bias of a post encircling spring. A



depending side panel is attached to each end of the web member. Impact on either side member due to a collision of



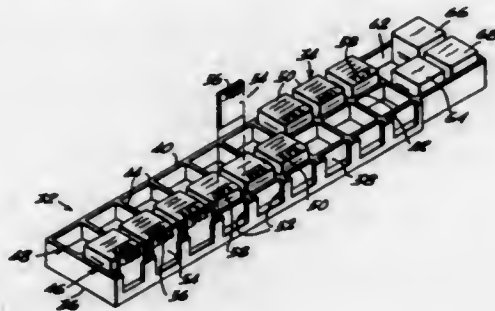
the cars at one of the intersections causes lateral movement of the web to disengage the teeth with the resulting car disassembly.

### 3,734,501 BASEBALL GAME

John La Monica, 3387 Mary St., Coconut Grove, Miami, Fla.  
Filed Apr. 5, 1971, Ser. No. 131,249  
Int. Cl. A63f 7/06

U.S. Cl. 273-93 R

6 Claims



This invention pertains to a baseball game which provides a game board, including indicia generally representative of a typical baseball diamond, two sets of dice, one representing each team and a compartmented "dug-out" tray for each set of dice. Each set of dice is of a distinctive color and includes nine dice, representing the nine regular batters, and one dice representing a pitcher, one a relief pitcher and one a pinch hitter. All of the dice contain indicia on each facet which indicates various circumstances occasioned during the active playing of a baseball game. The game is controlled generally by rolling the "pitcher" dice of the "out" team and the indicia appearing on the "up" side of the "pitcher" dice sequentially controls the fate of the "batter" dice of the "up" team as they come to bat in a prearranged batting order. The game progresses and is scored in general accord with regular baseball rules.

### 3,734,502 MAGNETIC GAME STRUCTURE

Douglas R. Bolton, Palatine, Ill., assignor to Cadaco, Inc., Chicago, Ill.

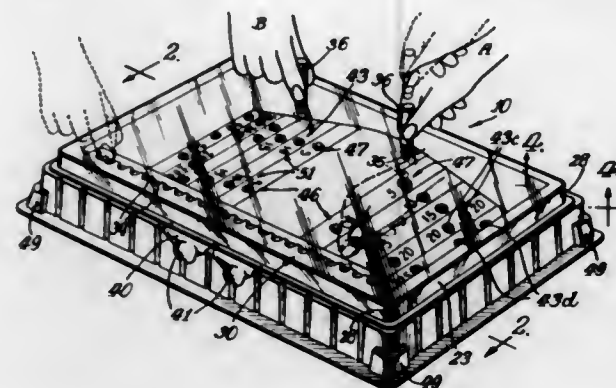
Filed June 3, 1971, Ser. No. 149,646  
Int. Cl. A63b 71/02

U.S. Cl. 273-95 R

16 Claims

A game structure such as for play by several persons on a table testing the skill of the players relative to dropping mar-

kers into subjacent receivers. The markers may comprise magnetic elements with control of the movement thereof being effected by the user through the medium of a suitable magnet. The receivers are spaced at different distances from the playing surface so as to require corresponding increase in the skill



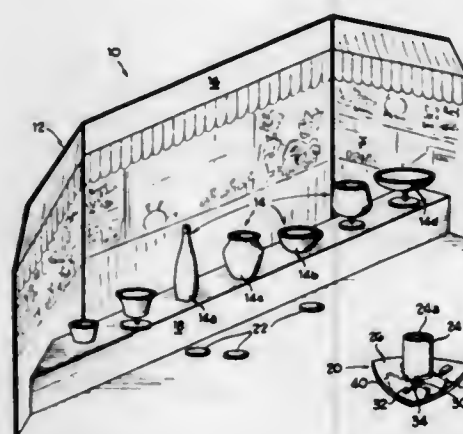
### 3,734,503 TARGET AND ADJUSTABLE TRAJECTORY DISC LAUNCHER

Jeffrey D. Breslow, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Oct. 16, 1970, Ser. No. 81,445  
Int. Cl. A63b 71/02

U.S. Cl. 273-101

2 Claims



A target game including target articles and means defining a target support area for supporting the target articles thereon and a movable missile launching member being adjustable in elevation for aiming at said target articles.

### 3,734,504 SIMULTANEOUS LAUNCHING GAME

Jeffrey D. Breslow, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

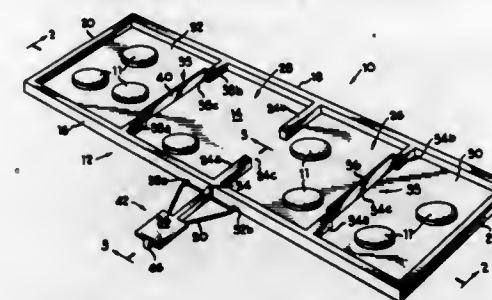
Filed Dec. 30, 1971, Ser. No. 213,894  
Int. Cl. A63f 3/00

U.S. Cl. 273-126 R

3 Claims

A skill-type launching game including a game board divided into opposing zones, by means of a medial barrier having an opening therein with a gate for closing the opening in the medial barrier. Each opposing zone is further divided into launching zones, by means of transverse barriers having interruptions therein for permitting a playing piece to travel

therethrough and a plurality of disc-like playing pieces for propelling from one end of the game board into the opposite upper row form the head portions of representations of a human figure which is progressively completed from one row



end in an effort to place all of the playing pieces in an opponent's scoring zone.

### 3,734,505 BOARD GAME APPARATUS

Raits Germanis, Flat 17, Knox Court, 53 King William Road, Unley, Australia

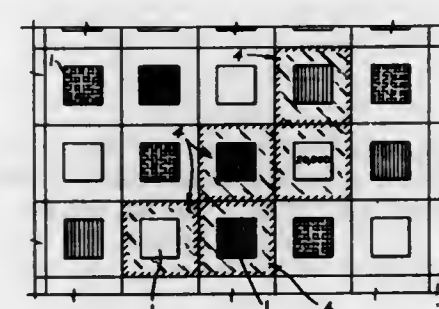
Filed July 20, 1971, Ser. No. 164,248

Claims priority, application Australia, July 24, 1970, 1968/70

Int. Cl. A63f 3/00

U.S. Cl. 273-130 R

4 Claims



Apparatus for use in a game by which expertise in exploration and development of ore bodies can be gained in a realistic manner, the apparatus including a board with areas marked out and onto which a number of tiles can be randomly placed, one on each area, there being sets of tiles with differing markings for each set on their back and each set having a different but known number of valuable tiles so that each marked area of the board has a greater or lesser probable value than other such areas of the board. The board areas are dimensioned to receive pegging (claiming) members which have openings dimensioned to receive a tile, the pegging members being marked to designate ownership by a player.

### 3,734,506 BOARD GAME APPARATUS

Robert J. Gingras, 721 Duncan Street, Schofield Barracks, Hawaii

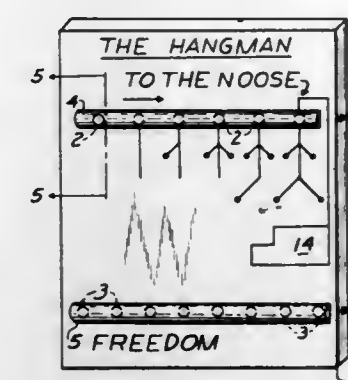
Filed June 25, 1971, Ser. No. 156,829

Int. Cl. A63f 3/00

U.S. Cl. 273-130 E

4 Claims

Parallel rows of openings in a front face of a block expose blank spaces or selected letters on wheels mounted within cavities in the rear face of the block. An elongated curved magnifying glass mounted over each row of openings enlarges the letters. Player A writes a word in a space between the parallel rows of cavities on the rear face of the block and slides a cover over the word. Player B chooses letters to complete the hidden word. Player A rotates appropriate wheels from the back to expose chosen correct letters of a word in proper sequence in the bottom row or to expose improper unused chosen letters in the top row. If the top row is filled first, Player A wins. If openings in the bottom row which spell out the word are filled first, Player B wins. The openings in the



end to the other, the end representation being a complete human figure suspended above a representation of a hangman's platform.

### 3,734,507 BOARD GAME APPARATUS

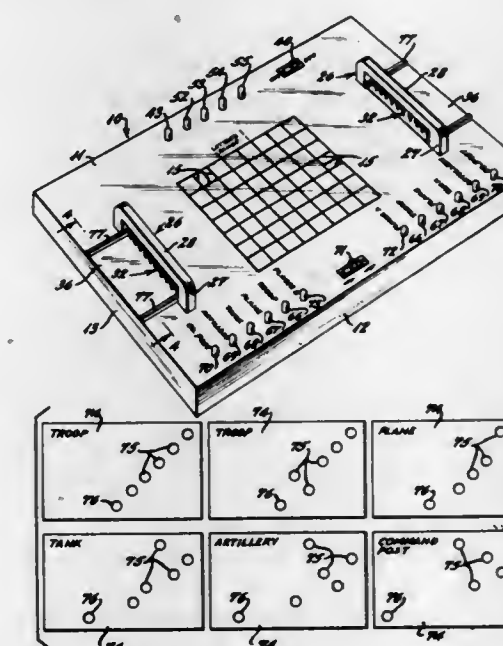
Arnold R. Hillman, 25821 Telegraph Road, Flat Rock, Mich., and Harvey T. Winckles, 14942 S. Dixie Highway, Monroe, Mich.

Filed Aug. 13, 1971, Ser. No. 171,664

Int. Cl. A63f 3/00

U.S. Cl. 273-134 A

7 Claims



Apparatus including a game board on which movable playing pieces of different categories are mounted and computer cards to determine the number of moves to be made and indicate the categories of the playing pieces involved, the moves being selectively controlled by individual players. A card sensing mechanism is disposed at each end of the board, and signal lights are arranged to indicate the results of the sensing. The game combines chance and skill to reach a predetermined point value.

### 3,734,508 TIME LOCK BOARD GAME APPARATUS

Larry F. Snyder, 324 Lake St., St. Ignace, Mich.

Filed Sept. 7, 1971, Ser. No. 178,318

Int. Cl. A63f 3/00

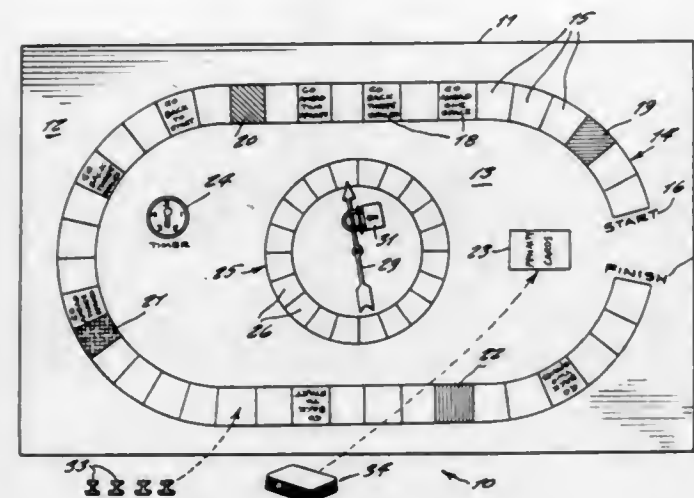
U.S. Cl. 273-134 C

1 Claim

A game for being played competitively between several players, and wherein the object of the game is for a player to

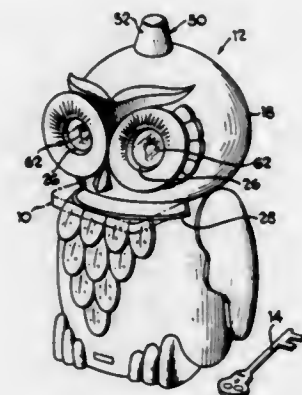


find a right key and open a lock before a bell goes off on a timer, the first player to reach a finished first being declared a winner, the game including a game board, 12 penalty cards, a



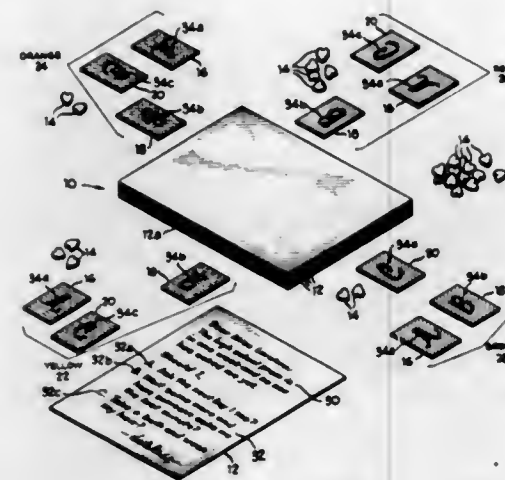
plastic lock and 6 keys of which only one will open the lock, a timer, a singular die and four playing pieces each of a different color.

**3,734,509**  
**INVISIBLE INDICIA MATCHING AND DISPLAY DEVICE**  
Marvin I. Glass, and Kathy A. Dunn, both of Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.  
Filed Dec. 23, 1971, Ser. No. 211,184  
Int. Cl. A63f 9/00, 1/02  
U.S. Cl. 273-139 9 Claims



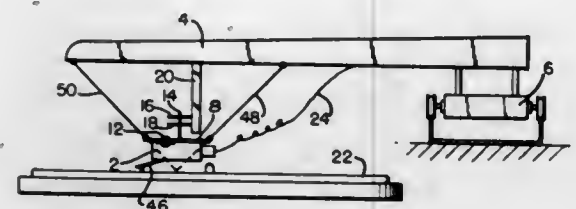
A game including a plurality of playing cards each having one of a set of characters printed thereon and a display device to be used in connection therewith for randomly exhibiting a second set of characters one at a time. The second set of characters are the same as those printed on the playing cards wherein the object of the game is to match the character printed on a playing card with the same character exhibited by the device. The characters printed on the playing cards are normally invisible and become visible only after exposure to concentrated light. The display device has a light for illuminating the normally invisible card characters.

**3,734,510**  
**MATCHING ANSWER GAME**  
Jeffrey D. Breslow, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.  
Filed Oct. 4, 1971, Ser. No. 185,955  
Int. Cl. A63f 1/00  
U.S. Cl. 273-152 R 1 Claim



A chance game including playing tokens, a plurality of master sheets, having situations depicted thereon and multiple keynoted solutions to the situations so depicted, and key cards for each participant corresponding to keynotes for each possible solution on each situation sheet.

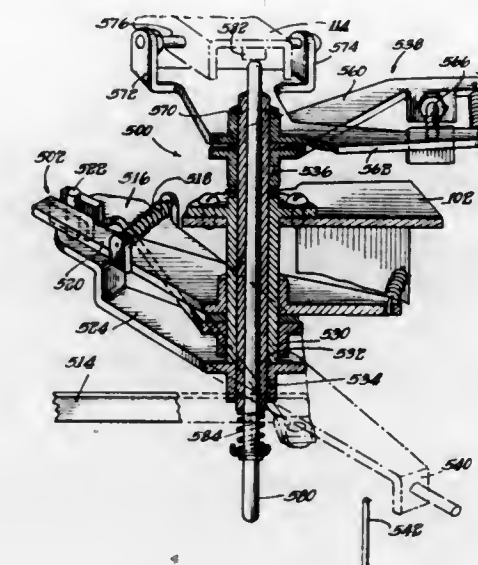
**3,734,511**  
**STRING-SUPPORTED PHONOGRAPH CARTRIDGE**  
Jacob Rabinow, 6920 Selkirk Drive, Bethesda, Md.  
Filed June 14, 1971, Ser. No. 152,730  
Int. Cl. G11b 3/02  
U.S. Cl. 274-1 R 6 Claims



To reduce the mass of the cartridge-tonearm system of a phonograph pickup to a minimum, the arm is completely eliminated and the cartridge is supported on two pairs of thin strings attached at their upper ends to a servo-driven carriage and at the other ends to four spaced points on the cartridge at such an angle that the projection of the strings of each pair meets at the surface of the record to provide a virtual axis of rotation at the surface of the record at a point below the cartridge, so that the stylus will move substantially in a perfect straight vertical line when playing a warped record and will follow the record with an extremely small effective mass as seen by the stylus.

**3,734,512**  
**TOPE ARM ASSEMBLY FOR AUTOMATIC PHONOGRAPH**  
Fred H. Osborne; Robert S. Tuttle, and Michael J. Corbett, all of c/o The Wurlitzer Company, North Tonawanda, N.Y.  
Division of Ser. No. 619,687, March 1, 1967, Pat. No. 3,501,153. This application Feb. 19, 1970, Ser. No. 14,866  
Int. Cl. G11b 3/10  
U.S. Cl. 274-23 R 3 Claims  
This invention relates generally to an automatic phono-

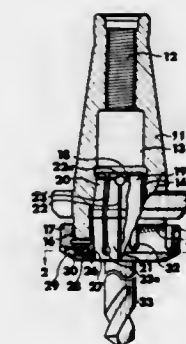
graph, and more particularly to an automatic phonograph for



playing either side of a particular record selected from a plurality of records.

**ERRATUM**  
For Class 277-233 see:  
Patent No. 3,734,514

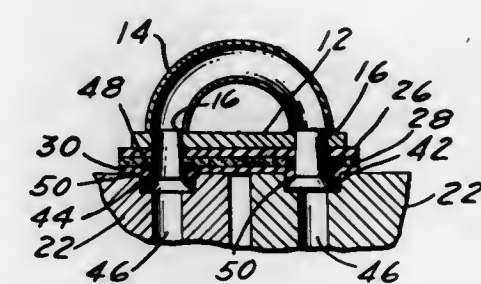
**3,734,513**  
**STRAIGHT CHUCK**  
Hiromu Kanebako, and Kazutoshi Wada, both of Kimatsu-gun, Chiba, Japan, assignors to Kuroda Selko Company, Ltd., Ota-ku, Tokyo, Japan  
Filed May 21, 1971, Ser. No. 145,854  
Claims priority, application Japan, June 4, 1970, 45/54442  
Int. Cl. B23b 31/20  
U.S. Cl. 279-48 2 Claims



This invention relates to a straight chuck of collet type setting in vertical machine tools to use. Revolving a collar along the direction of removal of it, the collet retained within the body portion of the straight chuck and fastened or clamped the external periphery can be loosened and a tool may be removed.

During the revolution of the collar and the loosening of the collet, an upper inclined surface of the collet only in the beginning is disengaged from an opposite and corresponding inclined surface of the body of the straight chuck, without loosening of a shank instantly and thoroughly, then the collet is prevented from dropping, finally a cramp ring is disengaged from the lower inclined surface so as to loose the tool. From beginning to end, the collet of the straight chuck in accordance with the invention has a sufficient and constant cramp force to prevent the tool from loosening and dropping.

**3,734,514**  
**CROSS-OVER SEALING MEANS**  
Preston W. Anderson, 10243 Sherrill St., Whittier, Calif.  
Filed June 28, 1971, Ser. No. 157,340  
Int. Cl. F16j 15/06  
U.S. Cl. 277-233 6 Claims



Sealing means for cross-over fuel line connections for internal fuel lines in cylinder heads of diesel engines having a plurality of such heads. The internal fuel lines terminate in recesses adjacent the adjacent edges of such heads and there is a plate with cross-over tubes which communicate with such recesses.

The sealing means includes a lower neoprene gasket, a high-pressure, rigid asbestos gasket and, on top of this asbestos gasket, there is an upper neoprene gasket which is at the underside of the plate. There is a cone for each end of each cross-over tube and each cone has a shank extending from an outwardly-flared base. The shank tapers from the small end of the base and the outside diameter of the small end of each shank is smaller than the inside diameter of the cross-over tubes, while the outside diameter of the larger end of the shank is greater than the inside diameter of said tubes. The neoprene and asbestos gaskets have aligned holes therethrough for reception of the shanks of the cones, the shanks of said cones being pressed into the ends of the cross-over tubes so that such shanks have sealing connections with said tubes.

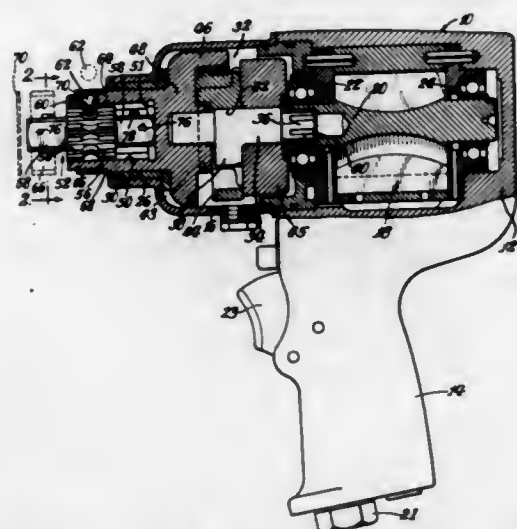
On the shanks and between the asbestos gasket and the lower neoprene gasket are flat, resilient, washer-like pressure elements fitting snugly on the cones at the junction of the shanks and the respective bases. The bases have small flanges extending radially from their free ends and said flanges are adapted to fit closely into the recesses in the cylinder heads. A second washer-like resilient seal is disposed on each cone below the lower neoprene gasket, said second seal resting on the base of the cone.

There are screws extending through openings provided therefor in the gaskets for securing the assembly to the adjacent edges of the adjacent cylinder heads, and when said screws are tightened the gaskets and cones are tightened to effect a secure seal. Further, when the screws are tightened the pressure elements are forced downwardly to force edge portions of the lower neoprene gasket sealingly onto the upper free edges of the recesses and sealingly onto the smaller end portion of the base. The second washer-like resilient seals are pressed tightly onto the respective bases, substantially filling the space between the bases of the cones and the adjacent cylindrical recess walls, thereby providing an additional seal for the cross-over sealing means.

**3,734,515**  
**POWER WRENCH WITH INTERCHANGEABLE ADAPTERS**  
Edmund C. Dudek, Saint Charles, Ill., assignor to Thor Power Tool Company, Aurora, Ill.  
Filed Jan. 29, 1971, Ser. No. 110,942  
Int. Cl. B25b 29/00; F16d 1/06  
U.S. Cl. 279-1 A 8 Claims  
A power wrench which has a spindle is provided with interchangeable adapters having drive portions of various sizes



for connecting a socket or the like to the wrench. The adapters can be easily installed and removed from the spindle, but tampering with the wrench is minimized, since upon inspection it is not apparent that the adapter is easily removable



from the spindle. Further, the adapter can be provided with two drive portions, one at each end. Should one portion be broken, the adapter can be reversed in the spindle, and the second drive portion can be used.

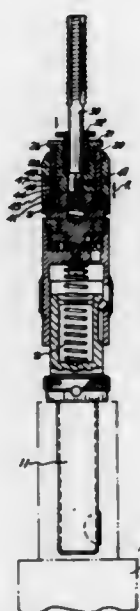
3,734,516

**CHUCK ASSEMBLY FOR TOOL HOLDERS**

Theodore M. Smith, 14750 Puritan Avenue, Detroit, Mich.  
Filed June 14, 1971, Ser. No. 152,907  
Int. Cl. B23b 31/04, 31/22

U.S. Cl. 279-75

3 Claims



A tool holder comprising a chuck locking sleeve, an adapter, and a bushing, wherein the adapter is locked to the sleeve against axial as well as rotatable displacement relatively by a ball grip means which serves not only for gripping the parts together against axial displacement but also for establishing a drive connection between the sleeve and the adapter.

3,734,517

**QUICK CHANGE TOOL HOLDER**

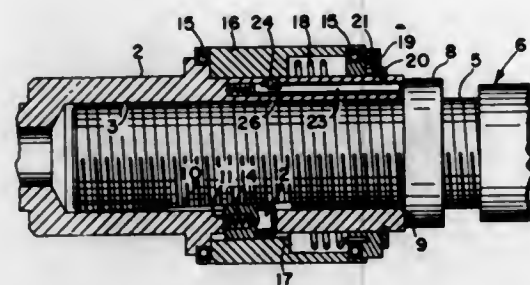
Milton L. Benjamin, Chagrin Falls, Ohio, assignor to Erickson Tool Company, Solon, Ohio  
Filed Feb. 25, 1971, Ser. No. 118,603  
Int. Cl. B23b 31/04

U.S. Cl. 279-81

14 Claims

A quick change tool holder characterized in that a socket member secured to a machine tool spindle or formed as a part

thereof has a bore in which the shank of a tool holder is non-rotatably telescoped and in that the socket member has lock



means automatically operative to lock the tool holder in the socket member when the tool holder is inserted to predetermined position in the socket member.

3,734,518

**STAIR CART**

Niles E. Sawmiller, 415 1/4 S. West Street, Lima, Ohio; Gary C. Clymer, 202 Elm Street, and Larry R. Clymer, 214 North Broadway, both of Columbus, Ohio

Filed Nov. 12, 1971, Ser. No. 198,183

Int. Cl. B62b 5/02

U.S. Cl. 280-5.3

5 Claims



A hand truck is provided with a push bar lift assembly for carrying loads vertically up stairs. A U-shaped push bar is positioned between the wheels and lower support frame to provide a downward force against the stairs. A chain and sprocket assembly is connected to the frame through an offset axle and a sliding handle. The operator pulls the handle in the same direction that he desires the load to be moved to effectuate the lifting station.

3,734,519

**MOLDED SKI**

William N. Bennett, 69 Rollingwood Lane, West Concord, Mass.

Filed Oct. 23, 1970, Ser. No. 83,345

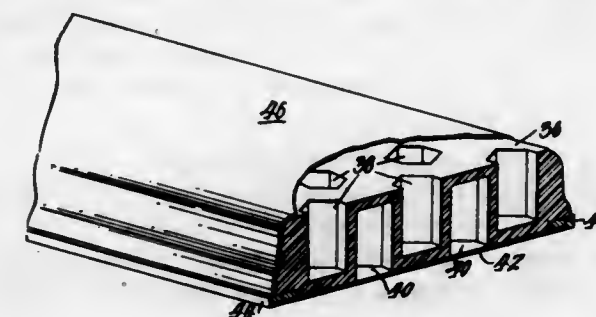
Int. Cl. A63c 5/12

U.S. Cl. 280-11.13 R

2 Claims

A one-shot molded ski having cored recesses at a right angle

to the general plane of the ski, said recesses being arranged



where desired according to the requirements of the design of the ski.

3,734,520

**RELEASABLE SKI BOOT HEEL BINDING**

Nobuyasu Hashioka, Kita-ku, Tokyo, Japan, assignor to Hope Kabushiki Kaisha, Tokyo, Japan

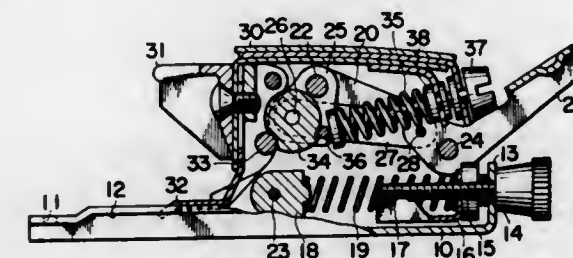
Filed May 13, 1971, Ser. No. 143,145

Claims priority, application Japan, May 23, 1970, 45/44231

Int. Cl. A63c 9/00

U.S. Cl. 280-11.35 T

7 Claims



In a releasable ski boot heel binding comprising a base to be attached to a ski, a casing having a boot heel engaging member at its front end, and a supporting member mounted to the base and pivotally connecting the casing, a cam member is swingably connected to the front portion of the supporting member. The cam member is urged and press-fitted to a transverse pin, which is connected to the front portion of the casing, by a depressing spring. The cam member has a dented portion in which normally the transverse pin engages and a protruded portion against which the transverse pin acts to force back the cam member.

3,734,521

**TOE IRON FOR SAFETY SKI BINDINGS**

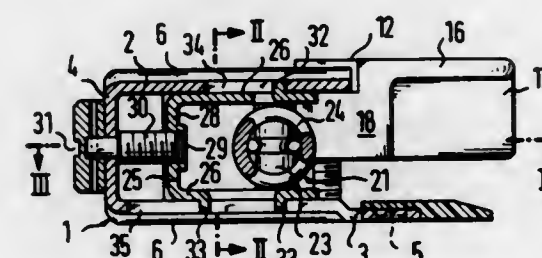
Bernd Payrhammer, Farchant, Germany, assignor to Hannes, Marker, Garmisch-Partenkirchen, Germany

Filed July 20, 1971, Ser. No. 164,409

Int. Cl. A63c 9/00

U.S. Cl. 280-11.35 T

15 Claims



The toe iron is suitable for downhill and cross-country runs and comprises two carrying levers, which are pivoted on vertical pivots to a toe iron member that is fixed to the ski. At their free ends, the carrying levers carry respective soleholders. In

their normal position, the carrying levers are pulled by a spring against a stop, which is fixed to the ski. The spring is connected at its ends to the carrying levers for a movement toward the tip of the ski. The carrying levers are adapted to be swung out against the force of the ski. A locking member is held on a toe iron member that is fixed to the ski. The locking member indirectly or directly forms a guideway for each end of the spring and prevents a movement toward the tip of the ski of that end of the spring which is associated with the carrying lever performing a pivotal movement at a time until the carrying levers have performed a pivotal movement through a predetermined angle, whereas the other end of the spring, which is associated with the carrying lever performing no pivotal movement at a time, is held in its normal position by the locking member.

3,734,522

**APPARATUS AND METHOD FOR COMPENSATING FOR THE LONGITUDINAL MOVEMENT OF A SAFETY SKI BINDING**

Georges Pierre Joseph Salomon, 34 Avenue de Loverchy, Annecy-Haute-Savoie, France

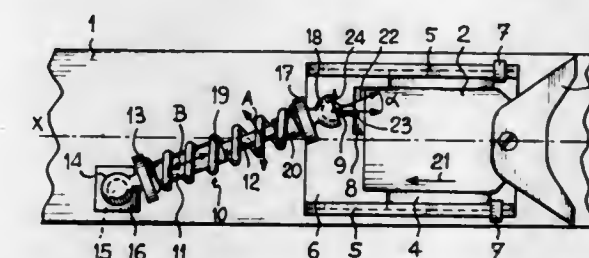
Filed Jan. 18, 1971, Ser. No. 107,254

Claims priority, application France, Jan. 19, 1970, 7001826

Int. Cl. A63c 9/00

U.S. Cl. 280-11.35 T

15 Claims



The disclosure herein describes an apparatus and method for compensating for the longitudinal movement of a safety ski binding and thereby protecting the skier when falling. To achieve this aim, the moving part of the ski binding is subjected to the action of a resilient force which resists the displacement of the moving part in one direction; this resilient force varies as a function of the moving part and, at the same time it varies, the component of this force which acts on the moving part of the binding parallel with the direction of movement thereof, is maintained at an appreciably constant value.

3,734,523

**SLALOM SLED**

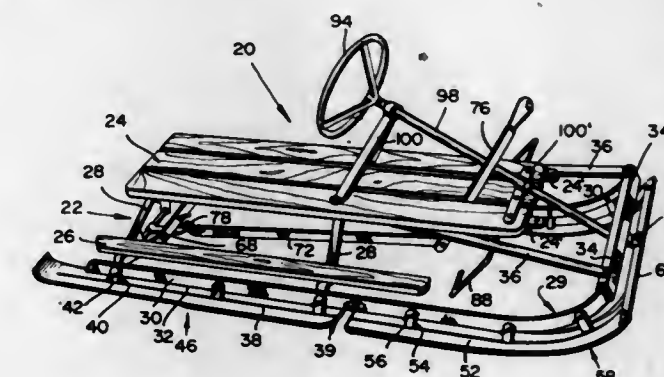
Lars Field, P.O. Box 344, Fishers Island, N.Y.

Filed Sept. 11, 1970, Ser. No. 71,516

Int. Cl. B62b 13/04

U.S. Cl. 280-16

5 Claims



A sled including a platform body mounted on a chassis having parallel spaced runners. The sled is provided with a steer-



ing mechanism incorporating a rack and pinion drive for displacing the runners laterally to the path of travel for directional control. A brake system is also incorporated into the sled and is optionally operated by a hand lever or a foot lever mechanically linked to a brake member, the latter being adapted to contact the terrain surface and thereby retard the movement of the sled. The runners are suitable for traversing ice covered surfaces and other surface traversing means such as snow skis may be selectively attached to the runners for specific surfaces. The runners and skis have a curved design with a longitudinal keel and dependent parallel edges so as to reduce frictional drag and to improve the lateral stability of the sled.

3,734,524

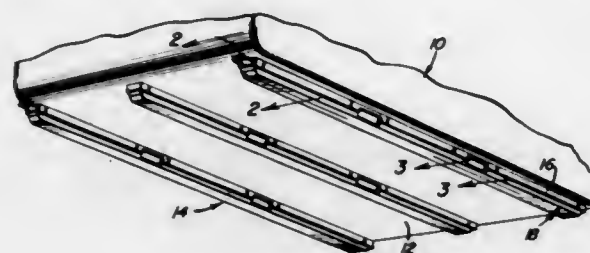
## SHOCK SKID ASSEMBLIES FOR SHELTER UNITS

William E. Ciccarelli, and Phillip A. Kaufman, both of York, Pa., assignors to Gichner Mobile Systems, Inc., Dallastown, Pa.

Filed Feb. 17, 1971, Ser. No. 116,135  
Int. Cl. B62b 17/04

U.S. Cl. 280—25

10 Claims



A shelter unit having a plurality of longitudinally extending shock absorbing skid assemblies mounted thereon for protecting internally mounted delicate equipment from excessive shock such as may occur when the shelter unit experiences rough handling during transport or deployment which frequently is by helicopter drop. Each shock absorbing skid assembly employs relatively movable channel-shaped members spaced apart by a plurality of cylindrical shock absorbing elements.

3,734,525

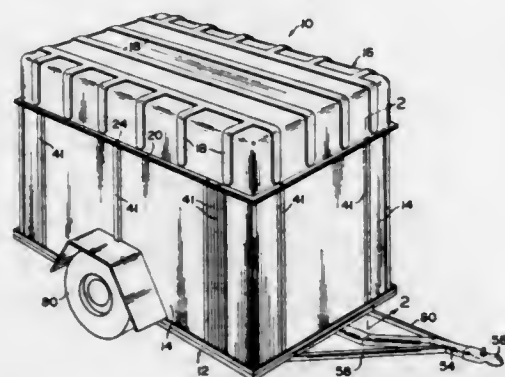
## COLLAPSIBLE TRAILER

Donald H. Rimbey, Temple Terrace, Fla., assignor to Helen A. Shook, Tampa, Fla.

Filed May 13, 1971, Ser. No. 143,009  
Int. Cl. B60p 3/34

U.S. Cl. 280—30

11 Claims



A trailer designed to be towed behind an automobile or the like and comprising a plurality of components including a base, side wall means surrounding the base, a top, a tow bar and a pair of spring loaded axis. The majority of the components which comprise the trailer are removably attached to the base or to one another such that each of the components

may be disconnected from their assembled position and stored on the base of the trailer. The top and the base may be connected directly to each other to define a storage compartment in which the various components are placed such that the trailer may be shipped or transported by means other than towing.

3,734,526

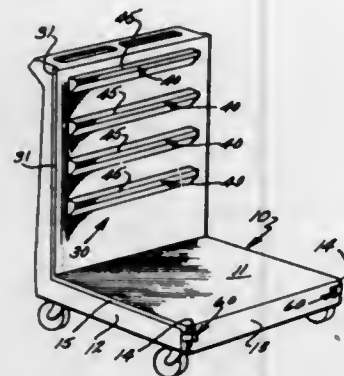
## CART

Robert L. Propst, Ann Arbor, and James O. Kelley, Sallme, both of Mich., assignors to Herman Miller Inc., Zeeland, Mich.

Filed Nov. 5, 1970, Ser. No. 87,144  
Int. Cl. B62b 3/02

U.S. Cl. 280—33.99 T

19 Claims



A cart which has a wheeled base and an upstanding back for carrying drawer and tray supporting frames during transport, integrally molded with the base. Supporting rails project upwardly and outwardly from the back for cooperation with hangers on the drawer supporting frames. Resilient bumpers are provided at each front corner of the base and include forwardly projecting tabs which cooperate with rearwardly projecting flanges at the rear of another cart whereby the carts can be transported in ganged fashion. The backs also include rearwardly and downwardly projecting hanger flanges such that one cart can be hung on the rail of another.

3,734,527

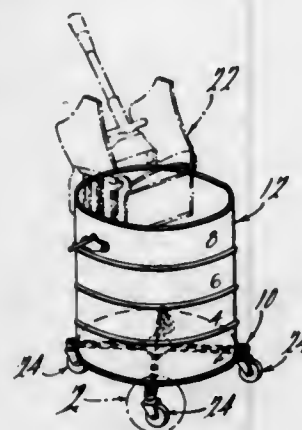
## BUCKET CHASSIS

Douglas C. Bard, Muskegon, Mich., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Feb. 4, 1971, Ser. No. 112,618  
Int. Cl. B62b 5/00

U.S. Cl. 280—79.1

1 Claim



A chassis for movably supporting a generally cylindrically-shaped container, pail, bucket or the like, the chassis being of a one-piece molded plastic construction and comprising a plurality of integrally connected generally coplanar arranged outwardly projecting arm sections adapted to support the con-

tainer thereon, and means on the outer end of each of the arm sections adapted for operative connection to a rollable castor, wheel or the like, whereby the container may be rolled or otherwise traversed along the floor during use thereof.

3,734,528

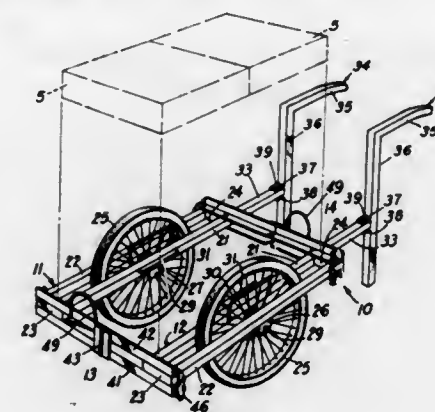
## POULTRY HANDLING CART

Thedford D. Echols, Jr., Rt. No. 6, Box 9, Cumming, Ga.

Filed July 14, 1971, Ser. No. 162,481  
Int. Cl. B02b 11/00

U.S. Cl. 280—42

4 Claims



A cart for use in the placement of chicks in a broiler house wherein the chicks are delivered from the hatchery to the broiler house in a plurality of trays by a transport vehicle means and are transferred into the broiler house by utilizing the cart. The chick placement cart is movable between an extended tray supporting position and a collapsed position and includes a first and second wheel assembly having frame support means associated with each of the wheel assemblies, with the two wheel assemblies being connected to each other by a pair of pivotally collapsible frame assemblies. The wheel assemblies and connectible frame assemblies are detailed for providing a supporting surface for supporting and maintaining a plurality of chick carrying trays thereon when in the extended tray supporting position. The connectible frame means for attaching the two wheel assemblies to each other includes a number of pivotally connected frame elements having openings therein adapted to be moved into alignment with openings on wheel assembly frame members, with connecting pins adapted to be inserted through the aligned openings for maintaining the cart in an extended tray carrying position. The connecting pins include attachment means for maintaining the pins in position relative to the cart, with the pin attachment means detailed in length for allowing the pins to be inserted through alternate holes when the cart is moved to a collapsed position, whereby the pin and pin attachment means are operable for maintaining the cart in a collapsed position.

3,734,529

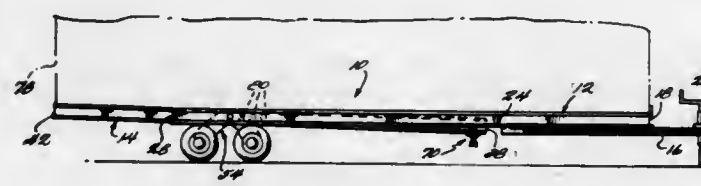
## TRAILER FRAME

James R. Selby, 1028 East F, Casper, Wyo.

Filed Mar. 25, 1971, Ser. No. 127,957  
Int. Cl. B62d 53/06

U.S. Cl. 280—80 B

6 Claims



A trailer frame structure is provided for mobile homes and consists of an outer, generally rectangular, frame having at its

front end coupling means for attaching the trailer to a vehicle and an inner, generally rectangular, frame which is pivotally mounted intermediate its ends between the outer frame adjacent the rear end thereof whereby the inner frame is capable of pivoting about a generally horizontal axis. A wheel bogie is attached to one of the frames adjacent the pivot axis; the rear end of the inner frame extends beyond the rear end of the outer frame so that the front end of the inner frame will intersect the outer frame at a point intermediate the outer frames ends; adjustable abutment elements are provided on the forward end of the inner frame for contacting the underside of the outer frame when the inner frame pivots about its axis in response to the weight of a load on the rear end of the inner frame.

3,734,530

## VEHICLE SUSPENSIONS

Vladimir Popelar, Prague, and Oldrich Ryc, Pribor, both of Czechoslovakia, assignors to TATRA, Narodni Podnik Koprivnice, Czechoslovakia

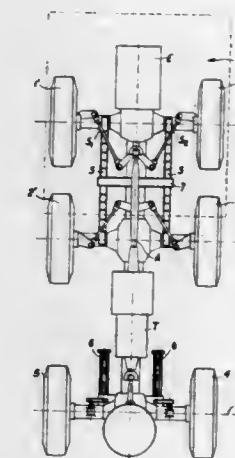
Filed Dec. 29, 1970, Ser. No. 102,425

Claims priority, application Czechoslovakia, Dec. 30, 1969, 8620/69

Int. Cl. B62d 13/00

U.S. Cl. 280—81.5

3 Claims



A suspension system for a vehicle having a longitudinal axis. The vehicle is provided with at least three pair of wheels, at least two of which are tandemly arranged and provided with means for steering. The tandemly arranged wheels are respectively sprung by a leaf spring parallel to the axis. Each leaf spring is located on opposite sides of the axis and nearer to the axis than to the respective wheels.

3,734,531

STABILIZING DEVICE FOR APPLIANCES FOR PUBLIC WORKS, FOR HANDLING AND FOR MAINTENANCE  
Roger Metallier, Grenoble, France, assignor to Richier, Paris, France

Filed Oct. 12, 1971, Ser. No. 188,179

Claims priority, application France, Oct. 12, 1970, 7036753  
Int. Cl. B60s 9/02

U.S. Cl. 280—150.5

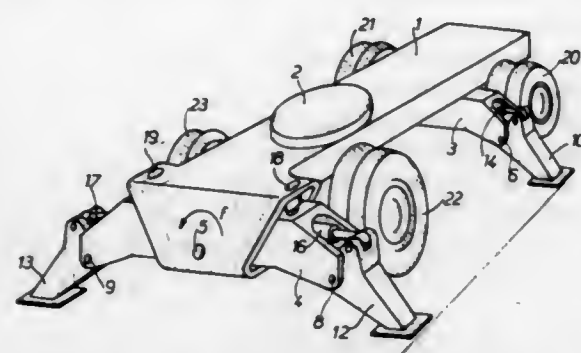
3 Claims

The invention relates to the field of appliances for public works, for handling and for maintenance.

More specifically, the invention relates to a stabilizing device for such appliances which comprises two pairs of stabilizing legs driven by jacks and arranged at the front and at the rear, respectively, of the appliance. At least one of these pairs of legs is mounted on a traverse articulated, about an axis, to the chassis of the appliance which can be immobilized about its axis by suitable means, such as jacks, which also



allow one to cause it to pivot about its axis.  
This device is useful for re-establishing the bearing on the



elongated member mounted on supports therefor and adapted to move downwards in front of occupants of a seat in the motor vehicle, the elongated member being releasably held adjacent the ceiling of the vehicle by means of a latch adapted to release the elongated member during abnormally fast decelerations of the vehicle to prevent persons in the car from falling forwardly beyond the elongated member.

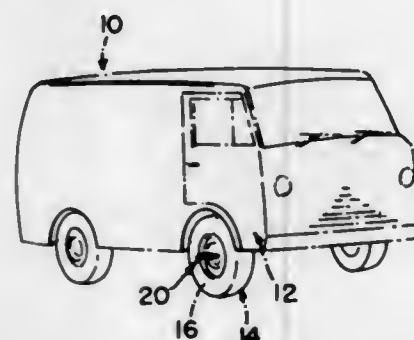
3,734,534

**MOUNTING STEP FOR AUTOMOTIVE VEHICLE**  
Paul Brooks, Jr., 621 Northeast 78th Street, and Clarence O. Teeters, 10211-12th Avenue Northeast, both of Seattle, Wash.

Filed Apr. 22, 1971, Ser. No. 136,380  
Int. Cl. B60v 3/02

U.S. Cl. 280-163

11 Claims



In a automotive vehicle having an access door above a front wheel, a removable step assembly located at the center of a front wheel and mounted to the front spindle of the automobile. There is a first mounting member comprising an extension nut which is threaded onto and locked to the front spindle. At the outer end of the extension nut is a hexagonal locking head connected by a neck portion of reduced diameter. The removable step has at its inner end a locking member comprising a pair of downwardly extending arms which reach around the neck of the extension nut, and is formed with a locking recess which mates with the locking head. A spring member mounted to the step adjacent the two locking arms holds the step in place and prevents any rattling of the step. A locking tab secures the extension nut to the automobile's front spindle.

3,734,535

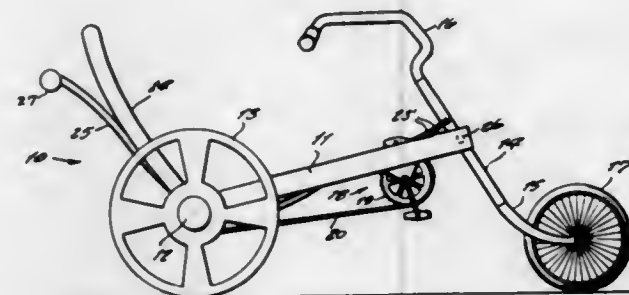
**TRICYCLE HAVING DRIVING ENERGY STORING ARRANGEMENT**

Donald M. Sidauskas, 3950 N.W. 32nd Terrace, Fort Lauderdale, Fla.

Filed Aug. 11, 1971, Ser. No. 170,897  
Int. Cl. B62m 1/10

U.S. Cl. 280-215

1 Claim



A tricycle for a child to ride upon, the tricycle including a frame supported at its rear end upon a pair of rear wheels mounted on a rear axle, the front end of the frame being supported upon a steering column supported upon a single front wheel, the steering wheel being controlled in direction by hand-

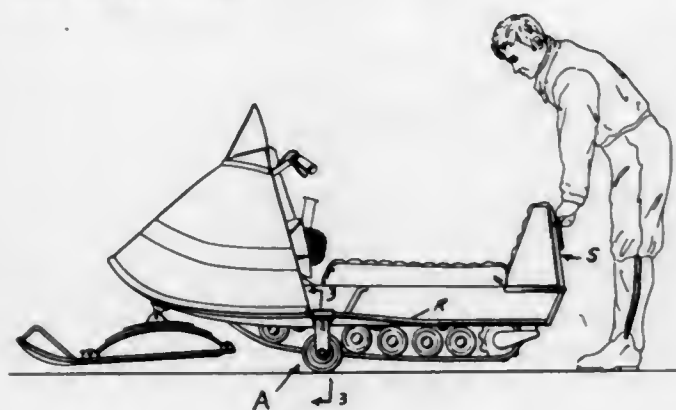
3,734,532

**AUXILIARY WHEEL UNITS FOR THE RUNNING BOARDS OF A SNOWMOBILE**

Martin L. Mattson, 10 Drake Road, Duluth, Minn.  
Filed July 21, 1971, Ser. No. 164,678  
Int. Cl. B60s 9/00

U.S. Cl. 280-150 A

2 Claims



Auxiliary wheel units for application to the running boards of a snowmobile having upturned rims at their outer edges, said units each including a wheel, a body underlying the running board of the snowmobile with legs depending therefrom and straddling the wheel, an axle extending across the legs at their lower ends and journaling the wheel for rotation, the wheels engaging the ground at a locality below the ground engaging structure of the snowmobile and a hook at the outer end of the body for holding the unit detachably secured to the running board of the snowmobile.

3,734,533

**MOTOR VEHICLE SAFETY DEVICE**

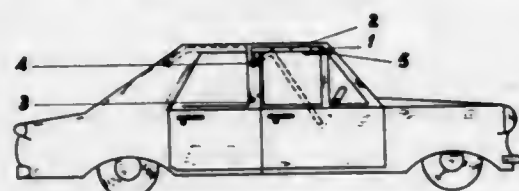
Franx Lang, 31 Simmonds Street, Johannesburg, Transvaal Province, South Africa

Filed Apr. 9, 1971, Ser. No. 132,652  
Claims priority, application South Africa, Apr. 23, 1970, 700886

Int. Cl. B60r 21/02

U.S. Cl. 280-150 B

13 Claims



A motor vehicle having seats therein and a ceiling over the seats and including a safety device comprising a transverse

die bars, the device including foot pedals for winding up a pair of springs for giving driving power to the rear wheels, and the handle bars when pushed forwardly acting as a level for a set of brakes.

3,734,536

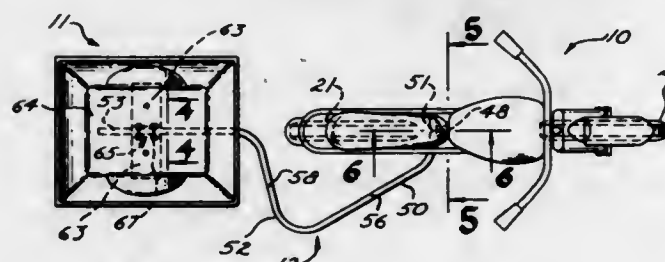
**TOW BAR MEANS**

James A. Dever, Bay Village; Harry D. Tenan, and George R. Finley, both of Cleveland, all of Ohio, assignors to The Green Ball Bearing Company, Cleveland, Ohio

Filed Aug. 17, 1970, Ser. No. 64,178  
Int. Cl. B62k 27/12

U.S. Cl. 280-204

5 Claims



A formed tow bar for trailering utility carts behind two-wheel cycles adapted to be operatively attached to the lowermost cycle frame member disposed below the axis of the wheels and forward of the rear cycle wheel and further adapted to be secured to the utility trailer whereby the formed tow-bar is maintained substantially horizontal to the ground during trailering.

3,734,537

**MECHANISMS FOR COUPLING SEMI-TRAILERS TO TRACTORS**

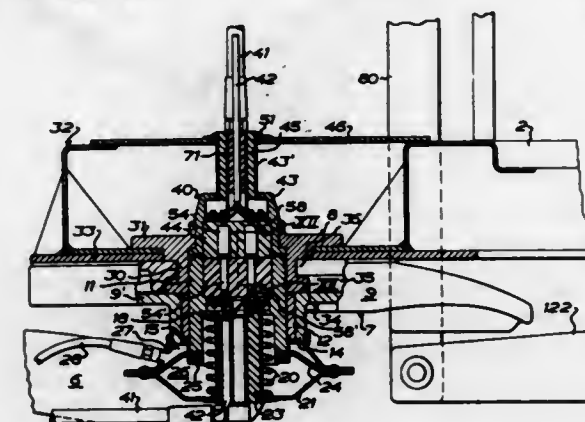
Roland Bengt Holmberg, Kalmar, and Ralf Krister Ebbe Peterson, Alsterbro, both of Sweden, assignors to Kalmar Verkstadsaktienbolag, Kalmar, Sweden

Filed Aug. 12, 1970, Ser. No. 63,174  
Claims priority, application Sweden, Aug. 13, 1969, 11244/69

Int. Cl. B62d 53/08

U.S. Cl. 280-421

5 Claims



A mechanism for coupling a semi-trailer to a tractor comprises a fifth wheel mechanism mounted on the tractor and king pin means mounted on the semi-trailer, which mechanism and which means are arranged, after having been brought into coupling position, to be locked in said position by means of a locking device which is operated by fluid pressure. Tracing of the coupling position between the fifth wheel mechanism and the king pin means is facilitated by means of a device which serves to raise and lower the fifth wheel mechanism and which is of the type that can be used to advantage as a spring for the spring suspension of the front end of the semi-trailer during driving.

3,734,538

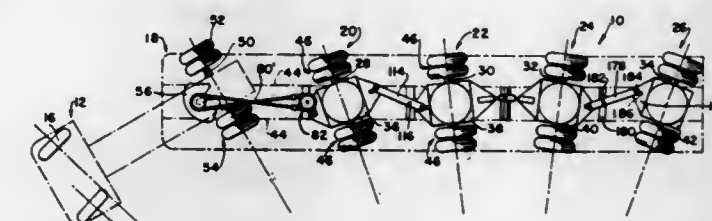
**STEERING ASSEMBLY FOR TRAILERS**

Carl E. Humes, 907 Franklin Avenue, Steubenville, Ohio  
Continuation-in-part of Ser. No. 135,243, April 19, 1971, Pat. No. 3,689,107.

Filed Feb. 7, 1972, Ser. No. 223,877  
Int. Cl. B62d 53/06

U.S. Cl. 280-426

3 Claims



Steering mechanism for a tractor driven multiple wheeled trailer wherein the motive force for steering a plurality of wheeled axle assemblies of the trailer is derived from the fifth wheel of the tractor in the form of flexible draft members extending from the fifth wheel to the first of the wheeled axle assemblies and thereafter each wheeled axle assembly is positively interconnected to its preceding wheeled axle assembly either for pivotal motion in the same or the reverse direction and at pre-selected amounts.

3,734,539

**APPARATUS FOR ALIGNING THE COUPLING ON SEPARATE VEHICLES**

Melvin I. Salmi, 13619 Pyramid Drive, Dallas, Tex.  
Filed Nov. 3, 1971, Ser. No. 195,263

Int. Cl. B60d 1/14

U.S. Cl. 280-477

10 Claims



Disclosed is an indicating apparatus for attachment to a trailer or the like for use in aligning the couplings between the trailer and a towing vehicle, said apparatus being mounted on the trailer and having a spring loaded extendible and retractable guide line which releasably attaches to the rear of the towing vehicle adjacent the coupling. Sensing means are included in the apparatus for sensing deflection of the guide line in horizontal and vertical directions and for sensing the separation of the vehicles and indicator means in the vehicle to indicate said deflections and separation to the operator of the towing vehicle. Variable sensitivity means for increasing the sensitivity of the apparatus as the towing vehicle approaches the trailer and means for allowing the towing vehicle to approach the trailer from various angles are also provided.

3,734,540

**UTILITY SERVICE TRAILER**

William E. Thiermann, 10726 N. Wauwatosa Road, Mequon, Wis.

Filed Apr. 5, 1971, Ser. No. 131,115  
Int. Cl. B60d 1/00, 1/16

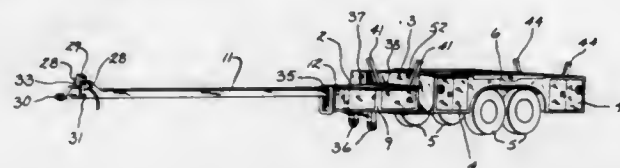
U.S. Cl. 280-482

10 Claims

An extensible trailer tongue is telescoped beneath the floor of the trailer with a hitch on its forward end at an appropriate level for attachment to a vehicle ahead, and when extended forwardly the tongue is raised to a higher level and locked in position to clear road obstacles, with the hitch lowered relative to the tongue to again be disposed at the appropriate level for attachment to the same vehicle ahead. The tongue rides loosely between an upper and a lower track facing each other,



and has upper rollers at its rear end bearing upwardly against the upper track and lower rollers disposed forwardly of said upper rollers and supporting the rear end of the tongue on the lower tracks. Means are provided to take up the looseness between the tongue and the track at hitch locations of the tongue. The body of the trailer has a platform for supporting utility poles and equipment with adjustably positioned stakes at either end and with a triangular central pillow serving as a central stake to position logs to one side of the trailer body. Side stakes or pole bolsters are secured in selected positions by



lateral pins on one side thereof entering corresponding key slots in the side walls of the trailer with heads on the pins interlocking the stakes against displacement and with spring loaded lock bolts preventing raising of the pins out of their corresponding slots. The platform is reinforced longitudinally by upstanding cabinets along either side, by a longitudinal channel extending centrally beneath the platform and receiving the tongue, and by diagonal compartments on either side of the channel. Cross beams are provided at the ends and beneath the platform.

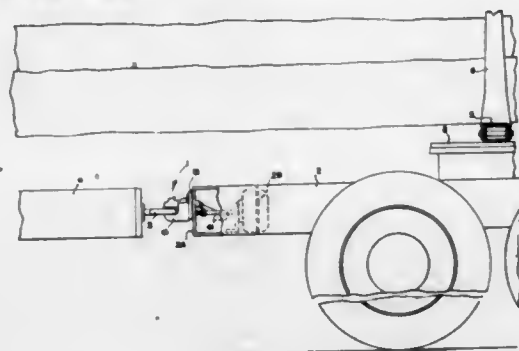
3,734,541

**AIR ACTUATED TRUCK-TRAILER HITCH**

Elvin O. Burroughs, Route 2, Box 207, Dexter, Oreg.  
Filed Aug. 16, 1971, Ser. No. 171,861  
Int. Cl. B60d 7/00

U.S. Cl. 280—506

8 Claims



A hitch for a truck and trailer with the locking member of the hitch adapted for opening and closing of the hitch by travel along a horizontal, rectilinear path. The locking member is moved to a closed position by an air pressurized booster unit. Movement is imparted to the locking member via a booster actuated assembly which additionally functions to move a pressure block of the hitch into engagement with the eye member carried by the trailer. The eye is thereby restrained against undesired movement while in engagement with the post of the hitch. Adjustable means enable the pressure block-eye engagement to be set to achieve the aforementioned result while avoiding restricting rotational movement of the eye. A mechanical lock automatically locks the locking member in a closed position.

3,734,542  
BINDER

Charles A. Nesmith, Jr., c/o Stoppenbeck Book-Bindery, Box 656, Bloomington, Ill.

Filed Apr. 26, 1971, Ser. No. 137,417

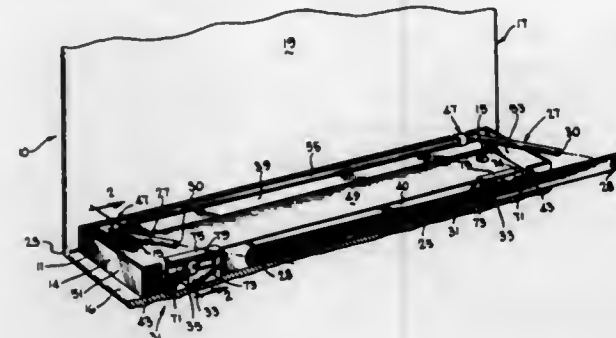
Int. Cl. B42d 3/00

U.S. Cl. 281—47

4 Claims

A semi permanent magazine binding device is provided for attachment to a binder cover for retaining in sequence

periodicals such as magazines and for locking the same against removal or loss from the binder. By means of a special key or tool the semi permanent binder may be unlocked and magazine straps may be removed from a magazine retaining position to a release position at which the periodicals may be



removed; and the semi permanent binder reused again. A low cost construction is provided by a rectangular tray base on which are pivotally mounted support rods which carry the magazine straps. The support rods are locked to retain magazine straps by a locking slide means carried on a wall of the tray base.

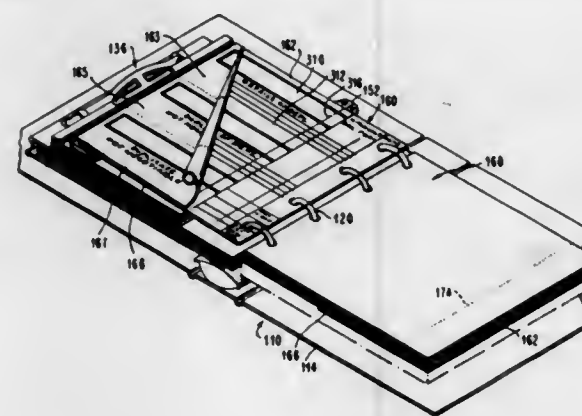
3,734,543

**COMBINED CHECK AND RECORD-KEEPING BOOK**

Marion Donovan, 418 Harbor Road, Southport, Conn.  
Division of Ser. No. 782,202, Dec. 9, 1968, Pat. No. 3,620,553.  
This application Dec. 16, 1970, Ser. No. 98,666  
Int. Cl. B411 1/20, 3/00; B42d 15/00

U.S. Cl. 282—23 R

7 Claims



A refillable check book and record-keeping combination for use with conventional bank checks and special preprinted record forms on which the data written on the checks is duplicated when the checks are written. A holder of particular form is secured in a loose leaf notebook and is so constructed as to hold the checks in a definite position so that they and record forms also secured in the book may be moved into registry and held in registry while the checks are being written. The record forms each include a permanent record sheet, preferably with detachable sheets for forming non-negotiable duplicate copies of individual checks, and the permanent record sheets also provide spaces for entry of deposits and other information relating to the bank account all arranged to facilitate accurate balancing and reconciling of the account. Certain of the modifications disclosed provide a storage pocket on the permanent record sheet for related papers such as deposit slips. Further modifications include simplified versions of the check books for pocket use in which preprinted record forms are so attached to the book that they are readily movable into registry with the checks for making duplicates as the checks are written.

3,734,544

**DUAL VALUE DOCUMENT**

Bruce I. Fishkin, West Redding, Conn., and John J. Taylor, Roslyn, N.Y., assignors to Sperry & Hutchinson Company, New York, N.Y.

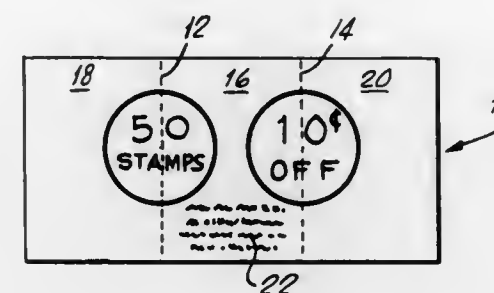
Filed June 16, 1971, Ser. No. 153,506

Int. Cl. G09f 3/00

U.S. Cl. 283—56

2 Claims

U.S. Cl. 285—49



A dual value document includes a sheet of flexible material such as paper divided into a middle section and at least two connected and detachable end sections. The middle section contains printed matter to indicate that a document consisting of the middle section and one of the end sections has one value, while a document consisting of the middle section and the other of the end sections has a different value.

3,734,545

**IRRIGATION CONNECTION**

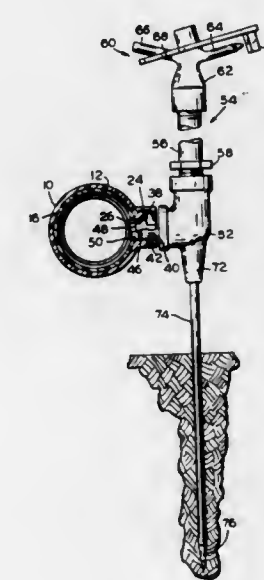
William A. Stout, Portland, Oreg., assignor to Portica Corporation, Portland, Oreg.

Filed Nov. 5, 1970, Ser. No. 87,250

Int. Cl. F16l 55/00

U.S. Cl. 285—5

11 Claims



A connection for irrigation pipes includes a bell member and a spigot member slidably receivable within the bell member and having an elongated aperture partly registrable with an aperture in the side of the bell member. A cantilever support for the connection comprises a horizontal conduit received through the two apertures and forming a bayonet joint with a tubular extension at the side of the bell member. The cantilever support includes a post for mounting the conduit and for additionally supporting fluid distribution means coupled to receive fluid from the aforementioned conduit.

3,734,546

**FLEXIBLE PIPE CONNECTION**

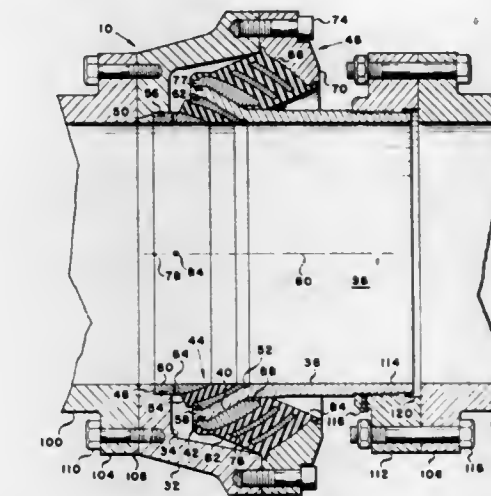
John T. Herbert; Paul E. Sullivan, and Stanley P. Vltt, Jr., all of Redlands, Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Mar. 30, 1972, Ser. No. 239,515

Int. Cl. F16l 27/10

U.S. Cl. 285—49

4 Claims



A flexible pipe connection configured to prevent the transmission of sounds produced in the pipeline. The joint has an annular housing and a nipple member partially submerged in the housing. The housing and nipple are connected by two elastomeric seal assemblies which provide flexibility and sound isolation between the housing and the nipple member.

3,734,547

**CLAMPING DEVICE BY SEGMENTAL THREAD PIPE FOR JOINT**

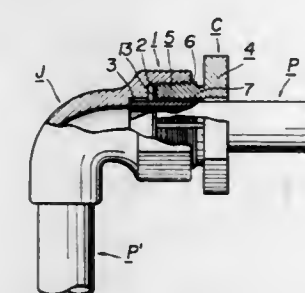
Noriatsu Kojima, No. 31, 5-chome, Yanagishima-cho, Nakagawa-ku, Nagoya, Japan

Filed Sept. 9, 1971, Ser. No. 179,119

Int. Cl. F16l 19/00

U.S. Cl. 285—357

1 Claim



A clamping device for coupling and securing firmly a pipe to be coupled to a joint is constructed in such a way that one end or both ends of a joint member is provided with a clamping portion, and a tapered female thread is formed on the internal surface of the clamping portion along the opening edge, and a thread portion and a nut portion are integrally formed and said clamping member is formed in combination of two pieces as a pair so as to be assembled for use, and a tapered male thread is formed on the external surface of the thread portion so as to be screwed to the tapered female thread formed on the clamping portion of the joint member, and also the thread ridge having an identical pitch with that of the tapered male thread formed on the external surface of the thread portion is formed on the internal surface, and a vertical slit groove is notched on the thread portion, and when the thread portion of the clamping member is caused to be screwed into the clamping portion of the joint member, the pipe to be coupled is gradually and uniformly clamped and secured in spiral stripe so as to be firmly coupled, and an en-



gaging step portion for engaging the tip of the pipe to be coupled is formed on the joint member and the clamping member is inserted to the pipe to be connected and when the clamping member is screwed into the clamping portion of the joint member, the pipe to be coupled is prevented from advancing ahead of a predetermined position in the joint member which is accompanied with the screwing of the clamping member, whereby the clamping member is provided with an assembling mechanism and this assembling mechanism prevents the discrepancy of mutual assembling positions when the two pieces of clamping members are assembled as a pair so as to obtain a complete assembly thereof.

3,734,548

## SHAFT CONNECTION MECHANISM

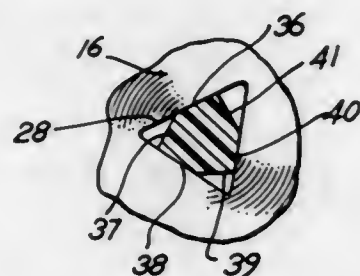
Garry Kieves, Winnipeg 13, Manitoba, Canada, assignor to K-Tel International, Inc., Minneapolis, Minn.

Filed Dec. 20, 1971, Ser. No. 209,692

Int. Cl. F16d 1/06

U.S. Cl. 287-53 R

7 Claims



Shaft connection mechanism for drivingly securing a device to a shaft in an appliance. The shaft is provided with a recessed portion adjacent an end. The end of the shaft has a non-circular configuration and the device has a non-circular opening adapted to pass over the shaft end and be retained in the recessed portion upon relative rotation between the device and the shaft. Camming means are provided in the recessed portion for drivingly engaging the device and the shaft upon relative rotation in one direction, and for effecting ready release of the device from the shaft upon rotation in an opposite direction. In a modification, the device may be non-rotatably mounted on the shaft and retained in place by a lock member having a non-circular opening adapted to pass over the shaft end and be retained in a recessed portion provided with camming means.

3,734,549

## WEDGE FOR USE IN A WEDGE CONNECTION

Nils Gosta Loov, Ersmark, Sweden

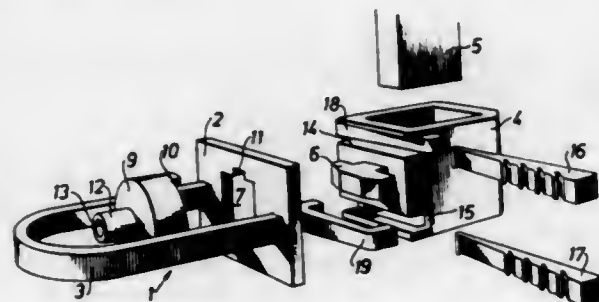
Filed Apr. 6, 1971, Ser. No. 131,608

Claims priority, application Sweden, Apr. 23, 1970, 5660/70

Int. Cl. F16b 7/00

U.S. Cl. 287-20.92 G

3 Claims



This invention relates to a wedge member that has a series of projections and recesses which make it possible to observe when the wedge has been driven in sufficiently far to establish the required rigidity of the wedge connection.

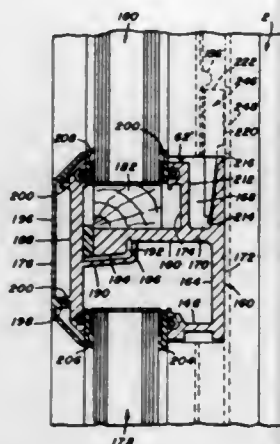
3,734,550  
BUILDING CONSTRUCTION ASSEMBLY  
Lawrence B. Vance, Pittsburgh, Pa., assignor to Engineered Products, Inc., Pittsburgh, Pa.

Filed Sept. 16, 1971, Ser. No. 181,082

Int. Cl. E04b 2/88

U.S. Cl. 287-189.36 A

12 Claims



A building construction assembly including a first elongated structural member having a longitudinally disposed keyway having a base wall and a pair of sidewalls projecting from the base wall. Means providing an elongated restricted throat keyway opening. A second elongated structural member having a longitudinal axis disposed generally transversely with respect to the longitudinal axis of the first elongated structural member. The second elongated structural member having a locking channel having a bottom wall, a front wall and a rear wall. The second elongated structural member disposed with its locking channel in aligned relationship with respect to an end opening of the keyway. A locking key having a first portion extending into the keyway and a second portion extending into and in engagement with the locking channel. Means resisting undesired movement of the key into the keyway sufficiently far to permit removal of the second key portion from the locking channel. A condensate gutter element may be secured within the locking channel.

3,734,551

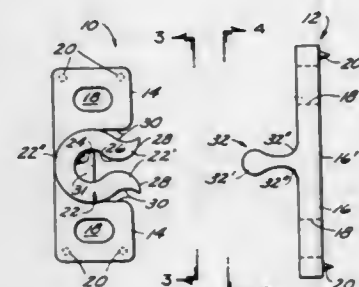
CLOSURE-FASTENER FOR CABINETS OR THE LIKE  
Robert T. Hughes, Thomasville, and Houston L. Adams, Hickory, both of N.C., assignors to Latch Plastics, Inc., Hickory, N.C.

Filed June 28, 1971, Ser. No. 157,289

Int. Cl. E05c 7/00

U.S. Cl. 292-17

10 Claims



The catch and strike components of the fastener are each unitarily formed, as by a molding operation, from polypropylene or other suitable plastic material to economically produce a low-cost fastener which may be quickly and easily installed, and which is relatively silent and quite durable and reliable in operation. The fastener self-compensates for minor misalignments, and may be employed to produce gripping forces of varying magnitude.

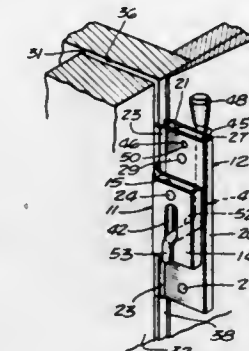
3,734,552  
HOUSE DOOR LATCHING DEVICE  
Claude S. Haxton, 10316 Cord Avenue, Downey, Calif.

Filed Jan. 14, 1972, Ser. No. 217,803

Int. Cl. E05c 5/00, 19/08

U.S. Cl. 292-67

8 Claims



A latching device is disclosed comprising a pair of brackets having their inner portions mounted in a door gap with the inner portion of one attached to the door and the inner portion of the other attached to the door frame in opposing relationship. The brackets are each formed of a thin sheet of steel and their inner portions are designed so that they can interfit in a common plane within the door gap so as to require a minimum of clearance and thus eliminate the need for mortising either the door or the door frame in order to install the latching device. The outer portion of each of the brackets is formed by bending the thin sheet of steel back on itself to provide a channel for receiving a strip of steel which serves to reinforce the outer portion. Each of the outer portions of the brackets is provided with a suitable slot for receiving the lower end of a latch pin which is loosely held by its upper end on one of the brackets.

3,734,553

## STOPPER FOR HOLDING A DOOR OPEN

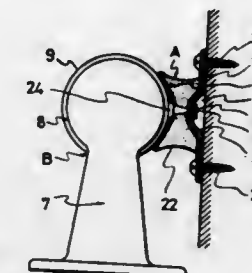
Tsunesaburo Sugawara, Chiyoda-ku, Tokyo, Japan, assignor to Sugatsune Industrial Co., Ltd., Tokyo, Japan

Filed Sept. 13, 1971, Ser. No. 179,637

Int. Cl. E05c 19/16

U.S. Cl. 292-251.5

5 Claims



A stopper for holding a door open which has a male part having a mounting leg to be installed onto a floor and a magnetic absorber provided on the peripheral edge thereof, and a female part to be installed onto a door having a magnetic concave absorber for the peripheral edge of the male part. Thus, the opened door is kept open without any difficulty.

3,734,554

## LOW IMPACT PROTECTION SYSTEM FOR VEHICLES

Carl W. Schwabenlender, Milwaukee, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Feb. 22, 1971, Ser. No. 117,469

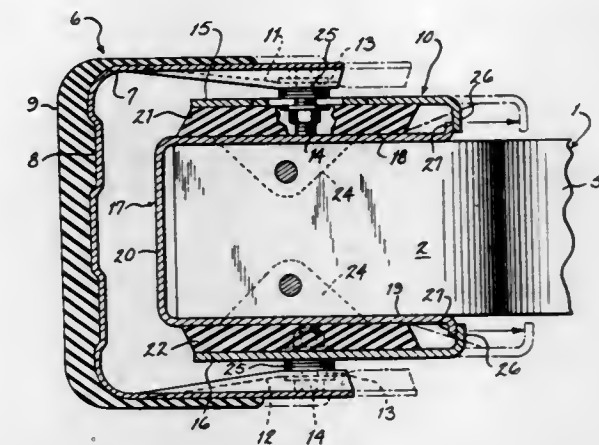
Int. Cl. B60r 19/06

U.S. Cl. 293-88

3 Claims

An impact absorbing system includes a bumper having a resilient coating, and shear mounts between the bumper and

the vehicle frame side bars. The ends of the side bars are strengthened and are offset outwardly from the wheel wells to near the ends of the bumpers where the shear mounts connect the bumper to the frame. Each shear mount includes an upper



and lower bracket fixed to the bumper and bonded to resilient blocks supported on an inner bracket which is bolted to the frame side bar. A rim on the inner bracket and corresponding flanges on the upper and lower brackets abut to hold the resilient blocks in a normally stressed condition.

## ERRATUM

For Class 293-71 see:  
Patent No. 3,734,557

3,734,555

## CONVERTIBLE CARRIER FRAME FOR SHIPPING CONTAINERS

Hans Tax, Potsdamer Str. 3, and Rudiger Franke, both of Munich, Germany, assignors to said Tax, by said Franke, Munich, Germany

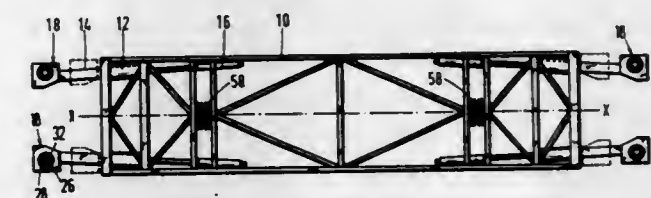
Filed Aug. 12, 1971, Ser. No. 171,196

Claims priority, application Germany, Aug. 26, 1970, P 20 42 357.8

Int. Cl. B66c 1/10

U.S. Cl. 294-81 SF

14 Claims



The container carrier on a crane for transferring containers toward and from container ships and the like has an elongated rectangular frame from whose corners two pairs of arms project longitudinally of the frame, the arms of each pair being inclined relative to each other at a small acute angle, their free ends carrying couplings for securing a container to the frame, and hydraulic motors moving the arms longitudinally in tubular guides fixed on the frame so that the arms may be adjusted for containers differing both in length and width. To accommodate the different containers, the couplings have interchangeable and/or convertible container engaging elements.

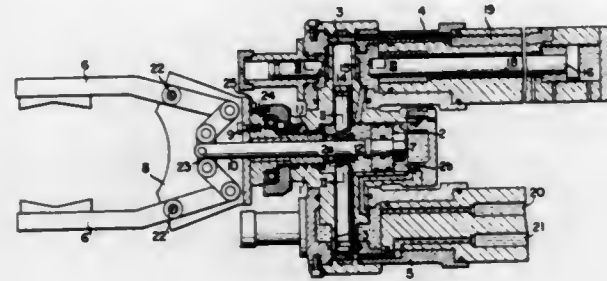


### 3,734,556 GRIPPER DEVICE FOR INDUSTRIAL ROBOTS OR THE LIKE

Hiroshi Misawa, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan  
Filed July 7, 1971, Ser. No. 160,395  
Int. Cl. B66c 1/00

U.S. Cl. 294-88

2 Claims



A gripper device for industrial robots or the like which includes a sleeve connected integrally with a support member for gripping arms and through which a piston rod for moving said arms towards and away is slidably disposed, said sleeve being formed with a pinion at the inner end thereof, and a cross-shaped cylinder having two cylinder portions, each having a respective axis disposed at a right angle relative to each other and spaced in the vertical direction, one of said cylinder portions receiving a spool formed with a rack engageable with said pinion therein and the other receiving a piston for moving said gripping arms towards and away therein, said cylinder portion receiving the spool being rotatably carried by base members and connected with a rotary mechanism.

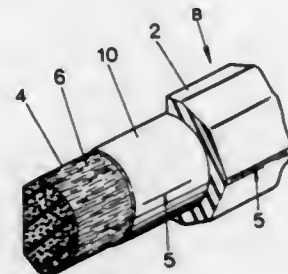
### 3,734,557 ELASTOMERIC BUMPER

Ross A. McKenzie, Toronto 3, Ontario, Canada, assignor to National Rubber Company Limited, Toronto, Ontario, Canada

Filed Oct. 14, 1971, Ser. No. 189,452  
Int. Cl. B60r 19/08

U.S. Cl. 293-71 R

13 Claims



An integral elongated bumper having impact absorption properties for mounting on a conventional basic metal bumper of an automobile comprising an overlay of elastomeric material covering a core of elastomeric material having short fibers dispersed densely and randomly throughout said core and integrally bonded to the core substance, increasing the impact resistance of said core over that of the overlay.

### 3,734,558 DUAL PURPOSE RECREATIONAL VEHICLE

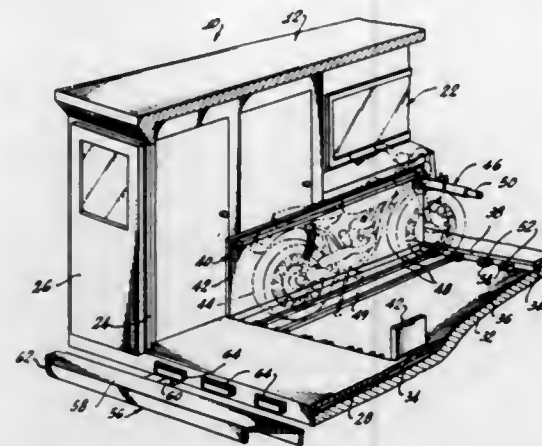
Ronald B. Stead, 8351 Imperial Highway, Downey, Calif.  
Filed June 21, 1971, Ser. No. 154,831  
Int. Cl. B60p 3/32

U.S. Cl. 296-23 R

11 Claims

A dual purpose recreational vehicle having a coach for use as a living quarters and a carrier for motor driven cycles and the like. The coach has an interior floor with an access open-

ing to a cycle storage well below the floor, and removable panel means, such as hinged floor panels, which normally close the access opening to provide a floor surface across the storage well and may be raised to permit placement of one or more cycles in upright travel positions in the well. The well



contains channels for receiving the cycle wheels and supporting the floor panels when in closed position within the access opening. The coach has a rear door opening and a removable step usable as a ramp for moving cycles into and from the coach through the door opening.

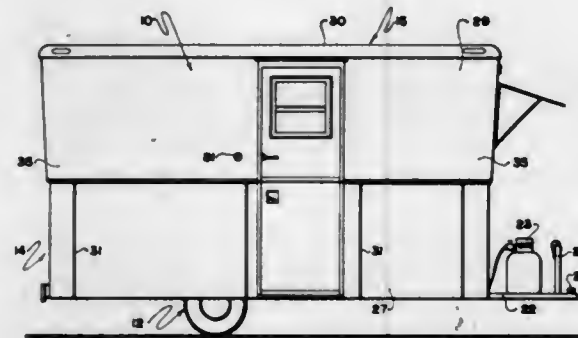
### 3,734,559 TELESCOPIC TRAILER

Donat Pierre Touchette, Box 250, St. Jean Baptiste, Manitoba, Canada

Filed June 10, 1971, Ser. No. 151,763  
Int. Cl. B60p 3/34

U.S. Cl. 296-23 C

3 Claims



The trailer consists of a base box-like portion with an open upper side and a top box-like portion slideable over the base portion with an open base so that the trailer can be collapsed for travel and storage or extended for use. A screw threaded shaft carries left and right hand threads thereon and a nut engages each of the portions of the shaft so that rotation of the shaft in one direction causes the nuts to move towards the center and in the other direction, to move towards the ends. Cables are attached to each nut, routed around pulleys and connected to the upper portion of the trailer body so that rotation of the shaft raises or lowers this portion relative to the base portion.

### 3,734,560 RETRACTABLE HINGE STRUCTURE FOR A TRUCK TAILGATE

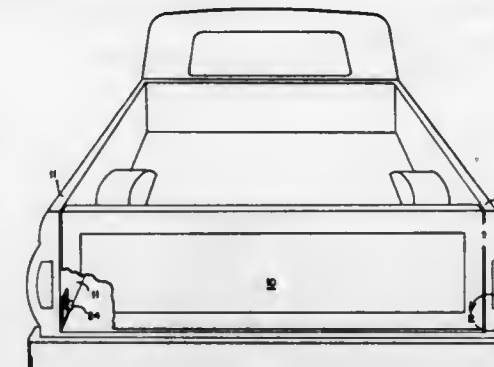
Charles D. Crambley, 894 Elm Street, Sweet Home, Oreg.  
Filed May 20, 1971, Ser. No. 145,427  
Int. Cl. B50j 5/10

U.S. Cl. 296-50

3 Claims

Hinge structure carried by a truck engageable with the truck tailgate and retractable into the truck for disengagement

from the tailgate permitting convenient tailgate removal and re-installation. A hinge pin is spring biased outwardly into tail-



gate engagement with manual release means permitting opposite hinge pin movement during tailgate disengagement. A housing carries the hinge pin in a captive manner.

### 3,734,561 SLED BASE FRAME CHAIR

Chester J. Barecki, Grand Rapids, and Bror W. Henrikson, Wayland, both of Mich., assignors to American Seating Company, Grand Rapids, Mich.

Filed June 3, 1971, Ser. No. 149,703  
Int. Cl. A47c 3/04

U.S. Cl. 297-239

6 Claims



A chair has a generally U-shaped tubular frame with the bottom portion of the U bent upwardly and provided with bracket shoes and with the rear portion of the frame forming sled runners merging into vertical back risers and, cooperating with the frame, is a one-piece plastic shell forming a seat and back provided with pockets which receive the bracket shoes of the frame front and the frame back risers to interlock the shell and chair frame.

### 3,734,562 AUTOMOTIVE SEATS WITH SAFETY HARNESSES

Francois Fourrey, Billancourt, France, assignor to Regle Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, France

Filed June 28, 1971, Ser. No. 157,462  
Claims priority, application France, Aug. 11, 1970, 7029492

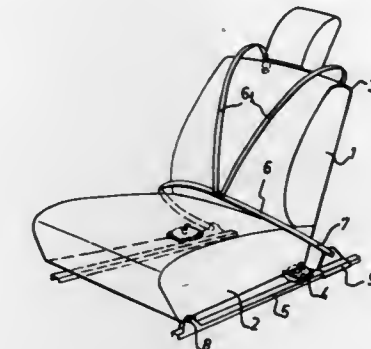
Int. Cl. A62b 35/60

U.S. Cl. 297-216

8 Claims

A seat provided with a safety harness, notably for automotive vehicles and of the type comprising a squab, a back pro-

vided with at least one anchor point for the shoulder-belt of said safety harness, said anchor point being located on the rear face of said back, an abdominal belt connected to said shoulder-belt, at least one kinetic energy absorption device interposed between said squab and a seat element adapted, in case of crash, to move in relation to said squab, said device being adapted, during this relative movement, to absorb one



fraction of the kinetic energy and wherein the anchor point located on said back is connected through said shoulder-belt to the abdominal belt of the safety harness, characterized in that at least one end of said abdominal belt is connected to the seat element movable in relation to the squab during a crash and that said seat element is mechanically connected to said squab in a manner known per se.

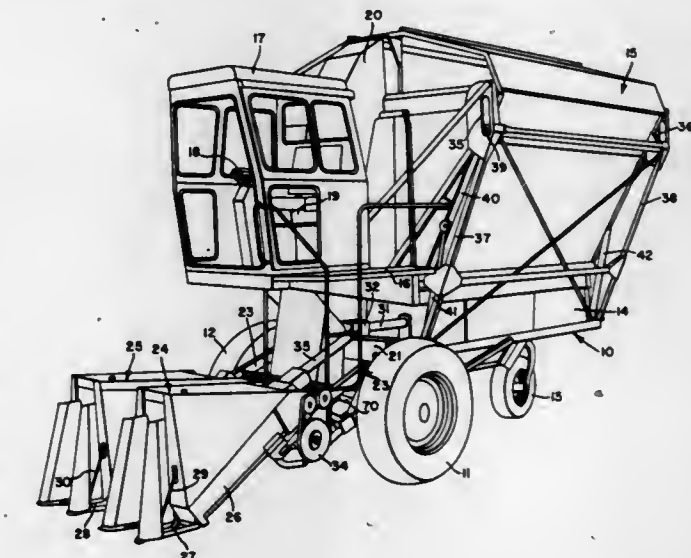
### 3,734,563 DISCHARGE MECHANISM FOR COTTON HARVESTER

Francis Edward Schlueter, Des Moines, Iowa, assignor to Deere & Company, Moline, Ill.

Filed July 12, 1971, Ser. No. 161,836  
Int. Cl. B60p 1/16

U.S. Cl. 298-8

4 Claims



In a cotton harvester in which green bolls are collected and held in a container by a retractable bottom and the ripe bolls are collected in a basket mounted on a horizontal axis, the improvement residing in hydraulic means for shifting the bottom out of its closed position and for shifting the basket to a tilted position so that material may be discharged from the container and basket respectively. The hydraulic motors for moving the bottom as well as tilting the basket are connected in parallel so that the bottom will be retracted first to its open position and the basket will then be tilted.



3,734,564

**ENDLESS BUCKET DREDGE WITH ARTICULATED LADDER AND SWELL COMPENSATOR**

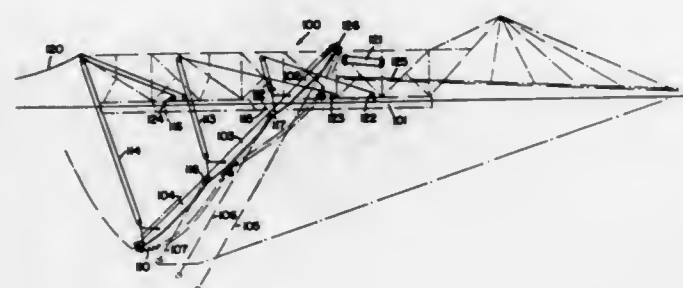
Cameron Edward McKay, 1632 Coronado Way, Burlingame, Calif., and George Paton Barker, Belmar, 85 Sauchenbush Road, Kirkcaldy, Fife, Scotland

Filed Apr. 27, 1970, Ser. No. 31,945

Int. Cl. E02f 3/14, 3/16, 7/06

U.S. Cl. 299-9

30 Claims



A deep-digging floating dredge having an articulated ladder with two or more sections pivoted together for relative swinging movement in a vertical plane only and a digging bucket line supported by the ladder. The dredge ladder may have a fixed uppermost section, with either the same or a different bucket line. For sea-going use the dredge may have sounding means for determining instantaneously the height of the hull above the bottom of the water on which the hull is floating, angle sensing means for determining instantaneously the angle to the horizontal of the upper movable ladder section, and control means receiving an input depth signal and an input angle signal controlling the suspension length of the articulated ladder sections and accommodating it to swells in the water level on which the hull floats.

3,734,565

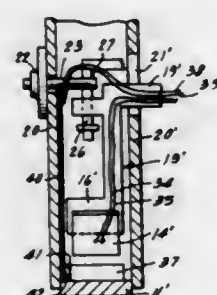
**ANTI-FRICTION MAGNETIC WHEEL**

Dzermal Mulasmajic, 338 Pleasant Hill Boulevard, Palatine, Ill. Continuation-in-part of Ser. No. 175,940, Aug. 30, 1971. This application Dec. 22, 1971, Ser. No. 210,923

Int. Cl. B60b 3/00, 19/00, 9/00

U.S. Cl. 301-5 R

2 Claims



A magnetic wheel for supporting a vehicle employs a permanent magnet or an electromagnet in the shape of a ring which is journaled for rotation about a shaft. The shaft is loosely coupled to the frame of the vehicle for vertical movement by means of a member which positions a permanent magnet or an electromagnet within the ring which is poled to repel the ring. The wheel is adapted for steering by providing that the loose coupling includes a pivotal coupling and by providing a lever arm for connection to a steering mechanism, such as a rack and pinion mechanism.

3,734,566

**RACING VEHICLE WHEEL HAVING IMPROVED COOLING STRUCTURE**

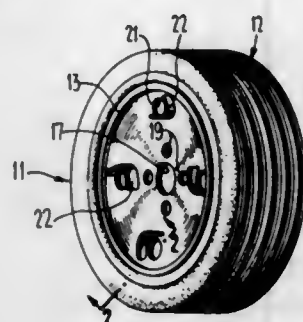
Donald E. Hanley, Butte, Mont., assignor to Red Devil Engineering, Inc., Butte, Mont.

Filed Apr. 9, 1971, Ser. No. 132,780

Int. Cl. B60b 19/10

U.S. Cl. 301-6 CS

4 Claims



A wheel especially designed for racing vehicles is described which has an improved structure for cooling both the wheel and any brake or vehicle structure behind the wheel. The wheel includes a circular frame for supporting a ground engaging tire and adapted for securance to the wheel hub or axle of a racing vehicle. A circular array of apertures extends through the side face of the frame adjacent the rim thereof upon which the tire is to be mounted. A fin is associated with each of the apertures and extends outwardly from the side face at a location and in an orientation with respect thereto at which the fin will intercept air flow by the face as the wheel turns and divert such air flow through the aperture.

3,734,567

**AIR CONVEYOR FOR FLAT THIN ARTICLES**

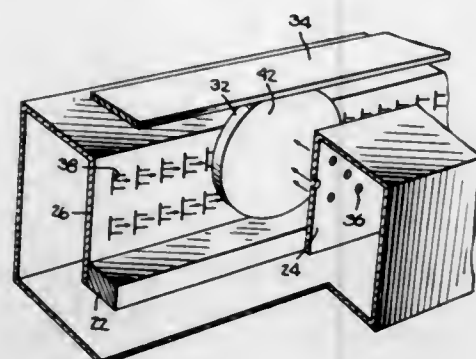
Leong Quock Fong, San Jose, Calif., assignor to Bangor Punta Operations, Inc., Greenwich, Conn.

Filed Jan. 25, 1971, Ser. No. 109,254

Int. Cl. B65g 51/02

U.S. Cl. 302-2 R

6 Claims



The conveyor includes an elongated channel-shaped trough for receiving circular articles. The trough includes a pair of side members extending in generally spaced parallel planes with openings through the members for transmitting air into the trough. The openings in one of the members are configured to provide air jets into the trough in a direction perpendicular to the one member to displace the articles in the trough toward the other member. The openings through the other member are configured to provide air jets having flow components predominantly parallel to the members to impart a propelling force to the articles. The articles are thus maintained in spaced relation from the one member in the course of their conveyance. Air issues outwardly from the trough along an open side thereof and imparts a force to the circular articles tending to rotate the latter in their direction of movement along the trough.

3,734,568

**AIR DELIVERY SYSTEM**

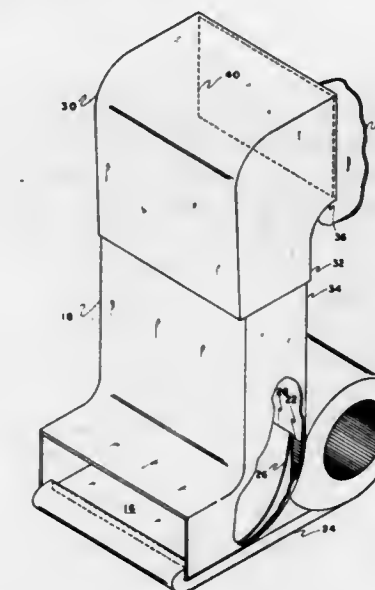
Ezra Cordell Lundahl, Idaho Falls, Idaho, assignor to Ezra C. Lundahl, Inc., Logan, Utah

Filed Nov. 4, 1971, Ser. No. 195,549

Int. Cl. B65g 53/40

U.S. Cl. 302-47

5 Claims



An air delivery system for particulate material wherein a vacuum is created in an area communicating an intake port with the flow of delivery air and a stream of pressurized air is directed into said area from a point adjacent the intake port to reduce turbulence caused by atmospheric air carrying entrained crop material into said intake port. The system also contemplates gradually expanding the cross-sectional area of the ducts throughout the delivery path to reduce damage to material entrained in the delivery air flow. Both method and apparatus are disclosed.

3,734,569

**PNEUMATIC CONVEYING SYSTEM AND APPARATUS**

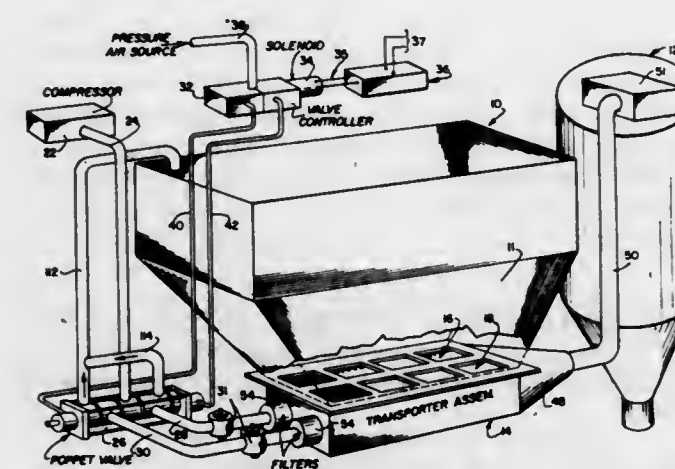
George J. Vingas, Mundelein, Ill., assignor to Pneu-Veyor, Inc., Lincolnwood, Ill.

Filed Nov. 3, 1971, Ser. No. 195,116

Int. Cl. B65g 53/40

U.S. Cl. 302-39

14 Claims



A pneumatic conveying system and apparatus for transferring or conveying powdered or granular material from one place to another including, transporter means having a plurality of compartments whereby each of the compartments first receives the material and then compressed air is introduced to the filled compartment to convey, transfer and discharge the material from said compartment to the delivery or destination station. The operations are in timed relation and in a continu-

ous cycle so that when one compartment is filling the other compartment will be discharging, thereby expediting the transfer of the material. Air speed control valves or metering devices are included for controlling the rate or speed of the exhausting or delivery of the material from the compartments.

3,734,570

**PROPORTIONING DEVICE**

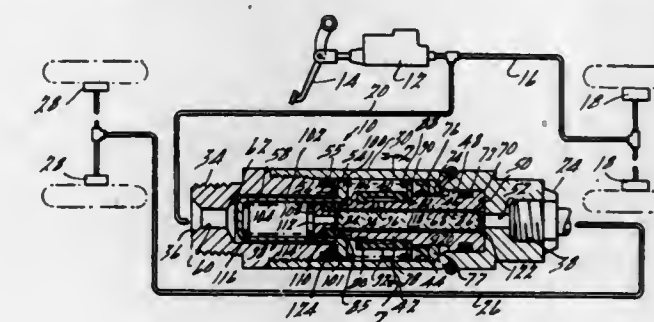
William Stelzer, Milford, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Sept. 2, 1970, Ser. No. 68,895

Int. Cl. B60t 8/26, 11/34

U.S. Cl. 303-6 C

18 Claims



A device for varying the proportion of brake pressure delivered to the front and rear brakes of a vehicle having a differential area piston for modulating the brake pressure delivered to the rear brakes after a certain inlet pressure is reached, and an additional member cooperating with the differential piston to provide a fixed offset between the pressure delivered to the front and rear brakes after a certain differential between front and rear brake pressures is reached.

3,734,571

**ELECTRO-PNEUMATIC BRAKE SYSTEM**

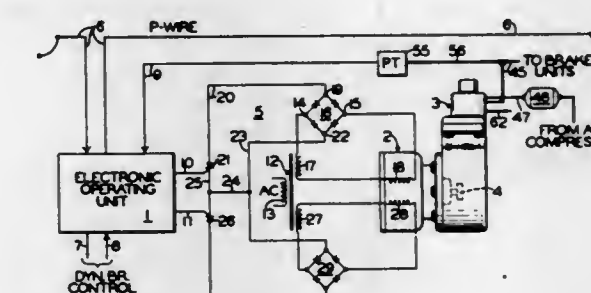
Rudolph A. Coccia, North Versailles, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Jan. 25, 1972, Ser. No. 220,576

Int. Cl. B60t 13/68

U.S. Cl. 303-20

8 Claims



Digital application and release brake control signals generated by an electronic operating unit in accordance with the difference between a desired retardation signal and the available dynamic brake effort are provided to control a pair of thyristors in an a.c. control circuit for energizing one or the other of separate field windings of a torque motor, the output shaft of which drives a pneumatic relay valve device between application, lap and release positions, accordingly. The output of the relay valve provides friction brake effort sufficient to compensate for the inability of the dynamic brake to satisfy the desired level of retardation called for. A pneumatic means of controlling the relay valve device independent of the torque motor is available to assure friction braking in the event the torque motor drive fails.



3,734,572

**ADAPTIVE BRAKING CONTROL SYSTEM USING PEAK WHEEL DECELERATION DETECTOR AND INITIAL HIGH SLIP**

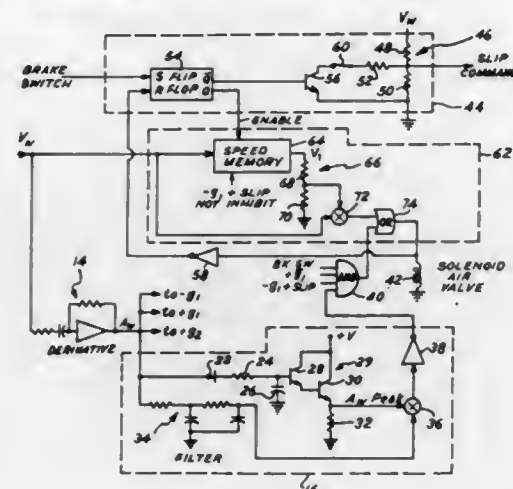
George B. Hickner; Michael Slavin, both of South Bend, Ind., and Donald W. Howard, Baltimore, Md., assignors to The Bendix Corporation, South Bend, Ind.

Filed Dec. 7, 1970, Ser. No. 95,785

Int. Cl. B60t 8/12

U.S. Cl. 303—21 BE

2 Claims



A control portion of an adaptive braking system utilizing peak wheel deceleration to prevent the skidding of an automotive vehicle. The control portion assumes the vehicle is operating on a high coefficient surface for a first cycle of brake pressure modulation. After the first cycle of modulation, if the vehicle is operating on a low coefficient surface, appropriate logic will change the allowable percent slip to a lower value. Along with the initial high coefficient surface condition for the first cycle of brake pressure modulation is included a means to memorize the initial speed upon applying the vehicle brakes. The braked wheel is brought back to a given percentage of the initial speed by further decay of brake pressure during the first cycle of modulation.

3,734,573

**ADAPTIVE CONTROL FOR FLUID PRESSURE BRAKING SYSTEMS**

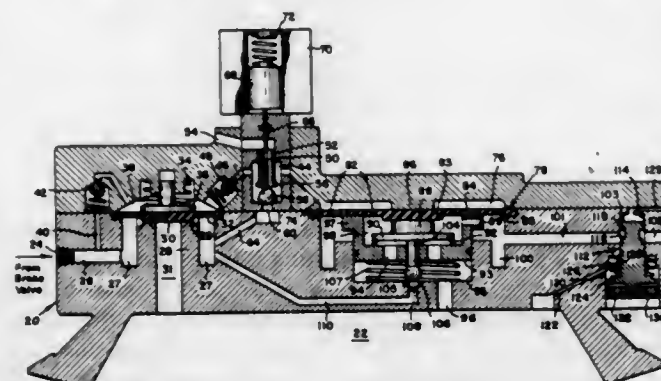
Dennis J. Davis; Sham L. Kurichh, and Gilbert A. Pataky, all of Elyria, Ohio, assignors to Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio

Filed Oct. 16, 1970, Ser. No. 81,481

Int. Cl. B60t 8/12

U.S. Cl. 303—21 F

14 Claims



Adaptive control for a fluid pressure braking system of the type which when a wheel decelerates to an impending skid opens an exhaust valve to reduce pressure in the actuator and after the wheel has accelerated in response thereto closes the exhaust valve and restores pressure in the actuator, the invention including apparatus responsive to the fluid pressure in the

actuator at the time the exhaust valve is opened for controlling the rate of fluid flow from the actuator through the exhaust port, the rate of fluid flow being preferably controlled by apparatus for varying the effective exhaust area in the path of fluid flow from the actuator in response to pressure in the actuator whereby for high actuator pressure a small exhaust area is provided and for a low actuator pressure a large exhaust area is provided.

3,734,574

**LOAD SENSING CONTROL DEVICE FOR A VEHICLE HYDRAULIC BRAKING SYSTEM**

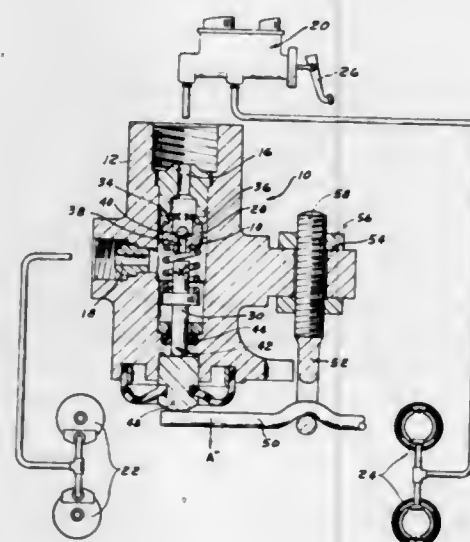
Richard L. Lewis, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Mar. 2, 1971, Ser. No. 120,144

Int. Cl. B60t 8/22

U.S. Cl. 303—22 R

5 Claims



A control device is provided for a vehicle hydraulic braking system which includes disc brakes on the front wheels of the vehicle and drum brakes on the rear wheels of the vehicle. The control device is interposed in the brake line between the master cylinder and the front wheel disc brakes and delays fluid communication through the brake line until the fluid pressure in the brake line attains a predetermined level. After the predetermined fluid pressure level is attained, the control device permits fluid communication between the master cylinder and the disc brakes. Means responsive to the load carried by the vehicle are operatively connected with the control device to vary the predetermined fluid pressure level at which fluid communication between the master cylinder and the disc brakes is initiated.

3,734,575

**FLUID PRESSURE OPERABLE BRAKE CONTROL VALVES**

Phillip Norman Paginton, London, England, assignor to Westinghouse Brake and Signal Company, Limited, London, England

Filed May 28, 1971, Ser. No. 147,750

Claims priority, application Great Britain, June 9, 1970, 27,923/70

Int. Cl. B60t 15/22

U.S. Cl. 303—33

10 Claims

A triple valve for fluid operable braking is provided with an additional emergency braking valve portion which has its own pressure responsive member which is responsive to at least a predetermined reduction of brake pipe pressure relative to quick action chamber pressure in a given period of time to open a valve to apply pressure to the brake cylinder from a reservoir and to vent the brake pipe, the pressure responsive

3,734,577

**TRACK ASSEMBLY FOR ENDLESS TRACK VEHICLES**

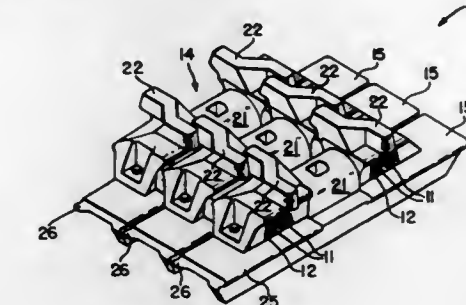
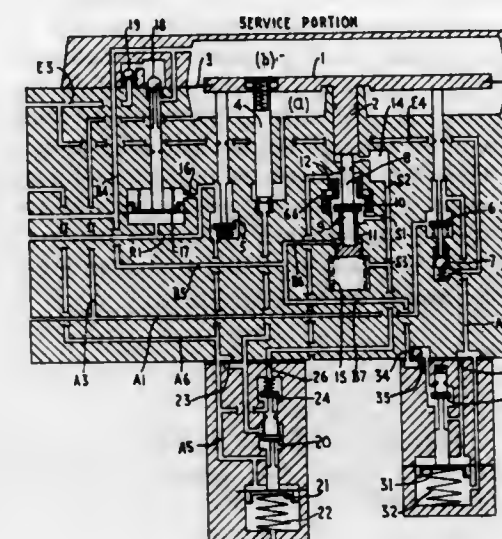
Donald L. Snellman, Seattle, Wash., assignor to Norfin, Inc., Seattle, Wash.

Filed Nov. 16, 1970, Ser. No. 89,822

Int. Cl. B62d 55/24

U.S. Cl. 305—40

10 Claims



position a choke passage between the quick action chamber and brake pipe becomes more constricted.

3,734,576

**TRACK FOR VEHICLES**

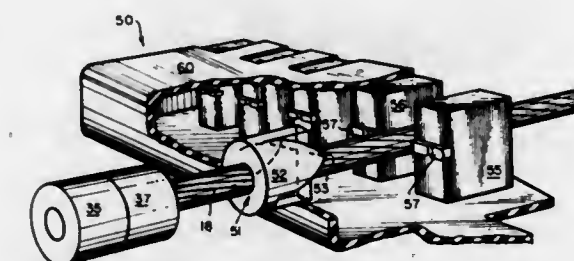
Danforth Kingsbury Helpe, Peoria; Danny Lee Hillman, Pekin; Edward George Orth, and Paul Joseph Stueve, both of Peoria, Ill., assignors to Westinghouse Air Brake Company, Peoria, Ill.

Filed July 6, 1971, Ser. No. 159,723

Int. Cl. B62d 55/24

U.S. Cl. 305—37

1 Claim



A sectional rubber track having cables extending longitudinally and embedded in the rubber with traction teeth on the ground contacting side of the track. Transverse connecting bars secure the ends of the cables. Adjacent connecting bars of adjacent track sections form intercalated knuckles which connect by meshing relationship. The knuckles have aligned holes to receive an anchor bar therethrough. The knuckles pivot upon the anchor bar. The cable ends are fixedly mounted to the connecting bar by swaging, riveting, or the like, the location where the cable changes from flexible to non-flexible being referred to as the transition location. A ferrule enclosing the cable is mounted at each transition location. The ferrule has a larger inner diameter than the diameter of the cable and the space between cable and ferrule is filled with an epoxy to allow limited flexing of the cable. Line pivots and associated seats are located around the cables near the ferrules. Each line pivot is secured to a cable with a pair of wedge portions forming two line edges on opposite sides of the cable and radial and transverse to the cable. Complementary seats upon which the edges pivot are mounted on bearing blocks in hollow channel structures extending across the track sections.

3,734,578

**MAGNETIC FLUID PNEUMATIC BEARINGS**

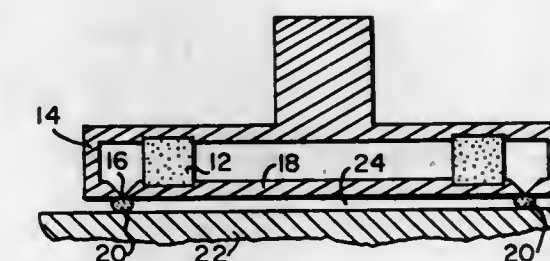
Ronald E. Rosensweig, Lexington, Mass., assignor to Ferrofluidics Corporation, Burlington, Mass.

Continuation-in-part of Ser. No. 5,167, Jan. 23, 1970, Pat. No. 3,612,630. This application Oct. 6, 1971, Ser. No. 186,926

Int. Cl. F16c 39/06

U.S. Cl. 308—10

25 Claims



A bearing assembly which includes a pin disposed within a housing and a magnetic fluid seals a fluid bearing pad between



the outer surface of the pin and the inner surface of the housing. The sealed fluid bearing pad provides a pneumatic action in response to thrust forces acting on either the housing or the pin. A plurality of magnetic fluid rings are disposed externally of the sealed bearing pad and between the surfaces of the pin and housing to provide a radial restoring force between the pin and the housing when an offsetting force acts on either the pin or the housing. The rings serve an additional function in that they also provide a multi-stage seal for the fluid bearing pad.

3,734,579

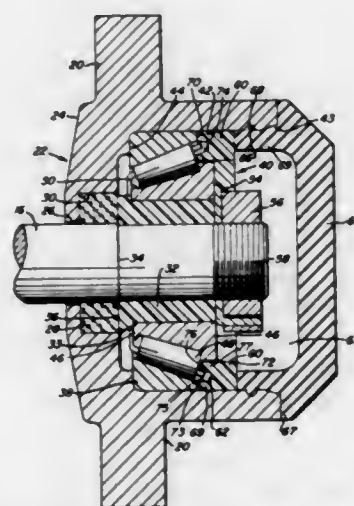
**BEARING HOUSING ASSEMBLY**

Gary B. Schumacher, 320 Park St., Navarre, Ohio  
Filed Dec. 9, 1970, Ser. No. 96,379

Int. Cl. F16c 13/00

U.S. Cl. 308—20

8 Claims



A bearing housing assembly to seal and simplify the installation of tapered roller bearings, consisting of; a felt seal sealing along the shaft and bushing end of the housing, a bearing housing cap snapping into the housing to seal the open end of said housing, and a bearing retainer ring located between a bearing and a housing cap to locate the bearing within the housing and retain relatively movable bearing members against incidental axial loading tending to unseat them.

3,734,580

**SPLIT SLEEVE BEARING WITH INTEGRAL SEALS**

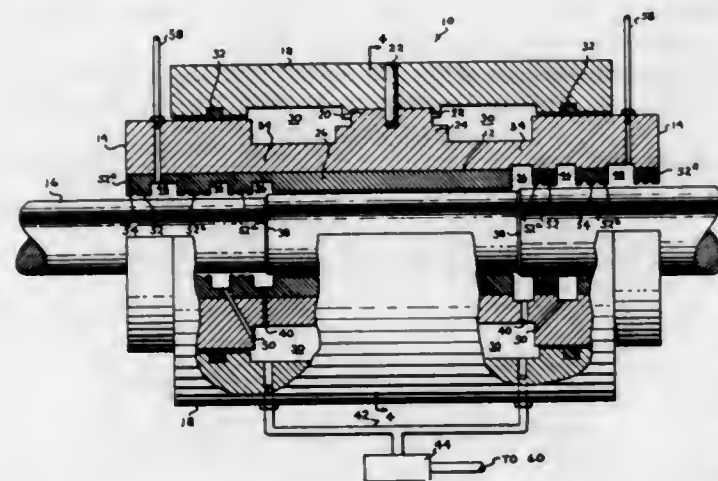
Vincent Americo Piscitelli, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 22, 1971, Ser. No. 155,544

Int. Cl. F16c 33/74

U.S. Cl. 308—36.3

2 Claims



An axially split sleeve bearing is described wherein the housing seal is formed integrally with the bearing to inhibit oil

leakage by permitting a reduction in the normally required clearance between the housing seal and the shaft. An axially split bearing support circumferentially encloses the composite bearing and housing seal and is spaced therefrom to form dual annular passageways for removal of oil passing axially from the bearing section into the adjacent housing seals. The housing seal also is provided with air locks, i.e., annular air chambers having a cross-sectional area at least five-fold the circumferential area of clearance between the shaft and housing seal, to inhibit flow of oil through the housing seals at each end of the bearing. When the outboard end of the motor is readily accessible, the split sleeve bearing preferably has an integral housing seal only at the inboard end of the bearing with the outboard seal for the bearing being a conventional unitary housing seal secured to the bearing support.

3,734,581

**TANDEM THRUST BEARING**

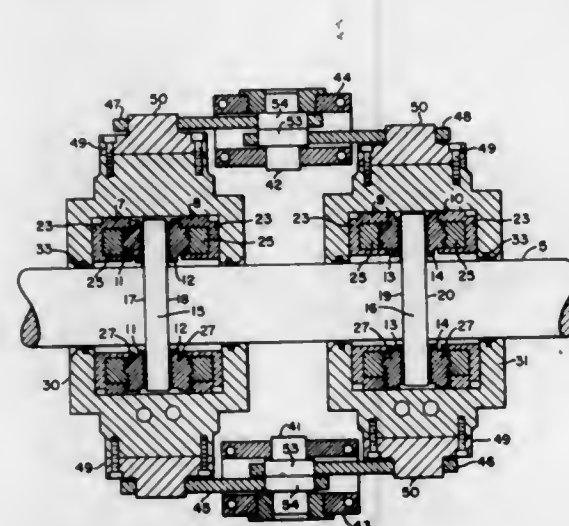
Albert F. LeBreton, Media, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 3, 1971, Ser. No. 168,635

Int. Cl. F16c 17/06

U.S. Cl. 308—160

14 Claims



A mechanism for equalizing the load on a pair of tandem thrust bearings comprising a pair of cranks disposed on opposite sides of a rotatable shaft having a thrust load thereon each crank having a pair of links pivotally connected thereto, and pivotally connected to each of the thrust bearings to cause the thrust bearings to move in unison to distribute the load equally.

3,734,582

**COMBINATION BEARING MATERIALS**

Jean Beauchet, Annecy (Haute Savoie), France, assignor to Societe Nouvelle De Roulements, Annecy (Haute Savoie), France

Continuation of Ser. No. 4,729, Jan. 21, 1970, abandoned.

This application Oct. 29, 1971, Ser. No. 194,069

Int. Cl. F16c

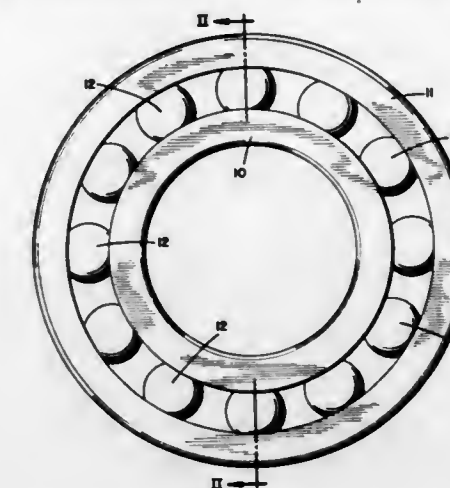
U.S. Cl. 308—173

2 Claims

This invention relates to the manufacture of rolling-contact bearings wherein the outer and inner races or rings were hitherto made of the same steel grade and subjected to a heat treatment with or without a preliminary cementation.

According to this invention, the inner races of the bearings are made of cementation steel and the outer races as well as the rolling-contact members, such as balls and rollers from

core-hardened alloy steel. The treatment consists of a case-hardening or cementation applied to the inner races and of a



hardening process applied to the outer races and rolling bodies.

3,734,583

**SPINDLE ADAPTED FOR TEXTILE MACHINERY**

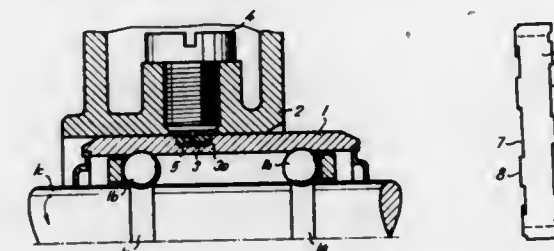
Vaclav Hosnedl; Zdenek Rajsigl; Jiri Rathusky; Miroslav Prokopec, all of Brno, and Milos Mladek, Usti nad Orlici, all of Czechoslovakia, assignors to Zvl Vyzkumny ustav pro Vallva loziska, Brno, Czechoslovakia

Filed Jan. 7, 1972, Ser. No. 216,020

Int. Cl. F16c 35/04

U.S. Cl. 308—189 R

6 Claims



A spindle, particularly adapted for use in textile machinery, with a spindle bushing containing a shaft mounted in a pair of bearings disposed in a holder. On the circumference or at least on a part of the circumference of the spindle bushing there is located a groove in which a split circular or segmental elastic adjusting element is mounted, the adjusting element being held down from above by a thrust screw screwed into the spindle bushing holder.

3,734,584

**ROLLER BEARING**

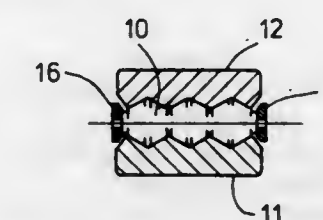
Robert Martin Studer, Bristol BS9 4LH, England, assignor to The Secretary of State for Defence in Her Majesty's Britannic Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed May 17, 1971, Ser. No. 144,205

Int. Cl. F16c 33/00

U.S. Cl. 308—213

3 Claims



The disclosure of this invention pertains to a roller bearing in which the rolling element has the form of alternately orien-

3,734,585

**PLASTIC IMPREGNATED FABRIC JOURNAL BEARING**

Harold Ward Conru, South Burlington, Vt., assignor to Textron Inc., Providence, R.I.

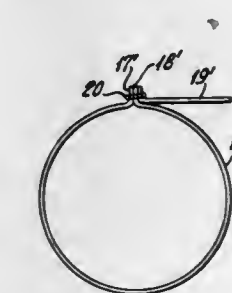
Division of Ser. No. 703,702, Feb. 7, 1968. This application

Sept. 25, 1971, Ser. No. 18,389

Int. Cl. F16c 33/20

U.S. Cl. 308—238

5 Claims



The invention contemplates an improved method of making fabric-lined journal bearings, of bore size determined by a mandrel. A piece of low-friction fabric material is cut from rectilinear stock, to such length between cut-off ends as to substantially equal the peripheral extent of the mandrel. A piece of bondable fabric is secured, as by sewing or clamping, to a cut-off end of the low-friction piece. The fabric composite, impregnated with hardenable material, is then wrapped onto the mandrel, beginning with the low-friction piece. The assembly is thereafter cured to hardness, and the mandrel removed.

3,734,586

**PAPER HANDTOWEL DISPENSER**

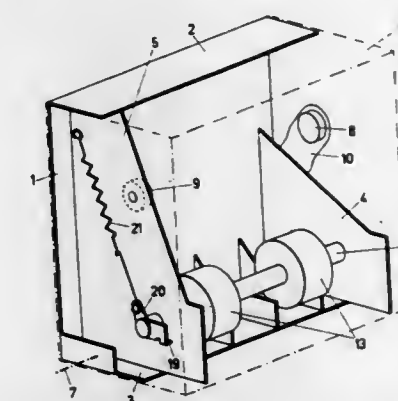
Conrad W. Schnyder, 9497 Triesenberg, Liechtenstein, assignor to CWS International AG, Zurich, Switzerland

Filed Aug. 4, 1971, Ser. No. 168,818

Int. Cl. B65h 19/00

U.S. Cl. 312—39

10 Claims



The paper handtowel dispenser mounts a paper handtowel roll from which towelling can be withdrawn over a metering roller. A timed stop arrangement is provided which can be changed over for stopping and temporarily locking the metering roller after every two revolutions or after each single revolution, respectively. When the handtowel roll is replaced, before it is completely empty, the part-used roll can be placed in the dispenser together with the first mentioned or fresh handtowel roll so that towelling can then be withdrawn, for some time, from both rolls simultaneously. A detector member is provided for automatically changing over the timed stop arrangement so as to stop the metering roller after every two revolutions if there is only one towel roll in the dispenser, and after each single revolution if there are two usable towel rolls in the dispenser.



3,734,587

## ROTARY CARD FILE

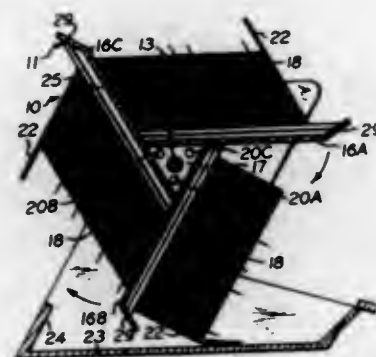
Albert Karper, 5700 Collins Avenue, Miami Beach, Fla.

Filed Dec. 23, 1971, Ser. No. 211,420

Int. Cl. A47b 63/00; B42f 9/00

U.S. Cl. 312-186

5 Claims



A rotary card file in which a card holder supported for rotation by a base structure has a plurality of trays that extend from a central hub and are equipped with retainer tracks that keep the cards in file alignment when the card holder is turned to position the tray in an upwardly facing access position, and which support the cards suspended from the tray when the card holder is turned to position the tray in a downwardly facing storage position.

3,734,588

## REFRIGERATOR CABINET

Robert P. Ellis, 350 Lomas Santa Fe Drive, Solana Beach, Calif.

Filed Apr. 20, 1972, Ser. No. 246,070

Int. Cl. A47b 67/02; A47f 5/08; A47b 53/00

U.S. Cl. 312-247

4 Claims



A cabinet for household refrigerators which may be an extension of or an accessory to the refrigerator, the cabinet being attached to the upper part of the refrigerator, which makes it too high for convenient access to the housewife when the cabinet is drawn forward out of the refrigerator, so access is provided by making the cabinet with an open bottom.

3,734,589

## HEIGHT ADJUSTMENT MEANS

Wendell D. Morgan, Marion, Ill., assignor to Feeders Corporation, Edison, N.J.

Filed Nov. 15, 1971, Ser. No. 198,685

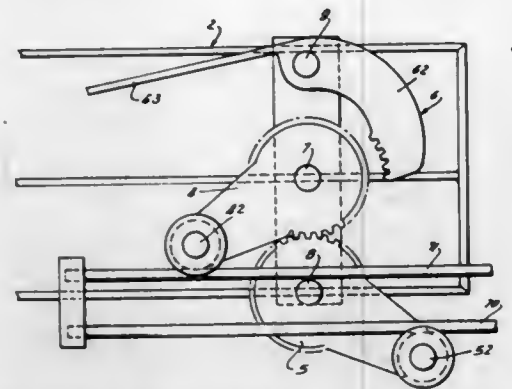
Int. Cl. A47b 51/00

U.S. Cl. 312-351

15 Claims

Means are provided for adjusting the height of one or both sides of the upper basket in a dishwasher, the means including

two interengaging members attached to support means on the



rack, with bearing members attached to the members adapted to move on the telescoping slide channel.

3,734,590

## FILE

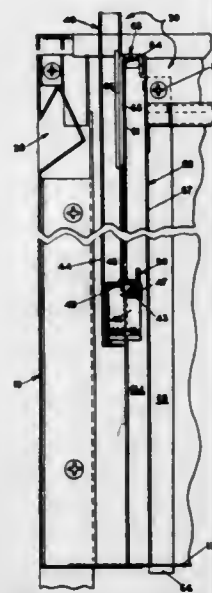
Robert B. Ormiston, Grandville, and Gale F. Wilcox, Wayland, both of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed Apr. 21, 1971, Ser. No. 136,113

Int. Cl. A47b 88/00

U.S. Cl. 312-322

16 Claims



The file includes an open top tub having casters on its legs. There are side hangers located at the sidewalls such that hanging files can be hung between the sides, and there are end hangers and a central hanger spaced between the ends such that hanging files can be hung between each end and the central hanger. The end hangers are removably secured in the tub such that they can be removed to facilitate the insertion of an integral door and interior end wall assembly. In the assembly, the door is slidably mounted to the end wall by means of inter-fitting channels and the end wall can be releasably secured to the tub at the end thereof. The end wall itself includes a hanger flange to serve the function of the removed end hanger.

3,734,591

## SCANNING SYSTEM WITH UNIFORM SCAN RATE AND RAPID RETURN

Spencer D. Howe, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 14, 1970, Ser. No. 97,641

Int. Cl. G02b 17/00

U.S. Cl. 350-6

24 Claims

A mirror useful for signal processing and display apparatus is caused to oscillate in a cyclic manner with a uniform scan

3,734,593

## PLURAL-MICROSCOPE WITH LIGHT INDICATOR

Iwao Mori, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan

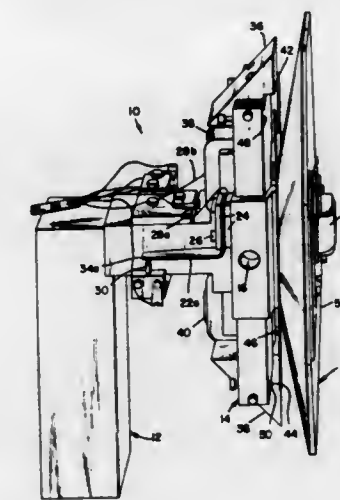
Filed June 7, 1971, Ser. No. 150,567

Claims priority, application Japan, June 12, 1970, 45/58352

Int. Cl. G02b 21/22

U.S. Cl. 350-31

7 Claims



contact with the frame at the end of each oscillatory arc for storage of spring energy to drive the mirror. The frame is oscillated in a substantially sinusoidal manner so that energy stored therein during the slower, active portion of the cycle is retransferred by impact to the mirror for the fast retrace thereof.

3,734,592

## HIGH INTENSITY LIGHT LIMITING DEVICE

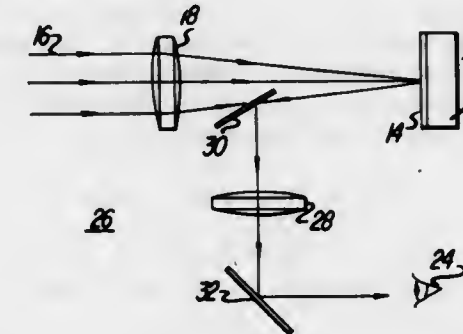
Zoltan G. Sztankay, Annandale, Va.; Richard J. Holland, Washington, D.C., and John P. Swirczynski, Adelphi, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 21, 1971, Ser. No. 154,798

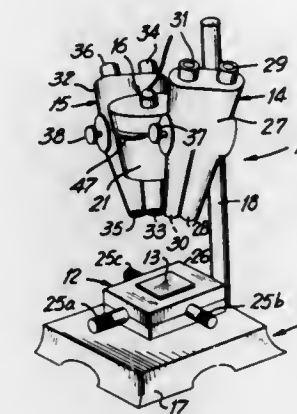
Int. Cl. G02b 17/00

U.S. Cl. 350-17

8 Claims



An optical device for limiting the transmission of high intensity light radiation through an optical system is disclosed. The device includes a limiting mirror consisting of a thin evaporative partially absorbing, partially reflective coating deposited on a radiation absorbing substrate. An objective lens is provided to focus incident light on a portion of the limiting mirror to maximize the energy density of the incident light beam. If the energy density of the focused beam exceeds a predetermined level, a small portion of the reflective coating is vaporized, markedly reducing the reflectivity of that portion of the limiting mirror. A portion of the substrate material may also be vaporized if the focused beam is of a particularly high energy density.



A plural-microscope, preferably having two stereoscopic microscopes, is further provided with a light indicator for projecting onto a specimen supported by the stage a light spot which is substantially smaller than the field of view of each microscope, and the light indicator and stage are made movable relative to each other for varying the position of the light spot on the specimen so that the light spot can be used to identify a selected portion of a specimen to be viewed simultaneously by the microscopes.

3,734,594

## OPTICAL FIBER CONNECTOR

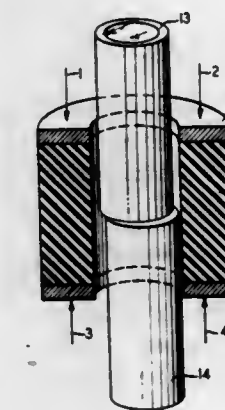
Ralph Francis Trambarulo, Red Bank, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 29, 1972, Ser. No. 239,034

Int. Cl. G02b 5/16

U.S. Cl. 350-96 B

8 Claims



An optical fiber connector comprises a deformable, annular core disposed between a pair of metallic pressure plates. The two fibers to be spliced are inserted into opposite ends of the core, and a longitudinal force applied to the plates. This causes the core to deform radially, simultaneously aligning and mechanically securing the fibers. Removing the pressure releases the fibers.

A core with a plurality of holes can be used to connect the fibers of a fiber cable.



3,734,595

**FOLDING HIGHWAY EMERGENCY DEVICE**

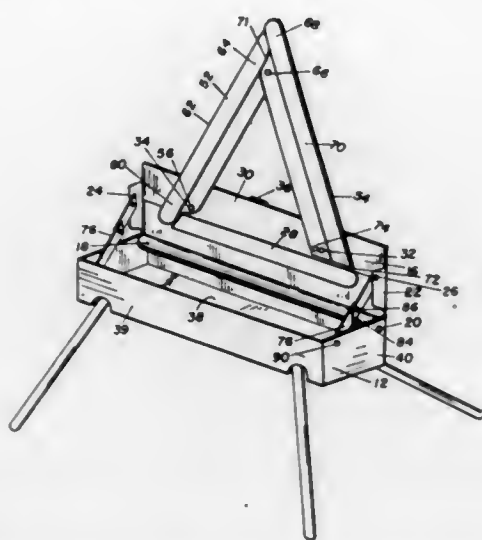
Marvin F. Bendzick, Pittsburgh, Pa., assignor to Cities Service Company, New York, N.Y.

Filed Aug. 6, 1971, Ser. No. 169,668

Int. Cl. G02b 5/12

U.S. Cl. 350-97

3 Claims



A storable highway reflector unit is shown having appropriate reflector surfaces which are foldable into a base and including unitarily mounted stabilizing legs for maintaining the reflector unit in an erect position.

3,734,596  
VIEWER

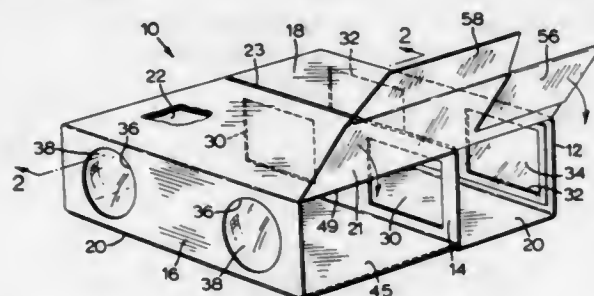
Gunter Nerlich, Toronto, Ontario, Canada, assignor to Dimensional Production Limited, Toronto, Ontario, Canada

Filed Mar. 24, 1971, Ser. No. 127,747

Int. Cl. G02b 27/04

U.S. Cl. 350-140

2 Claims



A collapsible device for viewing two images of an object to produce a three-dimensional effect. The images are mounted in a card which can be replaced in the device when other images are to be viewed.

3,734,597

**PROCESS FOR PRODUCING A COLOR STATE IN A DISPLAY DEVICE**

Donald Churchill, Kettering, and James V. Cartmell, Dayton, both of Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Division of Ser. No. 707,706, Feb. 23, 1968, Pat. No. 3,600,060. This application Apr. 9, 1971, Ser. No. 132,884

Int. Cl. G02l 1/40

U.S. Cl. 350-160 LC

6 Claims

This disclosure is directed to articles of manufacture, chiefly display devices, containing minute "naked" droplets or inclusions of cholesteric liquid crystal material in a substantially continuous polymeric matrix, said liquid crystal material changing color or shade of color not only upon application of an electric potential but also upon removal of the field. The image produces has a comparable outline to that of the path of

the electric field. Three chromatic states are evident, the normal color (before the electric potential is applied), the color given off when the electric field is applied, and the color observed when the electric field is removed. All three chromatic states are readily discernible from one another. The polymer



matrix protects the cholesteric liquid crystal droplets from aging and enhances electric field behavior because the third chromatic state (electric potential removed) has a greater longevity with the matrix-bound material versus unprotected material of identical composition but no polymeric matrix. Other advantages are also discussed.

3,734,598

**LIQUID CRYSTAL DISPLAY DEVICE HAVING AN INCLINED REAR REFLECTOR**

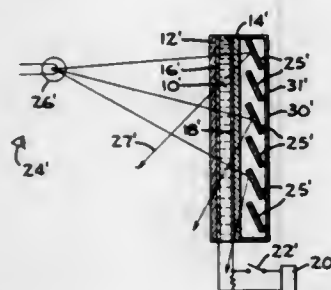
William Ross Aiken, Los Altos Hills, Calif., assignor to Display Technology Corporation, Cupertino, Calif.

Filed Apr. 30, 1971, Ser. No. 139,022

Int. Cl. G02f 1/16

U.S. Cl. 350-160 LC

4 Claims



A display device settable between transparent and translucent or opaque conditions comprising a layer of a material changeable between light-transmitting and light-scattering conditions in response to electric fields, such as the liquid crystal materials, front and rear covers of transparent material containing said layer, each having a transparent film of a conductive material, means for setting up an electric field between said films through said layer, a source of light in front of the front cover of said layer, and an inclined mirror arrangement located behind the rear cover of said layer for directing light from said source obliquely through said layer from its rear face to its front face in such a manner that the source of light is concealed from view by an observer before the front face of said layer when said layer is in transparent light-transmitting condition. This inclined mirror arrangement reflects the light from the source of light obliquely through said layer in a direction in which it misses the observer's eyes. In this manner light from the source of light is removed from view by the observer when the layer is in transparent light-transmitting condition, yet is available for scattering and thus gives the layer a frosted or milky appearance when the layer of light transmission changing material is in light-scattering condition.

3,734,599

**OPTICAL RASTER-TO-LINE CONVERTER**

Martin Feldman, Springfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 9, 1971, Ser. No. 196,994

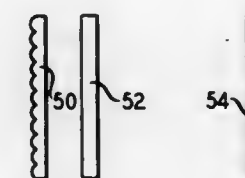
Int. Cl. G02b 3/06, 27/00

U.S. Cl. 350-190

6 Claims

A two-dimensional matrix array of light beams is translated into a linear array having the same number of spots. This is ac-

complished by an optical converter that comprises a cylindrical lenslet plate crossed, not quite orthogonally, with a single



cylindrical lens. Each column of the matrix array of light beams is imaged by the converter to form a segment of the final line array.

3,734,600

**FISHEYE LENS SYSTEMS**

Yoshiyuki Shimizu, Kawasaki, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

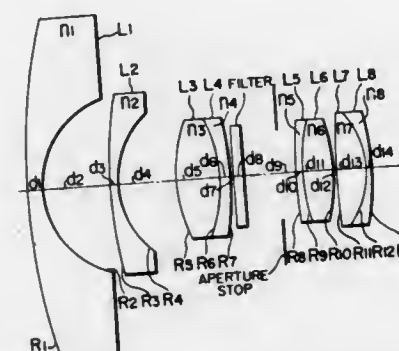
Filed Dec. 16, 1971, Ser. No. 208,639

Claims priority, application Japan, Dec. 24, 1970, 45/116645

Int. Cl. G02b 9/60

U.S. Cl. 350-196

4 Claims



A lens system comprises, in sequence moving from the object side, first and second negative meniscus lenses both convex to the object side, a biconvex lens, a negative meniscus lens cemented to the third lens, and fifth to eighth lenses including one or two negative lenses and cemented together so as to form two lens groups. An aperture stop is interposed between the fourth and fifth lenses. The lenses are arranged to satisfy predetermined conditions, thereby providing a fisheye lens system having a long back-focus two to three times greater than its focal length and yet having a compact construction.

3,734,601

**FLOW CELL ASSEMBLY FOR COLORIMETRIC MEASUREMENTS**

Louis Robert Heiss, Annapolis, Md., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

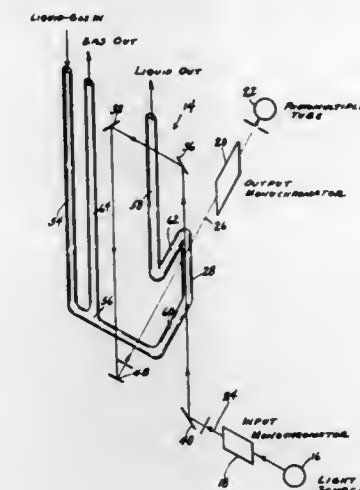
Filed July 8, 1971, Ser. No. 160,776

Int. Cl. G01n 1/10, 21/00

U.S. Cl. 356-246

18 Claims

A flow cell assembly for adapting an apparatus for both fluorometric and colorimetric studies. The assembly includes a holder having a folded optical path between an external light source and photosensitive response means. The light input to the optical path is at right angles to the light output therefrom so that the assembly may be employed in place of the sample cuvette of a conventional spectrofluorescence measuring instrument. The holder contains a flow tube having an offset sight passageway portion supported endwise in the optical path. The holder includes a light shield plate slotted to receive



from stray light. The flow tube may include an integral debubbler.

3,734,602

**SLOT LOAD PROJECTOR**

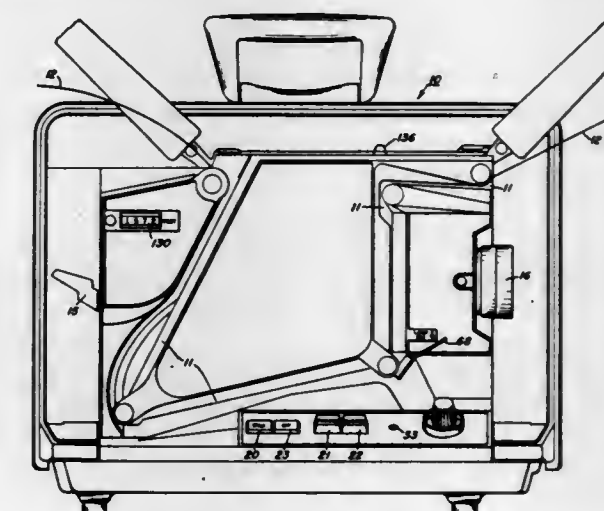
Howard C. Deck, Rush, N.Y., assignor to Grafler Inc., Pittsford, N.Y.

Filed Apr. 17, 1972, Ser. No. 244,579

Int. Cl. G03b 1/56

U.S. Cl. 352-157

58 Claims



A slot load projector uses a slot for edgewise loading of a filmstrip, and simplifies the controls for forward, reverse, rewind, and fast forward. A single control lever moves between two positions for forward and reverse projection in one position, and load, rewind, and fast forward run in another position. Push buttons for forward run, reverse run, off, and still, complete the operator controls, for simpler and easier operation. Along with increased operational functions with fewer controls, the projector is simplified in structure for economy of manufacture.

3,734,603

**PROJECTOR FOR ANALYTICAL VIEWING OF MOVING PICTURES**

Max E. Wastl, and Richard L. Shirley, both of Lafayette, Ind., assignors to Lafayette Instrument Company, Inc., Lafayette, Ind.

Continuation-in-part of Ser. No. 801,247, Feb. 18, 1969, abandoned. This application May 3, 1971, Ser. No. 139,760

Int. Cl. G03b 21/38

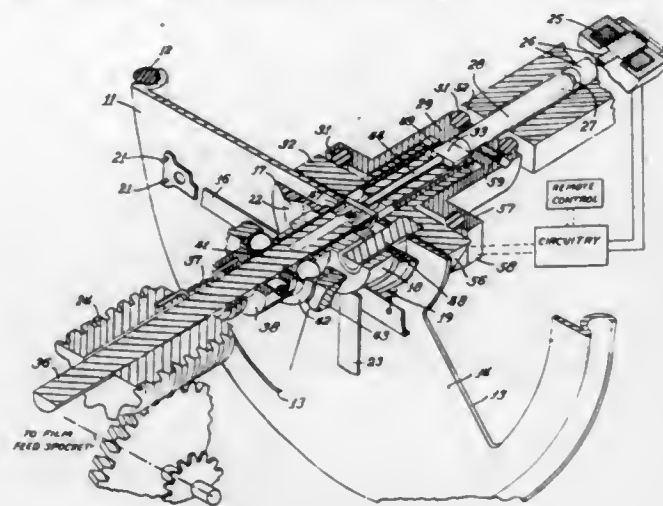
U.S. Cl. 352-169

12 Claims

The moving action is stopped and started by a solenoid, with diverse methods of control to stop the action or to show the



successive frames on the film at varying rates such as one per second to eight per second. To interrupt the advancing of the film through the light beam, the conventional claw-actuating cam is retracted so that it does not thrust the claw into engagement with the film aperture. At the same time, the auxiliary feed of the film toward and from the loop advanced by the claw is interrupted by axially shifting a clutch member. The clutch member may also be a brake; or the parts which are to stop when it disengages may be isolated from rotating parts.



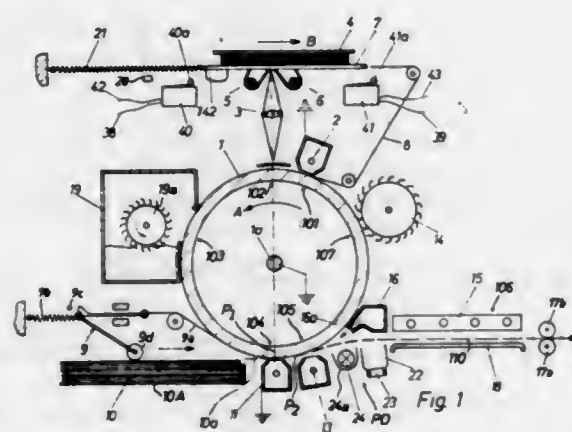
The shutter operates continuously, maintaining constant light intensity. A timing cam rotates continually with the shutter to time the actuation of the solenoid accurately for resuming all feeding operations. Another cam, rotating with the drive for the auxiliary feed controls the timing for the de-energization of the solenoid to discontinue the feed operations. An air jet blows on the film and on the optical member adjacent to it on the lamp side of the film, providing thoroughly adequate cooling of the film even when stopped indefinitely. Other details ensure reliable operation.

### 3,734,604 FAILSAFE SYSTEM FOR ELECTROSTATIC COPYING APPARATUS

Roland Szostak, Grunwald; Karl Hartwig, Unterhaching, and Gunter Maurischat, Munich, all of Germany, assignors to Afsa-Gevaert Aktiengesellschaft, Leverkusen, Germany  
Filed Sept. 17, 1971, Ser. No. 181,374

Claims priority, application Germany, Sept. 22, 1970, P 20 46 681.3

Int. Cl. G03g 15/00  
U.S. Cl. 355-14 12 Claims



An electrostatic copying apparatus wherein a photoelectric detector scans the path for transfer sheets which receive powder images from a drum-shaped xerographic surface. The detector cooperates with two timers the first of which is actuated by the latent image producing device to furnish signals at intervals when the detector normally should not detect sheets

and the second of which is also actuated by the latent image producing device but at such intervals that it furnishes signals when the detector normally should detect transfer sheets. The operation of the apparatus is terminated if a signal from the detector coincides with the signal from the first timer because this indicates a pileup of sheets, and also if a signal from the detector does not coincide with a signal from the second timer because this indicates the exhaustion of the supply of sheets in the apparatus. The detector scans the path for the sheets upstream of a fusing station wherein the powder images are fixed to respective sheets.

### 3,734,605 MECHANICAL OPTICAL SCANNER

George J. Yevick, Leonia, N.J., assignor to Personal Communications, Inc., Stamford, Conn.

Filed July 21, 1971, Ser. No. 164,744

Int. Cl. G03b 21/26, 21/28, 21/00

U.S. Cl. 353-30 6 Claims



A magnifying and reading device for microfiche films. The required magnification is achieved by breaking up the object into a series of narrow segments and sequentially projecting them onto a viewing screen by a rocking mirror.

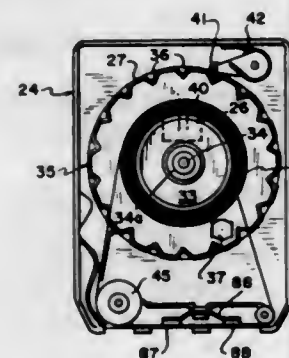
### 3,734,606 CARTRIDGE CONSTRUCTION FOR CONTAINING AUDIO AND VISUAL MEDIUMS

Donald E. Irving, Elmwood Park, Ill., assignor to Motorola Inc., Franklin Park, Ill.

Filed Oct. 21, 1970, Ser. No. 82,725

Int. Cl. G03b 31/06, 24/00

U.S. Cl. 353-120 2 Claims



A cartridge construction has a central hub for receiving a quantity of magnetic tape and a film disc, each positioned

about the axis of a shaft, to form an integral audio-visual display unit for use in audio-visual display apparatus. The cartridge has aligned apertures at a radial location outwardly from the shaft axis through which light passes to project a film segment contained within the cartridge and in registry with the aligned apertures, and further has an opening formed within one wall of the cartridge to allow an extended advancing pawl (or finger) to enter the cartridge through this opening and rotate the film disc one film segment at a time when such cartridge is inserted into the audio-visual display apparatus.

### ERRATUM

For Class 355-14 see:  
Patent No. 3,734,604

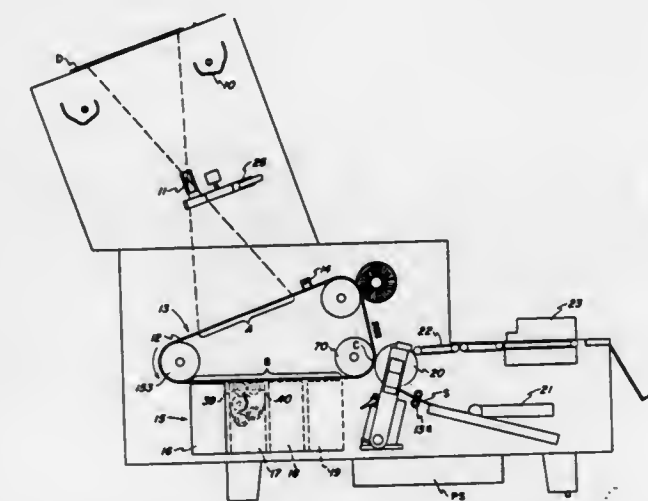
### 3,734,607 COLOR REPRODUCTION APPARATUS

Howard C. Davis; Harold E. Trumbull, and Charles A. Cummings, all of Columbus, Ohio, assignors to Xerox Corporation, Rochester, N.Y.

Filed June 4, 1969, Ser. No. 830,286

Int. Cl. G03g 15/00

U.S. Cl. 355-4 2 Claims



A multi-color electrostatic printing machine having processing components adapted to produce an image for each color of an original being copied, individual color developing units for effecting development of the corresponding images and a program arrangement for coordinating in timed sequence the operation of the processing components and the transfer of each developed image in superimposed relationship upon sheets of paper.

### 3,734,608 MACHINE PROGRAMMER

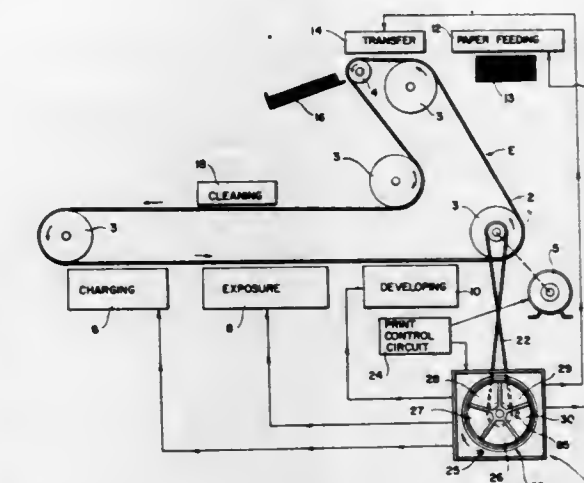
Lionel Russell Hickey, and Ellsworth Jacob McCune, both of Webster, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 19,999, March 16, 1970, Pat. No. 3,659,109. This application July 29, 1971, Ser. No. 167,461

Int. Cl. G03g 15/00

U.S. Cl. 355-14 6 Claims  
A machine programmer is provided for controlling work performed on a work piece which moves through separate work stations wherein a shift register selectively energizes and de-energizes the work stations in response to movement of the work. The shift register includes a multisectioned cylinder which is divided into individual light-tight sectors each of which has a slot along the periphery of the cylinder through which light can pass and is rotatably driven in response to movement of an endless photoconductive member. Each sec-

tor has a switching circuit which includes a lamp and a photosensitive device. The lamp is turned on by an input signal from a radiation device, such as an initiator light, adjacent the cylinder when it is desired to make electrophotographic copies of an original. As each sector moves along a circular path past the initiator light the photosensitive device turns on the lamp, whose light by means of a photosensitive device maintains the circuit in actuated condition so that the



lamp remains illuminated. The initiator light remains on until the number of sectors illuminated corresponds with the number of document copies to be made. As the cylinder is rotated the light therein activates each of a series of photosensitive devices spaced around the cylinder which energize circuits connected to various electrophotographic stations along the path of the photoconductive element in response to movement of the photoconductive element to cause copies of the original to be made.

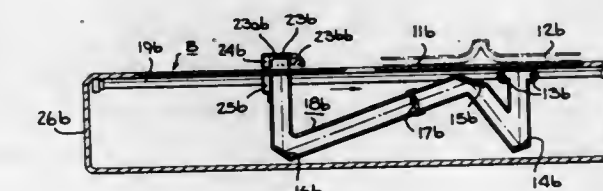
### 3,734,609 ELECTROPHOTOGRAPHIC PROCESS AND APPARATUS

Hiroshi Tanaka, Tokyo, and Shinkichi Takahashi, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 563,899, July 8, 1966, abandoned. This application Apr. 14, 1971, Ser. No. 133,788

Claims priority, application Japan, Feb. 23, 1966, 41/10915

Int. Cl. G03g 15/00 3 Claims



A process and apparatus for forming an electrostatic image on a photosensitive plate having a conductive base, a photoconductive layer overlying the base and exhibiting p-type or n-type semiconductor, and an insulative layer overlying the photoconductive layer. The photosensitive plate is characterized in having carrier charge of a polarity corresponding to the conductivity type of the photoconductive layer injectable from the conductive base into the photoconductive layer and bound in the region of the interface between the insulative and photoconductive layers. The conductive base is transparent to activating light and the insulative layer is opaque to the activating light. A first charge of a polarity opposite to the conductivity type of the photoconductive layer is applied onto the insulative layer to inject and bind carrier charge in the region of the interface between the insulative



and photoconductive layers. Then, the photoconductive layer is exposed to a pattern of activating image light by projecting the image light through the transparent conductive base while a corona discharge is applied onto the insulative layer. Thereafter, the photoconductive layer is exposed to activating light through the transparent conductive base to discharge bound carrier charge remaining in the region of the interface and form a high contrast electrostatic image.

3,734,610

# MICROFICHE VIEWER-COPIER WITH BILLING DATA STORAGE

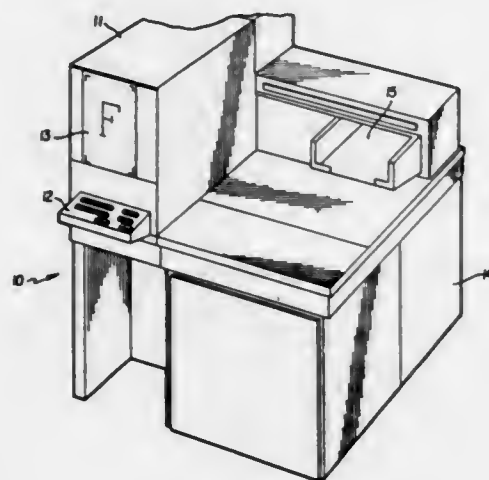
Richard P. O'Connell, and Edwin Zucker, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 1, 1972, Ser. No. 248,840

Int. Cl. G03b 27/52

U.S. Cl. 355-40

11 Claims



A microfiche viewer and copier provides for automatic random access to a desired microfiche card from a library, and automatic selection of a frame thereof for viewing. Copies of the selected frame or of a following sequence of frames may be made. Identification of each microfiche card and frame copied, the number of copies made, and the user is obtained and stored for billing and copyright royalty computation.

3,734,611

# PHOTOGRAPHIC PRINTING APPARATUS

Walter Knapp; Volker Weinert, and Kurt Ramsauer, all of Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

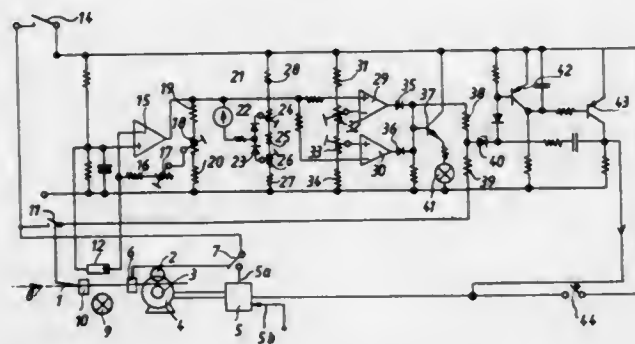
Filed Sept. 27, 1971, Ser. No. 184,096

Claims priority, application Germany, Sept. 30, 1970, P 20 48 061.9

Int. Cl. G03b 27/52

U.S. Cl. 355-41

12 Claims



The average transparency over substantially the complete surface of each negative of a film strip is measured and negatives whose so-measured transparency lies outside a predetermined range are transported past the printer without being reproduced.

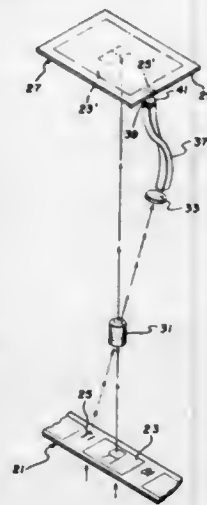
3,734,612  
NUMBER ON PRINT OPTICAL APPARATUS  
James E. Harvey, and Oliver W. Gnage, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 11, 1971, Ser. No. 170,855

Int. Cl. G03b 27/32, 17/24

U.S. Cl. 355-40

3 Claims



Optical print apparatus for use with film having individual frame numbers exposed for each camera exposure. During printing from the negative a secondary optical system intercepts the frame number, magnifies it and projects it for printing on the edge of the print paper.

3,734,613

# ORBITAL SIMULATION FACILITY

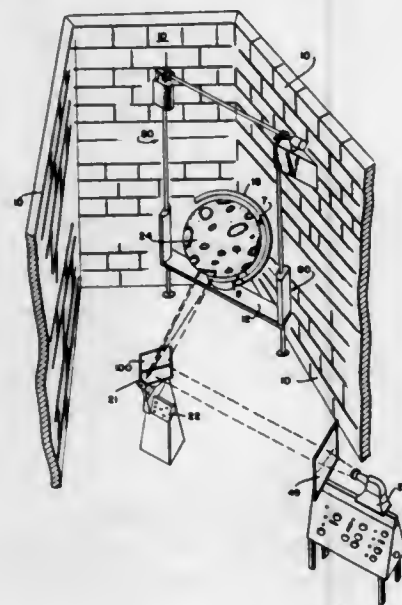
Ralph W. Harpe, Houston, Tex., and Henry S. Schrader, Vienna, Va., assignors to The United States of America as represented by the Secretary of the Army

Filed Mar. 19, 1971, Ser. No. 126,221

Int. Cl. G03b 27/64

U.S. Cl. 355-47

13 Claims



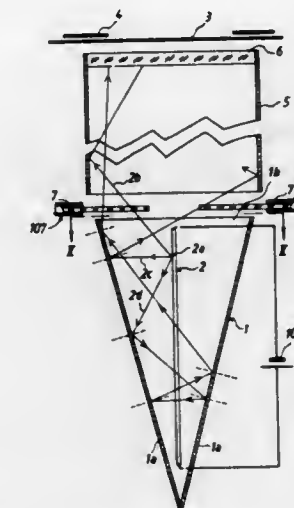
A method and apparatus for determining the orientation of a spacecraft in orbit around a central body and providing a simulated representation of the surface of the central body as seen from the spacecraft. A spherical model representing the central body is rotated by a motor-driven frictional belt drive. The axis of rotation is established by an adjustable vacuum cup device and an optical system projects a virtual image of the central body's surface as telemetered from a spacecraft onto the model. A viewing aperture is moved in relation to the model until the virtual image and a reflected image from the model coincide to produce the same view as from the spacecraft.

3,734,614  
PHOTOGRAPHIC COPYING APPARATUS  
Wolfgang Zahn, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany  
Filed June 7, 1971, Ser. No. 150,435  
Claims priority, application Germany, June 11, 1970, G 70 21 913.5

U.S. Cl. 355-67

Int. Cl. G03b 27/54

8 Claims



A photographic copying apparatus wherein the light source is an elongated electronic flash lamp and the reflector is a hollow pyramid which surrounds the lamp and diverges in a direction toward the support for copying material. The symmetry axis of the reflector coincides with the axis of the lamp. A polygonal light mixing duct is installed between the support for copying material and the open base of the reflector, and that end of the duct which is remote from the reflector contains a pane of light diffusing material. The walls of the reflector are cold light mirrors which transmit heat. One or more guides for color filters are installed between the base of the reflector and the adjacent end of the mixing duct. Such end of the mixing duct registers at least with the major part of the base.

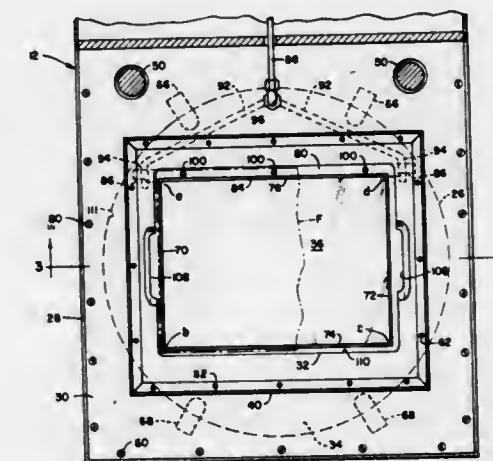
3,734,615  
VACUUM FILM PLATEN AND CONDENSER LENS ASSEMBLY FOR PHOTO REPRODUCTION APPARATUS  
Joseph H. Wally, Jr., Kansas City, Mo., assignor to Western Blue Print Co., Kansas City, Mo.

Filed May 27, 1971, Ser. No. 147,497

Int. Cl. G03b 27/64

U.S. Cl. 355-76

13 Claims



The condenser lens system of a camera-projector has a rectangular channel in the first surface thereof which is con-

nected to an air evacuating pump and adapts said surface as a film platen, and a plate embedded in said surface along one side of the channel has means for orienting a film on said surface. The plate has an inner wall along its length positioned so as to form a space with the part of the channel in which it is positioned for the passage of air.

3,734,616  
APPARATUS FOR THE MANUFACTURE OF PRINTED CIRCUITS

Antony James Mayhew, and Leonard Frederick Cheale, both of Essex, England, assignors to The Marconi Company Limited, London, England

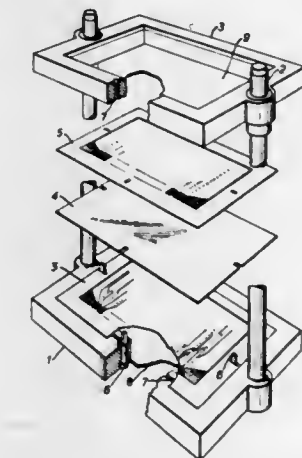
Filed Mar. 15, 1971, Ser. No. 123,962

Claims priority, application Great Britain, May 20, 1970, 24,333/70

Int. Cl. G03b 27/20

U.S. Cl. 355-89

5 Claims



An optical contact printer for use in the manufacture of photographically produced printed circuit boards comprises two frame members slidably connected together. Photographic masters are held in registration on the inner faces of the frame members and between the photographic masters is inserted a printed circuit board coated in photo-resist. Air channels are supplied on the inner faces of the frame members abutting the photographic masters and air suction produced to hold the photographic masters against the frame members. Thus by sliding apart the frame members printed circuit boards may be inserted into the projector without the need to handle the photographic masks.

3,734,617  
FILM DEPLETION DETECTION SYSTEM  
Paul E. Klitch, West Springfield, Mass., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Apr. 26, 1971, Ser. No. 137,413

Int. Cl. G03b 27/10

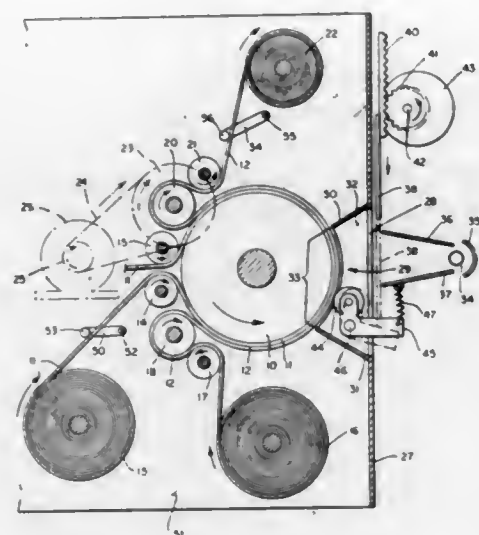
U.S. Cl. 355-111

9 Claims

A machine for handling films or tapes, such as film duplication apparatus, in which the image on an original master film is reproduced on a duplicating film by contact printing techniques, wherein the individual films or tapes are brought into overlying relationship with one another, jointly transported through an operational station, such as an illumination station in the case of film duplication, and separated. The apparatus includes a mechanism for moving each of the individual films or tapes through the operational stations, which mechanism is driven by an electric motor. Switches are employed to detect the depletion of one of the films or tapes, and to stop the electric motor driving the transport mechanism so



that, in the case of film duplication apparatus, the master film will not be advanced further until fresh duplicating film is fed into the apparatus, or duplicating film will not be fed into the apparatus until a new master film has been threaded into the apparatus, depending upon which of the films became



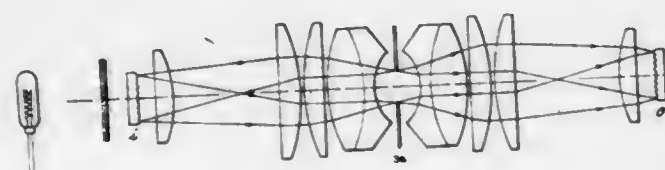
depleted. The apparatus also uses the switches both to turn off or to reduce the intensity of the light source directing light at the illumination station of the film duplicating apparatus, and to change the direction on the shutter drive motor so as to close the shutter, when one of the films is depleted.

3,734,618

**METHOD OF MAKING STEREOSCOPIC PHOTOGRAPHS**  
Leslie Peter Dudley, Los Angeles, Calif., assignor to Dudley Optical Laboratories, Inc., Beverly Hills, Calif.  
Division of Ser. No. 747,931, July 26, 1968. This application Aug. 24, 1970, Ser. No. 66,356  
Int. Cl. G03b 35/00

U.S. Cl. 355-132

2 Claims



Improved methods and systems are provided for producing stereoscopic photographs which exhibit optical characteristics resembling those of a hologram in that a photograph is produced by the methods of the invention the aspect of the recorded three-dimensional image changes with change of viewpoint about both horizontal and vertical axes. The photograph produced in accordance with the methods of the present invention may be appropriately termed an "integram" or an "integraph," and it possesses important advantages over the hologram. For example, coherent light, such as laser illumination, is not required for producing or viewing the photograph, the photographic equipment required to produce the photograph is compact and simple to operate, and exposure times for producing the photograph correspond to those which would be required for ordinary two-dimensional photography under the same conditions.

3,734,619  
**METHOD UTILIZING BREWSTER ANGLE FOR DETERMINING ANGULAR VELOCITY AND LIGHT BEAM INCIDENCE ANGLES**

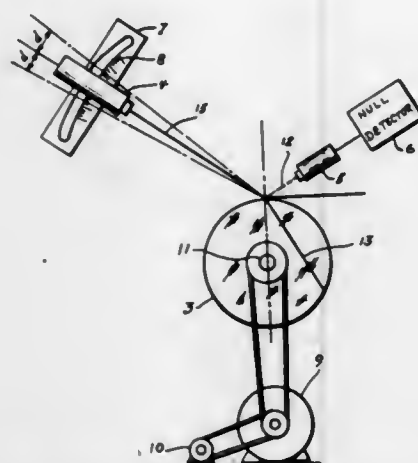
Ronald G. Newburgh, Belmont, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 10, 1971, Ser. No. 170,502

Int. Cl. G01p 3/36

U.S. Cl. 356-27

1 Claim



A light beam linearly polarized in its plane of incidence is projected onto the peripheral surface of a rotably refracting disc at an angle that effects absorption of all the incident light. Means for detecting reflected light are positioned proximate to the point of incidence. Angular velocity of the disc is determined by the amount of change in angle of incidence of the light beam required to eliminate any light reflected due to disc movement. Change in angle of incidence of the light beam is measured by rotating the disc to a speed that eliminates any light reflected due to such change in angle of incidence.

3,734,620

**MULTIPLE BAND ATOMIC ABSORPTION APPARATUS FOR SIMULTANEOUSLY MEASURING DIFFERENT PHYSICAL PARAMETERS OF A MATERIAL**

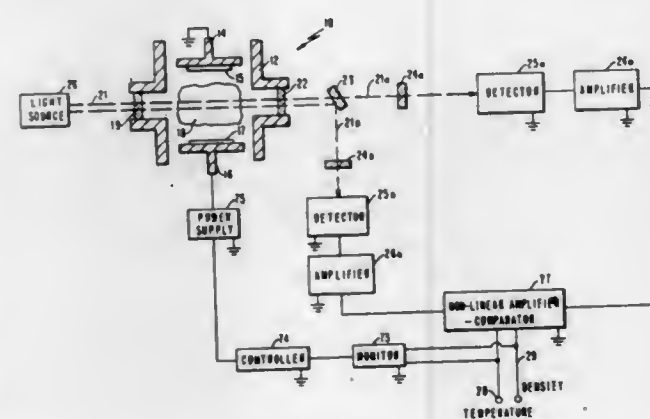
Paul E. Cade, Milton, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 1, 1971, Ser. No. 130,363

Int. Cl. G01n 21/00; B05c 11/00

U.S. Cl. 356-73

11 Claims



An apparatus for measuring certain properties of a material; such as, temperature and density, by monitoring the atomic absorption of two absorbable spectral lines of the material. The apparatus is based on a complete instrumental system composed of an apparatus for producing an atomic vapor; e.g., a sputtering apparatus, an emitter system capable of

producing frequencies absorbable by the atomic vapor; e.g., a light source parallel systems of spectral selection, e.g., optical filters, parallel systems for converting optical information into electrical signals; e.g. photo-electric transducers; and, finally a measurement system which displays the electrical signals, from the parallel transducers, in terms of density and temperature of the atomic vapor or in terms of the rate of deposition of material on a work piece in the sputtering apparatus.

The apparatus, in conjunction with an emission spectrometer, can also be used to determine the composition of an atomic vapor.

3,734,621  
**SPECTROPHOTOMETER UTILIZING MEMORY STORAGE CALIBRATION TECHNIQUES**

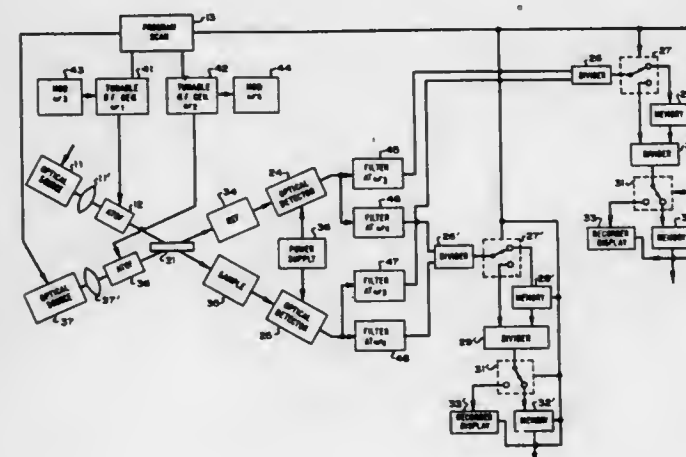
Robert E. Moody, Los Altos Hills, and David A. Wilson, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 6, 1971, Ser. No. 205,243

Int. Cl. G01j 3/42

U.S. Cl. 356-95

12 Claims



A spectrophotometer having no moving parts in the monochromator or the optical beam paths through the reference material and the sample material is disclosed. A preferred form of monochromator utilized is an acousto-optical filter tuned over the desired spectrum electronically by variation of the radio frequency producing the acoustical wave in the filter. A single beam spectrophotometer employs a memory device for storing the detected transmitted optical radiation in a first calibration run with the sample absent from the path, a divider circuit producing a ratio signal output responsive to one input comprising the detected transmitted optical radiation in a second measurement run with the sample in place and a second input comprising the absorption signal stored in the memory. A double beam spectrophotometer utilizes an optical beam splitter to split the radiation into two separate paths, one path extending through a reference material and the other path through the sample, the transmitted light detected in the two paths being transmitted to a divider circuit to produce an output dependent on the ratio of the two detected radiation beams. A calibration run with reference and sample absent may be made and stored in a memory, followed by a measurement run with reference and sample in place, and the two output ratios then compared to give a final ratio signal output. In a further embodiment, two optical sources and two associated monochromators are provided, the radiation from each being directed through the beam splitter into the two separate reference and sample paths to the detector circuitry.

3,734,622  
**APPARATUS FOR PHOTOMETRICALLY ANALYZING A DROPLET OF A SAMPLE LIQUID**

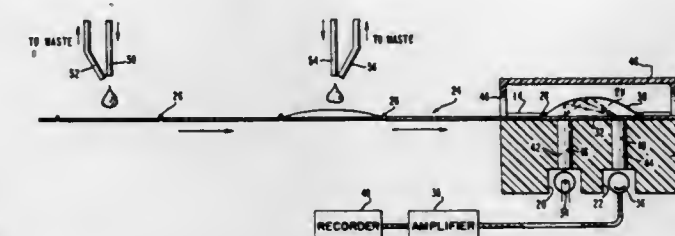
Stanford L. Adler, Monsey, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Nov. 19, 1971, Ser. No. 200,545

Int. Cl. G01r 21/00; G01j 3/46; G01r 21/26

U.S. Cl. 356-103

13 Claims



Method and apparatus for photometrically testing for a constituent of a droplet of a discrete liquid sample having an arcuate surface and having a planar surface resting on or suspended from a surface and wherein light rays from a source are directed into the droplet through the planar surface thereof. Light energy as a measure of absorbance, light scattering or fluorescence is transmitted through the planar droplet surface to a photodetector for analysis of the sample which analysis may be qualitative or quantitative or indicate an end reaction. Such analysis may be automated.

3,734,623

**INTERFEROMETER UTILIZING A TUNABLE LASER OR SIMILAR FREQUENCY VARIABLE WAVE ENERGY GENERATOR**

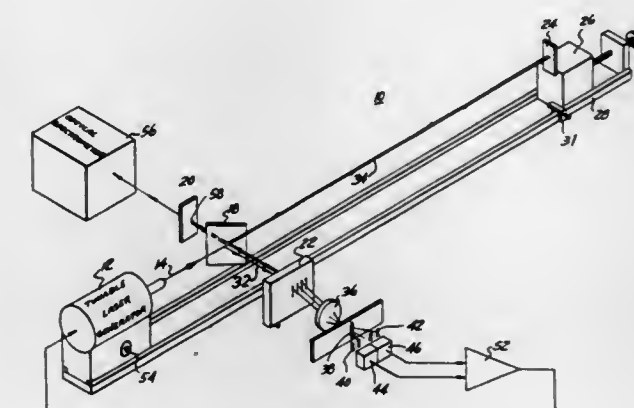
William G. Wolber, Southfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 1, 1972, Ser. No. 230,764

Int. Cl. G01b 9/02

U.S. Cl. 356-110

8 Claims



An interferometer having a frequency tunable laser generator for reflecting laser light from a movable mirror to provide an optical interference fringe pattern. A servo circuit, that includes detectors for receiving the optic fringe pattern and providing output signals whenever any displacement of the movable mirror causes the fringes to begin moving, automatically adjusts the frequency of the laser light signal to maintain the fringes in a fixed position. The direction and magnitude of the frequency variation of the laser signal required to hold the fringes in a fixed position is measured to determine the direction and magnitude of mirror displacement.



3,734,624

# APPARATUS USING REFLECTED POLARIZED LIGHT TO INSPECT A MOVING WEB

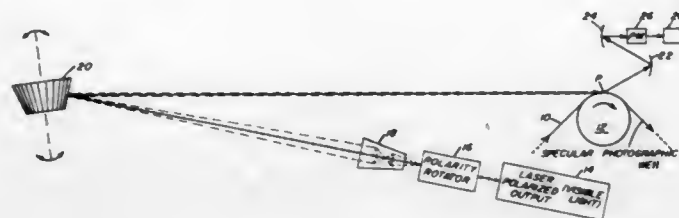
Edward C. Cornelius, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 6, 1971, Ser. No. 140,932

Int. Cl. G03b 27/04

U.S. Cl. 356-118

6 Claims



In an inspection system for detecting defects in the photosensitive surface of photographic material, laser means grazes visible light off the photosensitive surfaces of photographic material. The light is swept rapidly across the surface of the photosensitive material; and such light is polarized so that its plane of polarization is perpendicular to its plane of incidence. The special polarization, together with the rapid sweeping of the light across the photosensitive surface, prevents the photosensitive surface from producing latent images.

3,734,625

# READOUT SYSTEM FOR A MAGNETO-OPTIC MEMORY

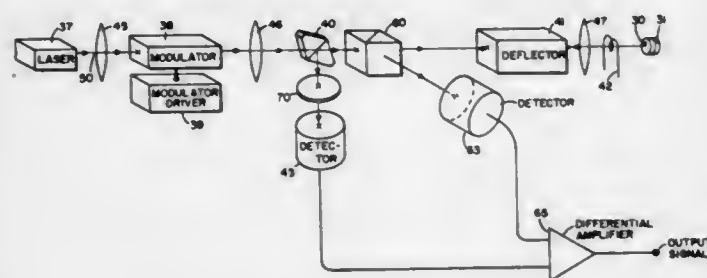
Roger L. Aagard, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 857,308, Sept. 12, 1969, Pat. No. 3,631,415. This application Dec. 23, 1971, Ser. No. 211,540

Int. Cl. G01n 21/40

U.S. Cl. 356-118

2 Claims



An optical mass memory utilizing the Curie point writing technique wherein information is stored on a manganese bismuth film. A laser beam provides thermal energy to a predetermined film spot to achieve Curie point writing. The stored information is retrieved utilizing the polar Kerr magneto-optic effect.

3,734,626

# LIGHT APPARATUS FOR TESTING SURFACES

Donald Lee Roberts, Cypress, and David John George, Westlake Village, both of Calif., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Jan. 14, 1972, Ser. No. 217,755

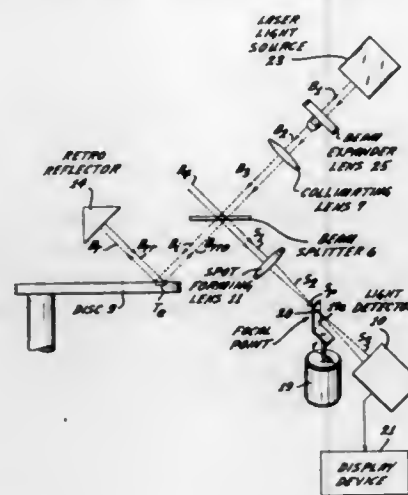
Int. Cl. G01b 11/30

U.S. Cl. 356-120

10 Claims

Apparatus for testing surface flatness of an object such as a magnetic disc. A laser light beam is reflected off the surface to be tested, is caught and returned by a corner cube reflector so that the returning rays are directed parallel to the incoming beam and are again reflected off of the same spot area receiv-

ing the incoming laser beam. The light returning from the corner cube reflector is then reflected from the surface to be tested onto a beam splitter from which it is reflected to a spot-forming lens which forms a light spot at the focal plane, and which light spot diameter is a measure of the surface irregularity of the area tested on the disc or object. The position of the light spot always remains stably at the same point. If the tested area of the disc were perfectly flat when the light spot at the principal focal plane would be of a minimum diameter.



Any enlargement from this minimum diameter is a measure of surface irregularity of the disc or object surface being tested. Means are provided for scanning the size of the light spot which is also made independent of the angular plane or level of the disc tested. Light detection means working in conjunction with an aperture scanning means provide a display showing the amount of deviation from flatness of the surface area tested. The sensitivity of the apparatus is such that it can easily detect surface deviations at least 35 micro-inches per inch per inch from flatness.

3,734,627

# LASER BORESIGHT KIT AND METHOD OF ALIGNMENT

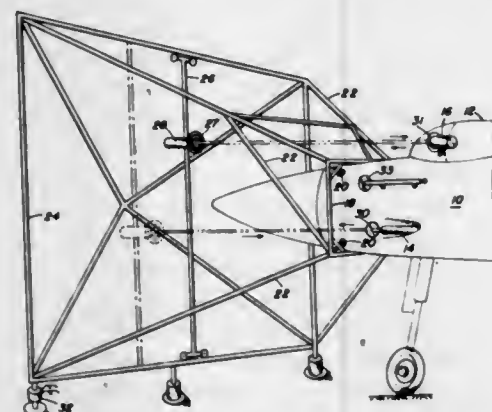
William R. Edwards, California, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 6,097, Jan. 27, 1970, abandoned. This application Nov. 29, 1971, Ser. No. 202,954

Int. Cl. G01b 11/26

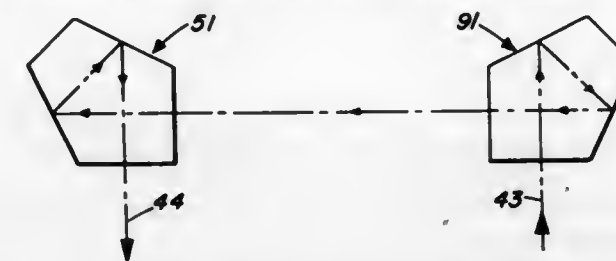
U.S. Cl. 356-153

8 Claims



Apparatus for accurately aligning aircraft guns using a laser. In one instance a laser is mounted in a gun barrel and a laser beam is used to locate a reference point used in determining the adjustments needed in aligning the guns with respect to the gunsight. Another form of the invention uses a pentaprism and a modified pentaprism on a boresight board in conjunction with a laser beam for emitting parallel beams used in sighting in the guns. Another form of the invention is a laser adjustably mounted on a frame and positioned in front of the airplane whose guns are being boresighted, until the frame is perpen-

dicular to the ADL (Armament Datum Line). The laser is correctly positioned on the frame according to boresight data and



then the guns are moved to bring the reflected light beam into coincidence with the set position of the laser.

3,734,628

# METHOD AND APPARATUS FOR DETECTING SURFACE DEFECTS OF MOVING BODIES

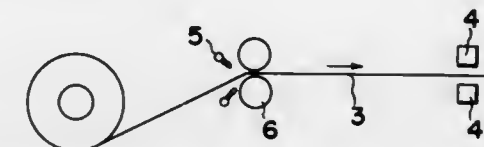
Katsumi Michishita; Yuji Okami, and Tokumatsu Emura, all of Kawasaki-shi, Kanagawa-ken, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1971, Ser. No. 198,317

Int. Cl. G01n 21/16, 21/32

U.S. Cl. 356-200

9 Claims



In a method of detecting a surface defect of a moving body deposited with non-uniformly distributed oil films wherein the surface of the moving body is scanned with light, the light reflected by the surface is converted into an electrical signal, and the electrical signal exceeding a predetermined level is derived out as a defect signal the improvement wherein, a scanning light of a wavelength having a high transmissibility for the oil film is formed, a uniform film of the oil is applied on the surface of the moving body, and the surface coated with the uniform thickness of oil film is scanned with the high transmissibility scanning light.

3,734,629

# INSTRUMENT FOR DETERMINING THE OPTICAL DENSITY OF FLUIDS

Victor Sidney Griffiths, 21 Symonds Lane, Guildford, and Roynon Howes, 1 Strathaven Close, Linton, both of England

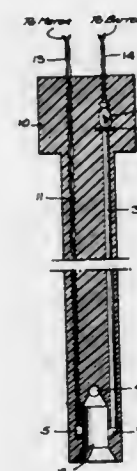
Filed June 22, 1971, Ser. No. 155,507

Claims priority, application Great Britain, June 26, 1970, 31,006/70

Int. Cl. G01n 21/22, 21/26

U.S. Cl. 356-201

7 Claims



A rod or tube made of an inert material into a part of which the fluid to be tested can enter and in which are embedded a

light source and a photo-electric cell arranged so that light from the source passes through the fluid and actuates the cell.

3,734,630

# COPY DENSITY READING AND EXPOSURE CONTROL SYSTEM

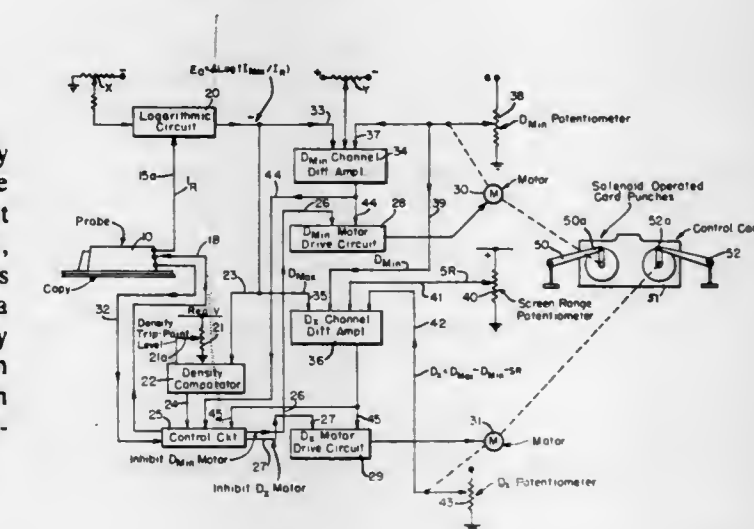
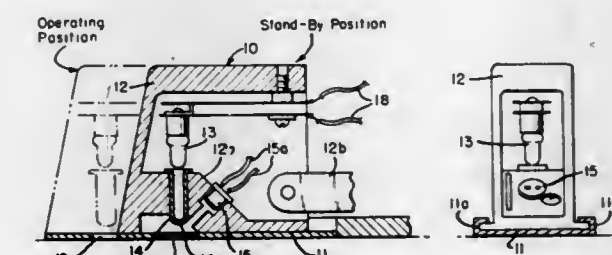
Walter L. McIntosh, Woodbridge, and Dale M. Schmidt, Anandale, both of Va., assignors to Log Etronics Inc., Springfield, Va.

Filed Sept. 9, 1971, Ser. No. 179,080

Int. Cl. G01b 9/02

U.S. Cl. 356-203

13 Claims



An automatic exposure control system for a Graphic Arts camera comprises a copy reading unit and a separate camera control unit. The copy reading unit includes a densitometer head adapted to be moved to various different selected portions of copy to produce signals representative of the reflectivity or light transmission of those selected portions; and these signals are converted into potentials representative of density. The levels of the density-representing signals are compared with a pre-set threshold potential to automatically segregate signals representative of minimum copy density ( $D_{min}$ ) from those representative of maximum copy density ( $D_{max}$ ); and the two different types of signals are then automatically routed to two different peak-reading channels in the copy reading unit operative to retain the lowest  $D_{min}$  encountered, and also operative to compute and retain, from  $D_{min}$ ,  $D_{max}$ , and screen range, the highest excess density ( $D_x$ ) encountered. The  $D_{min}$  and  $D_x$  parameters can be represented by potentials on potentiometers forming portions of null-seeking servomechanisms, and can also be recorded on a control card. The control card can be transferred, along with an associated piece of copy, to a camera control unit responsive to the recorded information and operative to reestablish the potentials  $D_x$  and  $D_{min}$ ; and these reestablished potentials are then used to compute and control the main, bump (or no-screen), and flash exposures.



3,734,631

# **NONDISPERSIVE INFRARED GAS ANALYZER EMPLOYING SOLID STATE EMITTERS AND PHOTODETECTORS**

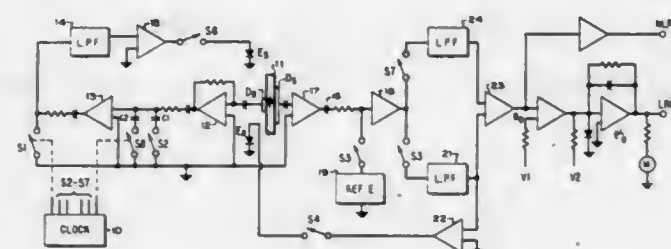
Gregory Justice, Mountain View, and Egon E. Loebner, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 28, 1971, Ser. No. 147,788

Int. Cl. G01n 21/22, 21/34

U.S. Cl. 356—205

16 Claims



A nondispersive infrared gas analyzer employing a pair of solid state radiation emitters and a pair of solid state photoconductors is arranged in an optoelectronic network comprising two branches, each branch including a separate optical radiation beam, both beams passing through the sample. The spectrum of one beam is such that the detected radiation from that beam is substantially independent of the concentration of the absorbent to be measured, the detected radiation of the other beam thereby being differentially modulated relative to that of the first beam by the absorbent under analysis. Means are provided including said photoconductors for converting the differential modulation into an output signal indication of the concentration of the absorbents. One embodiment employs a selective radiation source stage and another embodiment employs a selective detector stage. Control circuits are employed for regulating the relative radiation fluxes in the two branches of the networks. Additional control circuits are used for controlling the absolute amplitude of the fluxes in the two branches of the network.

3,734,632

# **CURRENT COMPENSATED DETECTION CIRCUITS FOR PHOTOVOLTAIC CELLS**

Motonobu Matsuda, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka-shi, Osaka-fu, Japan

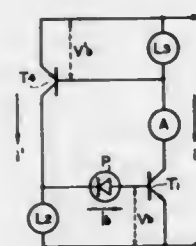
Filed Oct. 29, 1971, Ser. No. 193,817

Claims priority, application Japan, Oct. 31, 1970, 45/96209; Aug. 12, 1971, 46/60604

Int. Cl. G01j 1/44

U.S. Cl. 356—226

9 Claims



A circuit for detecting current generated by a light transducer such as a photovoltaic cell includes at least one P-N junction for biasing a transistor to compensate for the voltage drop of the base emitter junction thereof and includes feedback between the collector of the transistor and the biasing junction to compensate for temperature changes and changes in the amplification factor of the transistor whereby the linearity of the light transducer output is maintained.

## **ERRATUM**

For Class 356—246 see:  
Patent No. 3,734,601

3,734,633

# **TUBULAR WRITING POINT ESPECIALLY FOR AUTOMATIC DRAFTING MACHINES**

Gerold Anderka, Hamburg, Germany, assignor to Koh-I-Noor Rapidograph Inc., Bloomsbury, N.J.

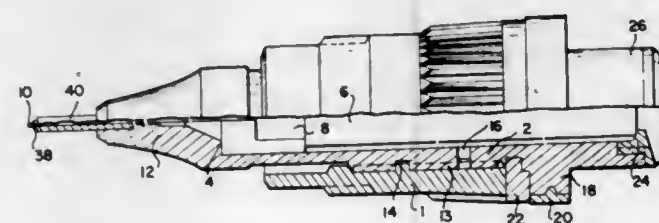
Filed Feb. 22, 1971, Ser. No. 117,617

Claims priority, application Germany, Mar. 5, 1970, P 20 10 355.3; Apr. 30, 1970, P 20 21 153.4

Int. Cl. B43k 1/10

U.S. Cl. 401—259

12 Claims



A tubular writing instrument, having a clearing wire with drop weight and being adapted for use in automatic drafting machines.

3,734,634

# **LOOSE LEAF BINDER**

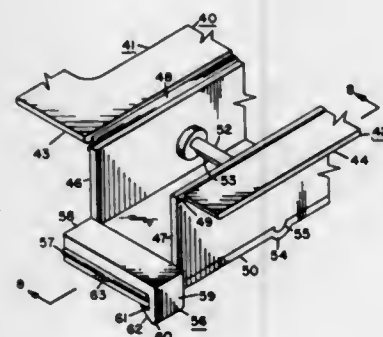
William M. Fenston, 936 Fairview St., Shreveport, La.

Continuation-in-part of Ser. No. 747,765, July 12, 1968, abandoned. This application June 5, 1970, Ser. No. 43,909

Int. Cl. B42f 3/00

U.S. Cl. 402—56

4 Claims



A looseleaf binder having front and rear covers slidably connected so that the covers may undergo limited movement relative to each other to facilitate access to the sheets confined therebetween without releasing said sheets, said covers having angular overlapping back members carrying mounting means for said sheets, and confining means comprising a channel at least at one end of one of the back members, means on one of said members slidable in the channel, a flexible detachable or hinged latch securing said back members to each other without interfering with relative movement of said covers; and means preventing endwise displacement of the slidable means from the channel.

3,734,635

# **SHAFT IN PARTICULAR SCREW SHAFT FOR FEEDING OR KNEADING OF RAW MATERIAL, BY EXAMPLE SYNTHETIC MATERIAL**

Josef Blach, Uhlendstrasse 4, D 7121 Grossingersheim, Germany, and Heribert Blach, Auhof Altenbergerstrasse 69, Linz, Danube, Austria

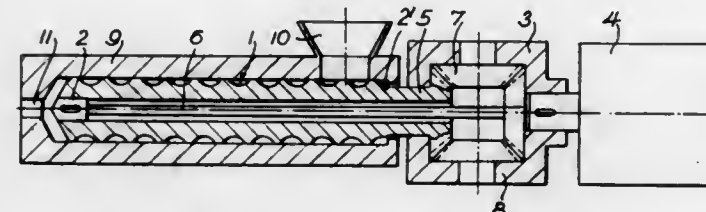
Filed Apr. 1, 1971, Ser. No. 130,373

Claims priority, application Austria, Apr. 2, 1970, 3007

Int. Cl. F01c 1/16; F01d 1/02

U.S. Cl. 415—72

4 Claims



A shaft, in particular a worm shaft for conveying or kneading of raw material, for example synthetic material, which comprises a hollow shaft and at least one coaxial shaft disposed in the hollow shaft. The hollow shaft and the coaxial shaft are operatively connected at least at one point, and means are provided for driving the shafts with the same angular speed.

3,734,636

# **ROTARY PUMP FOR HEATING AND COOLING SYSTEM**

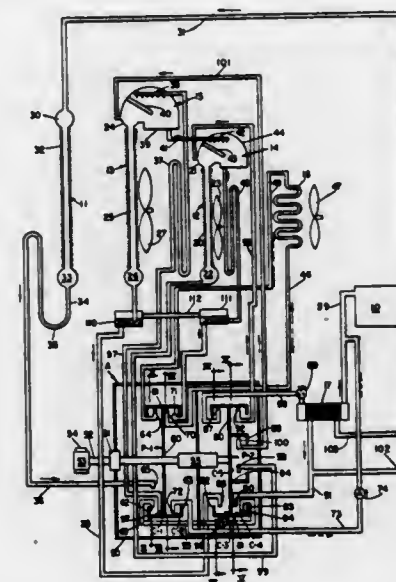
Louis H. Leonard, Jr., Dewitt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 20,772, March 18, 1970, Pat. No. 3,608,628. This application May 27, 1971, Ser. No. 147,492

Int. Cl. F04d 1/12; F04b 35/04

U.S. Cl. 415—88

3 Claims



An absorption refrigeration system having a cooling and a heating mode of operation. A generator, an air-cooled condenser, a two-stage air-cooled absorber, a two-stage adiabatic evaporator and an air conditioning heat exchanger are connected to provide cooling. A heating mode of operation is provided wherein absorbent solution is heated in the generator and passed through the heat exchanger back to the generator to supply heat to a space being conditioned. The system embodies a plural trough solution scoop pump and a plural trough refrigerant or chilled water scoop pump mounted on a single shaft and driven by a single reversible motor to effect a change from cooling to heating and return.

3,734,637

# **CENTRIFUGAL PUMP**

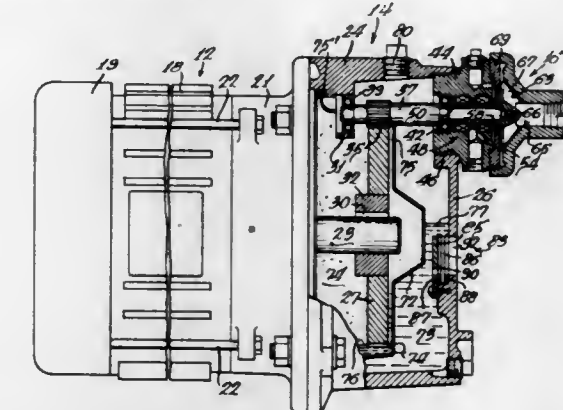
Richard Beck, Jr., Denver, Colo., assignor to Sundstrand Corporation, Rockford, Ill.

Filed May 13, 1971, Ser. No. 143,138

Int. Cl. F01d 15/12; F01m 1/00

U.S. Cl. 415—122 R

10 Claims



A speed increaser for a high speed centrifugal pump including a gearbox with a motor driven large gear therein drivingly interengaging a small pinion formed on a pump impeller rotating shaft. The gearbox is divided by a shroud adjacent the gears defining an oil reservoir on one side and a gear cavity on the other. A bleed orifice is provided in the shroud for bleeding oil into the gear cavity at a rate sufficient to maintain oil at a skimming level with respect to the large gear so that the large gear splashes oil in the gear cavity into a mist for lubricating the gears in various bearings within the gearbox.

3,734,638

# **FLEXIBLE VANE TURBINE PUMP**

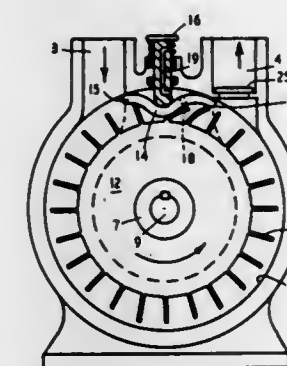
Vivan Richard Ebsary, Palm Beach, New South Wales, Australia, assignor to Rockwell Manufacturing Company, Pittsburgh, Pa.

Filed Nov. 6, 1970, Ser. No. 87,456

Int. Cl. F01d 17/12; F03b 3/12; F04d 15/00

U.S. Cl. 415—141

5 Claims



A turbine pump comprising an internally cylindrical case having an annular pump chamber therein, an inlet and outlet in the case communicating with the pump chamber, a rotor drive shaft extending axially into the case, an impeller on the drive shaft incorporating flow vanes made of an elastomeric material.

3,734,639

# **TURBINE COOLING**

Frederick R. Short, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 25, 1968, Ser. No. 701,815

Int. Cl. F01b 3/22

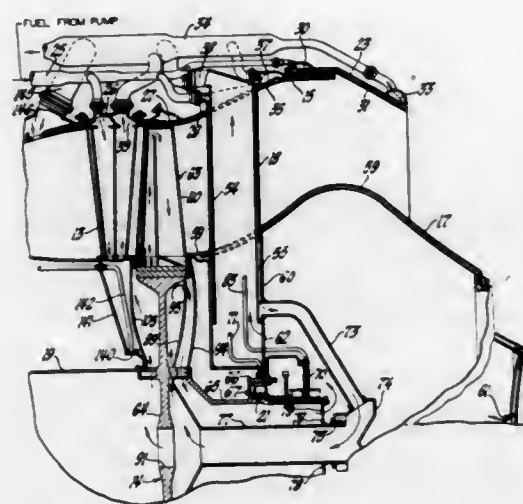
U.S. Cl. 415—114

7 Claims

A gas turbine engine in which the hotter parts of the engine are cooled by circulation of a cold fuel. The fuel cools parts of



the combustion chamber wall, the exhaust duct, the struts which extend across the exhaust duct, and the nozzle vanes and turbine wheel, including the turbine blades. This is a regenerative cooling system, since the heat imparted to the fuel is recovered in the combustion and expansion processes. The turbine wheel cooling embodies a circuit in which cold

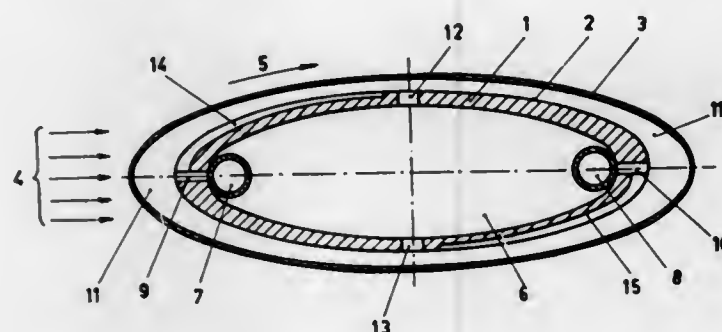


fuel flows radially outward of both faces of the turbine wheel, radially outward in the leading portion of the turbine blades, radially inward in the trailing portion of the turbine blades, and radially inward behind the turbine wheel to the coolant outlet. Preferably the fluid is vaporized in effecting the cooling.

**3,734,641**  
**AERODYNAMIC OR HYDRODYNAMIC ELEMENT, SUCH AS A WING OR A BLADE**  
Gilles Gerardus Hirs, Pijnacker, Netherlands, assignor to Nederlandse Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel & Verkeer, The Hague, Netherlands  
Filed May 28, 1971, Ser. No. 147,860

Claims priority, application Netherlands, May 29, 1970, 7007868

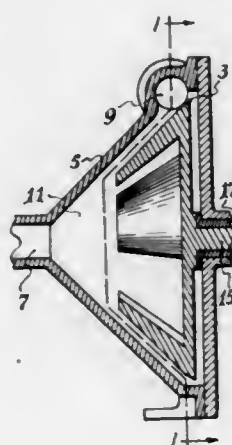
Int. Cl. B63h 9/02  
U.S. Cl. 416-4 6 Claims



Wings, blades and such aerodynamic and hydrodynamic elements, which are profiled to experience in a stream of a gas or a liquid a transverse force and which are provided with a moving surface constituted by a rotating belt of flexible material to benefit from the Magnus-effect and thus to increase efficiency, are improved by running the belt on a profiled body instead of on rollers. The belt is supported by a film of lubricant which is supplied through holes and distributed by grooves in the body, in such an arrangement that the lubricant flow not only supports the belt but also maintains its rotation.

**3,734,640**  
**AIRFOIL VACUUM PUMP WITH TAPERED ROTOR**  
William H. Daniel, 541 Putman Road, Rogers, Ark.  
Filed June 23, 1971, Ser. No. 155,766

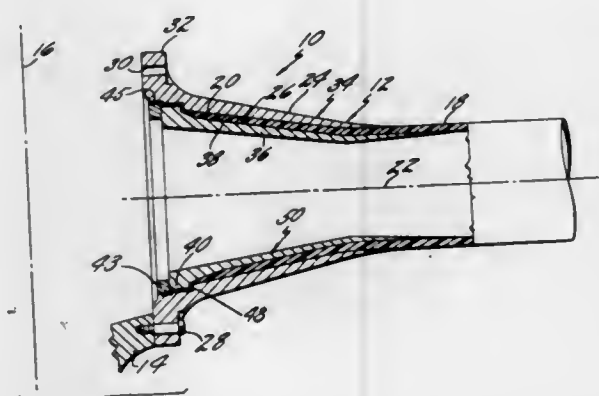
Int. Cl. F04d 7/02, 29/22  
U.S. Cl. 415-213 10 Claims



An airfoil vacuum pump of the centrifugal type has a rotor disposed in a conical housing. The rotor has vanes that taper radially inwardly away from the rotor toward the axial inlet of the pump. The leading and trailing edges of the vanes converge in a direction toward the inlet, and the thickness of the vanes decreases in that direction.

**3,734,642**  
**AERODYNAMIC BLADE ROOT END ATTACHMENT**  
Thomas P. Dixon, Stratford, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.  
Filed June 29, 1971, Ser. No. 157,968

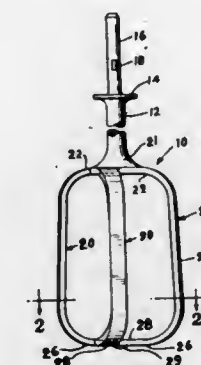
Int. Cl. B63h 1/20 25 Claims



The structural spar of an aerodynamic blade, preferably made of a composite material, is connected to the rotor hub through a primary connecting cuff to which the spar is bonded, and which normally constitutes the sole load path, and redundantly through a secondary cuff which is also bonded to the spar and which is normally unloaded and becomes loaded only upon failure of the bond between the spar and the primary cuff, which failure during operation causes position shifting of the spar and secondary cuff to thereby establish a malfunction warning vibration to the pilot.

**3,734,643**  
**KITCHEN MIXER IMPELLER AND MOLD FOR MAKING**  
Gus Waldemar Wallin, Waterbury, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.  
Filed June 1, 1971, Ser. No. 148,339

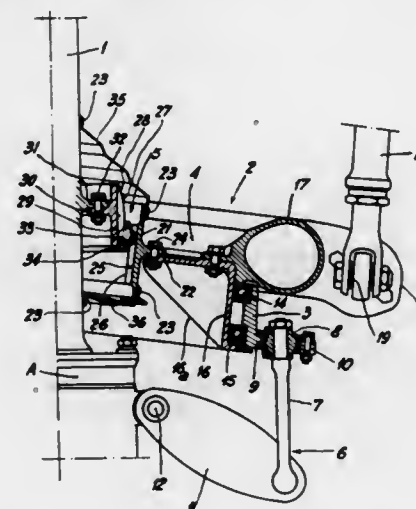
Int. Cl. B01f 7/24 4 Claims



An integral impeller having equally spaced blades and a two-piece mold for making it. The impeller is cast by rotating all blades slightly with respect to the mold parting plane and a plane perpendicular to the parting plane.

**3,734,644**  
**HELICOPTER ROTOR PITCH CONTROL SYSTEM**  
Jean-Claude Garcia, Pelissanne Bouches-du-Rhone, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France  
Filed Dec. 13, 1971, Ser. No. 207,043

Claims priority, application France, Dec. 14, 1970, 7044937  
Int. Cl. B64c 27/72 4 Claims



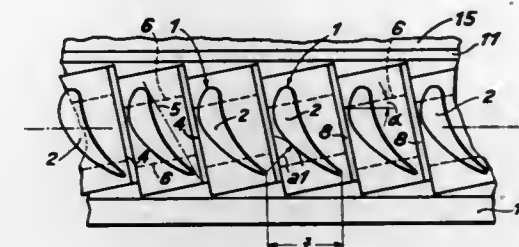
A blade pitch control assembly in accordance with the invention comprises an inner disc rotating with the rotor shaft and an outer non-rotating connected to the first disc by a bearing and which can be tilted by pitch variation control means.

**3,734,645**  
**TURBINE BLADE ASSEMBLY**  
Rene Strub, Winterthur, Switzerland, assignor to Brown Boveri-Suez Turbomachinery Limited, Zurich, Switzerland  
Filed Dec. 11, 1970, Ser. No. 97,105

Claims priority, application Switzerland, Dec. 12, 1969, 18500/69  
Int. Cl. F01d 5/30 4 Claims

The blades of a blade row in a turbine or similar machine possess roots having two pairs of opposite faces and are

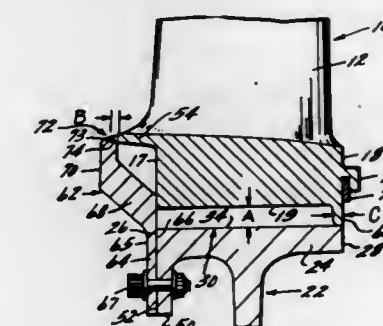
disposed in an annular array with the help of wedge-shaped spacers between the roots of adjacent blades. The blade root faces of one of these pairs define at each axial end of the array an annular stepped or sawtooth-shaped surface, according to



the angular orientation of the blades about their individual longitudinal axes, and the blades are held in a selected orientation by means of rings having mating annular stepped or sawtooth-shaped surfaces thereon.

**3,734,646**  
**BLADE FASTENING MEANS**  
Alan Vincent Perkins, West Peabody, Mass., assignor to General Electric Company, Lynn, Mass.  
Filed Feb. 2, 1972, Ser. No. 222,847

Int. Cl. F01d 5/32 6 Claims



Blade fastening means are provided for securing airfoil blades around the periphery of a rotating member wherein the blades include contiguous stiffening or vibration dampening means which cooperate to form a shroud intermediate the ends of the blades. Each individual blade member may be removed or inserted without interference with the contiguous airfoil stiffening or vibration dampening means of the adjacent blade member and without the interposition of an individual spacer element between the blade root and groove.

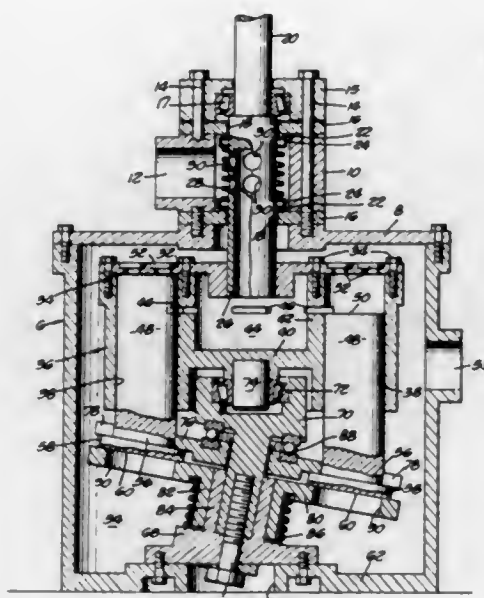
**3,734,647**  
**COMPRESSOR PUMP**  
Charles L. Sparks, deceased, late of 44426 Third St. East, Lancaster, Calif. (by Florence J. Sparks, executrix)  
Filed Sept. 7, 1971, Ser. No. 178,294

Int. Cl. F04b 49/00 9 Claims

A compressor pump or the like including a cylinder and piston assembly and a pressure chamber, the cylinder having an inlet and having an outlet in communication with the pressure chamber, the piston having a working face in the cylinder and having a pressure face exteriorly of the cylinder, cam means engaging the pressure face of the piston whereby relative rotation between the cylinder and piston as a unit and the cam plate causes reciprocation of the piston and compression

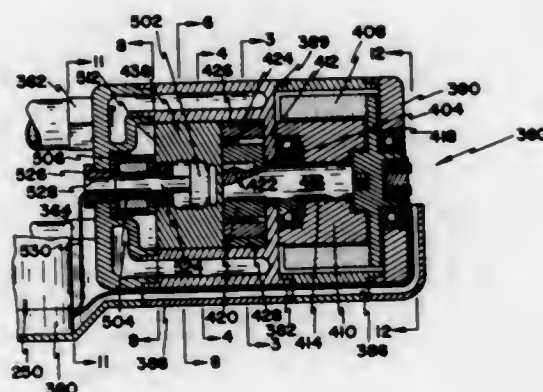


of gases in the cylinder and also in the pressure chamber, the cam plate, during the compression stroke of the piston, exposing the pressure face of the piston to pressure chamber pres-



ures to provide added power in the compression stroke of the piston, the pressure face of the piston being relieved of pressure chamber pressures during the intake stroke of the piston.

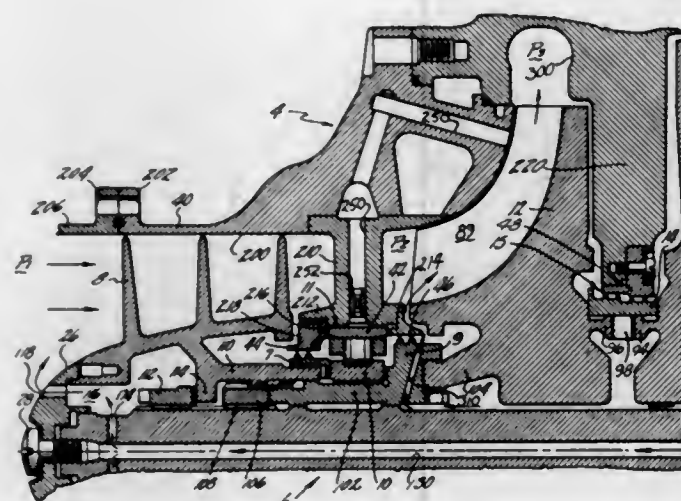
**3,734,648**  
**MECHANICAL HEART SYSTEM**  
Jay P. Nielson, 3490 S. 3685 East, Salt Lake City, Utah  
Division of Ser. No. 860,546, Sept. 24, 1969, Pat. No. 3,636,570. This application Nov. 12, 1971, Ser. No. 198,182  
Int. Cl. F01c 1/10; F04c 1/06; F04b 21/00  
U.S. Cl. 417-310 4 Claims



A mechanical heart system including an artificial heart having a rigid exterior casing which is partitioned into two halves, each half being divided into chambers by a flexible diaphragm which collapses to pump blood out of the artificial heart when subjected to fluid pressure and which expands to withdraw blood into the artificial heart when the fluid pressure is removed therefrom. A mechanical driving pump forces driving fluid into and withdraws driving fluid from the artificial

heart to control the operation of the diaphragm, the pump (a) forcing driving fluid into the artificial heart at a rate which is greater than the withdrawal of driving fluid from the artificial heart and (b) providing a more uniform rate of fluid flow between the pump and the artificial heart and modulating the transition between injection and withdrawal of driving fluid from the artificial heart. A pump regulator is connected to the power input of the mechanical pump, the regulator responding to the breathing rate of the user of the system to control the power input to the mechanical pump whereby the breathing rate of the user will determine the rate at which blood pumps from the artificial heart. In an alternative preferred embodiment, a fluid pump is substituted for the mechanical heart pump, the fluid pump accommodating injection of driving fluid into the artificial heart at a relatively constant rate and withdrawal of driving fluid from the artificial heart at another relatively constant rate. An alternate heart embodiment includes fluid-receiving cylinders and displaceable pistons alternately reciprocated in the cylinders due to fluid pressure developed by the fluid pump. An accumulator associated with the cylinders allows the pistons to travel in one direction at one rate and in the other direction at another rate.

**3,734,649**  
**TURBOPUMP HAVING COOLED SHAFT**  
James J. Sandy, Jr., Lake Park, Fla., assignor to United Aircraft Corporation, East Hartford, Conn.  
Filed May 24, 1971, Ser. No. 146,333  
Int. Cl. F04b 17/04  
U.S. Cl. 417-370 10 Claims



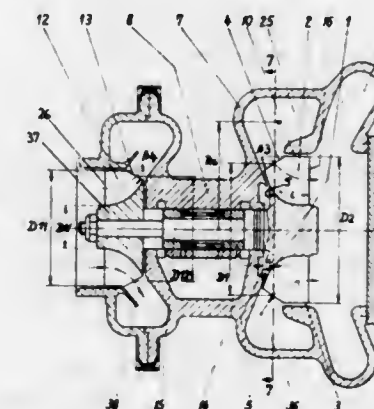
A turbopump having an inducer and a two stage centrifugal pump has hydrogen entering an inducer and passing through a first stage impeller and a second stage stage impeller to the exit thereof. A turbine is located on the opposite side of said impellers from the inducer and has an integral shaft extending through the impellers and inducer on which they are mounted. A front radial bearing means is positioned between the inducer and first impeller and a thrust balancer means and rear radial bearing means are positioned between the second impeller and the turbine. An interstage seal extends between the two impellers. Hydrogen is taken from the hydrogen path to operate the axial thrust bearing and to cool the two radial bearings.

Further, the hydrogen flow is taken from the inlet to the second stage impeller and directed through the shaft having a tortuous path therethrough to provide a desired cooling action. Dead air spaces are provided adjacent the turbine mounting to aid in the formation of a heat transfer barrier.

**3,734,650**  
**EXHAUST-GAS DRIVEN TURBOCHARGERS**  
Josef Reissacher; Hans Joachim Klau, both of Frankenthal, and Dieter Bergmeier, Heidelberg, all of Germany, assignors to Aktiengesellschaft Kuhnle, Kopp & Kausch, Frankenthal, Germany

Filed Apr. 30, 1971, Ser. No. 139,156  
Claims priority, application Germany, May 2, 1970, P 20 21 601.7; Aug. 18, 1970, P 20 4 901.2; May 2, 1970, P 20 21 602.8

Int. Cl. F04b 17/04 16 Claims  
U.S. Cl. 417-407

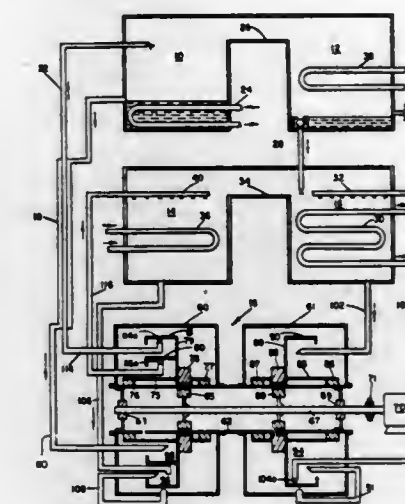


An exhaust gas turbocharger for use in connection with internal combustion engines has a turbine wheel and a compressor wheel which are arranged on a common drive shaft. The turbine wheel is provided with guide blades structured to be traversed by gases diagonally from the outside (periphery) of the wheel toward the inside (center) thereof. The blades have inlet edges and outlet edges whereby the inlet edges are substantially inclined, so that an entering gas flow is directed substantially perpendicularly to each inlet edge when the same is projected in the meridian plane, the cross section of the turbine wheel blades being arranged radially in sectional planes perpendicular to the wheel axis. The blades of the turbine wheel form at the inlet edge an entrance angle of less than 90° with respect to the wheel axis. The turbine has a housing constructed to constitute a single-slow spiral casing for gas admission over the entire circumferential surface of the turbine wheel, at the entrance portions of which there are provided at least two exhaust gas conduits, which are joined in such a way that their inlet cross section to the spiral casing is only slightly larger than the cross section at the respective ends of the gas conduits. The inlet edges of the blades of the turbine wheel assume a most favorable aerodynamic formation and are streamlined in profile. The mean wheel diameter at the outlet edge of each blade of the compressor wheel is less than approximately 88 percent of the maximum outer diameter of the blades of the turbine wheel. The gas flow through the compressor wheel is diagonally directed for traversal of the wheel from the inside toward the outside thereof.

**3,734,651**  
**MAGNETICALLY DRIVEN PUMP FOR ABSORPTION REFRIGERATION SYSTEM**  
Louis H. Leonard, Jr., Dewitt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.  
Division of Ser. No. 20,770; March 18, 1970, Pat. No. 3,608,330. This application Apr. 12, 1971, Ser. No. 133,053  
Int. Cl. F04b 35/04; F04d 1/12  
U.S. Cl. 417-420 2 Claims

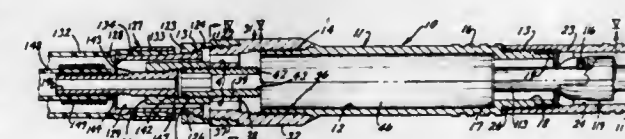
An absorption refrigeration system having a generator, a condenser, an evaporator, an absorber, and a fluid transfer apparatus for pumping liquids in the system. The fluid transfer apparatus includes a plurality of spaced housings sealingly secured to the exterior surface of a cylindrical nonferromagnetic wall. One or more scoop pump pans are rotatably

mounted within each of the housings for rotation about the nonferromagnetic wall. An annular magnetic coupling member is secured to the rotor member within each housing.



A second annular magnetic coupling member is mounted exteriorly of each housing in coupling relation with the annular magnet therein and is attached to an external electric motor to drive the scoop pump pans within the housings.

**3,734,652**  
**PNEUMATICALLY POWERED DEVICE**  
John E. Barnett, Kalamazoo, Mich., assignor to Stryker Corporation, Kalamazoo, Mich.  
Filed Oct. 26, 1970, Ser. No. 84,071  
Int. Cl. F01c 21/00; F03c 3/00; F04c 29/00  
U.S. Cl. 418-70 11 Claims



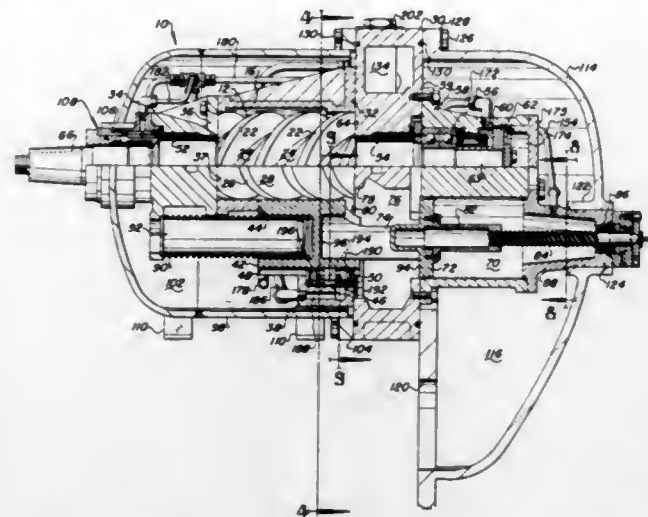
A pneumatically powered device for rotating, at a relatively high speed, a tool of the type used by a surgeon for performing an operation. A self-contained air motor is removably disposed within an elongated tubular housing easily held and manipulated by the hand of the surgeon and connected by swivel means to conduits through which a gas under pressure is delivered to and carried away from one end of the air motor. Coupling means extend from the other end of the air motor for connection to a tool, such as a drill bit.

**3,734,653**  
**SCREW COMPRESSOR**  
Soren E. H. Edstrom, and John E. Seckman, both of Quincy, Ill., assignors to Gardner-Denver, Quincy, Ill.  
Filed Aug. 23, 1971, Ser. No. 173,895  
Int. Cl. F01c 1/16, 21/04; F04c 17/12  
U.S. Cl. 418-88 10 Claims

A liquid injected screw compressor having an intermediate housing member which supports a detachable screw rotor housing portion, a thrust bearing housing, and a pressure fluid control actuator for a sliding capacity control valve. The intermediate housing member also includes a cavity for distributing lubricating and cooling oil to the compressor. The screw compressor includes a substantially cylindrical casing fabricated of steel plate which is bolted to the intermediate housing member and encloses the screw rotor housing portion to serve as a pressure vessel for compressor inlet gas and for gas vented



by the capacity control valve. A separate casing portion is bolted to the intermediate housing member and encloses the



thrust bearing housing and the pressure fluid control actuator. The compressor is adapted to be mounted on a base or frame by means of legs attached to the cylindrical casing.

3,734,654

## ROTARY ROLLER PUMPS

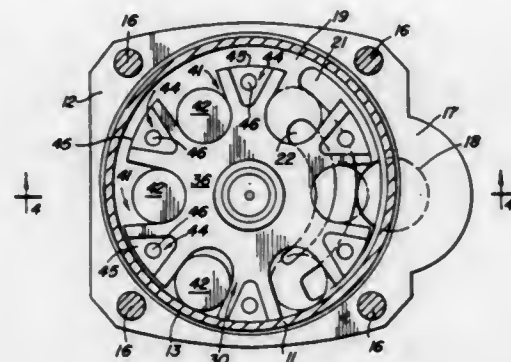
Thomas I. Burenga, Evanston, Ill., and Everett Elliott, Richland Center, Wis., assignors to TSC Industries Inc., Chicago, Ill.

Filed Mar. 29, 1971, Ser. No. 128,916

Int. Cl. F01c 21/00; F03c 3/00; F04c 15/00

U.S. Cl. 418-152

5 Claims



A rotary roller pump comprising a cylindrical pump chamber closed at both ends and having inlet and outlet openings into the chamber, a rotor eccentrically mounted in the pump chamber on a cantilever shaft, and a plurality of rollers located in longitudinal slots in the periphery of the rotor; the entire rotor is of molded plastic, keyed to the shaft. The periphery of the rotor, between roller slots, comprises a series of voids with central reinforcing ribs; apertures through the ribs equalize pressures on opposite sides of the rotor.

3,734,655

## TIRE SHAPING AND CURING DEVICE

Armando Cantarutti, Akron, Ohio, assignor to NRM Corporation, Akron, Ohio

Filed Nov. 1, 1971, Ser. No. 194,339

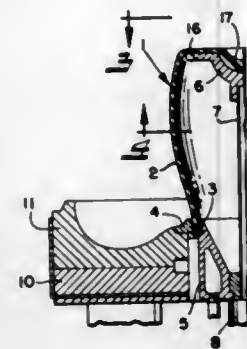
Int. Cl. B29h 5/02

U.S. Cl. 425-33

7 Claims

A tire shaping device of the upstanding bladder type characterized in that support means for the upper end of the bladder is of non-circular form e.g., Y, cross, or regular polygon form with concavely curved sides, to cause uniform axial folding or pleating of the bladder when axially stretched to facilitate loading of a tire carcass thereover and stripping of the cured tire therefrom, the unstressed bladder being of barrel shape

with a maximum diameter greater than the bead diameter of the tire and the crests or folds being of uniform spacing circumferentially around the bladder and being disposed at a



diameter no greater than the bead diameter when the bladder is axially stretched so that the loading and unloading as aforesaid does not entail rubbing contact of the tire beads and bladder and consequent kinking of the beads.

3,734,656

## TIRE VULCANIZING PRESS

Walter Balle, D-6451 Dornigheim ub. Hanau/Main, Germany, assignor to Leonhard Herbert Maschinenfabrik, Bergen-Enkheim, Germany

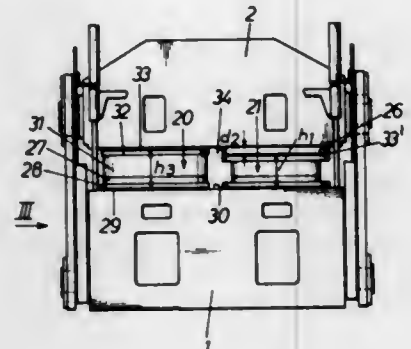
Filed Dec. 1, 1971, Ser. No. 203,655

Claims priority, application Germany, Dec. 5, 1970, P 20 60 018.4

Int. Cl. B29h 5/02

U.S. Cl. 425-34

10 Claims



In a tire vulcanizing press of the kind in which two side by side moulds are opened and closed simultaneously adjustment of the closing pressure is effected by the inclusion of shim plates in openings provided in connecting rods by which a top part of the press is reciprocated relative to a bottom part. The shim plates determine the positions in the openings of bearings by which the connecting rod is connected to the top press part. Adaptor plates can also be inserted between the moulds and one of the press parts for the purpose of adapting the press to accommodate moulds of different heights.

3,734,657

## GANG FORM MOVER

Richard F. Reed, Salt Lake City, Utah, assignor to Pavement Planning Company, Salt Lake City, Utah

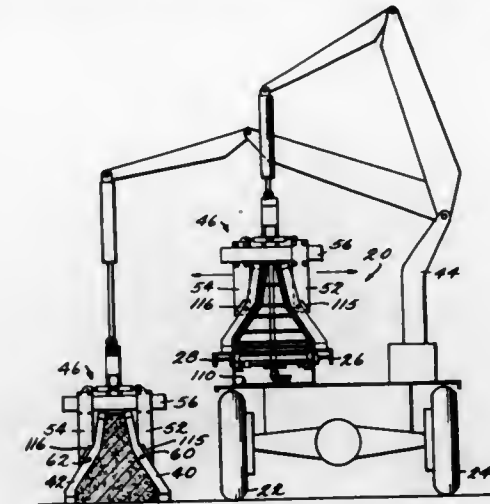
Int. Cl. B28b 13/06

U.S. Cl. 425-62

5 Claims

An apparatus for cleaning and transporting one or more pairs of concrete barrier strip forms and a method of cleaning and transporting forms and forming barrier strips whereby one or more pairs of forms are peeled from the set concrete by a crane on a vehicle, lifted by the crane and then placed on a

pair of structural members on the vehicle which have mounted between them a dolly which moves on tracks along the members. A stationary standpipe having a number of nozzles and a rotatable stand pipe having a number of brushes attached to it are mounted on the dolly. Both stand pipes extend vertically into the space between the forms. To clean the forms, the



brushes are rotated and at the same time move along the forms with the brushes successively cleaning the interior surfaces of the forms. Oil is sprayed from the nozzles in the stationary standpipe, preferably after the dolly has moved the length of the forms and is returning. The forms can be transported at the same time they are being cleaned.

3,734,658

## RAPID RELEASE MOLD

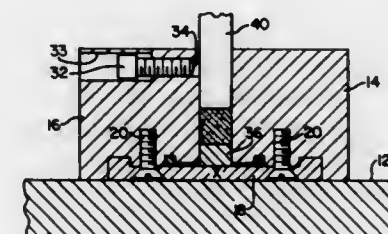
Phillip A. Livera, Bloomfield, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 24, 1971, Ser. No. 201,907

Int. Cl. B30b 11/00

U.S. Cl. 425-78

10 Claims



A rapid release mold for use in the compaction of metal powders into consolidated ingots which includes a pair of side walls connected together by means of a relatively rigid bottom buckle plate. The mold includes means associated with the upper portions of the side walls which are operative to slightly increase the separation of the side walls through slight flexure of the buckle plate to permit the unimpeded removal of a compacted ingot from the mold.

3,734,659

## DRIVE MEANS FOR MATERIAL COMPACTING APPARATUS

Leroy S. Harris, Rolling Meadows, Ill., assignor to K-G Industries Inc., Rosemont, Ill.

Continuation-in-part of Ser. No. 95,456, Dec. 7, 1970, Pat. No. 3,674,397. This application Feb. 16, 1972, Ser. No. 226,824

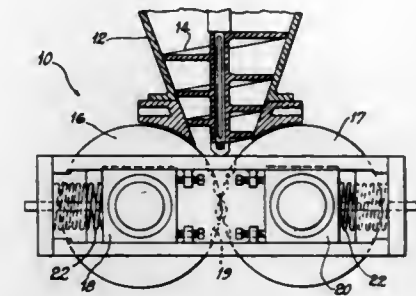
Int. Cl. B29c 3/02, 3/04, 3/06

U.S. Cl. 425-145

5 Claims

A material compacting apparatus including opposed compacting rolls mounted for lateral displacement to vary the

spacing between the rolls depending upon the pressure exerted during compacting. A hopper is positioned above the rolls for holding the material, and a feed screw is located within the hopper for feeding the material to the rolls. Control means are provided for varying the driving action of the feed screw with the variations depending upon any tendency of the



3,734,660

## APPARATUS FOR FABRICATING A BEARING DEVICE

Gilbert E. Davies; Robert J. Loubler; John M. Weston, and Robert A. Muhn, all of Fort Wayne, Ind., assignors to Tuthill Pump Company, Chicago, Ill.

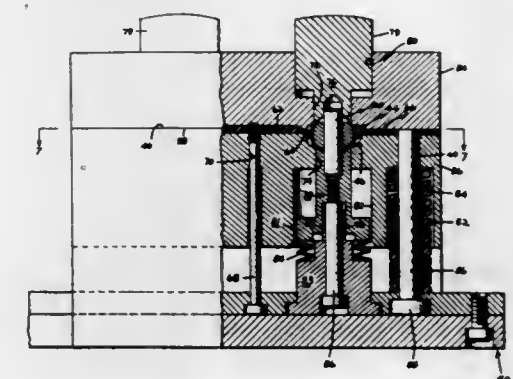
Division of Ser. No. 1,733, Jan. 9, 1970, Pat. No. 3,629,921.

This application June 17, 1971, Ser. No. 153,988

Int. Cl. B29f 1/10

U.S. Cl. 425-123

9 Claims



An apparatus for fabricating a bearing device comprising a housing having an opening therethrough, a ball-shaped swivel member positioned within the opening and spaced from the surface of the housing which defines the opening, and a raceway of solidified bearing material in the space between the swivel member and housing, the raceway having a swiveling clearance with and retaining said swivel member in the housing, the inner surface of the raceway being shaped to correspond to a part of an elongated sphere. In the fabrication of this bearing device, the swivel member is reciprocated relative to the housing during the hardening of liquefied bearing material injected into the space between the swivel member and housing. The apparatus which accomplishes this method includes relatively movable members which engage, respectively, the housing and the swivel member, these mold members providing the relative reciprocatory movement.



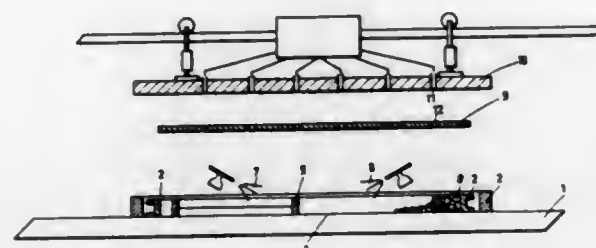
3,734,661

# **APPARATUS FOR THE CONTINUOUS MANUFACTURING OF CONSTRUCTION PANELS** Lucien Joly-Pottuz, and Jean-Claude Joly-Pottuz, both of 27 Rue Bellevue, Annemasse, France

Filed Oct. 19, 1970, Ser. No. 82,030  
Int. Cl. B29c 6/00; B29d 27/00; B29f 1/06

U.S. Cl. 425-129

5 Claims



The invention relates to an apparatus for the continuous manufacture of panels that fit together, particularly intended for constructing prefabricated houses and industrial buildings.

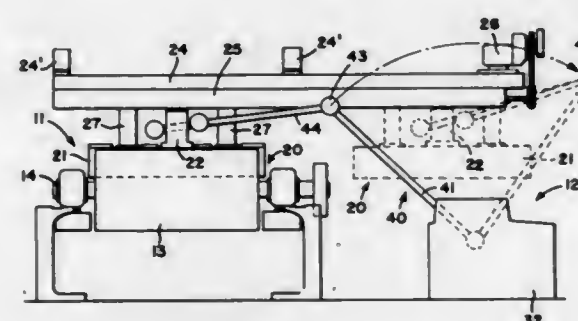
3,734,662

# **FLAT FILM PLASTIC EXTRUSION APPARATUS** Paul E. Harmon, Fulton, and Kenneth A. Mainstone, Oswego, both of N.Y., assignors to The Black Clawson Company, Hamilton, Ohio

Filed Feb. 8, 1971, Ser. No. 113,310  
Int. Cl. B29f 3/00, 3/04

U.S. Cl. 425-131

4 Claims



A die assembly for multiple layer extrusion onto a paper web substrate is movable on an overhead support beam from an on-line position over a laminating station to an off-line position transversely adjacent such station. A pair of stationary extruders feed plastic material to the die assembly through a pair of movable feed assemblies each of which includes two straight sections of conduit connected to each other by a rotary joint and connected to the extruder and to the die assembly by further rotary joints so that movement of the die assembly is enabled by a swinging and folding movement of the conduit sections. An improved die adapter is also disclosed for the simultaneous three-layer co-extrusion from the two extruders in which the film thicknesses of the outer layers are controlled with respect to the center layer.

3,734,663

# **ARMING CONTROL FOR SERVO-ADJUSTED TABLET COMPRESSING MACHINES**

James P. Holm, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

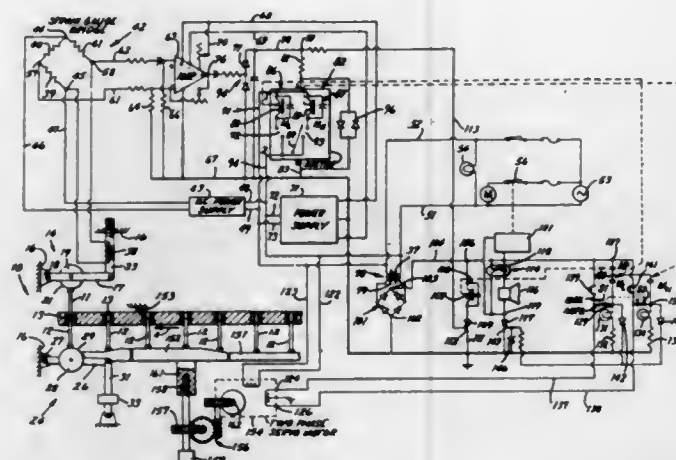
Filed Nov. 16, 1971, Ser. No. 199,133  
Int. Cl. B29b 5/06; B29c 3/06

U.S. Cl. 425-147

9 Claims

Compressing apparatus having die filling means adapted to fill a die with formable material, adjustable means for regulat-

ing the amount of formable material received in the die and force applying means for applying compressing force to the material within the die. Means are provided for measuring the force applied to the formable material within the die by the force applying means and producing a control signal which varies in proportion to said measured force which in turn indicates the degree to which the die was filled during a given compression operation. First switching means is provided which is responsive to the control signal and adapted to effect



adjustment of the adjustable die filling means to control the weight and, therefore, the amount of formable material in each of the dies and thereby the force imparted to the formable material. A prearming circuit including second switching means is provided which is also responsive to the magnitude of said control signal to prevent the first switching means from being effective to effect adjustment of the adjustable die filling means during intervals of time when the magnitude of the signal is below the predefined threshold value.

3,734,664

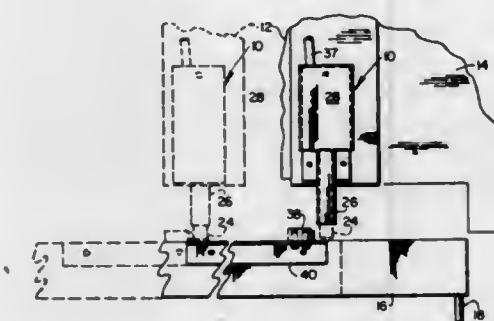
# **SOLENOID OPERATED DOOR OPENER FOR PLASTIC MOLDING MACHINES**

William Bosyk, Holyoke, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.

Filed Oct. 19, 1971, Ser. No. 190,539  
Int. Cl. B29f 1/00

U.S. Cl. 425-151

3 Claims



An automatically operable device for opening the sliding safety gate or door of a plastic injection molding machine whenever the die or mold halves of the machine are opened so that the machine operator can have ready access to the area between the mold halves.

3,734,665

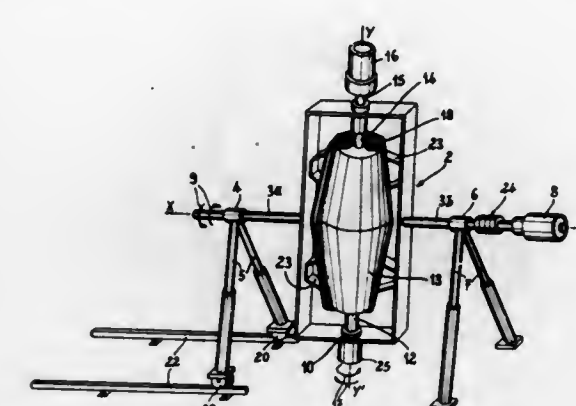
# **ROTARY MOLDING MACHINE**

Michel Pierre Cyrille Guillaud, Grenoble, France, assignor to Societe d'Etudes et de Construction de Materiel Electrique et Radioelectrique S.E.C.M.E.R. Chemin du Sablon La Tronche (Isere), France

Filed Mar. 9, 1971, Ser. No. 122,328  
Int. Cl. B29c 5/04

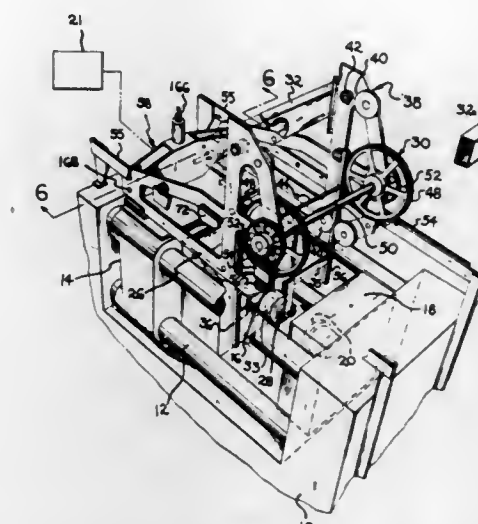
U.S. Cl. 425-174

6 Claims



This rotary molding machine designed mainly for the rotary molding of synthetic materials is also adapted to mix in a heated vessel a plurality of liquid, solid or pulverulent substances for carrying out certain heat treatments or chemical treatment by heat action, and comprises a frame structure adapted to be rotatably driven about a first transverse axis and provided with means for rotatably driving a mold about its axis, or a detachable vessel containing the material to be molded about a second axis coplanar and perpendicular to said first axis, said mold or vessel consisting of a relatively thin material adapted to be induction heated, the heating means proper consisting of an induction coil connected to a low-frequency a.c. source and secured to said frame structure, said coil consisting of connectors wound to form contiguous turns about an axis orthogonal to said first and second axes of rotation of said mold, so as to constitute a kind of sheath having a configuration homothetic to the mold configuration and bounded by two planes parallel to the plane in which the mold axes are located, whereby the mold, by approaching very closely the inner face of said coil, can easily be engaged therein or removed therefrom, and nevertheless be heated very rapidly and throughout its wall to a homogeneous temperature for melting the material contained therein or keeping said material at a predetermined temperature.

ing movement of the platens to retract clear of the platens and to thus carry the part into operative alignment with a discharge chute. As the holder arrives in operative alignment with the discharge chute, a pressure source is connected to the holder and to the chute, the application of pressure to the



3,734,667

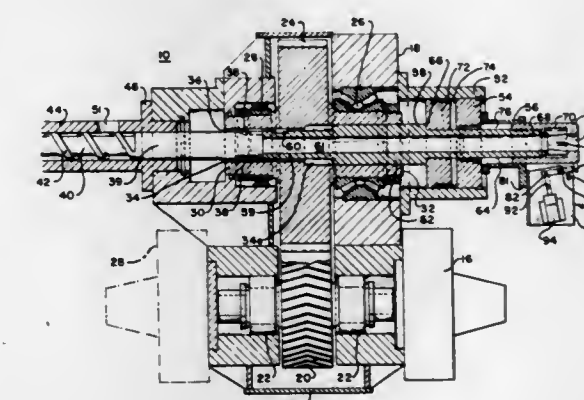
# **PLASTIC EXTRUSION APPARATUS**

Robert F. Dray, New Castle, Pa., assignor to Extruders, Inc., New Castle, Pa.

Filed Sept. 30, 1970, Ser. No. 76,698  
Int. Cl. B29f 3/06, 3/01

U.S. Cl. 425-190

2 Claims



A plastic extrusion apparatus of the type employing a rotatable screw mounted in an elongated tubular member and including pressures fluid operated piston means operably connected to the screw for applying a compressive axial force to the screw in a direction toward the discharge port of the extrusion apparatus. The apparatus further includes means operably connected to the piston means for ejecting the screw from the tubular member upon reciprocation of the piston means.

3,734,666

# **PART REMOVAL APPARATUS**

Paul R. Guest, and Robert F. Kontz, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 846,087, July 30, 1969, abandoned. This application Apr. 21, 1971, Ser. No. 135,926

Int. Cl. B29c 7/00, 1/14; B29f 1/14

U.S. Cl. 425-186

5 Claims

Part removal apparatus for removing and discharging in an oriented position parts formed on machines having reciprocating platens, such as plastic molding machines, for example. Relative movement between the platens of the machine is employed to mechanically drive a part holding element between the separating platens to position a part receiving holder in adjacent position to a freshly formed part which is retained on one of the machine platens. The part is transferred to the holder by the application of vacuum to the holder which then sucks the part into the holder and retains the part on the holder temporarily. The holder is mechanically driven by clos-

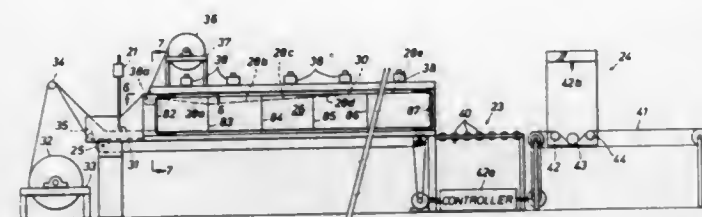


3,734,668

**APPARATUS FOR FORMING URETHANE FOAM STOCK**  
Lawrence C. Porter, Palos Verdes Peninsula, Calif., assignor to The Upjohn Company, Kalamazoo, Mich.  
Filed Nov. 18, 1970, Ser. No. 90,562  
Int. Cl. B29d 27/04

U.S. Cl. 425-330

15 Claims



Apparatus and methods are disclosed by which the wall surfaces of a form for expanding urethane stock are provided with horizontal, vertical and longitudinal pitch to enhance the character and shape of the foam product. Embodiments include means for selectively altering the pitch and curvature of a wall surface.

3,734,669

**APPARATUS FOR CONTINUOUS MANUFACTURE OF CHIPBOARD**

Hubert Ettel, Harz, Germany, assignor to Wilhelm Mende & Co., Harz, Germany

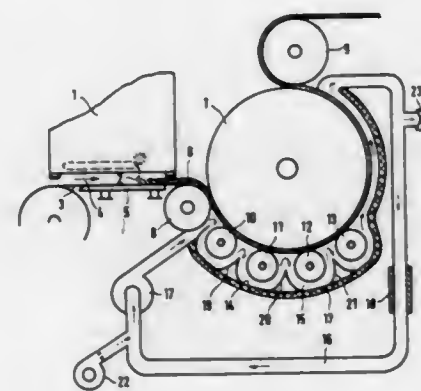
Filed Oct. 26, 1971, Ser. No. 192,373

Claims priority, application Germany, Oct. 30, 1970, P 20 53 351.1

Int. Cl. B29j 5/08; B30b 5/04

U.S. Cl. 425-373

7 Claims

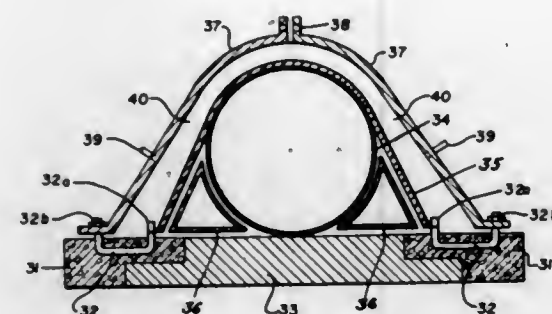


Apparatus for the continuous manufacture of chipboard comprising an endless steel band encircling a portion of the circumference of a drum and adapted to press and cure the chip material and which includes hot gas heating means for heating the chip material through the steel belt. The heating means comprises a sheet metal housing surrounding the portion of the belt which runs against the drum, an oil heater for discharging hot air and exhaust gas into said housing and a recirculating duct for carrying the discharged gases back to the point where the fresh gases enter the housing. The sheet metal housing may be of a configuration to direct the gases flowing through the housing into a tortuous path to promote heat transfer.

3,734,670  
**PORTABLE MOLD FOR ERECTING CONCRETE OR PLASTIC SHELTERS**

Charles W. Stickler, Jr., R.D. No. 4, Mohnton, Pa.  
Filed Mar. 3, 1970, Ser. No. 16,109  
Int. Cl. B28b 3/00, 7/32

5 Claims



The invention relates to a portable mold for erecting a poured concrete or plastic structure for use as a shelter or storage building. An inside inflatable form is used to develop an internal contour and supply a compressive force against a poured cement mix sandwiched between the inflatable form and an outside rigid form of determined contour, such as a quonset hut. The inflatable inner form can be removed after exhausting the compressed air from its confined area and may be reused.

3,734,671

**MOLD CLOSING UNIT**

Johann Talasz, 7920 Heidenheim, Germany, assignor to J. M. Volt GmbH, Heideheim (Brenz), Germany

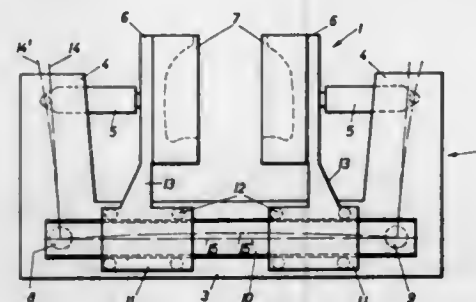
Filed Sept. 20, 1971, Ser. No. 182,057

Claims priority, application Germany, Oct. 1, 1970, P 20 48 258.0

Int. Cl. B29c 1/16

U.S. Cl. 425-450

5 Claims



A mold closing unit has a substantially U-shaped frame with a pair of guide rails positioned on both sides of the cross member of the frame and having their ends pivotally mounted to the frame below the arms thereof. A pair of mold supports are slideably mounted on said guide rails for movement toward and from each other between the arms of the frame. Closing and blowing forces are absorbed by the frame and deformations in the frame resulting from these forces do not misalign the mold halves which are mounted on the guide rails.

3,734,672

**EXTRUSION DIE FOR DOUGH**

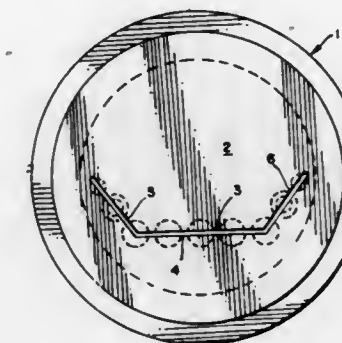
Elmer F. Glabe, Chicago; Perry W. Anderson, Niles, and Stergols Laftsidis, Chicago, all of Ill., assignors to Food Technology, Inc., Chicago, Ill.

Filed Oct. 18, 1971, Ser. No. 189,936

Int. Cl. A21c 3/00; A23p 1/00

U.S. Cl. 425-462

4 Claims



An extrusion die is provided for extruding a cup-shaped shell made from a dough, more specifically a simulated potato skin which is used to make a simulated stuffed baked potato.

3,734,673

**DIE CASTING AND LIKE APPARATUS**

Alan Hunter Paterson, Droltwich, County of Worcester; Thomas Matthew Ewale, Bromyard, County of Hereford, and John Samuel Rogers, Bromsgrove, County of Worcester, all of England, assignors to Metal Castings Doehler Limited, Worcester, England

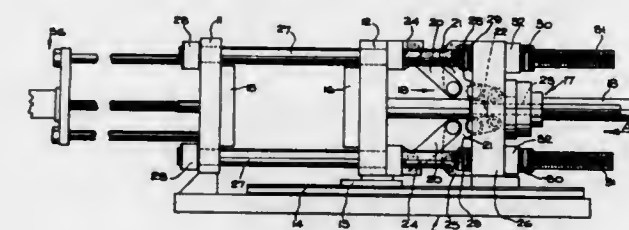
Filed Mar. 30, 1971, Ser. No. 129,397

Claims priority, application Great Britain, Apr. 4, 1970, 16,052/70

Int. Cl. B22d 17/10

U.S. Cl. 425-450

8 Claims



In die casting, injection moulding or like apparatus having tie bars which are subjected to tensile stress when die carrying members are moved to a die-closed position, a respective liquid-filled chamber is interposed in the stress path through each tie bar. The chambers have movable wall parts so arranged that the pressure of fluid in the chamber varies as the tension in the associated tie bar, and the chambers are interconnected to equalize pressures therein and therefore to equalize tensions in the tie bars. The chambers may also communicate with pressure relief means such as a pressure relief valve, a reservoir pressurized by a gas, or a solid state resilient element which can yield to provide a local increase in the space available for accommodation of the liquid.

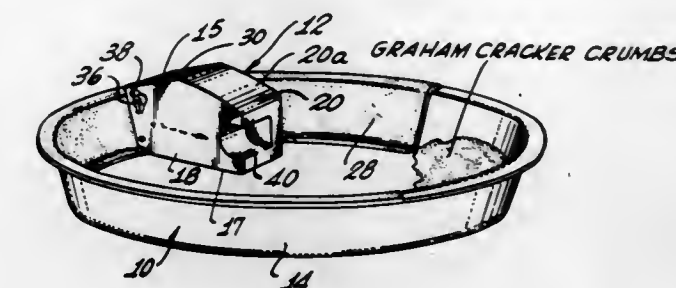
3,734,674

**IMPLEMENT FOR FORMING PIE CRUST**

Doty M. Steele, 1615 N. Edgemont St., Los Angeles, Calif.  
Filed Aug. 2, 1971, Ser. No. 168,065  
Int. Cl. A47j 43/00

U.S. Cl. 425-458

3 Claims



The disclosure is of a tamper implement, comprising a block contoured for use in moving and tamping cracker crumbs into position within a pie pan to form a cracker crumb pie crust.

3,734,675

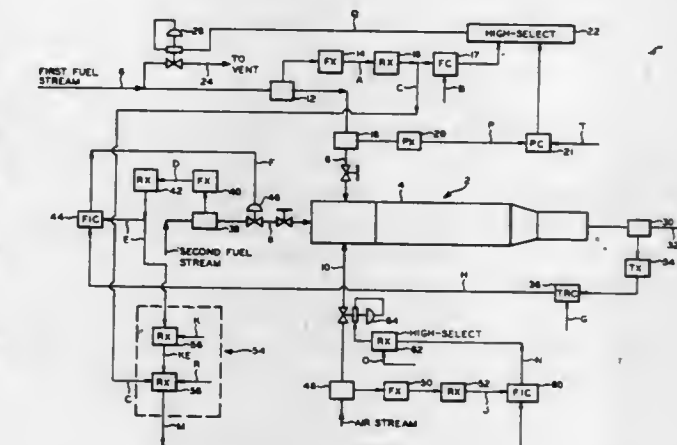
**BURNER CONTROLLING APPARATUS AND METHOD**  
Carl L. Osburn, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 13, 1971, Ser. No. 162,057

Int. Cl. F23c 1/00

U.S. Cl. 431-12

11 Claims



A method and apparatus for controlling the relative flow rates of first and second fuel streams and an air stream to a burner. The first fuel stream has a lower calorific value than the second fuel stream and the streams are controlled to maintain the burner combustion gas temperature above a preselected value, pass the first fuel into the burner at a maximum rate, pass the second fuel stream into the burner at a rate relative to the temperature of the combustion gas and provide a sufficient air stream flow rate for efficient combustion of the combined fuel streams.

3,734,676

**ELECTRICALLY ENERGIZABLE CONTROL SYSTEM FOR A FUEL BURNER**

Alvin D. Wyland, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed June 18, 1971, Ser. No. 154,311

Int. Cl. F23n 5/08

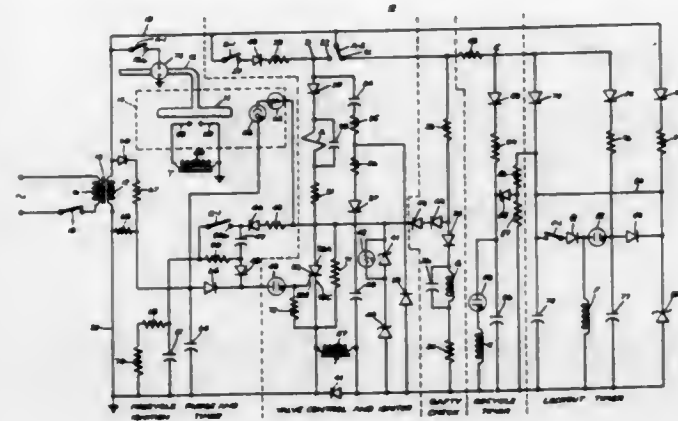
U.S. Cl. 431-79

18 Claims

An electrically energizable control system for a burner for a combustible fluid. The control system includes a valve control and igniter circuit for opening the control valve to allow fluid



to flow from the burner and generating an electric arc or spark for igniting the fluid. In the event ignition is not accomplished the valve control and igniter circuit automatically turns off after a predetermined period of time. A recycle timer circuit causes the valve control and igniter circuit to repeat the try for ignition a predetermined number of times after which a lockout timer circuit prevents further ignition trial, assuming



the fluid has not become ignited. A detection circuit maintains the valve control and igniter circuit in its valve open condition upon the fluid being ignited. The control system includes a safety check circuit which allows the initial valve opening and spark energization only if the control system is in proper condition at the beginning of its operation. Also there is a pre-cycle purge timer for providing an initial period of the operation of the control system before ignition is attempted.

3,734,677

## LIQUID FUEL BURNER

Shigeo Murase, Takatsuki-shi, and Mituhiko Imajima, Yamatokoriyama-shi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

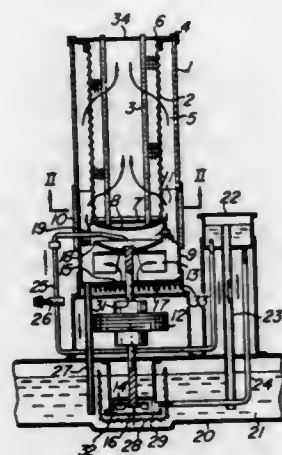
Filed Aug. 6, 1971, Ser. No. 169,608

Claims priority, application Japan, Aug. 12, 1970, 45/70991; Oct. 29, 1970, 45/96163

Int. Cl. F23n 5/24

U.S. Cl. 431-88

5 Claims



A liquid fuel burner in which a mixture of atomized liquid fuel and pre-heated air is burned on the surface of a heat-radiant cylinder and the resultant combustion gases are introduced into the interior of said radiant cylinder, whereby the unburned gas present in the combustion gases is completely burned by contact with heated rods arranged in said radiant cylinder.

3,734,678

## PHOTOFLASH LAMP

Reinhold Liepert, Wertingen, Germany, assignor to Patent-Treuhand Gesellschaft für elektrische Glühlampen mbH, Munich, Germany

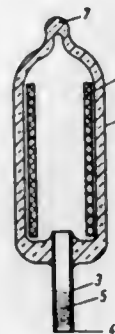
Filed June 15, 1971, Ser. No. 153,212

Claims priority, application Germany, July 10, 1970, P 20 34 328.6

Int. Cl. F21k 5/02

U.S. Cl. 431-93

3 Claims



A mechanically ignitable photoflash lamp in which an igniter tube containing a percussive type igniting material is sealed into the lamp bulb. The bulb has a filling of combustible material and a combustion supporting material. To prevent displacement of the combustible material due to the resulting pressure wave, when the igniting material is ignited, the combustible material is a physically stable web, mesh or network of foil or wire designed as a hollow body fitting the shape of the bulb and bearing against the bulb wall.

3,734,679

## PHOTOFLASH LAMP

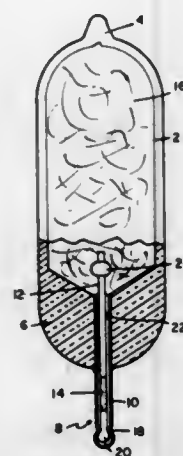
Thomas B. McDonough, c/o Sylvania Electric Products Inc., Montoursville, Pa.

Filed Nov. 20, 1970, Ser. No. 91,252

Int. Cl. F21k 5/02

U.S. Cl. 431-93

4 Claims



A percussive-type photoflash lamp having a primer of the type comprising a wire anvil partially coated with fulminating material and coaxially supported within a tube in a manner providing a clearance between the coating of fulminating material and the inner wall of the tube. The fulminating material contains sodium chlorate as the oxidizer and is prepared by mixing an aqueous slurry containing red phosphorus with an aqueous solution of dissolved sodium chlorate.

3,734,680

## LIGHTER

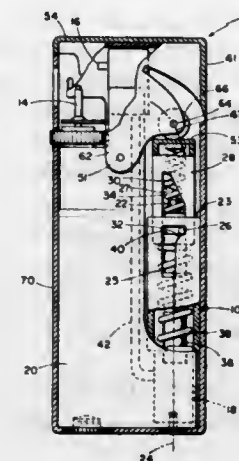
Susumu Maruyama, Taito-ku, Tokyo, Japan, assignor to Auto-Time Distributors, Inc., Providence, R.I.

Filed Mar. 6, 1972, Ser. No. 232,003

Int. Cl. F23q 2/08

U.S. Cl. 431-132

8 Claims



Cigarette lighter with an improved system for depressing a plunger to ignite a burner, comprising a thumb operated member carrying a bearing positioned adjacent a transverse surface of the plunger, the member having a path of movement carrying the bearing against and along the plunger surface while depressing the plunger.

3,734,681

## GAS SMOOTH TOP RANGE

Richard L. Perl, Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio

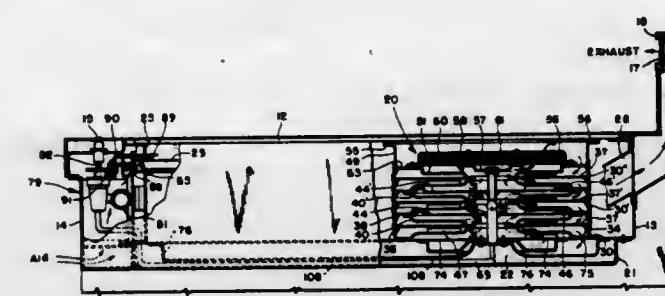
Division of Ser. No. 45,991, June 15, 1970, Pat. No. 3,646,927.

This application Sept. 7, 1971, Ser. No. 178,408

Int. Cl. F23d 11/44

U.S. Cl. 431-242

3 Claims



The range has plural radiant burners with individually associated heat exchangers and a common pressurized exhaust system. Each burner has a supply air tube the inlet end of which is obstructed by a coil spring which is variably expanded to act as an adjustable shutter regulating the amount of air that

enters through its turns in response to actuation of the gas control valve for the burner. The burners have center simmer sections for low heat and single gas lines with port controlled terminals which variably direct the gas to the center simmer sections or to the main burner sections depending upon the rate of delivery of the same. A safety circuit prevents flow of gas to the range except when exhaust fans are properly operating, and a taut wire exposed to heating by all burners expands when any is above a selected temperature to signal such condition.

3,734,682

## ADJUSTABLE CATALYTIC HEATER AND REPLACEABLE WICK ASSEMBLY THEREFOR

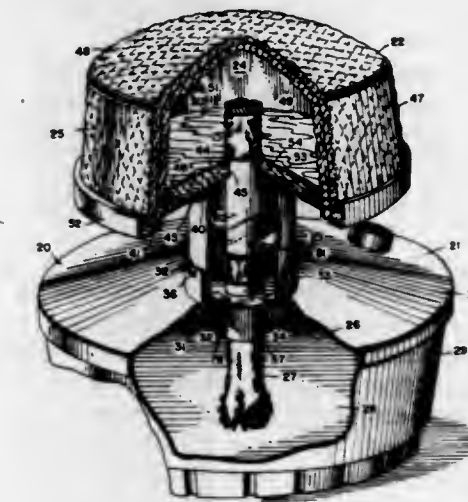
Randall L. May, Andover, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed July 9, 1971, Ser. No. 161,204

Int. Cl. F23d 3/18

U.S. Cl. 431-324

15 Claims



A catalytic heater is provided with a wick assembly which can be replaced when necessary and which permits the heat output of the heater to be varied. An elongated wick is secured within a generally cylindrical support tube, and an attaching collar extends radially outwardly from the support tube for removably securing the support tube and wick to the catalytic heater. The lower end of the wick extends into the fount of the heater, and the upper end of the wick extends into the vapor collection space of the combustion head of the heater for supplying fuel to the vapor collection space by capillary action. A tubular sleeve is slidably received by the upper portion of the wick, and the sleeve is movable by lever means between a raised position in which most of the wick within the vapor collection space is covered by the sleeve and a lowered position in which most of the wick within the vapor collection space is exposed. The combustion head is removably secured to the fount by a tubular connector to permit replacement of the wick and support tube when desired.



# CHEMICAL

3,734,683

## FLAMEPROOFING OF CELLULOSE

Virendra N. Gupta, and Renald L. Lafond, both of Hawkesbury, Ontario, Canada, assignors to Canadian International Paper Company, Montreal, Quebec, Canada

Filed Apr. 23, 1970, Ser. No. 31,374  
Int. Cl. D06m 11/04, 11/12; C09k 3/28

U.S. Cl. 8-116 R

4 Claims

A process for flameproofing cellulosic materials, such as cotton and rayon. The cellulosic material is (a) oxidized to carboxycellulose, (b) the carboxycellulose is reacted with either a water-soluble alkali metal hydroxide, a buffer solution of water-soluble alkali metal salts or ammonia, and (c) the product of (b) is suspended in an aqueous solution of a water-soluble polyvalent cationic salt.

3,734,684

## FLAME RETARDANT PHOSPHORUS CONTAINING FIBROUS PRODUCTS AND METHOD FOR PRODUCTION

Darrell J. Donaldson, Metairie, Donald J. Dalgle, New Orleans, George L. Drake, Jr., and Wilson A. Reeves, Metairie, and John V. Beninate, Gretna, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed May 7, 1971, Ser. No. 141,446

Int. Cl. D06m 13/28

U.S. Cl. 8-183

13 Claims

Methylol phosphine, methylol phosphines in combination with nitrogenous compounds or water soluble adducts of the phosphine and nitrogenous compounds are used to treat organic fibrous derivatives containing primary and/or secondary amino groups such as wool, leather, nylon and aminized cottons, etc., to produce fibrous derivatives which are glow-, wrinkle-, rot- and shrink-resistant.

3,734,685

## CATALYSIS OF THE CELLULOSE-CYCLIC UREA REACTIONS BY BUILT-IN ACID GROUPS

Dorothy M. Perrier, and Ruth R. Benerito, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 15, 1972, Ser. No. 234,960

Int. Cl. D06m 13/20, 15/58, 15/72

U.S. Cl. 8-129

5 Claims

Sulfonic acid groups in sulfonoethylated cotton act as built-in catalysts for the reaction of cotton with substituted cyclic ureas. The cotton in the acid form did not require an additional catalyst for its reaction in aqueous media with dimethylethylene urea, dimethylolpropylene urea, dihydroxyethylene urea, and dimethylolhydroxyethylene urea. The strong acid groups of SE-cotton were more effective than carboxylic or phosphonic acid groups of carboxymethylated and phosphonomethylated cottons of like degree of substitution with each urea.

3,734,686

## COMPOSITION AND METHOD FOR TREATING CARPETS AND PILE FABRICS

George W. Douglas, Homewood, Ill., assignor to Cosden Oil & Chemical Company, Big Spring, Tex.

No Drawing. Filed Aug. 12, 1971, Ser. No. 171,391

Int. Cl. B08b 3/00

U.S. Cl. 8-137

2 Claims

A composition and method for treating carpets and pile fabrics to enhance the abrasion resistance and antistatic

properties of such articles are disclosed. The compositions are formulated by adding an aqueous emulsion of oxygen-free polyethylene to a conventional detergent composition adapted for the cleaning of carpets and pile fabrics, advantageously a carpet or upholstery shampoo. In shampooing a carpet or pile fabric with the subject compositions, there is additionally obtained an increase in foaming action of the shampoo as well as a decrease in the force necessary to apply the shampoo.

3,734,687

## FABRIC FINISHED WITH A FLUORINATED QUARTERNIZED HALOMETHYL ETHER

John Thomas Gresham, Skillman, N.J., assignor to FMC Corporation, New York, N.Y.

Division of Ser. No. 813,725, April 4, 1969, Pat. No. 3,622,590. This application Apr. 5, 1971, Ser. No. 131,451

Int. Cl. D06m 13/34

U.S. Cl. 8-188

1 Claim

Fluorinated halomethyl ethers and the quaternary salts thereof, which are useful as stain repellents, have the formulas:



wherein R<sub>n</sub> is perfluoroalkyl of four to 16 carbon atoms, R is alkylene of two to three carbon atoms, X is halogen of the group chlorine or bromine, A is the residue of a tertiary nitrogenous base, n is an integer of 1-12 and m is an integer of 1-4. The quarterized compounds are employed for treating textile material such as cotton fabric.

3,734,688

## LAUNDRY APPARATUS

Samuel Fairney, 16 Willow Road, Wellesley, Mass.

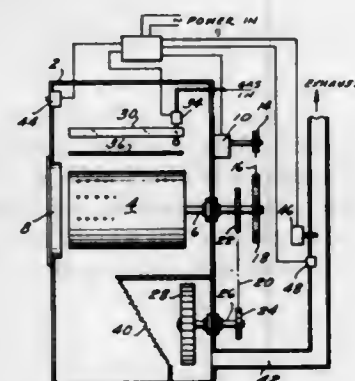
Continuation of Ser. No. 35,394, May 7, 1970, abandoned.

This application Dec. 27, 1971, Ser. No. 212,815

Int. Cl. D06f 33/02

U.S. Cl. 8-159

4 Claims



Laundry washer and drier equipment is adapted for washing sorted classes of fabrics, such as towelling, bed linens, and "no-iron" fabrics. Wash cycle lengths for the various classes of fabric are determined and the washer timer dial is marked for the start and finish time of each fabric. The dial on a drier having dry cycle times equal in length to the wash cycle times has its timer dial marked in the same manner.

MAY 22, 1973

CHEMICAL

1277

3,734,689

## PROCESS FOR SEPARATION OF HAFNIUM FROM ZIRCONIUM

Edwin M. Larsen, Madison, Wis., and Francisco C. Gil-Arno, San Bernardino, Caracas, Venezuela, assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

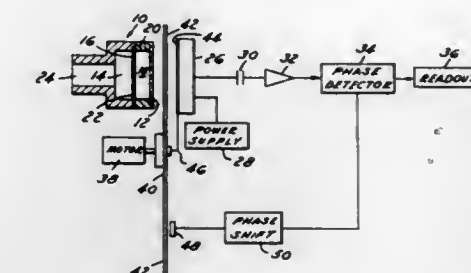
Filed Feb. 7, 1969, Ser. No. 797,683

Int. Cl. C22b 59/00

U.S. Cl. 423-71

13 Claims

A process for separating hafnium from zirconium wherein the tetrahalides of the metals are reacted with a metal selected from the group consisting of aluminum and zirconium in finely divided form in the presence of an aluminum trihalide at a reaction temperature above the melting point temperature for the aluminum trihalide whereby the reaction is carried out in a liquid system with preferential reduction of the zirconium component over the hafnium component to enable separations therebetween.



grounded electrically to the blade to prevent spurious electrical signals.

3,734,690

## CORROSION SURVEILLANCE SYSTEM

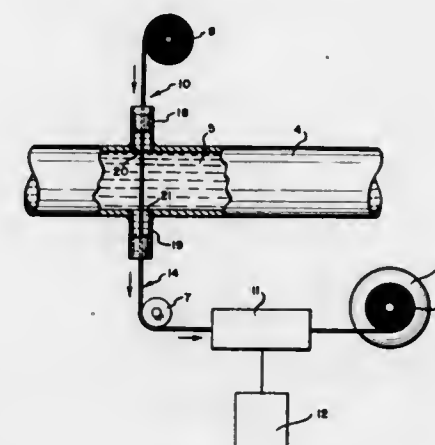
Morris Kolodney, River Edge, N.J., and William Arbiter, Yonkers, N.Y., granted to the United States Atomic Energy Commission under the provisions of 42 U.S.C. 2182

Filed Apr. 28, 1970, Ser. No. 32,542

Int. Cl. G01n 17/00

U.S. Cl. 23-230 C

21 Claims



An on-line corrosion surveillance system for monitoring corrosion damage to a structural component containing a corrosive liquid wherein a fine control element is, during operation, drawn longitudinally through the structural component and subsequently measured for corrosion damage due to its exposure to the corrosive liquid within the component. The control element is made of the same material as the structural component and specially constructed sealing means is provided for preventing escape of the corrosive liquid from the component as the control element is moved therethrough.

3,734,691

## SENSING SYSTEM FOR A CHEMILUMINESCENT INSTRUMENT

Cassimer M. Kukla, Taylor, and Alan Warnick, Oak Park, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sept. 15, 1971, Ser. No. 180,599

Int. Cl. G01n 21/52; G01j 1/54, 1/34

U.S. Cl. 23-253 R

7 Claims

An opaque blade is rotated between the light transmitting element of a chemiluminescent reaction chamber and a light sensing device. The blade is sufficiently wide to block momentarily all light transmission from the reaction chamber to the light sensing device. An alternating electrical signal thus is obtained directly from the light

3,734,692

## ALVEOLAR AIR BREATH SAMPLING AND ANALYZING APPARATUS

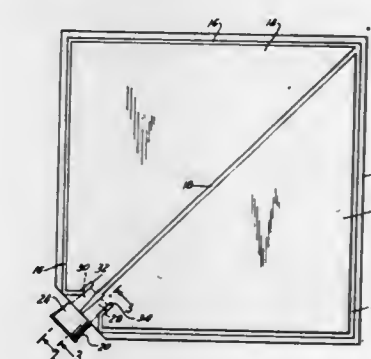
Jerome R. Lucker, Tenafly, and Andrew A. Oakes and Thomas H. Foster, Jr., Harrington Park, N.J., assignors to Becton Dickinson and Company, East Rutherford, N.J.

Filed Feb. 4, 1972, Ser. No. 223,670

Int. Cl. G01n 1/22, 33/16

U.S. Cl. 23-254 R

4 Claims



An apparatus for sampling alveolar breath by the sequential collection of a single exhalation includes an inelastic bag having first and second inflatable compartments therein. A mouthpiece is connected to the bag. The mouthpiece has an entrance conduit and a first outlet in communication with the first compartment and a second outlet in communication with the second compartment. The second outlet is adapted to retard the passage of air therethrough until a subject fills the first compartment. The sample of air collected in the second compartment is analyzed by forcing it through an ampoule filled with an alcohol colorimetric reagent.

3,734,693

## APPARATUS FOR DRYING AND DEVELOPING CHROMATOGRAMS

Darrell G. Petcoff, Hamilton, Mont., assignor to Ivan Sorvall, Inc., Newton, Conn.

Filed Aug. 9, 1971, Ser. No. 170,022

Int. Cl. F27b 5/14; F27d 11/00; G01n 31/08

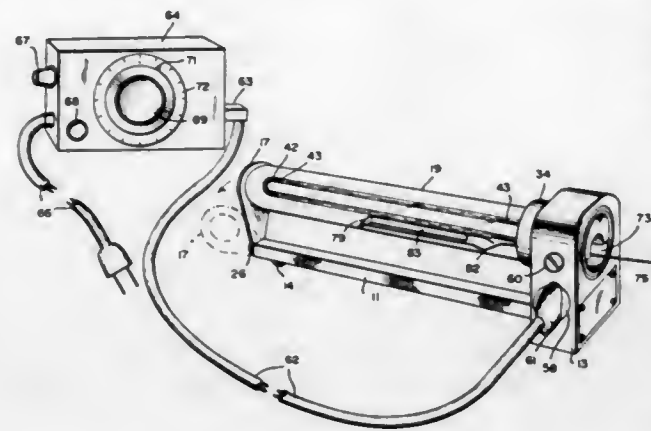
U.S. Cl. 23-253 PC

5 Claims

Apparatus and method for both drying and developing chromatograms safely in a single equipment into which they are removably inserted and processed within a confined heat controlled enclosure. A feature of the invention is the provision of an elongated heating element supported at one end by a block and a removable tubular enclosure

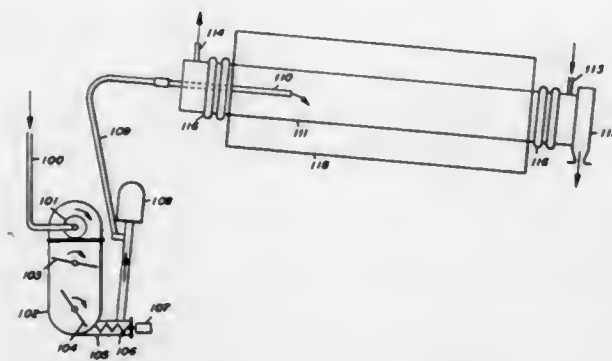


also supported by said block and forming a heating chamber around said heating element. Spring means are provided for releasably securing said tubular element around



said heating element. The apparatus comprises readily assembled and disassembled components which are corrosion-resistant and are easily cleaned.

**3,734,694**  
**APPARATUS FOR PRODUCING UO<sub>2</sub> POWDER**  
John J. McCoy, San Jose, Calif., assignor to General Electric Company  
Original application Apr. 25, 1968, Ser. No. 724,119, now Patent No. 3,579,311. Divided and this application Dec. 2, 1969, Ser. No. 881,438  
Int. Cl. C01g 43/02  
U.S. Cl. 23—262 3 Claims



An improved apparatus for preparing uranium dioxide powder suitable for use in the fabrication of fuel for nuclear reactors. The apparatus has a hopper for receiving dewatered sludge, mixing means within the hopper to maintain a uniform slurry in the hopper, means for receiving the slurry from the hopper and feeding the slurry through at least one outlet, and a rotating tube calciner adapted to be maintained at a temperature in excess of 1000° F. with the outlet positioned at about the center of the calciner circumference adjacent one end thereof.

**3,734,695**  
**PROCESS FOR MAKING MONOCRYSTALLINE SILICON**  
Willis H. Campbell, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.  
Filed Aug. 13, 1970, Ser. No. 63,381  
Int. Cl. B01j 17/18  
U.S. Cl. 23—301 SP 10 Claims

Disclosed is a process for making monocrystalline silicon in a zone refining operation. In this process, a gaseous mixture comprising predetermined volume percentages of hydrogen gas and a selected inert gas, such as argon,

is introduced or "purged" into a chamber of a zone refiner both prior to and during a silicon zone refining operation. The presence of a selected volume percentage of no more than 5% hydrogen gas in this gaseous mixture which is purged into the zone refining chamber has been found to eliminate swirls in the silicon which had previously been discovered after etching zone refined silicon wafers processed in a zone refining operation using no hydrogen gas.

**3,734,696**  
**VANADIUM RECOVERY FROM ACIDIC SOLUTIONS**  
Michael F. Lucid, and William M. Leaders, both of Oklahoma City, Okla., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.  
Filed Sept. 4, 1970, Ser. No. 69,938  
Int. Cl. B01d 11/04; C01g 31/00  
U.S. Cl. 23—312 ME 4 Claims

A method for the extraction of vanadium (V) from acidic mixtures containing fluoride comprising effecting the extraction with amines in a water-immiscible organic solvent, the vanadium being complexed with the extractant and being extracted into the organic phase.

**3,734,697**  
**PUMP IMPELLER MAKING**  
Leonard J. Sieghartner, Coal Valley, Ill., assignor to Roy E. Roth Company, Rock Island, Ill.  
Filed July 13, 1970, Ser. No. 54,441  
Int. Cl. B21k 3/04; B23p 15/02, 15/04  
U.S. Cl. 29—156.8 R 3 Claims



The process of making an impeller for use in a pump by affixing a disc having blades formed about its outer periphery onto the reduced diameter portion of a hub. A plurality of longitudinal grooves is formed lengthwise into the reduced diameter hub portion and then pressed into a circular bore formed in the center of the impeller disc. The assembly is then placed in a press to swage the outer annular edge of the reduced diameter hub portion into a chamfer provided around the circular bore of the disc to thereby solidly hold the disc against the shoulder on the hub.

**3,734,698**  
**TRANSPARENT ELECTROCONDUCTIVE WINDOW AND ELECTROCONDUCTIVE SOLDER THEREFOR**  
Dennis S. Postupack, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.  
No Drawing. Filed Sept. 18, 1970, Ser. No. 73,619  
Int. Cl. B21d 39/00  
U.S. Cl. 29—191 7 Claims

A tin-free alloy for use in making an electrical solder connection between a tinned copper wire and a ceramic silver conductive stripe on a glass substrate. The solder

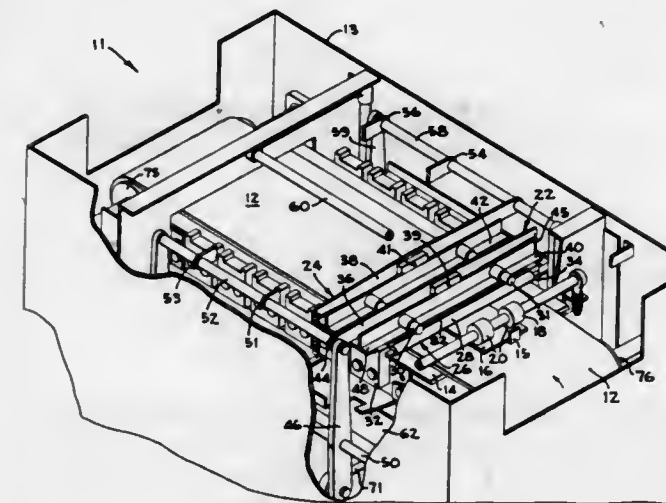
connection is useful in electroconductive windows, particularly laminated windows fabricated at a temperature range up to about 300° F.

**3,734,699**  
**REINFORCED PIG IRON WEAR PLATE**  
Herbert Austermann, Dortmund-Solde, Germany, assignor to Hermann Rappold & Co., GmbH, Duren-Birkesdorf, Germany  
Continuation of application Ser. No. 691,793, Dec. 19, 1967. This application Aug. 28, 1970, Ser. No. 68,003  
Claims priority, application Germany, Dec. 19, 1966, H 61,335  
Int. Cl. B23p 3/20  
U.S. Cl. 29—191.4 7 Claims



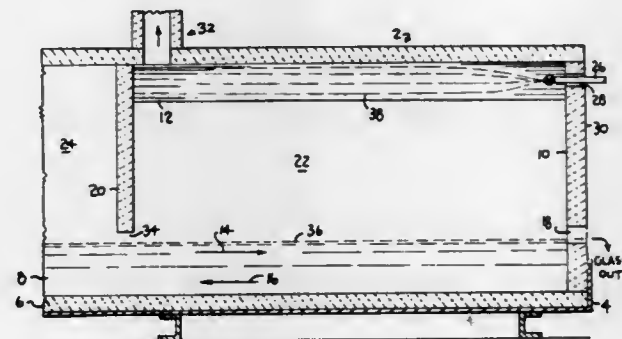
A cast iron wear plate, particularly resistant to stresses due to grinding action and due to impacts, such as are characteristic of mining operations, has the following composition in percentages by weight: carbon 3.4 to 4.1%, silicon 0.15 to 0.6%, manganese 0.5 to 0.9%, phosphor 1.6 to 2.0% and sulphur 0.025 to 0.15%, balance substantially all iron with the usual impurities. The wear plate has cast therewith a gridwork of circular cross section reinforcing rods arranged in two superposed layers so as to form square or rectangular interspaces, these circular cross section steel rods being welded to each other. A fastening screw or screws are also cast with the wear plate.

**3,734,700**  
**ARTICLE ABRADING APPARATUS**  
Thomas Gutierrez, 395 N. Madison St. 95050, and Wallace Amaral, 2547 Amethyst 95051, both of Santa Clara, Calif.  
Filed May 10, 1971, Ser. No. 141,761  
Int. Cl. B24b 7/12  
U.S. Cl. 51—61 10 Claims



The disclosure is an article abrading apparatus having an article carrier belt and arms including abrading members moving across the belt with abrasive reciprocating motion. Abrasive contact with articles of flat and triangular cross sectional shapes is provided by a

**3,734,701**  
**METHOD FOR MAKING FLOAT GLASS**  
George A. Pecoraro, Lower Burrell; John F. McConnell, and Leonard A. Knovich, both of Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.  
Filed Apr. 29, 1971, Ser. No. 138,699  
Int. Cl. C03b 5/22  
U.S. Cl. 65—27 5 Claims



In the production of high-quality flat glass by the float process, tridymite-frost stone defects are safely avoided by providing burners in the refiner zone of the furnace to shield the crown of that portion of the furnace from contact with alkali vapors, and at the same time providing not only a barrier that substantially separates the refiner-zone headspace from the melter headspace but also preferably a means associated with refiner-zone headspace for exhausting or venting it.

**3,734,702**  
**GLASS SEALING METHOD**  
Frank Veres, Toledo, Ohio, assignor to Owen-Illinois Inc., Toledo, Ohio  
Continuation-in-part of Ser. No. 860,433, Sept. 23, 1969, Pat. No. 3,645,839, which is a continuation-in-part of Ser. No. 790,465, Jan. 10, 1969, abandoned. This application May 3, 1971, Ser. No. 139,900  
Int. Cl. C03c 27/00, 29/00  
U.S. Cl. 65—43 9 Claims

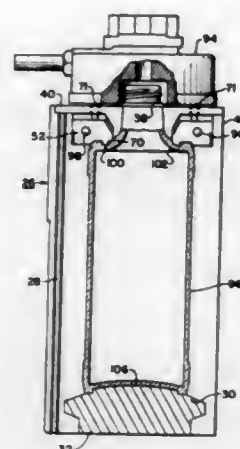
A crystallizable fusion-type glass sealing composition, such as lead borosilicate or lead-zinc-borate solder glass, having incorporated therein from about 1 to about 18 percent by weight of aluminum titanate; which composition is used as a sealing glass. The aluminum titanate inhibits crystallization, thus allowing for more time for sealing parts without developing a seal with uneven stress concentration due to crystallization.

**3,734,703**  
**METHOD FOR FORMING A BLOWN BOTTLE HAVING A CHIME IN THE SHOULDER PORTION THEREOF**  
Elvin R. Hollingsworth, Winchester, Ind., assignor to Overmyer Corporation, Winchester, Ind.  
Filed Jan. 12, 1971, Ser. No. 105,872  
Int. Cl. C03f 9/14  
U.S. Cl. 65—68 4 Claims

Method for forming a bottle having a chime or groove in its shoulder portion. This is achieved by providing at the tops of two mold halves movable mold parts forming an annular flange. The movable parts and the flange carried thereby are normally urged upwardly by coil springs but are forced downwardly against the force of the springs by a blowhead positioned over the mold halves when closed around a par-



tially formed glob of glass (i.e., a parison). After the bottle is blown, the blowhead is removed, permitting the aforesaid



movable mold halves to move upwardly under the force of the springs to permit the mold halves to open and release the blown bottle having a chime in its shoulder portion.

3,734,704

## METHOD OF MAKING GLASS ARTICLES

Roy Albert Fike, Waco, Tex., assignor to Owens-Illinois, Inc., Toledo, Ohio

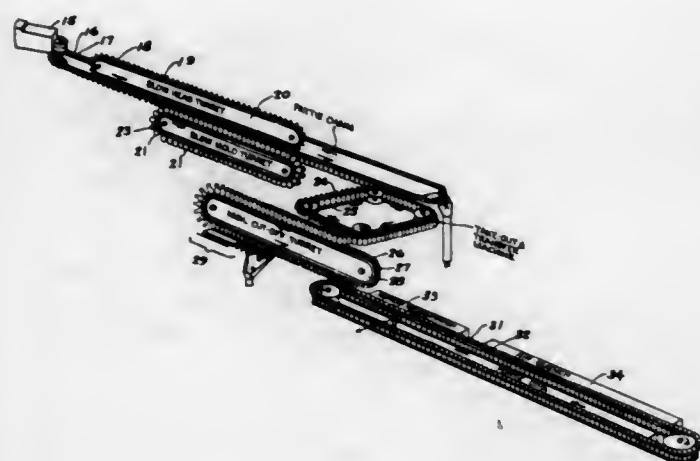
Continuation of Ser. No. 15,523, March 2, 1970, abandoned.

This application Oct. 15, 1971, Ser. No. 189,755

Int. Cl. C03b 9/14, 2/100, 25/00

U.S. Cl. 65-69

10 Claims



A method of forming a hollow glass article including a bulbous base portion and an open neck portion wherein the glass article initially formed is inclusive of an integral moile, with a compressive stress on the outer surface by first forming the glass article from a ribbon of glass by blowing the glass outwardly against the sides of the rotating mold, severing the article from the ribbon of glass, and allowing the blown article to cool which provides substantially uniform compressive stresses throughout the outer surface thereof, shaping the neck portion of the article by burning off the moile and forming a finish rim in bead form which disturbs the compressive stresses in an area of the neck portion; whereupon the area of the neck is heated and quenched to re-establish the compressive stresses in the outer surface of the neck portion as well as the balance of the outer surface of the article.

### 3,734,705 METHOD AND APPARATUS FOR PRODUCING AND PACKAGING SEALED TUBULAR GLASS BODIES

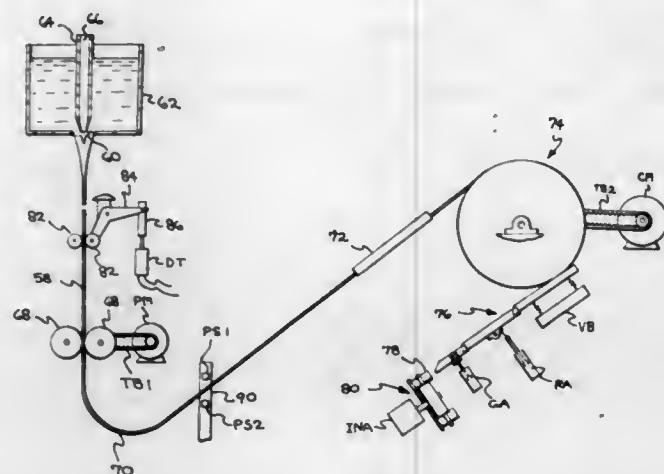
Frederick D. Fincham, Monclova, Ohio, assignor to Owens-Illinois, Inc.

Filed Apr. 9, 1971, Ser. No. 132,720

Int. Cl. C03b 15/18

U.S. Cl. 65-87

30 Claims



Method and apparatus for automatically producing and packaging sealed sections of thermoplastic tubing, such as glass tubing. Spaced localized zones, of a length of tubing held in an arcuate path to exert a bending moment on the tubing, are heated to melt the tubing at each zone to enable the tubing to separate at the zones into individual sections as the bending moment on the tubing pulls the tubing apart. The tubing is clamped in the arcuate path intermediate the localized zones to enable each tubing portion end to exert a bending moment independent from the bending moment exerted by the other end of the tubing portion. The clamped individual tubing sections are then released and directed to a packaging area.

3,734,706

## PRODUCING BENT TEMPERED GLASS SHEETS

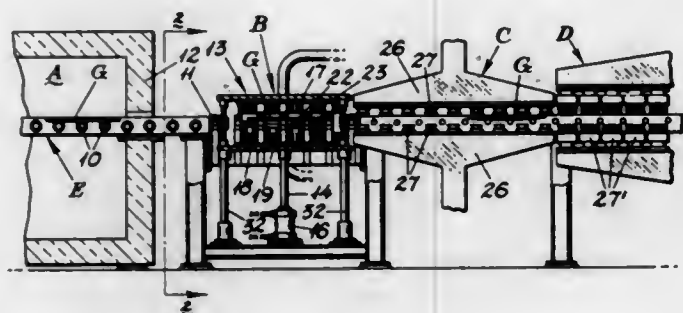
George F. Ritter, Jr., Toledo, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Apr. 16, 1971, Ser. No. 134,672

Int. Cl. C03b 27/00, 23/02

U.S. Cl. 65-104

10 Claims



Method and apparatus for producing bent tempered glass by heating a sheet of glass during movement along a horizontal path and toward a ring type bending mold located beneath the path, raising the mold when the heated sheet reaches a position directly over it to lift the sheet bodily from the path and rapidly enough to cause it to sag into conformity with the shaping surface of the mold, rapidly chilling the bent sheet on the raised mold to initiate the tempering thereof, and continuing the chilling without cessation during lowering of the mold to return the sheet to the path and until the tempering is complete.

### 3,734,707 PROCESS FOR REDUCING EMISSION OF DUST BY GRANULAR FERTILIZER COMPOSITIONS

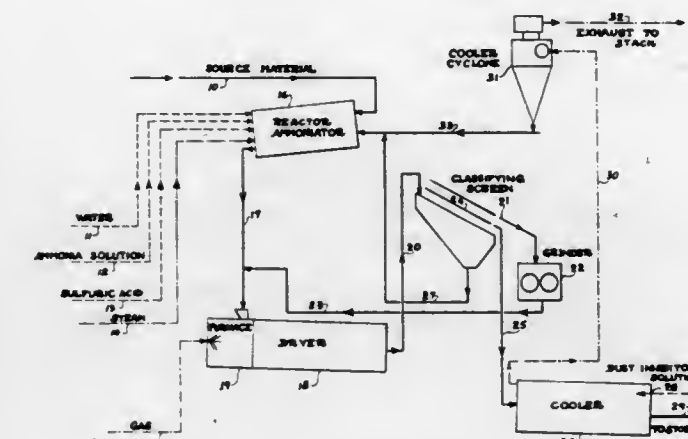
James E. Seymour, Virginia Beach, Va., assignor to Royster Company, Norfolk, Va.

Filed Oct. 22, 1970, Ser. No. 82,950

Int. Cl. C05c 7/00

U.S. Cl. 71-30

22 Claims



Emission of air-borne particulates by granular fertilizer compositions upon being moved or handled is substantially reduced by spraying the granules with aqueous solutions of nitrogen-containing salts at the end of the cooling phase of the manufacturing procedure.

3,734,708

## METHOD FOR MAKING AMMONIUM PHOSPHATE FERTILIZER

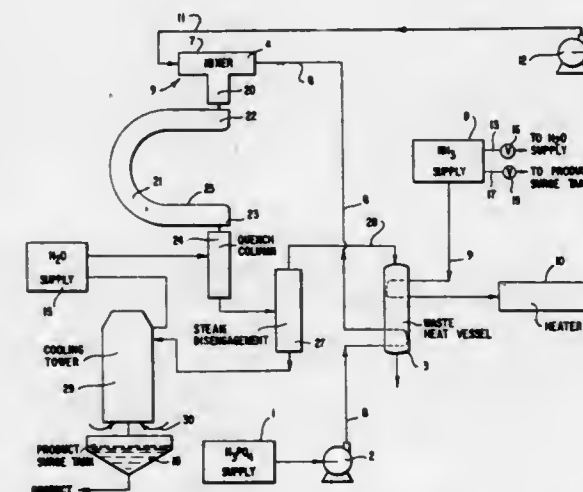
Tom V. Burns, St. Rose, La., assignor to Amex Phosphates, Inc., Houston, Tex.

Filed Feb. 24, 1971, Ser. No. 118,299

Int. Cl. G05b 7/00

U.S. Cl. 71-34

8 Claims



Methods and apparatus for reacting ammonia and phosphoric acid in a high temperature vaporous reaction. The apparatus includes a tee mixer wherein hot ammonia is used to heat and atomize phosphoric acid, and a loop reactor wherein the mixed reactants are retained for from 0.10 to 0.18 seconds after which the reaction product is immediately quenched. The apparatus also includes materials handling devices for controlling reactant flows and reaction conditions whereby high analysis polyphosphate fertilizers are produced in dry or liquid form.

### 3,734,709 PROCESS FOR THE PRODUCTION OF CHLORINE, SODIUM BICARBONATE AND AMMONIUM-SODIUM NITRATE

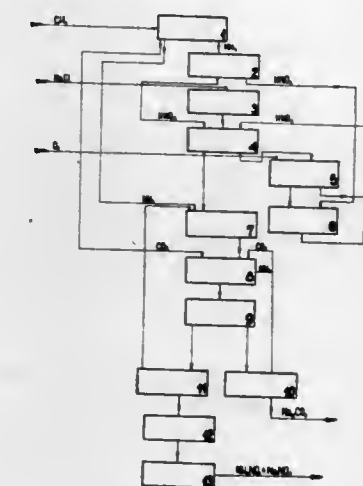
Ernest Pischinger, Konopnickiej 21a, Torun; Stanislaw Bursa, Malczewskiego 19/5, Szczecin; Henryk Konecny, Krasinskiego 57/9, Torun, and Jerzy Straszko, Ksieciz, Witolda 1a/10, Szczecin, all of Poland

Continuation-in-part of Ser. No. 808,062, March 18, 1969, abandoned. This application Oct. 22, 1971, Ser. No. 191,822

Int. Cl. C05c 13/00

U.S. Cl. 71-59

5 Claims



A combined process for producing chlorine, sodium bicarbonate and ammonium-sodium nitrate comprising oxidizing sodium chloride with nitric acid solution to form with unreacted nitric acid, sodium nitrate solution and gaseous reaction products including chloride, nitrogen oxide and nitrosyl chloride; oxidizing chlorine compound in said gaseous mixture to chlorine and removing chlorine by liquefaction and distillation or by absorption with solvent; absorbing nitrogen oxides in said gaseous reaction products into nitric acid, neutralizing the solution mixture of sodium nitrate and nitric acid by ammoniation and carbonizing the neutralized product to precipitate sodium carbonate and leave a solution of ammonium-sodium nitrate.

3,734,710

## HERBICIDAL METHOD EMPLOYING CHLORO-METHANE SULFONANILIDES

Alfons Lukaszczuk, Basel, Switzerland, and Georg Pissiotas, Loerrach, Germany, assignors to Ciba Limited, Basel, Switzerland

Filed Apr. 22, 1970, Ser. No. 30,982

Claims priority, application Switzerland, Apr. 30, 1969, 6617/69

Int. Cl. A01n 9/16

U.S. Cl. 71-103

1 Claim

Halogenmethanesulfonamides, preferably halogenmethanesulfonamides which are substituted or unsubstituted in the phenyl nucleus may be used as plant influencing agents, for example as selective herbicides.

3,734,711

## HERBICIDAL COMPOSITION AND METHOD

John Yates, Whitstable, and Barry R. J. Devlin, Sittingbourne, England, assignors to Shell Oil Company, New York, N.Y.

No Drawing. Original application Sept. 3, 1969, Ser. No. 855,014, now Patent No. 3,634,509. Divided and this application Mar. 15, 1971, Ser. No. 124,467

Int. Cl. A01n 9/20

U.S. Cl. 71-118

6 Claims

Novel herbicidal ortho-nitroanilinoacetamides such as 2-(2,6-dinitroanilino)-N-methyl-propionamide.



3,734,712

**METHOD FOR CONTROLLING UNWANTED PLANT GROWTH**

Adolf Fischer, Mutterstadt, Karl-Heinz Koenig, Ludwigshafen, Gustav Steinbrunn, Schwegenheim, and Albrecht Zaschocke, Bad Dürkheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Continuation-in-part of application Ser. No. 652,034, July 10, 1967, now Patent No. 3,621,055. This application Sept. 11, 1970, Ser. No. 71,356  
Claims priority, application Germany, July 19, 1966, P 15 42 834.9; Jan. 17, 1967, P 16 42 217.6  
Int. Cl. A01n 9/20

U.S. Cl. 71-120

2 Claims

Method for controlling unwanted plant growth with substituted urea derivatives.

3,734,713

**PREPARATION OF POWDER COMPOSITION FOR MAKING DISPERSION STRENGTHENED BINARY AND HIGHER NICKEL BASE ALLOYS**

Bud W. Kushnir, Edmonton, Alberta, Leon F. Norris and Robert W. Fraser, Fort Saskatchewan, Alberta, and David J. I. Evans, North Edmonton, Alberta, Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Ontario, Canada

No Drawing. Filed Aug. 21, 1969, Ser. No. 852,110

Int. Cl. B22f 9/00

U.S. Cl. 75-5 AC

5 Claims

Metal-refractory oxide powder compositions adapted for powder metallurgical fabrication of wrought dispersion strengthened nickel base binary and higher alloys are prepared by wet attritor grinding blends of very finely divided metal powders. The blends are formed of composite nickel-refractory oxide powder and chromium, tungsten, molybdenum and/or cobalt powder having a particle size below 1 micron. The wet attritor grinding is conducted for a time sufficient to produce a homogeneous powder mixture and to effect uniform spatial distribution of the refractory oxide particles in the powder mixture.

3,734,714

**PROCESS FOR PRODUCING A Ca-Ba-Al-Si-CONTAINING ALLOY**

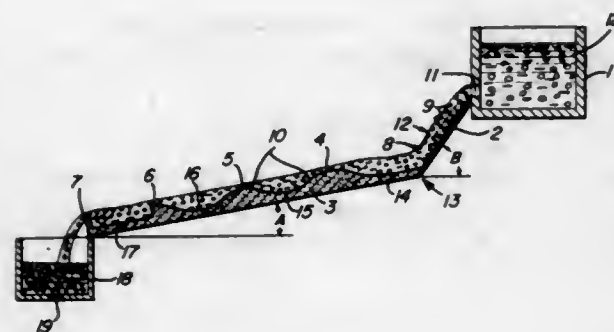
Donald S. Kozak, North Tonawanda, N.Y., and David P. Miller, Marietta, Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 29, 1970, Ser. No. 76,466

Int. Cl. C22d 7/06

U.S. Cl. 75-10 R

9 Claims



This invention relates to a continuous process and apparatus for producing a steel treating agent of a Ca-Ba-Al-Si-containing alloy and particularly to an intermediate pre-chilling step whereby the slag from a molten Ca-Ba-Si-containing alloy is effectively removed prior to introducing the additives of aluminum and a metal selected from the group consisting of iron, nickel, chromium, cobalt and manganese, to form the Ca-Ba-Al-Si-containing alloy.

3,734,715

**EXTRACTION OF METAL VALUES FROM COMPLEX ORES**

Michael J. Redman, Belmont, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.

Filed July 16, 1970, Ser. No. 55,304

Int. Cl. C22b 3/00; C21b 1/02

U.S. Cl. 75-21

9 Claims

Copper, nickel, cobalt and molybdenum may be extracted from complex ores containing manganese, iron, copper, nickel, cobalt and molybdenum by subjecting the complex ore to gaseous reductants at temperatures in the range of 300 to 800° C. and leaching the reduced complex ore with a solution of an ammonium salt in aqueous ammonia.

3,734,716

**STEELMAKING PROCESS**

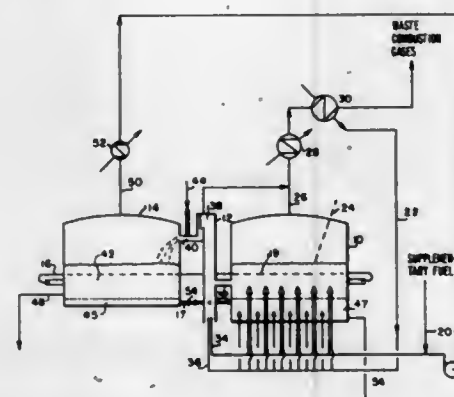
Leonard Seglin, New York, N.Y., and Charles A. Gray, Charleston, W. Va., assignors to FMC Corporation, New York, N.Y.

Filed Nov. 18, 1971, Ser. No. 200,033

Int. Cl. C21b 1/02, 13/14

U.S. Cl. 75-28

1 Claim



Iron ore is melted, together with recycle slag and a flux if necessary, in an oxidizing zone to a temperature substantially higher than that necessary for carbon to reduce the ore to the metal; the hot molten material is pumped into a separate reduction zone into which carbon is fed to reduce the oxidized iron to iron; the molten slag from the reduction, cooled substantially by the endothermic reaction, is then in part recirculated back to the oxidizing zone and in part removed from the process; the iron is fed back to the oxidizing zone, below the slag level, and is converted to steel by the use of oxygen, and chemical additives as needed.

3,734,717

**PRODUCTION OF PHOSPHORUS AND STEEL FROM IRON-CONTAINING PHOSPHATE ROCK**

Leonard Seglin, New York, N.Y., and Charles A. Gray, Charleston, W. Va., assignors to FMC Corporation, New York, N.Y.

Filed Nov. 18, 1971, Ser. No. 200,154

Int. Cl. C21b 1/02, 13/14; C01b 25/02

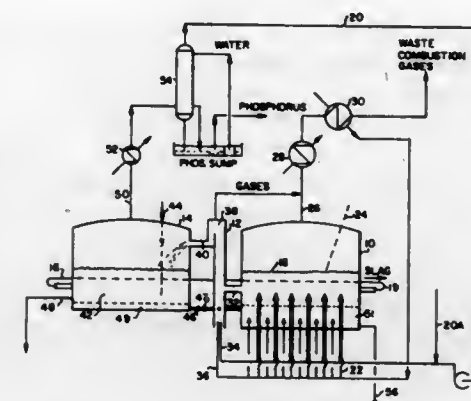
U.S. Cl. 75-28

1 Claim

Phosphate rock, containing oxidized phosphorus and iron, is melted, together with recycle slag and a flux if necessary, in an oxidizing zone to a temperature substantially higher than that necessary for carbon to reduce the iron and phosphorus; compounds in the ore to their elements; the molten material is pumped into a separate reduction zone into which carbon is fed to reduce the iron and phosphorus compounds to their elements; the molten slag from the reduction, cooled substantially by the endothermic reaction, is then in part recirculated back to the oxidizing zone and in part removed from the process. The phosphorus produced is collected overhead from

the reducing zone; the alloy of iron and phosphorus produced in the reduction is transferred to the oxidizing

furnace burner arrangements are disclosed which respectively employ oxy-oil burners of the self-atomizing tip-mix type, and oxy-gas burners of the rocket type. In each



zone, where the phosphorus is preferentially oxidized, and steel is recovered from the bottom of the oxidizing zone.

3,734,718

**MAGNESIUM-MAGNESIUM CHLORIDE BATH SEPARATION**

William L. Bradshaw, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 15, 1971, Ser. No. 208,263

Int. Cl. C22b 7/00, 45/00; B07b 1/00

U.S. Cl. 75-63

13 Claims

Magnesium metal, when removed from the electrolytic cells from which it is produced, unavoidably has an appreciable amount of electrolytic bath, also usually a small amount of particulate solid impurities (commonly called sludge) adhering to the metal. The separation of the electrolytic bath therefrom and the disposal thereof is attained by the practice of the invention which comprises, broadly, passing the mixture of molten metal and bath, together with the solid particulate sludge therein, onto a wire mesh metal screen, having openings in the range of about 2.46 mm. to about 0.84 mm., whereby the bath falls through the screen and is optionally transferred onto a cooler collecting surface, preferably a portable surface where it solidifies, and the molten metal, and any particulate solid impurities present, passes on preferably into a heated holding vessel or reservoir from which molten metal is being drawn for casting.

In the preferred embodiment of the invention the molten magnesium containing sludge particles is passed onto a wire mesh sieve, having openings of from between about 2.60 mm. to about 5.60 mm., usually in the form of a basket, the sludge being retained thereon and the molten magnesium passing through to the holding vessel.

3,734,719

**OXY-FUEL PROCESS FOR MELTING ALUMINUM**

James W. Estes, Piscataway, Lewis J. Geiger, Jr., Edison, and Thomas L. Shepherd, Essex Fells, N.J., assignors to Airco, Inc.

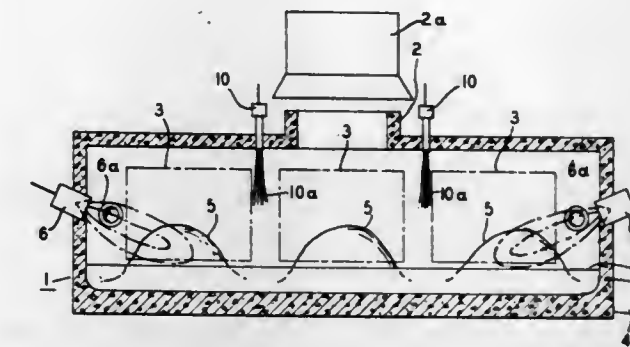
Filed Nov. 13, 1968, Ser. No. 775,367

Int. Cl. C22b 7/00, 21/06, 21/00

U.S. Cl. 75-65

14 Claims

Process for melting metals in a fuel-fired furnace, more specifically, for the remelting of secondary aluminum. The process, which may be applied in a furnace of the reverberatory type, employs one or more oxy-fuel burners to supplement the heating operation of conventional air-fuel burners. The oxy-fuel burner flame is carefully controlled as to length, direction, velocity, temperature, and flame chemistry so that at least 90 percent of the combustion is completed before the combustion products come in contact with the charge or the bath. Several alternative



case, the oxy-fuel burners are disposed to create turbulence which substantially enhances the heat transfer in the furnace, thereby vastly increasing the melting rate.

3,734,720

**METHOD OF SEPARATING SUBSTANCES FROM A MELT OF GOOD ELECTRICAL CONDUCTIVITY**

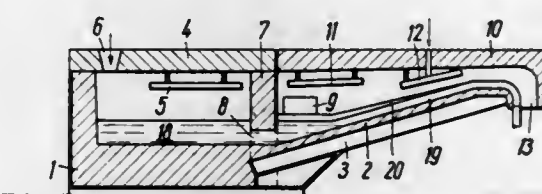
Axel von Starck, Remscheid-Luttringhausen, and Franz Pawlek, Berlin, Germany, assignors to AEG-Eltherm GmbH, Remscheid-Hasten, Germany

Filed June 1, 1971, Ser. No. 148,347

Int. Cl. C22b 9/12, 7/00, 21/06

U.S. Cl. 75-93

6 Claims



A method of separating from a melt substances having solubilities which decrease with decreasing temperature whereby the melt is conveyed by an electro-magnetic field up an ascending conveyor trough from a holding vessel and a temperature gradient generated along the trough to cause the substances to precipitate.

3,734,721

**PRODUCTION OF NICKEL POWDER FROM BASIC NICKEL CARBONATE**

Willie Seibt, Edmonton, and Donald Robert Weir, Fort Saskatchewan, Alberta, Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Ontario, Canada

No Drawing. Filed June 21, 1971, Ser. No. 155,328

Int. Cl. C22b 23/04

U.S. Cl. 75-108

15 Claims

Basic nickel carbonate which contains sulphur and undesirable impurities such as magnesium, aluminum, manganese, iron, zinc and silica is slurried in aqueous media and is reacted with hydrogen under conditions which are controlled such that the nickel content of the slurry is reduced to elemental powder form while the impurities are converted to insoluble compounds which are only physically associated with the nickel powder and, therefore, readily separable therefrom. Specifically, any sulphur in the reduction slurry that is not in sulphate form is



first oxidized to sulphate form and then sufficient compatible acid neutralizing reagent, such as ammonia, is provided in the slurry to produce a pH in the reduction end solution above about 3.5 and preferably between about 5 and about 7. With such pH control in the reduction operation the impurities in the basic nickel carbonate feed material are precipitated as a mixture of hydroxides and carbonates physically mixed with nickel powder product. The nickel powder product is separated from the reduction end solution and from the impurities precipitate by simple mechanical means such as magnetic decantation and is then washed with water and/or weak acid solution to remove any residual impurities. The final product is a high purity nickel powder which meets ASTM specifications with respect to metal impurities.

### 3,734,722 PROCESS FOR THE QUANTITATIVE RECOVERY OF GOLD FROM AQUEOUS SOLUTIONS

Max Ziegler, Göttingen-Herberhausen, Germany, assignor to W. C. Heraeus GmbH, Hanau, Germany  
No Drawing. Filed June 14, 1971, Ser. No. 153,114  
Claims priority, application Germany, June 25, 1970, P 20 31 432.3

U.S. Cl. 75—118 3 Claims  
Int. Cl. C01g 7/00; C22b 11/00  
Gold is recovered from mineral acid solution by forming a complex with tetrahydrofuran, dissolving the complex in an organic solvent and recovering the gold.

### 3,734,723 COMPACTED AND SINTERED POWDER MASS HAVING A DISCRETE CAVITY IN THE MASS AND METHOD OF FORMING

Earl B. Blasch, Colonie, Richard M. Klingaman, Tonawanda, and Daniel M. Page, Cohoes, N.Y., assignors to the United States of America as represented by the Secretary of the Army  
No Drawing. Filed Sept. 4, 1970, Ser. No. 69,977  
Int. Cl. B22f 1/00

U.S. Cl. 75—214 10 Claims  
A structure and method of forming the structure of a compacted and sintered powder mass having one or more discrete cavities in the mass. Each cavity within the mass is formed by the vaporization through sintering of a core material compacted within the powder mass prior to sintering.

### 3,734,724 DEVELOPED IMAGE TRANSFER

William C. York, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.  
No Drawing. Filed Oct. 13, 1969, Ser. No. 865,996  
Int. Cl. B41n 3/00; G03g 13/14

U.S. Cl. 96—1.4 13 Claims  
Developed images carried on a photoconductive element are transferred by first applying a repelling potential to a conductive receiving member, contacting the member with the developed image, and uniformly exposing the element to actinic radiation while applying an external bias potential.

### 3,734,725 SILVERLESS PHOTOGRAPHIC PRINTING PAPER

Robert J. Bailey, College Park, Md., assignor to W. R. Grace & Co., New York, N.Y.  
No Drawing. Filed May 28, 1969, Ser. No. 828,724  
Int. Cl. G03c 5/00

U.S. Cl. 96—35.1 18 Claims  
This invention relates to a novel polyethylene glycol-containing polyene which in combination with a polythiol, photosensitizer and pigment adhered to at least one UV transparent film by an adhesive layer can be used as a silverless photographic printing paper which can be developed by washing in warm water.

### 3,734,726 DIFFUSIBLE COLOR COUPLER MOIETIES ARE RELEASED FROM NONDIFFUSIBLE M-SULFOAMIDOANILINES OR M-SULFOAMIDOPHENOLS IN DIFFUSION TRANSFER PHOTOGRAPHIC PRODUCTS AND PROCESSES

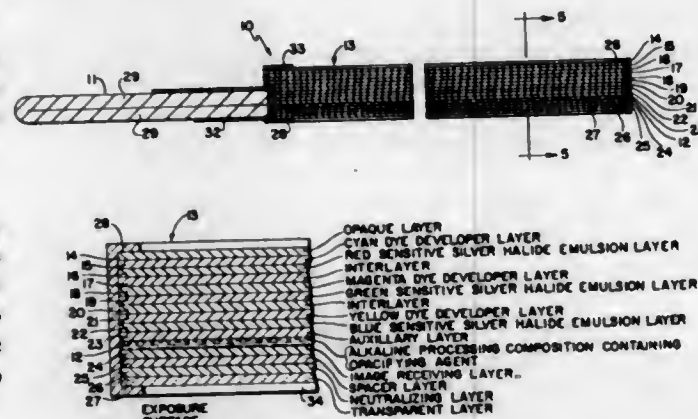
John Figueras, and Max H. Stern, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
Filed Oct. 4, 1971, Ser. No. 186,394  
Int. Cl. G03c 1/40, 5/54, 7/00

U.S. Cl. 96—3 20 Claims  
Color, diffusion transfer photographic elements, film units and processes are described which employ a nondiffusible, substantially colorless m-sulfonamidoaniline or m-sulfonamidophenol which reacts with oxidized color developing agent to release a coupler moiety which couples with oxidized color developing agent to produce a diffusible dye which diffuses to a dye image-receiving layer.

### 3,734,727 PHOTOGRAPHIC PRODUCTS AND PROCESSES

Terry W. Milligan, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of abandoned applications Ser. No. 83,479 and Ser. No. 83,480, both Oct. 23, 1970. This application Oct. 28, 1971, Ser. No. 193,480  
Int. Cl. G03c 1/48, 5/54, 17/00  
U.S. Cl. 96—29 D 41 Claims



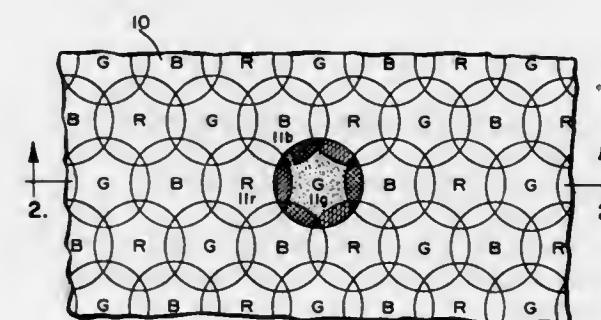
The present invention relates to photography and, more particularly, to reflection type diffusion transfer process photographic film units which comprise a composite photosensitive element adapted to provide, by diffusion transfer photographic processing, selective integral negative and positive image recodation of incident actinic radiation as a function of the point-to-point degree of photosensitive element exposure, which includes a plurality of sequential layers including a photosensitive silver halide layer having associated therewith image-forming material which is processing composition diffusible at a first pH as a function of the point-to-point degree of silver halide layer exposure to incident actinic radiation; a layer adapted to receive image-forming material diffusing thereto; and which additionally includes means for providing at least one optical filter agent at a pH above the  $pK_a$  of the optical filter agent whose  $pK_a$  is below said first pH in a concentration effective to provide, in situ, a layer exhibiting optical transmission density sufficient to provide a barrier with respect to incident visible radiation subsequent to photoexposure of the silver halide layer and means for reducing the initial pH of the layer to a second pH below the  $pK_a$  of the optical filter agent, which pH is above the pH necessary for diffusion of said image-forming material and, subsequent to substantial transfer

image formation in the reception layer, reducing the pH to a third pH wherein the image-forming material is nondiffusible.

### 3,734,728 METHOD OF SCREENING A COLOR PICTURE TUBE

Irwin Kachel, Skokie, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Aug. 24, 1970, Ser. No. 66,455  
Int. Cl. G03c 5/00, 7/00, 1/66  
U.S. Cl. 96—36.1



The screen of a color picture tube is provided with an interlaced pattern of filter components individually transmissive of one of the primary colors, green, blue and red. The filters are applied through a photographic printing process which features a water-based organic photosensitive coating material, including as an ingredient a metallic compound referred to as a luster, and having the property that upon being heated to a predetermined firing temperature the organic constituents evaporate, leaving as a residue an inorganic colorant that is predominantly transmissive to one of the three primary colors.

The filter components are dimensioned to overlap at their peripheral portions and define, in the areas of overlap, a light attenuator. The non-overlapping portion of each filter receives a deposit of a phosphor which emits light of the wavelength to which the associated filter component is transmissive.

### 3,734,729 DEEP ETCH PRINTING PLATES

Rexford W. Jones and William B. Thompson, Columbus, Ohio, assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

No Drawing. Continuation-in-part of applications Ser. No. 796,897, Feb. 5, 1969, now abandoned, Ser. No. 833,771, June 16, 1969, now Patent No. 3,677,759, Ser. No. 849,520, Aug. 12, 1969, now abandoned, and Ser. No. 123,084, Mar. 10, 1971. This application Sept. 27, 1971, Ser. No. 184,252  
Int. Cl. G03c 5/00

U.S. Cl. 96—36.3 10 Claims  
Method of forming a deep etch lithographic plate which comprises the steps of exposing a hydrophilic metal substrate bearing a light-sensitive layer capable of developing a  $R_d$  of 1.0 to 2.2 to actinic radiation to produce a potential  $R_d$  of 1.0 to 2.2; developing said light-sensitive layer with water-insoluble powder particles using physical force to embed the powder particles in the light-sensitive layer; removing non-embedded powder particles; fusing the water-insoluble powder particles to the hydrophilic metal substrate by heating; etching the hydrophilic metal substrate in the areas unprotected by the fused water-insoluble powder particles; applying a film forming, aromatic hydrocarbon insoluble, hydrophobic polymer to the plate from a poor solvent for the fused powder particles; and removing the fused powder particles and hydrophobic polymer adhering thereto with a poor solvent for said hydrophobic polymer.

### 3,734,730 POLYMETAL PRINTING PLATES

Rexford W. Jones and William B. Thompson, Columbus, Ohio, assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

No Drawing. Continuation-in-part of applications Ser. No. 796,897, Feb. 5, 1969, now abandoned, Ser. No. 833,771, June 16, 1969, now Patent No. 3,677,759, Ser. No. 849,520, Aug. 12, 1969, now abandoned, and Ser. No. 123,084, Mar. 10, 1971. This application Sept. 27, 1971, Ser. No. 184,261  
Int. Cl. G03c 5/00  
U.S. Cl. 96—36.3 10 Claims  
Method of forming a polymetal printing plate which comprises the steps of exposing a polymetal plate having a thin hydrophilic metal layer disposed over a hydrophobic metal surface, said hydrophilic metal layer bearing a light-sensitive layer capable of developing a  $R_d$  of 1.0 to 2.2 to actinic radiation to produce a potential  $R_d$  of 1.0 to 2.2; developing said light-sensitive layer with water-insoluble powder particles using physical force to embed the powder particles in the light-sensitive layer; removing non-embedded powder particles; fusing the water-insoluble powder particles to the hydrophilic metal subbing layer by heating; etching the hydrophilic metal layer in the areas unprotected by the fused water-insoluble powder particles and removing the fused water-insoluble powder particles.

### 3,734,731 PRODUCING PRINTED CIRCUITS BY USING POWDER-EMBEDDED COMPOSITION AS ETCH-RESIST

Rexford W. Jones and William B. Thompson, Columbus, Ohio, assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

No Drawing. Continuation-in-part of applications Ser. No. 796,897, Feb. 5, 1969, now abandoned, Ser. No. 833,771, June 16, 1969, now Patent No. 3,677,759, Ser. No. 849,520, Aug. 12, 1969, now abandoned, and Ser. No. 123,084, Mar. 10, 1971. This application Sept. 27, 1971, Ser. No. 184,272  
Int. Cl. G03c 5/00  
U.S. Cl. 96—36.1 10 Claims  
Method of forming a printed circuit which comprises the steps of exposing an insulating board bearing a conductive metal subbing layer, said conductive metal layer bearing a light-sensitive layer capable of developing a  $R_d$  of 1.0 to 2.2 to actinic radiation to produce a potential  $R_d$  of 1.0 to 2.2; developing said light-sensitive layer with water-insoluble powder particles using physical force to embed the powder particles in the light-sensitive layer; removing non-embedded powder particles from the non-image areas; fusing the water-insoluble powder particles to the metal subbing layer by heating; and etching the metal layer in the areas unprotected by the fused water-insoluble powder particles.

### 3,734,732 POLYMETAL PRINTING PLATES

Rexford W. Jones and William B. Thompson, Columbus, Ohio, assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

No Drawing. Continuation-in-part of applications Ser. No. 796,897, Feb. 5, 1969, now abandoned, Ser. No. 833,771, June 16, 1969, now Patent No. 3,677,759, Ser. No. 849,520, Aug. 12, 1969, now abandoned, and Ser. No. 123,084, Mar. 10, 1971. This application Sept. 27, 1971, Ser. No. 184,280  
Int. Cl. G03c 5/00

U.S. Cl. 96—36.3 10 Claims  
Method of forming a polymetal printing plate which comprises the steps of exposing a polymetal plate having a thin hydrophobic metal layer disposed over a hydrophilic metal surface, said hydrophobic metal layer bearing a



light-sensitive layer capable of developing a  $R_d$  of 1.0 to 2.2, to actinic radiation to produce a potential  $R_d$  of 1.0 to 2.2; developing said light-sensitive layer with water-insoluble powder particles using physical force to embed the powder particles in the light-sensitive layer; removing non-embedded powder particles; fusing the water-insoluble powder particles to the hydrophobic metal subbing layer by heating; and etching the hydrophobic metal layer in the areas unprotected by the fused water-insoluble powder particles.

3,734,733

# POSITIVE WORKING PHOTO-THERMOGRAPHIC MATERIALS CONTAINING BI-IMIDAZOLYL COMPOUNDS AND REDUCING AGENTS AND THE USE THEREOF IN COLOR DEVELOPMENT

Albert Lucien Poot, Kontich, Jan Frans van Besauw, Brasschaat, and Theofiel Hubert Ghys, Kontich, Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium. No Drawing. Filed Apr. 8, 1971, Ser. No. 132,612. Claims priority, application Great Britain, Apr. 9, 1970, 16,998/70.

Int. Cl. G03c 5/24, 1/00

U.S. Cl. 96—48 HD

19 Claims

A recording element carrying a photo-oxidizing bi-imidazolyl compound in chemically reactive contact with a compound having reducing properties is imagewise exposed to activating radiation to effect reaction between the bi-imidazolyl compound in the exposed areas of the element and the reducing compound to destroy the reducing properties of the latter in such exposed areas and thereafter the exposed element is uniformly contacted with an image-forming compound which is reactive on heating with said reducing compound to produce a distinctive coloration and heated so as to produce by such reaction a visible image corresponding to the unexposed areas of the recording element.

3,734,734

# DEPROTEINIZING PROTEIN-CONTAINING SOLUTIONS

Alfred Halpern, Great Neck, and Ernest J. Sasnor, Yonkers, both of N.Y., assignors to Synergistics, Yonkers, N.Y. Division of Ser. No. 872,783, July 7, 1969, and a continuation of Ser. No. 339,443, Jan. 22, 1964, Pat. No. 3,361,769. This application Dec. 29, 1971, Ser. No. 213,763.

Int. Cl. C12h 1/00

U.S. Cl. 99—48

5 Claims

Protein-containing solutions are deproteinized by adding a compound having the formula  $XAlOH_2R$ , wherein X may be the magnesium or calcium ion and R is either the gluconic, glucuronic or galacturonic acid radical.

3,734,735

# COLOUR RADIOGRAPHY

Jacques Elle Borles, La Varenne St. Hilaire, France, assignor to Agfa-Gevaert N.V., Mortsel, Belgium. Filed Aug. 22, 1969, Ser. No. 852,246.

Int. Cl. G03c 7/00

U.S. Cl. 96—55

22 Claims

X-ray recording method using photographic material having at least one silver halide emulsion layer and each such layer on color development gives a monochromatic blue dye image. Exposure can be directly to an X-ray image or indirectly by way of fluorescent screens and the like. The blue dye image absorbs strongly in the red spectral region and at least 30% as much in the green spectral region and can be produced by a mixture of color couplers for cyan and magenta. If plural emulsion layers are used, the same color coupler or mixture of color couplers is provided in each layer to give an identical monochromatic blue dye image. The photographic materials per se are also disclosed.

# IMPERVIOUS SURROUND FOR FILM INSERT IN RECORD CASE

Robert G. Rudd, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y. Continuation-in-part of application Ser. No. 18,967, Mar. 12, 1970. This application Oct. 5, 1970, Ser. No. 78,135.

Int. Cl. G03c 1/76

U.S. Cl. 96—67

4 Claims



A barrier layer surrounds a photographic film insert mounted in a record card. The barrier is formed by a suitable solvented resinous material, such as a solvented polyvinyl resin, polyacrylate resin, or by a pressure or thermal sensitive tape, and prevents developer solution from contacting the record card during processing of the exposed insert.

3,734,737

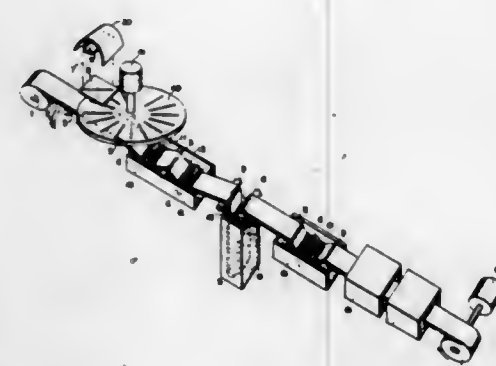
# PROCESS FOR MANUFACTURING CHROMATIC COLOR SCREEN

John R. Sharp, Quincy, Mass., assignor to Polaroid Corporation, Cambridge, Mass. Continuation-in-part of application Ser. No. 50,239, June 26, 1970, which is a continuation-in-part of application Ser. No. 628,940, Apr. 6, 1971, both now abandoned. This application Nov. 16, 1971, Ser. No. 199,248.

Int. Cl. G03c 1/84; G03f 5/00

U.S. Cl. 96—80

5 Claims



A color screen is produced by exposing, either successively or simultaneously, a plurality of photosensitive layers to short duration, high intensity radiation actinic to each layer. The radiation is in a pattern such that an aliquot part of each layer is exposed. The layer is dyed with a selected color. The exposed areas are in side-by-side registration on a transparent backing and form a multicolor screen of general utility in the photographic arts.

3,734,738

# SILVER HALIDE EMULSIONS CONTAINING REACTIVE QUATERNARY SALTS NUCLEATING AGENTS

Donald W. Kurtz and Judith M. Harbison, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y. No Drawing. Filed Oct. 30, 1970, Ser. No. 85,709.

Int. Cl. G03c 1/28

U.S. Cl. 96—107 R

9 Claims

Reactive N-substituted, cycloammonium quaternary salts, wherein the N-substituent includes alkyl radicals

whose terminal carbon atom is additionally substituted with an acyl radical such as a formyl radical, an acetyl radical or a benzoyl radical are useful nucleating agents in direct positive photographic emulsions.

3,734,739

# SILVER HALIDE EMULSIONS SENSITIZED WITH CYANINE DYES CONTAINING A QUATERNARY GROUP

Alan L. Borrer, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

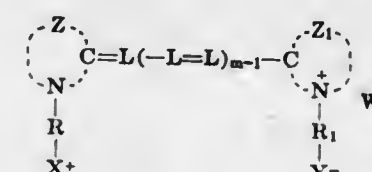
Filed July 29, 1971, Ser. No. 167,500

Int. Cl. G03c 1/16, 1/18

U.S. Cl. 96—132

11 Claims

The present invention relates to photography and, more particularly, to a novel spectrally (optically) sensitized radiation recording photographic element which comprises a cyanine dye of the formula:



wherein L represents a methine group; m represents a positive integer of from 1 to 3, inclusive; Z and Z<sub>1</sub> each represents the nonmetallic atoms necessary to complete a cyanine dye heterocyclic ring system containing a five or six membered heterocyclic nucleus; R and R<sub>1</sub> each represents a divalent acyclic cyclic group; X<sup>+</sup> represents a quaternary ammonium, sulfonium or phosphonium group; Y<sup>-</sup> represents a —SO<sub>3</sub><sup>-</sup> or a —COO<sup>-</sup> group; and W<sup>-</sup> represents an anion.

3,734,740

# CONTINUOUS FOOD COOKING DEVICE

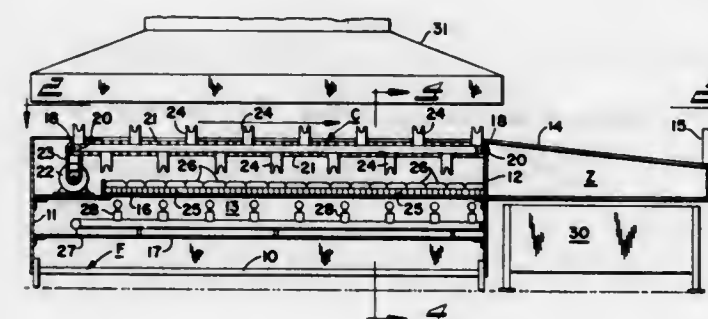
Steven Zenos, 1520 Sagebrush Trail S.E., Albuquerque, N. Mex.

Filed May 24, 1971, Ser. No. 146,157

Int. Cl. A231 1/31, 1/00

U.S. Cl. 99—1

21 Claims



A conveyor moves a train of food items, particularly meat items mounted on skewers, at a substantially constant rate past a heat source of substantially constant intensity toward a discharge point where the food items are collected. The conveyor has indicia marked along the path it traverses indicating predetermined starting points on the conveyor for the food items. The indicia correlate the distances from the starting points to the discharge point with an identifying characteristic of a food item first entered on the conveyor at such starting points, for example, the type of food to be cooked, the extent it is to be cooked, and the like. Preferably, detachable skewer means support the food items on the conveyor and have indicia cooperating with the indicia spaced along the path of travel of the conveyor.

3,734,741

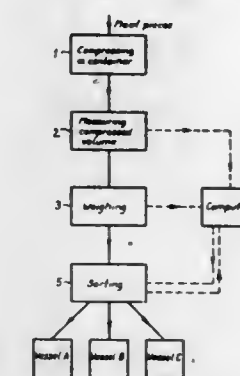
# METHOD OF OBTAINING MEAT WITH A PREDETERMINED FAT CONTENT

Hans Christian Larsen, Lyngby, Denmark, assignor to Alfa-Laval AB, Tumba, Sweden. Filed May 28, 1971, Ser. No. 147,795. Claims priority, application Denmark, May 28, 1970, 7,349/70.

Int. Cl. A22c 18/00

U.S. Cl. 99—107

3 Claims



After ascertaining the fat content of separate quantities of meat by calculating the specific gravity of each quantity, the separate quantities are distributed by way of a selecting step to a plurality of collecting vessels while determining the total fat content of the total meat quantity in each vessel. In the selecting step, each separate meat quantity is directed selectively, with reference to its fat content and according to the total fat content determination, to one of the collecting vessels to obtain a meat mass with a predetermined fat content.

3,734,742

# STABILIZED BEVERAGES

Lewis D. Morse, Princeton, and Paul A. Hammes, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J. Continuation-in-part of Ser. No. 30,978, April 22, 1970, abandoned. This application Dec. 8, 1971, Ser. No. 206,128.

Int. Cl. A231 1/30

U.S. Cl. 99—28

3 Claims

A sealed canned or bottled aqueous beverage containing at least about 80 percent water and having a pH of from 2.0 to 3.4, an ascorbic acid content of from 0.056 to 1.120 mg./ml. and a ferrous ion content of from 0.008 to 0.15 mg./ml.

3,734,743

# SOUR DOUGH FRENCH BREAD

Leo Kline, Richmond, and Takashi F. Sugihara, Pinole, Calif., assignors to the United States of America as represented by the Secretary of Agriculture. No Drawing. Filed Feb. 26, 1971, Ser. No. 119,382.

Int. Cl. A21d 8/04

U.S. Cl. 99—90 S

9 Claims

Processes for preparing sour dough French bread using a novel liquid starter which supplies the special microorganisms, *Lactobacillus sanfrancisco* and *Torulopsis holmii*, required for leavening and souring action and which provides many advantages over conventional sponge starters.

3,734,744

# METHOD FOR PRESSURIZED COOKING OF FOOD IN HIGH-TEMPERATURE NON-AQUEOUS LIQUID

Charles Jere Albright, 313 W. North Ave., Chicago, Ill. 60610

Continuation of abandoned application Ser. No. 751,127, Aug. 8, 1968. This application Dec. 14, 1970, Ser. No. 98,166.

Int. Cl. A47j 37/12

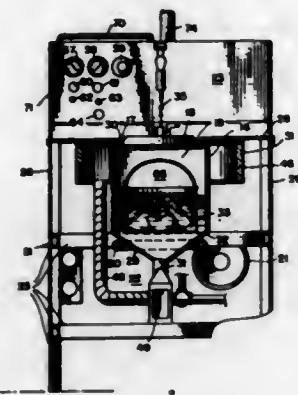
U.S. Cl. 99—107

21 Claims

A method for the pressurized cooking of foods in high-temperature, non-aqueous liquids for a time-controlled



period in which a nearly-instant separation of the cooked foods and the hot liquid at the termination of each cook-



ing period is effected so as to retain in the cooked food the juices inherent in the food.

3,734,745

**MULTI-LAYERED, MULTI-COLORED DESSERTS**

Robert R. Cassanelli, Yorktown Heights; Ronald P. Wauters, Vails Gate; Anastasia C. Wirchansky, Yonkers, all of N.Y., and Clement R. Wyss, Park Ridge, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Nov. 23, 1970, Ser. No. 92,169

Int. Cl. A231 1/04

U.S. Cl. 99—130

7 Claims

Multi-layered desserts having differently colored layers are prepared from a single dry whippable composition comprising gelatin, fat, sugar, emulsifiers for the fat, a fat soluble coloring agent, and a water soluble coloring agent.

3,734,746

**PROCESS FOR CONTINUOUS PRODUCTION OF VINEGAR BY SURFACE FERMENTATION**

Yukio Yasui, Wataru Ikoga, Akihiko Mori, Kimio Date, and Tadaaki Adachi, Tokyo, Japan, assignors to Kewpie Jyozo Kabushiki Kaisha, Tokyo, Japan

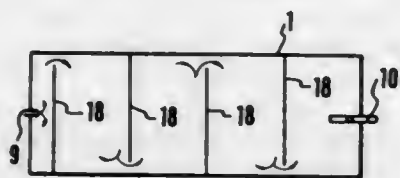
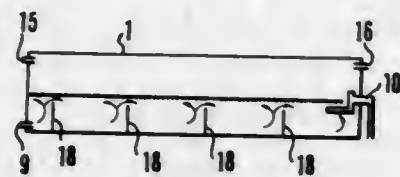
Filed Mar. 3, 1971, Ser. No. 120,662

Claims priority, application Japan, Apr. 28, 1970, 45/35,951

Int. Cl. C12j 1/04

U.S. Cl. 99—147

6 Claims



A continuous process for the production of vinegar may be carried out in a single fermentation vessel or a plurality of fermentation vessels intercommunicated in series. In either case, the vessel or vessels are furnished

with a plurality of flow regulating means thereby to ensure the rapid and uniform proceeding of the oxidative fermentation reaction in all parts of the vessel or vessels. Ethyl alcohol-containing liquid is firstly introduced into the above vessel or vessels and is inoculated with an overlaid layer of acetic acid bacteria which have been cultured in a suitably prepared nutrient medium and adapted to acidic broth. Succeedingly, fresh ethyl alcohol-containing liquid is continuously introduced into the single vessel or the first of the series-intercommunicated vessel or the first of the series-intercommunicated vessels, and the substantially fully fermented liquid is continuously withdrawn from the vessel or the last of the vessels at an equal rate to the rate of the introduction of the fresh ethyl alcohol-containing liquid.

3,734,747

**AEROSOL COLOR MIXTURE AND METHOD OF MAKING SAME**

David F. De Felice, 45 Mount Pleasant Ave.,

Stratford, Conn. 06497

No Drawing. Filed Oct. 1, 1970, Ser. No. 77,366

Int. Cl. A231 1/26

U.S. Cl. 99—148 R

12 Claims

An aerosol color concentrate for thin film color coating which contains dextrine, deionized water, propylene glycol, an organic dye, sodium benzoate and citrate and a drying agent. The concentrate is stable under pressurized as well as atmospheric conditions and does not precipitate dextrin.

3,734,748

**METHOD OF PREVENTING THE SPOILAGE OF BREAD**

Ryuzo Ueno, Nishinomiya, Tetsuya Miyazaki and Toshio Matsuda, Itami, and Shigeo Inamine and Shinichiro Arai, Nishinomiya, Japan, assignors to Ueno Fine Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed Dec. 18, 1970, Ser. No. 99,689

Int. Cl. A21d 2/14

U.S. Cl. 99—150 R

6 Claims

A method of preventing the spoilage of yeast leavened bread which consists of incorporating in the dough a mixture of an acetate and an acid compound which is crystalline at room temperature, the latter being coated with at least one coating agent of the group consisting of animal and vegetable oils and fats, monoglycerides, diglycerides, waxes and paraffin.

3,734,749

**AUTOMATICALLY OPENING FROZEN DOUGH BOX AND BAKING PAN**

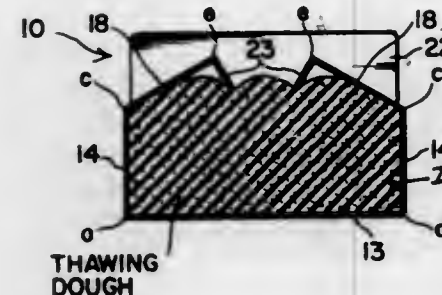
Hugh H. Bridgford, 6600 Boulevard East, West New York, N.J.

Filed Feb. 3, 1971, Ser. No. 112,331

Int. Cl. B65b 25/16; B65d 81/34

U.S. Cl. 99—172

5 Claims



A frozen yeast-containing developed dough fills a box-like folded box or receptacle made of a cardboard material. The receptacle is formed with two top opposing rectangular clo-

sure panels which together form the top wall of the receptacle. Integral side bottom, and end walls are also provided. When the mass of dough is permitted to thaw and rise, it presses upwardly against the top, rectangular closure panels to separate them and to effect automatic and gradual opening of the receptacle as baking proceeds. The top rectangular closure panels are each provided with an elongated scored line designed to be preliminarily manually folded inwardly to form elongated, outer hook panels. When the dough mass rises, it also catches under the hook panels and draws the opposing rectangular closure panels inwardly together at the same time as the closure panels are pressed upwardly. This inward drawing constituted a force which off-sets the tendency of the expanding mass of dough to force the receptacle side walls outwardly. As a result, numerous advantages accrue. For example, a lighter weight of cardboard material may be employed, both for economy and for providing a better shaped and more quickly baked loaf. Further, the inward drawing together of the receptacle side walls prevents those side walls from bowing outwardly and imparting an undesirable corresponding bow shape to the loaf side walls.

3,734,750

**CHEESE PACKAGE AND PACKAGING PROCESS**

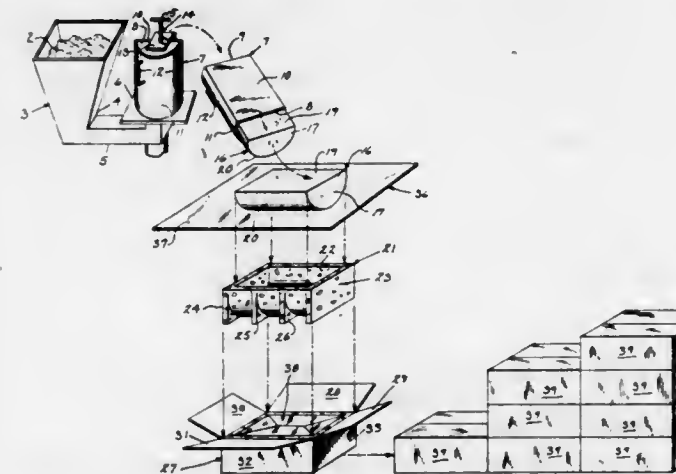
Harold H. Ludeman, 23 W. Jefferson St., Black River Falls, Wis.

Filed June 18, 1969, Ser. No. 834,375

Int. Cl. A23c 19/16

U.S. Cl. 99—178

5 Claims



Packaging for semi-soft cheese is disclosed whereby the cheese is formed into a semi-cylindrical shape. The package includes a carton with a polystyrene foam cradle seated snugly in it and having an interior shape forming to the shape of the cheese with a sheet of wrapping material lining the cradle and folded about the cheese. When the carton is closed, the completed packages are stacked.

3,734,751

**PREPARATION OF DEEP-FROZEN VEGETABLES**

Bengt Lennart Bengtsson, Bjuv, Sven Ingmar Walton Bosund, Halsingborg, and Bertil Hylmo, Bjuv, Sweden, assignors to Produits Finis S.A., Vevey, Switzerland

No Drawing. Filed Aug. 25, 1970, Ser. No. 66,888

Claims priority, application Great Britain, Aug. 25, 1969, 42,167/69

Int. Cl. A23b 7/04

U.S. Cl. 99—193

13 Claims

Deep-frozen comminuted leaf vegetables such as spinach are provided in particulate form and have a reduced water content. Other features of the invention are disclosed in the following specification.

3,734,752

**PROCESSING CEREAL GRAINS AND SEEDS BY A SEMI-DRY MILLING METHOD**

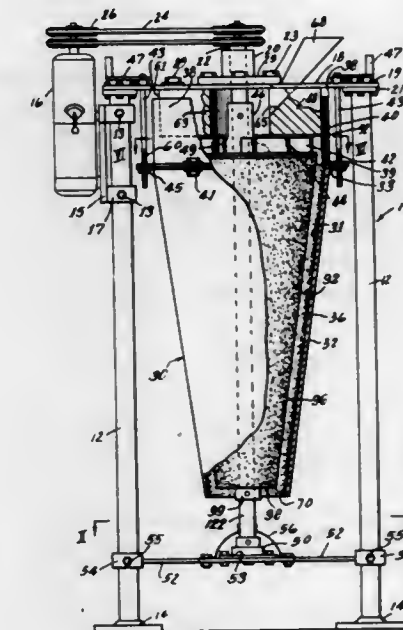
Verl E. Headley, Naperville, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Sept. 14, 1970, Ser. No. 72,061

Int. Cl. B02c 3/00

U.S. Cl. 99—233.3

9 Claims



Covers equipment and processes that are useful in degerminating or dehulling kernels of cereal and seeds. A preferred embodiment of the equipment has a frame on which a housing is mounted. A rotary assembly is mounted for rotation within a chamber in the housing. The rotary assembly consists of a vaned impeller that is disposed to confront a generally cylindrical impact surface in the housing chamber, and a rotor member that is secured below the impeller and that has a surface that is disposed in spaced relationship to the confronting surface of the housing chamber. These confronting surfaces define an annulus therebetween.

In operation of the equipment for processing material including kernels of cereal or seeds, the material is fed into a central portion of the impeller, accelerated by the impeller radially outwardly within the chamber to engage against the impact surface and to move along it, and then is immediately passed downward through the annular passage in a generally helical path.

For dehulling, the material is subjected to progressively milder abrading action as it passes through the annular passage, and then is discharged from the machine. For degerminating, the material is subjected to a series of impacts as it passes through the annular passage.

3,734,753

**PLASTICIZED SULFUR COMPOSITIONS**

Carl C. Greco, Garnerville, and Donald J. Martin, Irvington, N.Y., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 536,657, Mar. 23, 1966. This application Feb. 4, 1969, Ser. No. 796,561

Int. Cl. C09d 11/00, 13/00

U.S. Cl. 106—19

3 Claims

A plasticized sulfur composition comprising the reaction product of sulfur and a dimercaptan of the formula:



wherein A is selected from the group consisting of alkyl-ene, chalcogen interrupted alkylene and diester radicals.



3,734,754

**THERMALLY DARKENING PHOTOCHROMIC GLASS**

Lyman James Randall and Thomas P. Seward III, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

No Drawing. Filed Aug. 19, 1970, Ser. No. 65,270

The portion of the term of the patent subsequent to Nov. 21, 1989, has been disclaimed

Int. Cl. C03c 3/14, 3/26, 3/30

U.S. Cl. 106—47 R

5 Claims

This invention relates to articles comprising lanthanum borate glasses which exhibit unusual photochromic behavior. This photochromism is characterized by a darkened thermally stable state and by bleaching to a clear state in response to actinic radiation. These glasses are further characterized by the fact that they become colorless above a certain high temperature and colored again when the temperature is lowered below a certain critical value.

3,734,755

**METHOD OF PRODUCING REFRACTORY MATERIAL**

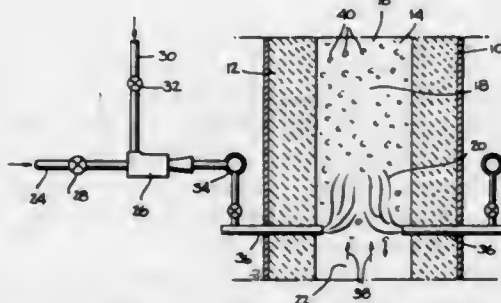
Ernest Andres Lado, Hastings-on-Hudson, N.Y., assignor to Nichols Engineering & Research Corp., New York, N.Y.

Filed May 20, 1971, Ser. No. 145,218

Int. Cl. F27b 1/00

U.S. Cl. 106—73.4

9 Claims



This disclosure relates to the production of refractory material in a vertical shaft forced draft kiln wherein a controlled quantity of water or steam is introduced with the combustion fuel into the burning zone of the kiln while passing said refractory material from the upper to the lower end thereof through successive preheating, burning and cooling zones, thereby effecting a close control over the flame temperature.

3,734,756

**FINELY DIVIDED ALKALI METAL SILICATE GLASS**

Richard H. Pierce, Broomall, Pa., assignor to Philadelphia Quartz Company, Philadelphia, Pa.

No Drawing. Filed June 16, 1971, Ser. No. 153,806

Int. Cl. C04b 35/16

U.S. Cl. 106—74

10 Claims

A method has been developed to prepare alkali metal silicate glasses of small particle size that dissolve readily and do not contain significant amounts of impurities from the grinding equipment. The method consists of casting molten alkali metal silicate glass in a thin sheet or film

which is then thermally stressed and fractured before grinding.

3,734,757

**THIOCARBOHYDRAZONE FUNGICIDES**

David M. Wiles, and Tony Suprunchuk, both of Ottawa, Ontario, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Aug. 7, 1970, Ser. No. 62,131

Int. Cl. A01n 9/12, 17/12; C08b 29/00

U.S. Cl. 106—186

7 Claims

A fungicidal composition, method of application and protected articles are described where the active fungicide (or fungistatic compound) is a mono- or dithiocarbohydrazone which may be prepared by condensation of thiocarbonylhydrazide with an aldehyde or ketone.

3,734,758

**NOVEL FLAME RETARDANT COMPOSITIONS OF MATTER**

Henryk A. Cyba, Evanston, and Allen K. Sparks, Des Plaines, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 757,763, Sept. 5, 1968. This application May 6, 1971, Ser. No. 141,028

Int. Cl. C08b 27/04

U.S. Cl. 106—193 R

10 Claims

Novel flame retardant compositions of matter comprise a mixture of an imide of a halo-substituted polycyclicdicarboxylic acid, a polymeric compound and an antimony-containing compound. These compositions of matter are exemplified by a mixture of the N-methyl imide of 5,6,7,8,9,9-hexachloro-1,2,3,4,4a,5,8,8a-octahydro-5,8-methano-2,3-naphthalenedicarboxylic acid, polypropylene and antimony trioxide. These compositions of matter are useful where a high degree of resistance to flame and low volatility are the required characteristics of the product.

3,734,759

**PROCESS FOR MAKING CARBOXYMETHYL CELLULOSE CARRIERS FOR BLUING AND FLUORESCERS**

Burton H. Gedge III, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed May 20, 1971, Ser. No. 145,576

Int. Cl. C08b 27/76

U.S. Cl. 106—193

4 Claims

A process of producing dyed alkali metal carboxymethylcellulose via a slurry process wherein cellulose is dyed after adding it to an alkali hydroxide-solvent-water mixture and prior to reacting it with monochloroacetic acid.

3,734,760

**PROCESS FOR THE PRODUCTION OF AMYLOSE FILMS**

Hiromi Hijiya and Mikihiro Yoshida, Okayama, Japan, assignors to Hayashibara Company, Okayama-shi, Okayama, Japan

No Drawing. Filed July 27, 1971, Ser. No. 166,640

Claims priority, application Japan, July 28, 1970, 45/66,004

Int. Cl. C08b 25/02

U.S. Cl. 106—210

8 Claims

The production of transparent, stable and strong amylose films comprising hydrolysis of a gelatinized solution

3,734,763

**CATIONIC UNSATURATED AMINE-FUNCTIONAL SILANE COUPLING AGENTS**

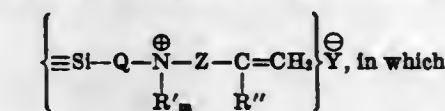
Edwin P. Pineddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.  
No Drawing. Continuation-in-part of abandoned application Ser. No. 825,035, May 15, 1969. This application Dec. 17, 1970, Ser. No. 99,228

Int. Cl. B44d 1/14; C07f 7/02; C03c 25/02

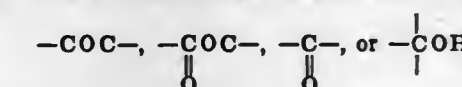
U.S. Cl. 117—72

16 Claims

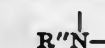
Organosilicon compounds of the formula



Q is a divalent hydrocarbon radical or a divalent hydrocarbon radical containing oxygen in the form of

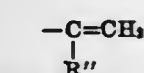


groups or nitrogen in the form of



groups;

Z is a divalent organic radical having a double bond conjugated with the



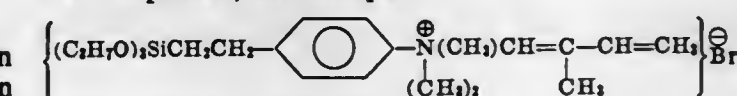
moiety, Z being bonded to the nitrogen atom by a C—N bond;

R' is independently selected from the group consisting of the hydrogen atom, lower alkyl radical or a heterocyclic organic compound containing the nitrogen atom as a ring member;

m is an integer of 1 or 2;

R'' is the hydrogen atom or a lower alkyl radical; and Y is an acid anion; are disclosed.

The compounds, for example



as coupling agents for promoting the adhesion of organic polymers to solid inorganic surfaces.

of amylozyme starch or ordinary starch with the action of alpha-1,6-glucosidase, precipitating by cooling the reaction mixture, recovering the formed starch precipitates which consist exclusively of amylose molecules, adding to the resultant plasticizer in which a maltitol with a purity of over 50% is present or a plasticizer in which a mixture of said maltitol product and another plasticizer is present, and forming amylose films with said mixture of amylose and plasticizers.

3,734,761

**PROCESS FOR PRODUCING TITANIUM DIOXIDE PRODUCT CONTAINING ALUMINUM OXIDE**

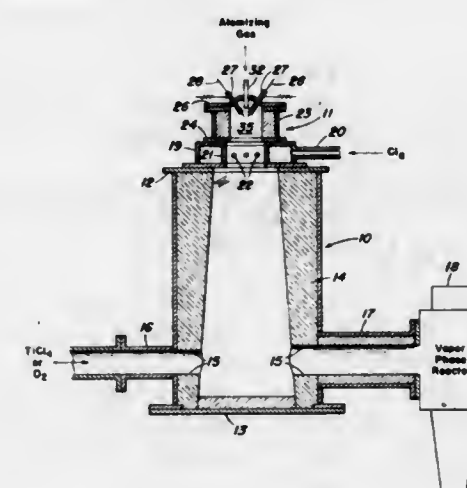
John V. Becker, New York, N.Y., and Arthur A. Bellinger, Willingboro, N.J., assignors to National Lead Company, New York, N.Y.

Filed Jan. 21, 1971, Ser. No. 108,438

Int. Cl. C01g 23/04

U.S. Cl. 106—300

2 Claims



A metal compound is prepared by melting a metal in a high temperature heating zone, atomizing the molten metal and reacting the atomized metal with a gas to produce a metal compound.

3,734,762

**METHOD OF MAKING FIBER REINFORCED METAL MATRIX PRODUCTS**

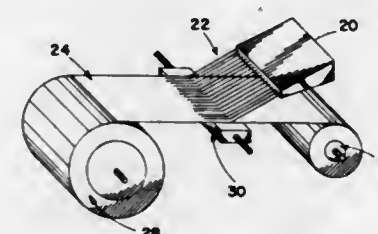
Lloyd E. Hackman, Worthington, and Carroll E. Mobley, Upper Arlington, Ohio, assignors to Ribbon Technology Corporation, Columbus, Ohio

Filed June 25, 1971, Ser. No. 156,694

Int. Cl. C23c 7/00

U.S. Cl. 117—37 R

4 Claims



A method of casting a metal fiber ribbon onto a metal matrix foil to form a fiber reinforced metal matrix specimen. The method is characterized by impinging a molten metal onto the moving surface of metal matrix foil in such a manner that the metal ribbon fiber adheres to the matrix foil.

3,734,764

**COATING COMPOSITIONS AND PROCESSES**

Lewis S. Miller, Bellevue, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Nov. 30, 1970, Ser. No. 93,857

Int. Cl. B44d 1/50

U.S. Cl. 117—93.31

17 Claims

A carboxylic acid chloride or bromide, a sulfonyl chloride or bromide, cyanuric chloride, calcium hypochlorite or phosphorus oxychloride and optionally a buffering pigment are combined with a liquid, acrylate ester resin curable by exposure to high-energy ionizing radiation to yield a coating composition which upon being cured in air by exposure to ionizing radiation yields a coating having an essentially tack-free surface.

3,734,765

**BOTTLE COATING**

Robert C. Russell and Richard W. Entler, Columbus, Ohio, assignors to Liberty Glass Company, Sapulpa, Okla.

Filed Oct. 12, 1971, Ser. No. 188,157

Int. Cl. B44d 1/06; C03c 17/32

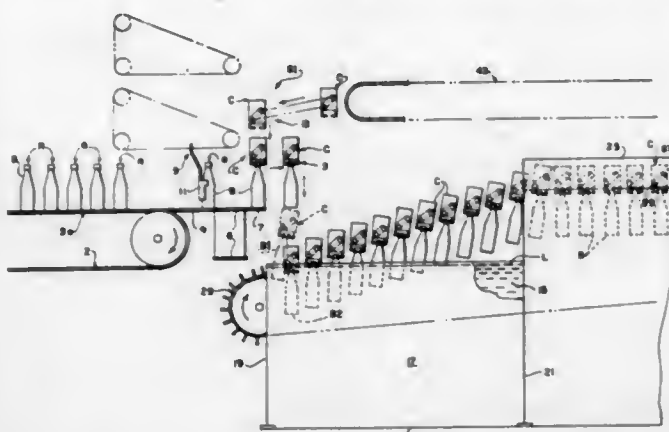
U.S. Cl. 117—94

10 Claims

A system of coating bottles in which rows of bottles issuing from a Lehr, the bottles in each row standing up-right side-by-side, are picked up by their necks, lowered



into a bath of a liquid coating composition, e.g., a containment coating composition, for dip coating thereof on the outside, then moved forwardly through the bath and raised to withdraw them from the bath and, still gripped as specified, moved through a heating zone in upright



position for heating the coating on the bottles. The bottles are then released and deposited on a conveyor for moving them forward with the bottles standing upright on the conveyor. As they are moved forward by the conveyor, they are sprayed with a molten plastic for lubricity and then cooled.

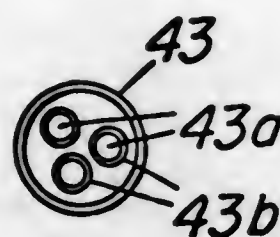
3,734,766

**BAGASSE FIBER PRODUCT AND PROCESS**  
Roland Botz, San Juan, Puerto Rico, assignor to Plasti-Fiber Formulations, Inc., Mercedita, Puerto Rico  
Application Oct. 9, 1969, Ser. No. 866,123, now Patent No. 3,694,308, which is a continuation-in-part of abandoned application Ser. No. 758,903, Sept. 10, 1958. Divided and this application Nov. 2, 1970, Ser. No. 86,322

Int. Cl. D06m 11/04

U.S. Cl. 117-100 A

3 Claims



Bagasse is treated with an aqueous solution of alum and defibrated to give a fibrous product suitable for the reinforcement of resin bodies. The fiber can also be pulverized to yield a flour suitable for use as a filler in resin bodies. The treatment also produces a clean, sugar free, moisture resistant, low density cellular pith material suitable for manufacturing insulation and acoustical materials, as a filler for synthetic foam products, and as a filler for animal feed formulations.

3,734,767

**CERAMIC TREATING PROCESS AND PRODUCT PRODUCED THEREBY**

Peter K. Church, Cascade, and Oliver J. Knutson, Colorado Springs, Colo., assignors to Kaman Sciences Corporation, Colorado Springs, Colo.  
No Drawing. Continuation of application Ser. No. 642,704, June 1, 1967. This application June 18, 1970, Ser. No. 63,998

Int. Cl. C04b 41/24

U.S. Cl. 117-123 B

11 Claims

A new ceramic treatment process and product and, more particularly, a process for treating underfired porous partially vitrified relatively soft machinable refractory

ceramic materials to produce hardened dimensionally stable end products at relatively low temperatures and the ceramic materials produced thereby which are suitable for application as bearings for undersea submergence, low temperature bearings for arctic vehicular and machinery applications, precision bearings for space use and liquid metal lubricated systems. The soft ceramics can be machined and shaped in the soft state and hardened by the process of this invention at temperatures well below normal vitrification temperatures with virtually no change in dimensions from the machined untreated ceramic to the treated and hardened end product. Other products produced by the process of this invention produce articles having a very dense surface capable of taking a high polish and other products have resulted in an abrasive or polishing stone having superior qualities to those of the Arkansas stones in respect to both speed of metal removal and degree of polishing or sharpening. In addition, coarser or finer grades are obtainable compared to a single grade of Arkansas stone. Other products produced by this process have negative temperature coefficients becoming very good electrical and heat conductors at high temperatures.

3,734,768

**METAL COATED WITH A SILICONE ELASTOMER CONTAINING MONOCELLULAR PARTICLES FOR ABLATIVE PURPOSES**

Frank A. Smith, 1412 Jay, Midland, Mich. 48640  
No Drawing. Filed Oct. 29, 1970, Ser. No. 85,231

Int. Cl. B32b 15/08, 27/20

U.S. Cl. 117-132 BS

6 Claims

A metal substrate coated with a silicone elastomer containing specific quantities of monocellular thermoplastic resinous polymeric particles which encapsulate a volatile liquid raising agent, is useful for protecting aerospace vehicles and support equipment from the deleterious effects of turbulent gases and severe temperatures encountered in the operation of said vehicle.

3,734,769

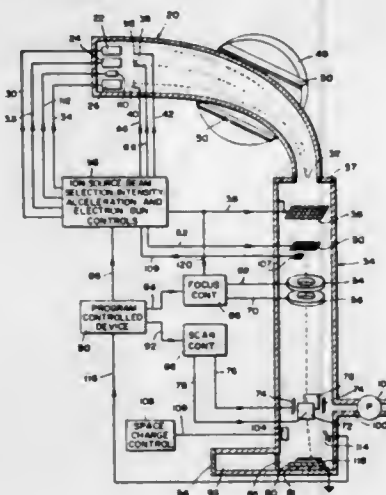
**METHOD OF FORMING MICROELEMENTS**  
Tomas Hirschfeld, Thousand Oaks, Calif., assignor to Block Engineering, Inc.

Original application Apr. 13, 1967, Ser. No. 630,754.  
Divided and this application Aug. 6, 1970, Ser. No. 61,807

Int. Cl. B44d 1/18, 1/50

U.S. Cl. 117-212

8 Claims



A method of forming microelements of a given configuration by producing in vacuum a number of separate ion beams of materials, each beam being directed one at a time to a common path. Each beam is intensity controlled and is electrostatically focussed onto a common work piece. The focussed beam is deflected laterally to

trace out a two-dimensional aspect of the configuration of the microelement, the ions being discharged along the trace to write-in the microelement, multiple layers being formed, if desired by depositing material on top of previously discharged ions. The method is preferably performed electronically in accordance with a sequence of instructions determining the parameters for a given type of microelement.

3,734,770

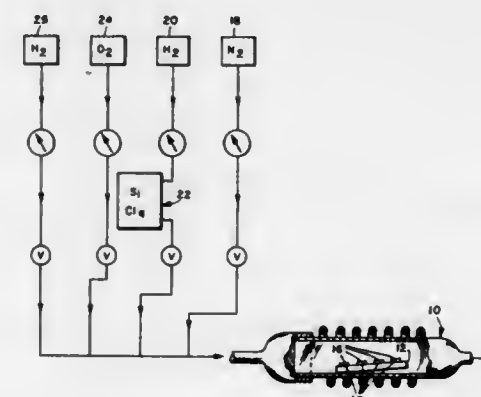
**NITROGEN NUCLEATION PROCESS FOR THE CHEMICAL VAPOR DEPOSITION OF POLY-CRYSTALLINE SILICON FROM SiCl<sub>4</sub>**

James B. Price, Phoenix, and William C. Roman, Tempe, Ariz., assignors to Motorola, Inc., Franklin Park, Ill.  
Filed Dec. 14, 1970, Ser. No. 97,811

Int. Cl. B44d 1/18

U.S. Cl. 117-217

6 Claims



A process is disclosed herein for the use of nitrogen in a nucleation process for the chemical vapor deposition of polycrystalline silicon from SiCl<sub>4</sub>. After establishing the desired furnace temperature at a single temperature lying within the range of 900° C. to 1200° C., the system is purged with nitrogen and hydrogen. After the system has been purged, the nitrogen flow is stopped and the SiCl<sub>4</sub> flow is started simultaneously. The overlap of nitrogen and SiCl<sub>4</sub> within the system causes nucleation from which a very fine grain layer of polycrystalline silicon is grown.

3,734,771

**METHOD FOR PRODUCING A PROTECTIVE COATING ON THE SURFACE OF A MANUFACTURED ARTICLE**

Harold L. Fritzsche, Fort Wayne, Ind., assignor to General Electric Company

Original application Feb. 27, 1969, Ser. No. 803,036, now Patent No. 3,607,553, dated Sept. 21, 1971. Divided and this application July 1, 1970, Ser. No. 51,637

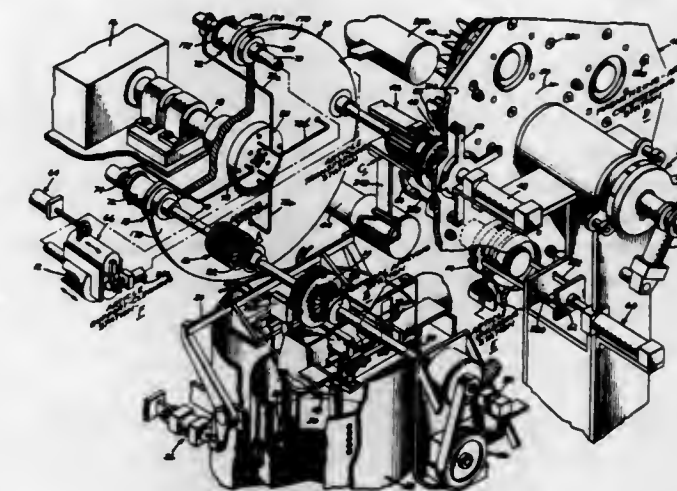
Int. Cl. H01f 3/02

U.S. Cl. 117-234

12 Claims

Method for forming a protective coating on an article of manufacture, such as a core formed from a stack of magnetic laminations. The material from which the protective coating is formed contains magnetic particles. Each core is carried by a different one of a plurality of article support and masking assemblies mounted on a first conveyor; e.g., a first rotary indexing assembly which rotates each of the support and masking assemblies sequentially through an Article-Loading Station, Material-Applying Station, Article-Transferring Station, and an Article Support-Cleaning Station. At the Article-Transferring Station, the core is transferred to a Magnetizing-Article Compressing Station, which transports the coated core to an Article-Unloading Station on a second conveyor. At the Magnetizing and Compressing Station, a magnetic field

magnetically compresses the laminations and concurrently magnetically draws the protective coating material to selected surfaces of the core in order to form an increased thickness of coating material on those selected surfaces. Each of the support and masking assemblies is connected through a rotary valve to a fluid pressure source which



feeds fluid through the assembly to accomplish masking and cooling of selected regions of the core. At the Article Support-Cleaning Station each support and masking assembly is mechanically cleaned to remove any residual protective coating material therefrom before the assembly is again indexed to the Article-Loading Station.

3,734,772

**MAGNETIC RECORDING MEDIA**  
Georg Schnell and Heinz Stritzinger, Ludwigshafen, Guenter Vaeth, Limburgerhof, Werner Grau, Lampertshelm, and Fritz Hammon and Manfred Hopp, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany  
No Drawing. Filed Jan. 13, 1971, Ser. No. 106,243

Claims priority, application Germany, Jan. 20, 1970, P 20 02 318.1

Int. Cl. H01f 10/00

U.S. Cl. 117-235

1 Claim

Magnetic recording media in tape form having on the back of the substrate a pattern of raised dots with a high coefficient of friction which improve the winding properties.

3,734,773

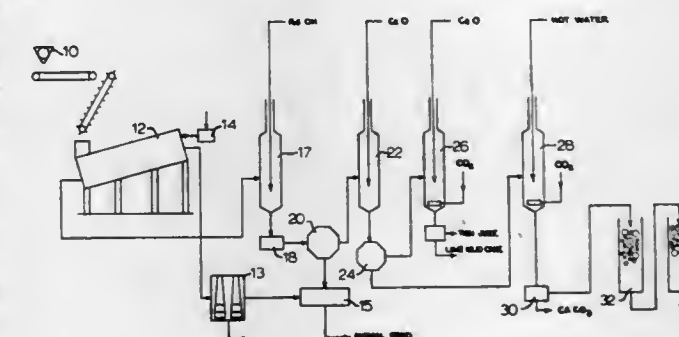
**PROCESS FOR SELECTIVELY PURIFYING SUGAR BEET DIFFUSION JUICE AND BY-PRODUCT RECOVERY OF VALUABLE ORGANIC ACIDS THEREFROM**  
Boyd E. Haley, 428 W. Spring Street, West Haven, Conn.

Filed Aug. 2, 1971, Ser. No. 167,995

Int. Cl. C07c 53/00, 55/00; C13d 3/00

U.S. Cl. 127-48

5 Claims



A process for selectively purifying sugar beet diffusion juice in which the raw diffusion juice is first neutralized to minimize



inverted sugar formation and stabilize the colloidal content without precipitating the soluble organic acids. The neutralized diffusion juice is then subjected to high centrifugal forces to separate the colloidal and particulate content from the diffusion juice. After the colloidal and particulate solids are removed, the clarified diffusion juice is contacted with a stoichiometric equivalent or slight excess of lime based upon the soluble organic acid concentration in the diffusion juice to react with the soluble organic acids to form insoluble calcium salts of the organic acids. The insoluble calcium salts of the organic acids are then removed from the diffusion juice. The diffusion juice may be further purified as needed. The insoluble calcium salts of the organic acids are then placed in an aqueous solution such as hot water. Carbon dioxide gas or other suitable carbonate ion producing agent is dissolved in the hot water to release the organic acids and produce a calcium carbonate precipitate. The dissolved organic acids are then selectively recovered by conventional means.

3,734,774

# METHOD AND APPARATUS FOR CLEANING SOLIDS FOR POLLUTION FREE DISPOSAL

George O. Culpepper, Jr., Oklahoma City, Okla., assignor to Jim W. Kendall and James W. Pitts, Oklahoma City, Okla., part interest to each

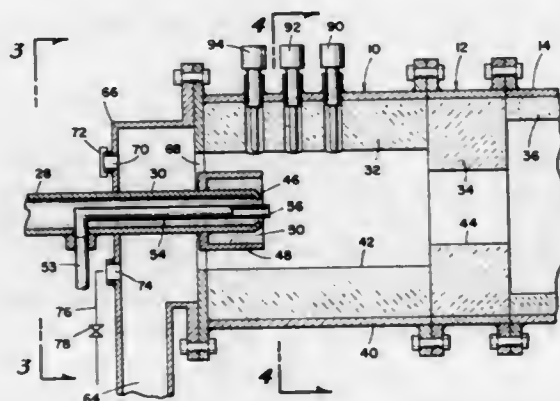
Filed Jan. 29, 1971, Ser. No. 110,826  
Int. Cl. B08b 7/00

U.S. Cl. 134-2

3 Claims U.S. Cl. 134-25 R

Int. Cl. B08b 7/04

11 Claims



A system for burning a hydrocarbon coating, such as an oil coating from the surface of particulate solid material such as sand in a pressurized firing zone or firing chamber where the solids are introduced under pressure into the firing zone. An air-fuel mixture is introduced into the firing zone and burned therein. Immediately downstream of the firing chamber is a doughnut restriction which confines the combustion to the firing chamber. The ratio of air to fuel in the air-fuel mixture is always such that the fuel will be completely burned. The system will be provided with controls to shut the unit down when the temperature goes above or below a predetermined temperature and also to shut the system down when a lack of complete combustion of the fuel is indicated.

3,734,775

# CATCH BASIN CLEANING SYSTEM AND METHOD

Ced F. Brown, Redford, Mich., assignor of a fractional part interest to Mike Torosian, Detroit, Mich.

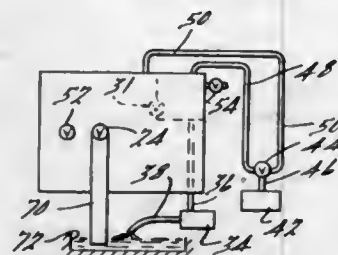
Filed Nov. 4, 1970, Ser. No. 86,899  
Int. Cl. B08b 3/02, 9/00; E03f 9/00

U.S. Cl. 134-10

16 Claims

A cleaning system for catch basins and the like having a first tank for receiving debris and water educted from the catch basin and a second tank for receiving water from the first tank via a transfer valve communicating the first and second tanks. As a preliminary step, water may be passed from the first tank into the catch basin by gravity flow to break up the debris therein. The fluid in

the second tank may be ejected into the catch basin under pressure to loosen and agitate the debris in the catch



basin concurrently with the eduction of water and debris from the catch basin.

3,734,776

# CLEANING OIL LADEN METAL WASTE TO RECOVER THE METAL AND RECLAIM THE OIL

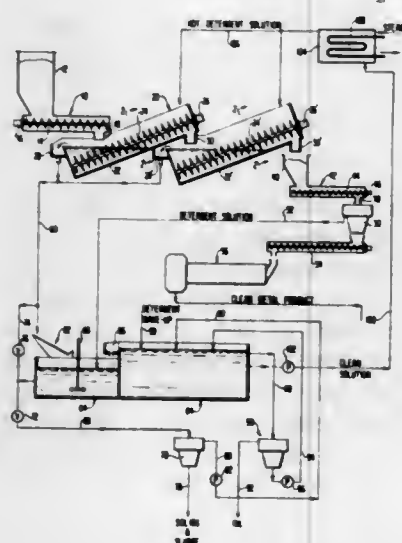
James R. Keogh, Jr., Philadelphia, Pa., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 53,261, July 8, 1970, Pat. No. 3,639,172, which is a continuation-in-part of Ser. No. 693,298, Dec. 26, 1967, Pat. No. 3,544,369. This application Aug. 4, 1971, Ser. No. 169,117

Int. Cl. B08b 7/04

U.S. Cl. 134-25 R

11 Claims



Oil laden metal waste such as turnings, chips and the like are cleaned to remove oil and other impurities from the metal waste enabling recovery of the metal and reclaiming of the oil. The cleaning is achieved through counterflow of a detergent solution in a wash bath, removing the cleaned metal waste from the bath and separating a substantial quantity of the remaining moisture therefrom, and removing the detergent solution from the wash bath and running it through a rehabilitation circuit where it is subjected to centrifugal force to separate sludge and oil from the solution. Then concentrated make up detergent solution is added, the make up and restored detergent solution heated and returned from the rehabilitation circuit to the wash bath.

3,734,777

# APPLYING A PRESERVATIVE TO GRAIN OR THE LIKE

John Bratschisch, Hamilton, Ontario, Canada, assignor to The Lely Corporation, Wilson, N.C.

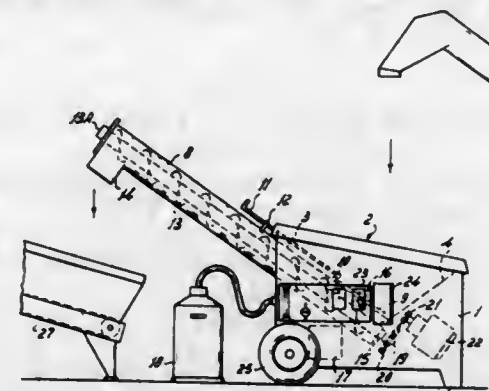
Filed Dec. 7, 1970, Ser. No. 95,854  
Int. Cl. B05c 5/00

U.S. Cl. 134-132

7 Claims

An implement for applying a preservative to grain or the like, comprising a frame supporting a hopper, means for ap-

plying the preservative and conveyor means for discharging the grain or the like from said hopper. The conveyor means is located in a space which adjoins the hopper near its lower



side. The means for applying the preservative comprises at least one spray nozzle by means of which the preservative can be brought into contact with the grain or the like.

3,734,778

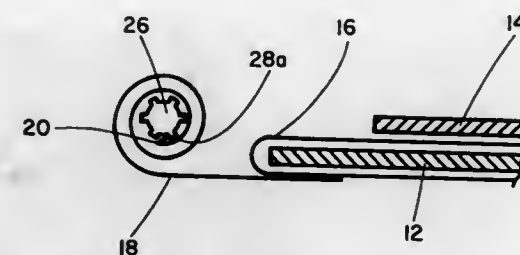
# METHOD FOR PRODUCING A SPIRALLY WOUND ELECTROLYTIC CELL

Leonard F. Huf, Wheatridge; Phillip A. Grossman, Lakewood; Roland L. Young, Denver, and Robert E. Stark, Littleton, all of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed May 10, 1971, Ser. No. 141,877  
Int. Cl. H01m 35/16

U.S. Cl. 136-13

16 Claims



An electrolytic cell pack consisting for instance of opposite polarity electrodes and alternate interposed separator is spirally wound by (a) attaching a thin flexible leader tab having a folded end to the cell pack, (b) curling the folded end of the leader tab in a spiral manner, (c) bringing a winding mandrel next to the thus formed curl and rotating the mandrel in the direction of the curled tab to thereby uncurl the leader tab and engage its folded end into a peripheral receiving portion of the mandrel, and (d) further rotating the mandrel to form the spirally wound cell pack. The described winding method is particularly suitable for spirally winding under firm stack pressure relatively small diameter cell packs such as may be required in rechargeable alkaline battery cells. The stack pressure achieved by the winding method is maintained by inserting a retainer in the axial void of the cell pack.

3,734,779

# SPIRAL ELECTRODE STORAGE BATTERY WITH IMPROVED ELECTRODE ASSEMBLY CONSTRUCTION AND METHOD OF MAKING

Mark Shoeld, 2140 E. Graves Ave., Orange City, Fla. 32763

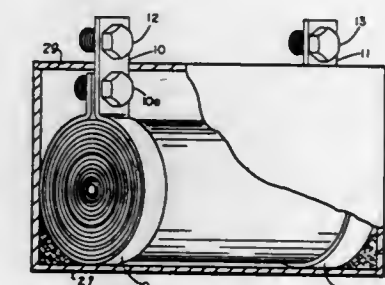
Filed Jan. 20, 1972, Ser. No. 219,370  
Int. Cl. H01m 35/16

U.S. Cl. 136-13

14 Claims

A lead-acid storage battery of the jelly-roll type is produced by rolling upon a mandrel two electrode strips, each

electrode strip comprising a pair of membranes of controlled microporosity with a sheet of pure lead provided with a plurality of spaced perforations interposed between the membranes of each pair. A spreadable mass of colloidal active positive electrode material mixed with acid is introduced into the perforations of one lead sheet and a similar mass of negative electrode material mixed with acid is introduced into the perforations of the other lead sheet. The spreadable electrode material is introduced centrally of the strips of lead in an amount controlled to fill only about 80% of the apertures and to leave apertures



3,734,780

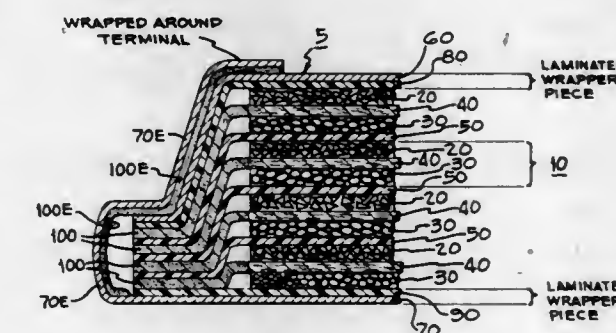
# FLAT CELL BATTERY WITH BOTH TERMINALS ON ONE FACE

John M. Bilhorn, Edgerton, and Bernard C. Bergum and Kent V. Anderson, Madison, Wis., assignors to ESB Incorporated

Filed June 25, 1971, Ser. No. 156,804  
Int. Cl. H01m 21/00

U.S. Cl. 136-111

7 Claims



A flat cell battery has a wrapper consisting of two pieces, each of which is in contact with an end electrode so as to serve as a battery terminal. One of these wrapper pieces or a laminated layer thereof is wrapped around the edge of the battery and overlays the other wrapper piece to produce a battery having both terminals on one face. Preferably the wrapper pieces are laminates of metal and electrically conductive plastic, with the plastic being in contact with the end electrodes and an extension of the metal in the laminate serving as the terminal which is wrapped around the edge of the battery. The wrapped



around extension, which must be electrically insulated from the wrapper piece over which it is overlaid, may be secured to the other wrapper piece by nonconductive adhesives or heat seals.

3,734,781

# LOW-GASSING HIGH STRENGTH BATTERY SEPARATOR AND METHOD OF PRODUCTION

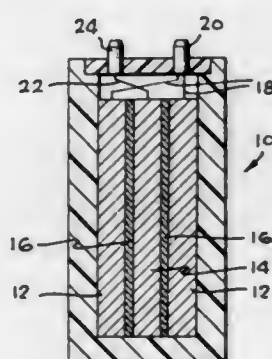
Joseph S. Smatko, Santa Barbara, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Oct. 19, 1970, Ser. No. 81,827

Int. Cl. H01m 3/00

U.S. Cl. 136-146

22 Claims



Production of inorganic porous sintered battery separator substantially reducing formation of gas when in contact with a zinc electrode, and having a dendrite formation inhibiting effect on such zinc electrode, permitting long cycle life of a high energy density battery such as a silver-zinc or nickel-zinc battery, and providing a sealed battery, produced by firing or sintering a compacted magnesium silicate-iron silicate composition, e.g., derived from the mineral olivine, and containing combined lead, e.g., as lead silicate, at temperature ranging from about 1,000°C to about 1,300°C in non-oxidizing atmosphere, e.g., a carbon monoxide-carbon dioxide atmosphere, to produce a porous sintered membrane consisting essentially of magnesium silicate, iron silicate and combine lead, e.g., in the form of lead silicate, the iron content thereof being substantially entirely in ferrous form.

3,734,782

# PROCESS FOR TREATING SURFACES OF ALUMINIUM AND ALUMINIUM ALLOYS

René Laroche, Beaurepaire, France, assignor to Aluminium Suisse S.A., Chippis, France

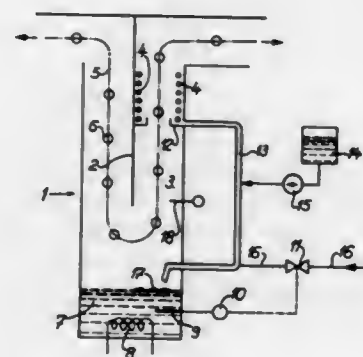
Filed Apr. 26, 1971, Ser. No. 137,566

Claims priority, application Switzerland, Apr. 29, 1970, 6,420/70

Int. Cl. C23f 7/06

U.S. Cl. 148-6.3

12 Claims



A surface layer of aluminium hydrate is formed by exposure of an aluminium surface to a gaseous mixture of

water, an organic solvent, and a volatilized alkaline catalyst. The percentage by weight of water in the mixture is less than the percentage by weight of an azeotrope of water with the solvent, and is preferably below 10%, for example between 2% and 4%.

3,734,783

# CORROSION RESISTANT VINYL COATED METAL ARTICLES

Harold McDonald, Harrington, N.J., assignor to Stanffer Chemical Company, New York, N.Y.

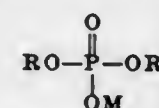
No Drawing. Original application July 24, 1968, Ser. No. 747,095, now abandoned. Divided and this application May 10, 1971, Ser. No. 142,011

Int. Cl. C23f 7/10

U.S. Cl. 148-6.15 R

6 Claims

Vinyl coated metal articles are rendered corrosion resistant by applying thereon an alkali metal dialkyl phosphate of the formula:



wherein R is an alkyl group containing from about 8 to about 16 carbon atoms inclusive, and M is an alkali metal ion.

3,734,784

# TREATING ALUMINUM SURFACES

Sigmund Bereday, R.F.D. 33-U 1, Lolza Station, San Juan, Puerto Rico 00914, and Edwin S. Kolic, Gahanna, Garson A. Lutz, Columbus, and Henry M. Grotta, Delaware, Ohio, and John H. Gibbs, San Juan, Puerto Rico; said Kolic, Lutz, Grotta, and Gibbs assignors to said Bereday

Filed Jan. 14, 1970, Ser. No. 2,883

Int. Cl. C23f 7/00; B32b 15/20

U.S. Cl. 148-6.27

20 Claims



A treated aluminum surface is provided having chemically bonded thereto an organic film comprising at its bonding interface a reaction product of a functional group of an organic compound and an active hydrated amorphous layer of aluminum oxide integral with the aluminum surface, the organic compound having at least 8 carbon atoms and being characterized by said functional group which reacts with an aliphatic alcohol, the active hydrated amorphous layer of aluminum oxide being characterized chemically in that it reacts like an alcohol with the functional group of said organic compound.

3,734,785

# ZINC FORGING ALLOY

Thorpe W. Watson, Oakville, Ontario, David V. Parsons, Clarkson, Ontario, and Arthur W. Wild, Wallaceburg, Ontario, Canada, assignors to Cominco Ltd., Montreal, Quebec, Canada

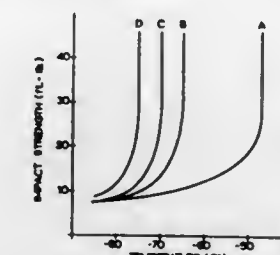
Filed Nov. 30, 1970, Ser. No. 93,725

Claims priority, application Canada, Dec. 31, 1969, 71,193

Int. Cl. C22f 1/16; C22c 17/00

U.S. Cl. 148-11.5 R

17 Claims



A method of providing zinc-base alloy forging stock and a zinc-base alloy forging having superior tensile strength, dimensional stability and resistance to fracture under impact at low temperatures. The alloy comprises from 9 to 22% by weight aluminum, from 0.5 to 1.5% by weight copper, from 0.01 to 0.03% by weight magnesium, and the balance zinc. The said alloy is extruded at a temperature between 275° and 382° C., forged at a temperature between 275° and 382° C., and the forging annealed from one to five hours at a temperature between 200° and 275° C.

## ERRATUM

For Class 148-23 see: Patent No. 3,734,791

3,734,786

# SOLID PROPELLANTS FABRICATED FROM A MIXED POLYMER SYSTEM

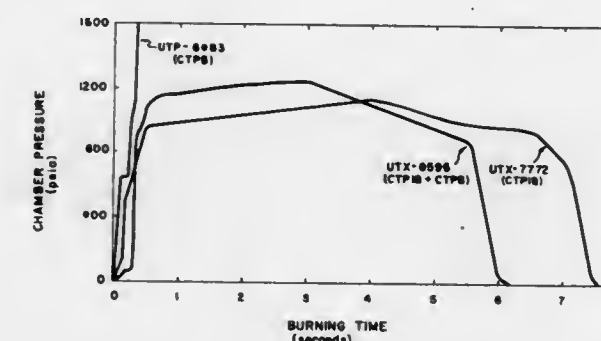
Ernest J. Walden, Mountain View, and John W. Allan, Menlo Park, Calif., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 16, 1971, Ser. No. 115,515

Int. Cl. C06d 5/06

U.S. Cl. 149-19

4 Claims



Functionally terminated polyisobutylene and functionally terminated polybutadiene are not completely soluble in each other at room temperature and lower. Nevertheless, it has been discovered that the insoluble mixtures of these materials can be crosslinked to form a

homogeneous binder network which is particularly useful in the manufacture of composite solid propellants.

3,734,787

# FABRICATION OF DIFFUSED JUNCTION CAPACITOR BY SIMULTANEOUS OUTDIFFUSION

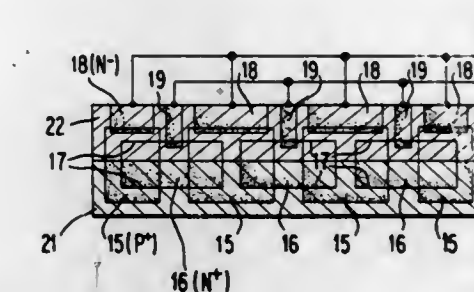
Vir A. Dhaka, and Walter F. Krollkowski, both of Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 9, 1970, Ser. No. 1,672

Int. Cl. H01l 7/64, 19/00, 5/00

U.S. Cl. 148-175

10 Claims



A diffused junction capacitor having two P<sup>+</sup>N<sup>+</sup> junctions, one in the semiconductor substrate and one in an epitaxial layer thereon and exhibiting high capacitance per unit area.

A method for forming such a capacitor makes use of the fact that the outdiffusion rate for boron is much faster than the outdiffusion rate for arsenic, whereby, for instance, boron and arsenic diffused into the surface of a semiconductor wafer can, after the growth of an N<sup>-</sup> epitaxial layer, be diffused into the N<sup>-</sup> epitaxial layer. Since the boron outdiffuses much faster, it will cover a larger area than the arsenic outdiffusion. This will, in turn, result in two P<sup>+</sup>N<sup>+</sup> junctions, one in the substrate and one in the N<sup>-</sup> epitaxial layer.

## ERRATUM

For Class 149-19 see: Patent No. 3,734,786

3,734,788

# HIGH DENSITY SOLID PROPELLANTS AND METHOD OF PREPARATION USING FLUORO-POLYMERS

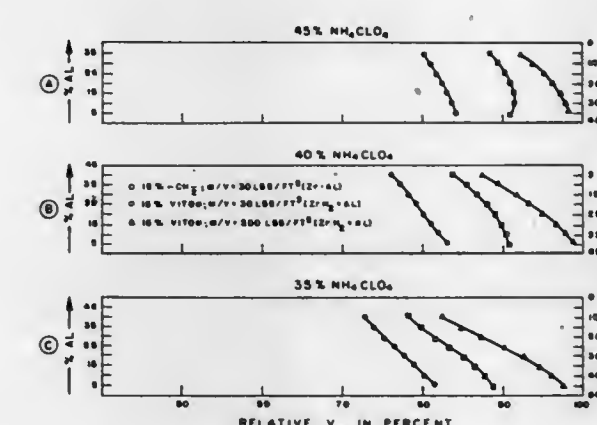
Martin H. Kaufman, China Lake, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed Apr. 17, 1964, Ser. No. 361,612

Int. Cl. C06d 5/06

U.S. Cl. 149-19

2 Claims



1. The process for preparing a high density impulse solid propellant comprising the steps of

(1) dissolving a copolymer of vinylidene fluoride and perfluoropropylene in methylethylketone forming a solution;



- (2) adding while stirring weighed quantities of dry ammonium perchlorate and zirconium of about 20 $\mu$  particle size to said solution until a consistent mixture results;
- (3) adding while stirring a volume of hexane about three times the volume of methylethylketone;
- (4) permitting a stand without stirring until all the solids settle;
- (5) decanting off sufficient liquid to leave about a one-half inch level above the solid residue thereby preventing agglomeration;
- (6) washing the residue a second time with hexane of about three times the volume of methylethylketone;
- (7) filtering out said residue; and
- (8) air drying.

3,734,789

**GAS GENERATING SOLID PROPELLANT CONTAINING 5-AMINOTETRAZOLE NITRATE**

Bertram K. Moy, White Plains, and Gerald L. MacKenzie, Port Tobacco, Md., and Frank J. Pisacane, Washington, D.C., assignors to the United States of America as represented by the Secretary of the Navy  
No Drawing. Filed Nov. 28, 1969, Ser. No. 883,327  
Int. Cl. C06d 5/06

U.S. Cl. 149—19

7 Claims

A gas generating solid composite propellant composition comprising 5-aminotetrazole nitrate as the oxidant component.

3,734,790

**GASEOUS ILLUMINANT PYROTECHNIC SYSTEMS**

Abraham D. Kirshenbaum, Succasunna, and Francis R. Taylor, Mount Arlington, N.J., assignors to the United States of America as represented by the Secretary of the Army  
No Drawing. Filed Oct. 22, 1970, Ser. No. 83,210  
Int. Cl. C06b 15/00

U.S. Cl. 149—22

7 Claims

A homogeneous pyrotechnic system which may be used for producing intense illumination such as that generated by flares. The system functions by reacting an all-gaseous fuel, oxidizer and boron additive to produce an intense flame.

3,734,791

**SURFACTANT-CONTAINING SOLDERING FLUXES**

Richard M. Pollak, Johnson City, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.  
No Drawing. Filed Oct. 23, 1970, Ser. No. 83,613  
Int. Cl. C23c 1/12

U.S. Cl. 148—23

12 Claims

A water soluble soldering flux substantially free of halide ions comprising organic solvents and a cationic fluorocarbon as an activator/surfactant/corrosion inhibitor. A typical formulation comprises ethylene glycol, glycerine, isopropyl alcohol, and the cationic fluorocarbon surfactant/activator.

3,734,792

**METHOD FOR RETARDING THE DECOMPOSITION OF HYDRAZINE ROCKET FUELS IN CONTACT WITH MARAGING STEELS**

John P. Young, Gaithersburg, Md., and Wahling H. Ng, Rockaway, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.  
Filed May 28, 1971, Ser. No. 148,062  
Int. Cl. C06c 1/02

U.S. Cl. 149—36

6 Claims

Liquid hydrazine fuel is stored in a maraging steel container, wherein the surface exposed to the liquid fuel comprises a bimetallic couple of metallic cadmium and bare

maraging steel. The rate of decomposition of the hydrazine fuel based on the exposed area of maraging steel is markedly lower than that for maraging steel alone.

3,734,793

**NITROCELLULOSE COMBUSTIBLE COMPOSITION HAVING SALT OF POLYETHYLENIMINE AS OXIDIZER**

John S. Lory, Commack, N.Y., and Suzanne T. Parrington, Raleigh, N.C., assignors to Lory Industries Inc., Deer Park, N.Y.  
No Drawing. Filed Dec. 29, 1971, Ser. No. 213,854  
Int. Cl. C06b 5/00

U.S. Cl. 149—100

4 Claims

The stabilized combustible plastic compositions comprise nitrocellulose, an oxidizer, a plasticizer and a stabilizer and are capable of combustion in a vacuum and leave a minimum of residue upon combustion. They are compounded with the aid of a solvent and are cast and cured for a variety of uses, e.g., shell cases and increment containers for artillery and mortar ammunition. An illustrative embodiment is a composition consisting essentially of nitrocellulose, perchlorate salt of polyethylenimine as oxidizer, dioctyl adipate and camphor as plasticizer and ethyl centralite and an organotin compound as stabilizer.

3,734,794

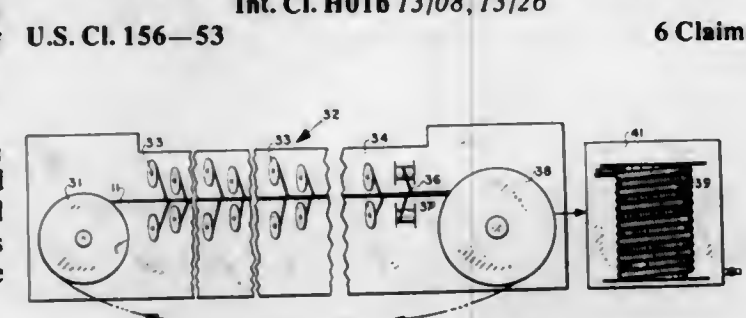
**HIGH-VOLTAGE CABLE AND METHOD OF MAKING**

Lawrence Charles Ebel, Hastings-on-Hudson, N.Y., assignor to Anaconda Wire and Cable Company, New York, N.Y.  
Division of Ser. No. 790,000, Jan. 9, 1969, Pat. No. 3,591,704.  
This application Nov. 23, 1970, Ser. No. 92,104  
Int. Cl. H01b 13/08, 13/26

U.S. Cl. 156—53

6 Claims

A high-voltage cable, with an insulating wall built up of dielectric tapes, has an electrically floating metal armor tape at mid-potential of the insulation. When the cable is manufactured it can be reeled up after the application of the armor and run through the taping machine a second time to apply the outer layers of insulating tape.



3,734,795

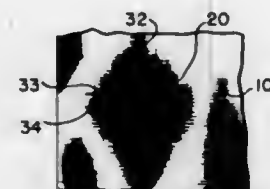
**PATCH AND SEAM FOR PLASTIC BELTS**

David W. Griffith, South Euclid, Ohio, assignor to The Lindsay Wire Weaving Company, Cleveland, Ohio  
Filed Apr. 23, 1971, Ser. No. 136,952  
Int. Cl. B32b 35/00; B29c 19/06

U.S. Cl. 156—98

3 Claims

Two portions of woven fabric containing polymeric plastic material are joined together by passing a current



3,734,799

**PROCESS FOR SULFOLANE BONDING OF TEXTILE FIBERS**

Rupert E. Schaffer, Camberley, John C. Moseley, Woking, and Derrick Sharrod, Farnborough, England, assignors to Shell Oil Company, New York, N.Y.  
No Drawing. Filed July 7, 1970, Ser. No. 53,021  
Claims priority, application Great Britain, July 9, 1969, 34,704/69

Int. Cl. C09j 5/02

U.S. Cl. 156—308

12 Claims

Fibers of textile articles are bonded by applying a blend of a sulfolane and at least one organic diluent, having an evaporation rate of between 0.01 and 3.50 times the evaporation rate of the sulfolane at 100° C. and miscible therewith, to the fibers and heating the article so as to bond the fibers.

3,734,796

**BONDED POLYESTER FIBROUS MATERIAL AND METHOD**

Frank Lamb, Chadderton, Oldham, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.  
No Drawing. Original application Apr. 15, 1965, Ser. No. 448,247. Divided and this application Jan. 2, 1969, Ser. No. 801,901

Claims priority, application Great Britain, Apr. 22, 1964, 16,606/64

Int. Cl. E06b 9/26

U.S. Cl. 156—176

14 Claims

The disclosure covers bonded polyester fibers and a process for their preparation which consists contacting the outer surface of the fibers with a bonding agent selected from:

- (a) a diester of a dicarboxylic acid and a monohydric compound, and
- (b) a diester of a monocarboxylic acid and a dihydroxy compound.

The bonded fibers are useful as a packing and insulating material.

3,734,797

**CARBON DISK QUALITY PROCESSING**

Clifton A. Byers, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio  
Filed June 29, 1971, Ser. No. 157,822  
Int. Cl. B32b 31/00

U.S. Cl. 156—253

5 Claims

Brake disk blanks are formed by laying up layers of resin impregnated graphite or carbon cloth. Small diameter holes are provided through the layer at spaced intervals over the entire surface of the blank after the blanks are partially cured. The blanks are subsequently fully cured in baking cycles at a temperature sufficient to carbonize and/or graphitize the resin, with a pressure of not less than 500 p.s.i. being applied to the blanks during the bake cycles. The invention contemplates that the invention can be performed with or without pressure, however.

3,734,798

**HOT MELT PACKAGE COATING METHOD**

Donald David Dooley, Lowell, Mass., assignor to Borden Inc., New York, N.Y.  
Division of Ser. No. 837,877, June 30, 1969, abandoned. This application Dec. 21, 1970, Ser. No. 100,200  
Int. Cl. C09j 5/02

U.S. Cl. 156—308

7 Claims

This invention relates to a new method for preparing blister-pack and skin-pack cards and packages which comprises coating the card with, and fastening the blister or skin to the card with, a universal hot-melt adhesive, particularly one as hereinafter described which contributes a high specular gloss to the printed package.

3,734,801

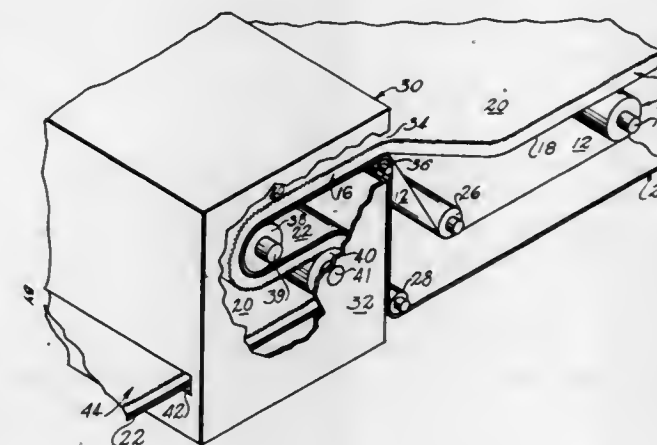
**METHOD FOR PREVENTING THE SLIDING OR RIDING UP OF PACKAGED ARTICLES BY COATING WITH ADHESIVE COMPOSITIONS**

Hans-Georg Sebel, Dusseldorf, Germany, assignor to Henkel & Cie GmbH, Dusseldorf, Germany  
Filed Aug. 25, 1970, Ser. No. 66,862  
Int. Cl. C09j 5/00, 7/00

U.S. Cl. 156—309

6 Claims

An aqueous colloidal adhesive composition for preventing sliding or riding up of packaged articles having coverings of paper, cardboard or pasteboard comprising an aqueous colloidal solution containing from 0.1 to 2 percent by weight of xanthan gum and the method of preventing sliding or riding up of packaged articles which comprises interspersing between said package articles, a layer of said aqueous colloidal adhesive composition.





3,734,802

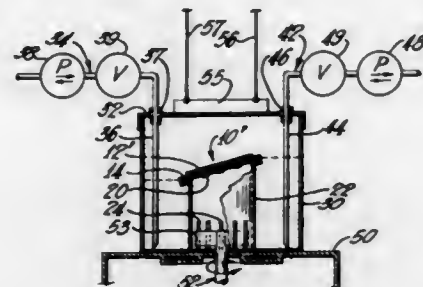
## APPARATUS FOR LEACHING GLASS FILMS

Charles I. Cohen, Granville, Ohio, assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio  
Division of Ser. No. 726,305, May 3, 1968, Pat. No. 3,615,958.  
This application Mar. 19, 1971, Ser. No. 126,246

Int. Cl. C03c 15/00

U.S. Cl. 156—345

6 Claims



Apparatus and method for leaching films including a container having within it means for supporting the film in inclined disposition during introduction and removal of heated fluids.

3,734,803

## APPARATUS FOR SPLAYING AND DEPOSITING NONWOVEN FILAMENTARY STRUCTURES

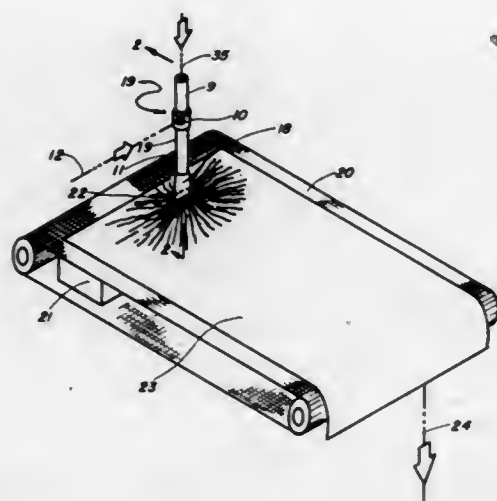
Walter Peter Lipscomb, and Eli Bently Shelburne, Sr., both of Chesterfield County, Va., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 28, 1971, Ser. No. 184,421

Int. Cl. D04h 3/00

U.S. Cl. 156—441

7 Claims



An apparatus of augmenting dispersal and improving deposition of a plurality of continuous filaments onto a continuously moving surface whereby random distribution of the filaments is provided for the production of uniformly distributed nonwoven webs. A splaying device comprising a completely enclosed channel with open ends, the exit end of which is in the form of a slot having an effective shorter dimension less than 25 percent of an effective longer dimension, is positioned near the exit of an aspirator so as to spread the filaments in substantially all directions and to provide greater openness and greater random laydown of filaments.

3,734,804

## ROTARY CUTTER AND STRIP FEEDING ARRANGEMENT

Siegfried Knecht and Helmut Demny, Gevelsberg, Germany assignors to Maschinenfabrik Alfred Schmersmund, Gevelsberg, Germany

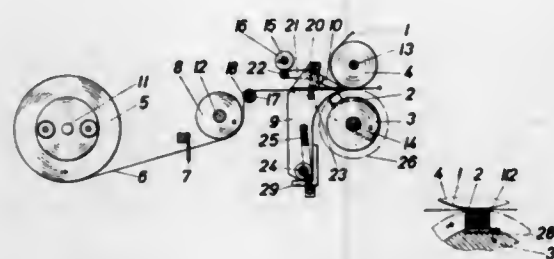
Filed Dec. 17, 1970, Ser. No. 99,029

Claims priority, application Germany, Nov. 11, 1969, P 19 56 531.2

Int. Cl. B32b 31/18

U.S. Cl. 156—518

13 Claims



A rotary cutter and strip feeding arrangement is disclosed.

The arrangement is provided with a cutter blade which is filled with rubber projecting beyond the cutting edge of the blade. The cutter blade is mounted on a rotating roller with the cutting edge thereof disposed parallel to the circumferential surface of the roller. The cutter blade cooperates with a counter-roller which feeds a web of cellophane provided with a welded-on tear-open strip to the rotating cutter and which provides a counter surface against which the rotating cutter blade periodically cuts-out a tongue shaped portion from the cellophane web. A length of self-adhesive coloured strip material is periodically contacted by the rotating rubber pad and pressed thereby against the moving web of cellophane so as to be drawn between the two rollers and periodically severed by the cutter blade.

3,734,805

## ULTRASONIC SEWING MACHINE

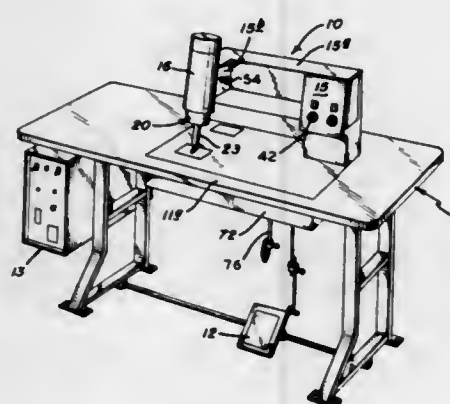
Edward G. Obeda, Brookfield, and Frank Parry, Monroe, both of Conn., assignors to Branson Instruments, Incorporated, Stamford, Conn.

Filed July 27, 1971, Ser. No. 166,462

Int. Cl. B32b 31/00

U.S. Cl. 156—580

4 Claims



An ultrasonic transducer assembly including a horn, is mounted in a sleeve bearing for axial movement by gravity to bring the horn toward an anvil. A spring actuated lever presses the transducer assembly toward the anvil with the final spring

pressed position determined by an adjustable stop. The lever may be rotated by control means against the pressure of the spring to withdraw the assembly from the stop and to release it thereafter for spring movement back against the stop. The spring pressure is adjustable to determine the pressure required to accept the reaction to the ultrasonic vibrations of the horn, and the stop is adjustable to determine the positioning of the assembly relatively to the anvil.

3,734,806

## PREPARATION OF PLASTIC PRODUCTS FROM VINYL CHLORIDE/PROPYLENE COPOLYMERS

Meyer H. Danzig, Bloomfield, and Allen W. Carlson, Wayne, N.J., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

No Drawing. Continuation-in-part of application Ser. No. 846,589, July 31, 1969. This application Aug. 30, 1971, Ser. No. 176,282

Int. Cl. B44f 1/00

U.S. Cl. 161—2

12 Claims

Vinyl chloride polymers, effective for forming rigid, dimensionally-stable molded products, can be modified by including therewith certain additives within specified low limits, to yield molding compositions which, when injection or compression molded, produce rigid, shaped articles that are transparent in the thin sections and opaque or translucent in the thick section.

3,734,807

## POLYVINYL FLUORIDE SURFACED LAMINATES

Peter Bernard Kelly, Cincinnati, Ohio, and Jay Thomas Oliver, Fort Mitchell, Ky., assignors to Formica Corporation, Cincinnati, Ohio

No Drawing. Continuation-in-part of abandoned application Ser. No. 780,183, Nov. 29, 1968. This application Mar. 29, 1971, Ser. No. 129,133

Int. Cl. B44c 1/26, 5/04; B32b 27/30

U.S. Cl. 161—5

6 Claims

A decorative laminate comprising a heat and pressure consolidated assembly of a rigidity imparting base member, a clear transparent film covering the surface of the decorative side of the laminate in which said clear, transparent, pigment-free film is a homogeneous blend of polyvinyl fluoride containing uniformly dispersed therein from about 0.1% to about 10% by weight of a polymer derived from a monomer of a polymerizable 2-hydroxy-benzophenone containing a polymerizable ethylenically unsaturated group wherein said film is bonded to the remaining layers of the laminate through an alpha cellulose paper layer impregnated with from about 60% to about 70% by weight of a thermosetting melamine formaldehyde resin having a mol ratio between about 1:1.5 and 1:2.5 melamine to formaldehyde respectively.

3,734,808

## TWO COLORED TAPE

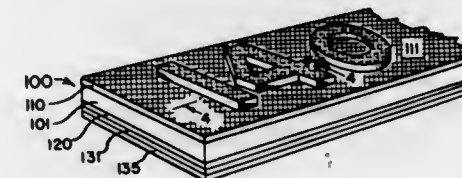
James D. Anderson, Kensington, Calif., assignor to Dymo Industries, Inc., Berkeley, Calif.

Filed Apr. 23, 1965, Ser. No. 450,399

Int. Cl. B44f 1/08; B32b 7/02, 27/08

U.S. Cl. 161—6

8 Claims



There is disclosed an embossable sheet material including an embossable base sheet of plastic, a transparent top coat of plastic firmly bonded to the front surface of

the base sheet and a transparent background coat of plastic firmly bonded to the rear surface of the base sheet, the transparent top coat having a first coloring agent uniformly distributed therethrough and the background coat having a second coloring agent uniformly distributed therethrough, whereby the sheet material is embossable to provide opaque embossments having the color of the first coloring agent on a field having a color that is a combination of the first and second coloring agents, a layer of pressure sensitive adhesive on the rear surface of the background coat, and a backing sheet covering the exposed surface of the adhesive.

3,734,809

## MEANS FOR MORE CONVENIENTLY PERUSE FROM A LARGE SHEET OF PAPER

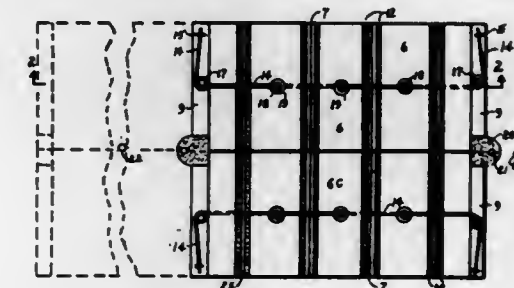
Robert Ellis, 350 Lomas Santa Fe Drive, Solana Beach, Calif. 92075

Filed Aug. 26, 1971, Ser. No. 175,077

Int. Cl. B32b 3/10

U.S. Cl. 161—17

1 Claim



A means for more conveniently permitting the user to peruse information from a large sheet of paper such as an auto-map and incidentally fold it into closed position without crumpling or tearing the map. Also, as a new article of manufacture, a hand grip which will removably secure the opposite edges of the map.

3,734,810

## HEATING AND COOLING SYSTEM

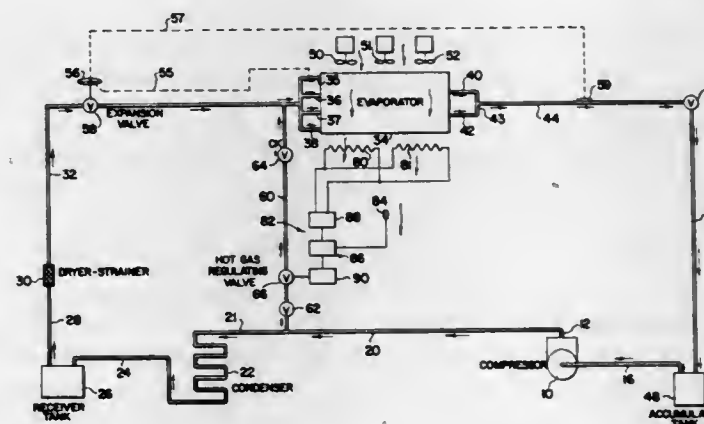
Noel Davis, Geauga, Ohio, assignor to Integrated Development & Mfg. Co., Chagrin Falls, Ohio

Continuation-in-part of Ser. No. 821,889, May 5, 1969, abandoned. This application June 16, 1971, Ser. No. 153,575

Int. Cl. F25b 29/00

U.S. Cl. 165—29

12 Claims



A direct expansion type heating and cooling system is provided with means for supplying a heat exchange coil with proportioned mixtures of liquid refrigerant and hot refrigerant gas. Constant temperature is maintained in the conditioned area at any point from full cooling to full heating, by propor-



tioning refrigerant condensate and hot, uncondensed refrigerant gas to the heat exchange coils. Proportioning is attained by modifying the refrigerant condensate expansion valve to move in the direction of closing in response to an increase in uncondensed refrigerant gas flow into the heat exchange coils. The amount of uncondensed refrigerant gas flow into the heat exchange coils is controlled in response to the temperature of the conditioned area. The feed to the heat exchange coils may vary between 100 percent condensate and no uncondensed refrigerant gas, to 100 percent uncondensed refrigerant gas and no condensate. Normally, a mixture of condensate and refrigerant gas is introduced into the evaporator coil.

Electric resistance heaters may be used in conjunction with the heat exchange coils to supplement heating and to "fine tune" temperature controls.

3,734,811

### LAMINATED CONSTRUCTION OF CELLULAR PLASTIC MATERIAL

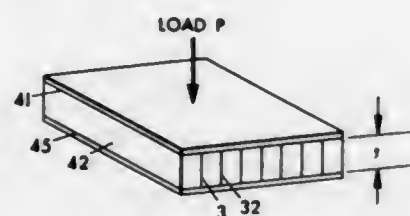
Augustus B. Small, Brussels, Belgium, Paul T. Gorman, Arenzano, Italy, and Frederick J. McGarry, Weston, Mass., assignors to Esso Research and Engineering Company, Linden, N.J.

Original application July 12, 1967, Ser. No. 652,748, now Patent No. 3,607,531. Divided and this application Oct. 29, 1970, Ser. No. 85,236

Int. Cl. B32b 3/10, 5/18; B65d 25/14

U.S. Cl. 161—37

4 Claims



According to the teachings of the instant invention, a high-strength cellular plastic insulation system comprised of alternating layers of cellular plastic and thin columns of solid plastic is formed by heat sealing blocks of the cellular plastic together. The resulting product, while retaining its high insulation efficiency, has greatly improved compressive strength and increased fatigue resistance.

3,734,812

### LAMINATE PRODUCT OF CROSSED STRETCHED TAPES HAVING PERFORATIONS FOR AIR PERMEATION AND METHOD FOR PREPARING THE SAME

Masahide Yazawa, Tokyo, Japan, assignor to Polymer Processing Research Institute Ltd., and Nippon Petrochemicals Co., Ltd., both of Tokyo, Japan

Filed Aug. 9, 1971, Ser. No. 169,990

Claims priority, application Japan, Aug. 25, 1970, 45/74,762

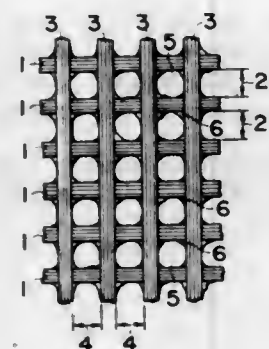
Int. Cl. B32b 5/12, 3/10, 31/26

U.S. Cl. 161—57

3 Claims

A cross-laminated product of stretched tapes having perforations for air permeation is prepared by warping a large number of elongated uniaxially stretched tapes of narrow width prepared from a fiber forming polymer at predetermined distances from one to another, laminating the warped tapes as a warp tape layer and weft tape layer, so that the warp tapes and weft tapes may be crossed perpendicularly or slantedly, or laminating two tape layers together, each of which has slantedly arranged tapes at predetermined distances from one to the other in the

longitudinal direction of the tape layer, so that the tapes of each tape layer may be crossed perpendicularly or slantedly, thermally bonding the tape layers to each other under a pressure by providing at least one film layer of a polymer having a lower melting or softening temperature than that of the tapes between both layers as an adhesive binder, subjecting the resulting laminate to sufficient heat, thereby to melt the film at portions surrounded by crossed



tapes, gather the molten film towards tape sides and form perforations for air permeation at portions surrounded by crossed tapes. And a composite laminate is prepared by bonding one layer composed of laminated product above-mentioned, onto at least one surface of a layer composed of fibrous material. Cleavage and fluffing of the stretched tapes are suppressed by the gathered and solidified film of the polymer, and adhesion at the crossings of the warp and weft tapes is much intensified.

3,734,813

### HIGH FREQUENCY-WELDABLE MATERIAL

Gerhard Pohl, 63 Professorenweg 33, GieBen, Germany

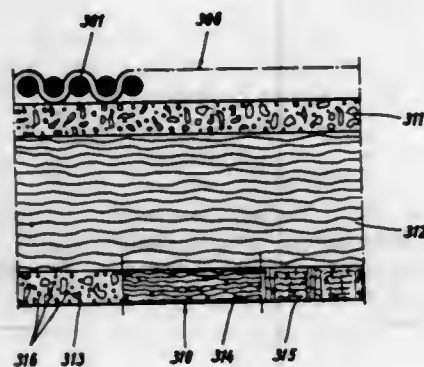
Filed Jan. 19, 1970, Ser. No. 3,950

Claims priority, application Germany, Jan. 25, 1969, P 19 03 667.0; Mar. 15, 1969, P 19 13 209.3; July 16, 1969, P 19 36 199.0; June 10, 1969, P 19 29 352.8

Int. Cl. B32b 7/14, 5/16

U.S. Cl. 161—148

24 Claims



A high frequency-weldable material for use in the manufacture of a composite material containing said weldable material comprises a structure which is permeable to gas, vapor and liquid and which is free of a tendency to rustle when subjected to deformation, and discrete particles arranged on at least one boundary surface of said structure and consisting of a thermoplastic synthetic resin, which is adapted to melt and to produce a high frequency-welded joint under the action of a high-frequency field and to resist the action of detergents and dry-cleaning agents.

3,734,814

### SHEET MOLDING COMPOUND AND MATERIALS THEREOF

Carlton J. Davis, Sr., 43 Garrick St., Newark; Richard P. Wood, 529 Burg St., Granville, and Everett R. Miller, Joy Lane, Route 2, Granville, all of Ohio

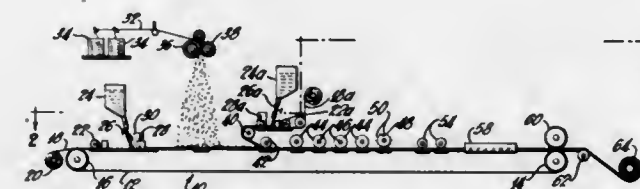
Division of Ser. No. 741,677, July 1, 1968, Pat. No. 3,615,979.

This application Oct. 4, 1971, Ser. No. 186,369

Int. Cl. B32b 3/10

U.S. Cl. 161—112

6 Claims



The specification describes a process for making a sheet molding compound wherein a layer of resin-filler paste that includes a thickening agent and a hardening catalyst is put down upon a first layer of sheet material; a layer of glass fibers that are sized with a material which induces wet out is placed thereon; following which another layer of the resin-filler paste containing the catalyst is placed thereon and covered by a second layer of sheet material. The sandwich thus formed is fed into the bite of rollers which squeeze out air and compress the resin-filler paste around the sized fibers, following which the composite is placed under further compaction that includes a perforating means which forces needle-like members through at least one layer of the sheet material, through the resin-filled paste, and into the layer of fibers for the removal of remaining entrapped air. The glass fibers which are used are sized with a material that includes both a hardening resin, and a nonhardening resin. Specifically, the fibers are coated with an unsaturated polyester resin and a saturated polyester resin which are preferably deposited on the glass fibers as emulsified particles.

3,734,815

### LAMINATED SAFETY-GLASS AND CABIN FURNISHED THEREWITH

Hendrik Jan Schorel, Beverwijk, Netherlands, assignor to Koninklijke Nederlandsch Hoogovens en Staalfabrieken N.V., IJmuiden, Netherlands

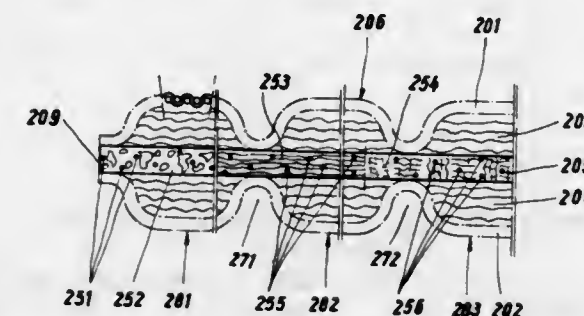
No Drawing. Filed Sept. 25, 1970, Ser. No. 75,766

Claims priority, application Netherlands, Apr. 1, 1970, 7004650

Int. Cl. B32b 17/10

U.S. Cl. 161—165

5 Claims



Laminated safety-glass or bullet-proof glass has at least three layers of glass with plastic layers therebetween; one outer glass layer is no thicker than the other two, a first plastic layer adjacent the other outer layer has not more than 13% of the thickness of said one outer glass

layer, and the plastic layer adjacent said one outer glass layer is 5 to 11 times as thick as said first plastic layer. Plate glass layers and polyvinylacetal, preferably polyvinylbutyral, plastic layers, are preferred; and relatively thick and relatively thin structures, and cabins having transparent walls thereof, are disclosed.

3,734,816

### LAMINATED STRUCTURE HAVING A RENEWABLE TACKY SURFACE

Joyce A. Swasey, Rutland Street, Carlisle, Mass.

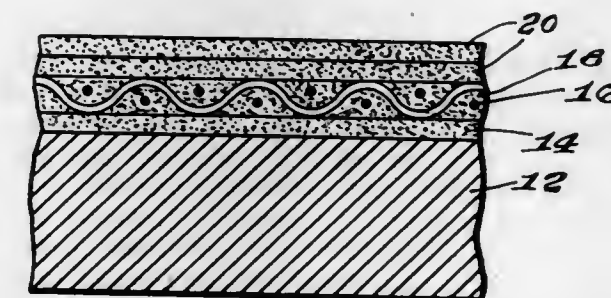
Continuation of Ser. No. 741,691, July 1, 1968, abandoned.

This application Feb. 10, 1971, Ser. No. 114,359

Int. Cl. C09J 7/02

U.S. Cl. 161—167

8 Claims



A laminated structure having a surface to which objects adhere upon application to the surface of the lamination and which objects may be removed from the surface and readhered thereto repeatedly over a long period of time. The lamination comprises an adhesively coated supporting member, a material impregnated with a pressure sensitive plastic adhesive, the material having open interstices in which the plastic adhesive is retained overlying and secured to the adhesively coated supporting member and a plastic adhesive film on the exposed surface of the underlying impregnated material. The film is believed to inhibit curing of the impregnant, and the plastic impregnant maintained in a substantially uncured flowable condition. Upon the application of an object to the surface film it is believed that the pressure exerted causes the film to be interrupted and an amount of the uncured plastic impregnant to flow to the surface of the film, thereby providing a surface to which the object may be removably adhered. The surface of the lamination is capable of being washed with soap and water to remove accumulations of dust, dirt or other material which pressure sensitive adhesive coatings normally attract. Such washings maintain both the appearance and the functional adhesiveness of the laminate over a very long period of time.

3,734,817

### TREATED QUARTZ VESSELS FOR USE IN PRODUCING AND FURTHER PROCESSING III-V SEMICONDUCTOR BODIES LOW IN SILICON

Klaus Blenert, Winfried Lang, and Egon Nordt, Burghausen, Upper Bavaria, Germany, assignor to Wacker-Chemtronik Gesellschaft für Elektronik-Grundstoffe m.b.H., Burghausen, Upper Bavaria, Germany

No Drawing. Filed Nov. 23, 1970, Ser. No. 92,318

Claims priority, application Germany, Nov. 26, 1969, P 19 59 392.1

Int. Cl. B32b 17/06

U.S. Cl. 161—192

1 Claim

A vessel particularly a phial or an ampoule for use in producing, and further processing, III-V semiconductor bodies low in silicon, which vessel is composed of quartz having its inside wall coated with a substance which is inert at the working temperature. Semiconductor bodies produced or further processed in such a vessel contain much less silicon than similar bodies produced or processed in conventional quartz vessels.



3,734,818

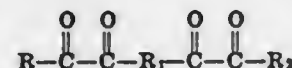
**LAMINATED PRODUCTS BONDED TOGETHER WITH A QUINOXALINE POLYMER**

John K. Stille, Iowa City, Iowa (% Department of Chemistry, University of Iowa, Iowa City, Iowa)  
No Drawing. Application Apr. 24, 1969, Ser. No. 819,532, which is a continuation-in-part of application Ser. No. 344,232, Feb. 12, 1964, both now abandoned. Divided and this application Mar. 2, 1970, Ser. No. 20,263  
Int. Cl. C08g 9/06; B32b 15/08

U.S. Cl. 161-213

3 Claims

Polymers containing recurring quinoxaline groups which are the reaction products of aromatic tetramines containing two sets of ortho-amine functions attached to the aromatic nucleus and tetracarbonyl compounds having the formula:



wherein R and R<sub>2</sub> represent a member selected from the group consisting of hydrogen and monovalent hydrocarbon groups, and R<sub>1</sub> represents a divalent hydrocarbon group. The salts of the aromatic tetramines and the hydrates of the tetracarbonyl compounds may also be used to prepare the polymers. Quinoxaline polymers can be used for making films, fibers and adhesives as well as for other purposes. Laminated articles bonded together with these adhesive compositions, such as high temperature metal laminates are also disclosed.

3,734,819

**ETHYLENE-VINYL ACETATE EMULSION ADHESIVE**

Gaylen M. Knutson, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 50,880, June 29, 1970, abandoned. This application Feb. 14, 1972, Ser. No. 226,256  
Int. Cl. C08f 37/00; C09j 3/14

U.S. Cl. 161-254

13 Claims

A process for the production of an aqueous emulsion of an ethylene-vinyl acetate polymer is disclosed wherein the polymerization is performed in the presence of a heel, a small amount of a vinyl or C<sub>3</sub> to C<sub>12</sub> vinylalkylene, vinylcycloalkylene or vinylarylene sulfonic acid or the sodium, potassium, lithium or ammonium salt thereof and a minor amount of a polyvinyl alcohol protective colloid. The heel is an aqueous emulsion of an ethylene vinyl-acetate polymer which contains from 1 to 20 weight percent ethylene and a small amount of polyvinyl alcohol protective colloid. The polymerization is performed under an ethylene pressure of 100 to 1,000 psig., sufficient to incorporate from 1 to 20 weight percent ethylene into the final polymer product and carried out until the total free monomer content of the emulsion is maintained below about 1 weight percent. Conventional free radical initiation of the polymerization reaction is used. The resultant emulsion can be used as an adhesive since films formed therefrom exhibit a high degree of adhesiveness to vinyl surfaces.

3,734,820

**CATIONIC DEXTRAN GRAFT COPOLYMERS AS DRY STRENGTH ADDITIVES FOR PAPER**

Merwin Frederick Hoover, Pittsburgh, and Gloria Di Marco Sinkovitz, Bridgeville, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

No Drawing. Filed Sept. 22, 1971, Ser. No. 182,898  
Int. Cl. D21h 3/20

U.S. Cl. 162-168

10 Claims

Paper products exhibiting markedly improved dry strength properties are produced by adding to the aqueous cellulose dispersion, prior to sheet formation, novel, cationic graft copolymers of certain polymerizable acrylic and/or diallylic quaternary ammonium monomers and acrylamide grafted onto a dextran substrate.

3,734,821

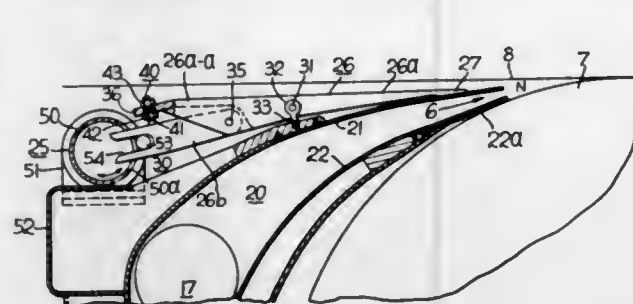
**HEADBOX FOR CYLINDER ROLL PAPERMAKING MACHINE**

Donald R. Curtis, Appleton, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Dec. 14, 1970, Ser. No. 97,607  
Int. Cl. D21f 1/04

U.S. Cl. 162-317

5 Claims



A headbox is disclosed having a vertical flow chamber connected to a curved and tapered nozzle which defines a slice opening for jetting paper stock from the flow chamber along a path having both horizontal and vertical components and into a nip above a cylindrical forming roll and beneath a felt tangentially engaging an upper portion of the forming roll. The headbox nozzle has an upper and lower lip projecting into the nip. An adjusting mechanism is provided for the upper lip which includes a plurality of adjusting arms each connected on one end to the top of the upper lip proximate to the slice opening. The arm projects from the slice opening toward the flow chamber end of the nozzle and diverges from the upper lip to define a generally wedge-shaped space between the arm and the upper lip. A horizontal pivot is connected to the arm intermediate the ends thereof. A journal is connected to the pivot and has a link portion which spans the space between the adjusting arm and the upper lip and is connected to the upper lip. The adjusting arm is made up of a first and a second section pivotally connected by a horizontal pin at a location between the journal and the flow chamber end of the adjusting arm. The section that comprises the slice opening end of the arm has a portion projecting around the pin with a terminal end of this portion vertically spaced above the other of the sections. A vertically adjustable link connects this terminal end portion of the one section, to said other of the sections, to provide for holding the two sections of each arm in variable preselected angular positions relative to each other for warping the upper slice lip to provide a desired profile to the upper lip. A horizontal rotatable drive shaft is mounted on the headbox adjacent the flow chamber end of the adjusting arm and this shaft has a horizontal pin attached to the periphery of the shaft which projects into a slot defined in the adjacent end of the arm. Rotation of the drive shaft raises and lowers the connected end of the adjusting arm about the pivot and bends the upper lip to vertically adjust the position of the slice opening end of the upper lip relative to the lower lip.

3,734,822

**HEADBOX FOR VERTICAL DOUBLE-WIRE PAPER MACHINE**

Weston T. Bennett, Montreal, Quebec; Donald B. Coveney, Ottawa, Quebec, both of Canada; Charles A. Lamb, and Jonathan Leslie Hanson, both of Watertown, N.Y., assignors to The Black Clawson Company, Middletown, Ohio

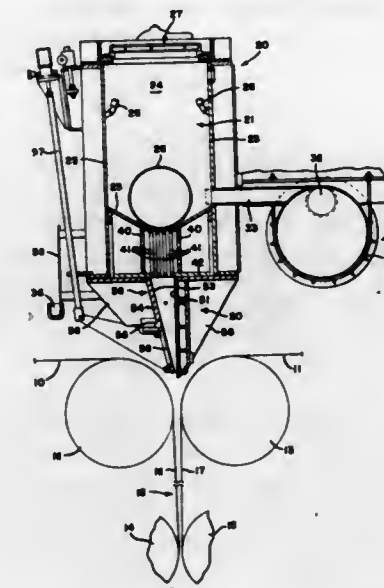
Filed Oct. 16, 1970, Ser. No. 81,447  
Int. Cl. D21f 1/06

U.S. Cl. 162-343

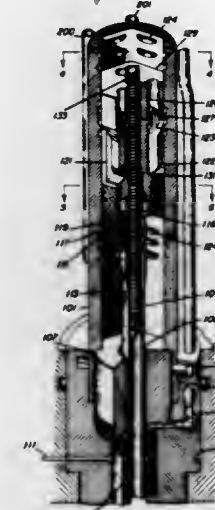
1 Claim

The headbox for a vertically oriented double-wire paper-making machine is formed with one fixed slice lip parallel to

the forming zone defined by the wires and another, adjustable slice lip in converging relationship to the first. The second slice lip is formed with a fixed upper section and a pivotally mounted lower section, and the first slice lip includes a



chamber on the side opposite the second slice lip which has inlet and outlet openings which allow for heated liquid recirculation therethrough so that the first slice lip may be preheated and the opening between the slice lips adjusted before stock is passed therebetween.



position of the control elements is included. Safety and reliability are enhanced by a trapped part design which eliminates the need for numerous fasteners and permits rapid, convenient maintenance of the components in the mechanism.

3,734,823

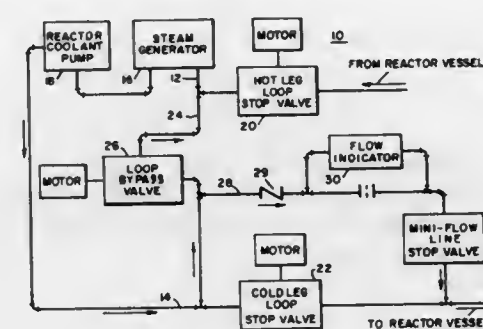
**NUCLEAR REACTOR LOOP REACTIVATION SYSTEM**

William W. Brown, Monroeville; Robert A. Loose, Murrysville, and John A. Vogel, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 18, 1969, Ser. No. 877,644  
Int. Cl. G21c 7/32, 17/00

U.S. Cl. 176-26

2 Claims



A method and means for protecting a nuclear reactor against rapid insertion of reactivity upon the reactivation of an isolated loop. A temperature interlock, a flow mixing line and a time sequence logic system are coupled to each loop of a nuclear reactor to insure that the temperature and boron concentration of the fluid in each loop are acceptable before such a loop can be recoupled to the reactor coolant system.

3,734,824

**NUCLEAR REACTOR CONTROL ROD DRIVE WITH ROD POSITION INDICATING MEANS**

Charles C. Ripley, San Jose, Calif., assignor to General Electric Company

Filed Apr. 14, 1969, Ser. No. 815,608  
Int. Cl. G21c 7/08

U.S. Cl. 176-36 R

22 Claims

A nuclear reactor control element drive system is disclosed which is capable of both gradual movement during

A dual control member serves to control and shutdown a pressurized-water nuclear reactor and has a control element that includes a plurality of finger control rods secured to a central drive rod through a spider-shaped holder and a shutdown member held by a drive tube surrounding the drive rod and having a separate coaxial spider-shaped holder for a plurality of finger shutdown rods.





3,734,826

# METHOD OF SUPPRESSING THE FORMATION OF METHYL IODIDE IN A WATER-COOLED NUCLEAR REACTOR

William L. Slagle, Idaho Falls, Idaho, assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed July 20, 1972, Ser. No. 273,668  
Int. Cl. G21c 9/00

U.S. Cl. 176—37

6 Claims

Release of methyl iodide to the environment following a major loss-of-coolant accident in which significant core melt-down occurs is prevented by suppressing its formation rather than by reducing its concentration after it has been formed. This is accomplished by injecting a large excess of a material which is more reactive to methyl radicals than is iodine, such as chlorine or fluorine, into the reactor plenum and, if desired, into the reactor containment vessel immediately upon occurrence of a major loss-of-coolant accident. Preferably, the chlorine injection system is activated the same time as the emergency core cooling system.

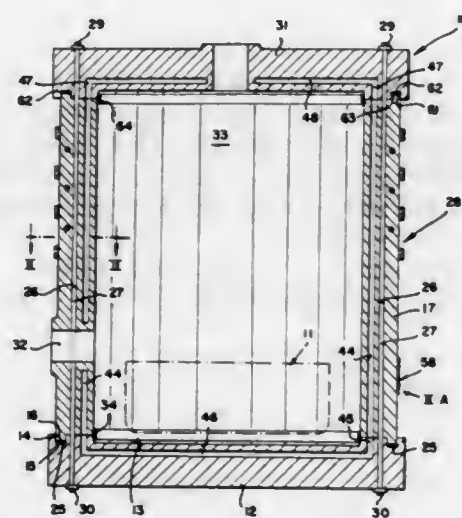
3,734,827

# NUCLEAR-REACTOR STRUCTURE

Franz Schilling, Kempen, Rhineland, Germany, assignor to Siempelkamp Giesserei KG, Krefeld, Germany  
Filed Jan. 5, 1970, Ser. No. 780  
Int. Cl. G21c 13/08

U.S. Cl. 176—87

12 Claims



A nuclear-reactor structure in which the reactor core is housed in a metallic enclosure serving in part as a pressure vessel and at least in part as a radioactive shield. The walls of the structure are made up of prestressed cast-iron bodies which may have interfitting or interlocking formations with any gaps filled by pressure-retaining compounds. Stressing may be effected by rods or cables running through the cast-iron elements or by externally positioned cables, wires, bands or rings.

3,734,828

# PROCESS FOR THE SEPARATION AND PURIFICATION OF RIBOFLAVINYL GLYCOSIDES

Toshio Miyake, Okayama, and Yukio Suzuki, Kurashiki, Japan, assignors to Hayashibara Company, Okayama, Japan  
No Drawing. Filed Mar. 31, 1971, Ser. No. 130,035  
Claims priority, application Japan, Mar. 31, 1970, 45/27,328

Int. Cl. C07d 57/32  
U.S. Cl. 195—28 R

4 Claims

Process for recovering and purifying riboflavinyl glycosides which are produced by subjecting transglucosidase to a mixture solution of carbohydrates and riboflavin,

which comprises crystallizing riboflavin by means of reduction concentration thereby removing the crystallized riboflavin, adding hydrosulfite to the crystallized riboflavin to give reduced riboflavinyl glucosides in crystal forms, separating the product from the sugars, passing the resulting product through acidic- and moderately basic ion exchange resins thereby removing impurities, then concentrating and crystallizing the resulting product.

3,734,829

# FERMENTATIVE PREPARATION OF L-ARGININE

Ichiro Chibata, Sakai, Masahiko Kisumi, Kobe, Jyoji Kato, Sakai, and Masaki Sugura, Osaka, Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan  
No Drawing. Filed Dec. 13, 1971, Ser. No. 207,576  
Claims priority, application Japan, Dec. 25, 1970, 45/125,917

Int. Cl. C12d 13/06

U.S. Cl. 195—29

7 Claims

An arginine hydroxamate-resistant mutant of *Bacillus subtilis* is cultivated in an aqueous nutrient medium under aerobic conditions. 1 to 5 w./v. percent of glutamic acid may be optionally added to the medium. The cultivation is preferably carried out at about 25° to 37° C. and at a pH of 6 to 9. L-arginine is recovered from the fermentation broth.

3,734,830

# CONTINUOUS PROCESS FOR PREPARING DELTA-DEHYDROGENASE

Dewey Y. Ryu, East Brunswick; Bong Kuk Lee, Old Bridge, and Richard W. Thoma, Somerville, all of N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.  
Filed Feb. 4, 1971, Ser. No. 112,827

Int. Cl. C12d 13/10  
U.S. Cl. 195—65

7 Claims

A continuous process is provided for preparing inducible enzymes wherein cells of a microorganism are grown in a first stage under substantially optimal conditions for growth and enzyme is produced in a second stage in the presence of an inducer under conditions substantially optimal for enzyme production. This process is especially applicable to the production of *Arthrobacter simplex* cells rich in 3-ketosteroid-Δ<sup>1</sup>-dehydrogenase activity.

3,734,831

# PRODUCTION OF CELLULASE

Michael Anthony Hulme, Ottawa, Ontario, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada  
No Drawing. Filed Nov. 27, 1970, Ser. No. 93,506

Int. Cl. C07g 7/02  
U.S. Cl. 195—66 R

8 Claims

In a process for producing cellulase in a submerged culture containing a cellulase synthesizing fungus and nutrients including an assimilable carbon source material, the improvement comprising regulating the amount of assimilable carbon source material in said culture medium so as to maintain its concentration at a stage of imminent exhaustion so as to maximize cellulase production.

3,734,832

# FERMENTATION PROCESS FOR PRODUCING PHYSOSTIGMINE

Donald R. Daoust, South Plainfield, N.J., assignor to Merck & Co., Rahway, N.J.  
No Drawing. Filed Sept. 24, 1971, Ser. No. 183,649

Int. Cl. C12b 1/00  
U.S. Cl. 195—80 R

6 Claims

A fermentation process for preparing the known compound physostigmine.

3,734,833

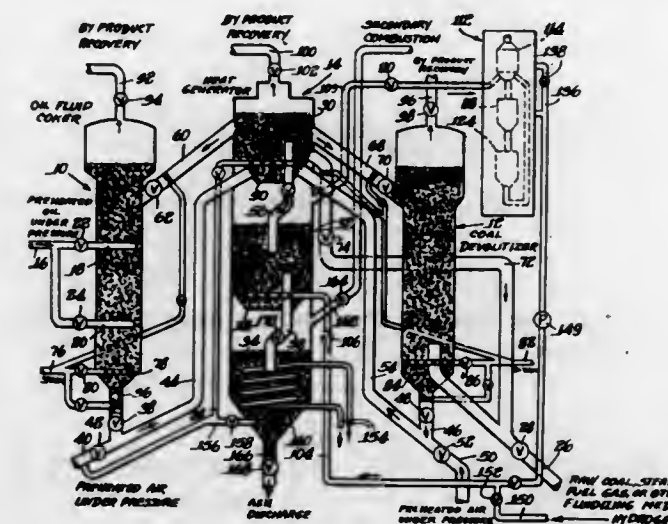
# LOW SULPHUR FUEL SYSTEM

Alamjit D. Singh, 4015 N. Whipple St., Chicago, Ill. 60618  
Filed Dec. 10, 1969, Ser. No. 883,982

The portion of the term of the patent subsequent to Apr. 8, 1986, has been disclaimed  
Int. Cl. C10b 55/10, 57/00

U.S. Cl. 201—17

14 Claims



In accordance with the method and apparatus herein set forth, an oil fluid coker and a coal devolatilizer are interconnected with a heat generator, whereby to effect the formation of a carbonaceous product or char, which is a combination of oil fluid coke and devolatilized coal. By-products from the oil fluid coker, and from the coal devolatilizer, and from the heat generator may be separately withdrawn. The heat generator is sectionalized to provide for a maximum removal of sulphur from the carbonaceous product, or fuel, and to effect a partial gasification thereof, and to provide for the burning or combustion of the fuel directly within the heat generator, for maximum combustion efficiency.

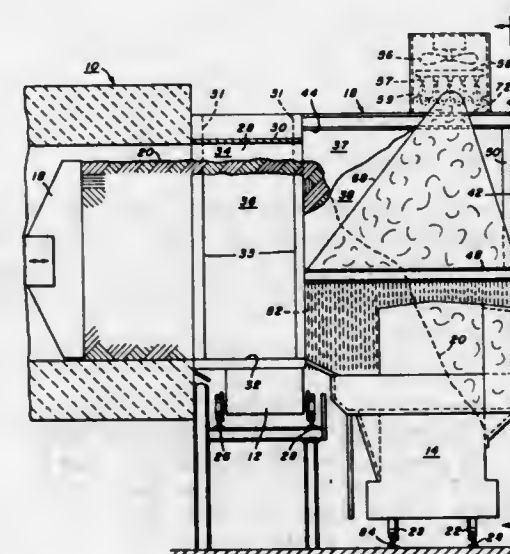
3,734,834

# APPARATUS AND METHOD FOR APPLYING A FOAM COATING TO EJECTED HOT COKE

Francis H. Brimont, Pittsburgh, Pa., assignor to Brimont Associates, Inc., Pittsburgh, Pa.  
Filed July 19, 1971, Ser. No. 163,947

Int. Cl. C10b 39/00  
U.S. Cl. 201—39

7 Claims



\*Apparatus and method for applying an adherent foamy layer of bubbles on hot coke as it is ejected from an oven of a

battery of by-product coke ovens, wherein a box-like housing extends outwardly from a coke oven guide carriage and over a coke transfer car which car is on a level below the coke oven guide carriage; the housing having an open end facing and alignable with the coke oven and having an open bottom side; and means associated with the housing for generating and applying a foamy coating onto the mass of coke as it passes through the housing; and the foam generating means being mounted on the housing, whereby the foamy coating excludes air from the coke and encompasses any fumes and dust generated by the coke during its ejection and fall into the transfer car.

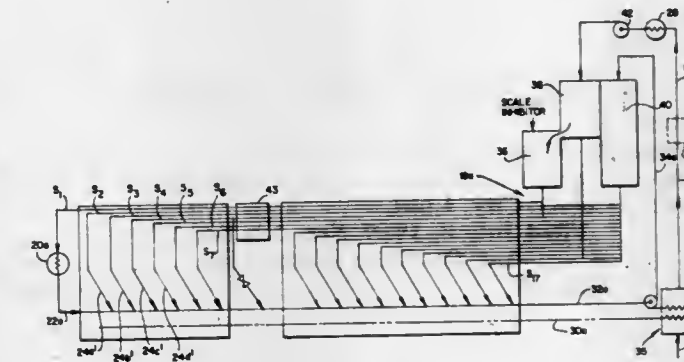
3,734,835

# MULTI-STAGE FLASH DISTILLATION PROCESS

Attilio R. Spicacchi, 22 Allen Street, New Britain, Conn.  
Filed July 29, 1971, Ser. No. 167,366

Int. Cl. B01d 3/00, 3/10, 3/02, 1/28  
U.S. Cl. 203—7

11 Claims



In a multi-stage flash distillation process, feed liquid to be distilled is progressively preheated by passage along a primary flow path in heat exchange relation with vapor zones of a series of successively staged flash evaporation chambers having flash liquid zones arranged in fluid communication. Flash liquid evaporated from the various flash liquid zones is replenished by feed liquid diverted from the primary flow path to and along secondary or by-pass flow paths leading directly to associated liquid zones. The liquid diverted to each secondary flow path has a temperature substantially equal to the temperature of the flash liquid in the zone to which it is diverted. When the liquid to be distilled contains scale forming materials which tend to precipitate at high temperatures, the liquid is preferably divided into a plurality of parts and at least one of the parts is treated with a suitable scale inhibitor. Feed liquid is tapped from the various parts to provide a plurality of streams of feed liquid which collectively comprise the primary flow path. At least some of the streams contain differing concentrations of scale inhibitor. Each stream is diverted from the primary flow path as aforesaid when the preheated liquid in the stream attains a temperature slightly below the temperature at which scale deposition tends to occur.

3,734,836

# METHOD OF MAKING AN ELECTROCHEMICAL TIMING MEMBER

Charles William Erwood, 28 Canonsfield Road, Welwyn, England  
Original application Jan. 31, 1958, Ser. No. 712,588, now Patent No. 3,475,571, dated Oct. 28, 1969. Divided and this application Sept. 21, 1960, Ser. No. 57,585  
Int. Cl. C23b 5/48

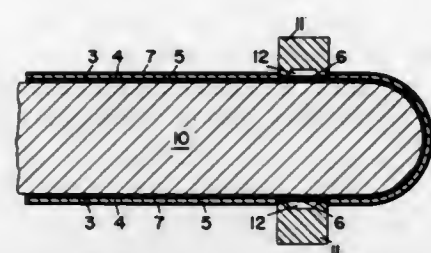
U.S. Cl. 204—15

1 Claim

The method of forming an electrochemical tubular member for use in an electrochemical timing device comprises electrodepositing successive layers of copper, gold,



and silver upon a cylindrical former member; placing a non-conductive ring over a circumferential section of the deposited material; successively electrodepositing silver and gold; removing the non-conductive ring and electro-



depositing lead. When used in an electrochemical timing device wherein the metal on the tubular member is dissolved, rupture occurs at the circumferential section to initiate a desired action.

3,734,837

# METHOD OF HARDENING POLISHED ALUMINUM SURFACES

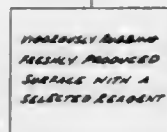
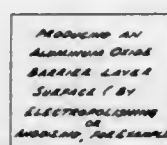
George R. Blair, Culver City, and Francois J. Ricaud, Pico Rivera, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed July 8, 1969, Ser. No. 843,910

Int. Cl. C23b 3/06, 9/02

U.S. Cl. 204—36

2 Claims



A method of providing a scratch resistant aluminum surface wherein a freshly processed aluminum oxide barrier layer surface is vigorously rubbed with soft absorbent material saturated with a water soluble hydroxylated compound such as, for example, methanol, water, hydroxyacetic acid, monoethanolamine, ethylene glycol and monoethyl ether of ethylene glycol. The latter step may also directly follow an electropolishing and/or an anodizing treatment.

3,734,838

# MULTIPLE METAL ELECTRODEPOSITION

Steve Eisner, Schenectady, N.Y., assignor to Norton Company, Troy, N.Y.

Filed May 24, 1972, Ser. No. 256,395

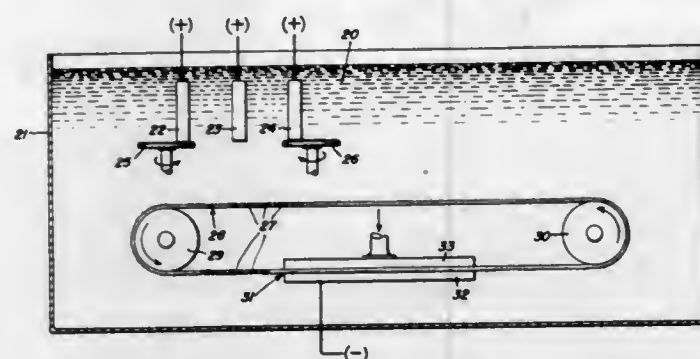
Int. Cl. C23b 5/32

U.S. Cl. 204—43 R

5 Claims

A method for deposition of two or more metals simultaneously at high deposition rates by continuously and repetitively contacting the surface of the electrodeposit during its formation with a plurality of small, dynamically hard particles held in spaced, fixed relationship to one

another in or on a supporting matrix while simultaneously introducing the electrolyte containing the ions of such



metals into the plating zone in the form of small, isolated volumes.

3,734,839

# ALKALINE CYANIDE ZINC ELECTROPLATING

Paul Jean Hoyer and John Derek Rushmere, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

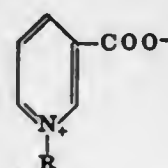
No Drawing. Filed Sept. 30, 1971, Ser. No. 185,348

Int. Cl. C23b 5/10

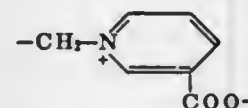
U.S. Cl. 204—55 Y

18 Claims

Aqueous, alkaline cyanide zinc electroplating baths and processes are provided which electrodeposit bright zinc at low cyanide concentrations by using as an addition agent a combination of polyethylenimine having a molecular weight between about 600 and 60,000 and a quaternary pyridine compound of the formula:



wherein R is alkyl, alkenyl or alkynyl of 1 to 4 carbon atoms, benzyl and substituted benzyl wherein the substituent is at least one of alkyl of 1 to 4 carbon atoms, halogen, cyanide, alkoxy of 1 to 4 carbon atoms, phenyl and



or a hydrohalide salt thereof,

the weight ratio of polyethylenimine to quaternary pyridine compound being within the range of 10:1 to 1:100. The electroplating bath has a weight ratio of cyanide to zinc within the range of 0.1–3.5:1, preferably about 1:1.

3,734,840

# ELECTRODEPOSITION OF NICKEL

Frank Passal, Detroit, Mich., assignor to M & T Chemicals Inc., New York, N.Y.

No Drawing. Filed July 24, 1968, Ser. No. 747,098

Int. Cl. C23b 5/08, 5/46

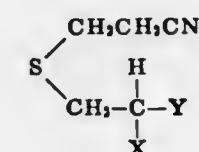
U.S. Cl. 204—49

21 Claims

This invention relates to novel compositions and to an improved process for electroplating bright nickel which

comprises electrodepositing nickel from an aqueous nickel electroplating bath containing (a) as a first primary brightener an effective amount of a water-soluble acetylenic compound, (b) a secondary brightener, and (c) as a second cooperating primary brightener an effective amount of:

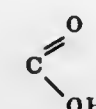
- A heterocyclic compound having at least two nitrogen atoms in an otherwise carbocyclic structure wherein at least one nitrogen atom bears at least one cyanoethyl group and wherein said compound contains at least one sulfur atom; or
- A compound having the formula



wherein X is selected from the group consisting of H, —NH<sub>2</sub>, and



and Y is CN or



and salts thereof.

3,734,841

# METHOD OF DETERMINING THE ACTUAL RESISTANCE VALUE OF AN ELECTROLYTIC CELL

Johann Thomas, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

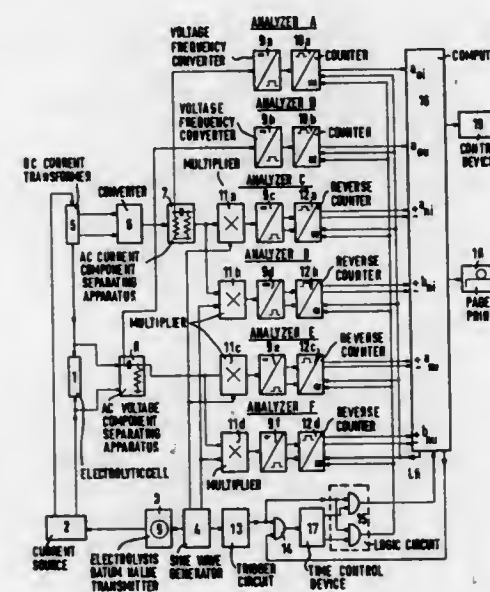
Filed Oct. 12, 1971, Ser. No. 188,103

Claims priority, application Germany, Oct. 13, 1970, P 20 50 126.2

Int. Cl. B01k 3/00; C22d 3/12

U.S. Cl. 204—67

9 Claims



A method of determining the actual resistance value of an electrolytic cell for regulation to a constant cell re-

sistance by measuring the cell voltage and the cell current comprises the steps of determining by Fourier analysis the median value of the Fourier coefficients of a harmonic wave in a specified period of time from the alternating components of the cell current and the cell voltage and computing the active and reactive components of the AC resistance from the Fourier coefficients. The method is undertaken by apparatus comprising Fourier analyzer means. The Fourier analyzer means comprises a plurality of multipliers equal in number to the number of Fourier coefficients to be determined. Each of a plurality of integrators is connected to the output of a corresponding one of the multipliers. An adjustable frequency sine wave generator has outputs connected to the inputs of the multipliers. Computer means has inputs connected to the outputs of the integrators for computing the effective resistance and the reactance from the Fourier coefficients.

3,734,842

# ELECTROLYTIC PROCESS FOR THE PRODUCTION OF ALKALI METAL BOROHYDRIDES

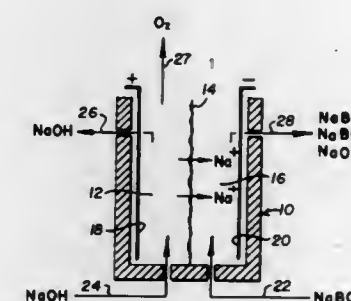
Hal B. H. Cooper, 4234 Chevy Chase Drive, Pasadena, Calif. 91103

Continuation-in-part of abandoned application Ser. No. 881,664, Dec. 3, 1969. This application May 5, 1971, Ser. No. 140,584

Int. Cl. B01k 1/00; C01b 6/14

U.S. Cl. 204—86

21 Claims



A process for producing an alkali-metal borohydride solution utilizing an electrolytic cell having a cationic-selective membrane separating the anode and cathode compartments with reduction of borate ions to borohydride ions occurring in the cathode compartment to produce the alkali-metal borohydride solution from which the borohydride material may be separated.

3,734,843

# IRRADIATION OF ETHYLENE/VINYL ACETATE COPOLYMERS

Robert K. Tubbs, Lewiston, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of abandoned application Ser. No. 796,985, Feb. 6, 1969. This application Nov. 17, 1970, Ser. No. 90,456

Int. Cl. B01j 1/10, 1/12

U.S. Cl. 204—159.14

21 Claims

The initial melt index of ethylene/vinyl acetate copolymers can be substantially, i.e., more than 50 percent, lowered by treating the copolymers with high energy ionizing radiation of high dose rates, e.g., high energy electrons. In the present process the amount of radiation employed is less than that which transforms the copolymers into elastomers as indicated by the presence of copolymer gel. Gel free irradiated ethylene/vinyl acetate copolymers containing 15–35 weight percent vinyl acetate are exceptionally useful as wax additives.



3,734,844

## NOVEL COMPOUNDS AND PROCESS

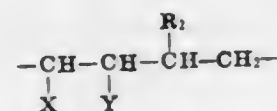
Adnan A. R. Sayigh; Fred A. Stuber, both of North Haven, and Henri Ulrich; Northford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.  
Division of Ser. No. 93,445, Nov. 27, 1970, Pat. No. 3,669,080, which is a continuation-in-part of Ser. No. 39,178, May 20, 1970, abandoned. This application Sept. 25, 1972, Ser. No. 291,754

Int. Cl. C08f 27/00, 47/12

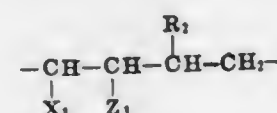
U.S. Cl. 204—159.14

6 Claims

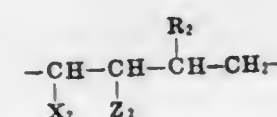
Radiation (thermal and light)-sensitive polymers are provided and are characterized by (1) a recurring unit of the formula:



wherein  $R_1$  is lower-alkoxy or phenyl, one of X and Y is —COOR and the other is —COR<sub>1</sub>, R is an azidosulfonylcarbanilyloxy alkylene group and  $R_1$  is —O—dye, —NH—dye or hydroxyarylamino, or (2) a combination in the same polymer chain of recurring units having the formulas:



wherein one of  $X_1$  and  $Z_1$  represents —COOH and the other represents —COOR as defined above, and



wherein one of  $X_2$  and  $Z_2$  represents —COOH and the other represents —COR<sub>1</sub> as defined above. The polymers can be chemically bonded to substrates, such as those containing C—H bonds only (e.g., polyolefins), which are not normally dye receptive. The bonding is effected by exposure to appropriate radiation; the exposure can be carried out imagewise to produce an appropriate image on the substrate. Accordingly, the polymers of the invention find use in the photoresist, printing and like arts.

3,734,845

## PROCESS TO IMPROVE THE EFFICIENCY OF PHOTOCHEMICAL REACTIONS

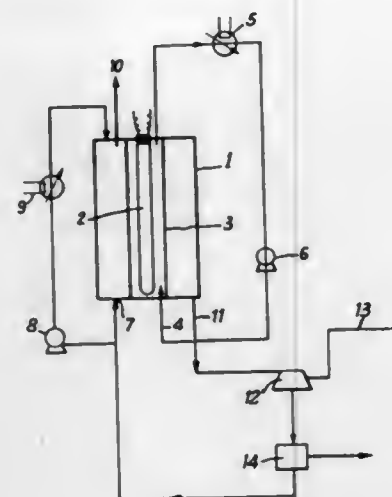
Jean-Claude Bravi, Pau, Claude Poulain, Orsay, and Claude Viallet, Pau, France, assignors to Societe Anonyme dite: Aquitaine Total Organico, Paris, France  
Filed Mar. 16, 1971, Ser. No. 124,720  
Claims priority, application France, Mar. 17, 1970, 7009500; Jan. 21, 1971, 7101975  
Int. Cl. B01j 1/10; C07c 3/24

U.S. Cl. 204—162 XM

5 Claims

A process for the continuous preparation of cycloalkane oximes by the action of nitrosyl chloride prepared in situ in a sulphuric medium on a liquid cycloalkane or a cycloalkane dissolved in an organic solution which is inert under the reaction conditions, under the effect of actinic radiation, characterized by the fact that, for a given concentration of oxime in the sulphuric me-

dium, the minimum temperatures of the surfaces transmitting the light energy and in contact with the reactive



3,734,846

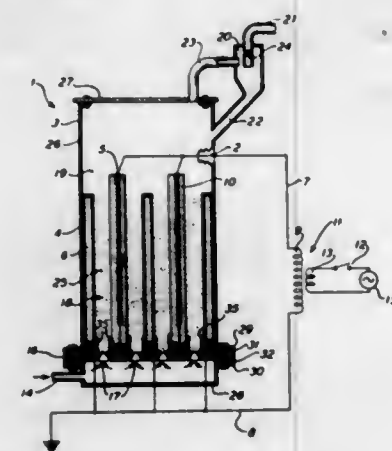
## PROCESS FOR PRODUCING OZONE USING A FLUIDIZED BED DIELECTRIC

Ralph McNabney, Morristown, N.J., and Derk Th. A. Huibers, Naarden, Netherlands, assignors to Airco Inc., New York, N.Y.

Division of Ser. No. 878,494, Nov. 20, 1969, Pat. No. 3,654,126. This application July 1, 1971, Ser. No. 159,047  
Int. Cl. C01b 13/10, 13/12

U.S. Cl. 204—176

4 Claims



Apparatus and method are disclosed for high efficiency electrical conversion of oxygen to ozone. An oxygen-containing gas is passed upwardly through a particulate dielectric contained between spaced electrode surfaces, whereby a fluidized bed is established consisting of a suspension of said dielectric particles in the streaming gas. Means are present for simultaneously maintaining a silent electrical discharge across the spaced electrodes and through the fluidized bed. The bed acts as a highly effective heat sink and also promotes the presence of high-frequency components in the current waves passing between electrodes, as a result of which increased electrical efficiency and increased ozone output is enabled in the conversion process.

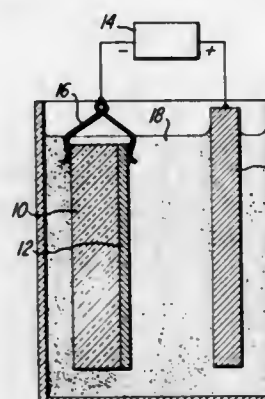
3,734,847

## ELECTROPHORETIC DEPOSITION OF POWDERED MATERIAL ON AN INSULATING SUPPORT

Donald Richard Tshudy, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.  
Filed May 27, 1971, Ser. No. 147,326  
Int. Cl. B01k 5/02; C23b 13/00

U.S. Cl. 204—181

1 Claim



A method for producing a coating of particles, such as phosphor particles, upon an electrically-insulating support comprising

- depositing an electrically-conducting undercoating, such as aluminum or magnesium metal, on the support,
- electrophoretically depositing a coating of the particles on the undercoating,
- and then converting the undercoating to a material which enhances the adherence of the deposited coating to the support.

3,734,848

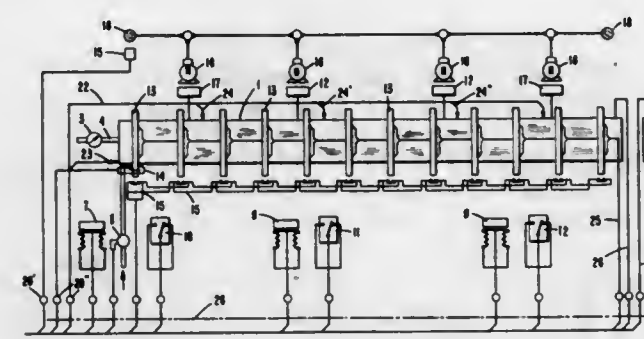
## EQUIPMENT FOR THE CONTROL AND THE REGULATION OF AN ALKALI-CHLORINE ELECTROLYSIS PLANT WITH MERCURY-CATHODE CELLS

Luigi Bertoni, Giancarlo Pizzamiglio, and Renato Fava, Mantova, and Giordano Cimmarosti, Roverbella, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy  
Filed Mar. 25, 1971, Ser. No. 128,070  
Claims priority, application Italy, Mar. 25, 1970, 22,407/70

Int. Cl. C22d 1/04; B01k 3/00; B23p 1/12

U.S. Cl. 204—220

8 Claims



Equipment for the operation of an alkali-chlorine electrolysis plant of the type employing series-connected mercury cathode cells comprising, for each cell, a device responsive to brine flow variations for monitoring current decreases at the first anodic descent bar of the cell, a device for monitoring overloads at each of the anodic ascent bars, a device regulating the cathodic mercury delivery and an instrument for metering the delivery of brine to each cell. These devices are arranged to regulate the inter-electrode gaps in the cells and to disconnect the cells when necessary.

3,734,849

## APPARATUS FOR THE MANUFACTURE OF BONDED PLASTIC SACKS EMPLOYING AN ELECTRICAL FIELD AND AN IONIZABLE GAS

Herbert Schmedding and Helmut Helbig, Lengerich, Germany, assignors to Windmoller & Holscher, Lengerich, Westphalia, Germany

Original application Jan. 3, 1967, Ser. No. 607,021, now Patent No. 3,554,828, dated Jan. 12, 1971. Divided and this application Dec. 30, 1969, Ser. No. 1,915  
Claims priority, application Germany, Feb. 14, 1966, W 40,937

Int. Cl. B01k 1/00; C23c 11/00, 17/00

U.S. Cl. 204—312

10 Claims



Apparatus for the manufacture of sacks made of plastic material having a station for pretreating the inside surfaces of the plastic tube by moving the tube through a pretreating electric field while the inside surfaces of the tube are separated by an ionizable gas. Guide means are provided for flattening the sides of the tube so that the inside surfaces are slightly spaced apart when the pretreatment occurs.

3,734,850

## WASTEWATER TREATMENT SYSTEM

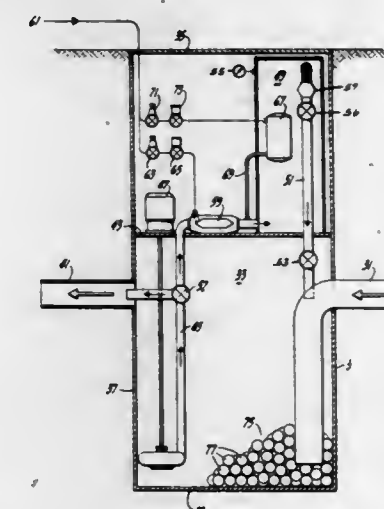
Fred A. Karr, Redwood City, Calif., assignor to Shasta Beverages Division of Consolidated Food Corporation, Hayward, Calif.

Filed Sept. 8, 1971, Ser. No. 178,739

Int. Cl. C02c 1/08

U.S. Cl. 210—3

10 Claims



Apparatus and method for injecting air or other oxygen-containing gas under pressure into wastewater from within a gas porous shell capable of passing gas bubbles of a size (e.g., 1-2 microns or less) for retention by the wastewater. The injection is through elements at the bottom of a sump or on stream in a recycle line to and from the tank.



the sump. A bed of perforate balls on the bottom of the sump provides an excellent surface area for bacterial treatment as by coated enzymes injected into the system.

upon discharge of the treated waste material, substantially all of the bacteria have been destroyed.

### 3,734,851 METHOD AND DEVICE FOR PURIFYING BLOOD

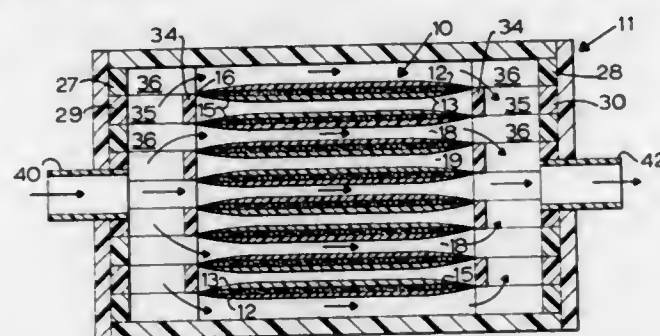
Kenneth N. Matsumura, 2 Claremont Crescent, Berkeley, Calif.

Filed Dec. 29, 1969, Ser. No. 888,733

Int. Cl. B01d 31/00, 13/00

U.S. Cl. 210—22

18 Claims



A method for hepatifying, or purifying animal blood of living animal and providing it with desirable liver cell metabolic products, in cooperation with or substitution for the animal liver; and a device for carrying out such hepatification or purification and provision of desirable products. The method comprises flowing animal blood over a first semi-permeable membrane, flowing a dialysate liquid over a second semi-permeable membrane, maintaining a layer of living liver cells between the two membranes and out of contact with the blood and the liquid, and withdrawing impurities from the blood into the dialysate liquid, and restoring liver cell products to the blood. The device comprises at least one hepatification unit having a first semi-permeable membrane, a second semi-permeable membrane, a layer of living liver cells disposed between such membranes, means for introducing blood over a surface of one membrane, means for introducing dialysate liquid over a surface of the other membrane, and means to maintain the blood, liquid and liver cells out of contact with each other.

### 3,734,852 WASTE DISPOSAL ASSEMBLY

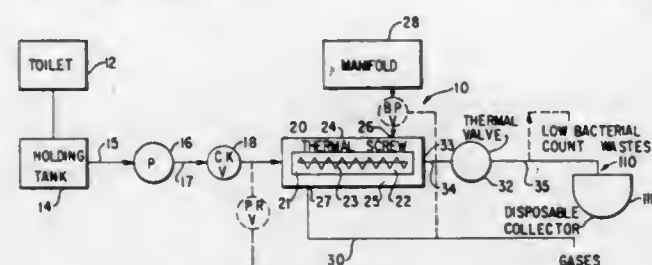
A. Gale Borden, 5 Central Drive, Port Washington, N.Y. 11050

Application Aug. 25, 1969, Ser. No. 852,859, which is a continuation-in-part of application Ser. No. 724,988, Apr. 29, 1968. Divided and this application Feb. 14, 1972, Ser. No. 226,332

Int. Cl. C02b 3/04

U.S. Cl. 210—152

3 Claims



Process for the substantial reduction of bacterial count in sewage waste and assembly for treating same. The assembly comprises means for conveying sewage waste material to a treatment zone, means for retaining the waste material therein, temperature control means to insure that the contents retained in the treatment zone attain a temperature at least that of boiling water and means for passing the treated sewage waste from the treatment zone so that

### 3,734,853 SUCTION CLEANER FOR AQUARIUMS

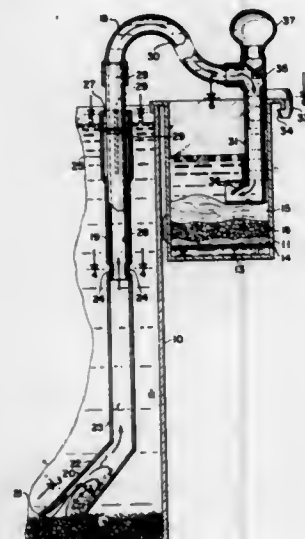
Tibor Horvath, Brooklyn, N.Y., assignor to Holvin Products Co., Inc., Brooklyn, N.Y.

Filed Oct. 4, 1971, Ser. No. 186,331

Int. Cl. E04h 3/20

U.S. Cl. 210—169

9 Claims



In aquarium tanks having a separate filter tank from which water is pumped from below layers of filter material into the aquarium and a syphon returning water from the aquarium to the filter tank, a suction cleaner is provided to replace or augment the syphon return, the suction cleaner having a suction arm with an upper portion grasped by the hand of a user, a flared, offset, and rotatable end to suck up debris on the bottom of the aquarium, and means to reduce and control the flow into the lower end of the arm, a syphon leg extending into the filter tank, flexible tubing connecting the suction arm and the syphon leg, and pump and valve means to start the action of the suction cleaner as a syphon. The means to reduce and control the flow into the suction arm may be a bypass opening or a valve in the arm activated to reduce flow therethrough when the arm is raised by its upper end.

### 3,734,854 LIQUID PROCESSING SYSTEM

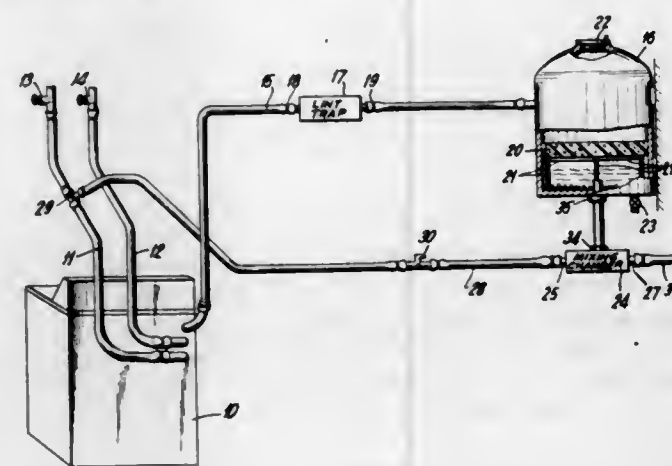
James Altadonna, 90 East 2nd St., Deer Park, N.Y.

Filed Dec. 29, 1971, Ser. No. 213,442

Int. Cl. B01d 35/02

U.S. Cl. 210—203

5 Claims



A liquid processing system for the treatment of a liquid byproduct heretofore unfit for reuse or disposal due to the

presence therein of impurities, the system providing first a filter for the removal of solid impurities, a second filter for the removal of foam as well as additional solid impurities and finally a mixing chamber for mixing the liquid byproduct, heretofore filtered, with quantities of the liquid byproduct in its pure state, in such proportions and in such amounts so as to provide upon discharge from the system, a virtually pure, reusable liquid.

### 3,734,855 CONNECTOR FOR USE IN PERMEABILITY SEPARATION DEVICES

Ernest Robert Sawyer, Solana Beach, Calif., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed May 20, 1971, Ser. No. 145,156

Int. Cl. B01d 31/00

U.S. Cl. 210—321

4 Claims



A new device is disclosed for connecting headers, turn-arounds, and the like to membrane support tubes. The device comprises a plastic adapter tube for insertion within a permeable coated tube, having an O-ring seal at its end, and includes a sleeve which snugly fits around the adapter and effects a seal between the adapter and the membrane portion of the tube when pressure is applied from inside the tube through the action of pressure applied in a permeability separation process. In a variation of the invention, a guard is provided for retaining a volume displacement rod within the membrane coated tube.

### 3,734,856 USE OF MICELLAR DISPERSIONS AS DRILLING FLUIDS

Marion O. Son, Jr., Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

No Drawing. Continuation-in-part of abandoned application Ser. No. 792,886, Dec. 16, 1968. This application Aug. 30, 1971, Ser. No. 176,272

Int. Cl. C10m 1/40

U.S. Cl. 252—8.5 M

8 Claims

A well drilling process is improved by using a micellar dispersion as a drilling fluid. The micellar dispersion is obtained by mixing about 10% to about 95% of a hydrocarbon with about 5% to about 40% of a petroleum sulfonate having an average equivalent weight within the range of about 350 to about 520 and then admixing with sufficient water to obtain a desired viscosity. In addition, electrolytes and/or cosurfactants can be incorporated into the micellar dispersion to obtain the desired viscosity.

### 3,734,857 LIQUID PETROLEUM HYDROCARBONS CONTAINING AZO DYES

Ugo Molso, Saronno, and Sisto Papa, Milan, Italy, assignors to Aziende Colori Nazionali Affini Acna S.p.A., Milan, Italy

No Drawing. Filed Mar. 10, 1971, Ser. No. 123,040

Claims priority, application Italy, Mar. 11, 1970, 21,749/70

Int. Cl. C10m 1/20, 1/32; C10I 1/22

U.S. Cl. 252—51.5 R

4 Claims

Concentrates of azo dyes in organic solvents are useful in coloring various materials, including inks, synthetic

plastic materials, wood substitutes and, in particular petroleum derivatives like gasoline, lubricating oils, and other similar liquid petroleum distillates and for other purposes.

### 3,734,858 PRE-ELECTRIC SHAVE COMPOSITIONS

Graham Barker, Fair Lawn, and Ronald H. Gordon, New Brunswick, N.J., assignors to Witco Chemical Corporation, New York, N.Y.

No Drawing. Filed Jan. 20, 1971, Ser. No. 108,140

Int. Cl. C11d 17/04

U.S. Cl. 252—90

6 Claims

Pre-electric shave composition and process for shaving utilizing same whereby improved skin lubrication is obtained, said composition being a self-propelled, quick-breaking foam comprising (a) a cosmetic absorbent powder, (b) an aqueous alcoholic carrier medium, (c) a surfactant being a member of the group of ethoxylated fatty acids or alcohols, glycerol and polyglycerol esters of fatty acids and certain cationic pyridinium compounds, and (d) an aerosol propellant.

### 3,734,859 DICARBOXYLIC ACID SOAPS

Benjamin F. Ward, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

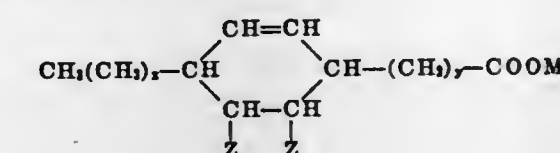
Filed Oct. 12, 1971, Ser. No. 188,458

Int. Cl. C11d 9/00

U.S. Cl. 252—108

14 Claims

Dicarboxylic acid soap compositions comprising a compound of the formula



wherein x and y are integers from 3 to 9, x and y together equal 12, Z is a member of the group consisting of hydrogen and COOM<sub>1</sub>, with one Z of each moiety, and M and M<sub>1</sub> are selected from the group consisting of hydrogen, sodium potassium, lithium, ammonium, organic amines, and mixtures thereof in an amount sufficient to impart detergency to said compositions, and water. Another aspect of this invention is that soap of the above composition may be blended at from 5% to 90% by soap weight with coconut fatty acids, tallow fatty acids, tall oil fatty acids, oleic acid, soya fatty acids, safflower oil and other fatty acids, and retain the advantageous properties of using C<sub>21</sub> dicarboxylic acid soaps alone. The soaps and soap blends are water soluble not only at low solids concentration but also at high solids concentration, for example, above 40% solids and in some cases above 90% solids. The soap compositions find utility among other places as liquid hand soaps, cleaning aids and shampoos.

### 3,734,860 CLEANING COMPOSITIONS

Jonathan L. Bowen, Niagara Falls, and Theodore H. Dexter, Lewiston, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Filed Nov. 17, 1969, Ser. No. 877,471

Int. Cl. C11d 7/06

U.S. Cl. 252—158

16 Claims

Basic materials such as sodium or potassium hydroxide are suspended uniformly in a liquid hydrocarbon such as perchloroethylene by the addition thereto of a suspension agent selected from carboxylic acids containing from 8 to 22 carbon atoms, or metal salts or esters thereof. In combination with a water-active metal such as aluminum, such compositions find utility as drain cleaners.



3,734,861

## SYNERGISTIC METAL SEQUESTRANT

Ronald H. Carlson, Lewiston, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.  
No Drawing. Continuation-in-part of application Ser. No. 680,011, Nov. 2, 1967. This application July 13, 1970, Ser. No. 54,663

The portion of the term of the patent subsequent to May 11, 1988, has been disclaimed

Int. Cl. C02b 1/22, 5/06

U.S. Cl. 252—180

7 Claims

Mixtures of tris(hydroxymethyl)phosphine oxide, and tris(N-acetoaminomethyl)phosphine as well as the alkali metal salts thereof, exhibit marked synergism as sequestrant compositions over a broad pH range. The sequestrant compositions are useful as additives for detergents, metal cleaning baths, peroxide compositions and dyes. The chelate products are useful in the field of agriculture for the introduction of trace elements into plant life and especially in the treatment of iron chlorosis in plants.

3,734,862

## NOVEL POLYCHLORO-1,3-DIOXOLANES

Donald Roy Maulding, Branchburg Township, Somerset County, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Jan. 27, 1971, Ser. No. 110,296

Int. Cl. C09k 3/00

U.S. Cl. 252—188.3 CL

5 Claims

Novel polyhalo-1,3-dioxolanes having from 2 to 5 halo substituents. These compounds are useful in a composition for producing chemiluminescent light, and as biocides.

3,734,863

## HYDROGEN GENERATING COMPOSITIONS

Werner F. Beckert and Ottmar H. Dengel, Oxon Hill, Md., and Rodger W. McKain, Lima, Ohio, assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Continuation-in-part of abandoned application Ser. No. 872,419, Oct. 29, 1969. This application June 11, 1971, Ser. No. 152,422

Int. Cl. C01b 1/05; C09k 3/02

U.S. Cl. 252—188

12 Claims

Solid compositions, stable at ambient temperatures, which generate hydrogen gas when heated to initiate the reaction between the components of the composition.

The compositions comprise certain ammonium salts such as  $\text{NH}_4\text{Cl}$  and complex hydrides such as  $\text{LiAlH}_4$  and  $\text{NaAlH}_4$  or certain hydrazine derivatives such as  $\text{N}_2\text{H}_4\text{Cl}_2$  and complex hydrides such as  $\text{NaBH}_4$ .

3,734,864

## AQUEOUS GEL FOR SLURRY EXPLOSIVES COMPOSITION AND METHOD OF PREPARING SAID GEL

William Allan Craig, Glasgow, Scotland, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Nov. 8, 1971, Ser. No. 196,797

Claims priority, application Great Britain, Nov. 30, 1970, 56,694/70

Int. Cl. B01j 13/00

U.S. Cl. 252—315

8 Claims

Aqueous gel for slurry explosive composition containing at least one inorganic oxygen-supplying salt and as a thickener, a macromolecular compound containing vicinal cis-hydroxyl groups (e.g., guar gum) cross-linked with compound of tellurium VI. Aqueous gel is prepared by method in which the macromolecular compound dissolved in water is cross-linked with the compound of tellurium VI and mixed with the inorganic oxygen-supplying salt(s). The aqueous gels are useful as general binding and thickening agents.

3,734,865

## SUBSTITUTED GAMMA-BUTYROLACTONES, AMINE DERIVATIVES THEREOF AND ORGANIC FLUIDS CONTAINING SAME

El Ahmadi I. Helba, Princeton, and Ralph M. Dessau, Highland Park, N.J., assignors to Mobil Oil Corporation

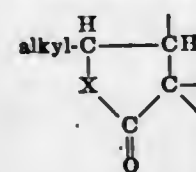
No Drawing. Continuation-in-part of application Ser. No. 799,939, Feb. 17, 1969, which is a continuation-in-part of abandoned application Ser. No. 714,447, Mar. 20, 1968. This application Aug. 30, 1971, Ser. No. 176,267

Int. Cl. C10m 1/20, 1/32

U.S. Cl. 252—51.5 A

9 Claims

Gamma-alkyl-gamma-butyrolactones having an alkyl substituent of at least 16 carbon atoms in length, preferably at least 25 carbon atoms, are formed by reacting a monoolefin with a carboxylic acid in the presence of a reducible metal ion of higher-valent form, such as the manganic ion,  $\text{Mn}^{+3}$ . The resulting lactones are useful as anti-wear agents and for improving the adherence of wax coatings of paper and, upon reaction with amines, polyalkylenepolyamines, for providing novel lactams and bislactams useful as multifunctional agents in lubricants, fuels, coolants and other organic fluids. Thus, the compounds of this invention are of the general structure



the alkyl group being as defined above, X being oxygen, imino, alkylimino, polyalkylenepolyamino or lactam (polyalkylenepolyamino) and the dangling valences being hydrogen or lower alkyl (that is, no greater than 6 carbon atoms).

3,734,866

## PREPARATION OF POLYMERIC AROMATIC COMPOSITIONS

Sargeant E. Ayiles, Youngstown, N.Y., and Mial T. Hillhouse, Alexander Kyriakis, and Brian W. Pengilly, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Application Ser. No. 648,933, June 26, 1967, now Patent No. 3,634,339, dated Jan. 11, 1972, which is a continuation-in-part of abandoned application Ser. No. 361,551, Apr. 21, 1964. Divided and this application June 9, 1971, Ser. No. 151,518

Int. Cl. C08g 33/00, 33/02

U.S. Cl. 260—2 R

2 Claims

The invention relates to polymeric aromatic compounds and to the preparation of these materials by polymerizing the monomeric aromatic compound using a catalyst comprising an active metal halide, chloranil and water. These polymers are linear chains of aromatic rings attached together.

3,734,867

## METHOD OF PRODUCING POROUS POLYMERIZATES FROM WATER-IN-OIL EMULSIONS

Gunther B. G. P. Will, Zimmerstrasse 10-12, 61 Darmstadt, Germany

Continuation of Ser. No. 879,943, Nov. 25, 1969, abandoned. This application Dec. 17, 1971, Ser. No. 209,408

Int. Cl. C08f 47/08, 1/13

U.S. Cl. 260—2.5 R

15 Claims

Polymerization of water-in-oil emulsions which contain a polymerizable monomer, a water-in-oil emulsifier, and an oil-in-water emulsifier (in an amount less than that required to break the emulsion) is disclosed. Various products and fields of application are also disclosed, including especially the manufacture of shaped products.

3,734,868

## LOAD-BEARING FLEXIBLE POLYURETHANE FOAMS AND METHOD OF MAKING THE SAME

Heinz Uelzmann, Cuyahoga Falls, and Edwin M. Maxey, Kent, Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Jan. 24, 1972, Ser. No. 220,426

Int. Cl. C08g 22/44

U.S. Cl. 260—2.5 AM

19 Claims

The load carrying capacity of flexible polyurethane foams is improved by the use of minor amounts of certain primary and secondary amine compounds which are insoluble in the polyol at temperatures up to about 100° F. in conjunction with certain tertiary amine catalysts.

3,734,869

## ROTARY SWITCH ASSEMBLY WITH ADJUSTABLE PROGRAMMING LIMIT MECHANISM

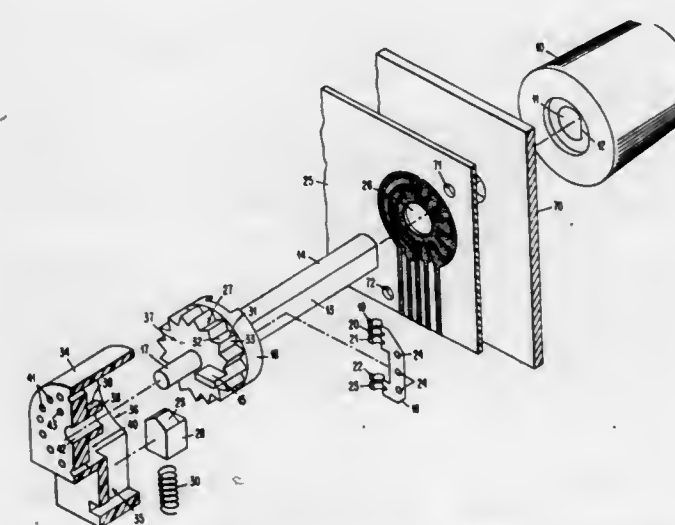
Edward A. Menard, Lafayette, and David O. Webster, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 17, 1972, Ser. No. 235,518

Int. Cl. H01h 21/78

U.S. Cl. 200—11 R

20 Claims



A multifunction switch selectively providing a multiposition rotary, a multiposition toggle, or a momentary toggle switch function. A switch rotor carries a movable switch member. A detent means cooperates with the rotor and establishes a plurality of stable rotor positions and intermediate unstable rotor positions. A selectively changeable switch function program member selectively limits movement of the rotor relative to its stable and unstable positions in a manner to achieve the desired switch function.

3,734,870

## PREPARATION OF FOAMED BODIES USING A UREA BLOWING AGENT

Gunter Schroeder, Ober-Ramstadt-Elche, and Wolfgang Gaenzler, Darmstadt, Germany, assignors to Rohm G.m.b.H., Darmstadt, Germany

No Drawing. Continuation-in-part of application Ser. No. 758,695, Sept. 10, 1968. This application June 17, 1971, Ser. No. 154,159

Claims priority, application Germany, Sept. 16, 1967, R 46,928

Int. Cl. C08f 27/08, 47/10; B29d 27/00

U.S. Cl. 260—2.5 N

8 Claims

A two-step method for preparing shaped foamed bodies from a plastic comprising a urea blowing agent and a copolymer including acrylic or methacrylic acids and their amides or nitriles which comprises first heating

the unconfined plastic to foam it partially and then foaming it further by heating at a higher temperature while the plastic is confined.

3,734,871

## POLYURETHANE FOAMS PRODUCED FROM NITROGENOUS POLYETHERS

Christian Burba, Wilhelmstr. 1, Luenen, Germany; Manfred Drawert, Selmer str. 4, Werne, Germany; and Hartmut Voigt, Fritz-Husemann-str. 22, and Eugen Griebisch, Steinstr. 22, both of Unna, Germany

No Drawing. Original application Aug. 8, 1969, Ser. No. 848,718, now Pat. No. 3,697,458. Divided and this application Jan. 24, 1972, Ser. No. 220,531

Claims priority, application Germany, Aug. 15, 1968, P 17 93 201.3

Int. Cl. C08c 17/08

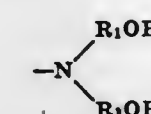
U.S. Cl. 260—2.5 AQ

1 Claim

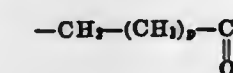
Polyhydroxy compounds obtained by propoxylation of compounds of the formula



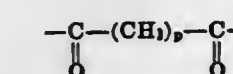
where Y is —OH or



R is a divalent or trivalent hydrocarbon radical, or



or



$\text{R}_1$  and  $\text{R}_2$  are lower alkylene; and  $m$ ,  $n$ ,  $p$ , and  $q$  have small integral values or are, in part, zero. Methods of making these compounds by propoxylation of the reaction product of: (1) a dialkanolamine and a monohalohydrin or epihalohydrin; (2) the hydrolyzed or dialkanolamine-reacted reaction product of a diol or triol and an epihalohydrin; or (3) the reaction product of a halocarboxylic acid or dicarboxylic acid and a dialkanolamine. Methods of making rigid polyurethane foams from these polyhydroxy compounds.

3,734,872

## DISPERSION OF FINELY DIVIDED PIGMENT PARTICLES AND PROCESS FOR PREPARATION OF THE SAME

Saburo Wakimoto, Nishinomiya, Hideyoshi Tugukuni, Sakai, and Masafumi Kano, Kyoto, Japan, assignors to Dai Nippon Toray Co., Ltd., and Sinlohi Co., both of Osaka-shi, Japan

Filed Sept. 2, 1971, Ser. No. 177,561

Claims priority, application Japan, Dec. 22, 1970, 45/115,351; Aug. 23, 1971, 46/64,177, 46/64,178, 46/64,179, 46/64,180

Int. Cl. C09d 3/48

U.S. Cl. 260—22 CB

14 Claims

A dispersion of finely divided pigment particles useful as printing ink and paint which comprises a copolymer composed of copolymerizable unsaturated monomers uniformly colored with a dyestuff incapable of being copolymerized with said copolymer, said colored copolymer being dispersed uniformly in an organic liquid having no polarity or a low polarity, by a protective layer of a stabilizer and a process for the preparation of the dispersion.



3,734,873

**RAPID DISSOLVING WATER-SOLUBLE POLYMERS**  
Donald R. Anderson, Oswego, and Alvin J. Frisque, La Grange, Ill., assignors to Nalco Chemical Company, Chicago, Ill.

No Drawing. Continuation of application Ser. No. 172,946, Aug. 18, 1971, which is a continuation-in-part of application Ser. No. 92,031, Dec. 15, 1970, now Patent No. 3,624,091. This application Aug. 7, 1972, Ser. No. 278,329

Int. Cl. C08g 47/16, 47/18

U.S. Cl. 260—29.6 H

13 Claims  
Water-soluble vinyl addition polymers may be rapidly dissolved in water by first dispersing these polymers into a water-in-oil emulsion and then inverting these emulsions in water. The inversion of the emulsion releases the polymer into water as a solution.

3,734,874

**POLYESTERS AND POLYESTERAMIDES CONTAINING ETHER GROUPS AND SULFONATE GROUPS IN THE FORM OF A METALLIC SALT**

Charles J. Kibler and Gerald R. Lappin, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.  
No Drawing. Continuation-in-part of application Ser. No. 695,339, Jan. 3, 1968. This application Feb. 27, 1970, Ser. No. 15,193

Int. Cl. C08g 17/06, 20/30

U.S. Cl. 260—29.2 E

40 Claims  
Water-dissipatable, meltable polyesters and polyesteramides derived from monomer components which include dicarboxylic acid, hydroxycarboxylic acid, aminocarboxylic acid, aminoalcohol, glycol, diamine or combinations of such monomer components wherein at least a part of the total of all such monomer components is a poly(ethylene glycol), and at least a part of said total is one or more of said monomer components substituted with one or more sulfonate metal salt groups. A typical polyester is composed of 80 mole parts of isophthalic acid, 10 mole parts of adipic acid, 10 mole parts of 5-sodium-sulfoisophthalate, 20 mole parts of ethylene glycol and 80 mole parts diethylene glycol. Such polymers are useful as adhesives, coating materials, films, packaging materials and other products which can be dissolved, dispersed or otherwise dissipated in cold water, hot water or aqueous solutions.

3,734,875

**AEROSOL BIRD REPELLENT COMPOSITION**

Stanley H. Sekuler, Silver Spring, Md., assignor to L & S Associates, Incorporated

No Drawing. Filed June 15, 1971, Ser. No. 153,436

Int. Cl. C08f 45/28, 45/36, 45/34

U.S. Cl. 260—31.2 R

9 Claims  
An aerosol composition useful for repelling birds from a given locus comprising polyisobutylene, at least one inert nonpolar organic solvent, and an aerosol propellant, and methods of applying the same to a locus.

3,734,876

**CROSS-LINKED POLYALKYLENE OXIDE**

Nan S. Chu, Hartsdale, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed July 6, 1971, Ser. No. 160,134

Int. Cl. C08g 51/28

U.S. Cl. 260—33.6 R

11 Claims  
A process for chemically cross-linking poly(alkylene oxide) of molecular weight of at least 100,000 which comprises contacting said poly(alkylene oxide) with a suitable cross-linking agent in the presence of a solvent and a free radical catalyst, at a temperature and for a time sufficient to cross-link said poly(alkylene oxide), said poly(alkylene oxide) being present in said solvent in an amount within the range of from about 1 percent to about 10 percent by weight based on the weight of the solvent.

3,734,877

**FLAME RETARDANT COMPOSITION**

George Christie, Jr., Loudonville, N.Y., assignor to General Electric Company

No Drawing. Filed June 17, 1971, Ser. No. 154,185

Int. Cl. C08g 51/04

U.S. Cl. 260—37 SB

11 Claims  
A silicone elastomer stock which exhibits improved flame resistance in the cured state consists essentially of a silicone elastomer, a filler and a small amount of a platinum compound in combination with triphenyl phosphite.

3,734,878

**NON-BLOCKING ETHYLENE COPOLYMER COMPOSITION**

Werner Claus von Dohlen, Charleston, W. Va., and Harvey Lionel Bateman, Somerville, N.J., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Oct. 5, 1971, Ser. No. 186,774

Int. Cl. C08f 45/44

U.S. Cl. 260—32.6 PQ

20 Claims  
Copolymers of ethylene with an acrylyl acid or salt thereof or a vinyl acrylate or an alkyl acrylyl ester or an N-alkyl-N-vinyl acrylamide are treated with an N,N'-di-n-alkyl terephthalamide to improve the blocking and slip characteristics of films produced therewith.

3,734,879

**METHYLOLATED AMINOPLAST MOLDING RESINS AND METHODS FOR PREPARING SAME**

Joseph A. Vona, Westfield, Lawrence B. Holzman, West Orange, and James E. Tracy, Somerset, N.J., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Filed Apr. 20, 1971, Ser. No. 135,750

Int. Cl. C08f 45/04

U.S. Cl. 260—37 N

14 Claims  
Molding resins prepared from methylolated 2,7-dioxo-4,5-dimethyl-decahydropyrimido-[4,5-d]-pyrimidine having desirable physical and electrical properties, and processes for producing said molding resins, are disclosed.

3,734,880

**POLYURETHANE COMPOSITION AND METHOD OF ITS PREPARATION**

Anthony F. Finelli, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation-in-part of application Ser. No. 155,280, June 21, 1971, which is a continuation of application Ser. No. 688,668, Dec. 7, 1967. This application June 28, 1972, Ser. No. 266,871

Int. Cl. C08g 22/00

U.S. Cl. 260—37 N

9 Claims  
A polyurethane composition resistant to phosphoric acid prepared by first forming a prepolymer by reacting in the presence of a 2,6-dialkylated para cresol a hydroxy-containing unsaturated polymeric polyol having a molecular weight of from about 1000 to about 5000 and a hydroxyl functionality of about 2.1 to about 2.8 and a liquid diphenyl methane diisocyanate followed by curing said prepolymer by reacting with an organic primary diamine.

3,734,881

**ONE COMPONENT NON-TOXIC SELF-EXTINGUISHING SILICONE ELASTOMER**

Ross A. Shingledecker, Elizabethtown, Ky., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed July 15, 1971, Ser. No. 163,113

Int. Cl. C08g 51/04

U.S. Cl. 260—37 SB

18 Claims  
A silicone elastomer composition free of sulfur, compounds of tin, mercury, bismuth, copper and sulfur of a polydiorganosiloxane, a silica or titanium dioxide filler, an acetoxysilane or ketoxime silane, carbon black and

a platinum compound are used as self-extinguishing elastomers which are non-toxic and cure at room temperature.

3,734,882

**METHOD OF MAKING AN IMPROVED PROCESSABLE SILICONE RUBBER AND PRODUCT THEREOF**

Thomas D. Talcott, Midland, Mich., assignor to

Dow Corning Corporation, Midland, Mich.

No Drawing. Filed Aug. 17, 1971, Ser. No. 172,599

Int. Cl. C08g 51/04

U.S. Cl. 260—37 SB

23 Claims  
Mixing a silicone rubber stock comprising an organosiloxane gum and a reinforcing silica filler with an organic titanate gives a silicone rubber stock with improved handling properties, increased flow resistance, improved processability and increased green strength.

3,734,883

**STABILIZING ORGANIC MATERIAL WITH PIPERIDONE AZINES**

Brian Holt, Royton, Lancs, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Apr. 9, 1971, Ser. No. 132,801  
Claims priority, application Great Britain, Apr. 16, 1970, 18,090/70; July 24, 1970, 35,954/70

Int. Cl. C08f 45/60

U.S. Cl. 260—45.8 N

4 Claims  
A process for stabilising organic material by incorporating into said material a minor proportion of certain piperidone azines, thereby imparting to the material an unexpectedly high degree of stability to exposure to light radiation, as well as stabilising compositions comprising an organic material and a minor proportion of said piperidone azines, are disclosed.

3,734,884

**BISOXALIC ACID DIAMIDES AS STABILIZERS**

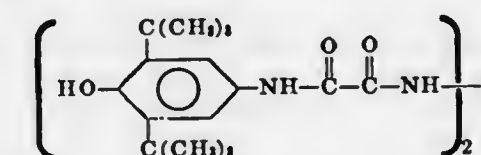
Max Dunnenberger, Frenkenndorf, and Hans Rudolf Biland, Gelterkinden, both of Basel-Land, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Original application Apr. 12, 1971, Ser. No. 133,377. Divided and this application June 15, 1972, Ser. No. 263,339

Int. Cl. C07c 103/14; C08f 45/60

U.S. Cl. 260—45.9 NC

3 Claims  
Bisoxalic acid diamines having the structure



where R is an alkylene group having 5 to 18 carbon atoms are stabilizers of organic materials such as polyolefins. These compounds are prepared by reacting an oxalic acid monoamide or the chloride or an ester thereof with an alkylene diamine.

3,734,885

**STABILISING HOMO- OR COPOLYMERIC POLYOLEFINS WITH DIACYL DIHYDRAZIDES**

Helmut Muller, Binningen, Basel-Land, Siegfried Rosenberger, Riehen, Basel-Land, and Heimo Brunetti, Reinach, Basel-Land, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed May 6, 1971, Ser. No. 141,027  
Claims priority, application Switzerland, May 19, 1970, 7,371/70

Int. Cl. C08f 45/58, 45/60

U.S. Cl. 260—45.85 B

17 Claims  
A process for stabilising homo- or copolymeric polyolefins, especially polypropylene, with certain symmetrical

3,734,886

**STABILIZED RUBBER CONTAINING 4-NITROSODIPHENYLHYDROXYLAMINE OR DERIVATIVE THEREOF**

David Dodman, Peter Laithwaite, Boris Nicholas Leyland, and Peter Michael Quan, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Nov. 29, 1971, Ser. No. 203,005  
Claims priority, application Great Britain, Dec. 10, 1970, 58,688/70

Int. Cl. C08f 45/60

U.S. Cl. 260—45.9 R

5 Claims  
4-nitrosodiphenylamines and salts and isocyanate adducts of these are antioxidants for rubbers. These compounds are resistant to extraction from the rubber by solvents.

3,734,887

**COMPOSITIONS OF POLYAMIDE OF 2,2,4-AND/OR 2,4,4-TRIMETHYLHEXAMETHYLENE DIAMINES AND EPOXY COMPOUNDS**

Karl Schmitt, Herne, Fritz Gude, Wanne-Eickel, and Siegfried Brandt, Herne, Germany, assignors to VEB-Chemie Aktiengesellschaft, Gelsenkirchen-Buer, Germany

No Drawing. Continuation of application Ser. No. 744,625, July 15, 1968. This application Sept. 21, 1970, Ser. No. 74,242

Claims priority, application Germany, July 21, 1967, Sch 41,040

Int. Cl. C08g 30/14

U.S. Cl. 260—47 EN

17 Claims  
Plastic of polyamide of 2,2,4- and/or 2,4,4-trimethylhexamethylenediamine, and an epoxy compound. The plastic is useful for production of shaped articles and coatings.

3,734,888

**POLYKETALS OF AROMATIC POLYKETONES**

Roland Darms, Therwil, Switzerland, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Oct. 7, 1971, Ser. No. 187,509

Int. Cl. C08g 23/20

U.S. Cl. 260—47 R

6 Claims  
Polyketals based on aromatic polyketones and 1,2- or 1,3-glycols and a process for their preparation. The ketals are extrudable and solvent soluble, and are easily hydrolyzed to the original polyketone and glycol.

3,734,889

**QUATERNIZED OLIGOMERS BASED ON UREAS, GUANIDINE AND GUANYLUREA**

Stanley A. Lipowski, Livingston, and John J. Miskel, Jr., Mendham, N.J., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

No Drawing. Filed Aug. 25, 1971, Ser. No. 174,970

Int. Cl. C08g 22/02, 41/00; D21h 3/36

U.S. Cl. 260—77.5 C

10 Claims  
A polyamine having only one primary amino group and only one tertiary amino group is condensed with a difunctional reactant to form a pre-condensate. This pre-condensate is then extended and quaternized by further reaction with a chain extender which is a dihalogenated hydrocarbon ether. Alternatively, a diamine having one primary amino group and one tertiary group is condensed with a difunctional reactant to form a pre-condensate which is then extended and quaternized by further re-



action with a chain extender which is an epihalohydrin. The resulting products are useful as flocculents, as drainage aids, and as dry strength resins in paper manufacture.

3,734,890

**PROCESS TO PRODUCE OILLESS ALKYDS**  
Thomas M. Powanda, Middlesex, N.J., assignor to Celanese Corporation, New York, N.Y.  
No Drawing. Continuation of abandoned application Ser. No. 796,575, Feb. 4, 1969. This application Apr. 8, 1971, Ser. No. 132,365

Int. Cl. C08g 17/04, 17/15

**U.S. Cl. 260—75 R** 4 Claims  
An improved process for producing an oilless alkyd capable of providing superior coating compositions which comprises producing an interpolymer, being substantially free of gelation by the reaction of a polyol having 3 to 4 hydroxyl functional groups, an aliphatic diol having 5 to 7 carbon atoms and a phthalic anhydride component in the presence of a catalytic amount of dialkyl stannic oxide wherein each alkyl group can contain from 1 to 6 carbon atoms.

3,734,891

**TRANSESTERIFICATION CATALYSTS FOR PRODUCTION OF POLY (C<sub>4</sub> TO C<sub>12</sub> ALKYLENETEREPHTHALATE)**

William N. Knopka, Wilmington, Del., assignor to FMC Corporation, Philadelphia, Pa.

No Drawing. Filed May 24, 1971, Ser. No. 146,484

Int. Cl. C08g 17/13, 17/15

**U.S. Cl. 260—75 R** 18 Claims  
The process of preparing a poly(C<sub>4</sub> to C<sub>12</sub> alkylene-terephthalate) resin comprising carrying out a transesterification reaction between a C<sub>4</sub> to C<sub>12</sub> alkylene glycol and a lower dialkyl terephthalate in the presence of a transesterification catalyst represented by the formula M<sub>2</sub>TiF<sub>6</sub>, wherein M is a NH<sub>4</sub>-radical, an alkali metal or alkaline earth metal, to form a prepolymer and then polycondensing said prepolymer.

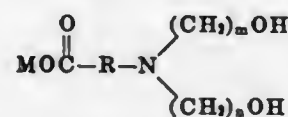
3,734,892

**ESTERIFICATION OF TEREPHTHALIC ACID WITH AN ALKYLENE GLYCOL IN THE PRESENCE OF AN ALKALINE SALT OF A GLYCINE COMPOUND**

Robert Alden Lofquist, Richmond, Va., assignor to Allied Chemical Corporation, New York, N.Y.  
No Drawing. Continuation-in-part of application Ser. No. 883,355, Dec. 8, 1969. This application Sept. 30, 1971, Ser. No. 185,407

Int. Cl. C08g 17/13

**U.S. Cl. 260—75 R** 20 Claims  
The esterification of polycarboxylic acid with an alkylene glycol is described under conditions of direct esterification wherein the polycarboxylic acid is esterified with an alkylene glycol in the presence of a compound of the formula



wherein

M is an alkaline metal selected from the group consisting of sodium and potassium, or a tertiary alkyl amine,

R is CH<sub>2</sub>, and

m and n are whole numbers from 2 to 4 wherein the number can be equal or unequal one to the other.

3,734,893

**PROCESS FOR THE MANUFACTURE OF LINEAR AROMATIC POLY-1,3,4-OXADIAZOLES**

Josef Studinka, Zurich, and Rudolf Gabler, Uetikon, Switzerland, assignors to Inventa A.G. fur Forschung und Patentverwertung, Zurich, Switzerland  
No Drawing. Filed Oct. 19, 1971, Ser. No. 190,676

Claims priority, application Switzerland, Oct. 29, 1970

15,981/70

Int. Cl. C08g 33/04

**U.S. Cl. 260—78.4 R** 18 Claims  
Process for the manufacture of linear aromatic poly-1,3,4-oxadiazoles by reacting in chlorosulphonic acid an inorganic hydrazine salt and an aromatic dicarboxylic acid.

3,734,894

**METHOD OF CONTROLLING REACTION OF POLYISOCYANATE WITH POLYAMINE**

Anthony F. Finelli and James C. West, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio.

No Drawing. Continuation of abandoned application Ser. No. 857,616, Aug. 27, 1969, which is a continuation of abandoned application Ser. No. 467,115, June 25, 1965. This application July 1, 1971, Ser. No. 159,045

Int. Cl. C08g 22/02, 22/18

**U.S. Cl. 260—32.8 N** 2 Claims  
This invention relates to a method of making polyurethane having improved resistance to discoloration, for instance, in a weatherometer for 100 hours. These polyurethanes are prepared by reacting a reactive hydrogen containing material such as polyesters, polyethers, polyester amides, castor oil, polycarbonate polyols and polydiene polyols and the hydrogenated polydiene polyols with a nonaromatic organic polyisocyanate and a nonaromatic primary diamine in the presence of sufficient inert solvent to render the mixture spreadable.

3,734,895

**POLYBUTADIENEIMINE AND PROCESS FOR PREPARATION THEREOF**

David C. Sayles, Huntsville, Ala., assignor to the United States of America as represented by the Secretary of the Army

No Drawing. Original application Dec. 5, 1969, Ser. No. 885,394. Divided and this application Aug. 31, 1971, Ser. No. 176,724

Int. Cl. C08d 5/02, 5/04

**U.S. Cl. 260—77.5 R** 5 Claims  
A novel compound, polybutadieneimine, serves as a crosslinking agent or chain-extending agent for carboxyl-terminated polybutadiene prepolymer or hydrogenated carboxyl-terminated polybutadiene prepolymer. The cross-linked prepolymer is used in conjunction with aluminum as the metal fuel, ammonium perchlorate as the inorganic oxidizer, and other additives to form a high temperature-resistant propellant. The chain-extended prepolymer is used in a like manner with the specified propellant ingredients.

3,734,896

**CURING OF POLYURETHANE PREPOLYMERS**

Tad L. Patton, Baytown, Tex., assignor to Esso Research and Engineering Company

No Drawing. Continuation-in-part of application Ser. No. 29,657, Apr. 17, 1970. This application Oct. 28, 1971, Ser. No. 193,588

Int. Cl. C08g 22/00

**U.S. Cl. 260—77.5 AM** 30 Claims  
This application relates to the process and products resulting therefrom of curing polyisocyanate prepolymers with either HCN, mixtures of HCN and one or more polyisocyanates or with polycyanoformamides, all in the presence of a suitable catalyst, particularly CN<sup>-</sup> and tertiary amines. The resulting polymers are chain-extended

through one or more heterocyclic rings, which are imino-imidazolidinediones and upon hydrolysis are converted to imidazolidinetriene rings.

3,734,897

**POLYMERS CONTAINING SILVER AND COPPER DERIVED FROM CYANO AND SULFONIC CONTAINING MONOMERS**

Arthur Stoy, Prague, Czechoslovakia, assignor to Ceskoslovenska Akademie ved, Prague, Czechoslovakia  
No Drawing. Continuation of abandoned application Ser. No. 729,897, May 17, 1968. This application Feb. 9, 1971, Ser. No. 114,088

Int. Cl. C08f 13/00; C12g 1/00; G03c 1/86

**U.S. Cl. 260—79.3 MU** 8 Claims  
New polymers and copolymers containing silver and/or copper, useful e.g. in manufacturing dialyze and filtration membranes, ion exchangers, light sensitive layers, catalysts and hydrophilic coatings, are prepared from copolymers or polymer mixtures containing both nitrile groups and strong acidic groups, by bringing them in contact with monovalent silver or copper ions or with their mixtures. Silver and/or copper are attached to nitrile groups by side valences, forming thus complex compounds. The probable formulae of the complex side-groups are: —CN.Ag<sup>+</sup> or perhaps —CN.Ag<sup>+</sup>.NC<sup>-</sup> and —CN.Cu<sup>+</sup> or perhaps —CN.Cu<sup>+</sup>.Cu<sup>+</sup>.NC<sup>-</sup>, the complex cations forming polymeric salts with strong acidic groups of the same or of an adjoining macromolecule, to which all said nitrile and strongly acidic groups are attached as their side substituents.

3,734,898

**PROCESS FOR THE PREPARING OF RANDOM COPOLYMERS OF CONJUGATED DIENES AND VINYL AROMATIC HYDROCARBONS**

Koei Komatsu; Shigeki Hayashi; Akira Ohishi, and Mashato Sakai, all of Yokohama, Japan, assignors to Japan Synthetic Rubber Co. Ltd., Tokyo, Japan

Claims priority, application Japan, Apr. 10, 1970, 45/30161

Filed Apr. 5, 1971, Ser. No. 131,508

Int. Cl. C08f 19/06, 19/08

**U.S. Cl. 260—84.3** 11 Claims  
A process for copolymerization of a conjugated diolefin with a vinyl aromatic hydrocarbon by a lithium type initiator in the presence of a randomizer selected from anionic surface active compounds having a hydrophilic group represented by —SO<sub>3</sub>M or —OSO<sub>3</sub>M where M is Na or K, in 1–20 parts by weight of a hydrocarbon or halogenated hydrocarbon solvent per 1 part by weight of the monomers, which comprises initiating the polymerization reaction at 20°C. – 90°C. and polymerizing substantially all monomers at the maximum temperature below 150°C. without removal of polymerization heat.

3,734,899

**POLYMERIZATION PROCESS AND CATALYST SYSTEM**

Lawrence M. Fodor, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Nov. 20, 1969, Ser. No. 878,531

Int. Cl. C08f 1/56, 3/10

**U.S. Cl. 260—93.7** 6 Claims  
Utilization of a catalyst system formed by admixing (a) a compound of the formula R<sub>n</sub>AlX<sub>3-n</sub>; (b) a titanium trichloride-aluminum trichloride complex of the approximate formula TiCl<sub>3</sub>·½AlCl<sub>3</sub> and (c) a compound of the formula M(NR<sub>2</sub>)<sub>m</sub> in the polymerization of 1-olefin results in the increased production of polymers. In the above formulas, R is selected from alkyl, cycloalkyl and aryl groups and combinations thereof, having from 1 to 12 carbon atoms, M is a Group IV–A or IV–B metal, n is 1, 2 or mixtures thereof, X is halogen and m is the valence of M.

3,734,900

**POLYMERIZATION OF CONJUGATED DIOLEFINS**  
Morford C. Throckmorton, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed July 8, 1970, Ser. No. 53,294

Int. Cl. C08d 1/14, 1/20, 3/08

**U.S. Cl. 260—94.3** 7 Claims  
There is disclosed a method for the polymerization of butadiene or butadiene in mixture with other diolefins such as isoprene, 2-ethyl butadiene, 2,3-dimethyl butadiene and the like, with a catalyst system comprising (1) an organometallic compound in which the metal is from Groups I, II and III of the Periodic System, (2) a nickel compound from the group of carboxylic acid salts of nickel, organic complex compounds of nickel or nickel carbonyls, (3) a fluorine containing compound from the group of metal fluorides and complexes thereof and (4) a compound containing a hydroperoxide group. The polymers contain a high proportion of cis 1,4 content and find use as synthetic rubbers in such products as tires and tire treads.

3,734,901

**DEFATTED SOYBEAN FRACTIONATION BY SOLVENT EXTRACTION**

Lester P. Hayes and Ross F. Simms, Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Sept. 28, 1970, Ser. No. 75,933

Int. Cl. A23j 1/14

**U.S. Cl. 260—123.5** 25 Claims  
Soya protein concentrates are prepared by removing residual lipid and water-soluble constituents from defatted soybean flakes. The residual lipids are initially extracted from the soybean flakes with a hydrocarbon/monohydric alcohol solvent followed by aqueous extraction of the water-soluble constituents. A high lecithin-containing oil is obtained by admixing the resultant lipid miscella and aqueous miscella and then effectuating an oil phase separation from the admixture.

3,734,902

**HIGHLY SOLUBLE GLUCOSIDE COMPOSITIONS AND METHOD OF PREPARING SAME**

Andrew McNaughton, P.O. Box 778, Mill Valley, Calif. 94941; and Ernst T. Krebs, 1348 S. Van Ness Ave. 94109; and Charles Gurchot, 150 Palo Alto Ave. 94114, both of San Francisco, Calif.

Filed Nov. 26, 1969, Ser. No. 880,185

Int. Cl. C07c 47/18

**U.S. Cl. 260—210 R** 6 Claims  
A method of preparing a highly water soluble, but unstable form of glucoside compositions which comprises the steps of forming an aqueous solution of said composition, lowering the temperature and pressure to freeze said solution, and removing the water by sublimation whereby highly soluble crystals of said material are formed; and the compositions prepared by said method, particularly amygdalin monohydrate; said compositions having high water solubility in the ambient to blood temperature ranges whereby highly concentrated forms may be injected intravenously or intramuscularly for experimental or therapeutic purposes.

3,734,903

**PENICILLINS DERIVED FROM THE REACTION OF ENAMINES WITH 6-ISOCYANATOPENICILLANIC ACID SACCHARIMIDE**

James L. Diebold, Broomall, Joel S. Sanet, St. Davids, and Milton Wolf, West Chester, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed June 3, 1971, Ser. No. 149,848

Int. Cl. C07d 99/16

**U.S. Cl. 260—239.1** 2 Claims  
Novel penicillanic acid derivatives have been prepared by the reaction of an enamine with 6-isocyanatopenicillanic acid saccharimide.



3,734,904

## 6-(1-AMINOTHIOCYCLOALKANOYL AMINO) PENICILLANIC ACIDS

Gerhard R. Wendt, Havertown, Donald E. Clark, Norristown, and Norman H. Grant, Wynnwood, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed July 23, 1971, Ser. No. 165,712

Int. Cl. C07d 99/16

U.S. Cl. 260—239.1

5 Claims

6-(1-aminothiocycloalkanoyl amino) penicillanic acids are prepared from the appropriate amino acid N-carboxy-anhydrides. The products exhibit anti-bacterial activity.

3,734,905

## PROCESS FOR THE PREPARATION OF NAPHTHOYLENEBENZIMIDAZOLIUM DYESTUFFS

René Pierre Victor Roe, Rouen, André Adolphe René Levavasseur, Sotteville les Rouen, Robert Frédéric Michel Sureau, Enghien les Bains, and Marie-Joséphine Jeanne Alicot, Saisy Sous Montmorency, France, assignors to Ugine Kuhlmann, Paris, France

No Drawing. Filed July 23, 1970, Ser. No. 57,753

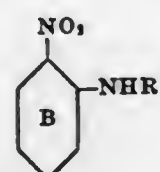
Claims priority, application France, July 23, 1969, 6925113

Int. Cl. C07d 57/02

U.S. Cl. 260—247.2 A

6 Claims

A process for the manufacture of naphthoylenebenzimidazolium dyestuffs which comprises condensing, in the presence of acetic acid or one of its higher homologues and of iron, a naphthalic acid anhydride which may be substituted by one or more atoms of chlorine or bromine, by one or two hydroxy groups, by one or two O—Y groups, Y representing an alkyl, aralkyl or aryl group, or by a tertiary amino group, with a secondary amine of the formula:



wherein the nucleus B may be substituted by chlorine or bromine atoms, methyl, O—Y, nitrile or trifluoromethyl groups and wherein R represents an alkyl, substituted alkyl or aralkyl group. These dyestuffs are useful for the coloration of polymers or copolymers of acrylonitrile.

3,734,906

## CARBAMATE AND THIOCARBAMATE DERIVATIVES OF 6-ISOCYANATO PENICILLANIC ACID SACCHARIMIDE

James L. Diebold, Broomall, and Milton Wolf, West Chester, Pa., assignors to American Home Products Corporation, New York, N.Y.

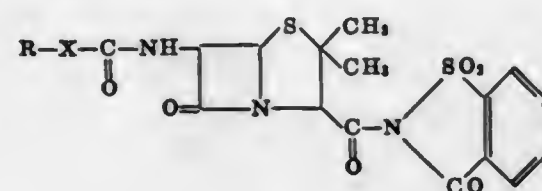
No Drawing. Filed June 3, 1971, Ser. No. 149,795

Int. Cl. C07d 99/16

U.S. Cl. 260—239.1

3 Claims

Novel antibiotic compounds have been prepared which have the following generic formula:



## 7-[D-(α-AMINO-α-PHENYLACETAMIDO)]-3-(5-METHYL-1,3,4-OXADIAZOL-2-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACID AND SALTS THEREOF

Leonard Bruce Crast, Jr., Clay, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

No Drawing. Filed Sept. 14, 1970, Ser. No. 72,173

Int. Cl. C07d 99/24

U.S. Cl. 260—243 C

7 Claims

7-[D-(α-amino-α-phenylacetamido)]-3-(5-methyl-1,3,4-oxadiazol-2-ylthiomethyl)-3-cephem-4-carboxylic acid and its nontoxic, pharmaceutically acceptable salts are valuable as antibacterial agents, as nutritional supplements in animal feeds and as therapeutic agents in poultry and animals, including man, and are especially useful in the treatment, particularly by oral administration, of infectious diseases caused by many Gram-positive and Gram-negative bacteria.

3,734,908

## 1,2,4-OXADIAZINE-3-ONES

Daniel Makula and Monique Druet, Lyon, and Beatrice Gonthier, Caluire, France, assignors to Progil, Paris, France

No Drawing. Original application Apr. 1, 1970, Ser. No. 24,859, now Pat. No. 3,696,099. Divided and this application May 5, 1972, Ser. No. 250,814

Int. Cl. C07d 87/52

U.S. Cl. 260—244 R

12 Claims

1,2,4-oxadiazine-ones, useful as algicides, bactericides and fungicides, are obtained by reacting an N-hydroxyurea and a dihalogenated organic derivative having halogen atoms on two adjacent carbon atoms.

3,734,909

## 2-GUANIDINO-4,6-BIS-AMINO-S-TRIAZINES

Denis Varsanyi, Arlesheim, and Willy Roth, Aargau, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 672,743, Oct. 4, 1967. This application Feb. 23, 1971, Ser. No. 118,153

Claims priority, application Switzerland, Oct. 27, 1966, 15,590/66

Int. Cl. C07d 55/22, 93/10

U.S. Cl. 260—249.6

7 Claims

Novel 2-guanidino-4,6-bis-amino-s-triazine derivatives as well as quaternary and acid addition salts thereof and salts of certain of the novel s-triazines in which the latter constitute the anion are described, which contain, per molecule, two 2-guanidino-4-amino-s-triazine moieties linked with each other via different nitrogen atoms of a polybasic amine and which have wax-like properties and are useful as components in surface treating agents, especially in combination with conventional ingredients in compositions for the treatment of floor surfaces, such as natural and synthetic waxes, resins, silicones, inorganic and organic fillers, detergents and other surfactants, pigments, stabilizing agents and the like conventional adjuvants; the aforesaid novel s-triazine derivatives afford to the treated surfaces, among other advantages, high gloss and at the same time satisfactory antislip effects. They are also useful as textile softeners.

3,734,910

## CERTAIN DIAZINYLCARBOXAMIDOETHYL-BENZENESULFONYLUREAS

Vittorio Ambrogia, Willy Logemann, Marcantonio Parenti, and Raffaele Tommasini, Milan, Italy, assignors to Carlo Erba S.p.A., Milan, Italy

No Drawing. Filed Oct. 12, 1970, Ser. No. 80,142

Claims priority, application Italy, Oct. 13, 1969, 23,275/69, 23,276/69

Int. Cl. C07d 51/36, 51/04

U.S. Cl. 260—250 A

11 Claims

New acylamino-alkyl-benzenesulfonyl ureas and acylamino-alkylbenzenesulfonyl-semicarbazides and process

for their preparation are disclosed, for example N-{4-[β-(2,6-dimethoxy-pyrimidine-4-carboxamido)ethyl]benzenesulfonyl}-N'-cyclohexylurea. These compounds are useful for their hypoglycemic activity.

3,734,911

## DIALKYL-XANTHINE DERIVATIVES

Walter Bestian, Braunschweiger Strasse 5, Bad Gandersheim, Germany

No Drawing. Filed Mar. 23, 1970, Ser. No. 22,075

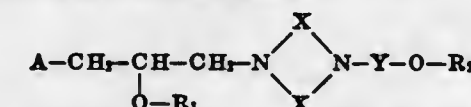
Claims priority, application Germany, Mar. 28, 1969, P 19 15 979.6-44

Int. Cl. C07d 57/48

U.S. Cl. 260—256

33 Claims

Dialkyl-xanthine derivatives including the pharmaceutically acceptable salts and quaternary ammonium salts characterized by their coronary dilating and central inhibiting activity and have the formula:



wherein A designates a 1,3-dimethyl-xanthine or a 3,7-dimethyl-xanthine radical, R1 and R2 each designate hydrogen, an aliphatic, cycloaliphatic, heterocyclic or aromatic acyl radical, X designates alkylene having 2 to 3 carbon atoms and Y designates alkylene having 2 to 4 carbon atoms.

3,734,912

## CERTAIN PYRIMIDO(1,2-a)(1,4)BENZODIAZEPIN-1(5H)-ONES

Arthur R. Hanze, deceased, by Janice W. Hanze, administratrix, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

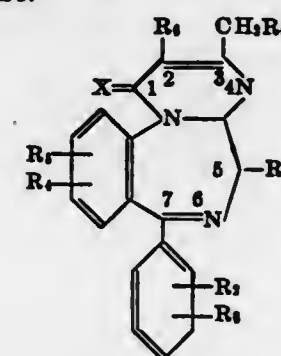
No Drawing. Continuation-in-part of Ser. No. 47,602, June 18, 1970. This application May 4, 1971, Ser. No. 140,238

Int. Cl. C07d 57/12

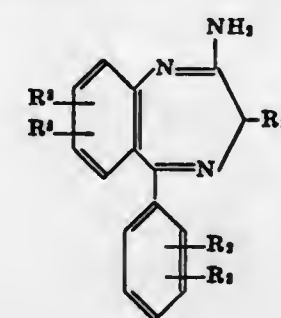
U.S. Cl. 260—256.5 R

10 Claims

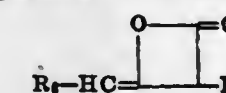
7-phenylpyrimido[1,2-a][1,4]benzodiazepin-1(5H)-one of the Formula IX:



wherein R1 is selected from the group consisting of hydrogen, alkyl, hydroxy and acetoxy; wherein R2, R3, R4, and R5 are selected from the group consisting of hydrogen, halogen, nitro, cyano, trifluoromethyl, sulfonamido, amino, lower-alkyl, -alkoxy, -alkylthio, -alkylsulfinyl, -alkylsulfonyl, -alkanoylamino and -dialkylamino; wherein R6 is hydrogen, loweralkyl, phenyl and benzyl; and wherein X is oxygen, sulfur or =NH, are synthesized by condensing a 2-amino-5-phenyl-3H-1,4-benzodiazepine of the Formula I



wherein R1, R2, R3, R4, and R5 are defined as above with a diketene of the formula



wherein R6 is defined as above, and heating the thus produced N-acetoacetyl derivative to obtain the compounds of Formula IX, in which R1 is hydrogen or lower alkyl, and X is oxygen. These compounds, as well as products in which X is sulfur and =NH, and R1 is also hydroxy and acetoxy, and their pharmaceutically acceptable acid addition salts are useful tranquilizer for mammals.

3,734,913

## THIAMINE DERIVATIVES AND PRODUCTION THEREOF

Akira Takamizawa, Ibaraki, and Kentaro Hirai, Kyoto, Japan, assignors to Shionogi & Co. Ltd., Higashi-ku Osaka Prefecture, Japan

No Drawing. Filed Oct. 12, 1970, Ser. No. 80,163

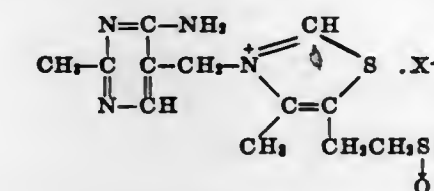
Claims priority, application Japan, Oct. 24, 1969, 44/85,578; Dec. 18, 1969, 44/101,829

Int. Cl. C07d 99/12

U.S. Cl. 260—256.5 B

1 Claim

Thiazolium salts represented by the formula:



wherein R represents a lower alkyl group, an aryl group, or an ar(lower)alkyl group, and X represents an acid residue or its acid addition salt, being useful as poultry anti-coccidial agents, are prepared by two routes.

3,734,914

## 2-OXODIHYDROQUINOLINETHIONO-PHOSPHORIC (PHOSPHONIC) ACID ESTERS

Walter Lorenz, Wuppertal-Cronenberg, and Ingeborg Hammann, Cologne, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 5, 1971, Ser. No. 104,176

Claims priority, application Germany, Jan. 24, 1970, P 20 03-141.8

Int. Cl. C07d 33/46

U.S. Cl. 260—268 P

6 Claims

2-Oxodihydroquinolinethiono-phosphoric (-phosphonic) acid esters, i.e., O,O-dialkyl-[1-methyl-2-oxo-1,2-dihydroquinoline-(4)-yl]-thionophosphoric acid esters and alkyl-O-alkyl[1-methyl-2-oxo-1,2-dihydroquinoline-(4)-yl]thionophosphonic acid esters, which possess insecticidal properties.

3,734,915

## N-[(4-PHENYL-1-PIPERAZINYL)ALKYL]BENZO[b]THIOPHENE OR BENZOFURAN-2-CARBOXAMIDES

William Blythe Wright, Jr., Woodcliff Lake, N.J., and Herbert Joseph Brabander, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 8,090, Feb. 2, 1970, now Patent No. 3,646,047. This application Oct. 15, 1971, Ser. No. 189,727

Int. Cl. C07d 51/70

U.S. Cl. 260—268 FT

8 Claims

The preparation of N-(secondary-aminoalkyl)derivatives of benzo[b]thiophene-2-carboxamide and benzofuran-2-carboxamide by reacting the corresponding benzo[b]thiophene or benzofuran carboxylic acid with N,N'



carbonyldiimidazole and subsequently with a primary alkylamine, is described. Other methods of preparing the compounds of this invention are also described.

3,734,916

# **N-(TERT-AMINOALKYL) - 2 - INDENECARBOXAMIDES AND METHODS OF PREPARING THE SAME**

William Blythe Wright, Jr., Woodcliff Lake, N.J., and Herbert Joseph Brabander, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.  
No Drawing. Continuation-in-part of application Ser. No. 8,091, Feb. 2, 1970, now Patent No. 3,646,048. This application Oct. 15, 1971, Ser. No. 189,737  
Int. Cl. C07d 51/70

U.S. Cl. 260—268 BC

9 Claims

The preparation of N-(tert. aminoalkyl) derivatives of substituted or unsubstituted 2-indenecarboxamides, is described. The compounds are prepared by several methods, the preferred method being the reaction of a substituted or unsubstituted indenecarboxylic acid with N,N'-carbonyldiimidazole and subsequently with a substituted alkylendiamine. These compounds are useful primarily for their depressant and analgesic activity.

3,734,917

# **DIPYRIDINIUM DICHROMATE PROCESS OF MANUFACTURE**

John R. Corrigan and William M. Coates, Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.  
No Drawing. Original application July 2, 1969, Ser. No. 838,705, now Patent No. 3,641,058, dated Feb. 8, 1972. Divided and this application July 29, 1971, Ser. No. 167,515  
Int. Cl. C07d 31/24

U.S. Cl. 260—270

16 Claims

An improved process for preparation of dipyridinium dichromate oxidizing reagent is provided.

3,734,918

# **WOOD ADHESIVE**

Johann Mayer and Christof Schmidt-Hellerau, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany  
No Drawing. Filed Apr. 23, 1971, Ser. No. 137,030  
Claims priority, application Germany, Apr. 27, 1970, P 20 20 481.3; Sept. 2, 1970, P 20 43 440.6  
Int. Cl. C08g 37/18, 51/24

U.S. Cl. 260—29.3

8 Claims

A process for the production of an aminoplast adhesive resin for the preparation of weatherproof adhesive joints in which melamine urea, and a small amount of phenol are condensed with formaldehyde in a definite sequence.

3,734,919

# **4,5 - DI-HYDROPYRROLO[3,2,1-jk][1,4]BENZODIAZEPIN-7(6H)-ONES AND 4,5-DI-HYDROPYRROLO[1,2,3-ef][1,5]BENZODIAZEPIN - 6(7H)-ONES**

Jackson B. Hester, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.  
No Drawing. Original application Nov. 3, 1969, Ser. No. 873,693, now Patent No. 3,642,821. Divided and this application June 21, 1971, Ser. No. 155,282  
Int. Cl. C07d 53/02

U.S. Cl. 260—239.3 T

14 Claims

4,5,6,7 - tetrahydropyrrolo[3,2,1 - jk][1,4]benzodiazepines, 4,5,6,7 - tetrahydropyrrolo[1,2,3-ef][1,5]benzodiazepines, 4,5 - dihydropyrrolo[3,2,1-jk][1,4]benzodiazepin - 7(6H) - ones, 4,5-dihydropyrrolo[1,2,3-ef][1,5]benzodiazepin - 6(7H) - ones and processes for preparing the same. Said compounds exhibit tranquilizing and anticonvulsant activity.

# **DIQUINOLONOPYRIDONE**

Chung C. Chen, Belleville, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.  
No Drawing. Original application Oct. 11, 1967, Ser. No. 674,635, now Patent No. 3,586,684. Divided and this application Nov. 25, 1970, Ser. No. 92,902  
Int. Cl. C07d 31/36

U.S. Cl. 260—295 R

1 Claim

A class of compounds of which diquinolonopyridone is illustrative, and new and useful pigments formed therefrom along with a class of intermediates of which dimethyl-3,5-dianilinochelidamate is typical.

3,734,921

# **N-HALOQUINOLINIMIDES**

Lubomir C. Vacek, Toledo, Ohio, assignor to The Sherwin Williams Company, Cleveland, Ohio  
Continuation-in-part of Ser. No. 840,508, July 9, 1969, abandoned. This application Nov. 3, 1971, Ser. No. 195,449  
Int. Cl. C07d 39/00

U.S. Cl. 260—295.5 B

2 Claims

Method for producing isatoic anhydride and 3-azaisatoic anhydride which involves reacting, in an aqueous medium, an alkali or alkaline earth metal base and certain N-halophthalimides or N-haloquinolinimides at temperatures ranging from about 25° (all temperatures herein are in degrees Centigrade) down to the freezing point of the reaction mixture for a time sufficient to enable acidification of the reaction mixture to a pH in the range of about 5.5 to 7.0 within the aforesaid temperature range without causing souring. After acidification, the reaction mixture is heated to a temperature where exothermic reaction begins and reaction is allowed to proceed while the pH of the reaction mixture is maintained in the range of about 5.5 to 7 until reaction is complete.

3,734,922

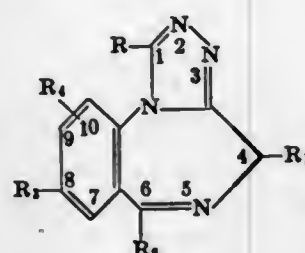
# **CERTAIN 4H-s-TRIAZOLO[4,3-a][1,4]BENZODIAZEPINES**

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.  
No Drawing. Filed May 11, 1971, Ser. No. 142,419  
Int. Cl. C07d 31/42

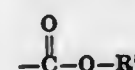
U.S. Cl. 260—296 T

2 Claims

This invention relates to novel 4H-s-triazolo[4,3-a]-[1,4]benzodiazepines embraced by the formula



wherein R is selected from the group consisting of hydrogen, lower alkyl of 1 through 3 carbon atoms, phenyl, benzyl, nitromethyl, cyanomethyl, lower alkoxyethyl having an alkoxy moiety of 1 through 3 carbon atoms, lower dialkylaminomethyl having an alkyl moiety of 1 through 3 carbon atoms, lower alkylthiomethyl having an alkyl moiety of 1 through 3 carbon atoms, pyrrolidinomethyl,



wherein R' is lower alkyl of 1 through 3 carbon atoms; R1 is selected from the group consisting of hydrogen and lower alkyl of 1 through 3 carbon atoms; R2 is selected from the group consisting of pyridyl, 2-pyrimidyl, furyl, pyrrol, thienyl, lower alkyl of 1 through 3 carbon atoms,

lower alkenyl of 2 through 3 carbon atoms, cycloalkyl of 5 through 7 carbon atoms and cycloalkenyl of 5 through 7 carbon atoms; R3 and R4 are selected from the group consisting of hydrogen, lower alkyl of 1 through 3 carbon atoms, halogen, nitro, trifluoromethyl and lower alkoxy, lower alkylthio and lower dialkylamino wherein their lower alkyl moieties are of from 1 through 3 carbon atoms; and pharmacologically acceptable acid addition salts thereof. The new products of Formula I are useful as sedatives, hypnotics, tranquilizers, muscle relaxants and anticonvulsants in mammals and birds. Also, as feed additives for increasing growth rate and feed efficiency of livestock.

3,734,923

# **THIAZOLE DERIVATIVES**

John Dowling, Burnham-on-Crouch, and William George Leeds, London, England, assignors to May & Baker Limited, Dagenham, Essex, England  
No Drawing. Filed Aug. 13, 1970, Ser. No. 63,654  
Claims priority, application Great Britain, Aug. 15, 1969, 40,868/69  
Int. Cl. C07d 91/34

U.S. Cl. 260—306.8 R

8 Claims

The hitherto unknown thiazole derivatives with a urea grouping —N(R<sup>4</sup>)CONR<sup>5</sup>R<sup>6</sup> (wherein R<sup>4</sup> represents a methyl or ethyl group, R<sup>5</sup> represents a hydrogen atom or a methyl group, and R<sup>6</sup> represents a methyl group or, when R<sup>4</sup> and R<sup>5</sup> each represent a methyl group, an ethyl or n-propyl group) in the 2-position of the thiazole nucleus, and a bromine, chlorine or iodine atom in the 5-position, and acid addition salts thereof, are useful as herbicides.

3,734,924

# **CARBOXAMIDINES**

James Whyte Black, Hemel Hempstead, Graham John Durant, Welwyn Garden City, John Colin Emmett, Kimpton, and Charon Robin Ganellin, Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England  
No Drawing. Filed Oct. 14, 1970, Ser. No. 80,794  
Int. Cl. C07d 31/40, 41/18, 49/36, 55/06, 91/32

U.S. Cl. 260—309

3 Claims

N-heterocyclic - alkylcarboxamidines. The compounds inhibit histamine activity.

3,734,925

# **N-AMINO-3,4-DIMETHYL-6-ISOBUTYL-PHTHALIMIDES**

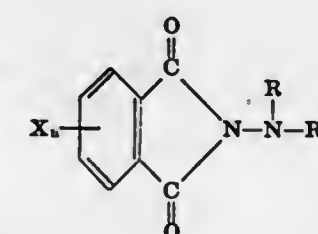
Pasquale P. Minieri, Woodside, N.Y., assignor to Tenneco Chemicals, Inc.

No Drawing. Filed Feb. 8, 1971, Ser. No. 113,710  
Int. Cl. C07d 27/52

U.S. Cl. 260—326 N

5 Claims

Fungicidal compositions that are suitable for use on living plant materials intended for human or animal consumption contain as their fungicidally-active component a compound having the structural formula



wherein X represents a lower alkyl group, chlorine, phenyl, or nitro; n represents an integer in the range of 1 to 4, R represents hydrogen or a lower alkyl group; R' represents hydrogen, a lower alkyl group, or the group —COOR''; and R'' represents a lower alkyl group.

3,734,926

# **BENZOPHENONE-3,4,3',4'-TETRACARBOXYLIC ACID DIIMIDES OF 3,5-DIALKYL-4-HYDROXYPHENYLSUBSTITUTED AMINES**

Martin Dexter, Briarcliff Manor, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.  
Filed Oct. 4, 1971, Ser. No. 186,560  
Int. Cl. C07d 27/52

U.S. Cl. 260—326 N

3 Claims

Benzophenonetetracarboxylic acid diimides of 3,5-dialkyl-4-hydroxyphenylsubstituted amines of this invention effectively stabilize organic materials against the effects of heat and oxygen. The diimides of this invention are prepared by reacting the appropriate 3,5-dialkyl-4-hydroxyphenylsubstituted amine with benzophenone-3,4,3',4'-tetracarboxylic acid dianhydride or diimide. An example of this class of stabilizers is N,N'-bis(3,5-di-t-butyl-4-hydroxybenzyl)3,4,3',4'-tetracarboxylic acid-diimide.

3,734,927

# **NOVEL MALEIMIDE AND AGRICULTURAL FUNGICIDE**

Seigo Kawada, Kikukawa-machi, Hideo Ito, Shimizu, Kazuo Matsui, Komae-machi, and Hiroshi Kasugai, Tokyo, Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

No Drawing. Filed Jan. 6, 1971, Ser. No. 104,464  
Claims priority, application Japan, Jan. 10, 1970, 45/3,143

Int. Cl. C07d 27/18

1 Claim

The novel compound, N-(4-fluorophenyl)-2,3-dichloromaleimide, has been found to possess good fungicidal properties, particularly for such plant diseases as tomato disease, rice blight, anthrax disease in cucumbers and black spot disease in citrus fruit. This compound can be effectively used in lower concentrations compared with previously known fungicidal maleimides.

3,734,928

# **DIFUNCTIONAL IODONIUM SALTS OF DIPHENYL OXIDE AND PREPARATION**

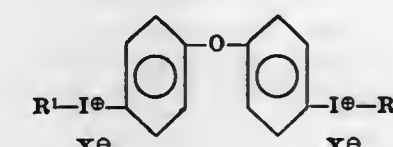
Zdravko Jezic, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Aug. 11, 1970, Ser. No. 63,005  
Int. Cl. A61k 27/00; C07c 43/28; C07d 63/14

U.S. Cl. 260—332.2 R

13 Claims

Difunctional iodonium salts of diphenyl oxide corresponding to the formula



wherein R<sup>1</sup> and R<sup>2</sup> represent phenyl-, nitrophenyl-, fluoro-phenyl-, chlorophenyl-, bromophenyl-, loweralkylphenyl-, loweralkoxyphenyl-, trifluoromethylphenyl-, phenylphenyl-, phenokyoxyphenyl-, disubstituted phenyl- in which the substituents are fluoro, chloro, bromo, loweralkyl, lower-



alkoxy; naphthyl; or 2-thienyl; and X represents fluoride, chloride, bromide, iodide, hydrogen sulfate, nitrate, trifluoroacetate, trichloroacetate, loweralkanoate, lactate or tetrafluoroborate. The compounds have antimicrobial properties.

3,734,929

# **HEXAHYDRO - 3,3,6,6 - TETRAMETHYLFLURO-[3,2-b]-FURAN-2,5-DIONE AND METHOD OF ITS PREPARATION**

Alfred G. Robinson, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 45,218, June 10, 1970. This application Aug. 27, 1971, Ser. No. 175,724

Int. Cl. C07d 5/46

U.S. Cl. 260—343.6

1 Claim

Hexahydro - 3,3,6,6 - tetramethylfuro-[3,2-b]-furan-2,5-dione is formed by the oxidation of hexahydro-3,3,6,6-tetramethylfuro-[3,2-b]-furan-2,5-diol using hypohalous acid or salts of a hypohalous acid. The reaction may be conducted under atmospheric pressure at temperatures from about 5° C. to about 90° C. The novel compound hexahydro - 3,3,6,6 - tetramethylfuro-[3,2-b]-furan-2,5-diol is useful as a reactive chemical intermediate which can be used to produce stabilizers for plastics, solvents, plasticizers, synthetic lubricants and polyesters.

3,734,930

# **DIRECT SYNTHESIS OF (-)-TRANS-Δ TETRAHYDROCANNABINOL FROM OLIVETOL AND (+)-TRANS-Δ-CARENE OXIDE**

Raj Kumar Razdan, 76 Lawrence Lane, Belmont, Mass., and G. Richard Handrick, 516 Concord Avenue, Lexington, Mass.

Filed Sept. 22, 1971, Ser. No. 182,841

Int. Cl. C07d 7/24

U.S. Cl. 260—345.3

7 Claims

A one step stereospecific synthesis of Δ<sup>9</sup>-tetrahydrocannabinol by the condensation of olivetol with Δ<sup>9</sup>-carene oxide is disclosed.

3,734,931

# **5'-SUBSTITUTED GRISEOFULVINS**

Howard Newman, Monsey, and Thomas Lynn Fields, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of applications Ser. No. 26,404, Apr. 7, 1970, and Ser. No. 824,310, May 13, 1969, now abandoned. This application Nov. 10, 1971, Ser. No. 197,521

Int. Cl. C07d 5/36

U.S. Cl. 260—346.2 G

10 Claims

This disclosure describes compounds of the class of 5'-substituted griseofulvins useful as antifungal agents.

3,734,932

# **1-OXA-8-OXO-2,6,10,10-TETRAMETHYL-SPIRO-[4,5]-DECA-6-ENE**

Yajiro Sakato and Kazuo Ina, both of 4300 Mitsuke, Iwata, Japan; Yukitsune Yamamoto, 479 Higashi-cho, Karasumaru-shiru, Kyoto, Japan; and Harumi Morishita, 149 Owari-cho, Hamamatsu, Japan

No Drawing. Original application Jan. 21, 1969, Ser. No. 792,810. Divided and this application May 3, 1971, Ser. No. 139,815

Claims priority, application Japan, Jan. 26, 1968, 43/4,856

Int. Cl. C07d 5/32

U.S. Cl. 260—347.8

1 Claim

Novel 1-oxa - 8 - oxo-2,6,10,10-tetramethyl-spiro-[4,5]-deca-6-ene; compositions for improving aroma and flavor of black tea which contain the above compound; and black tea containing the above compound.

3,734,933

# **ARYLTHIOANTHRAQUINONES**

Guido R. Genta, Snyder, N.Y., assignor to American Aniline Products, Inc., Lock Haven, Pa.

No Drawing. Filed Mar. 8, 1972, Ser. No. 232,969

Int. Cl. C09b 1/56

U.S. Cl. 260—371

4 Claims

A new series of compounds, 1-arylsulfonamido-5(or 8)-arylthioanthraquinones, are provided. 1,5(or 1,8)-dichloroanthraquinone is condensed with an arylsulfonamide to produce an intermediate monochloro-arylsulfonamidoanthraquinone intermediate, which is then converted into the desired final product by condensation with an aromatic mercaptan. The compounds provide bright yellow dyeings of excellent fastness properties on polyester fabrics, and are also useful for the coloration of rigid plastic materials in yellow shades.

3,734,934

# **DISPERSIBLE α- AND β-SUBSTITUTED ANTHRAQUINONE DYE STUFFS CONTAINING AN ALKYLENEOCOOR GROUP**

Hans-Peter Kolliker, Munchenstein/Basel-Land; Alfred Staub, Binningen/Basel-Land, and Peter Hindermann, Bottmingen/Basel-Land, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

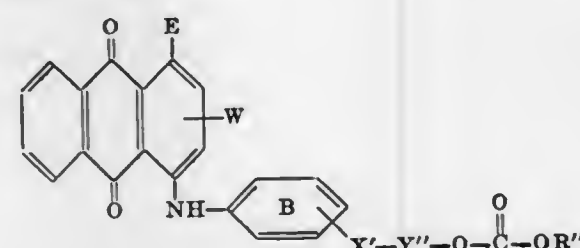
Filed Apr. 1, 1970, Ser. No. 24,809

Int. Cl. C09b 1/20, 1/22; D06p 3/54

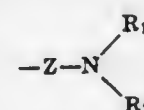
U.S. Cl. 260—376

5 Claims

Dyestuffs of the formula



wherein W is chlorine, bromine, cyano, lower alkyl, lower alkoxy carbonyl, phenoxycarbonyl, lower alkythio, phenylthio, lower alkyl sulfonyl or a grouping of the formula



wherein Z is -CO- or -SO<sub>2</sub>- and R<sub>1</sub> and R<sub>2</sub> are each independently hydrogen or lower alkyl.

Y' is lower alkylene, -CH<sub>2</sub>CH<sub>2</sub>OCH<sub>2</sub>CH<sub>2</sub>- or -CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>-OBQCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>-.

X is a direct bond, -O-, -S-, -NH-, -COHN- or -SO<sub>2</sub>NH-.

R'' is lower alkyl, cyclohexyl, phenyl or phenyl substituted by chlorine, lower alkyl or lower alkoxy, or bromine, the nucleus B is either unsubstituted or is further mono-substituted by chlorine, lower alkyl or lower alkoxy.

E is NH<sub>2</sub>, OH or NHT, and T is lower alkyl, cyclohexyl, phenyl, lower alkyl phenyl or phenoxyphenyl.

3,734,935

# **BIOLOGICALLY ACTIVE 17α-ETHYNYL-16,17-DIHYDROXY-13-ALKYLGONANES**

George E. M. Husbands, Philadelphia, and Reinhardt P. Stein, Audubon, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed July 21, 1972, Ser. No. 274,004

Int. Cl. C07c 169/22

U.S. Cl. 260—397.4

1 Claim

13 - alkyl - 16α,17β - dihydroxy-gon-4-ene-3-one compounds are converted to 13-alkyl-16α,17β-dihydroxy-17-

ethynyl gonane and 13-alkyl-16β,17β-dihydroxy gonane compounds having progestational and anti-estrogenic activity.

3,734,936

# **PROCESS OF PRODUCING A FOUNDRY CORE COMPOSITION**

Lloyd H. Brown, Crystal Lake, and Daniel S. P. Eftax, Barrington, Ill., assignors to The Quaker Oats Company, Chicago, Ill.

No Drawing. Filed Feb. 3, 1971, Ser. No. 112,485

Int. Cl. C08g 51/04

U.S. Cl. 260—395 B

14 Claims

A foundry core composition which is the product of the process which comprises: (a) forming a monomeric binder mixture of specified amounts of aqueous urea-formaldehyde mixture; furfuryl alcohol; and a silane coupling agent of the general formula:



wherein R' is a short chain alkylene radical; R'' is aryl, alkyl, substituted aryl, or furfuryl; and X is amino, mercapto, epoxy, or glycidioxy; (b) forming a mixture of specified amounts of sand and acidic catalyst; and (c) admixing specified amounts of the monomeric binder with specified amounts of the sand-acidic catalyst mixture.

3,734,937

# **DERIVATIVES OF α-HALO-α-BENZYL PROPIONIC ACID**

Sandor Karady, Elizabeth, Seemon H. Pines, Murray Hill, Manuel G. Ly, Edison, and Meyer Slettinger, North Plainfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed June 24, 1970, Ser. No. 49,540

Claims priority, application Canada, Mar. 25, 1970, 78,424

Int. Cl. C09b 11/04

U.S. Cl. 260—395

1 Claim

A new method of preparing L-α-hydrazino-β-phenyl-alkanoic acids and their derivatives by direct hydrazino displacement of a corresponding α-substituted-β-phenyl-alkanoic acid or derivative is disclosed. The preparation of the novel intermediate compounds is also described.

3,734,938

# **NOVEL PROCESS FOR 3β,17β-DIHYDROXY-5-ANDROSTENE-17α-PROPIONIC ACID**

Francisc Petru Hodosan, Nicolae Serban, Arpad Balogh, Ioan Jude, Ottmar Carol Mantsch, and Nicolae Stefan Bodor, Cluj, Rumania, assignors to Institutul de Chimie Cluj, Cluj, Rumania

No Drawing. Filed Aug. 2, 1971, Ser. No. 168,442

Claims priority, application Rumania, Aug. 5, 1970, 64,146/70

Int. Cl. C07c 169/24

U.S. Cl. 260—397.1

2 Claims

A process for preparing 3β,17β-dihydroxy-5-androstene-17α-propionic acid in a one-step synthesis characterized in that 3β-hydroxy-5-androsten-17-one is condensed with propionic acid in alcohol solution in the presence of an alkaline hydroxide. The condensation product is then isolated as the ammonium salt. The yield is about 70%.

3,734,939

# **N,N-DIALLYLGUANIDINE SALTS**

Frederic Charles Schaefer, Darien, and Alan Carl Wright, Willimantic, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Jan. 18, 1971, Ser. No. 107,406

Int. Cl. C11c 3/00

U.S. Cl. 260—404.5

5 Claims

1,1-diallylguanidine and its salts are prepared by reaction of diallylamine with cyanamide or by reaction of diallylcyanamide with ammonium chloride, and are useful

3,734,940

# **CHELATES OF HYDROXY CARBOXYLIC ACIDS AND METHODS FOR PREPARING THE SAME**

Andrew M. Rubino, Caldwell, N.J., assignor to Armour's Pharmaceutical Company, Berkeley Heights, N.J.

No Drawing. Division of application Ser. No. 544,833, Apr. 25, 1966, now Patent No. 3,553,316, dated Jan. 5, 1971, which is a continuation-in-part of applications Ser. No. 668,886, July 1, 1957, Ser. No. 236,168, Nov. 7, 1962, and Ser. No. 255,218, Jan. 31, 1963, all now abandoned. This application Mar. 30, 1970, Ser. No. 29,716

Int. Cl. C07f 5/06

U.S. Cl. 260—448 B

9 Claims

Aluminum chelates are prepared by reacting an aluminum compound selected from the group consisting of alkali metal aluminates and aluminum chlorhydroxy complexes with water and alcohol soluble hydroxy carboxylic acids until no precipitation of aluminum is obtained when a sample of the aqueous reaction solution is heated with an ionic precipitant for aluminum. If necessary, the pH of the reaction solution is adjusted to a range of about 4-9 with an alkali.

3,734,941

# **PROCESS FOR CONVERTING URETHANES TO ISOCYANATES**

Walter Joseph Sydor, Raritan, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Sept. 6, 1968, Ser. No. 758,138

Int. Cl. C07c 119/04

U.S. Cl. 260—453 P

4 Claims

A process for producing isocyanates from urethanes which comprises heating a urethane of the formula:



wherein R is alkyl of from 1 to 18 carbon atoms, aryl or alkaryl containing less than 3 rings, R' is alkyl of 1 to 6 carbon atoms, aryl or alkaryl of less than three rings, and x is 1, 2 or 3, at a temperature between 400° C. and 600° C. in the presence of a Lewis acid to form vapors and condensing the vapors to recover an organic isocyanate.

3,734,942

# **PREPARATION OF NITRILES**

William E. Dennis, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed Mar. 26, 1970, Ser. No. 23,025

Int. Cl. C07c 121/02

U.S. Cl. 260—465 B

4 Claims

Nitriles are prepared by reacting amides or aldoximes with cyclic diorganosilazanes. For example, benzamide was reacted with hexa-methylcyclotrisilazane at 130° C. to give a 94% yield of benzonitrile.

3,734,943

# **DEEP WELL DISPOSAL PROCESS FOR ACRYLO-NITRILE PROCESS WASTE WATER**

William O. Fitzgibbons, Hudson, Elaine M. Scherko, Solon, and Allan H. Bralnard, Bedford, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 6, 1971, Ser. No. 140,782

Int. Cl. C07c 121/32

U.S. Cl. 260—465.3

4 Claims

A process for the deep well disposal of a waste water stream resulting from a catalytic ammoxidation process



for the production of acrylonitrile comprises adding minor amounts of acrolein or a mixture of acrolein and ammonium sulfate to the waste water stream prior to pumping the stream into the well.

3,734,944

## GLYCYRRHETINIC ACID ESTERS

John Cameron Turner, Kent, England, assignor to Biorex Laboratories Limited, London, England

No Drawing. Filed May 15, 1970, Ser. No. 37,924

Int. Cl. C07c 69/36, 69/74

U.S. Cl. 260—468.5 16 Claims

New derivatives of glycyrrhetic acid are obtained by the esterification of glycyrrhetic acid with unsaturated alcohols. The new compounds have valuable anti-inflammatory properties.

3,734,945

## CYCLOALKYL CARBAMATES

Richard W. Fraley, Barberton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed May 28, 1971, Ser. No. 148,175

Int. Cl. C07c 125/06

U.S. Cl. 260—468 E 6 Claims

The soil lives of many herbicides may be extended combining them with various O-phenylcarbamates having one group attached to the carbamic nitrogen atom. An exemplary composition is a mixture of isopropyl N-(3-chlorophenyl)carbamate and 4-chlorophenyl N-cyclohexylcarbamate.

3,734,946

## SERINE DERIVATIVES

Miguel A. Ondetti, North Brunswick, Josip Pluscec, East Brunswick, and John T. Sheehan, Middlesex, N.J., and Johan E. Jorpes, Stockholm, and Viktor Mutt, Farsta, Sweden, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

No Drawing. Original application May 3, 1968, Ser. No. 726,558. Divided and this application Dec. 23, 1969, Ser. No. 889,769

Int. Cl. C07c 125/06

U.S. Cl. 260—471 C 2 Claims

Novel peptide amides of the general formula



wherein R represents L-aspartyl-O-sulfate-L-tyrosyl, L-aspartyl-L-arginyl-L-aspartyl-O-sulfate-L-tyrosyl, or isoleucyl-L-ceryl-L-aspartyl-L-arginyl-L-aspartyl-O-sulfate-L-tyrosyl, and intermediates in the production thereof. The peptide amides of this invention as well as the pharmaceutically acceptable salts thereof have been found to possess cholecystokinase activity.

3,734,947

## PROCESS FOR THE PRODUCTION OF 4-(2-HYDROXYETHOXY) BENZOIC ACID LOWER ALKYL ESTERS OF HIGH PURITY

Ryuzo Ueno and Motomu Kashiwara, Nishinomiya, Japan, assignors to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo, Osaka, Japan

No Drawing. Filed July 23, 1970, Ser. No. 57,768

Int. Cl. C07c 69/78

U.S. Cl. 260—473 R 3 Claims

A process for producing 4-(2-hydroxyethoxy) benzoic acid lower alkyl esters which comprises dissolving or suspending a mixture of an alkali metal salt of a 4-hydroxy benzoic acid lower alkyl ester, where the lower alkyl is of not more than 6 carbon atoms, and a 4-hydroxy benzoic acid lower alkyl ester, in an inert organic solvent, and contacting the resulting solution or suspension with ethylene oxide.

3,734,948  
CARBAMATES OF p-HYDROXYBENZOATES

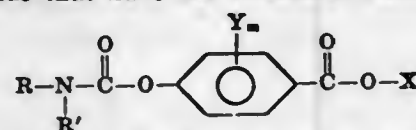
Henri Sidi, Paramus, N.J., assignor to Tenneco Chemicals, Inc.

No Drawing. Filed Feb. 18, 1971, Ser. No. 116,607

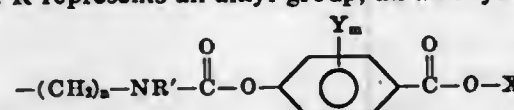
Int. Cl. C07c 125/06

U.S. Cl. 260—473 R 6 Claims

Compounds that have the structural formula



wherein R represents an alkyl group, an alkenyl group, or



R' represents hydrogen or an alkyl group; X represents an alkyl group,  $-(\text{CH}_2)_n-\text{OH}$ , or  $-(\text{CH}_2)_n-\text{OCONRR}'$ ; Y represents an alkyl group or an alkoxy group; m represents an integer in the range of 0 to 2; and n represents an integer in the range of 2 to 6 are used to protect surface-coating compositions from deterioration resulting from attack by fungi and other microorganisms. Illustrative of these carbamates are ethylene glycol mono-p-hydroxybenzoate N-methyl carbamate and ethyl 3-methoxy-4-hydroxybenzoate N-methyl carbamate.

3,734,949

## CARBAMATES OF NORBORNANES

Harvey E. Alburn, West Chester, and William Dvornch, Radnor, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 644,089, June 7, 1967. This application June 3, 1970, Ser. No. 43,207

Int. Cl. C07c 125/04

U.S. Cl. 260—482 B 2 Claims

Carbamic acid esters of 2-norbornanol, 5-norbornene-2,3-dimethanol, and related compounds exhibit antiviral activity.

3,734,950

## PRODUCTION OF 3-ACETOXY-2-METHYLENE PROPIONIC ACID ALKYL ESTERS

Gerhard Scharfe, Leverkusen; Wolfgang Swodenk, Odenthal-Globus; Johann Grollg, Leverkusen, and Manfred Martin, Cologne, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 29, 1970, Ser. No. 59,357

Claims priority, application Germany, Aug. 1, 1969, P 19 39 143.6

Int. Cl. C07c 69/66

U.S. Cl. 260—484 A 7 Claims

A process for the production of 3-acetoxy-2-methylene propionic acid alkyl esters, wherein methacrylic acid alkyl ester, oxygen and acetic acid are reacted in the gas phase at a temperature of from about 50 to 250°C in the presence of a palladium catalyst containing an alkali metal acetate. The catalyst may contain additions of one or more metals or compounds of metals selected from the group consisting of gold, copper and metals of the fifth to eighth Groups of the Periodic System.

3,734,951

## CONTINUOUS PRODUCTION OF NEUTRAL ADIPIC ESTERS

Hubert Suter, Juergen Jahn, Franz Janka, and Friedrich Brunnmueller, Ludwigshafen, and Otto Bernd Claren, Mannheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Oct. 12, 1970, Ser. No. 80,169

Int. Cl. C07c 69/44

U.S. Cl. 260—485 R 1 Claim

Continuous production of neutral esters of adipic acid and an alcohol in which solid adipic acid is mixed with

alcohol in the molar ratio 1:2 in a mixing zone at from 120° to 180° and the mixture is esterified while boiling the alcohol and setting up the stoichiometric amount of alcohol in the liquid at from 180° to 250°.

3,734,952

## PREPARATION OF L-DOPA

Alan Martin Krubiner, Montville, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Dec. 27, 1968, Ser. No. 787,563

Int. Cl. C07c 101/08

U.S. Cl. 260—501.11 5 Claims

The present invention relates to a process for the preparation of L-dopa and to an aryl lower alkylamine resolving agent usable in this preparation.

3,734,953

## TRIS-TRIODOISOPHTHALAMIC ACIDS AND DERIVATIVES

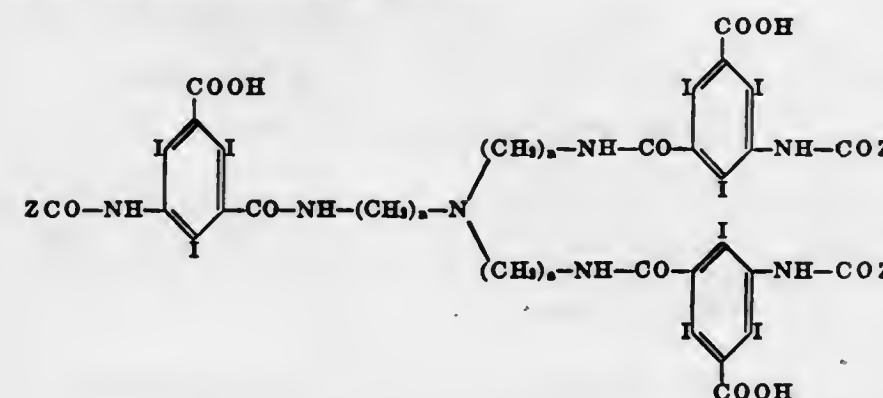
Jack Bernstein and Kathryn Losee, New Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed Aug. 11, 1969, Ser. No. 849,175

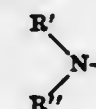
Int. Cl. C07c 103/30

U.S. Cl. 260—501.11 8 Claims

This invention relates to new tris-triiodoisophthalamic acid compounds having the formula



wherein Z is an alkyl chain of up to 6 carbon atoms, or a radical of the formula



wherein R' is an alkyl chain of up to 6 carbon atoms, and R'' is hydrogen or an alkyl chain of up to 6 carbon atoms, n is an integer from 2 to 4, and to salts and lower alkyl esters of these compounds. These compounds are useful as radiopaque agents.

3,734,954

## POLYPHOSPHINIC ACIDS AND SALTS THEREOF

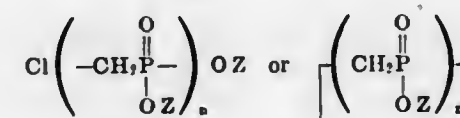
Ludwig Maier, Zurich, Switzerland, assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 15, 1969, Ser. No. 850,623

Int. Cl. C07f 9/30, 9/32

U.S. Cl. 260—502.4 P 3 Claims

Polyphosphinic acids and salts thereof of the general formula



wherein Z is hydrogen, a metal, ammonium or substituted ammonium and n is an integer of at least 2. The polyphosphinic acids are useful as complex-forming agents and sequestering

agents. The polyphosphinic acid salts are useful as stabilizers for peroxide solutions and active chlorine compounds.

3,734,955

## CARBOXYLATION OF INDENE

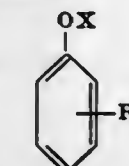
Edwin L. Patmore, Fishkill, and William R. Siegert and Harry Chafetz, Poughkeepsie, N.Y., assignors to Texaco Inc., New York, N.Y.

No Drawing. Original application Jan. 27, 1969, Ser. No. 794,344, now Patent No. 3,658,874. Divided and this application Nov. 10, 1971, Ser. No. 197,531

Int. Cl. C07c 51/14

U.S. Cl. 260—515 R 5 Claims

Method of carboxylating an organic compound of the group of  $\text{RC}\equiv\text{CH}$ ,  $\text{RCH}_2\text{CN}$ , indene or cyclopentadiene where R is hydrocarbyl comprising contacting under anhydrous conditions in an inert atmosphere and in the presence of an inert, aprotic, dipolar, liquid solvent, said compound with a carbonated metal phenoxide, the metal phenoxide of the formula:



where X is sodium or potassium, R1 is hydrogen or alkyl, and subsequently acidifying the resultant intermediate product to form the carboxylated product.

3,734,956

## PROCESS FOR THE PREPARATION OF DIPHENIC ACID AND 2-PHENYL BENZOIC ACID

John Martin Nilsson, Solna, and Jadwiga Palicka, Lidings, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

No Drawing. Filed Mar. 28, 1972, Ser. No. 238,981

Int. Cl. C07c 63/00

U.S. Cl. 260—515 P 2 Claims

Diphenic acid and 2-phenyl benzoic acid may be prepared according to the invention by heating copper (I)-phthalate in a solvent, such as quinoline, at a temperature of 110–200° C.

3,734,957

## METHOD FOR THE PRODUCTION OF α,α-DI-ALKYL-β-CHLOROPROPIONIC ACIDS

Moustafa El-Shahawi, Kenntemich-Platz, and Hermann Richtzenhain, Post Marialinden, Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

No Drawing. Filed Mar. 26, 1970, Ser. No. 23,038

Claims priority, application Germany, Apr. 1, 1969, P 19 16 684.8

Int. Cl. C07c 53/32

U.S. Cl. 260—539 R 4 Claims

A method for the production of β-chloropropionic acids disubstituted in α-position by alkyl residues having 1 to 4 C-atoms, by treating β-hydroxypropionaldehyde or its acetals disubstituted in α-position by alkyl residues having 1 to 4 C-atoms with chlorine in the presence of



water or aqueous hydrochloric acid, and heating the resulting reaction mixture to temperatures between 100 and 200° C.

3,734,958

### PROCESS FOR THE PREPARATION OF DIORGANOCHLOROPHOSPHINES

Andre Rio, Lyon, Rhone, France, assignor to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Sept. 5, 1969, Ser. No. 855,724  
Claims priority, application France, Sept. 9, 1968, 165,535

Int. Cl. C07f 9/52  
U.S. Cl. 260—543 P

6 Claims

Diorganochlorophosphines of the formula:



wherein R is a hydrocarbon radical are prepared by heating white phosphorus with a compound of the formula R—Cl in the presence of a compound of the formula



where R' is a hydrocarbon radical and may be the same as or different from R.

3,734,959

### CATALYTIC PROCESS FOR PRODUCING PHTHALOYL CHLORIDES

Charles Frank Hauser, Charleston, W. Va., and John Wendell Lynn, Westfield, N.J., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Apr. 7, 1972, Ser. No. 242,242  
Int. Cl. C07c 63/24, 63/30

U.S. Cl. 260—544 M

6 Claims

The catalytic activity of ferric chloride is maintained or restored by the addition of an oxidant such as chlorine, ammonium persulfate or peracetic acid to the reaction mixture of phthaloyl chloride, carbon tetrachloride and catalyst.

3,734,960

### SYNTHESIS OF ORGANIC SULFONYL CYANIDES

R. Garth Pews and Fred P. Corson, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Aug. 4, 1969, Ser. No. 847,455  
Int. Cl. C07c 161/00

U.S. Cl. 260—545 R

4 Claims

Organic thiocyanates are reacted under essentially anhydrous conditions in the liquid phase with an organic peracid oxidizing agent to produce the corresponding sulfonyl cyanide.

3,734,961

### HERBICIDAL FLUORINATED PHENYL UREAS AND THIOUREAS

John E. Englehart, Westfield, N.J., assignor to Esso Research and Engineering Company

No Drawing. Filed June 25, 1969, Ser. No. 836,666  
Int. Cl. C07c 127/16

U.S. Cl. 260—553 A

2 Claims

Phenyl ureas and phenyl thioureas containing from 2 to 5 fluorine atoms on the phenyl ring are active pesticides, particularly as herbicides, both pre- and post-emergent.

3,734,962

### PROCESS FOR THE PREPARATION OF HYDROXY-ALKYL-PERFLUOROALKANE SULFONAMIDES

Hans Niederprüm, Monheim, Rhineland, and Peter Voss, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 13, 1971, Ser. No. 143,238  
Claims priority, application Germany, May 22, 1970, P 20 24 909.6

Int. Cl. C07c 143/74  
U.S. Cl. 260—556 F

3 Claims

Preparation of N-hydroxyalkyl perfluoroalkane sulfonamides by reacting the corresponding N-unsubstituted sul-

fonamides with a cyclic carbonate or sulfite at a temperature of about 50 to 250° C. in the presence of an inorganic or organic base.

3,734,963

### INORGANIC LITHIUM-AMINE COMPLEXES

Arthur W. Langer, Jr., Watchung, and Thomas A. Whitney, Linden, N.J., assignors to Esso Research and Engineering Company

No Drawing. Filed Mar. 18, 1969, Ser. No. 808,328  
Int. Cl. C07c 87/14, 87/20, 87/38

U.S. Cl. 260—563 R

11 Claims

Complexed inorganic lithium salts are prepared by mixing an inorganic lithium salt such as a lithium halide with a monomeric or polymeric organic complexing agent which contains at least one nitrogen atom and at least one other atom which is nitrogen, oxygen, phosphorus or sulfur. The complexing agent may be nonchelating (e.g. triethylenediamine) or chelating in nature. The chelating complexing agents (e.g. triamines such as pentamethyl diethylenetriamine) are preferred. The resultant complex is useful for a variety of processes such as separations, catalytic reactions, substitution reactions, electrochemical reactions, etc. and as oil and fuel additives.

3,734,964

### SELECTIVE PARTIAL REDUCTION OF NITROPARAFFIN SUBSTRATES

John F. Knifton, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

No Drawing. Filed Mar. 17, 1969, Ser. No. 807,943  
Int. Cl. C07c 13/00

U.S. Cl. 260—566 A

12 Claims

This invention concerns the selective partial reduction of nitroparaffin substrates to the corresponding oxime under mild conditions using critical ratios of copper salt catalysts, nitrogenous base and water.

3,734,965

### N-ALKYLENE-OXY-ALKYLENEAMINES OF HYDROXYBENZYLAMINES

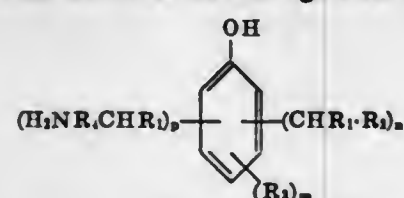
Wilhelm Becker, Hamburg, Germany, assignor to Reichhold-Albert-Chemie Aktiengesellschaft, Hamburg, Germany

No Drawing. Filed Nov. 3, 1969, Ser. No. 873,620  
Claims priority, application Switzerland, Nov. 13, 1968, 17,157/68

Int. Cl. C07c 87/28  
U.S. Cl. 260—570.5 P

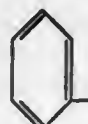
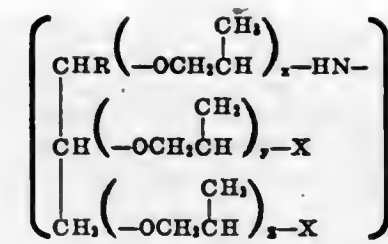
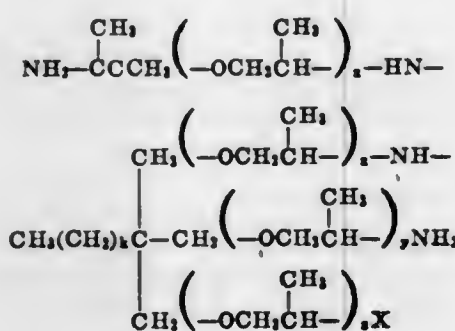
5 Claims

A phenolic resin having a polyoxypropyleneamine substituent wherein the resin has the general formula:

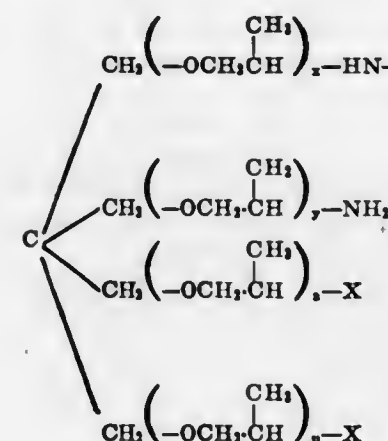
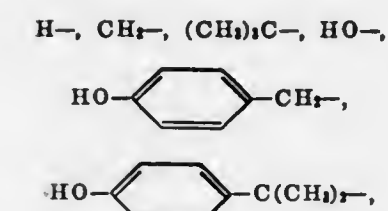


wherein

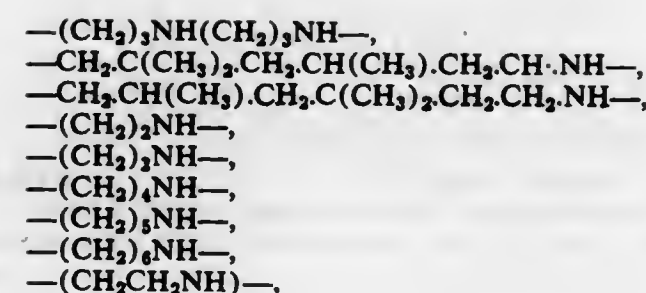
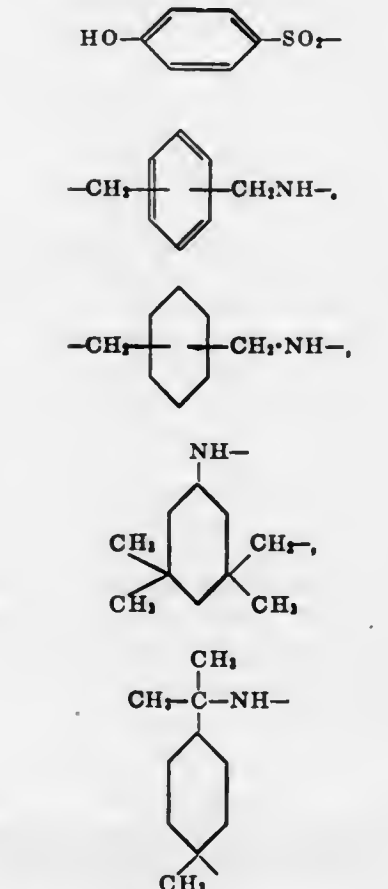
$\text{R}_1 = \text{H}-, \text{CH}_3-, \text{C}_2\text{H}_5-, \text{C}_3\text{H}_7-, \text{C}_4\text{H}_9-$  or

 $\text{R}_2 =$ 

or

 $\text{R}_3 =$ 

or

 $\text{R}_4 =$ 

$\text{R} = \text{H}$  or  $-\text{CH}_3$ ;  
 $\text{X} = -\text{NH}_2$  or  $-\text{OH}$ ;  
 $n$  and  $m =$  integers from 1 to 3;  
 $x, y$  and  $z = 1$  to 50;  
 $k$  and  $u = 0$  to 4; and  
 $p = 0$  or an integer from 1 to 2.

3,734,966

### HYDROFLUORENE DICARBOXYLIC ACID DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Akira Tahara, Asaka, Yasuo Ohtsuka and Tadashi Nakata, Tokyo, and Shoichi Takada, Kawaguchi, Japan, assignors to Rikagaku Kenkyusho, Saitama-ken, Japan  
No Drawing. Filed June 25, 1971, Ser. No. 157,021  
Claims priority, application Japan, June 30, 1970, 45/57,191; Oct. 2, 1970, 45/86,532; Nov. 28, 1970, 45/105,138; Mar. 29, 1971, 46/18,621; Mar. 29, 1971, 46/18,622

Int. Cl. C07c 63/48  
U.S. Cl. 260—515 P

8 Claims

Novel chemical compound of 4β,10α-dimethyl-1,2,3,4,5β,10-hexahydrofluorene-4α,6α-dicarboxylic acid and alkali salts thereof which are useful as a new synthetic sweetening agent and a potential intermediate in the synthesis of gibberellin A<sub>12</sub> or its related substances.

Said compounds can be synthesized via 4β,10α-dimethyl-1,2,3,4,5α,10-hexahydro-6β-hydroxyfluorene-4α,6α-dicarboxylic acid derived from disproportionated rosin containing dehydroabietic acid.

3,734,967

### 1-(4-OXOPENT-1-ENYL)-1,3-DIMETHYLCYCLOHEX-2-ENE, 1-(4'-OXOPENT-1-ENYL)-1,3-DIMETHYLCYCLOHEX-3-ENE AND THEIR METHYL HOMOLOGS

Werner Hoffmann, Heinrich Paschedach, and Horst Pommer, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed May 29, 1969, Ser. No. 829,113  
Claims priority, application Germany, June 1, 1968, P 17 68 596.0

Int. Cl. C07c 49/48  
U.S. Cl. 260—586 R

9 Claims

1-(4-oxopent-1-enyl)-1,3-dimethylcyclohex-2-ene, 1-(4-oxopent-1-enyl)-1,3-dimethylcyclohex-3-ene and their methyl homologs and a process for the production of these compounds in which formic acid is allowed to act on a 6,10-dimethylundeca-3,5,10-trien-2-one.

3,734,968

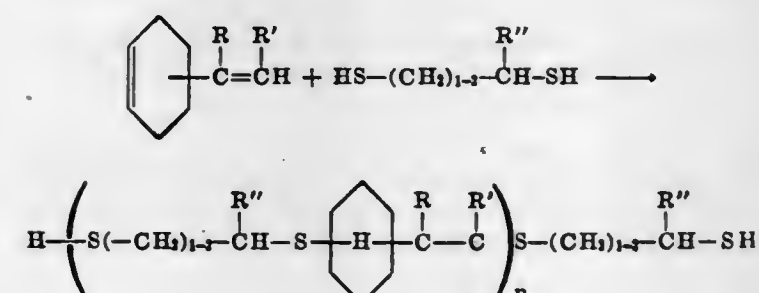
### CYCLOHEXYL THIOL-DIENES

Richard A. Hickner, Midland, and Edward W. Goss, Auburn, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Nov. 16, 1970, Ser. No. 90,022  
Int. Cl. C07c 149/26

U.S. Cl. 260—609 D

2 Claims





wherein  $n$  is 1-5, one of R and R' is hydrogen and the other is hydrogen or methyl, and R'' is hydrogen or methyl; with the average molecular weight of product not above about 700; illustratively, ethanedithiol reacts with 4-vinylcyclohexene to yield a product in which on average  $1 < n < 3$ . The products are liquids of low viscosity adapted to be used as curing agents for various plastics including epoxy resins.

3,734,969

## MANUFACTURE OF THIOPHENOL

Harold M. Pitt, Lafayette, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Continuation-in-part of application Ser. No. 750,314, Aug. 5, 1968. This application June 11, 1969, Ser. No. 834,232

Int. Cl. C07c 149/32

U.S. Cl. 260-609 D

6 Claims

A process for producing thiophenols is described herein. The process involves reacting aromatic sulfonic acid and elemental phosphorus in the presence of the catalyst in the first reaction zone. Thereafter the reaction product is transferred to a second zone wherein water is added thereto to maintain the composition of the aqueous phase at between about 86-96%  $H_2PO_4$ . The thiophenol is then separated from the aqueous phase containing phosphoric acid.

3,734,970

PREPARATION OF METHYL- $\beta$ -PHENYL-ETHYL-ETHER

Yogesh Chand Chaturvedi, Lashkar, India (Government College of Science, Raipur, Madhya Pradesh, India)

No Drawing. Filed Sept. 21, 1970, Ser. No. 74,225

Int. Cl. C07c 41/04

U.S. Cl. 260-611 A

3 Claims

Methyl- $\beta$ -phenyl-ethyl-ether is prepared by treating aluminium- $\beta$ -phenyl-ethoxide with dimethylsulphate at water bath temperature. The unreacted dimethyl sulphate is destroyed by boiling with caustic soda solution and the lighter layer containing methyl- $\beta$ -phenyl-ether is separated by fractionation. The aluminium- $\beta$ -phenyl-ethoxide is prepared by treating  $\beta$ -phenyl-ethyl-alcohol with Al/Hg couple in the presence of carbon tetrachloride.

3,734,971

## DIBENZO [A,E] CYCLOPROPA [C] CYCLOHEPTENE DERIVATIVES

John W. Cusic, Skokie, Ill., and William E. Coyne, St. Paul, Minn., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 733,261, May 31, 1968, Pat. No. 3,658,908. This application Dec. 27, 1971, Ser. No. 212,384

Int. Cl. C07c 35/44

U.S. Cl. 260-618 F

3 Claims

Tetrahydrodibenzo[a,e]cyclopropa[c]cycloheptene 5-ones and 5-alcohols are described herein. They are prepared by starting from 5H-dibenzo[a,e]cyclohepten-5-one and ethyl trichloroacetate and are themselves useful as intermediates in the preparation of other compounds which possess pharmacological activity such as diuretic activity or antidepressant activity.

3,734,972

## MULTIFUNCTIONAL INITIATORS

Floyd E. Naylor and Ralph C. Farrar, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Continuation-in-part of application Ser. No. 800,271, Feb. 18, 1969, now abandoned. This application Nov. 4, 1971, Ser. No. 195,863

Int. Cl. C07f 1/02

U.S. Cl. 260-665 R

8 Claims

Multifunctional initiators are prepared by contacting organomonolithium compounds with selected compounds containing at least two carbon-carbon double bonds in the presence of polar compounds.

3,734,973

## MULTIFUNCTIONAL POLYMERIZATION INITIATORS FROM DIISOPROPENYL BENZENE

Ralph C. Farrar, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Original application Feb. 10, 1969, Ser. No. 798,128. Divided and this application Nov. 4, 1971, Ser. No. 195,832

Int. Cl. C07f 1/02

U.S. Cl. 260-665 R

15 Claims

Hydrocarbon soluble multifunctional polymerization initiators are produced by reacting diisopropenylbenzene compounds with organomonolithium compounds.

3,734,974

## HYDROCARBON SEPARATION PROCESS

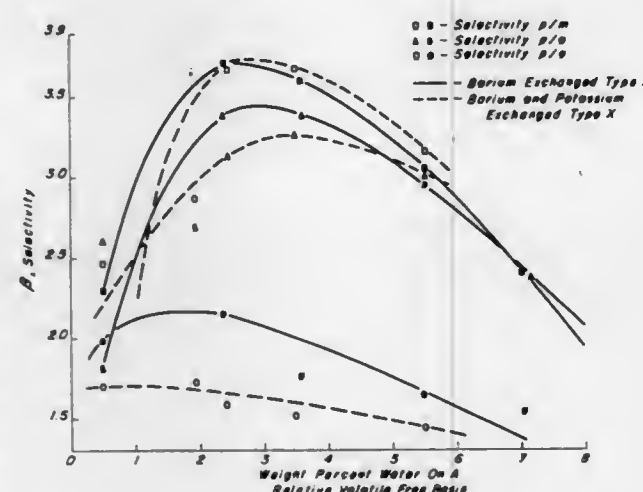
Richard W. Neuzil, Downers Grove, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed July 26, 1971, Ser. No. 165,101

Int. Cl. C07c 7/12; C10g 25/04

U.S. Cl. 260-674 SA

8 Claims



This application broadly discloses a process for the separation of para-aromatics isomer from a feed mixture containing para- and at least one other aromatic isomer. The process utilizes a crystalline aluminosilicate adsorbent containing barium cations base-exchanged upon the zeolite. The zeolite also contains a pre-determined quantity of water upon the adsorbent. The process can be performed in batch fixed-bed processes, moving bed processing sequences or fixed-bed simulated moving bed countercurrent flow process. Separation takes place in either liquid or vapor operations using isothermal, isobaric or both operating conditions.

The specific disclosure of this application relates to the use of a particular adsorbent to separate para-xylene from xylene mixtures which adsorbent is of a type X or type Y crystalline structured aluminosilicate containing barium cations and water within the zeolite.

3,734,975

## CATALYTIC DIMERIZATION OF OLEFINS WITH A BIS(ISOQUINOLINE)DIHALOCOBALT (II) COMPLEX

Howard E. Dunn, Evansville, Ind., assignor to Phillips Petroleum Company

No Drawing. Original application June 18, 1970, Ser. No. 47,633, now Patent No. 3,686,353. Divided and this application May 25, 1972, Ser. No. 257,054

Int. Cl. C07c 3/10

U.S. Cl. 260-683.15 D

4 Claims

A catalytic process for the dimerization of olefins utilizing a cobalt(II) complex activated by the presence of an alkylaluminum halide.

3,734,976

## HALOGENATED TRIAZINE ELASTOMERS

Edwin Dorfman and William E. Emerson, Grand Island, Claude T. Bem, Jr., Niagara Falls, and Russell L. K. Carr, Grand Island, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

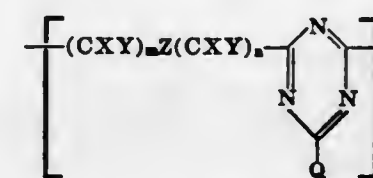
No Drawing. Filed Mar. 11, 1966, Ser. No. 533,430

Int. Cl. C08g 33/06, 33/04

U.S. Cl. 260-823

42 Claims

This invention relates to linear or essentially linear triazine elastomers containing at least one triazine ring of the following general formula:



where  $x$  is one to one million, the Q halogenated organic radicals are the same or different pendant groups comprising halo lower alkyl, substituted halo lower alkyl where the substituents are chosen from alkoxy, carbonyl, carbamoyl, carboxy-, haloformyl-, nitro-, nitroso-, dialkoxy phosphonate-, perhalo lower alkoxy-, aryl-, halogenated aryl-, cyano-, perhalo lower alkene, and perhalo lower alkyne, perfluoro lower alkyl polyoxyalkylene where each alkylene unit has from 2 to 10 carbon atoms and the units are from one to 35 in number, and the  $-(\text{CXY})_m \text{Z(CXY)}_n-$  radical is a difunctional polyhalo organic radical in which the X's in any (CXY) group are halogens selected from the group consisting of chloro- and fluoro-, the Y's in any (CXY) group are selected from halogen and perhalo lower alkyl,  $m$  and  $n$  are positive integers greater than zero and the sum of  $m$  plus  $n$  plus the number of equivalent units in Z is at least four and Z is selected from perhalo lower alkylene, perhalo lower alkylidene, omega-hydroperhalo lower alkylidene, keto, oxy, thio, sulfoxide, sulfone,



wherein R is perhalo lower alkyl or omega-hydroperfluoro lower alkyl, poly-perfluoroalkylene where each alkylene unit has from two to ten carbon atoms and the units are from 2 to 35 in number, poly(perfluoroalkylenedioxy) where each alkylene unit has from 2 to 10 carbon atoms and the units are from 2 to 35 in number, perfluoroalkylenedioxy, perhalo lower alkyl-amino, perhalo-cyclopentylene, perhalocyclohexylene, perhalopyridinediyl, perhalopyrazolidinediyl, perhalopyranylene, perhalopiperidylene, perhalophenylene, perhalonaphthalenediyl, perhalodecalinylenylene, oxadiazolylenylene, triazolylenylene and aryl perhalo lower alkylene wherein substituents on the said aryl group are selected from hydrogen, lower alkenyl, chloro, fluoro, lower alkoxy, nitro, nitroso, cyano, and alkoxy carbonyl, and mixtures thereof. The triazine polymers are useful as sealants, resins, electrical insulations, damping materials, viscosity modifiers of fluids for use at high temperature, greases, lubricants, hydraulic fluids, and the like.

3,734,977

## WATER-SOLUBLE CATIONIC THERMOSETTING ACRYLAMIDE-GRAFTED GLYOXALATED ALKYLAMINE-EPICHLOROHYDRIN WET STRENGTH RESIN AND PAPER CONTAINING THE SAME

Anthony Thomas Coscia, Norwalk, and Laurence Lyman Williams, Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of applications Ser. No. 471,463, July 12, 1965, now abandoned, and Ser. No. 745,486, July 17, 1968, now Patent No. 3,556,932. This application Jan. 18, 1971, Ser. No. 107,458

Int. Cl. C08g 33/06

U.S. Cl. 260-874

5 Claims

Water-soluble lower alkylamine-epichlorohydrin polymers which have been grafted with at least  $\frac{1}{3}$  mol of acrylamide per polymer linkage and then glyoxalated are cationic thermosetting wet strength resins. Paper having a thermoset content thereof loses about half of its wet strength in 24 hours on normal wet weathering.

3,734,978

## BLOCKING POLYSTYRENE PRODUCED BY ANIONIC SLURRY POLYMERIZATION

Frederick C. Schwab, Metuchen, N.J., assignor to Mobil Oil Corporation

No Drawing. Filed May 12, 1971, Ser. No. 142,774

Int. Cl. C08f 19/00

U.S. Cl. 260-878 B

8 Claims

There is provided a blocking process for polystyrene in which a styrene monomer is initially polymerized slurried in a paraffinic or monoolefin slurring medium, using an anionic initiator and a styrene-alkylstyrene block polymer dispersant, a divinyl-benzene modifying agent is added anionically to modify the polystyrene, and the modified polystyrene is blocking with a monomer polymerizable with a free radical initiator, a Ziegler-Natta coordination catalyst, or a cationic initiator.

3,734,979

## SHAPED AND MOLDED ARTICLES OF POLYMER BLENDS COMPRISING POLYOLEFINS AND LACTONE POLYMER

Joseph Victor Koleske and Earl Richard Walter, Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 812,427, Apr. 1, 1969. This application Dec. 30, 1970, Ser. No. 102,921

Int. Cl. C08f 29/12

U.S. Cl. 260-897 R

18 Claims

Molded and shaped articles comprising solid olefin polymers, particularly crystalline alkenes, and solid cyclic ester polymers such as fibers, films, wire and cable coatings, and the like which exhibit or possess improved dyeability, stress crack resistance, low haze, and high gloss, and/or high light transmission.

3,734,980

## PHOSPHORUS CONTAINING AMIDINES

Ferenc M. Pallos, Pleasant Hill, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

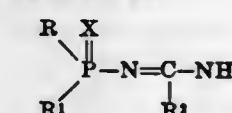
No Drawing. Filed Dec. 15, 1969, Ser. No. 885,263

Int. Cl. A01n 9/36; C07f 9/24

U.S. Cl. 260-944

12 Claims

Compounds of the formula:





in which R is lower alkyl or lower alkoxy; R<sup>1</sup> is lower alkoxy or lower alkylthio; R<sup>2</sup> is hydrogen, lower alkyl, phenyl; mono or di-substituted phenyl; and X is oxygen when R<sup>1</sup> is lower alkylthio and sulfur when R<sup>1</sup> is lower alkoxy as insecticides and acaricides, and a process for preparing the compounds above having X be oxygen.

3,734,981

# BIS-METHYLENE-AMIDES OF PHOSPHOR OR PHOSPHONIC ACIDS AND THEIR THIO- DERIVATIVES

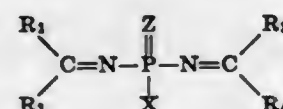
Klaus Hunger, Kelkheim, Taunus, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany  
No Drawing. Original application Feb. 4, 1969, Ser. No. 796,581. Divided and this application Mar. 18, 1971, Ser. No. 125,886

Int. Cl. C07f 9/24; C10m 1/48

U.S. Cl. 260-959

4 Claims

Compounds having utility as lubricant additives having antioxidant and thermal-stabilizing properties, of the formula



wherein R<sub>1</sub>-R<sub>4</sub>, taken alone are the same or different and are alkyl, cyclohexyl, phenyl, halo phenyl or alkylphenyl; or R<sub>1</sub> and R<sub>2</sub> taken together, or R<sub>3</sub> and R<sub>4</sub> taken together are alkylene; X is alkyl, cyclohexyl, phenyl or alkyl phenyl bound directly to carbon or by way of an oxygen or sulfur atom; and Z is oxygen or sulfur.

3,734,982

# PROCESS FOR CASE BONDING CAST COMPOSITE PROPELLANT GRAINS

Henry T. Sampson, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1962, Ser. No. 170,849

Int. Cl. C06b 21/02

U.S. Cl. 264-3 R

1 Claim

1. The method of bonding composite propellant grains to rocket motor tubes which comprises
  - a. coating the inside of the tube with a formulation consisting essentially of
    - 60 percent by weight castor oil and
    - 31 percent by weight 2,4-toluene diisocyanate to form a first liner,
  - b. applying to said first liner before curing a second liner consisting of a silicon tape composed of glass cloth impregnated with a composition consisting essentially of
    1. a benzene soluble resin polymer composed essentially of structural units of SiO<sub>2</sub> and R<sub>2</sub>SiO<sub>1/2</sub> where R is a monovalent hydrocarbon selected from the group consisting of alkyl radicals of less than four carbon atoms and phenyl and at least 90 percent of the total number of R radicals are alkyl and in said copolymer the ratio of R<sub>2</sub>SiO<sub>1/2</sub> units is between 0.6 to 0.9 inclusive, and
    2. a benzene soluble organosiloxane of at least 1 million centistokes viscosity at 25° C., said organosiloxane having the general formula R'<sub>2</sub>SiO where R' is a monovalent hydrocarbon radical selected from the group consisting of methyl and phenyl and at least 90 percent of the total number of R' radicals are methyl.
  - c. casting a composite propellant composition into said tube, and
  - d. curing up to 4 hours at temperatures ranging up to 200° F.; whereby the first and second liners and the propellant grain together are firmly bonded to the inside of the motor tube.

# 3,734,983 CONTINUOUS MELT-POUR PROCESS FOR HIGH EXPLOSIVES

Irving Forsten, West Orange, Louis Jablonsky, Fair Lawn, Colin B. Piper, Sparta, and John J. Canavan, Mine Hill, N.J., assignors to the United States of America as represented by the Secretary of the Army

Filed Aug. 23, 1971, Ser. No. 174,078

Int. Cl. C06b 21/02

U.S. Cl. 264-3 C

5 Claims

Method and apparatus are provided for a novel continuous, automated melt-pour process for high explosives, such as TNT, wherein flaked high explosive is continuously introduced into a vessel containing an agitated pool of the molten explosive and providing a high ratio of heating surface to volume of explosive and the molten explosive is continuously pumped to a remote shell loading station through a heated pipe system provided with detonation traps which prevent propagation of an explosion.

3,734,984

# PROCESS OF EXTRUDING MELTED POLYMERIC THERMOPLASTIC MATERIALS

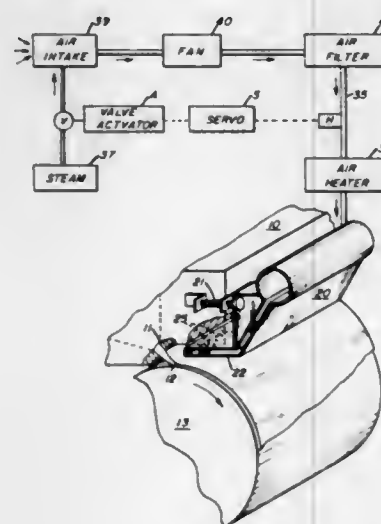
Edward P. Hoffman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 4, 1971, Ser. No. 140,087

Int. Cl. B29d 7/02

U.S. Cl. 264-40

11 Claims



A molten polymeric plastic such as a sheet of poly(ethylene terephthalate) is extruded under pressure through an orifice while impinging a blast of clean hot air or other gas against the extruded product at the instant it leaves the orifice. Water vapor is introduced into the gas, as by steam injection or water sprays, so as to maintain its humidity at a level corresponding to a dew point of at least 35°F., and preferably 50°-80°F. When casting a sheet of film onto a wheel, die lines are avoided by this process. The apparatus comprises a humidistat for monitoring the humidity of the air fed to the blast, a valve for controlling the injection of steam into the air, and a control system between the humidistat and valve for automatically maintaining the desired humidity.

3,734,985

# GLASS FIBER REINFORCED THERMOPLASTIC CELLULAR PLASTICS

Walter H. Greenberg, 220 Miller Road, Syosset, N.Y.

Filed Apr. 13, 1970, Ser. No. 28,087

Int. Cl. B29d 27/00

U.S. Cl. 264-45

1 Claim

Glass fibers are coated with uncured thermosetting resin selected from the group consisting of glycerol triacrylate, urea-formaldehyde and phenol-formaldehyde of the type

designated as B stage. About 5 percent by weight of the coated fibers, while cool, are introduced into a mixture of gas and molten thermoplastic material selected from the group consisting of polypropylene nylon and polystyene shortly (i.e. less than a minute) prior to entry into the mold of low pressure injection molding apparatus. The heat of the molten thermoplastic material brings about a curing of the thermosetting coating on the glass fibers, but such curing is so slow that it becomes effective at about the same time as the thermoplastic material cools and solidifies in the mold. The product, a thermoplastic structural foam having short fibers of thermoset-coated glass fibers distributed throughout, has greater stiffness and greater tensile strength than conventional structural foam.

3,734,986

# METHOD FOR PRODUCING POLYAMIDE FIBER HAVING IMPROVED SILKY FEEL AND LUSTRE

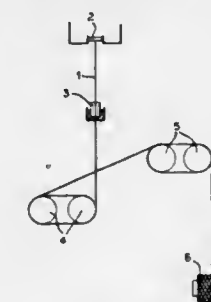
Tetsuya Kato, Nagoya, Toshiaki Hidaka, Nishikasugun, and Chikatsu Okagawa, Nagoya, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed July 31, 1970, Ser. No. 60,029

Int. Cl. B29d 27/00; D01d 5/08, 5/12

U.S. Cl. 264-49

10 Claims



Polyamide fiber having improved silky lustre and silky touch is produced by melt-spinning modified polyamide pellets obtained by dispersing fine particles of polyalkylene ether into polyamide, continuously drawing the melt spun filaments until the birefringence of said filament reaches a specific pre-selected point, treating the drawn yarn with a solvent for polyalkylene ether and recovering the same.

3,734,987

# GEL CAPSULES FOR SMALL UNITS AND METHODS OF ENCAPSULATING SUCH UNITS

Bjorn Staffan Artur Hamrin, Bjarred, Sweden, assignor to Aktiebolaget Forenade Superfosfatfabriker, Landskrona, Sweden

Filed Jan. 22, 1971, Ser. No. 108,808

Claims priority, application Sweden, Jan. 29, 1970, 1,096/70

Int. Cl. A01c 1/06; A01n 21/02

U.S. Cl. 264-54

11 Claims



A method of encapsulating small units such as pharmaceutical preparations, seed and the like by a chemical process for obtaining a hollow capsule in which the unit is contained, said capsule preferably being formed of gelatinous matter and inflated by means of a gas generated by a chemical composition covering said unit.

3,734,988

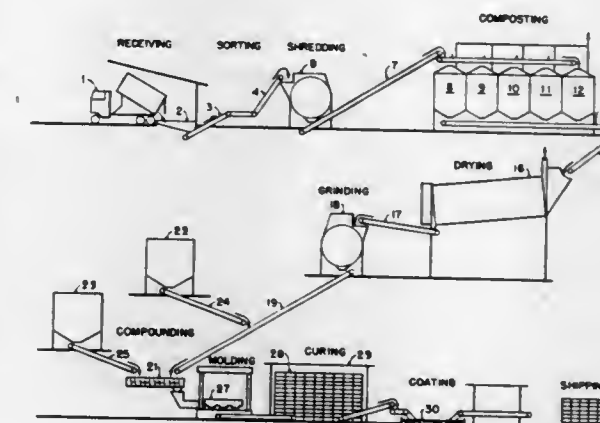
# USE OF COMPOSTED REFUSE TO MAKE CONSTRUCTION PRODUCTS

Avedis A. Aintablian, Santa Clara, Calif., assignor to International Systems Management Corporation, Santa Clara, Calif.  
Continuation-in-part of Ser. No. 119,564, March 1, 1971, abandoned. This application Nov. 8, 1971, Ser. No. 196,767

Int. Cl. C04b 31/40, 15/02; C05f 9/00

U.S. Cl. 264-82

13 Claims



A process for converting municipal refuse into useable products such as building blocks, wall board, and building bricks which consists of the steps of reducing the size of the refuse to a chip size by shredding; decomposing the refuse in the presence of nitrogen, water and air; drying the chemically processed material in a gas fired dryer to render it biologically inert; grinding the dried material to a fine powder; mixing the powder with fillers and binders such as hydraulic setting cements and glues; adding water and other chemicals as required; forming the blocks or other building materials by pressing; and curing the product until a specified strength has been achieved.

3,734,989

# FIBER BUNDLE ASSEMBLY

Richard L. Leonard, Cary, and Donald F. Carey, Durham, N.C., assignors to the United States of America as represented by the Secretary of the Interior

No Drawing. Filed Aug. 13, 1971, Ser. No. 171,728

Int. Cl. B29d 3/00

U.S. Cl. 264-135

12 Claims

An improved method for forming primary high pressure seals for water equilibrated, hollow fiber membranes, wherein a solution of gelatin is used to surround the active membrane area prior to casting the high pressure seal thereon, comprises applying a secondary, elastomeric seal to the fiber membranes prior to the application of the gelatin, which secondary seal serves as an inter-fiber barrier to the passage of gelatin thus preventing the gelatin from passing to the area of the primary high pressure seal and interfering with the sealing properties thereof.

3,734,990

# PROCESS FOR THE MANUFACTURE OF CORRUGATED GLASS FIBER REINFORCED POLY-VINYL CHLORIDE SHEETS

William K. Glesner, Midland, Mich., and Clifford E. Thompson, Horgen, Switzerland, assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of abandoned application Ser. No. 590,502, Oct. 3, 1966. This application Apr. 15, 1970, Ser. No. 28,921

Int. Cl. B29g 5/00

U.S. Cl. 264-137

2 Claims

The present invention is directed to an improved process for the manufacture of corrugated sheet materials from glass fiber reinforced mats impregnated with certain



polymerizable fluid compositions where the impregnated mat is shaped prior to initiation of gelling of the polymerizable fluid composition thereby providing unexpectedly enhanced uniformity and transparency in the finally cured corrugated structures.

3,734,991

**METHOD FOR CUTTING PLASTIC MATERIAL**

Berend Vrijma, Vuren, Netherlands, assignor to Calsilox S.A., Luxemburg, Belgium

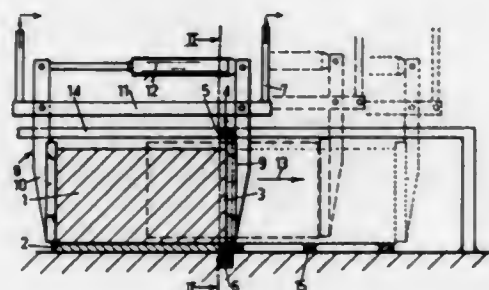
Filed June 22, 1970, Ser. No. 48,267

Claims priority, application Netherlands, June 26, 1969, 6909800

Int. Cl. B28b 11/14

U.S. Cl. 264—157

3 Claims



The invention relates to a method of cutting a block of material in a plastic state, more particularly light weight concrete, the block being cut by a number of cutting wires each tensioned between a clamping member retained above the block and a clamping member retained therebelow.

A method is provided in which the block can be cut along any selected planes parallel with a cutting direction, and in which the required conveying means can be very simple.

To this end the block is cut while being carried by carrying means engaging opposite sides of the block.

3,734,992

**METHOD FOR INSULATING WIRE TERMINATIONS**

Carlo Masino and Paolo Gilardino, Turin, Italy, assignors to AMP Incorporated, Harrisburg, Pa.

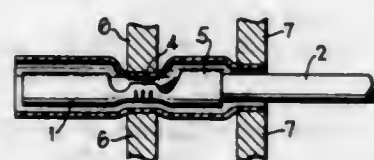
Original application Jan. 29, 1969, Ser. No. 794,882, now abandoned. Divided and this application Apr. 8, 1970, Ser. No. 29,343

Claims priority, application Italy, Jan. 31, 1968, 12,254/68

Int. Cl. H01b 19/00; H02g 15/00

U.S. Cl. 264—159

2 Claims



A cold crimp sleeve applicator is fed with a continuous length of sleeve material directed against a stop at a

cutting station from which the cut length is transferred laterally to a crimping station, the crimping dies and the shear blade being operated simultaneously. A further transfer device is provided for moving the transferred cut length of sleeve into the crimping dies from a first transfer path and this device has a stop designed to locate the leading end of a terminal in predetermined position within the cold crimp sleeve.

3,734,993

**METHOD FOR EXTRUDING T-SHAPED FILAMENTS**

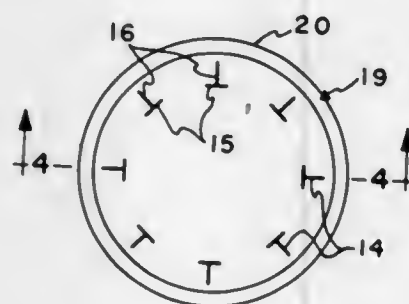
Paul Paliyenko, 6350 Gaywind Drive, Charlotte, N.C. 28211, and Werner E. Beler, Sardis View Lane, Matthews, N.C. 28105

Original application June 20, 1968, Ser. No. 745,652, now Patent No. 3,640,670. Divided and this application July 29, 1971, Ser. No. 167,524

Int. Cl. B28h 21/54; B29f 3/00

U.S. Cl. 264—177 F

9 Claims



Method for extruding filament-forming material through a spinnerette having a plurality of T-shaped orifices wherein the orifices are arranged annularly with respect to the center of the spinnerette. Each of the T-shaped orifices comprises a crossbar and a stem extending perpendicularly from the crossbar at its midpoint with the stem facing away from the center of the spinnerette. Further embodiments of the spinnerette include a split T-configuration.

3,734,994

**TWO-STAGE UNIAXIAL ORIENTATION OF POLY-ETHYLENE TEREPHTHALATE FILMS**

Dennis Leonard Blecha, Circleville, Ohio, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 9, 1971, Ser. No. 113,850

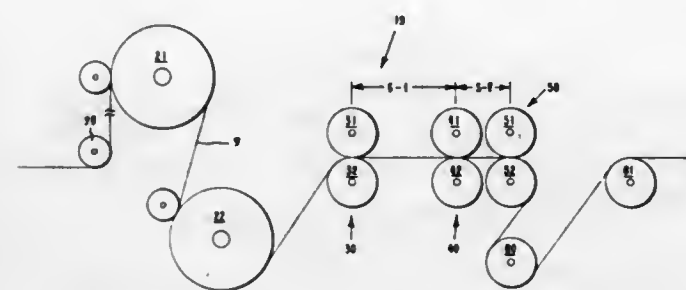
Int. Cl. B29d 7/24

U.S. Cl. 264—288

4 Claims

A method of orienting a web of thermoplastic polymeric film (i.e., polyethylene terephthalate film) by stretching it in two stages in making film having high birefringence. A web of substantially amorphous film is heated to a first stretching temperature by first heating means and stretched in a first stretching span between first and second sets of nip rolls of a first stretching means. The first stretching temperature to which the web is heated is from 72° to 86° C. whereby, upon first stretching, cold stretching does not occur. Then, this stretched film is heated, from 91° to 102° C., by second heating means to a second stretching temperature and stretched again in a second stretching span, whose length is less than the

length of the first stretching span, between second and third sets of nip rolls of a second stretching means where-



by to a make a film having improved birefringence properties.

3,734,995

**METHOD OF FORMING AN INSULATED FEED-THROUGH SEAL**

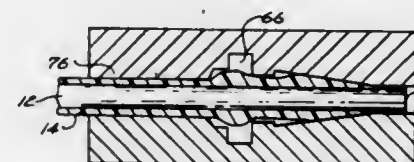
Chas E. Thomas, Cement City, Mich., assignor to Sparton Corporation, Jackson, Mich.

Filed Nov. 18, 1971, Ser. No. 200,103

Int. Cl. B29c 17/00; H01b 17/30

U.S. Cl. 264—322

3 Claims



A sheathed electrical conductor adapted to extend through a plate or panel in a sealed condition, and electrically insulated therefrom, wherein the sheath of dielectric insulation defined on the conductor homogeneously forms sealing and orientation structure. The conductor includes a metallic core surrounded by a thermoplastic dielectric sheath wherein the sheath is heated and molded to homogeneously define the sealing structure. An O-ring is employed in conjunction with the molded structure for sealing cooperation with the panel. The invention contemplates a method of manufacturing an electrical conductor in accord with the invention whereby the sealing structure homogeneously formed of the conductor sheath material may be created by heating a portion of the conductor and inserting the same into a die to form the desired configuration by extrusion and molding.

3,734,996

**PREPARATION OF TITANIUM DIOXIDE CONCENTRATES AND IRON OXIDE PIGMENTS FROM ILMENITE**

Heribert Bade, August Bellefontaine, and Gerhard Kienast, Krefeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 19, 1970, Ser. No. 90,918

Claims priority, application Germany, Dec. 2, 1969, P 19 60 379.3

Int. Cl. C01g 49/06

U.S. Cl. 423—83

8 Claims

Ilmenite, preferably after pre-oxidation, is reduced to convert iron oxide contained therein to iron, the ilmenite

is treated with nitrobenzene at about 20 to 100° C. and a pH of 3 to 7 to oxidize the iron to iron oxide pigment which can be separated in relatively pure form from the titanium dioxide concentrate. The concentrate is then preferably leached with acid to remove residual iron impurities and leave a relatively pure titanium dioxide suited for chlorination.

Modifying agents present during the nitrobenzene oxidation will affect the color of the iron oxide pigment.

To facilitate clean separation of the iron oxide pigment from the titanium dioxide concentrate the reduced ilmenite should not contain an appreciable amount of particles with grain sizes of less than about 40 microns.

3,734,997

**HIGH PURITY HOT PRESSED BORON NITRIDE**

Victor Mandorf, Jr., Olmsted Falls, and Lionel C. Montgomery, North Olmsted, Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Original application May 6, 1969, Ser. No. 822,214.

Divided and this application Oct. 4, 1971, Ser. No. 186,083

Int. Cl. C01b 21/06

U.S. Cl. 423—290

12 Claims

High purity boron nitride articles of manufacture having a high density and improved properties. The improved boron nitride articles have a unique acicular crystal structure, an oxygen content of less than 0.5 percent by weight, a density of at least 1.9 grams/cc., excellent hot strength, low and substantially isotropic coefficients of thermal expansion with no irreversible thermal expansion, excellent thermal shock resistance, moisture insensitivity and improved dielectric properties. These articles are produced by treating conventional hot pressed boron nitride articles with a suitable solvent to lower their boron oxide (B<sub>2</sub>O<sub>3</sub>) content, and then sintering the treated material in an inert atmosphere at a temperature of from 1600° C. to 2100° C. in the absence of pressure or mechanical restraint.

3,734,998

**PROCESS FOR THE PRODUCTION OF HYDRAZOIC ACID**

Lloyd W. Piester, New Martinsville, W. Va., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 24, 1970, Ser. No. 92,341

Int. Cl. C01b 21/08

U.S. Cl. 423—406

25 Claims

The production of hydrazoic acid by acidifying an alkali metal azide or alkaline earth metal azide is described. Residual hydrazoic acid dissolved in the reaction mixture is stripped and recovered, thereby improving the yield of the process and reducing the azide contamination of the by-product liquid.

3,734,999

**CONTROL OF CARBON BLACK QUALITY**

Robert E. Dollinger, Toledo, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of abandoned application Ser. No. 838,265, July 1, 1969. This application Oct. 21, 1971, Ser. No. 191,504

Int. Cl. C09c 1/50

U.S. Cl. 423—450

7 Claims

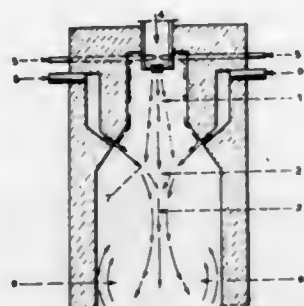
Carbon black quality is controlled in a carbon black process wherein the smoke is prequenched to reduce the extent of the reaction prior to the final quench which terminates the reaction by measuring the concentration of methane and/or acetylene of the finally quenched smoke and adjusting the prequench according to said measurement to maintain the concentration of methane and/or acetylene in the finally-quenched smoke at a predetermined level.



**3,735,000**  
**PROCESS FOR PREPARING TITANIUM DIOXIDE**  
 Benedetto Calcagno and Luigi Piccolo, Milan, Italy, assignors to Società Italiana Resine S.p.A., Milan, Italy  
 Filed July 14, 1970, Ser. No. 54,715  
 Claims priority, application Italy, July 31, 1969, 20,367/69

Int. Cl. C01g 23/04  
 U.S. Cl. 423—613

6 Claims



Titanium tetrachloride is oxidized to titanium dioxide in a burner-heated chamber of particular design preventing formation of deposits on the walls and in the feed passages for titanium tetrachloride.

**3,735,001**  
**TECHNETIUM BONE SCANNING MEDIUM**  
 James McRae, El Cerrito, Donald C. Van Dyke, Berkeley, and Yukio Yano, Richmond, Calif., assignors to the United States of America as represented by the United States Atomic Energy Commission  
 No Drawing. Filed May 24, 1972, Ser. No. 256,233  
 Int. Cl. A61k 27/04

U.S. Cl. 424—1 9 Claims  
 An aqueous solution of ethane-1-hydroxy-1,1-diphosphonate (EHDP) is added to an acidic solution of stannous chloride and mixed. <sup>99m</sup>TcO<sub>4</sub> in isotonic saline solution is then added and the mixture is again mixed. The solution is adjusted to a pH of about 6-7 yielding a preparation appropriate for injection into a subject. The medium is highly specific with respect to deposition in the skeleton while troublesome and undesired effects such as colloid formation, binding to blood proteins, localization in the kidneys, etc., are avoided.

**3,735,002**  
**BONE DECALCIFICATION COMPOSITION**  
 Mary F. Poston, 14527 Littleford, Houston, Tex.  
 Filed Oct. 27, 1971, Ser. No. 193,164  
 Int. Cl. G01n 1/00

U.S. Cl. 424—3 6 Claims  
 A bone decalcification composition wherein an aqueous solution of about 2 grams of sodium oxalate or potassium oxalate is dissolved in about 100 cubic centimeters of formic acid, having a concentration of about 22 percent, which composition is capable of penetrating bone tissue and extracting calcium therefrom to render the bone soft enough to cut with a knife or the like into microscopic sections within a period of about 24 hours or less and without destroying cancer cells or elastic tissues with the bone.

**3,735,003**  
**AEROSOL HAIR-SETTING COMPOSITION COMPRISING AN INTERPOLYMER OF AN N-3-OXO-ALKYLAMIDE AND  $\alpha,\beta$ -UNSATURATED ALIPHATIC ACID**  
 Gerhard Zimmer, 20 Siemensstrasse, Kelkheim, Taunus, Germany, and Hermann Stein, 152 Mullheimerstrasse, Basel, Switzerland  
 No Drawing. Filed Dec. 15, 1969, Ser. No. 885,352  
 Int. Cl. A61k

U.S. Cl. 424—47 4 Claims  
 A hair-setting composition suitable for application to the hair preferably in the form of an aerosol spray is dis-

closed. The composition comprises a copolymer of an N-3-oxohydrocarbon-substituted amide of an  $\alpha,\beta$ -unsaturated aliphatic carboxylic acid;  $\alpha,\beta$ -unsaturated aliphatic mono-and/or dicarboxylic acids; and optionally a mono-ester of an  $\alpha$ -unsaturated aliphatic mono-or dicarboxylic acid.

**3,735,004**  
**HEPATITIS VACCINE**  
 Saul Krugman, New York, N.Y., Joan P. Gilles, Westfield, N.J., and Jack Hammond, New York, N.Y., assignors to the United States of America as represented by the Secretary of the Army  
 Filed Nov. 1, 1971, Ser. No. 194,439  
 Int. Cl. C12k 5/00

U.S. Cl. 424—89 15 Claims  
 Production of a vaccine against viral hepatitis, Type B and administration thereof to humans. The vaccine is prepared by boiling viral hepatitis, Type B serum.

**3,735,005**  
**METHOD FOR PREPARING A VIABLE PLATELET CONCENTRATE**  
 Hideo Shio, Palo Alto, and Peter W. Ramwell, Portola Valley, Calif., assignors to Alza Corporation, Palo Alto, Calif.  
 No Drawing. Filed Aug. 19, 1970, Ser. No. 65,317  
 Int. Cl. A61k 17/00; C12k 9/00

U.S. Cl. 424—101 7 Claims  
 A method for the preparation of a viable platelet concentrate while simultaneously preserving the platelet's function and integrity by adding to plasma-containing platelets, a platelet-preserving prostaglandin and separating the platelets from the plasma to give a viable platelet concentrate. The preserving prostaglandin is used alone or in intimate combination with other platelet preserving agents.

**3,735,006**  
**NOVEL ANTIBIOTICS PRODUCED FROM THE STRAINS OF STREPTOMYCES PHAEVERTICILLATUS AND THEIR METHOD OF PREPARATION**  
 Kazuo Asano, Ibaraki-shi, Minoru Furukawa, Kyoto-shi, and Nobuo Kanda, Osaka-shi, Japan, assignors to Daiichi Seliyaku Company, Limited, Tokyo, Japan  
 Filed July 25, 1969, Ser. No. 844,862  
 Claims priority, application Japan, Nov. 20, 1968, 43/84,502

Int. Cl. A61k 21/00; C12b 1/00; C12k 1/00  
 U.S. Cl. 424—122 21 Claims  
 Two antibiotic substances are produced by cultivation of strains of *Streptomyces phaeovorticillatus*, preferably newly separated strains of *Streptomyces phaeovorticillatus* var. *takatsukiensis* (ATCC 21395, 21396 and 21397) in a nutrient medium containing anthraquinone sulfonic acid or metal salts thereof. Each of the above antibiotics afforded the same acetylated derivative.

These three substances, 289-FO, 289-F and Acetyl 289-F, have an inhibitory activity against the growth of certain microorganisms, including bacteria.

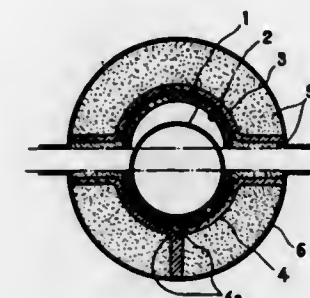
**3,735,007**  
**CLEAR LIQUID LAXATIVE-ANTACID COMPOSITION**  
 Herbert Lapidus, Edison, N.J., and Leonard Mackles, New York, N.Y., assignors to Bristol-Myers Company, New York, N.Y.  
 No Drawing. Filed Sept. 21, 1970, Ser. No. 74,243  
 Int. Cl. A61k 27/00

U.S. Cl. 424—158 10 Claims  
 A clear liquid laxative-antacid composition containing magnesium hydroxide, an amino acid and an oxy or oxo acid in an aqueous medium.

## ELECTRICAL

**3,735,008**  
**ELECTRIC FURNACE**  
 Motoi Ieda; Yoichi Mizushima, both of Kawasaki, and Masaru Shimazaki, Tokyo, all of Japan, assignors to Kokusai Denki Kabushiki Kaisha, Tokyo-to, Japan  
 Filed Mar. 19, 1971, Ser. No. 125,986  
 Claims priority, application Japan, Mar. 20, 1970, 45/27330

Int. Cl. H05b 3/66  
 U.S. Cl. 13—25

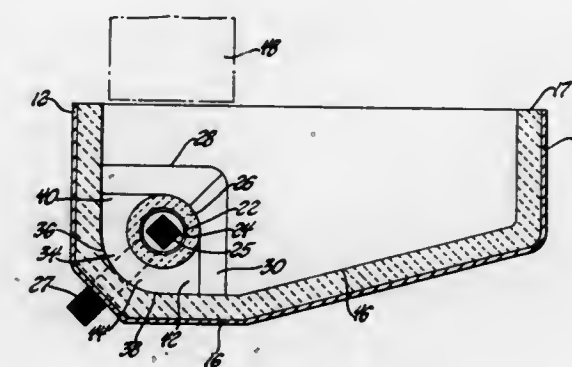


An electrically energizable heating coil having a plurality of convolutions about its longitudinal axis. The coil is kept from deforming by a tubular insulator split longitudinally in a plane corresponding with the longitudinal axis of the coil so that it comprises two half-cylinders. Avoiding deformation allows uniform heat distribution by the coil. The tubular insulator is made of a thermosetting material and has a supporting radial rib axially thereof on one of half-cylinders along the full axial length of the coil. The rib is disposed in a plane normal to the first-mentioned plane so that in a horizontal position of the coil the rib is a principal support for the coil.

**3,735,009**  
**ELECTRIC INDUCTION HEATING FURNACE AND METHOD FOR PREHEAT THEREOF**  
 John M. Larkin, 9411 South Turner St., Evergreen Park, Ill.  
 Filed Dec. 27, 1971, Ser. No. 212,082  
 Int. Cl. H05f 5/14

U.S. Cl. 13—29

12 Claims



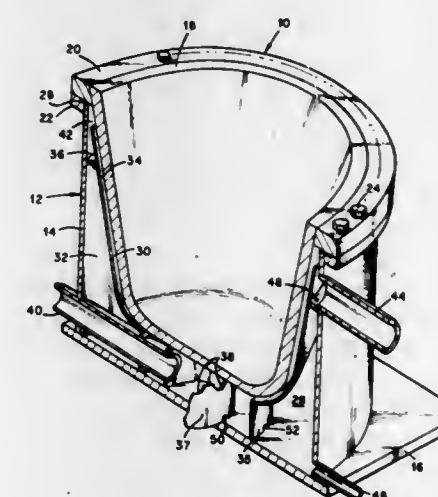
In accordance with the invention there is provided a channel type electric induction furnace for heating molten metal comprising a refractory lined receptacle having an open-ended hearth portion of large cross sectional area for holding a mass of the molten metal and an induction heating portion comprising a channel which is of small cross sectional area and which is formed by a refractory covered electrical induction coil positioned adjacent a side wall and a bottom wall of the receptacle, the end of the channel adjacent the side wall

being oriented in a direction of less than about 45° from vertical and aligned with the open end of the hearth portion, and the end of the channel adjacent the bottom wall being oriented in a direction of less than about 60° from horizontal, the two ends of the channel communicating with the hearth portion in divergent directions.

**3,735,010**  
**SKULL-MELTING CRUCIBLE**  
 John N. Turpin, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.  
 Filed Aug. 23, 1972, Ser. No. 283,018  
 Int. Cl. F27d 1/12

U.S. Cl. 13—35

6 Claims

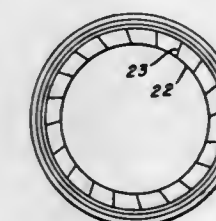


This invention is directed to an improved crucible for skull melting metals and alloys by employing consumable electrode arcmelting procedures. The crucible is formed of a housing containing a removable, relatively thin, cup-shaped liner and a substantially conforming enclosed chambered volume through which liquid metal is channeled and circulated for uniformly cooling the liner.

**3,735,011**  
**CIRCULAR REFRACTORY BRICK CONSTRUCTION**  
 Ferhun H. Soykan, New Hartford, N.Y., assignor to Special Metals Corporation, New Hartford, N.Y.  
 Filed Jan. 17, 1972, Ser. No. 218,340  
 Int. Cl. F27d 1/04; H05b 5/00

U.S. Cl. 13—35

5 Claims



Circular crucible or the like constructed from arcuate refractory bricks wherein the mating edges of the bricks are at uniform acute angles with respect to the radius of the furnace. This permits each brick to slide on the mating edges of adjacent bricks such that circumferential or tangential thermal expansion forces will not materially increase the radius of the crucible.



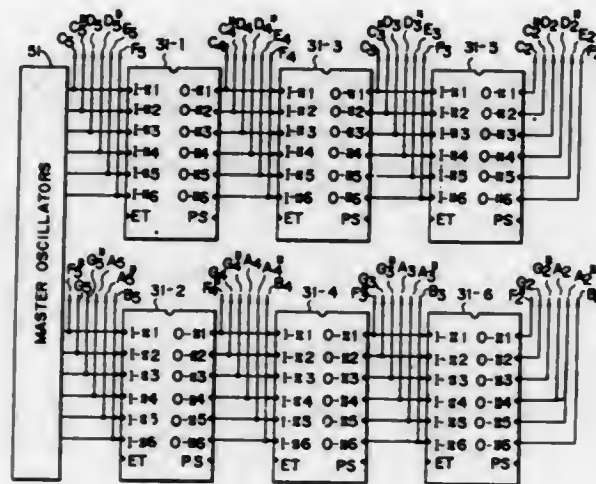
3,735,012

**INTEGRATED CIRCUIT FREQUENCY DIVIDERS IN ELECTRONIC MUSICAL INSTRUMENT**

Katsuhiko Hirano, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka-ken, Japan  
 Filed Feb. 22, 1971, Ser. No. 117,527  
 Claims priority, application Japan, Feb. 25, 1970, 45/19106  
 Int. Cl. G10h 1/00

U.S. Cl. 84-1.01

7 Claims



In an electronic musical instrument, the frequency dividers for the tone generators consist of integrated circuit units connected in cascade. Each unit includes a plurality of independent flip-flops in a number representing a divisor (six, four, three or two) of twelve, the corresponding number of input terminals aligned on one side of the unit and the corresponding number of output terminals aligned on the opposite side thereof. The units are connected in cascade one after another with every flip-flop in one unit dealing with different tone name signal in an octave and the corresponding flip-flops in separate units constituting a divider chain for the same-named tones. Inter-unit wirings become very simple.

3,735,013

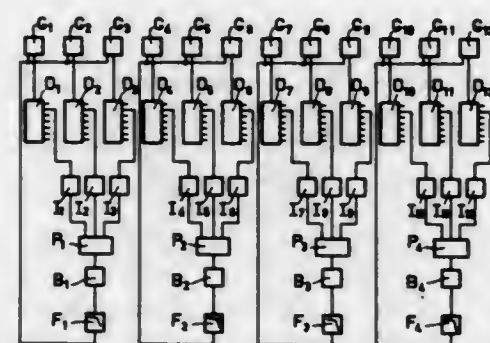
**SYSTEM FOR PRODUCING AN APERIODIC VIBRATO SIGNAL**

Cornelis Johannes Van Der Peet, deceased; by Casper Antonius Henricus Mulkens, acting administrator, and Willem Ruitkamp, both of Emmasingel, Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.  
 Filed Sept. 20, 1971, Ser. No. 182,068  
 Claims priority, application Netherlands, Sept. 22, 1970, 7013955

Int. Cl. G10h 1/02

U.S. Cl. 84-1.25

4 Claims



A system for producing a vibrato signal which varies in frequency in a manner uncorrelated with time in an electronic musical instrument, in which at least two dissonant signals are applied to a control input of each tone generator via a gate circuit, a divider chain and a low-pass filter.

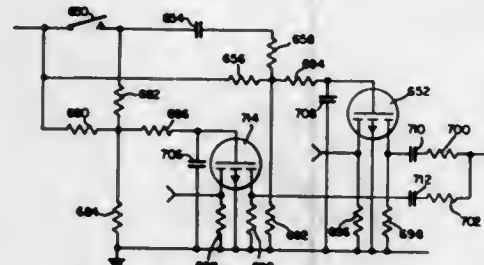
3,735,014

**ELECTRONIC MUSICAL INSTRUMENT SIMULATING CHIFF, TRACKER, AND DYNAMIC KEYING**

William D. Turner, 108 Manchester Avenue, Moylan, Pa.  
 Continuation-in-part of Ser. No. 19,641, March 16, 1970, Pat. No. 3,647,928, which is a continuation-in-part of Ser. No. 713,594, March 18, 1968, abandoned. This application Apr. 1, 1971, Ser. No. 130,297  
 Int. Cl. G10h 1/02

U.S. Cl. 84-1.24

21 Claims



An electrical musical instrument for simulating pipe organs, and having a natural ensemble effect, spatial tone-distribution effect, air turbulence effect, wind-pressure-change effect, tracker keying effect, piano voice keying effect, and exact differently modulated harmonic pitch registers for mutation and compound stops and chiff. Insulated gate field-effect transistors are used for switching tone and chiff frequency currents so that the change in amplitude is sigmoid during turn-on and turn-off. RC circuitry in combination with the switching insulated gate field-effect transistors permit tracker keying and piano voice keying.

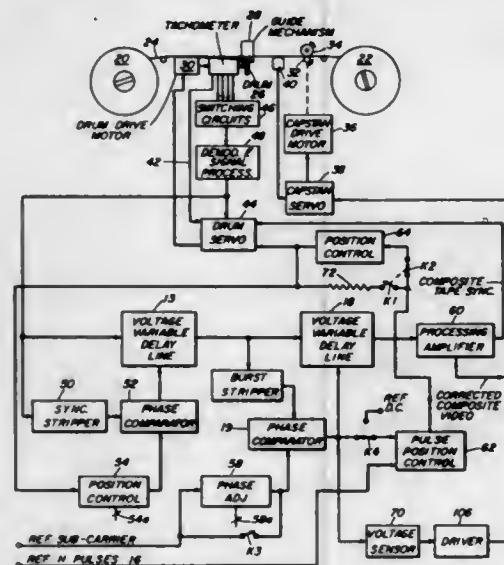
3,735,015

**COLOR FRAME LOCK CONTROL FOR SIGNAL REPRODUCING SYSTEMS**

Charles Mesak, El Segundo, Calif., assignor to Columbia Broadcasting System, Inc., New York, N.Y.  
 Filed Aug. 19, 1971, Ser. No. 172,982  
 Int. Cl. H04n 5/78

U.S. Cl. 178-5.4 CD

11 Claims



A system for causing a color video tape machine to always lock to the correct color frame in which the machine is allowed to lock up randomly and the locking characteristic examined to ascertain whether lockup has occurred on the correct or incorrect color frame. If lockup is on the correct color frame, the playback machine is allowed to function normally, but if it is incorrect, a signal is generated and applied to the capstan servo which momentarily speeds up the capstan drive motor to move the tape forward by an amount corresponding to one frame.

3,735,016

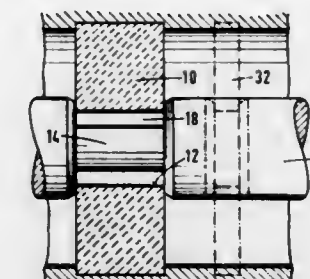
**COAXIAL LINE SECTION**

Georg Spinner, Erzgiesselestr. 33, Munich, Germany  
 Filed Aug. 6, 1971, Ser. No. 169,773  
 Claims priority, application Germany, Aug. 27, 1970, P 20 42 565.6

U.S. Cl. 174-28

Int. Cl. H01b 9/04

11 Claims



A coaxial line section supported by a dielectric support of a high dielectric constant; an annular gap inside the support around the line section, which gap is filled with a material of low dielectric constant, like air.

3,735,017

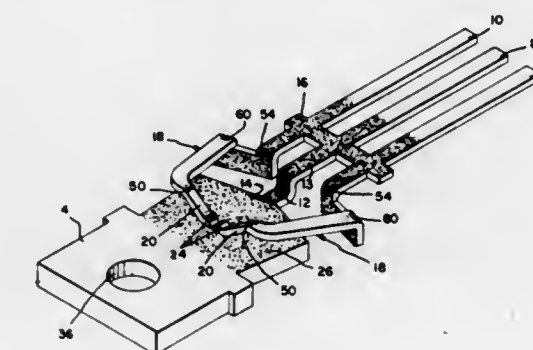
**LEAD FRAMES AND METHOD OF MAKING SAME**

Randy Marshall Manning, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.  
 Filed Apr. 12, 1971, Ser. No. 133,065

U.S. Cl. 174-52 S

Int. Cl. H01r 9/00

5 Claims



The disclosure relates to a lead frame having a platelike heat sink portion and three leads, one of which is integral with the heat sink, are manufactured by blanking heat sink and leads, bending the integral lead relative to the heat sink, forming ends of the remaining leads, and again bending integral leads so that leads are in a plane which is parallel to, and spaced from, the heat sink.

3,735,018

**SUPERCOOLED ELECTRIC CABLE**

Wolfram Griesinger, Ottobrunn, Germany, assignor to Kabel- und Metallwerke Gutehoffnungshütte Aktiengesellschaft, Hannover, Germany  
 Filed Aug. 30, 1971, Ser. No. 175,937  
 Claims priority, application Germany, Sept. 2, 1970, P 20 43 451.1

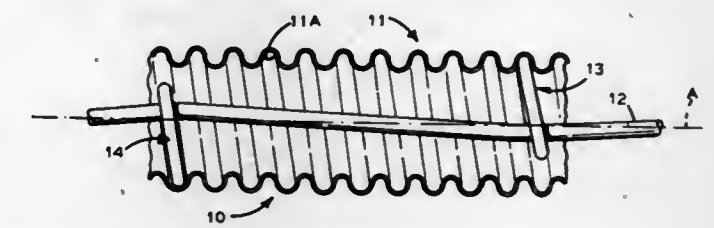
U.S. Cl. 174-28

Int. Cl. H01b 9/04; H01v 11/00

8 Claims

A supercooled electric cable having a conductor element centrally disposed within a tubular sheath for passing a coolant such as liquid helium therethrough, spacer elements being

provided for locating the conductor element relative to the tubular sheath; the spacer elements being of a configuration



such as to maintain the conductor element in a selected position relative to the sheath during the installation of the cable as well as at operating temperatures.

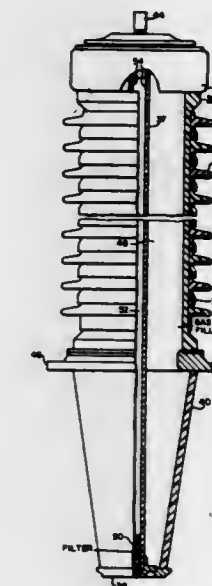
3,735,019

**FLEXIBLE WEATHER CASING FOR A GAS FILLED BUSHING**

Robert L. Hess, North Versailles, Pa., and James H. Frakes, Tucson, Ariz., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.  
 Filed Nov. 24, 1971, Ser. No. 201,758  
 Int. Cl. H01b 17/26, 17/36

U.S. Cl. 174-31 R

6 Claims



An improved insulating device comprising a main tubular insulating structure on which are mounted a plurality of overlapping flexible weather sheds.

3,735,020

**HEAT SINK WALL PLATE WITH OFF-CENTER MOUNTING OPENINGS**

Joseph Licata, Schnecksville, Pa., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.  
 Filed Sept. 29, 1971, Ser. No. 184,861  
 Int. Cl. H02g 3/14

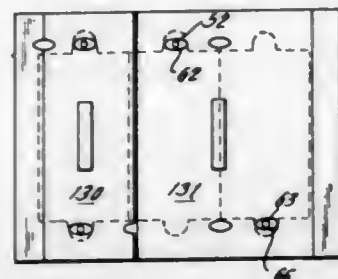
U.S. Cl. 174-66

21 Claims

A light control switch device for mounting in a wall box has a conductive front mounting plate arranged to overlap the edges of the wall extending around the opening receiving the wall box. Mounting-screw receiving openings are disposed in the wall plate, with one pair of openings aligned vertically centrally of the plate while two additional openings are formed on opposite sides of the center line of the plate, and in horizontal alignment with respective ones of the pair of centrally aligned



openings. The spacing between a central opening and a laterally displaced opening is equal to one-half the distance between the screw-receiving openings of a standard wall box. The vertical edges of the wall plate are then provided with snap-off sections, where the distance between the two snap-off



sections is equal to some multiple of the distance between the screw-receiving openings of a conventional wall box. Switch devices may then be ganged in a multiswitch wall box either with or without snap-off sections. The front surface of the conductive face plate contains heat-radiating fins.

3,735,021

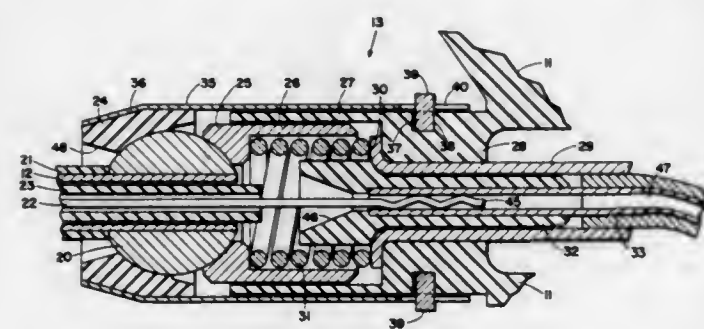
## ELECTRICALLY CONDUCTING PIVOTAL JOINT

David Raynes Bonis, N. Dorchester, Putnam, Ontario, and Eric Foster, London, Ontario, both of Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed June 11, 1971, Ser. No. 152,244  
Int. Cl. H01r 5/00

U.S. Cl. 174-86

10 Claims



Electrically conducting pivot joint which provides continuous shielding. The inner conductor is connected through the pivot joint and the outer conductor is connected by shielding elements around the path of the inner connector. The joint is specifically designed for the lightweight headset. Complete rotational movement and angular movement of the boom is available. At the same time the boom is held in a set position. A high impedance transducer can be used for the microphone.

3,735,022

## INTERFERENCE CONTROLLED COMMUNICATIONS CABLE

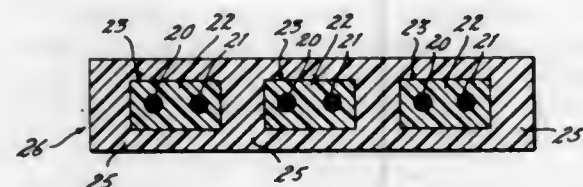
Alton W. Estep, R. D. No. 1, North Wales, Pa.  
Filed Sept. 22, 1971, Ser. No. 182,740  
Int. Cl. H01b 7/02

U.S. Cl. 174-117 F

2 Claims

A communication cable having a plurality of pairs or triplets of parallel conductors, wherein each pair or triplets of con-

ductors are imbedded in a first insulation material to form a core, and a plurality of cores are imbedded in a second insula-



tion material, or jacket. The conductors extend in planar form through an axial cross-section of the cable. The first and second insulations are of different dielectrics.

3,735,023

## SENSOR PACKAGE FOR ELECTRICAL SENSING OF PLANE COORDINATES AND METHOD OF PREPARING THE SAME

George S. Hurst, and William C. Colwell, Jr., both of Oak Ridge, Tenn., assignors to University of Kentucky Research Foundation, Lexington, Ky.

Filed Apr. 19, 1972, Ser. No. 245,564  
Int. Cl. H01b 7/08

U.S. Cl. 174-117 FF

10 Claims



A sensor package for ready insertion in properly registered position upon, or for removal from, a cabinet employed in electrical sensing of plane coordinates, is constructed to provide accurate readings when pierced by a small manually operated cursor.

A method for manufacturing the package including the affixing of accurately spaced electrodes on the package, is disclosed.

3,735,024

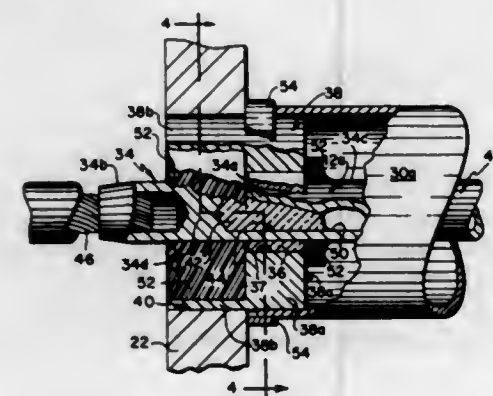
## HIGH-PRESSURE AND HERMETIC ELECTRICAL FEED-THROUGH APPARATUS

Edward R. Walker, Sr., Natick, Mass., assignor to D. G. O'Brien Inc., Framingham, Mass.

Filed May 10, 1971, Ser. No. 141,794  
Int. Cl. H01b 17/26; C03c 27/02

U.S. Cl. 174-151

19 Claims



A leak-proof and pressure-tight seal at the passage of an electrical current conductor through a wall employs an elec-

trical conductor which is tubular and contains therein a core of hard material having a low coefficient of thermal expansion. A collar-like electrically insulating member encircles the conductor about the core and radially compresses the conductor inward onto the core. The insulating member is seated in the conductor-passing aperture in the wall and the wall exerts significant radial compression onto the collar-like member to compress it firmly against the tubular conductor. Further, the cross-sectional area of the conductor around the core is not substantially less than, and preferably is at least equal to, the cross-sectional area of the conductor elsewhere along its length.

3,735,025

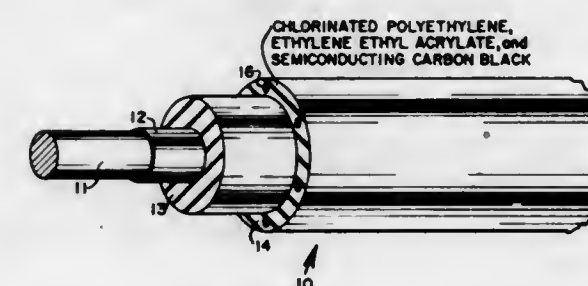
## SEMICONDUCTING COMPOSITION AND CABLE JACKETED THEREWITH

Ting H. Ling, Marion; Robert M. Wade, Wabash, and Marwick H. Solomon, Muncie, all of Ind., assignors to Anaconda Wire and Cable Company, New York, N.Y.

Filed July 30, 1971, Ser. No. 167,741  
Int. Cl. H01b 5/16, 9/02

U.S. Cl. 174-120 SC

6 Claims



Electrical cables are jacketed with a novel thermoplastic semiconducting composition comprising chlorinated polyethylene, ethylene ethyl acrylate and carbon black.

3,735,026

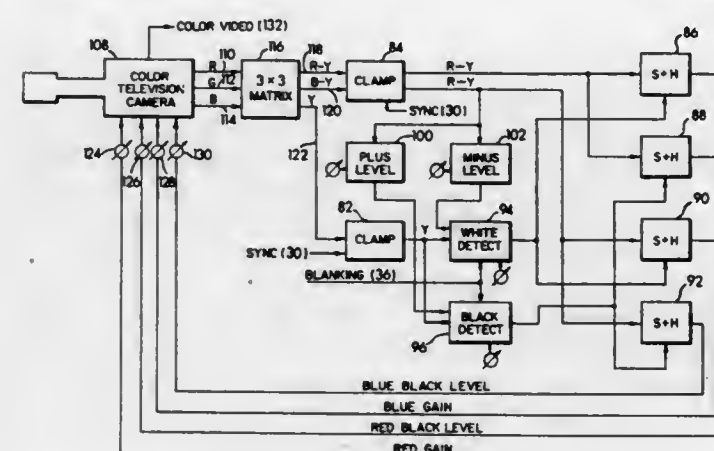
## AUTOMATIC COLOR CORRECTOR FOR A COLOR VIDEO SIGNAL

Clyde W. Smith, North Salem, N.Y., and Renville H. McMann, New Canaan, Conn., assignors to Columbia Broadcasting System, Inc., New York, N.Y.

Filed Sept. 3, 1971, Ser. No. 177,567  
Int. Cl. H04n 9/00

U.S. Cl. 178-5.4 R

15 Claims



A video signal color corrector automatically operative to restore standard color balance in a color video signal. Video signal color content is detected in substantially black and substantially white portions of the video signal where there should be little or no color. This color content during white and black portions is then used to generate error signals which have proportional and constant components respectively. The error signal is combined with the video signal to cancel erroneous color information and restore the standard color balance.

3,735,027

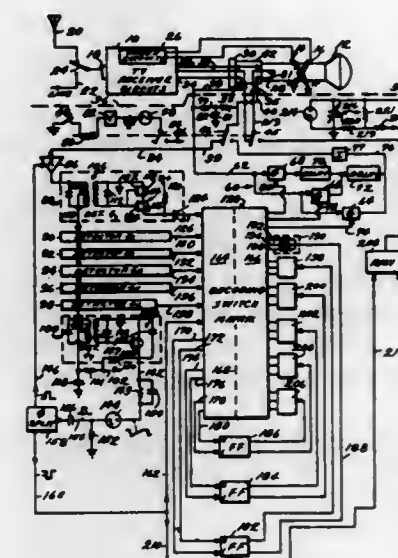
## DECODING SCRAMBLED TELEVISION

Jordan J. Corwin, Levittown, and William J. Shanahan, Northport, both of N.Y., assignors to Skiatron Electronics Television Corporation, New York, N.Y.

Filed Nov. 2, 1970, Ser. No. 86,115  
Int. Cl. H04n 1/44

U.S. Cl. 178-5.1

32 Claims



A scrambled television decoder and its installation to a conventional television receiver by merely making a direct connection to the socket of the cathode ray tube so as to intercept only the single line that normally carries the video signals to the beam intensity control element. Signals are generated without direct connection to the television receiver, by placing a neon glow discharge tube adjacent the electromagnetic deflection coil, the neon tube being connected internally to the decoder to the relaxation oscillator and monostable multivibrator, the output of which is connected through the cathode ray tube socket to the appropriate control element for regular blanking purposes.

3,735,028

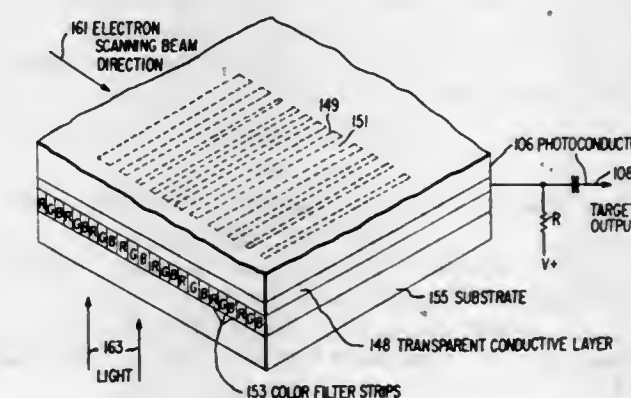
## TELEVISION CAMERA SYSTEM WITH A SINUSOIDALLY VARYING INDEXING SIGNAL

Dalton Harold Pritchard, and Walter Edgar Sepp, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 17, 1972, Ser. No. 235,497  
Int. Cl. H04n 9/06

U.S. Cl. 178-5.4 ST

24 Claims



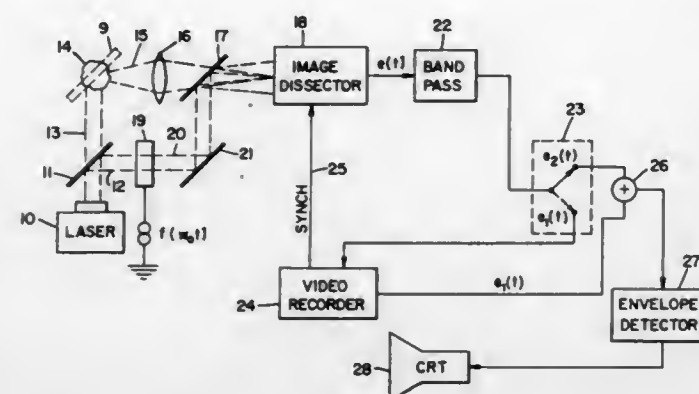
Light from a scene is directed through the faceplate of an image pickup device having an electron gun operative to







closed. Two interference patterns are formed, one of an object whose surface is to be mapped and one of a reference plane or other standard surface using holographic techniques. The interference patterns form visual inputs to a television camera



which converts them into electrical signals. These electrical signals are combined to produce an output which contains information relative to the height variations or altitude contours of the object and the height contour information is displayed on an appropriate display device.

3,735,037

#### TELEVISION DEMODULATOR WITH SHORT AND LONG TIME CONSTANTS

Henry Louis Baker, Northwood Hills; Kenneth Charles Quinton, Esher, and Daniel Henry Smart, Morden, all of England, assignors to Communications Patents Limited, London, England

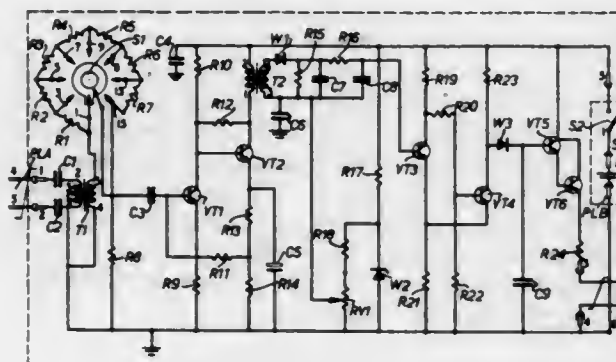
Filed Aug. 20, 1971, Ser. No. 173,389

Claims priority, application Great Britain, Aug. 28, 1970, 41,536/70

Int. Cl. H04n 5/44

U.S. Cl. 178-7.3 R

6 Claims



A demodulator for television or like signals having modulated and cyclic signals intermixed comprises two cascaded demodulators having respective short- and long-time constants compared to the modulation content and a signal level sensor between the cascaded demodulators responsive to the cyclic signals connected to provide an input signal to the second demodulator.

#### 3,735,038 MEANS FOR SUPERIMPOSING A MARKER SIGNAL ONTO A COMPOSITE VIDEO SIGNAL

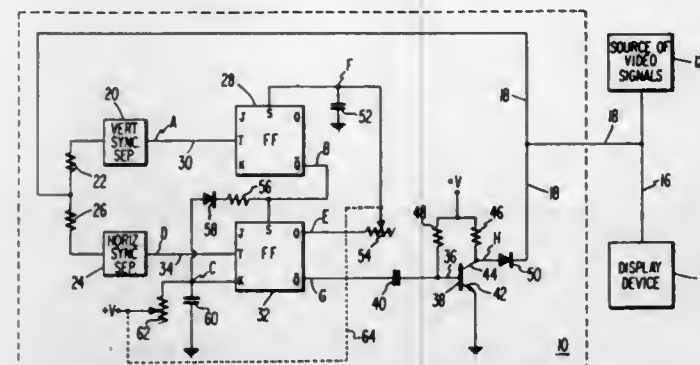
Ronald Lee Loper, Simi, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 27, 1972, Ser. No. 221,243

Int. Cl. H04n 5/44

U.S. Cl. 178-7.3 R

12 Claims



A circuit for generating a marker signal on a video signal at a predetermined point in a stream of composite video signals. Each vertical sync pulse causes a clock pulse to be applied to a first bistable logic circuit. The switched output state of the first circuit starts a first timing circuit which enables a second bistable logic circuit after a first predetermined time period. After being enabled, the second bistable circuit changes state upon application of the next horizontal sync pulse and thereby starts a second timing circuit which resets the first circuit after a predetermined time period. The reset output at the first circuit resets the second circuit and the changing output signal momentarily cuts off an output transistor. The output circuit of the transistor applies a marker signal on the video signal at a point determined by the first and second time periods.

3,735,039

#### EXCESSIVE BEAM CURRENT INDICATOR CIRCUIT

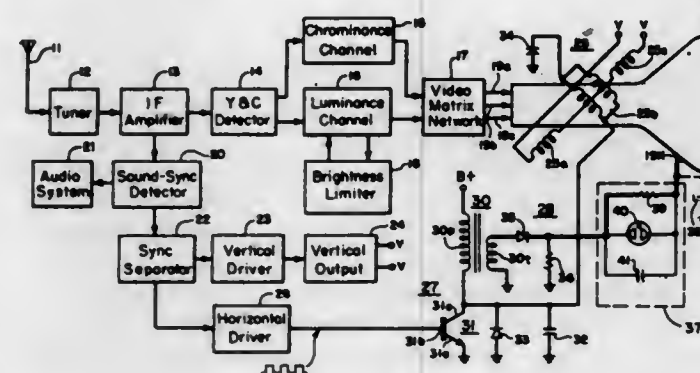
William A. Trzyna, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Dec. 6, 1971, Ser. No. 204,815

Int. Cl. H04n 5/00

U.S. Cl. 178-7.5 R

5 Claims



An excessive beam current indicator circuit in a television receiver for indicating whenever the beam current in a cathode-ray tube exceeds a predetermined, maximum "safe" level. The indicator circuitry utilizes the anode current supplied to the second anode of a cathode-ray tube to develop a voltage drop across a resistor interposed in the anode lead. The voltage drop, representative of the actual beam current, is applied to a switch device, such as a neon bulb, causing it to ignite whenever its firing potential is exceeded. Proper selection of the resistor insures that the neon device will light only when the beam current exceeds the maximum "safe" level.

3,735,040

#### FACSIMILE TRANSCIVER

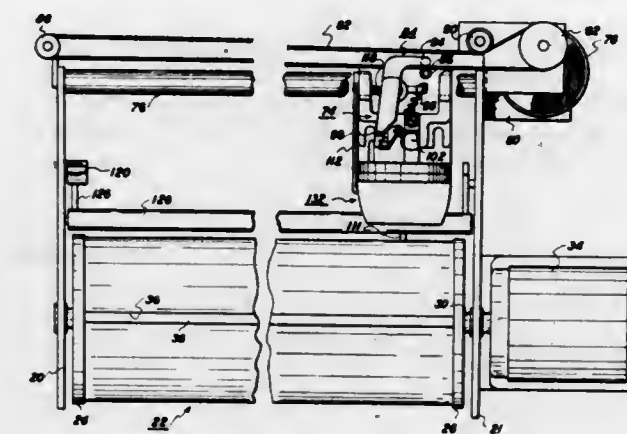
Vernon E. Punt, Fairport; Charles G. Van Neil, Webster, and John F. Hatzmann, Rochester all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Apr. 8, 1970, Ser. No. 26,543

Int. Cl. H04n 1/14

U.S. Cl. 178-7.6

11 Claims



Facsimile transceiver of the drum scanning type wherein the writing stylus and scanning head carriage is releasably attached to a drive belt whereby the carriage can be manually moved relative to the belt to any point along the longitudinal axis of the drum. The transceiver is further characterized by the provision of stylus retracting structure which effects disengagement of the stylus from a copy sheet when the access cover is opened for removing or installing copy paper. Stylus retraction or disabling is also accomplished when the carriage is manually moved or when the transceiver is placed in the send mode of operation.

3,735,041

#### CABINET FOR ELECTRONIC COMMUNICATIONS APPARATUS

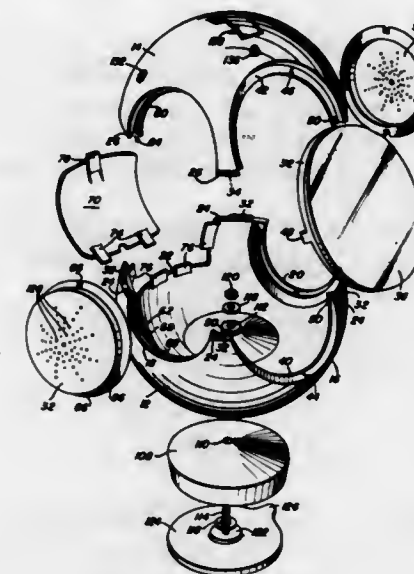
Ryuzo Fujita, Suidobashi Bldg., 4-4, 1-chome, Hongo, Bunkyo-ku, Tokyo, Japan

Filed July 6, 1971, Ser. No. 159,594

Int. Cl. H04n 5/64

U.S. Cl. 178-7.9

8 Claims



A generally ball-shaped enclosure is formed by two complementary separable portions having appropriately arranged cut out portions to receive and retain between them a control panel, loudspeaker mountings, and access plate when the portions are joined together without the use of additional fasteners.

3,735,042

#### DUAL PURPOSE CHARACTER GENERATOR

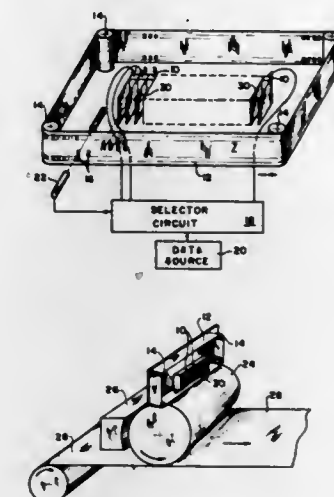
Kemal M. Aydin, and Lester L. Selnick, both of Stamford, Conn., assignors to The Singer Company, Little Falls, N.J.

Filed Nov. 26, 1971, Ser. No. 202,477

Int. Cl. H04I 15/34

U.S. Cl. 178-15

11 Claims



A dual purpose graphic form or character generator which can be used as a visual display or as a line printer when combined with any suitable image transfer process. Lines of print characters or other graphic signs or symbols are formed through an endless band by means of a plurality of light sources which are activated selectively with precise timing by means of an electronic selector circuit. The selector circuit determines the position of the characters with respect to the light sources and fires the light sources according to the information fed into it by a data source.

3,735,043

#### DATA TRANSMISSION SYSTEM INTERRUPTION MONITOR

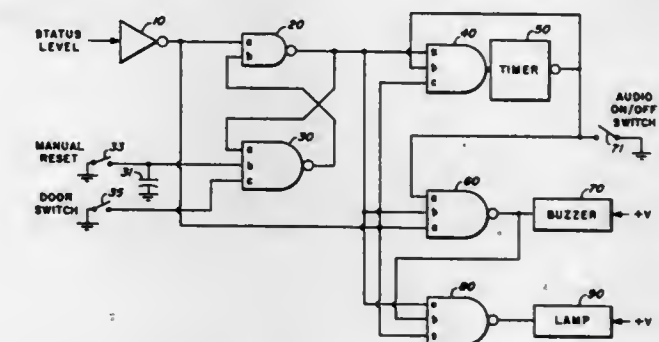
Alton F. Riethmeier, Rochester, and Frank R. Fahey, Pittsford, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Nov. 14, 1968, Ser. No. 776,860

Int. Cl. H04I 25/02

U.S. Cl. 178-69 G

4 Claims



An end of transmission signal apparatus for indicating that a facsimile system or other data communication apparatus has ceased transmitting or receiving a message. By the means of logic and timing circuits, an audible and/or visual indication is provided upon detection of a completion of a message or that the data transmission system has ceased operating for any one of various reasons. The visual indication is a light which flashes alternately with the sounding of a buzzer.



3,735,044

# COORDINATE DETERMINING DEVICE EMPLOYING A SLOWLY VARYING DIFFERENCE SIGNAL TO DETERMINE APPROXIMATE CURSOR POSITION

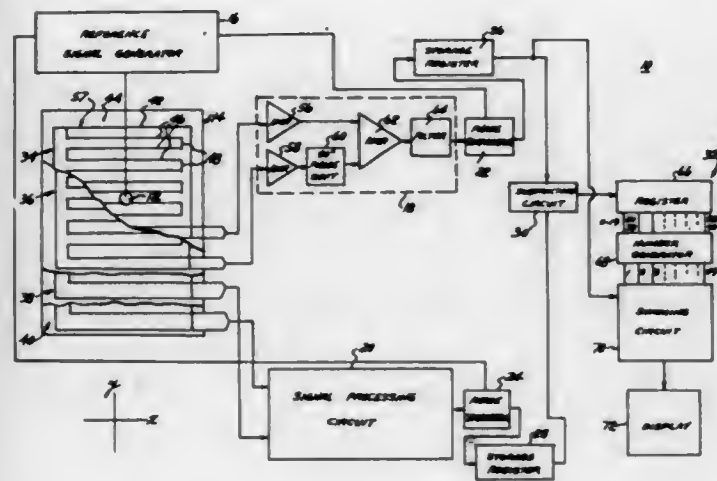
Ronald M. Centner, Southfield, and Vernon C. Kamm, Farmington, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed July 6, 1971, Ser. No. 159,899

Int. Cl. G08c 21/00

U.S. Cl. 178-19

8 Claims



Cursor position is determined by providing two different signals that vary cyclically in response to cursor displacement. The first signal varies at a slightly faster rate than the second. Because of this small difference in the rate of variation of the two cyclic signals, the difference between the two signals varies at a rate substantially slower than the rate at which either of the two signals vary. The difference between the two cyclic signals provides an absolute or complete determination of approximate cursor position in a relatively long interval in which the two cyclic signals oscillate through many cycles. The value of this difference signal is measured to determine approximate cursor position.

3,735,045

# FRAME SYNCHRONIZATION SYSTEM FOR A DIGITAL COMMUNICATION SYSTEM

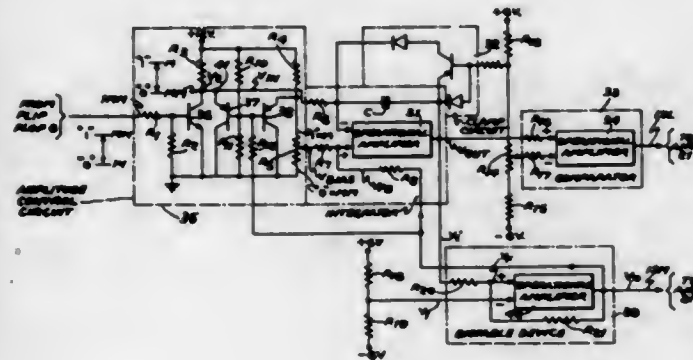
James M. Clark, Cedar Grove, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 24, 1970, Ser. No. 66,258

Int. Cl. H04l 7/08; H04j 3/06

U.S. Cl. 178-69.5 R

12 Claims



A framing control circuit for a frame synchronization system employing one integrator for both the sense and search modes rather than a separate integrator for each of the sense and search modes. A voltage controlled amplitude control circuit is disposed at the input to the integrator. The control signal for the control circuit is produced by a bistable device

coupled to the output of the integrator. A low binary control signal, indicating a sense mode, provides a relatively low amplitude input signal to the integrator and, hence, an effective long time constant for the integrator. A high binary control signal, indicating a search mode, provides a relatively large amplitude input signal to the integrator and, hence, an effective short time constant for the integrator.

3,735,046

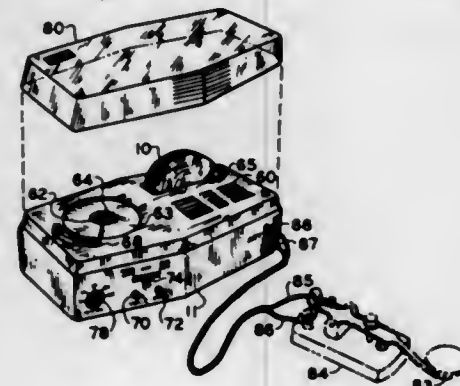
# APPARATUS FOR SIMULATING, PRODUCING AND TRANSMITTING CODE SIGNALS

Russell H. Romney, 3259 Bon View Drive, Salt Lake City, Utah  
Continuation-in-part of Ser. No. 38,382, May 18, 1970, Pat. No. 3,656,157. This application Aug. 27, 1971, Ser. No. 175,460

Int. Cl. H04l 15/02

U.S. Cl. 178-115

5 Claims



Code signals, such as alpha-numeric elements of the Morse International Code, are produced by rotating a disc member selected from a set bearing character elements represented by perforations in or printed circuit components on the disc. These signal components are sensed by detector means, electronic or mechanical, which are connected to an oscillator or equivalent tone generator and to a suitable amplifier or transmitter. Each separate disc bears a group of annularly spaced characters encoded for detection; a small group of discs thus contains the full code alphabet, including numerical and punctuation characters.

3,735,047

# MEANS FOR INDICATING A BALANCED LISTENING POSITION FOR 4-CHANNEL STEREOPHONIC SYSTEMS

Toshio Kawada, Neyagawa-shi; Tadashi Torama, Higashimiyoshi-ku, and Tamio Kobayashi, Hirakata-shi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

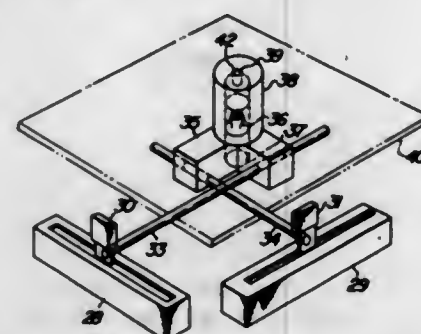
Filed Sept. 23, 1971, Ser. No. 183,012

Claims priority, application Japan, Sept. 29, 1970, 45/86017

Int. Cl. H03g 3/00

U.S. Cl. 179-1 GQ

3 Claims



A means for indicating a balanced listening position for four-channel stereophonic systems comprising a position in-

3,735,050

# ELECTRICAL STORAGE CIRCUIT

Alexis Mardas, London N. W. 2, England, assignor to Modern Telephones Limited, London, England

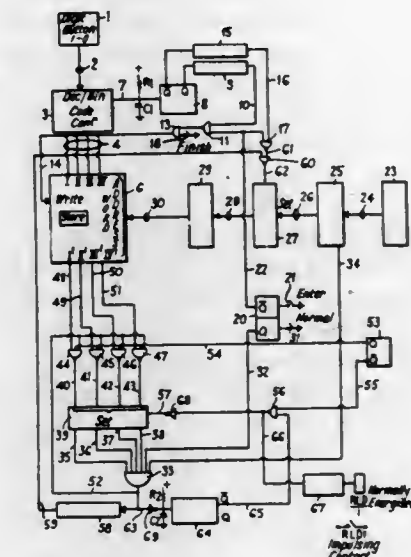
Filed July 16, 1971, Ser. No. 163,279

Claims priority, application Great Britain, July 21, 1970, 35384/70

Int. Cl. H04m 1/26

U.S. Cl. 179-90 B

7 Claims



An electrical storage circuit suitable for use as a repertory dialler in a telephone system in which the digits of a number to be dialled are stored at respective addressed locations in a coordinate store constituted by active bistable devices as four bit words, and words read out from the store are applied via an inverter to a four bit counter which is stepped until each stage is set at 1 in synchronism with an output from a pulse generator to give a digital output according to an addressed word associated with a particular digit of a stored number at a rate governed by the frequency and duration of the clock pulse output from the generator.

3,735,051

# DIGITAL INFORMATION STORAGE UNIT HAVING PARALLEL STORES AND A CONTROL THEREFOR

David Christopher Harms, Beeston, England, assignor to Plessey Handel Und Investments A.G., Zug, Switzerland

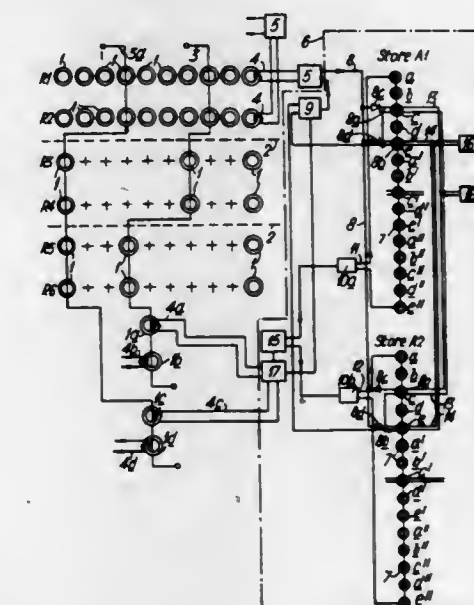
Filed Oct. 1, 1971, Ser. No. 185,561

Claims priority, application Great Britain, Oct. 2, 1970, 46,873/70

Int. Cl. H04q 3/42

U.S. Cl. 179-18 EB

11 Claims



A digital information storage unit which has a particular but not necessarily an exclusive application in an electronic

3,735,048

# IN-BAND DATA TRANSMISSION SYSTEM

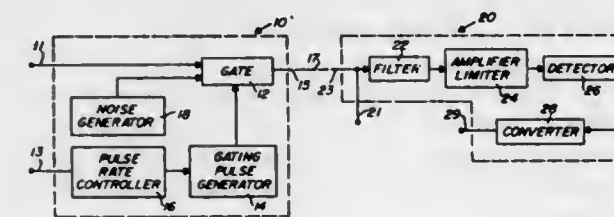
Stanley J. Tomsa, Chicago, and Bruce C. Eastmond, Westmont, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed May 28, 1971, Ser. No. 148,040

Int. Cl. H04m 11/06

U.S. Cl. 179-15 BM

11 Claims



An information transmission system for transmitting data signals simultaneously with audio signals in an audio channel includes a gate circuit at the transmitting unit for interrupting the transmitted audio at a rate controlled by the data signal, and a detector at the receiving unit for detecting the interruptions in the audio and reconstructing the data signal from the interruptions. The duration of the interruptions is selected to be short enough so as not to be readily detectable audibly. The system is suitable for use in a multiple radio-receiver system wherein signals are transmitted from spaced receivers to a central station with data signals indicating the quality of the signals received at each receiver.

3,735,049

# TELECOMMUNICATION SYSTEM WITH TIME DIVISION MULTIPLEX

Robert Bertold Buchner, and Jan Philippus Maat, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

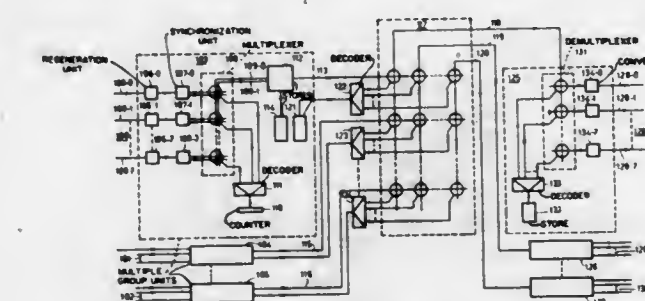
Filed Mar. 19, 1971, Ser. No. 126,150

Claims priority, application Netherlands, Apr. 10, 1970, 7005143

Int. Cl. H04j 3/06

U.S. Cl. 179-15 AQ

2 Claims



A telecommunication system with time division multiplex wherein information signals in serial form are received, converted to parallel form in a plurality of shift registers, remultiplexed and transferred to an information storage unit under the control of a local clock pulse generator and a local address generator. An overflow detector generates an overflow signal in the event that the information signals are being received faster than they can be converted to parallel form and remultiplexed. In response to the overflow signal the address generator provides overflow addresses and the excess received information is transferred through an auxiliary transfer channel to the information storage unit.



telecommunication exchange system includes at least two stores arranged for parallel and substantially independent operation and a control unit for controlling the operation of the stores. When a digital information signal is applied to the storage unit input it is channelled to one of the stores, the other store is connected to the input and said one store is inhibited for a period determined by the signal storage period. When both stores are occupied the input is inhibited until one of the stores is cleared, the cleared store being connected to the input. During the storage period the information is processed through three stages of control and the store whose contents is to be processed is selected in dependence upon the nature of the stored information. Before each stage of control the progress of the information can be inhibited in dependence on the nature and time of arrival of the information.

3,735,052

# MAGNETIC HEAD ASSEMBLY USING TITANIUM DIOXIDE AND BARIUM TITANATE SLIDER

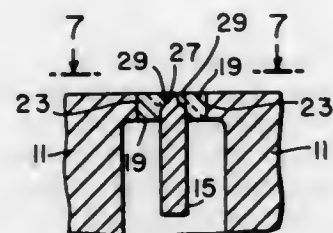
Helen M. Hoogendoorn, Schenectady, N.Y., and Charles M. McIntosh, Burlington, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 6,865, Jan. 29, 1970, abandoned. This application July 16, 1971, Ser. No. 163,196

Int. Cl. G11b 5/14

U.S. Cl. 179-100.2 C

2 Claims



A magnetic head assembly includes a glass-gapped ferrite head bonded into a ceramic slider with a glass. The slider is made of a ceramic composition consisting essentially of the reaction product of 70 to 85 percent, by weight, titanium dioxide ( $\text{TiO}_2$ ) and 30-15 percent barium titanate ( $\text{BaTiO}_3$ ). Infrared bonding is employed. Copper may be introduced into the ceramic composition to enhance its infrared absorption properties.

3,735,053

# RECORDING AND/OR PLAYBACK APPARATUS WITH TAPE ENGAGEMENT MEANS RESILIENTLY URGED TO AN OPERATING POSITION

Walter Eibensteiner, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

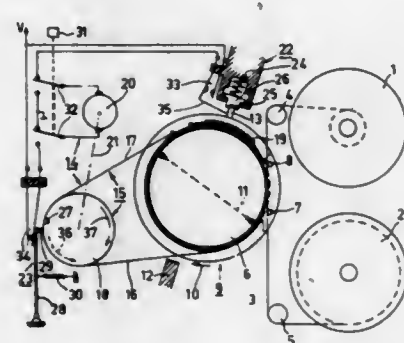
Filed Nov. 3, 1971, Ser. No. 195,391

Claims priority, application Austria, Nov. 17, 1970, 10329/70

Int. Cl. G11b 15/66, 23/04

U.S. Cl. 179-100.2 ZA

4 Claims



A recording and/or playback apparatus for recording and playing signals having a wide frequency spectrum from a tape-

shaped record carrier such as video tape. The apparatus has a cylindrical drum about which the tape is to be wound for the recording and playing operation. A guide pin support member is arranged for pivotal movement about the drum between a first and second operating position and is provided with at least one guide pin for engaging the tape in the first operating position and when the guide pin support is pivoted to the second operating position the guide pin will engage the tape and wrap it about the cylindrical drum in a helical path. A stop member is mounted on the apparatus so as to define the second operating position and the guide pin support has a projection which will engage the stop member when the second operating position has been reached. A shifting device is provided to pivot the guide pin support between the operating positions and includes two pull members connected to the guide pin support, one of the pull members arranged for moving the guide pin support from the first to the second operating position and the other pull member arranged for moving the guide pin support from the second back to the first operating position. A motor is provided having reversible direction for driving the pull members. The pull member arranged for moving the guide pin support from the first to the second operating position is provided with a resilient element such as a spring so that when the pull member moves the guide pin support to the second operating position it will be resiliently urged against the stop member. Manually operable switch means are provided for initiating operation of the motor and additional switches are provided for turning off the motor when the guide pin support has reached either of its operating positions. The switch for turning off the motor when the guide pin support is moved to the second operating position is arranged so as to turn off the motor after the guide pin support has already reached the second operating position so that the support will be resiliently urged against the stop. Position retaining means are also provided so as to hold the guide pin support in either of its operating positions.

3,735,054

# TAPE RECORDER-OPERATING DEVICE WITH AUTOMATIC EXCHANGE FROM REWIND OR QUICK FEED TO REPRODUCTION BY SENSING NONRECORDED SECTION

Kazuo Poshimura, Fuji, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

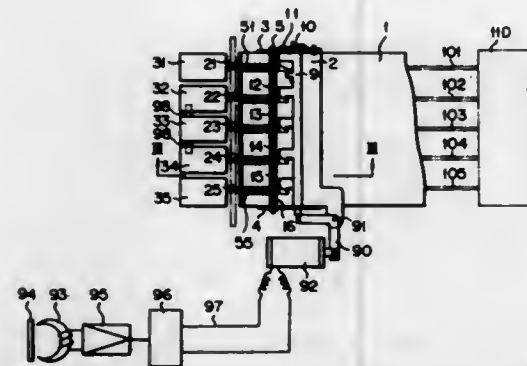
Filed July 6, 1971, Ser. No. 159,670

Claims priority, application Japan, July 6, 1970, 45/58537

Int. Cl. G11b 15/44, 27/28

U.S. Cl. 179-100.2 S

3 Claims



A tape recorder-operating device, wherein a sound reproducing lever for bringing a drive mechanism to a sound reproducing state is coupled by a connecting member with a quick feed lever for bringing said drive mechanism to a quick feed state so as to be jointly operated with the latter lever; a first lock plate for locking the sound reproducing lever to an operable state and a second lock plate disposed above said first lock plate substantially in parallel relationship so as to

lock the quick feed lever to an operable state are so supported as to face both levers respectively; the first and second lock plates interlock each other only when the operations of both sound reproducing and quick feed levers are locked or released at the same time; there are provided detachable projections so as to cause the second lock plate alone to be actuated only when the operation of the quick feed lever is locked or released; and there is further provided plunger means for actuating the second lock plate so as to release the lock of the quick feed lever alone upon detection of a nonrecorded portion of the tape.

3,735,055

# METHOD FOR IMPROVING THE SETTLING TIME OF A TRANSVERSAL FILTER ADAPTIVE ECHO CANCELLER

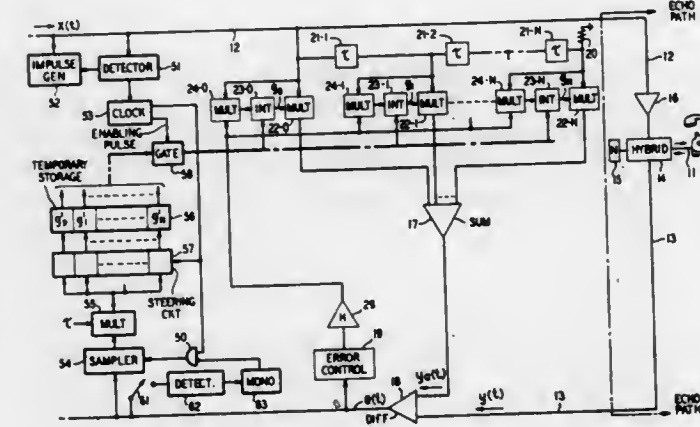
Edmond Joseph Thomas, New Shrewsbury, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 5, 1971, Ser. No. 196,038

Int. Cl. H04b 3/22

U.S. Cl. 179-170.2

5 Claims



The method disclosed accomplishes a reduction in the initial "distance" between the tap gain vector, of a transversal filter adaptive echo canceller, and its optimum value. The echo path bridged by the canceller is first interrogated with an impulse immediately after a connection is established. The impulse response of the echo path is sampled at the Nyquist rate, the samples are multiplied by a predetermined constant, and the weighted samples are stored. The respective gains of the tap components of the transversal filter are then set in accordance with the weighted and stored impulse response samples. Convergence thence proceeds naturally from this setting of the tap gain vector.

3,735,056

# SYSTEM FOR TRANSMITTING DIGITAL SIGNALS

Helmut Martin, and Lothar Krisch, both of Hannover, Germany, assignors to Kobel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Mar. 6, 1972, Ser. No. 232,020

Claims priority, application Germany, Mar. 3, 1971, P 21 10 090.3; June 6, 1971, P 21 28 016.0

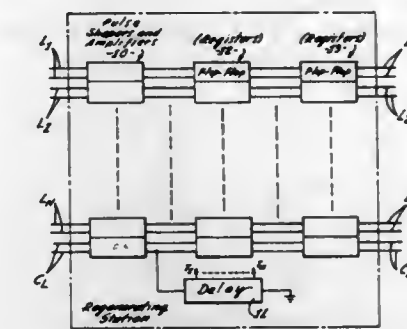
Int. Cl. H04L 25/02

U.S. Cl. 179-170 E

5 Claims

In a communication system for the transmission of digital signals and including plural stranded conductors, respective two conductors defining a single transmission path, the system further including signal regenerating stations, for regenerating the individual signals for improving the signal to noise ratio of the transmission system as a whole, the digital signals as transmitted including clocking signals, transmitted in one of the

paths; means are included in the system for equalizing propagation phase differences in the signals of the transmis-



sion paths of the plurality as resulting from differences in length of twist of the several conductors as stranded, to be in phase synchronism at a regenerating station.

3,735,057

# COMPENSATED CROSSPOINT SWITCHING SYSTEM

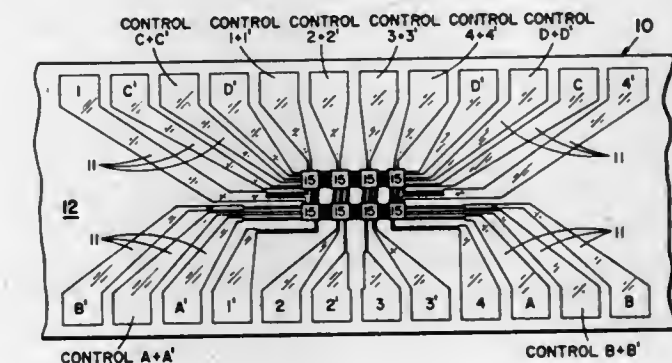
Anthony G. Bryan, Tempe, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Sept. 27, 1971, Ser. No. 184,081

Int. Cl. H04q 3/50

U.S. Cl. 179-186 F

13 Claims



A crosspoint switching circuit in which the transmission paths through the circuit are compensated such that the resistance from any input to any output is equal to the resistance from any other input to any other output. This is accomplished by varying the resistance of the metallization in the circuit according to a prescribed method. The varying of the metallization resistance is accomplished by varying the width and length of metallization from the output or input package pins to the circuit. This width variation either adds or reduces resistance to the particular switching path indicated by the prescribed method. The prescribed method entails ascertaining that set of transmission paths having a maximum of resistance between inputs and outputs, and thereafter systematically adding resistance to other transmission paths to bring their resistances up to this maximum without adding to the maximum already established. This is accomplished by first compensating those circuit paths having resistances next highest to the ascertained maximum. Thereafter all transmission paths are compensated in descending order. If there is no possibility of raising the resistance of a particular transmission path to the ascertained maximum without raising another transmission path resistance past the ascertained maximum, then the resistance of this particular transmission path is raised to the ascertained maximum which raises certain other transmission paths past the ascertained maximum by a certain amount. This certain amount if then added to all paths not affected by the above addition, such that a minimum resistance spread is achieved between the possible paths in the switching circuit network.



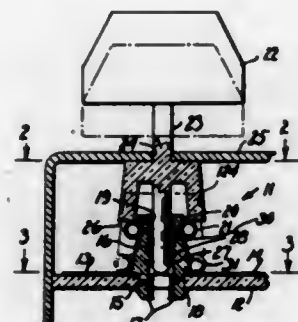
3,735,058

**KEYBOARD PRINTED CIRCUIT SWITCH ASSEMBLY WITH AXIALLY MOVABLE COIL SPRING CONTACT AND ASSOCIATED KEY TYPE ACTUATOR**  
William A. Berry, Covina, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.

Filed Sept. 15, 1971, Ser. No. 180,665  
Int. Cl. H01h 15/04, 1/34

U.S. Cl. 200-16 A

8 Claims



A key operated switch incorporated with a printed circuit board having conductors thereon and an upwardly extending conical post of non-conducting material between adjacent terminals of certain of the conductors. An expandable toroidal contact spring surrounds the post and is normally located above the conductors by virtue of its constriction against the conical surface. A depressible key member, which is normally held in raised position by the contact spring, is effective upon depression to move the spring into bridging contact with the conductors.

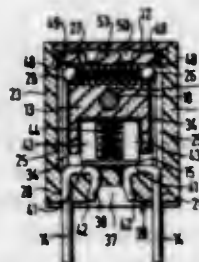
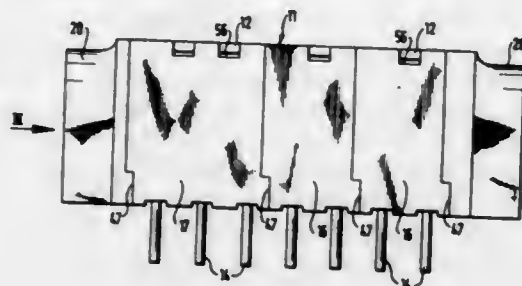
3,735,059

**SLIDING SWITCH ASSEMBLY WITH SPRING-BIASED CONTACT AND MULTI-SECTIONAL HOUSING**  
Karl Glaser, 7021 Stetten/Filder, and Ernst Stengle, Esslingen, both of Germany, assignors to EBE Elektro-Bau-Elemente GmbH, Stetten/Filder, Germany

Filed Nov. 16, 1971, Ser. No. 199,193  
Int. Cl. H01h 15/00, 9/02

U.S. Cl. 200-16 C

22 Claims



This invention relates to an electrical switch structure comprising a housing including a plurality of U-shaped housing

structural elements arranged in side-by-side relationship, a plurality of slides adjustably arranged within the housing structural elements, each housing structural element being provided with at least one pair of contacts fixedly mounted therein, each slide being freely adjustable to any position in any of the housing structural elements, each slide adapted to engage only a single pair of contacts at any one particular position, and a removeable cover closing the interior of the housing.

3,735,060

**LINEARLY MOVABLE ACTUATOR FOR SLIDE-PIVOT CONTACT ASSEMBLY IN SWITCH DEVICES**

Yoshihiro Kawal, Nishi-ku, Nagoya, Japan, assignor to Kabushiki-Kaisha Tokai Rika Denki Selsakusho, Nishi-Kasugai-ken, Aichi-ken, Japan

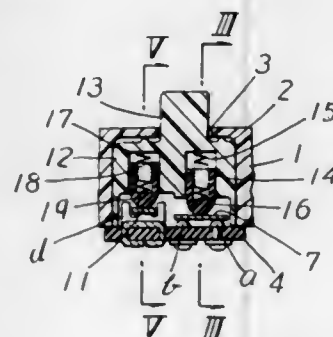
Filed Dec. 21, 1971, Ser. No. 210,368

Claims priority, application Japan, Dec. 28, 1970, 45/136604

Int. Cl. H01h 15/00, 19/00

U.S. Cl. 200-16 R

4 Claims



A switching device, particularly for use with a vehicle, which is characterized in that a plurality of stationary contacts are selectively connectable with movable contacts which are movable substantially in a vertical direction by means of a single actuating member.

3,735,061

**ELECTRICAL SWITCH ASSEMBLY**

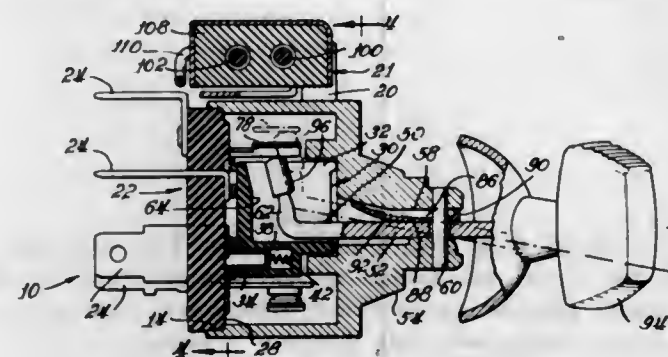
Lucid Lincoln Byrd, Mount Prospect, Ill., assignor to Carter Precision Electric Company, Skokie, Ill.

Filed Dec. 16, 1971, Ser. No. 208,694

Int. Cl. H01h 15/00

U.S. Cl. 200-16 R

9 Claims



An electrical switch assembly having multiple on switch positions operated by an actuator lever and a pair of normally open switch contacts. One of the switch contacts is disposed along the path traced by the actuator lever in moving between the multiple on switch positions. Lever biasing means are provided to enable the actuator lever to be moved perpendicular to the switch path for closing the pair of switch contacts in any of the multiple on switch positions. A resistor subassembly encased in a heat conducting casing is mounted on the switch housing in a manner to provide a heat sink arrangement.

3,735,062

**EXTENDED CYCLE TIMER WITH MOMENTARY SWITCH**

Benjamin F. Chestnut, and Joseph E. Wiser, both of Indianapolis, Ind., assignors to P.R. Mallory & Co. Inc., Indianapolis, Ind.

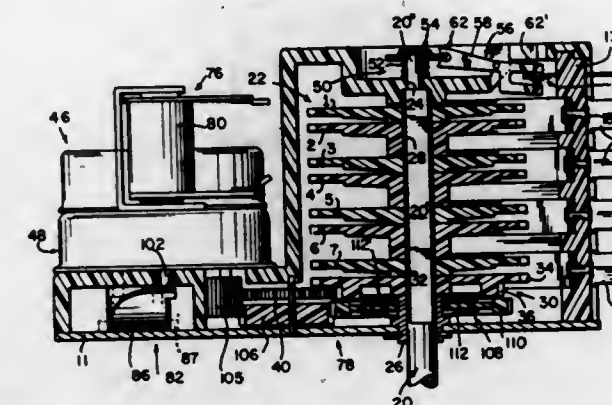
Continuation of Ser. No. 813,522, May 4, 1969, abandoned.

This application Aug. 19, 1971, Ser. No. 173,318

Int. Cl. H01h 43/00

U.S. Cl. 200-38 R

14 Claims



A timer wherein the "push or pull" of a shaft means, which carries a cam means for actuating switches responsive to the cam means, actuates an actuator means which in turn actuates a contact blade to open and close electrical contacts. The cam means includes a cycle selector means coupled to a constant drive means, and an intermittent drive means coupled to the shaft means, with means responsive to the cycle selector means to selectively energize the intermittent drive means.

3,735,063

**TIME CONTROLLED AUTOMATIC PROGRAMMING DEVICE WITH ADJUSTABLE PINS ON PROGRAMMING DRUM AND ADJUSTABLE CONTACT ARRAY**

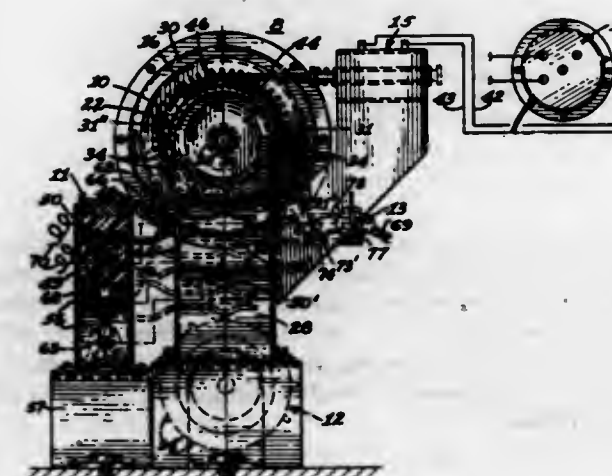
Leonard R. Stillbert, 3218 W. State Avenue, Phoenix, Ariz.

Filed Mar. 28, 1972, Ser. No. 238,886

Int. Cl. H01h 43/10

U.S. Cl. 200-38 CA

5 Claims



A programming device removably associated with television, radio, or any other similar receiver which may be manually, selectively adjusted to cause the receiver to automatically function to select particular channels at precise times of day or night. The programming device is also provided with an alarm or call component which functions in conjunction with the device to attract the viewer or listener's attention to a particular preset channel or program at a given time.

3,735,064

**VOIDABLE COVER INTERLOCK**

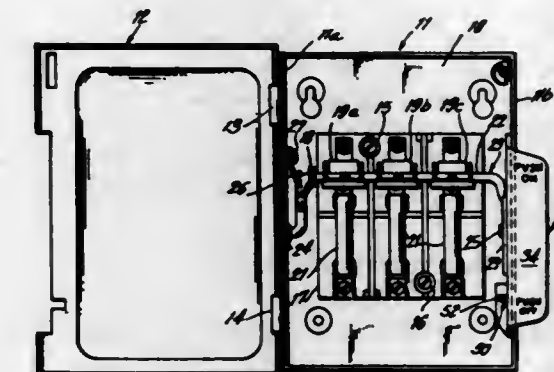
Ralph C. Clement, Bellefontaine, Ohio, assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Jan. 24, 1972, Ser. No. 220,095

Int. Cl. H01h 9/22, 3/20

U.S. Cl. 200-50 A

9 Claims



A switch enclosure having an openable cover and a handle operable externally of the enclosure for operating a switch therein, is provided with a voidable interlock that normally prevents opening of the cover when the handle is in the switch ON position. The interlock consists of a single screw mounted to the handle and movable therewith. Under normal operating conditions, with the handle in the ON position the screw blocks opening of the cover and in the handle OFF position the screw is aligned with a notch in the cover that provides clearance thereby permitting the cover to be opened. When the handle is in the switch ON position a formation thereof covers the notch so that objects may not be inserted through the notch into the enclosure. Also, when the handle is in ON position, the interlock limits movement of the cover from its fully open position to a partly rather than completely closed position and in this partly closed position it is not possible to apply a padlock to maintain the cover in this position. The head of the screw is accessible externally of the enclosure to permit operation of the screw to a retracted position wherein the interlock is voided and the cover may be opened whether the handle is in switch ON or OFF position.

3,735,065

**LOW PROFILE CIRCUIT BREAKER WITH STAGGERED TERMINALS**

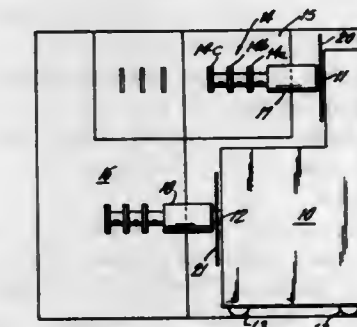
Thomas F. Brandt, Jr., Swarthmore, and Philip C. Netzel, Milmont Park, both of Pa., assignors to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Oct. 26, 1971, Ser. No. 192,073

Int. Cl. H01h 33/66

U.S. Cl. 200-50 AA

8 Claims



Low profile high voltage truck mounted switchgear having upper back disconnect studs and contacts and lower back disconnect studs and contacts in which the lower back discon-



nect studs and contacts extend beyond the truck and the upper back disconnect contacts are stepped back toward or above the switchgear in the truck to produce the proper electrical clearance and spacing on a diagonal line in a vertical plane. This structure makes it possible to produce a low silhouette which may more readily be camouflaged for environmental beautification and obviates the need for spacing the axes of the upper and lower back disconnect studs by the full vertical distance necessary for proper electrical clearance and spacing. The volume of the entire assembly including the switchboard housing may be reduced since the horizontal length of the switchgear truck need not be increased; while a portion of the housing, as for instance the part containing the supply bus, may overlie a portion of the truck and lower back disconnect stud and contact when the switchgear is placed in the switchboard.

3,735,066

# SWITCHING DEVICE FOR A COIN CONTROLLED MACHINE

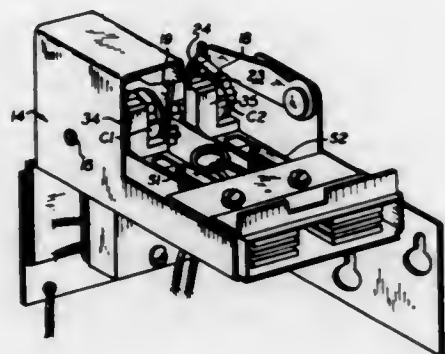
Harry Greenwald, Whitestone, and Robert Tuppo, Elmhurst, both of N.Y., assignors to Walter Kiddie & Company, Inc., Clifton, N.J.

Filed Nov. 26, 1971, Ser. No. 202,506

Int. Cl. H01h 13/58; G07f 5/10

U.S. Cl. 200—52 R

8 Claims



A switching device for a coin controlled machine in which a drive member, movable in unison with the coin slide, has two alternately selectable configurations for operating a pair of series connected switches that control the machine. In one configuration, the drive member displaces cams that actuate the switches to establish conduction through both switches after a given number of coin slide insertions. In the other configuration, the drive member engages contact members extending from the switches to establish conduction through both switches after a single coin slide insertion.

3,735,067

# PISTON TYPE CONTACT ACTUATOR STRUCTURE FOR AUTOMOTIVE POWER BRAKE SWITCH ASSEMBLY

Ronald L. Shellhouse, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 14, 1972, Ser. No. 217,805

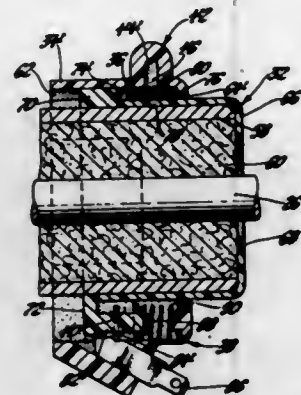
Int. Cl. H01h 9/06, 15/12

U.S. Cl. 200—61.86

2 Claims

A power brake assembly has a boot through which the brake pedal operated push rod extends to control the power brake. Instead of the usual flexible convoluted rubber boot, the boot is made of two housings forming tubes or cylinders, one slidably located within the other, with the power brake piston extension containing the atmospheric air inlet filter extending into the inner housing. A switch mechanism is provided in the outer housing and includes a biasing spring acting on a switch contact carrier. The inner housing has a probe which engages the contact carrier so that in one slidable posi-

tion of the inner housing relative to the outer housing the contact carrier is urged into position relative to other switch contacts so that the switch or switches comprising the switch mechanism have assumed positions, either open or closed, as desired. This occurs when the power brake piston has moved in the brake apply direction. When the power brake piston moves to the brake release position, the probe on the inner



housing moves the contact carrier against the spring, changing the operational status positions of the switches. A vacuum control valve arrangement is also provided so that a port is closed or connected to atmosphere depending upon the position of the inner housing relative to the outer housing, if such a vacuum control is needed as, for example, in conjunction with a road speed control device.

3,735,068

# PUSH-BUTTON SWITCH WITH RESILIENT CONDUCTIVE CONTACT MEMBER AND WITH HELICAL CONDUCTIVE NETWORKS

Makoto Yanaga, and Takemi Shimojo, both of Tokyo, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

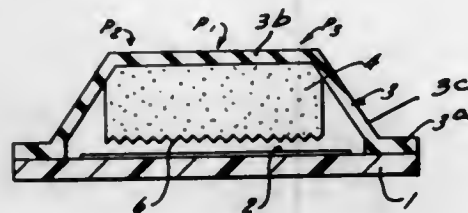
Filed Aug. 18, 1971, Ser. No. 172,765

Claims priority, application Japan, Sept. 26, 1970, 45/95870

Int. Cl. H01h 13/06, 13/52, 1/24

U.S. Cl. 200—159 B

4 Claims



In a push-button switch using an elastic and electrically conductive contact member movable into and out of engagement with adjacent but separated conductive paths on a substrate, the conductive paths are in the form of helices fitting within one another and the engaging surface of the contact member is provided with a series of lands arranged in a plurality of L-shaped patterns.

3,735,069

# SNAP-ACTION ELECTRIC SWITCH

Jens Nicolai Andresen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Jan. 5, 1972, Ser. No. 215,488

Claims priority, application Germany, Feb. 12, 1972, P 21 01 195.0

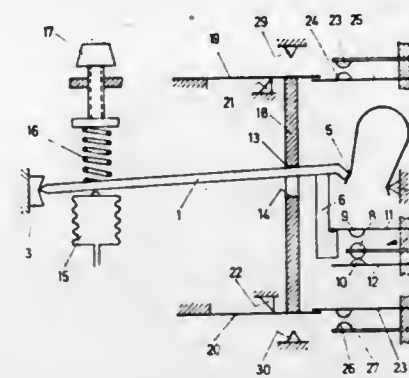
Int. Cl. H01h 13/36

U.S. Cl. 200—67 D

2 Claims

The invention relates to a snap action switch assembly which in addition to the usual contact switch means has a mid-

dle or normal range bound by movable stops which movement is proportional to or determined by the amount of force applied thereto through an actuating lever. The actuating lever is not only acted upon by moderate forces in the usual way to provide the usual control but, in addition, is also acted upon



by larger forces in response to extreme conditions in a system. These larger forces move the displaceable stops and one or more auxiliary switch means are provided which are actuated under these circumstances to provide control under the extreme conditions referred to.

3,735,070  
SWITCH

Harm Kreutzelman, and Laurentius Maria Verhoeven, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

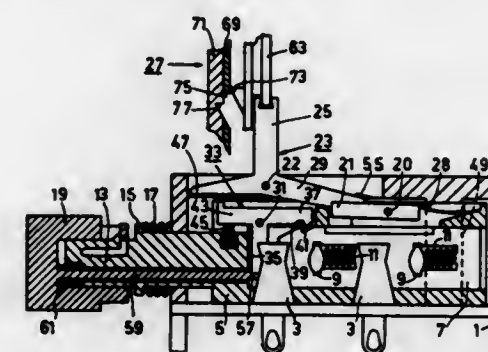
Filed Nov. 11, 1971, Ser. No. 197,861

Claims priority, application Netherlands, Nov. 21, 1970, 7017069

Int. Cl. H04h 15/18

U.S. Cl. 200—78

18 Claims



A switch comprises a housing having fixed switching contacts and a slidable carriage which is movable by a switch-on spring. The switch-on spring can be locked in place. A slide having moving switching contacts is also provided and is movable by a switch-off spring, which can also be locked. The slide having the moving contacts is arranged for sliding movement in the carriage. The springs are consecutively unlocked by a trigger mechanism moving twice in the same direction.

3,735,071

# LOW PRESSURE CONTROL SWITCH WITH BRIDGING CONTACTS

George R. Burnett, and Jessie E. Burnett, both of No. 2 Pyc Court, El Dorado, Ark.

Filed Dec. 6, 1971, Ser. No. 204,863

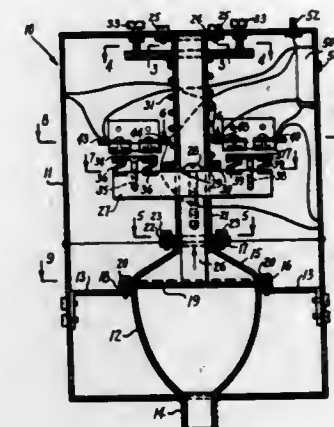
Int. Cl. H01h 35/34, 1/20

U.S. Cl. 200—83 J

2 Claims

The present invention relates to a low pressure control switch for pump controls and includes a diaphragm actuated

double contact switch for controlling both sides of the electric circuit. The diaphragm is spring returned and the spring ten-



3,735,072

# IMPACT-OPENING ELECTRICAL SWITCH WITH BREAKABLE FRANGIBLE ELEMENT

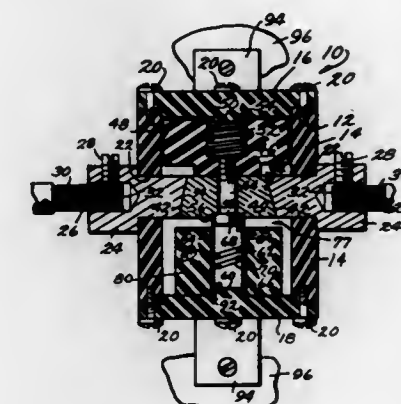
Robert C. Six, Jr., Route 1, Elliston, Va.

Filed Aug. 19, 1971, Ser. No. 173,222

Int. Cl. H01h 35/02

U.S. Cl. 200—61.45 R

7 Claims



Primarily for automotive use between the battery and the electrical system, the switch includes two stationary contacts normally bridged by a movable contact. The movable contact is biased by resilient means toward an open condition, but is normally held closed by a frangible element designed to be broken by a breaker element upon a change in momentum equal to a preselected threshold level of e.g. 10 miles per hour. The switch is preferably interposed in the battery cable on the "hot" side and mounted on the vehicle near the battery, e.g. on an engine compartment wall.

3,735,073

# CIRCUIT INTERRUPTER WITH OVERCENTER SPRING CHARGING MEANS

Norman Davies, East Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 30, 1971, Ser. No. 203,216

Int. Cl. H01h 3/30

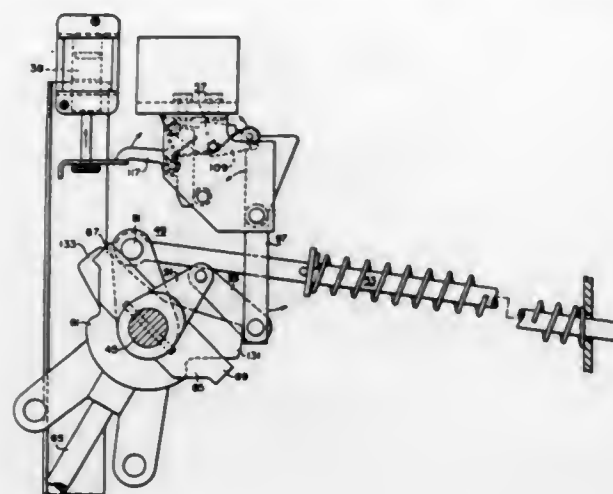
U.S. Cl. 200—153 SC

9 Claims

A circuit interrupter having stored energy overcenter spring



operating means for operating the interrupter between open and closed positions and having auxiliary spring closing means



for overcoming electromagnetic "blow-out" forces incurred by fault current.

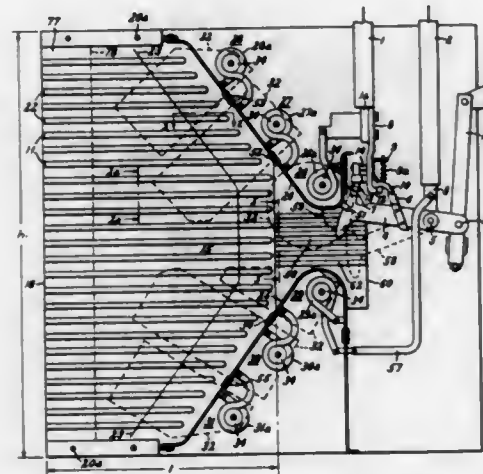
3,735,074

**ARC CHUTE FOR AN ELECTRIC CIRCUIT BREAKER**  
Gerhard Frind, Schenectady, N.Y.; Richard M. Korte, West Chester, and John E. Zupko, Philadelphia, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed July 14, 1971, Ser. No. 162,431  
Int. Cl. H01h 33/08

U.S. Cl. 200-144 C

16 Claims



An arc chute for an electric circuit breaker comprises insulating sidewalls and plates, or fins, of insulating material that extend transversely of the sidewalls and have edges for engaging the arc as it moves into the chute. The sidewalls and edges of the plates are coated with a plasma-arc-sprayed refractory metal-oxide consisting essentially of amorphous fused silica.

3,735,075

**ELECTRIC CIRCUIT BREAKER HAVING AN ARCING CONTACT WITH LARGER PIVOT NOTCH THAN PARALLEL MOVABLE CONTACTS**

Alan Lister Kidd, Southport, England, assignor to Dorman Smith Switchgear Limited, Preston, PR2 2DQ, England  
Filed Sept. 29, 1971, Ser. No. 184,799

Claims priority, application Great Britain, Oct. 29, 1970, 51,353/70

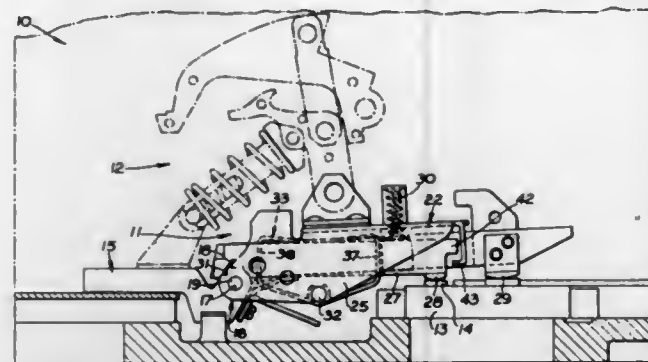
Int. Cl. H01h 1/54, 33/12

U.S. Cl. 200-146 R

7 Claims

An electrical circuit breaker or isolator, for switching currents of the order of 100,000 amperes, has for each pole

thereof, a respective moving contact assembly comprising a plurality of parallel-connected movable contact arms each carrying a respective movable contact engageable with a fixed contact, said arms being of strip metal resiliently mounted side-by-side and substantially parallel to each other in a carrier, each said arm having a V-shaped notch adjacent one end whereby it locates onto an arcuate surface provided by a fixed



hinge contact block to which the carrier is hingedly connected, whereby electrical continuity is provided between the arms and the block by direct contact therebetween. An arcing contact arm present in the assembly has the angle of the V-shaped notch in the arcing contact different from that in the other arms to take account of the larger blow-off force occurring between the arcing contact arm and the arcuate surface.

3,735,076

**ELECTRONIC MUSICAL INSTRUMENT KEY-OPERATED SWITCH ASSEMBLY HAVING VIBRATION-ABSORBER ATTACHED TO MOVABLE CONTACT MEMBER**

Masakatsu Iijima, Shizuoka-ken, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

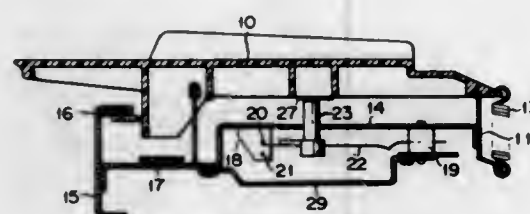
Filed Dec. 22, 1971, Ser. No. 210,890

Claims priority, application Japan, Dec. 26, 1970, 45/131831

Int. Cl. H01h 1/50

U.S. Cl. 200-166 D

12 Claims



In a key-operated switch assembly having a movable and a stationary contact member, a soft shock or vibration absorbing member is attached to the movable contact member. The shock absorbing member is made of elastic or resilient material having greater shock or vibration absorbing capacity and is molded into one integral piece along with an actuator actuating the movable contact member. The shock absorbing member may be provided with a thin tongue-like projection extending toward the free end of the contact member so as to obtain a better shock absorbing effect.

3,735,077

**ILLUMINATED MINIATURE SWITCH**

Shigeo Ohashi, Tokyo, Japan, assignor to Nihon Kaiheiki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 28, 1971, Ser. No. 184,394

Claims priority, application Japan, Feb. 5, 1971, 46/5548

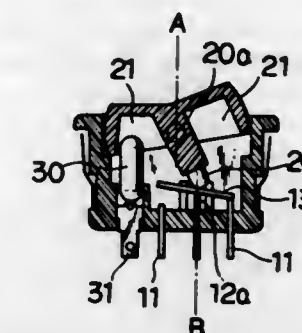
Int. Cl. H01h 9/16

U.S. Cl. 200-167 A

8 Claims

An illuminated miniature switch which is switched ON or OFF by rocking motion of an actuator, wherein a projected

portion of the actuator is provided inclined relative to the side face of the body portion of the switch, and the fulcrum portion of a movable contact plate receiving element is offset from a straight line vertical to the bottom surface of the switch body



portion and passing through the axial portion of the actuator, whereby a space is formed in the opposite side from the offset position of the receiving element to dispose an illuminator such as a lamp, neon bulb or luminous diode therein, so as to illuminate the actuator from thereunder.

3,735,078

**EXPLOSION PROOF BOX WITH DOOR MOUNTED SWITCH**

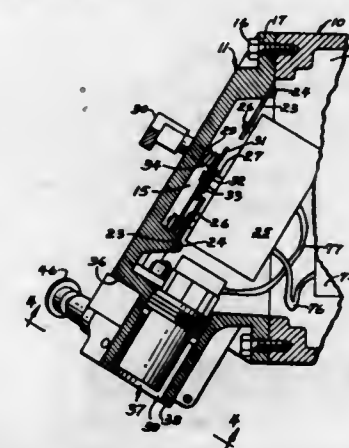
Arthur I. Appleton, Northbrook; Duncan Turner, Des Plaines, and Robert J. Pastorek, Chicago, all of Ill., assignors to Appleton Electric Company, Chicago, Ill.

Filed May 10, 1971, Ser. No. 141,670

Int. Cl. H01h 9/04

U.S. Cl. 200-168 G

9 Claims



A rigid cast box has a rectangular flange encircling the box opening. A cover has a mating flange which is bolted to the box flange to define an explosion proof enclosure. The cover is also hinged to the box so that it will be supported when the bolts are removed. Attached to the inside of the cover is an electrical switch. A handle on the face of the cover is rotatable to actuate the switch. The cover also carries the socket of a mating plug and socket combination. An interlocking apparatus connects the socket and the switch handle so that the switch cannot be turned on without having the plug all the way in the socket and, when the switch is turned on, the plug cannot be removed from the socket.

3,735,079

**SPRING CONTACT BLANK**

Frank L. Dieterich, 3727 S. Robertson Boulevard, Culver City, Calif.

Division of Ser. No. 728,683, May 13, 1968, Pat. No. 3,579,822. This application Apr. 29, 1971, Ser. No. 138,824

Int. Cl. H01h 1/06

U.S. Cl. 200-166 F

6 Claims

A contact strip blank of plural spring contacts from which individual spring contacts are severable. The blank has a plu-

ality of side-by-side wire fingers joined at one end by a conductive, plated strip with the opposite finger ends extending in flexure relation therefrom. The free ends of the wire fingers are formed as radiused points of contact, and the blank is heat treated to develop hardness, wear resistance and spring characteristics in the fingers, and spring contacts of varying widths are severable from the blank by cuts in the direction of the fingers. In a preferred method, the blank is made by wind-



ing a substantial length coil of a single layer of fine, heat-treatable precious metal alloy wire on a generally cylindrical mandrel, masking spaced strips longitudinally of the wire coil, silver plating the wire coil between the masked strips, removing the strips and cutting the strip-plated wire band from the mandrel as a sheet, cutting the wire sheet in the middle of the plated and unplated strips to provide the strip blanks for the forming and heat treating steps.

3,735,080

**SNAP-ACTION ELECTRIC SWITCH**

Jens Nicolai Andresen, Damager 16, Nordborg, Denmark

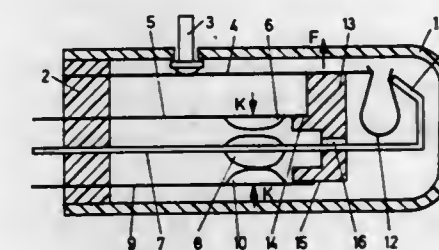
Filed Jan. 5, 1972, Ser. No. 215,487

Claims priority, application Germany, Jan. 12, 1971, P 21 01 197.2

Int. Cl. H09h 13/36

U.S. Cl. 200-67 D

3 Claims



The invention relates to a snap action electric switch assembly in which the contact system is completely separated from the snap action system. The separation feature allows adjustments of the snap action system without affecting other properties of the switch.

3,735,081

**RUN TIME METER INSTALLATION FOR MICROWAVE OVENS**

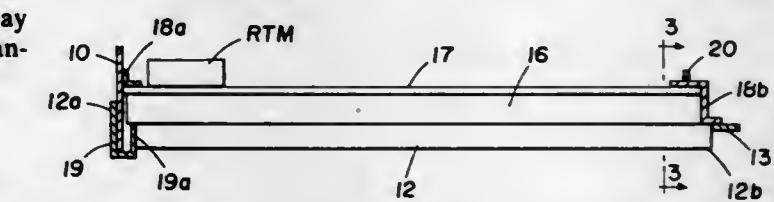
George C. Foerstner, Amana, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Filed Sept. 20, 1971, Ser. No. 182,019

Int. Cl. G04b 5/20; H05b 9/06

U.S. Cl. 219-10.55

1 Claim



A microwave oven for rental installations is provided with a run time meter which cumulatively records the periods of time during which the oven is in operation. The run time meter is hidden behind a grille at the front of the oven, the grille being removable for access to the meter upon removal of a hidden Allen headed screw.



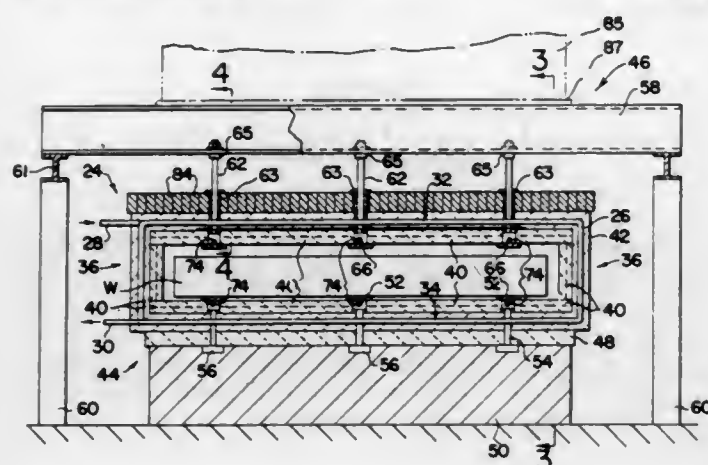
3,735,082

**INDUCTION HEATING COIL SUPPORT**  
Robert J. Kasper, Seven Hills, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Feb. 2, 1972, Ser. No. 222,827  
Int. Cl. H05b 5/18

U.S. Cl. 219-10.79

16 Claims



An induction heating coil support is disclosed which includes overhead support rails and tie rods interconnecting the support rails and an upper portion of the coil in a manner whereby the latter portion of the coil is supported in suspension with the axis of the coil horizontal. The coil includes axially spaced apart convolutions and the tie rods extend downwardly between adjacent convolutions and are interconnected with guide rail means disposed within the coil so as to engage the inner surface of the upper portion of the coil. The overhead support rails may extend longitudinally or transversely with respect to the coil axis, and the support rails are supported above the coil by vertical support posts at opposite ends thereof. The bottom portion of the coil rests on underlying support means provided therefore.

3,735,083

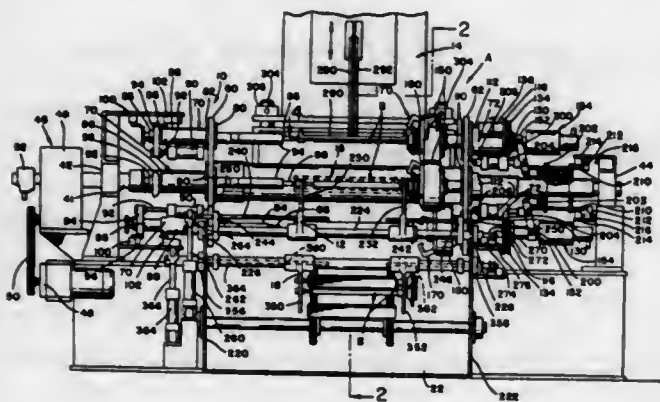
**METHOD FOR INDUCTIVELY HEATING AN ELONGATED WORKPIECE**

Richard F. Seyfried, Parma Heights, and Norbert R. Balzer, Parma, both of Ohio, assignors to Park-Ohio Industries, Inc., Cleveland, Ohio

Division of Ser. No. 884,492, Dec. 12, 1969, Pat. No. 3,648,995. This application Jan. 10, 1972, Ser. No. 216,642  
Int. Cl. H05b 5/02

U.S. Cl. 219-10.41

4 Claims



An apparatus for inductively heating an elongated workpiece preparatory to quench hardening, employing means for conveying the workpiece along a path, a single turn inductor positioned adjacent this path for inductively heating the elongated workpiece, as a unit, while it is being rotated, means for shifting the induction heating means away from the workpiece to clear the workpiece for movement along the path, and means for subsequently quench hardening the workpiece.

3,735,084

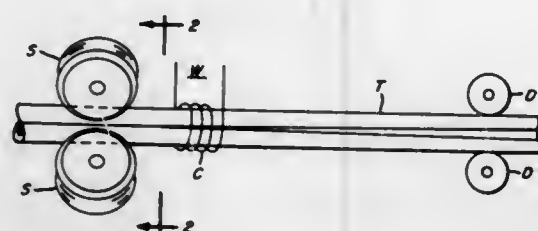
**METHOD OF CONTROLLING THE QUALITY OF SEAM WELDED PRODUCT**

John M. Urbanic, Pittsburgh; D. Marshall Fox, and Frederick C. Panlan, both of Lower Burrell, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 77,411, Oct. 20, 1970, abandoned. This application May 11, 1972, Ser. No. 252,306  
Int. Cl. B23k 31/06

U.S. Cl. 219-67

3 Claims



A method of controlling the quality of a product having a weld seam extending longitudinally thereof, the seam being progressively produced by a welding arc generated across adjacent edges of product stock as the stock travels past a welding station, and as the edges are forced together at a location downstream from the welding station. The method includes the steps of continuously measuring a plurality of critical welding parameters as the seam is being formed, and identifying for rejection the lengths of the product welded when any one or group of the welding parameters deviate from limits predetermined for the parameters. By this method confidence levels of 99.95 percent, soundly welded product are obtained.

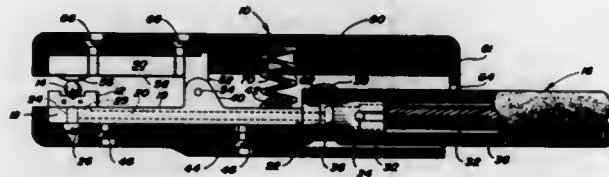
3,735,085

**CUTTING AND GOUGING TORCH**

Kenneth E. McCall, and Donald H. Reese, both of Lancaster, Ohio, assignors to Arcalr Company, Lancaster, Ohio  
Filed Feb. 11, 1972, Ser. No. 225,541  
Int. Cl. B23k 9/00, 9/28

U.S. Cl. 19-70

6 Claims



A cutting and gouging torch to be used in the air-carbon arc process. This low current capacity torch is ideally suited for use with electrodes of less than one-quarter inch in diameter and is readily fabricated, has fewer parts, and is relatively inexpensive to manufacture. The torch is characterized in that the members that insulate the operator from the current carrying members serve as the operative members for inserting or removing electrodes from the torch. A further feature of the new torch resides in the nozzle head acting as a valve to control the passage of the air therethrough.

3,735,086

**CIRCUMFERENTIAL ELECTROSLAG WELDING**

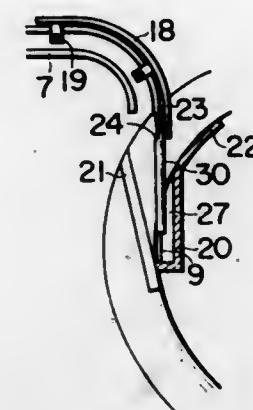
Takeshi Wada; Hisanao Kita, and Michio Kitamura, all of Hitachi-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed Oct. 19, 1971, Ser. No. 190,588  
Int. Cl. B23k 9/18

U.S. Cl. 219-73

3 Claims

Circumferential electroslag welding for jointing a pair of cylindrical members in which a water-cooled mold to be

removed after the start of welding is placed outside of the annular space formed between the members so that the deposit metal at the start zone is formed outside of the annular space and the tip of a welding wire is steadily guided through a con-



sumable nozzle, the top end of which is electrically connected to the tip of a non-consumable nozzle in the start zone, said top end being partially cut off so that the consumable nozzle can be detached from said wire when said consumable nozzle is consumed to the point of the cut.

3,735,087

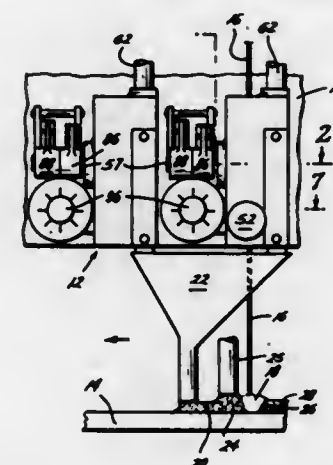
**METHOD AND APPARATUS FOR ADJUSTABLE METERING**

Roman F. Arnoldy, Houston, Tex., assignor to R. I. Patents, Inc., Houston, Tex.

Division of Ser. No. 849,020, Aug. 11, 1969, abandoned. This application Mar. 4, 1971, Ser. No. 121,220  
Int. Cl. B23k 9/12

U.S. Cl. 219-73

23 Claims



The present invention relates to metal metering methods and apparatus such as employed in welding equipment using granular material to form its weld bead; and more particularly, relates to such metering methods and apparatus and the controls therefor. The present invention encompasses the use of methods and control means to provide controlled rates of feed for the granular material, either based on the rate of feed of the electrode or on selected compositions for the weld bead. In addition to the basic method disclosed, a mechanical embodiment of the apparatus is shown which employs a rocker arm or arms and a linkage to transfer motion from a shaft connected to the electrode feed means to the metering wheel. Adjustment is provided for the rocker arm and linkage to adjust the amount of motion that is transferred to each individual metering wheel. An electrical embodiment of the apparatus is also disclosed and this utilizes two controls to limit the current flow to the metering wheel motors, one to adjust the current

flow in relation to the rate of feed for the electrode and the second to provide individual control over individual motors, and in turn, over individual metering wheels. The present invention, therefore, provides method and means to give, not only synchronization of the granular feed with the electrode feed, but also over the composition of the total feed by controlling the rate of feed of the individual ingredients.

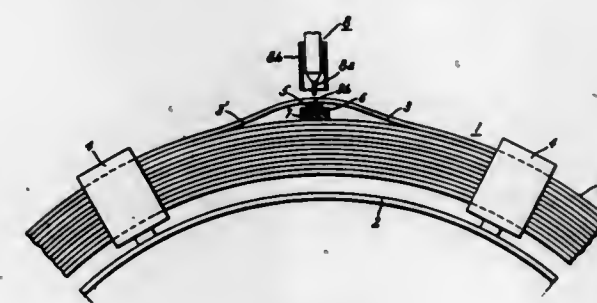
3,735,088

**BRAZING METHOD AND APPARATUS**  
Homer H. Hall, Rome, Ga., assignor to General Electric Company

Filed Mar. 8, 1971, Ser. No. 121,685  
Int. Cl. B23k 1/04

U.S. Cl. 219-85

8 Claims



Joints in copper wire of electrical coil windings are brazed by applying a tungsten inert gas (TIG) torch on the upper side of the joint with a braze alloy arranged on the under side. A thermal shield, such as superposed asbestos and mica sheets, is arranged between the braze alloy and the underlying coil windings to protect the windings from the heat of the brazing process.

3,735,089

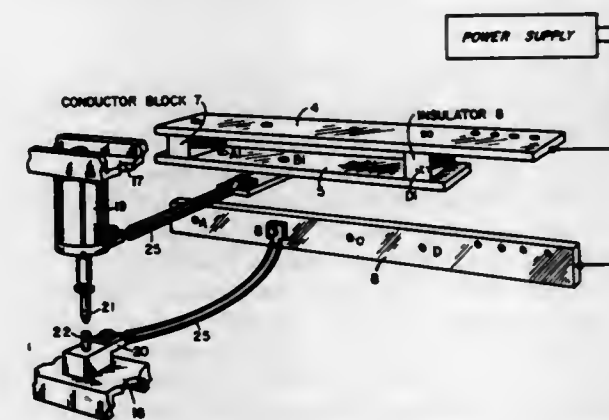
**MULTIPLE ELECTRODE RESISTANCE WELDING MACHINE**

David Sciaky, Chicago, Ill., assignor to Welding Research, Inc., Chicago, Ill.

Filed Nov. 5, 1971, Ser. No. 196,030  
Int. Cl. B23k 9/28

U.S. Cl. 219-87

6 Claims



The subject of this invention is a multiple electrode resistance welding machine in which, by a particular configuration of the conductors which connect the power supply to the several welding positions, the DC resistance and the inductance of the circuit between the power supply and each of the welding guns is made constant. Through the use of the novel arrangement of secondary circuit conductors, the total resistance and the inductors in all of the circuits is the same so that the welding current and wave shape is the same in all of the secondary gun circuits and the weld quality at all of the welding points is uniform.



3,735,090

**FLUX CORED TUBULAR ELECTRODE FOR GAS SHIELDED ELECTRIC-ARC WELDING**

Igor Konstantinovich Pokhodnya, and Vladimir Nikolaevich Golovko, both of Kiev, U.S.S.R., assignors to Institut Elektrosvarki imeni E. O. Patrona Akademii Nauk Ukrainsskoi SSR, Kiev, U.S.S.R.

Filed July 8, 1971, Ser. No. 160,918  
Int. Cl. B23k 35/22

U.S. Cl. 219—146

2 Claims

A continuous electrode for shielded-gas welding and building-up of steels consisting of a powdery core in a steel envelope, the core comprising taken in the following per cent by weight:

|                      |         |
|----------------------|---------|
| fluorite concentrate | 15-26   |
| marble               | 5.0-10  |
| ferromanganese       | 4.5-6.5 |
| ferrosilicon         | 1.0-3.5 |
| alumina              | 2.0-6.0 |
| manganese ore        | 0.5-1.5 |

the balance being iron powder.

The electrode having a core composition according to the present invention features good welding and technological characteristics and provides for high mechanical properties of the weld joint metal.

3,735,091

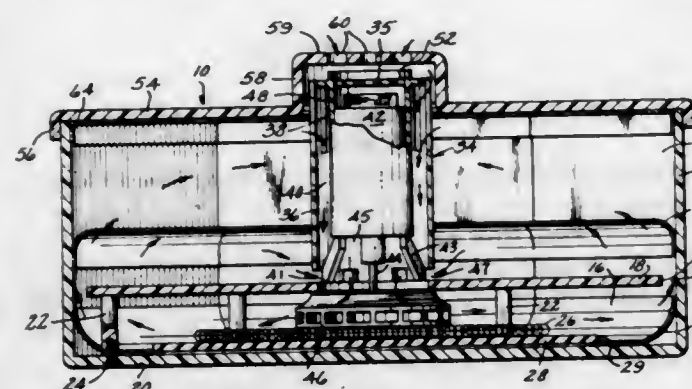
**ELECTRICALLY HEATED HAIR CURLING APPARATUS**

Fred E. Baker, Asheboro, N.C., assignor to General Electric Company, Bridgeport, Conn.

Filed Dec. 17, 1971, Ser. No. 209,192  
Int. Cl. H05b 1/00; F27d 7/04; A45d 4/12

U.S. Cl. 219—400

5 Claims



Hair curling apparatus that employs heated air for heating hair curlers. A drum housing has bottom, side, and a removable top wall with a central opening in the top wall. An electrical resistance heating element is disposed low in the housing under a horizontal partition that forms upper and lower chambers and has openings around the partition and centrally thereof for continuous circulation of warm air from one chamber to the other. A motor-driven fan is centrally disposed in the upper chamber under the central opening and its shaft extends through the partition to a fan in the lower chamber. The motor is surrounded by a double-walled cylinder so that cool make-up air is continuously circulated through the central opening over the motor while the warmed air is continuously recirculated in the housing over the curlers.

3,735,092

**FUSER CONTROL CIRCUIT FOR COPYING APPARATUS**

Robert L. Traister, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

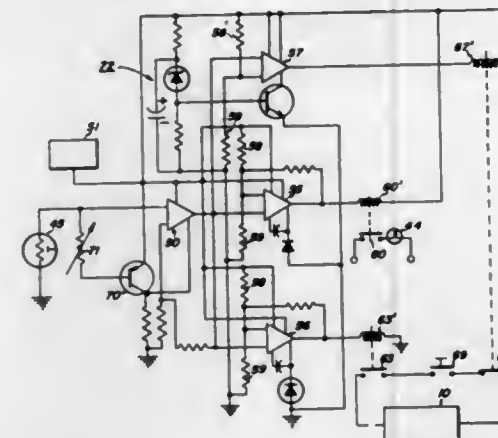
Filed Oct. 18, 1971, Ser. No. 189,859  
Int. Cl. H05b 1/02

U.S. Cl. 219—501

6 Claims

An arrangement for controlling the fuser heat source in an electrostatic type reproduction machine to maintain fuser

temperatures within a desired operating range and protect the reproduction machine in the event fuser temperatures become too high. The arrangement includes a thermistor to sense temperature conditions within the fuser, an amplifier to amplify the thermistor signal output to a level permitting relatively in-



expensive switching devices to be used directly as fuser and reproduction machine controls without the need for relatively sensitive and correspondingly expensive intermediate comparator circuitry, and switching devices for operating the fuser heat source and controlling the reproduction machine in response to predetermined fuser temperature conditions.

3,735,093

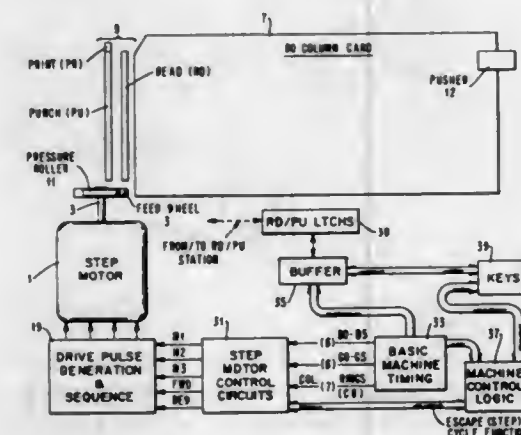
**STEP MOTOR AND CONTROLS FOR NON-OSCILLATING PUNCH/READ POSITIONING OF 80-COLUMN RECORD CARDS**

Frank T. Kendall, Poughkeepsie; Donald L. Pierce, Hyde Park, and Walter J. Weikel, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1971, Ser. No. 158,343  
Int. Cl. B26f 1/04; G06k 13/07; H02k 37/00

U.S. Cl. 235—61.1

10 Claims



A high precision high speed bidirectional step motor assembly, without gears or commutation, rapidly and precisely positions standard 80 column record cards without oscillation relative to a combined reading, punching and printing station of a card data recorder. Read cells and punch-print elements are separated by 2 units of card column displacement ( $2 \times 0.087$  inches). Four step drive excitation for the step motor (three drive pulses and one "hold" or "detent" pulse) is derived from pre-existing recorder circuits associated with buffer storage and logic sections. This permits reading, punching and printing operations to occur in synchronization with buffer and logic operations while card motion is definite-

ly stopped in the holding stage of the motor drive cycle. A pressure roller which engages the card with a feed wheel extension of the step motor is disengaged either manually or by operation of conventional registration mechanisms as the cards are fed to the initial registration position of the combined station (card column "0" under punch and print elements; column 2 under read cells). In read mode the first dummy cycle of step motor excitation backs up the card one column returning column 1 of the card to the read position. The advantage of this is that the read cells can be utilized in a dual mode to detect the leading edges of cards as a condition of the registration operation and to read card apertures. In punching-printing mode the usual first "dummy" cycle of forward stepping is taken.

3,735,094

**OPTICAL CODE READING SYSTEM**

Robert A. Dunn, Willowick, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

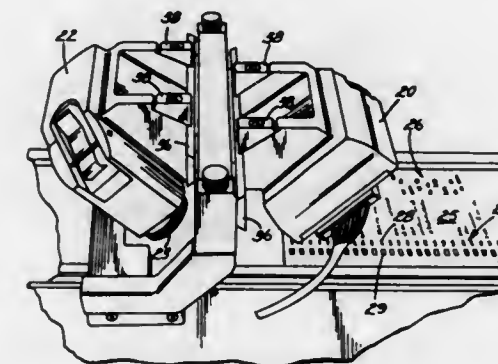
Continuation of Ser. No. 50,129, June 26, 1970, abandoned.

This application July 3, 1972, Ser. No. 268,409

Int. Cl. G06k 7/015, 7/10, 9/04

U.S. Cl. 235—61.11 E

7 Claims



An optical scan card reader incorporating substantially a dual electrical package as set forth in U.S. Ser. No. 11,613, filed Feb. 29, 1960. Although that teaching is not essential to an understanding of this description, it is referred to for the convenience of those who may not be fully familiar with such electronic systems.

This invention sets forth the coordination of a plurality of optical scan devices having a plurality of read heads aimed at a single strip area extending transverse to the path of travel of a document whereby various portions of a single document may be read simultaneously by the read head as those portions are positioned in the strip area. The invention further sets forth means to find and read a scan path wherever it is located on a document and a plurality of interchangeable light responsive means arranged in different predetermined arrays which may be selectively inserted in the read head to sense varying arrays of data carried on the document.

3,735,095

**CARD ROUTING APPARATUS**

Gerhard Mutz, Bernhard Hettich, and Werner Moser, all of Villingen, Germany, assignors to Kienzle Apparate GmbH, Villingen/Schwarzwald, Germany

Division of Ser. No. 818,523, April 23, 1969, Pat. No.

3,614,094. This application Apr. 29, 1971, Ser. No. 138,669

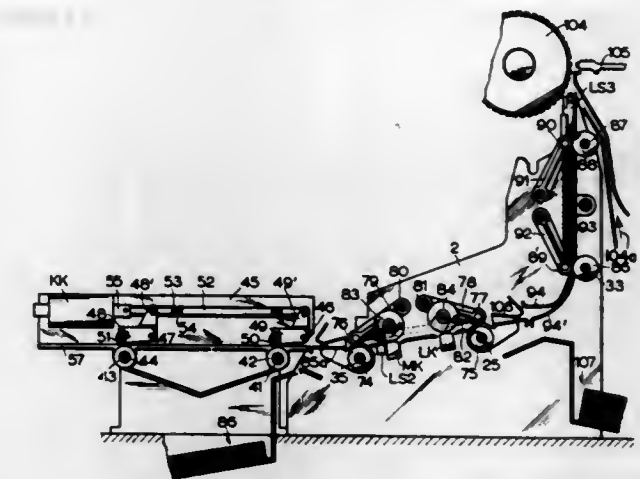
Int. Cl. B65h 24/58; G06k 3/00

U.S. Cl. 235—61.9 R

11 Claims

Cards are transported by reversible transporting means between an input station, a readout and recording station, and a printing station. Routing means are disposed between the

input station, and the readout and recording station, for discharging returned cards, and other routing means are located between the readout and recording station, and the



printing station, for discharging read out cards which need not reach the printing station. The routing means cooperate with reversible transporting means for the cards.

3,735,096

**SYSTEM FOR PROCESSING CODED PULSE DATA**

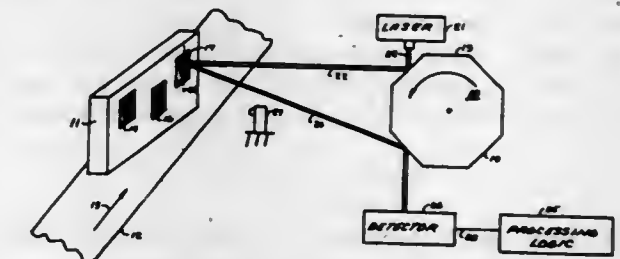
Ronald P. Knockart, Walled Lake, and Frank A. Russo, Farmington, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 13, 1971, Ser. No. 207,150

Int. Cl. G06k 7/10

U.S. Cl. 235—61.11 E

33 Claims



This invention is directed to a system for processing pulse information which is coded in binary, BCD, or some other type of pulse code. The information is coded into a plurality of active states which represent a series of functional operations. The functional operations occur in a specific sequence, and all operations occur several times before an output is generated. Accordingly, the system is capable of distinguishing each state and of either accepting or rejecting incoming data signals, depending upon the correspondence of the incoming signals with the defined operational functions. As each state is properly received, the system sequences to receive the next state. After a complete set of states is received, the data signals are stored and the remainder of the system cleared of all processing signals. The data received during the next complete series of states is compared with the prior data stored and, if a valid comparison results, a data ready signal generated. After a preselected number of valid comparisons are made the pulse code is accepted as valid and used to actuate a utilization device.



3,735,097

**EMBOSSMENT READER**

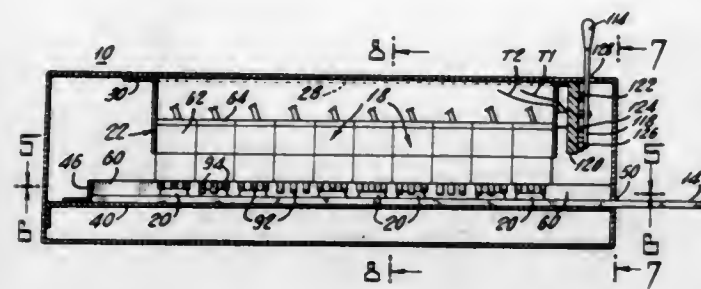
Richard A. Zeitlin, Pelham Park, N.Y., assignor to Autoelectron Corporation, Mt. Vernon, N.Y.

Filed Sept. 15, 1971, Ser. No. 180,734

Int. Cl. G06r 9/00

U.S. Cl. 235-61.11 F

14 Claims



A device is disclosed for detecting the presence or absence of information in the form of raised portions of an information bearing medium with said device comprising sensor means movable between a first and second position in response to a raised portion of said medium being positioned therebeneath; and pressure sensitive responsive means responsive to said sensor means moving to a second position for producing an electrical signal indicative of the presence of a raised portion beneath said sensor means. A plurality of sensors are combined with an integrated circuit to form a character recognition module and a plurality of such modules provide a device which can directly read embossed cards, such as conventional embossed credit cards. Advantageously, the pressure sensitive responsive means which respond to the movement of each sensing element comprises a pressure sensitive semiconductor region which changes electrical states to indicate the presence of a raised portion of the character sensed beneath the associated sensor. In each character recognition module, the respective pressure sensitive semiconductor regions are formed (preferably by doping) in their character recognition pattern on a single integrated circuit chip providing both the normal pressure sensitive electrical characteristics and additionally mechanical orientation and stability. The chip also includes, as an integral part thereof, the necessary logic circuitry and internal connected conductors to decode the change of state of the various semiconductor regions and thereby provide an output signal representative of the character being read. Means are provided such that the device will read different styles of display of the characters, commonly known as font styles.

3,735,098

**RECORDING MEDIUM FEED SYSTEM FOR READER OF DATA PROCESSING EQUIPMENT**

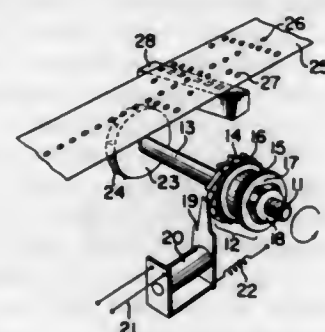
Shinichi Hirata, Kohoku-ku, Yokohama, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Aug. 9, 1971, Ser. No. 170,090

Int. Cl. G06k 17/00; G11b 15/52; H04l 15/24

U.S. Cl. 235-61.11 R

10 Claims



The feed of a recording medium is initiated by a drive means which is energized in response to a first readout instruc-

tion signal from a master such as a punch typewriter or electronic computer. Upon completion of transmission of one character data, a sync signal is mechanically generated and is compared with a second readout instruction signal from the master in a timing control circuit. When the sync signal is generated prior to the second readout instruction signal, the drive means is de-energized in response to the sync signal to thereby stop the recording medium and is again energized in response to the second readout instruction signal to thereby again initiate the feed. When the second readout instruction signal is generated prior to the sync signal, the drive means is kept energized even when the sync signal is generated so as to continue the feed of recording medium. The above cyclic operation is repeated in response to the succeeding readout instruction signals.

3,735,099

**CIGARETTE LIGHTER**

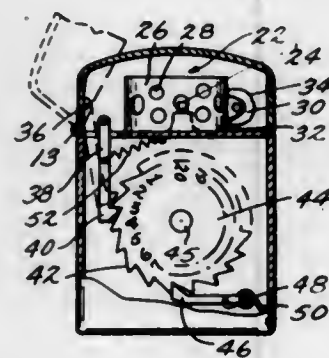
Harry C. Herr, 404 Willow Road, Savannah, Ga.

Filed Feb. 24, 1971, Ser. No. 118,459

Int. Cl. G06m 1/00; G09f 9/00

U.S. Cl. 235-91 R

6 Claims



A warning device for a cigarette lighter includes a counter wheel which indicates the cumulative total of times the cover of the lighter has been opened to expose the flint and wick. Thus, the counter indirectly indicates the number of cigarettes consumed by the lighter's owner which acts as a device for discouraging smoking.

3,735,100

**LINEAR DISTANCE-SPEED-TIME COMPUTER**

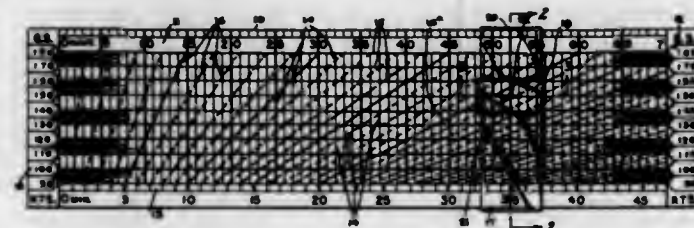
Gilbert B. Wagenfeld, 30 Derwen Road, Bala Cynwyd, County of Montgomery, Pa.

Filed Aug. 19, 1971, Ser. No. 173,071

Int. Cl. G06g 1/16

U.S. Cl. 235-89 R

6 Claims



A computer for air navigation and the like having a distance scale for use with sectional maps drawn on a distance scale matching that of the computer, the said computer in addition to its said distance scale having coordinated ground speed and time scales and a pair of cursors which are not only shiftable relatively to one another but are also conjointly shiftable relatively to a main supporting member having said three scales marked thereon, thereby enabling an index point on one of said cursors to be brought into registry with intersecting graduation lines of any two of said scales, whereby any one of the three parameters of distance, ground speed or time may be readily determined where two of said parameters are known.

3,735,101

**PHYSIOTHERAPY CONTROL DEVICE**

John Stewart Simpson Stewart, 50 The Common, Parbold, Wigan, England

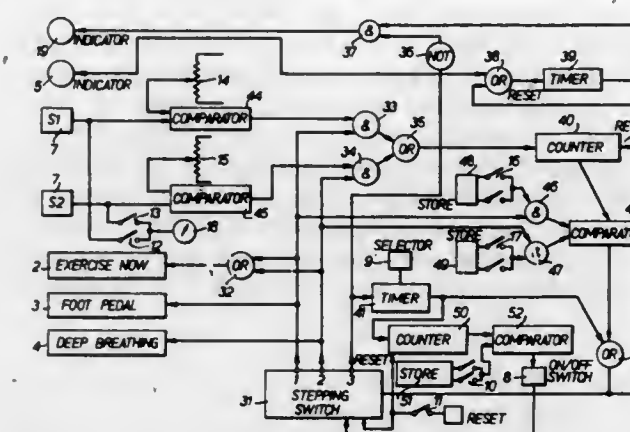
Filed June 22, 1971, Ser. No. 155,531

Claims priority, application Great Britain, June 23, 1970, 3,034/70

Int. Cl. G06m 3/02

U.S. Cl. 235-92 T

5 Claims



The physiotherapy control device described herein includes means for instructing a patient to perform a particular exercise, means for counting the number of times the exercise has been properly performed, and when a predetermined count has been reached for then instructing the patient to perform a different exercise, means for counting the number of times the exercise has been properly performed, and when a predetermined count has been reached for instructing the patient to rest. After a predetermined time the cycle is repeated and the operation is terminated after a predetermined number of cycles.

3,735,102

**CLOCK FOR METERS**

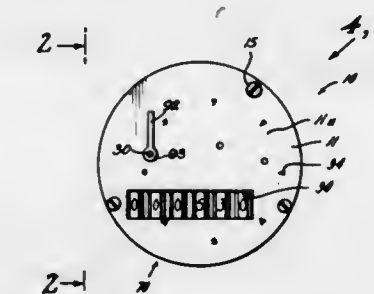
Joe H. Blancett, 4729 Jacksboro Highway, Wichita Falls, Tex.

Filed June 18, 1971, Ser. No. 154,342

Int. Cl. G06m 1/00

U.S. Cl. 235-94 R

4 Claims



A rotatable shaft extends upwardly into the space between a pair of spaced holding members to rotate a plurality of horizontally and vertically positioned gear means which causes an indicator means to indicate the amount of fluid passing through a meter.

3,735,103

**ODOMETER**

Carl E. Finley, 401 East 4th Street, Lamar, Mo.

Filed Dec. 13, 1971, Ser. No. 207,258

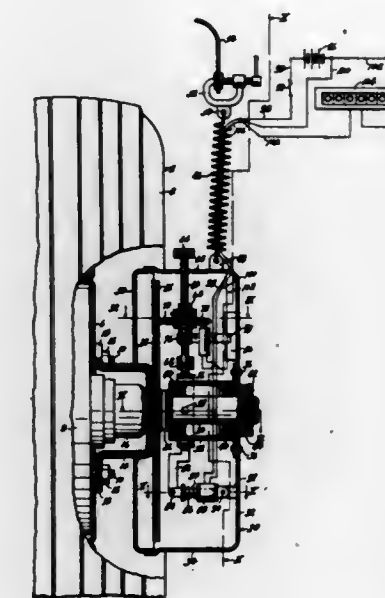
Int. Cl. G01c 22/00

U.S. Cl. 235-95 R

4 Claims

An odometer for automotive vehicles consisting of a planar disc affixable to a wheel of the vehicle, concentrically therewith and parallel to the plane thereof, a roller carried

rotatably on an axis radial to the wheel but not rotatable with the wheel, and frictionally engaging the disc whereby to be rotated on its axis as said vehicle travels, a mechanism operable to count and record the number of revolutions of the



roller, and adjusting mechanism for moving the roller radially of the disc to engage and be actuated by different diameters of the disc, whereby to adjust the ratio of the rotative speeds of the vehicle wheel and the roller.

3,735,104

**MAINTAINING DESIRED SPEED OF CUTTING TOOL IN NUMERICALLY CONTROLLED MACHINE TOOL**

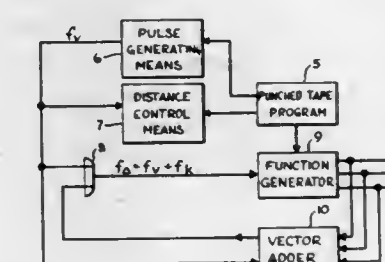
Per Harald Holmgren, Jonkoping, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed Sept. 13, 1971, Ser. No. 179,661

Int. Cl. G06f 15/46

U.S. Cl. 235-151.11

2 Claims



In a numerically controlled machine tool in which a fundamental pulse frequency determines speed of cutting tool motion along an axis, and pulses are distributed to axes according to programmed direction of cutting tool movement, successive pulses are counted into successive equal groups, each containing a number of pulses which is a multiple of the number of axes. The number of possible pulse distributions in a group is limited; hence an augmenting pulse frequency can be precomputed for each possible distribution, based on a relationship between total staircase motion distance signified by pulses of the group and corresponding direct distance. For each group, pulses of the proper augmenting frequency are injected between pulses of the fundamental frequency so that for a given fundamental frequency speed in the same in any direction.



3,735,105

**ERROR CORRECTING SYSTEM AND METHOD FOR MONOLITHIC MEMORIES**

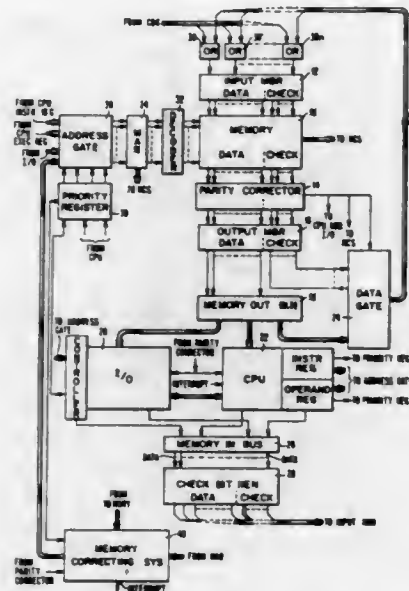
Gerald A. Maley, Fishkill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 11, 1971, Ser. No. 152,324

Int. Cl. G11c 29/00; G06f 11/10

U.S. Cl. 235-153 AC

26 Claims



A memory correcting system in accordance with this disclosure is an integral part of a digital electronic computer having a monolithic memory. The memory correcting system detects, records and analyzes errors occurring during normal operation of the computer. Also, the memory correcting system systematically addresses the monolithic memory on a cycle stealing basis monitoring the general health of the monolithic memory. The systematic reading and writing of all monolithic memory locations prevents the accumulating effects of random errors. By detecting single errors as rapidly as possible, the probability of acquiring additional errors that are above the correcting capabilities of the redundancy code are avoided.

3,735,106

**PROGRAMMABLE CODE SELECTION FOR AUTOMATIC ADDRESS ANSWERBACK IN A TERMINAL SYSTEM**

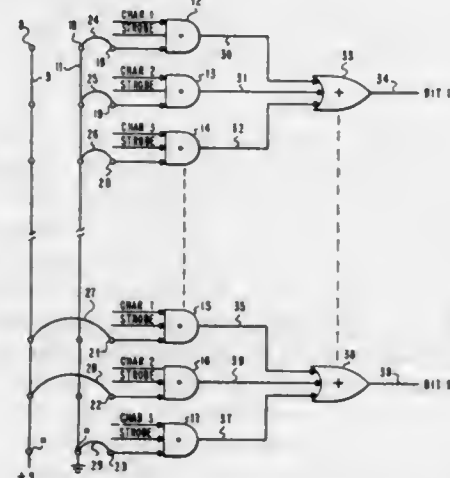
John Thomas Hollaway, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1971, Ser. No. 214,266

Int. Cl. H03r 13/00; G06f 5/02

U.S. Cl. 235-154

8 Claims



An automatic terminal identifying system is provided which allows a terminal to respond with decimal weighted identity

codes upon receipt of an identification query from a processor. To develop the identity characters the total decimal equivalent sum for each bit position of the unique identifying binary codes assigned to a terminal is determined with a binary 1 in bit 1 of character 1 given a decimal value of 1; a binary 1 in bit 1 of character 2 given a decimal value of 2; a binary 1 in bit 1 of character 3 given a decimal value of 4, etc. For three characters logical signals are generated from two clocks which are applied by means of jumpers to the output buss of the terminal such that the logical signal representative of the required decimal sum is applied to each of the bit positions on the output buss as characters are transmitted sequentially to the processor. This is accomplished by overlapping the two clocks to define three character times. A value of decimal one is applied to the output buss of the terminal during character one time; decimal two applied during character two time; and decimal four applied during character three time. Appropriate logical combinations of these clocks thus allows any decimal numbers zero through seven to be applied by means of the jumpers to the output buss of the terminal.

3,735,107

**CODED DECIMAL DIVIDER WITH PRE-CONDITIONING OF DIVISOR**

Durk Jan Bolt, and Jogchum Reitsma, both of Beekbergen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

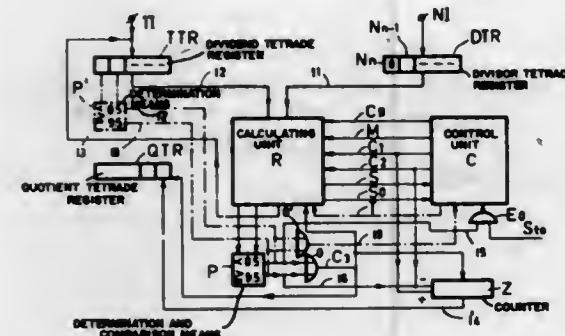
Filed Jan. 26, 1972, Ser. No. 220,979

Claims priority, application Netherlands, Jan. 30, 1971, 7101258

Int. Cl. G06f 7/52

U.S. Cl. 235-159

3 Claims



A calculating device for dividing decimal numbers according to the method of division without restoration of the remainder, comprising means for determining, prior to the start of the dividing process, whether the divisor digit present in the tetrad of the highest order less one of the divisor tetrad register (a 0 is present in the divisor tetrad of the highest order) is smaller than 5. If this is the case, these means produce a command for multiplying the dividend and the divisor, such that, said divisor digit becomes larger than or at least equal to 5. The said means provide a shift command during the dividing process, so as to shift the remainder present in the calculating unit over a number of digit tetrads of a higher order, this number being at least equal to one, in the dividend tetrad register, and for storing a corresponding number of quotient digits in the quotient digit tetrad(s) of the lowest order in the quotient tetrad register. The said number of digit tetrads is determined by the number, or number reduced by one, respectively, of zeros or nines of the remainder which precedes the number  $<5$  or  $\geq 5$ , or  $\geq 5$  or  $<5$ , respectively. A modification of the device enables direct and automatic formation of the correct quotient digits.

3,735,108

**CODED DECIMAL NON-RESTORING DIVIDER**

Durk Jan Bolt, and Jogchum Reitsma, Beekbergen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

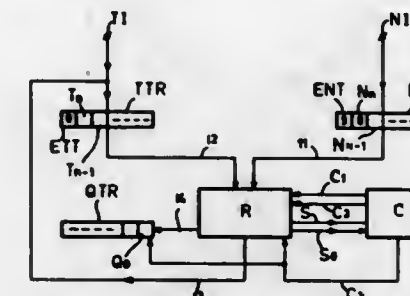
Filed Jan. 26, 1972, Ser. No. 220,980

Claims priority, application Netherlands, Jan. 30, 1971, 7101257

Int. Cl. G06f 7/52

U.S. Cl. 235-159

1 Claim



A calculating device for dividing decimal numbers according to the method of division without restoration of the remainder, in which the dividend tetrad register comprises an additional tetrad in the location whose order is one higher than the location of the dividend digit of the highest order, and in which a 0 is stored prior to the start of a division. The divisor tetrad register comprises an additional tetrad in the location of the highest order which is a 0, a digit 9 being permanently stored in the latter additional tetrad. In a calculating unit the contents of said additional tetrads are normally included in the subtract and add operations. The correct quotient digits are then automatically produced, said digits being stored, in reaction to a shift command, in the quotient tetrad register each time that the dividend or remainder passes through 0. The shift command, moreover, ensures that the remainder is shifted into the dividend tetrad register in a location of the next higher order.

3,735,109

**SYSTEM FOR DISCOVERING A CRITICAL PATH IN A NETWORK**

Jacques Berthelemy, Thorigny; Pierre Germain R. Boue, Butte Montceau, and Jacques Louis Sauvan, Paris, all of France, assignors to Societe Anonyme: Societe Nationale D'Etude Et De Construction De Moteurs D'Aviation, Paris, France

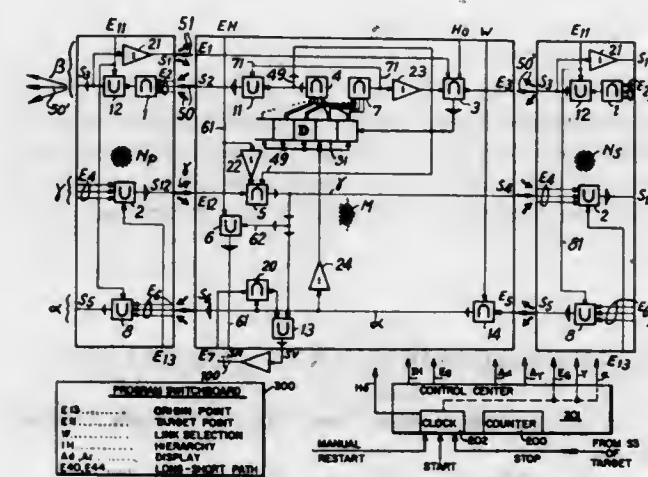
Filed June 1, 1971, Ser. No. 148,835

Claims priority, application France, June 1, 1970, 7020051

Int. Cl. G06g 7/48, 7/50

U.S. Cl. 235-185

17 Claims



A plurality of node elements are interconnected by link elements together with an appropriate control center for simulating or modelling a network. Three categories of lines intercon-

nect and pass through the node elements. One, a  $\beta$  chain conveys signals from node element to node element via respective link elements in a direction through the network. A second, a  $\gamma$  chain conveys signals in the direction opposite to the direction of the  $\beta$  chain. The third, an  $\alpha$  chain conveys signals in the same direction as the  $\beta$  chain and effectively forms a validation in the network-modelling circuit which is necessary for operation of the corresponding  $\beta$  chain. Signals are advanced stepwise under supervision of a clock (part of the control center). Energization of the  $\gamma$  chain is initiated at the end of the advance of the  $\beta$  signals. The network-modelling circuit includes a circuit which is arranged to detect amongst the several link elements connected to each node element the first one, or the last one, or both the first and last ones which are reached by the  $\beta$  signal. This detection is employed to progressively validate the  $\gamma$  line. Loops are detected either by exciting signals in the  $\alpha$  chain before  $\beta$  excitation from a target point of the network and interrupting the excitation after  $\alpha$  signals have progressed as far as they can, or alternatively by artificially rendering all the  $\gamma$  lines conductive before  $\beta$  excitation and exciting the  $\gamma$  chain from a target point and then interrupting the  $\gamma$  excitation after  $\gamma$  signals have progressed as far as they may. In either case the loops and the parts of the circuit downstream of the loops remain capable of passing signals.

3,735,110

**DIGITAL SINE/COSINE GENERATOR**

Corstiaan LeComte, Hilzen, Netherlands, assignor to N.V. Hollandse Signaalapparaten, Hengelo, Netherlands

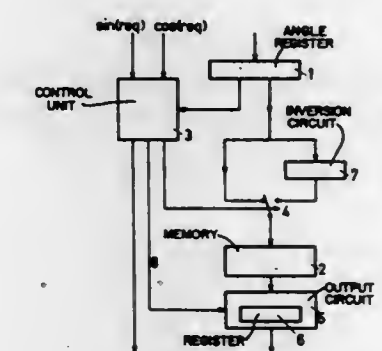
Filed Oct. 14, 1971, Ser. No. 189,211

Claims priority, application Netherlands, Oct. 19, 1970, 7015266

Int. Cl. G06f 15/34; G06g 7/22

U.S. Cl. 235-197

9 Claims



In a sine/cosine generator the angular value written into an angle register, is directly supplied to a memory (ROM), if either the sine of an angle located in the first or third quadrant, or the cosine of an angle in the second or fourth quadrant must be determined. The value is supplied in inverted form to the memory, if either the sine of an angle located in the second or fourth quadrant, or the cosine of an angle located in the first or third quadrant must be determined. The memory contains the sine values of a discrete number of angular values to be offered by the angle register. Furthermore, the sine/cosine generator comprises various logic circuits to minimize the memory capacity to be used, and to place the sine and cosine values, obtained by the memory and provided with a sign bit, in a register which is part of an output circuit.



3,735,111

**SELECTIVE ACTUATING MECHANISM FOR PERCUSSIVE PHOTOFLASH LAMP ARRAY**

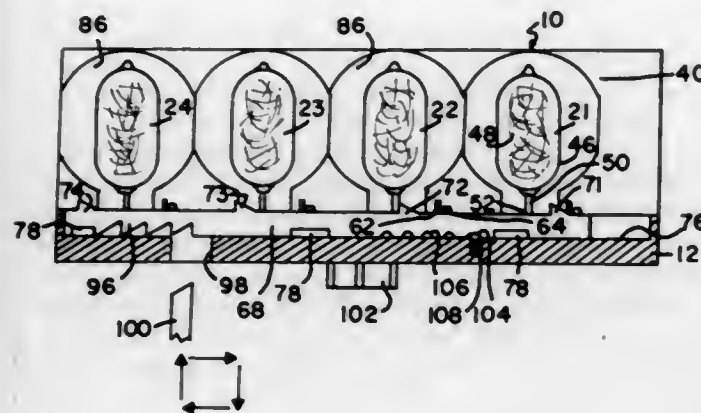
John W. Shaffer, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed June 12, 1972, Ser. No. 261,588

Int. Cl. G03b 15/02

U.S. Cl. 240-1.3

15 Claims



For a photoflash assembly comprising a plurality of percussively-ignitable flashlamps mounted on a base and arranged in a linear array with respectively associated reflectors and preenergized striker springs, a selective actuating mechanism for sequentially releasing the striker springs to fire respective flashlamps in response to successive indexing. The selective actuating mechanism comprises a slidable bar retained in a longitudinal channel in the base and having a number of linearly spaced projecting ramps. The lamps and striker springs are mounted in a row parallel to the channel with the strikers projecting over the bar to lie in the path of travel of the ramps. Linear indexing of the slidable bar along the channel causes one of the ramps to release a striker. A detent retains the position of the bar after each indexing cycle, and the sequence of releasing the strikers in response to successive indexing is programmed by the number and respective location of the ramps along the length of the bar.

3,735,112

**ILLUMINATED ELECTRONIC DOORBELL**

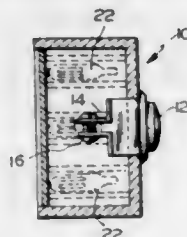
Rikk Harrison Randel, 7403 Insey Street, S.E., Berkshire, Md.

Filed Nov. 24, 1970, Ser. No. 92,390

Int. Cl. F21v 33/00; H05b 41/42

U.S. Cl. 240-2 S

1 Claim



An electronic doorbell being illuminated by a series of five or six neon tube relaxation oscillator circuits disposed about a pushbutton doorbell and which provide illumination for seeking out said doorbell.

3,735,113

**OPTICAL DISPLAY**

Thomas H. Stott, 72 Kathryn Drive, Pleasant Hills, Calif.

Filed Apr. 18, 1972, Ser. No. 245,210

Int. Cl. F21v 33/00

U.S. Cl. 240-6.4 G

5 Claims



A visual display is disclosed in the form of a wine glass having a hollow stem, a doubled walled bowl with an interior chamber communicating with the stem and a bundle of optical fibers extending through the stem into the chamber where the terminal ends of the bundle are spread out by the chamber walls. A removable light, switch and battery package is mounted in the base of the glass for shining light into the fiber bundle.

3,735,114

**HEADLIGHTS FOR VEHICLES**

Ferdinand Alexander Porsche, 7031 Doffingen, Germany, assignor to Firma Dr. Ing. h. c. F. Porsche KG, Stuttgart-Zuffenhausen, Germany

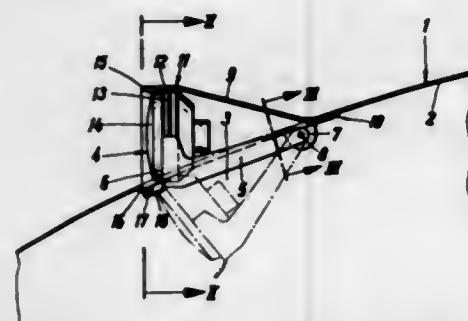
Filed July 13, 1971, Ser. No. 162,128

Claims priority, application Germany, July 15, 1970, P 20 34 997.7

Int. Cl. B60q 3/00

U.S. Cl. 240-7.1

8 Claims



A headlight for vehicles, especially motor vehicles, which is constructed so as to be pivotal from an operating position into an opening of the body; the opening is covered by means of a part made from stretchable material which is retained at the body.

3,735,115

**STREAMLINED GAS DISCHARGE ANTICOLLISION BEACON**

Charles Adler, Jr., 1506 Sutton Place Apt., 1111 Park Avenue, Baltimore, Md.

Filed Mar. 16, 1972, Ser. No. 235,436

Int. Cl. B64d 47/02

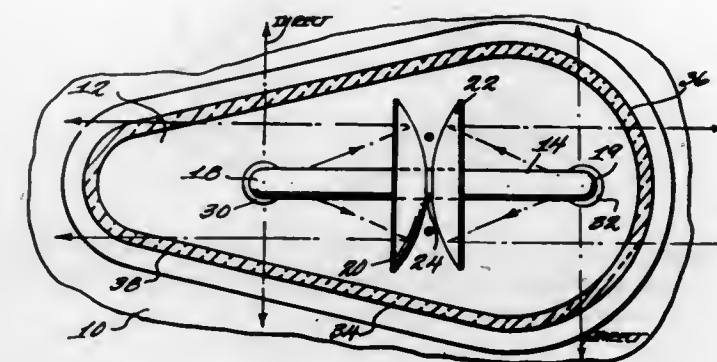
U.S. Cl. 240-7.7

6 Claims

A streamlined, gas discharge, anti-collision aircraft beacon for high speed aircraft which is adapted for mounting on an external portion of the aircraft, and which includes a generally

inverted U-shaped gas discharge tube to provide light through 360° in a horizontal plane and 180° in a vertical plane. Two concave reflectors positioned concentrically with the horizontal elongated portion of the gas discharge tube so as to in-

branches supporting twigs with needles, and the trunk and branches having electrical wiring therewithin leading from a transformer in the tree stand to electric lamp sockets scattered



crease the intensity of light projected in the fore and aft directions of an airplane. An aerodynamically streamlined design light transmitting cover over the reflectors and gas discharge tube is provided to reduce aerodynamic drag on the aircraft.

upon the twigs and branches, the transformer being connected by an extension cord and plug to an electric power source of a house.

3,735,118

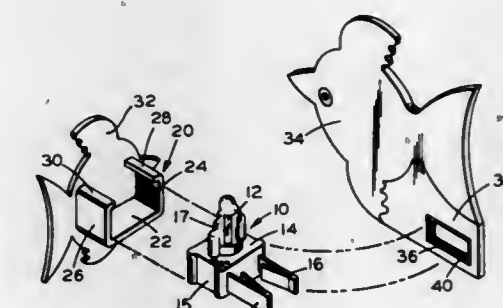
**DECORATIVE SUPPORT AND METHOD OF MOUNTING**  
Robert L. Martin, Cranston, and Lawrence P. Mellyn, Gloucester, both of R.I., assignors to General Electric Company

Filed June 23, 1972, Ser. No. 265,683

Int. Cl. F21s 1/00

U.S. Cl. 240-10 R

4 Claims



A guide light having an electrically connected low level light source and power blades supported in an insulating casing is made decorative by the mounting to the casing of the guide light a frame for support of decorative elements and by supporting decorative elements from this frame. The frame has side and bottom walls in the form of a stirrup conforming to and embracing the casing of the guide light. The frame extends between a forward and rear decorative element. The frame and forward and rear walls together comprise a cup in which the casing is held and from which the light source and power blades extend.

3,735,117

**ELECTRIFIED PLASTIC CHRISTMAS TREE**

John W. E. Hunt, Norway House, Manitoba, Canada

Filed Mar. 9, 1972, Ser. No. 233,073

Int. Cl. A47g 33/06, 33/16

U.S. Cl. 240-10 T

1 Claim

An artificial christmas tree having an electrical circuit built into it so to eliminate dangling wiring hanging visibly from the tree branches; the tree including a tree trunk supported at its lower end on a tree stand, a series of sidewardly radiating tree

3,735,119

**PORTABLE ELECTRIC FLASHLIGHT**

Edgar L. Williams, Jr., 20015 Michigan, Apt. 22B, Chicago, Ill.

Filed Mar. 24, 1971, Ser. No. 127,565

Int. Cl. F21l 7/00, 15/14

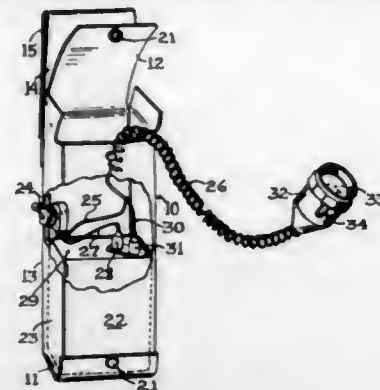
U.S. Cl. 240-10.6 R

1 Claim

A portable electric flashlight in which the light-carrying head is connected by a flexible conductor cable to a power source within a case, the power source being controlled by a switch and the case having a loop for the reception of the belt



of a person carrying the case, the light-carrying head being capable of being confined in the case in the upper portion



thereof and the case being provided with a flap for closing the case when the light-carrying head is confined therein.

3,735,120

### MODULARLY CONSTRUCTED PLASTIC CARBIDE LAMP

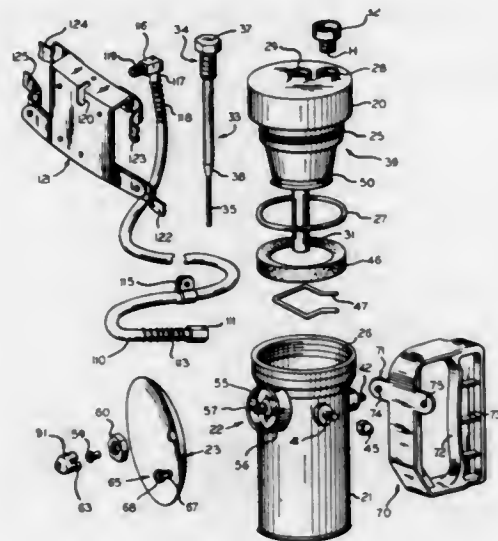
Frank S. Flider, Chicago, Ill., assignor to The Justrite Manufacturing Company, Chicago, Ill.

Filed Jan. 5, 1972, Ser. No. 215,577

Int. Cl. F21H 7/00

U.S. Cl. 240—11.1

6 Claims



A modular plastic carbide lamp includes upper and lower containers or housings with a water control needle valve therebetween. When the needle valve is opened, water drips from the upper container upon calcium carbide in the lower container, to generate acetylene gas therein. The acetylene gas rises in the lower chamber to a burner tip, at which the gas burns. These lamps are made from standardized modules which may be assembled in a great variety of arrangements and forms to make many different types of carbide lamps.

3,735,121

### HEADLAMP BEARING

Joseph H. Jaeger, Indianapolis, Ind., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 12, 1971, Ser. No. 188,047

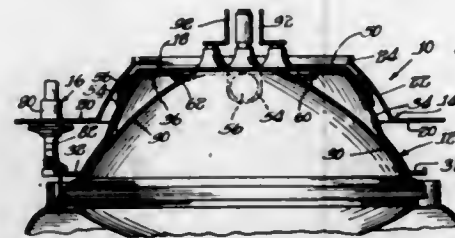
Int. Cl. F21V 7/00

U.S. Cl. 240—41.6

9 Claims

A bearing element having a relatively thin, flat plate-like body and leg-like members extending from the apices of the body. Each of the leg members having convexly curved bearing surfaces, the legs and bearing surfaces adapted to be posi-

tioned between a headlamp housing and a mounting ring of the ball-and-socket type to provide ease of adjustment of said



housing relative to said ring. The flat body portion includes retaining elements for mounting the body relative to the housing in assembled relationship.

3,735,122

### LAMP FIXTURE AND FLUORESCENT LAMP THEREFOR

Joseph A. Eblin, Los Angeles, and John W. Logan, Hollywood, both of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

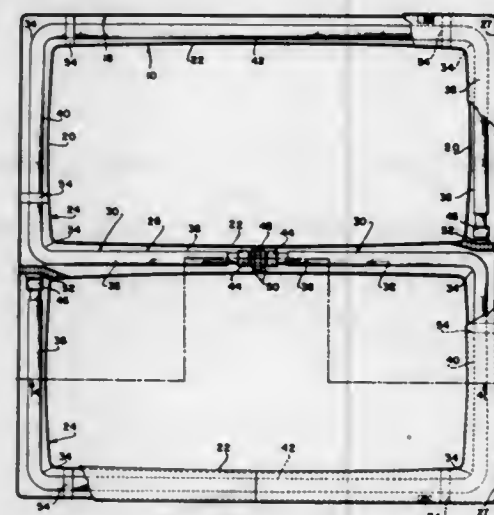
Division of Ser. No. 78,093, Oct. 5, 1970. This application

Sept. 25, 1972, Ser. No. 291,541

Int. Cl. H05B 33/02

U.S. Cl. 240—51.12

12 Claims



A lamp fixture and a complementary fluorescent lamp having a tube with three right angle bends defining a pair of mutually perpendicular end portions and a pair of mutually perpendicular intermediate portions paralleling the end portions respectively. One tube end portion and its parallel intermediate tube portions have substantially equal lengths. The remaining tube end portion has a length approximately one half that of its parallel intermediate tube portion such that each lamp has a G shape. A pair of such lamps may be arranged in side-by-side inverted relation with the shorter end portions of the lamp tubes disposed end-to-end and electrically connected through their adjacent end terminals to form a fluorescent lamp assembly having a generally figure-eight configuration. The complementary lighting fixture comprises a reflector housing containing and conforming in shape to the fluorescent lamp assembly.

3,735,123

### FOLDABLE CHANDELIER

David H. Porter, Fort Atkinson; Wayne Kemmerer, Jefferson, and Douglas Bray, Fort Atkinson, all of Wis., assignors to Thomas Industries Inc., Fort Atkinson, Wis.

Filed Dec. 27, 1971, Ser. No. 212,242

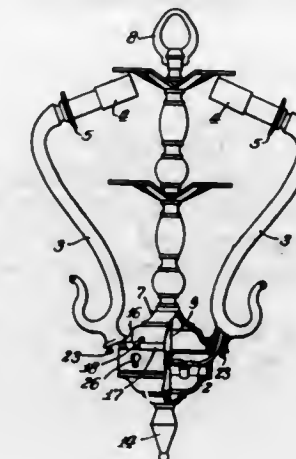
Int. Cl. H02G 3/20

U.S. Cl. 240—78 F

10 Claims

A chandelier has arms which fold up for ease in shipping and storage. The hub portion, to which the arms are attached,

consists of a cylindrical portion which is held by an upper and a lower shell. Each arm has two lugs, one of which engages a slot in the upper shell and an other which engages the lower



shell when the upper and lower shell, with the cylindrical portion therebetween, are brought together to lock the arms to the hub.

3,735,124

### PRISMATIC LENSES FOR LIGHTING FIXTURES

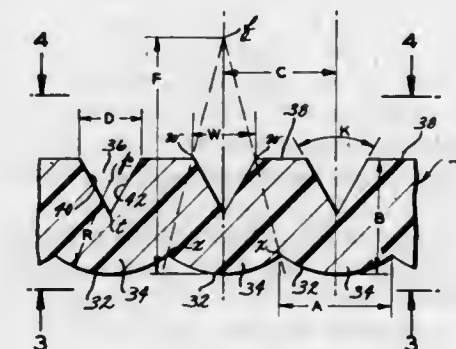
Leo G. Stahlhut, Kirkwood, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 5, 1971, Ser. No. 169,303

Int. Cl. F21V 5/04

U.S. Cl. 240—106 R

19 Claims



A prismatic lens for an overhead lighting fixture is formed from a transparent material and has a lower face composed of a plurality of arcuate surfaces arranged side-by-side. These surfaces form convex magnifying segments or lenticules in the lens. The opposite or upper face is composed of a plurality of V-shaped depressions extending downwardly from a generally flat intervening surface. The depressions are located behind and centered relative to the arcuate surfaces, whereas the intervening surfaces are positioned directly behind the junctures of adjacent arcuate surfaces. The prismatic lens diverts light rays emanating from a light source behind it primarily into zones disposed oblique to the lens so that the intensity of illumination is minimal in the reflected glare zone located directly beneath the lens and in the direct glare zone located generally to the side of the lens, but is maximum in the oblique zones located between the reflected and direct glare zones. This distribution provides the most pleasant and comfortable illumination for most visual observations performed beneath the fixture.

3,735,125  
SLIT LAMP

Karl-Heinz Wilms, Munich, Germany, assignor to Optische Werke G. Rodenstock, Munich, Germany

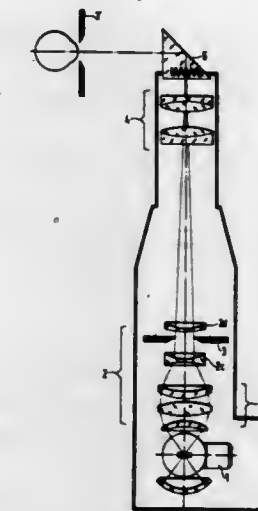
Filed Oct. 9, 1970, Ser. No. 79,547

Claims priority, application Germany, Oct. 29, 1969, P 19 54 312.5

Int. Cl. F21V 13/04

U.S. Cl. 240—41.3

7 Claims



A slit lamp in which a telecondenser is connected behind the incandescent lamp which consists of several positive and at least one negative lens element whereby a slot diaphragm is arranged close to the last negative lens of the telecondenser.

3,735,126

### METHOD AND APPARATUS FOR TESTING ROCK COAL DUST

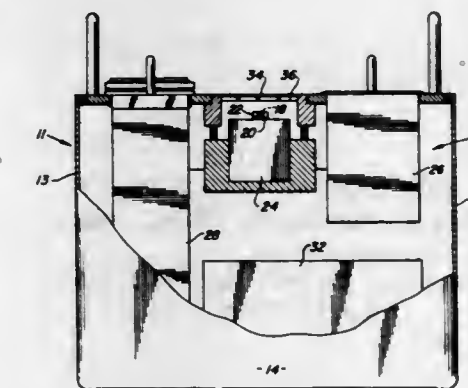
Karl J. Casper, Cleveland Heights, Ohio, assignor to Renter-Stokes Electronic Components, Inc., Warrensville Heights, Ohio

Filed Jan. 8, 1971, Ser. No. 104,937

Int. Cl. G01N 23/10

U.S. Cl. 250—43.5 D

16 Claims



A method and apparatus for determining the percentage incombustibles in a rock coal dust mixture by irradiating a sample of rock coal dust with gamma radiation from a collimated source spaced from the sample and measuring the backscattered radiation at an area behind the source. The sample of rock coal dust has a depth of about 2 inches to the entering gamma rays in order to minimize any changes in the count rate due to sample depth and density. Time is measured for detection of a predetermined number of radiation counts as a measurement of the percentage of incombustibles.

The apparatus includes a source of radiation collimated by a lead holder to irradiate a sample of the mixture of rock coal dust. The lead holder is centered on a detector's area of sensitivity to give significant count rates with relatively small sources of radiation.



3,735,127

## INFRARED TWO GAS ANALYZER

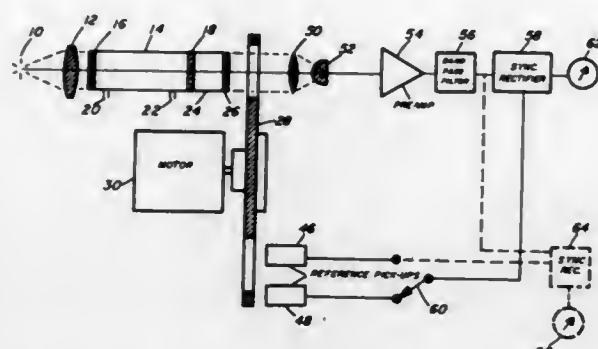
Robert W. Astheimer, Westport, Conn., assignor to Barnes Engineering Company, Stamford, Conn.

Filed Sept. 15, 1971, Ser. No. 180,583

Int. Cl. G01n 21/26

U.S. Cl. 250-43.5 R

8 Claims



A radiation absorption analyzer is disclosed for the measurement of two gases in a gas sample being analyzed utilizing the same equipment, and for simultaneous measurement of the two gases with some duplication in the electronic processing. A source of infrared radiation is applied through a sample or absorption cell containing the gas to be measured, and through a rotating optical filter wheel onto an infrared detector. The filter wheel contains two analytic filters passing absorption regions of the gases desired to be measured, and two reference filters in non-absorbing regions. Two reference pickups are utilized, which generate two signals as the filter wheel rotates, which are out of phase with each other by 90°. The signals from the detector and from the reference pickups are fed to a synchronous rectifier which rejects signals 90° out of phase with the reference signal, thereby providing a rectified output representing the quantity of gas in the sample cell under test. A switch may be utilized to apply the reference signals to a single synchronous rectifier, or a separate synchronous rectifier and meter may be utilized, with the reference pickups applied one to each channel for providing simultaneous two-gas analysis.

The two-gas analyzer is provided with aperture trimming to radiometrically balance each analytic filter with respect to its reference filter. The two-gas analyzer is suitable for the measurement of auto emissions from the tail pipe of a car for use in inspection stations, garages, etc.

3,735,128

## FIELD TERMINATION PLATE

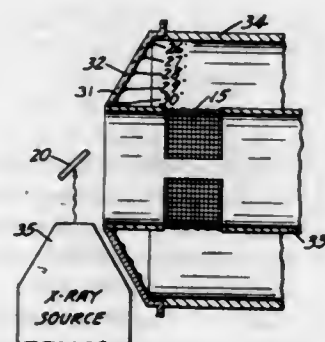
Paul W. Palmberg, Minneapolis, Minn., assignor to Physical Electronics, Inc., Edina, Minn.

Filed Aug. 27, 1971, Ser. No. 175,633

Int. Cl. B01d 59/44

U.S. Cl. 250-49.5 C

14 Claims



Field termination plates for cylindrical electron analyzers are provided wherein the plates are constructed of an insula-

tive material coated on the interior surface with a high resistance, electrically conducting coating. Spaced concentric rings of relatively high conductivity material in electrical contact with said coating are provided; the rings providing equipotential regions on the plates, thereby minimizing field fringing near the ends of the cylindrical tube electron analyzer.

3,735,129

## METHOD FOR LOCATING THE POSITION OF MEMBERS RELATIVE TO EACH OTHER

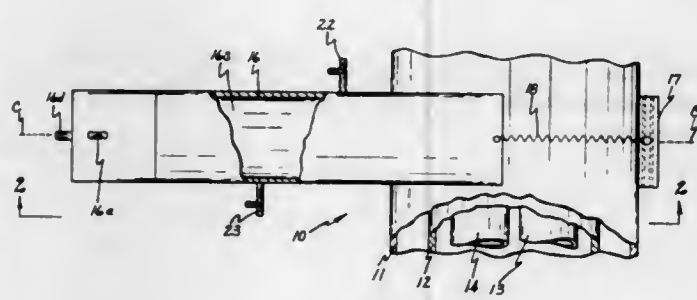
James William Montgomery, and Michael D. Relfel, both of Houston, Tex., assignors to Tenneco Oil Company, Houston, Tex.

Filed Aug. 20, 1971, Ser. No. 173,535

Int. Cl. G01n 23/02

U.S. Cl. 250-65

8 Claims



Energy from a point source is directed through a plurality of non-visible structures having known dimensions in a given plane. Variations in the density of the material traversed by the energy vary the intensity of the energy reaching a photographic film. Within the plane including the energy source and the film, the distance from the source to each of the structures determines the lateral dimensions and the relative position of the structure's image on the film. Given the distance between the source and the film, the lateral dimensions of the structures and the lateral position, size and intensity of the image cast by each of the structures on the film, the relative location of all such structures with respect to the known position of a reference structure may be determined either graphically or mathematically.

The device employed in the practice of the present invention includes a source of radio active energy carried in a camera housing which supports the source at a known, fixed distance from the reference structure. A film holder mounts the film behind the non-visible structures so that energy emitted from the source travels through the structures before striking the film. A small aperture in the camera housing focuses the energy causing it to radiate from a point. In use, the housing is flooded with water, lowered below the water surface and positioned about a subsurface well structure. The water in the housing is replaced with air after the housing is in place to reduce energy attenuation caused by the water.

3,735,130

## DIAPHRAGM-TYPE HIGH SPEED SPOT FILM DEVICE

John W. Bock, Greendale, and Marvin L. Sivertsen, Milwaukee, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed July 27, 1971, Ser. No. 166,394

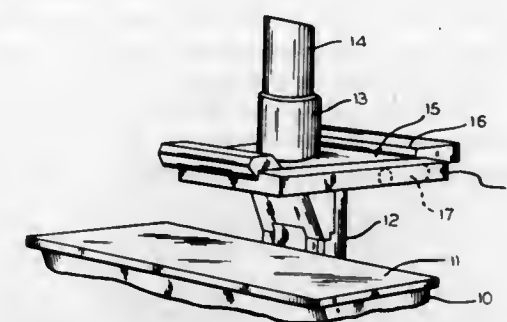
Int. Cl. G01n 21/34, 23/04; H01J 37/22

U.S. Cl. 250-66

9 Claims

Radiographic film is transported intermittently between a pressure-producing diaphragm and a platen, each of which has an x-ray fluorescent screen on its face. The diaphragm constitutes a wall of a chamber which is subject to being depressurized when the film is in transport and to being pressurized

when the film is in radiographic position. The film contact pressure chamber is supplied and exhausted through flexible hoses which lead to a stationary pump. The pump has a



chamber and a diaphragm which is displaced in one direction to generate pressure and is retracted in the other direction by an electromagnet to relieve the pressure.

3,735,131

## FLUORESCENT PENETRANT COMPOSITION AND METHOD

Amos G. Sherwin, 8330 Gainford St., Downey, Calif.

Filed Jan. 27, 1972, Ser. No. 221,403

Int. Cl. G01n 21/16

U.S. Cl. 250-71 T

5 Claims

An Oil-Base Water-Absorbing Fluorescent Dyestuff Carrying Fluid used for testing metal which not only locates surface defects such as cracks but distinguishes between flaw depths and, consequently, flaw relevancy by means of combining different color water-soluble and oil-soluble fluorescent dyestuffs is disclosed in this invention. A process step in the use of this fluid is water washing of the surface to remove fluid which has not become entrapped in a surface discontinuity. During this step, fluid entrapped in shallow defects absorbs a relatively high percentage of water which activates the water-soluble dyestuff while fluid in deep defects remains substantially water free and the water-soluble dyestuff remains substantially inactive. Thus, shallow defects fluoresce the color of the water-soluble dyestuff and deep defects fluoresce the color of the oil-soluble dyestuff.

3,735,132

## RADIOGRAPHIC DISPLAY SYSTEM

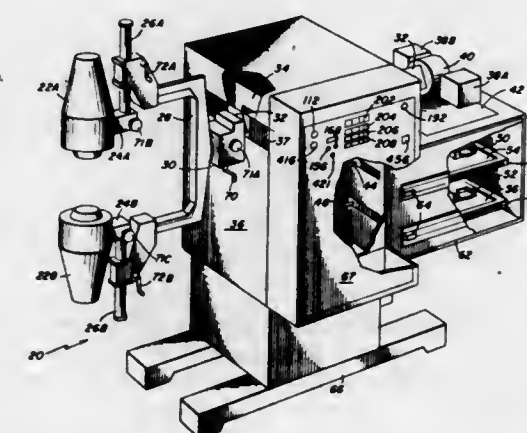
Sergio Colombo, Milan; Vitaliano Carugati, Cologno Monzese; Gianni Ferramola, Milan; Sergio Ferrari, 5 Cernusco sul Naviglio, all of Italy, assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 16, 1970, Ser. No. 81,214

Int. Cl. G01t 1/20

U.S. Cl. 250-71.5 S

10 Claims



A nuclear imaging device comprising a plurality of scanning heads spaced apart in a predetermined configuration with the

aid of a support member that permits the individual scanning heads to scan in parallel, antiparallel, and tomographic modes. The support member which is driven in both X and Y directions is mechanically connected with the stylus of a graphical X-Y plotter via a backlash linkage. Displays are provided wherein the color of the ink dot on printed paper or the intensity of the light projected on photographic film are related to the nuclear particle count in a preselectable manner.

3,735,133

## REAR SCREEN PROJECTION DEVICE PROVIDED WITH LUMINOUS MARKINGS

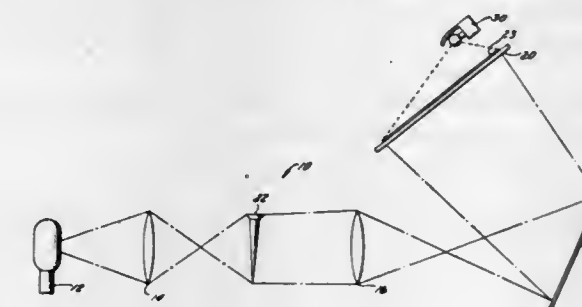
James E. Fox, Northport, N.Y., assignor to Diamagnetics, Inc., Freeport, N.Y.

Filed July 7, 1971, Ser. No. 160,365

Int. Cl. G01d 7/06

U.S. Cl. 250-72

3 Claims



An improved rear screen projection device is disclosed. The projection device includes a front mounted source of non-visible light directed at indicia or reference markings on the screen. The markings are formed from a luminous paint or ink which glows under the nonvisible light thereby enabling the visibility of the markings to be vastly improved without effecting the resolution of the projected image. The ink is transparent or translucent so as not to interfere with any portion of the projected image.

3,735,134

## THERMOLUMINESCENT RADIATION DETECTOR

Arthur C. Lucas, Goleta, Calif., assignor to EG &amp; G, Inc., Bedford, Conn.

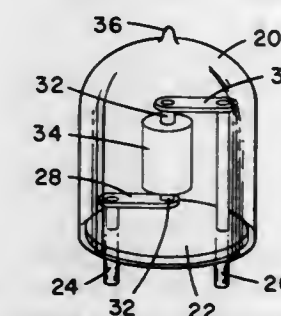
Continuation of Ser. No. 688,615, Dec. 6, 1967, abandoned.

This application Apr. 10, 1970, Ser. No. 28,168

Int. Cl. G01t 1/11

U.S. Cl. 250-71 R

2 Claims



Radiation detector having hot-pressed thermoluminescent material disposed in close proximity to a heater element, both supported by electrical connecting pins passing through a base of a glass envelope enclosing the same in a gaseous environment of high thermal conductivity or of an open glass cylinder leaving the same exposed in an air environment. Combination may be heater wire threaded through cylinder of hot-pressed thermoluminescent material or flat planar heater and planar chip of hot-pressed thermoluminescent material.



3,735,135

**NEUTRON DETECTOR OF THE TRACK-DAMAGE TYPE**  
 Francois Jean-Marie Bredoux, Vincennes; Claude Andre Mercier, Fontenay sous Bois, and Georges Achille Philpot, Paris, all of France, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 2, 1970, Ser. No. 77,727

Claims priority, application France, Nov. 4, 1969, 6937866  
 Int. Cl. G01t 5/00, 3/00

U.S. Cl. 250—83.1

10 Claims

A neutrographic product comprising a recorder layer capable of undergoing selective radiation-damage and a converter layer comprising a composition dispersed in a binder, said composition being capable of producing a nuclear (n, alpha) reaction.

3,735,136

**DUAL COLOR RADIOMETER METHOD SELECTIVELY DISCRIMINATING AGAINST A RADIANT ENERGY EMISSIVITY CHARACTERISTIC OF A PRESELECTED ATMOSPHERIC STATE**

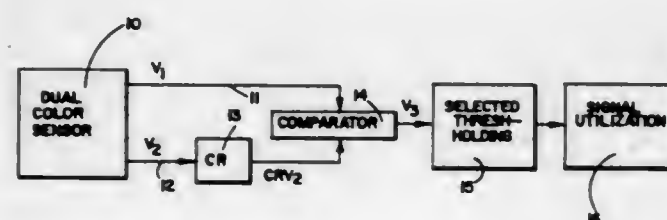
Edward F. Flint, Fullerton, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed June 22, 1972, Ser. No. 265,840

Int. Cl. G01j 3/02

U.S. Cl. 250—83.3 H

11 Claims



A dual color radiometer method for detection and discrimination of radiant energy emissivity characteristics of preselected atmospheric states. The dual output signals from the radiometer and corresponding to a respective first and second atmospheric spectral sample in a preselected spectral region, are differentially combined, one of the spectral sample signals being compensatorily gain changed such that the component signal intensity in both such output signals for a preselected atmospheric state are equal. Thus, the differentially combined signals provide a resultant signal indicative of an atmospheric state other than such preselected atmospheric state.

3,735,137

**LARGE, TWO DIMENSION, SCREEN FOR CONVERTING AN OPTICAL IMAGE PROJECTED ON ONE SIDE TO AN IDENTICAL INFRARED IMAGE DISPLAY ON THE OTHER SIDE**

Vincent T. Bly, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 2, 1972, Ser. No. 249,572

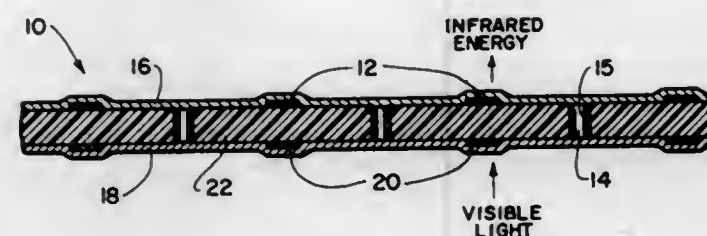
Int. Cl. G01j 1/02

U.S. Cl. 250—83.3 HP

12 Claims

A screen panel having conductive lattices, such as a copper plate, juxtaposed on each side of a dielectric substrate. The back side of the substrate and the conductive lattice thereon is covered with some photoconductive material, such as cadmi-

um sulphide. The front side of the substrate and the conductive lattice thereon is covered with an infrared emitting substance of electrically resistive material having a high thermal emissivity, such as resistive black or a carbon slurry paint. A power supply is connected across the lattices on each side of the substrate and a conductor is inserted through the substrate for conductively connecting the photoconductive material and the electrically resistive material. An electrical circuit is formed that includes the voltage source, the back lattice, the photoconductive material, the conductor through the substrate, the electrically resistive material, and the front lattice,



all connected in series. Light intensity, according to an image pattern projected on the back of the panel, lowers the electrical resistance of the photoconductive material. Lowering of the resistance in the photoconductive material causes increased current flow in the electrical circuit, and thus through the electrically resistive material on the front of the panel. Increased current flow in the electrically resistive material causes a temperature increase therein, and thus a pattern of infrared energy is emitted from the resistive material on the front of the panel in proportion to the visible light displayed on the back of the panel.

3,735,138

**IONIZATION SMOKE DETECTOR**

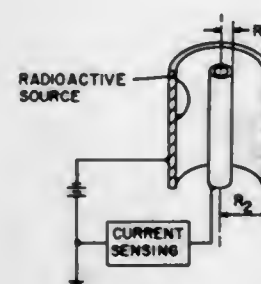
Gerald D. Rork, Bloomington, Minn.; Alfred S. Schlachter, Paris, France; Frank N. Simon, Bloomington, and Robert A. Stryk, Edina, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 27, 1971, Ser. No. 192,827

Int. Cl. G01t 1/18

U.S. Cl. 250—83.6 FT

2 Claims



An improved ionization type smoke detector which is specifically designed to be independent of variations in atmospheric pressure and to be highly sensitive to smoke. A number of factors are involved in choosing optimum design parameters for an ionization smoke detector which has minimum sensitivity to pressure and which also has a maximum sensitivity to the presence of smoke. Several equations are described which aid in the design.

3,735,139

**PHOTO DETECTOR SYSTEM WITH DUAL MODE CAPABILITY**

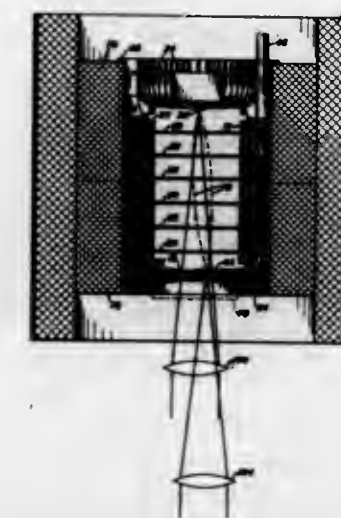
Andrew Kallitsky, La Jolla, and James W. Crooks, Jr., San Diego, both of Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Filed Apr. 7, 1972, Ser. No. 241,932

Int. Cl. H01j 31/26, 31/50

U.S. Cl. 250—213 VT

34 Claims



A photo detector system is described which has dual modes of operation under both dim and bright illumination conditions. Optics image incoming illumination directly upon an array of semiconductor detector diodes as well as upon a photo cathode. When bright light is present the optical image is focused upon the diode detector array and no high voltage is applied to the photo cathode. The light will not damage the photo cathode since the high voltage is off. Also, no electrons are accelerated toward the photo diode detectors. Thus, during bright light operation, the signal current is caused primarily by the direct effect of light on the diode detectors.

In dim light, high negative voltage is applied to the photo cathode and the optical image is focused on the photo cathode. The electron optic design causes the electrons emitted from the photo cathode to be imaged onto the same diode detectors that are used during bright light operation. These electrons strike the detectors with a high velocity induced by the applied voltage. The signal current due to this electron bombardment is therefore many times greater than the current due to the dim light striking the diodes directly. Detector response to dim levels of illumination is thus increased while retaining normal operational capability under bright illumination conditions.

3,735,140

**LOW LIGHT LEVEL LASER IMAGING SYSTEM**

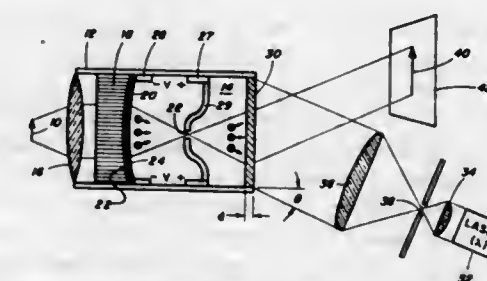
Morton Stimler, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 25, 1970, Ser. No. 49,640

Int. Cl. H01j 31/50

U.S. Cl. 250—213 VT

7 Claims



A low light level imaging system having an image intensifier which utilizes a semiconductive material. A photoemissive

material emits spatially modulated electrons in response to a detected image to spatially modulate the reflectivity of the semiconductive material. A laser beam from a laser located external to the image intensifier is reflected from the modulated semiconductor reflector to provide an image on a screen.

3,735,141

**ELECTRONIC LIGHTING CONTROL RESPONSIVE TO AMBIENT LIGHT**

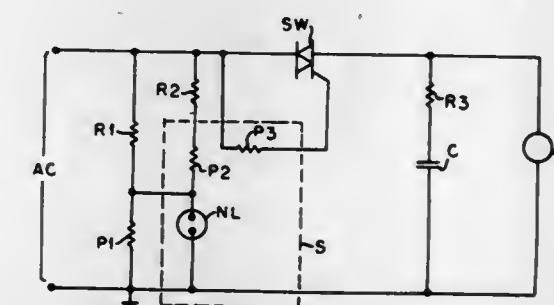
Thomas E. Beling, Saxonville, Mass., assignor to Sigma Instruments, Inc., South Braintree, Mass.

Filed Sept. 1, 1971, Ser. No. 176,808

Int. Cl. H01j 39/12

U.S. Cl. 250—214 R

19 Claims



In the disclosed control, a light source is turned on and off bistably in response to ambient light. To do this, a photoresistor or photocell, whose resistance increases with decreasing light, is exposed to the ambient light. The photoresistor or cell forms part of a voltage-energized voltage divider, and is connected across a neon lamp from which the cell is shielded. When the ambient light is sufficiently dim the lamp is lit. The current through the neon lamp is intensified with a second photoresistor or photocell in series with the lamp and subject to decreasing resistance as the lamp brightens. This constitutes a positive feedback and holds the neon lamp on. A third photoresistor or photocell in series with a switch responds to the bright lamp to turn on the switch and hence the light source. When the ambient light reduces beyond a given threshold the first photocell turns off the lamp and the second photocell increases its resistance enough to hold off the lamp.

3,735,142

**MANUALLY OPERATED BAR CODING SCANNING SYSTEM**

Jerome Danforth Harr, San Jose, and David Harwood McMurry, Portola Valley, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 4, 1972, Ser. No. 223,555

Int. Cl. G01n 21/30

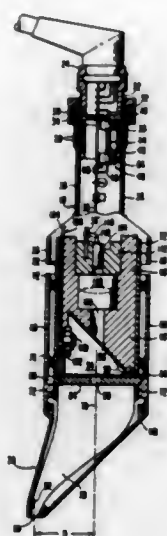
U.S. Cl. 250—219 D

10 Claims

A low-cost hand held probe for scanning bar coding documents of high density comprises a bundle of many discrete optical image fibers which is optically constricted into a light carrying conduit of bar-shaped cross-section by means of an aperture plate having a single elongated aperture stop therein. The aperture transmits light from a source of illumination down the optical conduit to a paper document. The light is reflected from the document in preparation to the bar coding indicia thereon and is transmitted back up through the conduit to a photosensitive device coupled to circuitry for determining the degree of light reflected. The optical bundle is preferably tapered and is drawn in a unit which eliminates critical align-



ment problems and reduces the number of operations for manufacture. No critical movement on the part of the operator is required in orienting the probe with respect to the document being scanned. One embodiment comprises an offset op-



tical fiber tip arranged to rotate at the end of the probe in a caster-like fashion. In other embodiments a flexible fiber optic conduit permits the use of larger and more complex illumination and photoresponsive devices without unduly handicapping the operator.

3,735,143

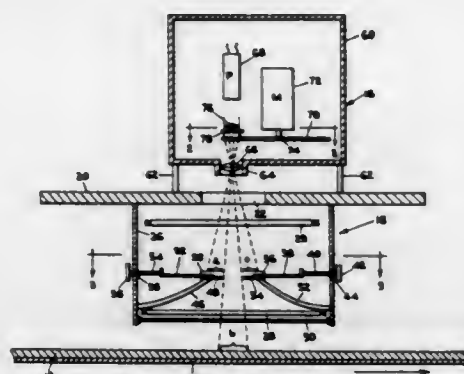
## COLOR MONITORING APPARATUS

Graham G. Langford, Johannesburg, South Africa, assignor to Sortex Company of North America, Inc., Lowell, Mich.  
Filed Jan. 3, 1972, Ser. No. 214,979

Int. Cl. G01J 3/34

U.S. Cl. 250—226

12 Claims



A color monitoring apparatus in which the color of the product is photoelectrically monitored by viewing the product in its entirety and also serially viewing optical reference means having lighter and darker optical values than the product. An automatic gain control sets the gain from the photoelectric detecting means at a predetermined level based on the optical values of the optical reference means. The optical values seen by the detecting means can be changed by adjusting the optical reference means. A special shutter disk having radially and circumferentially spaced openings rotates beneath a photomultiplier tube to effect the serial viewing of the reference plates and the product.

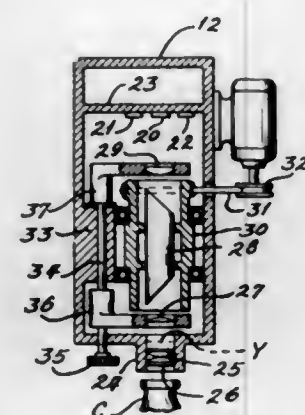
3,735,144  
CONTAINER FLAW INSPECTION APPARATUS  
Momir Babunovic, Des Peres, and Stamac Faani, Crestwood, both of Mo., assignors to Barry-Wehmiller Company, St. Louis, Mo.

Filed July 19, 1971, Ser. No. 163,704

Int. Cl. H01J 39/12

U.S. Cl. 250—223 B

5 Claims



Apparatus for inspecting containers, such as glass or plastic bottles, for defects that would render the same unsuitable for commercial use. The apparatus includes means to illuminate each container from more than one position so that defects are highlighted, independently of the orientation of round bodied containers, and means to inspect the container through its filling neck with the area of view and depth of focus selected to be appropriate to the size and character of containers. The inspection means employs photocells arranged in a pattern to make it easy to inspect more or less of the interior of a container and incorporates a lens system having the characteristics of converting an object of substantial depth to an image whose depth is greatly condensed and easily handled by a photocell scanner.

3,735,145

## MAGNETIC BUBBLE DOMAIN SYSTEM

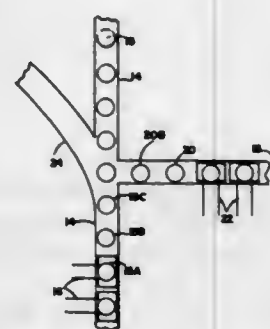
David M. Heinz, Orange, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed Oct. 16, 1970, Ser. No. 81,232

Int. Cl. H03K 19/168; G11C 11/14, 19/00

U.S. Cl. 307—88 LC

8 Claims



A magnetic bubble domain system comprising one or more channels of magnetic bubble domain material on a supporting substrate is described. Any number of these individual magnetic bubble domain channels may be interconnected or connected to a main channel. The movement of bubble domains along a channel is effected by the repulsive or interaction forces between bubble domains which are present in a channel when a bubble domain is formed or propagated near another bubble domain. The movement of bubbles from a given channel into one of several possible adjoining channels to perform a logic function may be directed by the presence or absence of bubbles in one or more connecting channels.

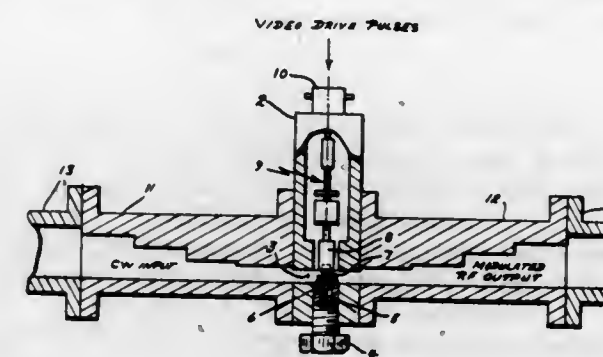
3,735,146  
NANOSECOND PULSE MODULATOR  
William E. Blore; Srbslav V. Zivanovic, both of Goleta, Calif., and Bernard Charest, Ste-foy, Quebec, Canada, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 27, 1972, Ser. No. 266,811

Int. Cl. H03K 3/00

U.S. Cl. 307—106

5 Claims



Nanosecond pulse modulation of a CW carrier wave propagating in a waveguide transmission line is accomplished by control of a varactor diode disposed across a one-quarter height waveguide section. In its quiescent the varactor diode is series resonant at the frequency of the carrier wave, causing the carrier wave to be reflected (or switched off). Control of the series resonant frequency is accomplished by selection of a diode having appropriate capacitance and package inductance, by diode position within the waveguide section, and by a reverse diode bias. Additional shunt capacitance and resonance control is obtained by means of a variable post proximate to the varactor diode. The varactor diode is converted to parallel resonance (and the CW carrier wave switched on) by periodically forward biasing the varactor diode with pulses from a video drive pulse source.

3,735,147

## AUTOMATIC RESTART CIRCUIT FOR KNITTING MACHINES AND THE LIKE

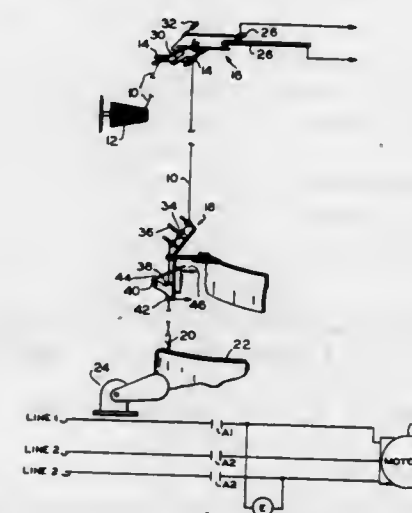
Albert A. Kryszek, 5716 S. W. Brugger, Portland, Ore.

Filed June 8, 1972, Ser. No. 260,768

Int. Cl. H01B 35/00

U.S. Cl. 307—119

13 Claims



A control circuit for a knitting machine interrupts machine operation in the event that yarn tension is improper as detected by plural stop-motion devices. After a predetermined time period, the machine is automatically restarted if proper tension conditions are restored, but if improper tension remains, the machine is semi-permanently disabled until service personnel can correct the improper conditions and restart the machine manually. A main control relay remains operative

for a predetermined delay period after a "tentative stop" for reinitiating machine operation at the end of such time under proper conditions.

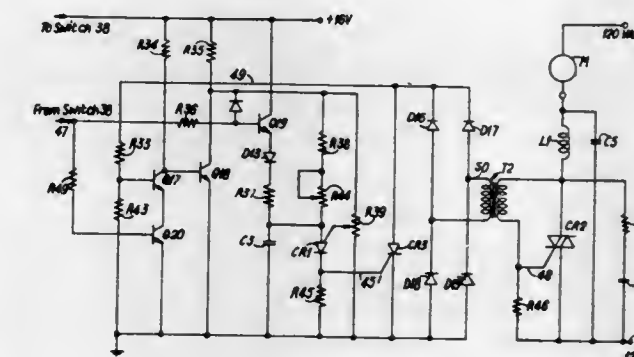
3,735,148

SYSTEM FOR HEATING OR AIR CONDITIONING  
Said Sapir, Westlake Village, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.  
Division of Ser. No. 31,167, April 23, 1970. This application  
Jan. 10, 1972, Ser. No. 216,715

Int. Cl. H01h 33/44

U.S. Cl. 307—133

1 Claim



A system for heating or air conditioning wherein provision is made for controlling fan speed and/or the heating and modulating valve in accordance with thermostat demand. The thermostat puts out a step function followed by a ramp for both on-off and proportional control. One valve may be used in series with another for each function. A logic gate is provided to override the speed control when the plenum is cold. Half speed is provided for a hot plenum even though there is no thermostat demand for heat. Two detectors are provided for plenum temperature. The same thermostat is used with both voltage sensitive and current sensitive circuits.

3,735,149

## OPERATIONAL CIRCUIT

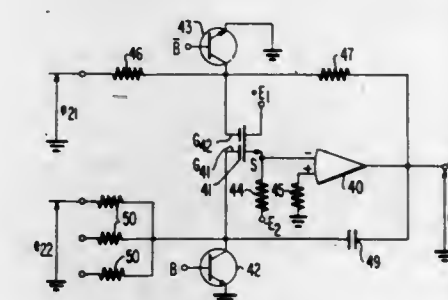
Kiyoshi Tuchiya, Minato-ku, Tokyo-to, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed July 1, 1971, Ser. No. 158,793

Int. Cl. G06g 7/12

U.S. Cl. 307—230

7 Claims



Disclosed herein are a variety of operational circuits each including an operational amplifier with a plurality of feedback loops. Each of the feedback loops as well as the circuit inputs are connected to the operational amplifier through a high impedance input terminal forming part of a feedback loop switching circuit. The switching circuit includes a field effect transistor circuit, the high impedance input terminals comprising the gate electrodes of the field effect transistors. Signals in the feedback circuits are selectively applied to the inputs of



the operational amplifier by selectively shorting each of the feedback loops to ground potential. The selective shorting is accomplished by using bipolar transistors placed in a conductive state by control signals.

3,735,150

## LOW NOISE PHASE DETECTOR

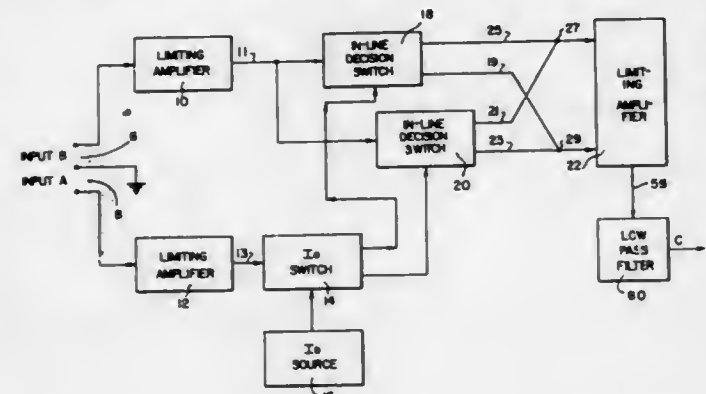
Robert W. Harris, Temple Hills, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 21, 1971, Ser. No. 210,349

Int. Cl. H03k 5/20

U.S. Cl. 307—232

5 Claims



A phase sensitive detector employing a pair of limiting amplifiers, wherein the outputs are respectively connected to a current switch and a pair of in-line decision switches. The in-line decision switches and the current switch provide a current on one of two lines that is indicative of a phase difference between two periodic waveforms as they appear on the input of the limiting amplifier. The switching properties are controlled as a function of each waveforms' zero-cross-over point in time. This circuit measures phase difference with high accuracy and resolution and with minimal degradation of the accuracy when measuring weak or noisy signals as a result of employing all zero cross-overs.

3,735,151

## OUTPUT CIRCUIT FOR COMPARATORS

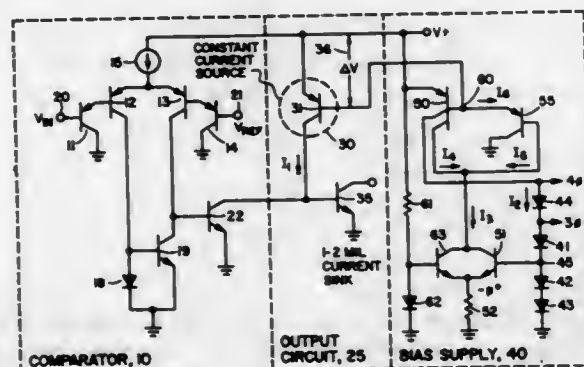
Thomas M. Frederiksen, Scottsdale, and Ronald W. Russell, Mesa, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 16, 1971, Ser. No. 171,994

Int. Cl. H03k 1/02, 1/14; H03l 1/30

U.S. Cl. 307—235 R

12 Claims



There is disclosed an output circuit for a comparator which operates, because of its high gain, as a switching circuit. It is the major feature of the output circuit that it operates such

that the drive current for its output stage and the amount of load current it can sink are independent of supply voltage variations. Thus the output circuit is relatively unaffected by changes in, for instance, the output of a portable power supply such as a battery. Whenever an analog input level from the comparator is below a given level, the drive current is coupled to drive an output transistor into saturation. When the comparator changes state this drive current is shunted to ground through a transistor of the comparator circuit. Thus the output transistor acts as either an opened or closed switch capable of sinking a predetermined amount of current.

3,735,152

## DC REGENERATING SYSTEMS HAVING CURRENT SOURCE EXHIBITING POSITIVE RESISTANCE AND HAVING ZERO CROSSING V-I CHARACTERISTIC AT A REFERENCE POTENTIAL

Minoru Oda, Minami-Shimizu, Amagasaki-shi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

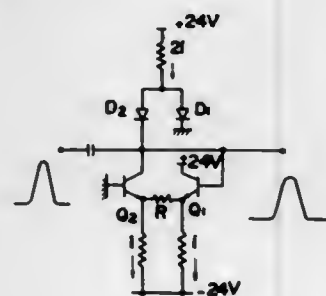
Filed May 10, 1971, Ser. No. 141,796

Claims priority, application Japan, May 19, 1970, 45/42626

Int. Cl. H03k 5/08

U.S. Cl. 307—237

13 Claims



A DC regenerating system, comprising a differential amplifier including first and second transistors with their emitter electrodes connected to a common power source of a first polarity, preferably through a resistor, a pair of semiconductor elements, a source of opposite polarity potential connected in common to one electrode of the semiconductor elements preferably through a resistor, means to connect another electrode of one of the semiconductor elements to the junction between the base electrode of the first transistor and the collector electrode of the second transistor, an input terminal, a capacitor connected between the input terminal and said junction and an output terminal connected said junction. The DC regenerating system functions to supply a large current in a limited potential region with respect to a reference potential (usually zero), but decreases its current outside the potential region. The system has a positive resistance at a reference point of the potential and supplies a zero current only at the reference point of the potential.

3,735,153

## HIGH VOLTAGE SEMICONDUCTOR PULSE

Narendra M. Shukla, Framingham, Mass., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 8, 1971, Ser. No. 121,753

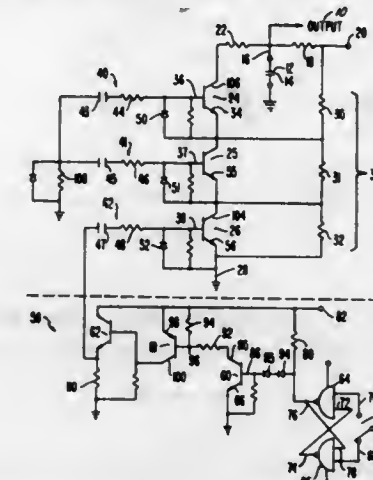
Int. Cl. H03k 17/00

U.S. Cl. 307—246

4 Claims

High voltage transistorized pulse circuit controlling a high voltage pulse as might be applied to a piezoelectric crystal for operating a hammer or a wide line high speed printer. The dimensional change of a piezoelectric crystal is a function of the potential in an application of energy which is applied to the crystal. The crystal is initially charged across its width which is transverse to the length of the crystal causing a reduction in its length thereby storing potential energy for later utilization. When the crystal is to be actuated, the crystal is discharged and the charge stored on the crystal plates is quickly dissipated through a plurality of cascaded

transistorized switches. Each switch has an individual breakdown voltage rating which is proportional to the circuit voltage, therefore it is necessary to sequentially control the turn-



ing on and turning off of the individual transistorized switches to prevent the collector-emitter voltage of the several transistors from exceeding their breakdown voltage rating.

3,735,154

## DISABLING CIRCUIT HAVING A PREDETERMINED DISABLING INTERVAL

George W. Meeker, Silver Spring, and Allan E. Pertman, Baltimore, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

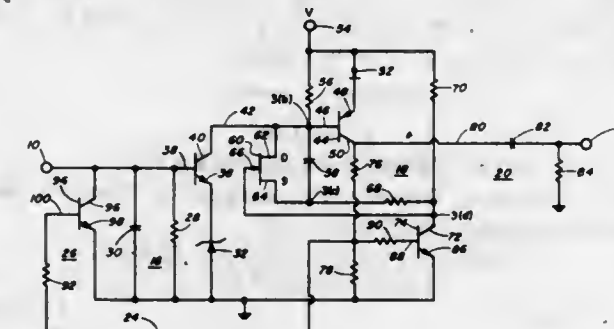
Continuation of Ser. No. 866,303, Oct. 4, 1969, abandoned.

This application Nov. 19, 1971, Ser. No. 200,534

Int. Cl. H03k 3/10

U.S. Cl. 307—273

1 Claim



A disabling circuit having an integrator-threshold device, a pulse generator such as a monostable multivibrator and a shaper for delivering an output pulse to a load. A feedback path including a semiconductive switch element from the output of the multivibrator to the integrator-threshold device inhibits operation of the integrator for a predetermined time interval determined by the duration of the multivibrator pulse. The monostable multivibrator includes semiconductive circuitry which draws no power in the OFF condition and further includes a FET to insure rapid transition from the ON mode to the OFF mode of operation.

3,735,155

## INTEGRATED BISTABLE STAGE HAVING MOS FIELD EFFECT TRANSISTORS

Gunther Eberhard, Munchen 80, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munchen, Germany

Filed Feb. 7, 1972, Ser. No. 224,182

Claims priority, application Germany, Mar. 16, 1971, P 21 12 481.2

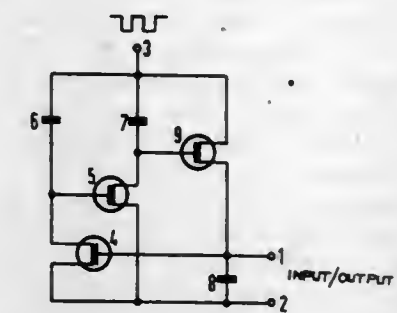
Int. Cl. H03k 3/286

U.S. Cl. 307—279

1 Claim

A bistable stage in an integrated circuit has two inverter stages connected in series. Each of the inverter stages com-

prises an MOS-FET and a load capacitor. The inverter stages have a timed supply potential. The first inverter stage is controlled via the storage capacitor and controls the second in-



verter stage which is itself connected via an additional MOS-FET to the storage capacitor of the timed supply potential thereby maintaining the storage condition.

3,735,156

## REVERSIBLE TWO-PHASE CHARGE COUPLED DEVICES

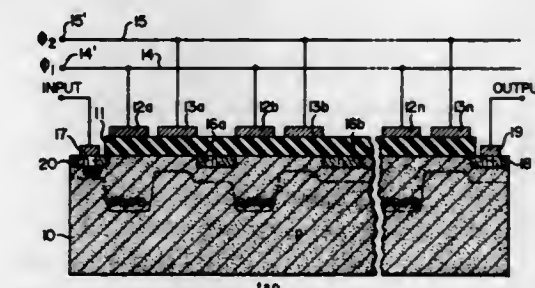
Robert Harold Krambeck, South Plainfield, and Carlo Heinrich Sequin, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 28, 1971, Ser. No. 157,510

Int. Cl. H011 1/14

U.S. Cl. 307—304

8 Claims



Two-phase charge coupled devices are disclosed with no asymmetry in the structure to prevent reversing the direction of flow of charge carriers. The structure includes sets of two electrodes separated by wide gaps. An appropriate fixed charge in these gaps allows storage and transfer of charge carriers. The charge may be localized in the gap, or may be implanted uniformly over the surface of the device in the storage medium or in the insulating layer.

Unidirectionality of transfer is achieved by a pulse train having an asymmetric phase relation. Reversing the phase relation reverses the directionality of charge.

3,735,157

## TEMPERATURE COMPENSATION FOR MAGNETIC MILLING FORCE SENSORS

William J. Whetham, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 26, 1972, Ser. No. 220,748

Int. Cl. H03k 5/18

U.S. Cl. 307—304

6 Claims

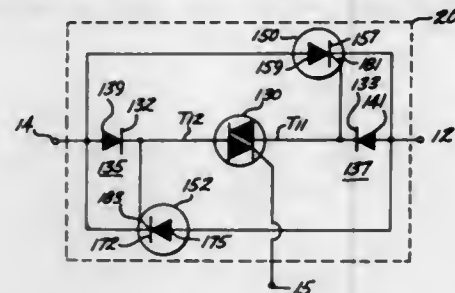
An improved system is provided for sensing spindle deflection of a milling machine and developing a feedrate control signal in accordance therewith to achieve optimum tool life consistent with high metal removal rate from a workpiece. A plurality of magnetic transducers are disposed adjacent the spindle or spindles of a milling machine, and each magnetic transducer is excited by an audio frequency signal such that, as deflection of a spindle brings the spindle closer to or moves it further from a transducer, a corresponding change in the impedance characteristics of the transducer is utilized to develop



an a-c signal of a given amplitude. Signals developed from opposing transducers are fed to a differential amplifier to derive a difference signal which is demodulated by a phase detector, rectified and filtered, and then passed through a squaring circuit in order that signals corresponding to the square of the deflection sensed by each transducer pair may be mixed to provide a d-c voltage representing the sum of the squares representing the deflection components. The square root of the sum of the squares is then taken to give a feedback signal proportional to the vector sum of spindle deflection for utilization as a feedrate correction signal. For milling machines utilizing multiple spindles simultaneously, a peak detector circuit is utilized to select the largest sum of the squares only for subsequent development of the feedrate correction signal.

Changes in the resistance of the magnetic transducers due to temperature variations encountered under normal operating conditions are compensated by placing the coil of each

load terminals however with triac level control signals applied to the third gating terminal. The network includes a triac and



series connected diodes between the load terminals and a pair of inverse paralleled SCR's in circuit therewith.

### 3,735,159 METHOD AND APPARATUS FOR TRANSLATING ULTRASONIC ENERGY

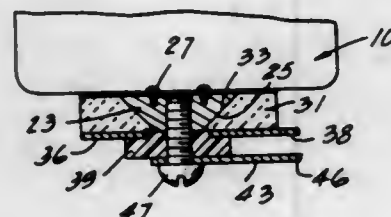
Edward J. Murry, 9223 West 119th St., Palos Park, Ill.

Filed Jan. 24, 1972, Ser. No. 220,096

Int. Cl. H04r 17/00

U.S. Cl. 310-8.3

13 Claims



A novel method and apparatus for converting vibratory energy in the radial direction into vibratory energy in the longitudinal direction by forming a tapered surface on a piezoelectric element and attaching it to a mating transition member which has a corresponding tapered surface.

### 3,735,160 ELECTROSTATIC GENERATOR

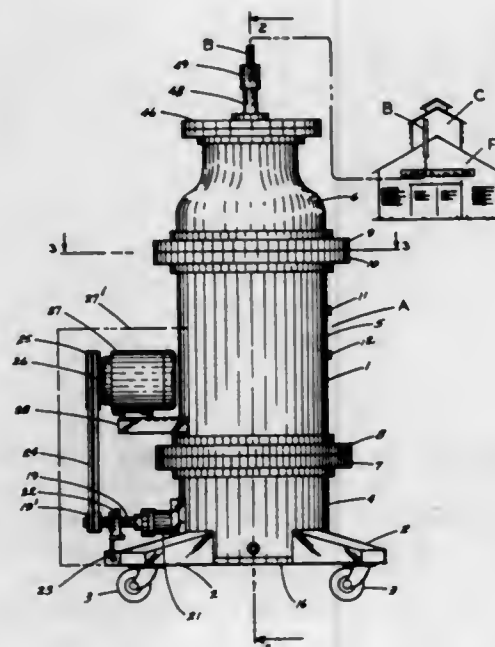
John W. Thomley, Decatur, Ill., assignor to Thomley Static Control Systems, Inc., Decatur, Ill.

Filed Sept. 7, 1971, Ser. No. 178,037

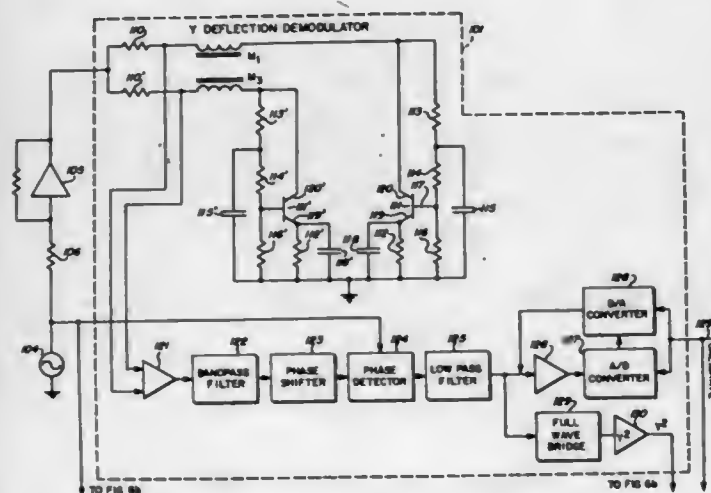
Int. Cl. H02n 1/00

U.S. Cl. 310-6

13 Claims



The combination of a tubular conductor for an electrostatic charge and a generator, said latter comprising an insulated



magnetic transducer in a series circuit which includes a field effect transistor biased to perform as a variable resistor responsive to a change in current flow through the coil by presenting an apparent resistance which opposes the change in current. Runout, which introduces an invalid deflection signal component by modulating the audio frequency reference signal according to the rate of spindle rotation, is compensated by observing the signal produced by runout from each tool holder, tool combination prior to machining, and then providing a continuous equal and opposite signal thereby leaving only the component due to actual spindle deflection. This signal also compensates for component drift. This function is carried out by a loop including a d-c amplifier which drives an A-D converter which, in turn drives a D-A converter which has its output coupled back to the input of the d-c amplifier. When activated, the calibrate circuit introduces trial signal levels until the output of the d-c amplifier is zero, thus negating the effect of runout.

### 3,735,158 THREE TERMINAL BIDIRECTIONAL CONDUCTIVE SWITCHING NETWORK

Glen L. McDonald, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed June 19, 1972, Ser. No. 264,096

Int. Cl. H03k 17/72

U.S. Cl. 307-305

7 Claims

A three terminal network having first and second load terminals for connection in series circuit relationship with a load across a pair of power supply terminals, and a third gating terminal for controlling alternating current flow in the load. The present three terminal network may be substituted for a triac with corresponding terminal connections to provide triac control functions at greatly increased current levels through the

housing having an insulated endless belt for accepting a charge at its lower end and transferring same at its upper end to a tubular electrostatic conductor; the portion of the latter immediately adjacent said belt being surrounded by a bell-shaped collector. The charge is developed by the speed of travel of the belt and the pressure within the housing.

### 3,735,161 PIEZOELECTRIC TRANSDUCER

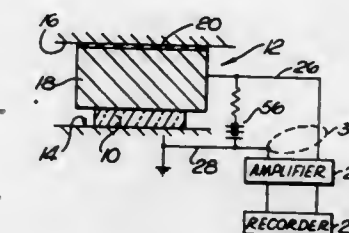
George D. Perkins, Glendora, Calif., and John R. Colbert, Champaign, Ill., assignors to Bell & Howell Company, Pasadena, Calif.

Filed Dec. 23, 1971, Ser. No. 211,200

Int. Cl. H01v 7/02

U.S. Cl. 310-9.5

16 Claims



A lithium niobate piezoelectric single crystal transducer having selected rotational orientations with respect to X, Y and Z rectangular coordinate axes. Compressional mode accelerometers having low or zero shear and torsion sensitivity are provided in which the crystal is oriented, in IRE notation, as (a) a (yxl) +38.6° cut or symmetrical equivalents thereof, such as (zx1) (b) a +60°/+51.4° cut. Shear mode accelerometers having low or zero compression sensitivity are provided in which the crystal is oriented, in IRE notation, as (a) (xyl) +31.7° cut, or symmetrical equivalents, and (b) an (xyl) +76.7° cut.

### 3,735,162 SINGLE-COIL LINEAR MOTORS

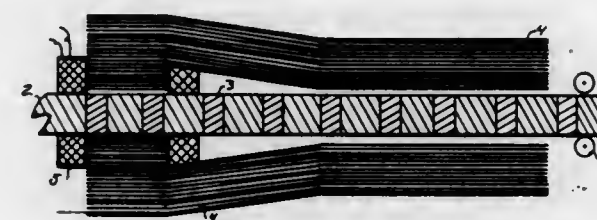
Max Alth, 6 Tamarack Road, Port Chester, N.Y.

Filed Feb. 25, 1972, Ser. No. 229,267

Int. Cl. H02k 41/02

U.S. Cl. 310-13

10 Claims



One element comprises a long bar of copper or aluminum transversely pierced at regular intervals by iron cores. The second element—either element may move—comprises a solenoid with an iron core terminating in two long arms, parallel to each other and spaced a little wider than the aforementioned conductive bar, which is positioned by idler wheels between and in line with the arms of the solenoid's core.

When the solenoid is energized by AC, a repulsion current is induced in the conductive bar and it moves away from the coil, guided by the idler wheels.

### 3,735,163 LINEAR MOTOR FOR THE POSITIONING OF MAGNETIC HEADS

Durk Dijkstra, Rijswijk; Willem Van Der Hoek, Eindhoven, Emmasingel, and Wim Visser, Rijswijk, all of Netherlands, assignors to U.S. Phillips Corporation, New York, N.Y.

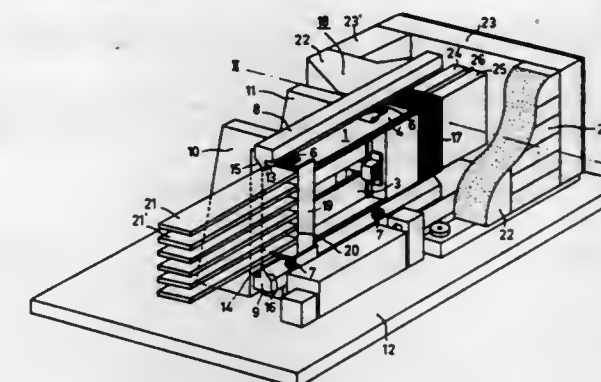
Filed May 1, 1972, Ser. No. 249,315

Claims priority, application Netherlands, May 6, 1971, 7106185

Int. Cl. H02k 41/02

U.S. Cl. 310-13

7 Claims



A device for positioning magnetic heads for use in a disk store, which device includes a carriage which is provided with rollers and is displaceable on fixed guide tracks. The carriage has the form of a sectional beam which has at least two parallel outer surfaces and on one end of which a coil is wound. When the coil is energized the carriage is movable with respect to a magnet system. On the other end of the beam, there is secured a mounting column to which a plurality of parallel supporting arms carrying magnetic heads are secured. The rollers are mounted at two spaced locations on the two outer surfaces in a manner such that the rotation axes of the rollers are inclined to these surfaces. The guide tracks extend parallel to the two outer surfaces and provide dimensional stability to the beam which is supported at four points.

### 3,735,164 DRIVE ARRANGEMENT INCLUDING A SYNCHRONOUS MOTOR

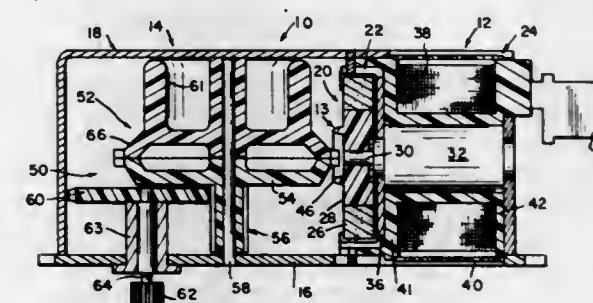
Wallace L. Lian; Bill G. Kilmer, and Richard H. Weber, all of Indianapolis, Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Sept. 16, 1971, Ser. No. 181,177

Int. Cl. H02k 7/10

U.S. Cl. 310-41

17 Claims



A synchronous motor and a rotating motion transmission arrangement, the synchronous motor including a rotor having a driving surface operable in a plane substantially normal to the axis of the rotor, the rotating motion transmission arrangement being responsive to the driving surface and operable in a plane substantially normal to the plane of the driving surface, with each of the driving surface and the rotating motion transmission arrangement including a means cooperating with one another to prevent the rotor from rotating in a wrong direction. The stator structure of the synchronous motor has



poles arranged in groups whereby good starting characteristics and relatively high running torque is achieved in a relatively small amount of confined space. A coil bobbin includes a spool arranged for receiving electrical terminals and adapted to provide passage for a wire of a winding to the electrical terminals within the confines of the spool. The spool is unitarily constructed with a base member, the base member adapted to align and maintain the spool, the permanent magnet rotor and the stator structure in cooperating working relationship with each other.

3,735,165

# PERMANENT MAGNET TYPE TORSIONAL STEPPING MOTOR

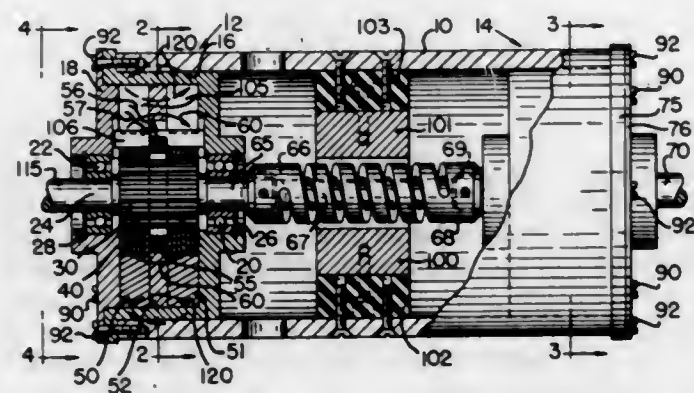
William S. Touchman, Kettering, Ohio, and John D. Hays, Ithaca, N.Y., assignors to The National Cash Register Company, Dayton, Ohio

Filed July 6, 1972, Ser. No. 269,477

Int. Cl. H02k 37/00

U.S. Cl. 310-49

20 Claims



An incremental rotary motion device or stepping motor has a plurality of permanent magnet rotor assemblies which are connected by means of a torsionally resilient coupling member. The coupling member is in the form of a torsion spring which is capable of storing and releasing energy for aiding in incrementally advancing one rotor assembly and then the other rotor assembly in sequential manner. A bucking coil is positioned around each rotor and is pulsed to divert the magnetic lines of force emanating from the permanent magnet thereby allowing the releasing and storing of energy of the coupling member to advance the output shaft.

3,735,166

# PIEZOELECTRIC CRYSTAL ASSEMBLY

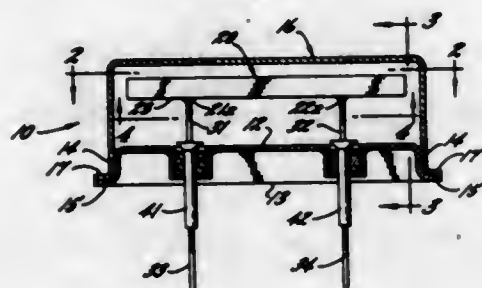
Deward C. Bradley, Sandwich, Ill., assignor to CTS Corporation, Elkhart, Ind.

Filed Oct. 6, 1971, Ser. No. 186,990

Int. Cl. H04r 17/00

U.S. Cl. 310-9.4

2 Claims



A piezoelectric crystal assembly in which a base is provided having small diameter tubulations parallel to one another with a center-to-center spacing which corresponds to the center-to-center spacing of crystal lead wires which extend straight downwardly at right angles from the undersurface of the

crystal, with the leads being telescoped into the tubulations and soldered therein to provide the sole support for the crystal and with the lead wires being elongated to extend beyond the tubulations for direct connection to associated circuit components. The tubulations are flared to provide guidance for the lead wires and to accommodate an annular body of solder. The crystal is spaced upwardly from the tubulations to provide straight free lengths of lead wire for accommodation of torsional vibration imparted to the lead wires by the crystal.

3,735,167

# SPEED SENSOR FOR MECHANICAL ADJUSTABLE SPEED DRIVE

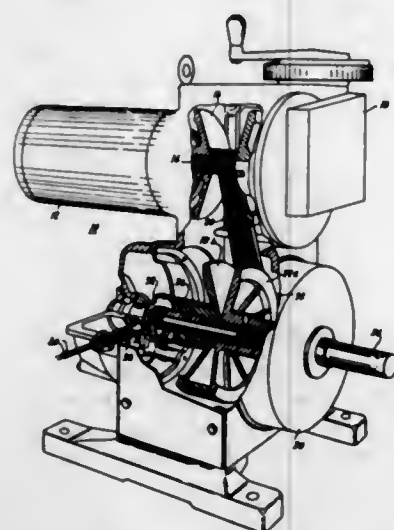
Jack C. Wickersheimer, West Allis, Wis., assignor to The Louis Allis Company, Milwaukee, Wis.

Filed Dec. 7, 1971, Ser. No. 205,573

Int. Cl. H02k 19/24

U.S. Cl. 310-168

5 Claims



An adjustable ratio transmission mechanism having a variable speed ratio between an input shaft and an output shaft where the speed ratio is varied by changing the effective diameters of a pulley on one shaft having oppositely disposed, coned halves, one fixed and one selectively axially movable along the shaft, and a second pulley on the other shaft having oppositely disposed, coned halves, one fixed on the shaft and one movable axially along the shaft, the movable half being spring biased against the fixed half, the two pulleys being coupled by a belt. Adjusting selectively movable half of one pulley with respect to its fixed half produces the opposite movement of the movable half of the other pulley biased by the spring. The improvement comprising a single cup-like member to both retain the pulley biasing spring and position and provide a means to sensing shaft speed. The cup-like member is perforated to periodically vary the reluctance of the magnetic circuit of a magnetic pickup as the shaft rotates, thereby providing a signal indicative of the speed of the shaft.

3,735,168

# HIGH VOLTAGE INSULATED COIL AND MACHINE UTILIZING THE SAME

Robert L. Anderson, Bay Village, and Marvin M. Fromm, Cleveland Heights, both of Ohio, assignors to Portec, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 119,571, March 1, 1971, Pat. No. 3,662,199. This application Dec. 20, 1971, Ser. No.

210,178

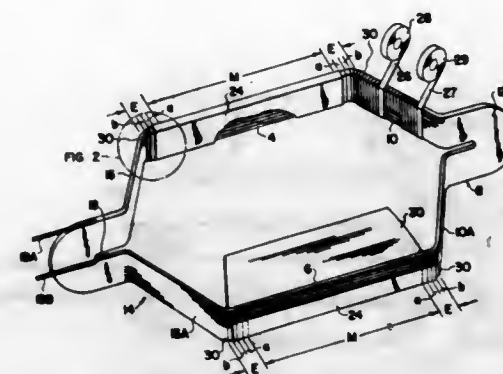
Int. Cl. H02k 3/00

U.S. Cl. 310-200

14 Claims

An improved insulated coil for an electrodynamic machine is prepared by wrapping multiple layers of a wide insulative wrapper around the straight section of the coil, in overlapping contact with a narrow insulative tape applied on the end portion of the coil. The wrapped coil is then vacuum-pressure im-

pregnated with a liquid, heat-reactive resin, and the coil is then heat and pressure treated to cure the liquid resin im-



pregnate to a permanent, solid set and to form thereby an insulated coil with a continuous, unitary insulative joint between the wrapper and the tape.

3,735,169

# CHANNEL, SHAPED, LAMINATED, HIGH TEMPERATURE SLOT WEDGE FOR DYNAMOELECTRIC MACHINES

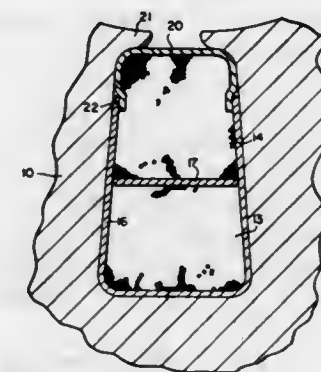
Roy Leonard Balke, and Domenico Cipriani, both of Erie, Pa., assignors to General Electric Company, Wilmington, Mass.

Filed Apr. 14, 1971, Ser. No. 133,820

Int. Cl. H02h 3/48

U.S. Cl. 310-214

7 Claims



A rigid, laminated, thin "slot wedge" construction is described along with the method for fabricating it from flexible, normally difficult to form plastics. The laminated wedge is channel shaped with well defined corners to provide firm seating of the wedge in the slots of a dynamoelectric machine. A rigid, laminated channel shaped slot wedge having excellent corner definition is produced from thin, flexible high temperature plastics such as "Kapton" polyimide film or "Nomex" polyamide sheets by laminating them with an adhesive which is rigid when cured. The laminate is baked and the adhesive cured while it is held in the desired channel form by a clamping fixture. This imparts the desired rigidity and long term corner definition to the wedge while yet retaining the desired high temperature qualities of the individual laminations.

3,735,170

# COMMUTATOR FOR D.C. MACHINES

Roland S. Christensen, 6101 June Street North, Minneapolis, Minn., and Stanley A. Helder, 4609 Vallacher Avenue, St. Louis Park, Minn.

Filed Aug. 9, 1971, Ser. No. 170,074

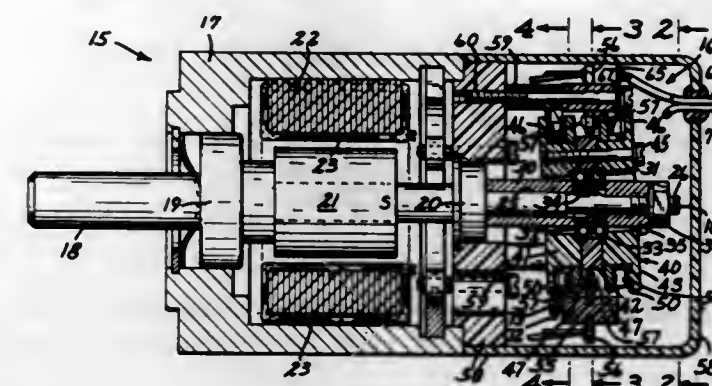
Int. Cl. H02k 13/00

U.S. Cl. 310-219

16 Claims

A pair of electrically conducting rings having continuous contact surfaces thereon positioned in parallel spaced apart

relationship to form a channel, and a plurality of contacts adapted to be connected to the various windings of the machine and positioned in a circular spaced apart orientation within the channel so that at least one contact is engaged with



one of the rings and an oppositely disposed contact is engaged with the opposite ring. A mounting device is engaged with the shaft to produce relative oscillatory movement between the pair of rings and the contacts so that the contacts sequentially engage each ring during each rotation of the shaft.

3,735,171

# FLAT COMMUTATOR STRUCTURE

Jan Maarten Van De Griend, Dordrecht, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.

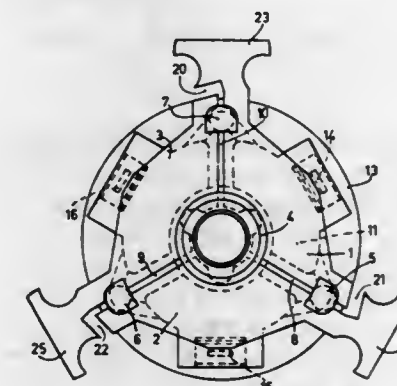
Filed Sept. 13, 1971, Ser. No. 180,027

Claims priority, application Netherlands, Sept. 23, 1970, 7014025

Int. Cl. H01r 39/16

U.S. Cl. 310-235

8 Claims



A flat commutator structure having commutator segments which are made by stamping from sheet material and at their ends facing the shaft are anchored in a hub made of a synthetic material by injection moulding. To increase the flatness of the commutator face the commutator segments are also interconnected by anchoring elements near the outer periphery of the commutator. Both the hub and the latter anchoring elements may form parts of a single commutator support made from a synthetic material by injection moulding and preferably have open chambers into which the grooves separating the commutator segments terminate.

3,735,172

# MOTOR BRUSH HOLDER

Patrick A. Battaglia, Elizabeth, and Edwin Fitzwater, Rahway, both of N.J., assignors to The General Signal Corporation, New York, N.Y.

Filed Dec. 22, 1971, Ser. No. 210,683

Int. Cl. H02k 13/00

U.S. Cl. 310-239

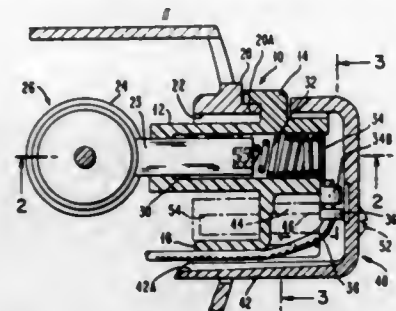
7 Claims

A motor brush holder is disclosed including a plastic housing having a bore for receiving an electrically conductive



brush and spring means engaged at one end with the brush, and further having the provision of a terminal clip means

a spring and an electromagnet in the direction of the armature shaft are transferred to the hollow rotor by a disk attached to the sliding sleeve. The braking areas used are parts of the in-



secured at the outer end of the housing in contact with the spring means, and a plastic cover for shielding the terminal clip and its associated wire.

3,735,173

**ELECTRIC MOTOR CONSTRUCTION**

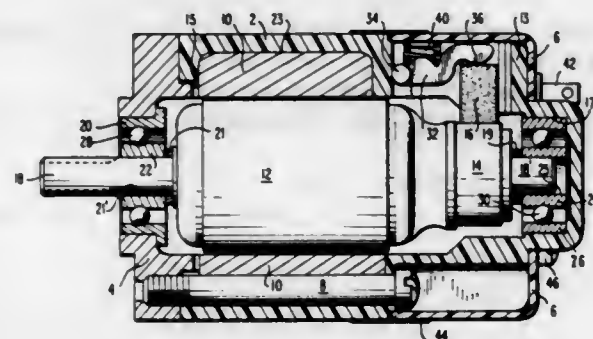
Jules Wisniewski, Cliffside Park, N.J., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Nov. 24, 1971, Ser. No. 201,639

Int. Cl. H02k 13/00

U.S. Cl. 310-242

9 Claims



This invention relates to brush actuating mechanisms for direct current motors and, more particularly, to an innovative plastic-molded housing for these motors. The invention discloses a plastic-molded housing, closed at one end and apertured at the other end, said closed end having opposed longitudinal recesses for receiving a brush, a cam lever, and a helical spring, respectively therein, positively retained by an end cover slipped over said closed end and secured thereto, while said apertured end provides for the insertion of permanent magnets and a driven shaft carrying an armature, and commutator.

3,735,174

**ELECTRIC MOTOR WITH HOLLOW ROTOR AND METHOD OF FABRICATING THE HOLLOW ROTOR**

Lothar Bosch, 755 Rastatt, and Hans-Joachim Blocher, 7418 Metzingen, both of Germany, assignors to Gesellschaft für Kernforschung mbH, Metzingen, Germany

Filed Nov. 27, 1970, Ser. No. 93,374

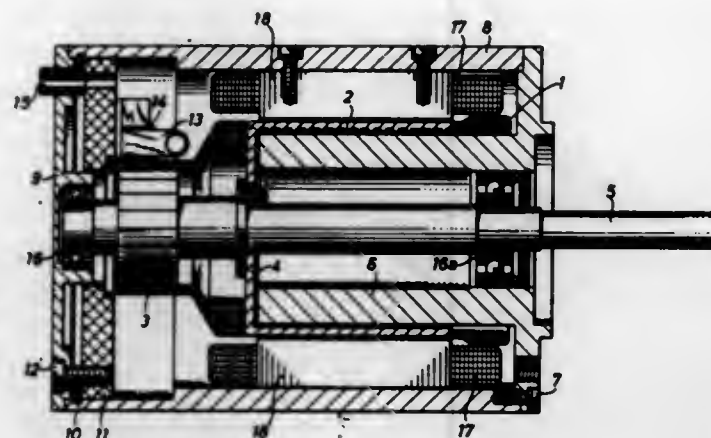
Claims priority, application Germany, Nov. 26, 1969, P 19 54 280.4

Int. Cl. H02k 1/22

U.S. Cl. 310-266

14 Claims

An electric motor with a hollow rotor is described whose armature winding is arranged on an extremely thin-walled tubular winding support. The stationary ferromagnetic core of the hollow rotor and the likewise ferromagnetic core of the exciting winding are equipped with cooling channels through which, e.g., water is fed for removal of the heat produced by the electric current. The hollow rotor, which is arranged on the armature shaft so as to be displaceable by means of a sliding sleeve can be slowed down by means of an electromagnetic braking device in such a way that the forces generated by



side wall of the winding support which has a cylindrical or conical shape. Moreover, a method of fabricating a hollow rotor is described.

3,735,175

**METHOD AND APPARATUS FOR REMOVING HEAT FROM WITHIN A VACUUM AND FROM WITHIN A MASS**

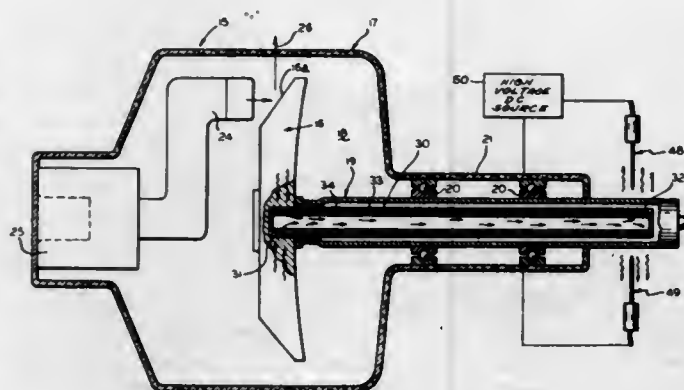
Oscar C. Blomgren, Jr., Lake Bluff, Ill., assignor to Inter-Probe, Inc., North Chicago, Ill.

Filed Mar. 15, 1971, Ser. No. 124,030

Int. Cl. H01j 35/10

U.S. Cl. 313-60

5 Claims



A method and apparatus for cooling elements generating heat within a vacuum and the center of a large mass of hot material including a heat pipe having the input end within a vacuum or a large mass of material and the output end exterior thereof, and means for subjecting the output end to an electrostatic field to materially increase the rate of heat transfer into the atmosphere.

3,735,176

**ROTATING ANODE BALANCE AND GETTER**

Helmuth Langer, Springdale, and William W. Fengler, Fairfield, both of Conn., assignors to The Machlett Laboratories, Incorporated, Springdale, Conn.

Filed May 1, 1972, Ser. No. 252,509

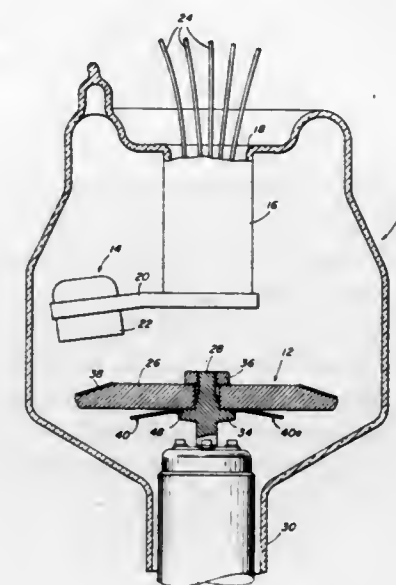
Int. Cl. H01j 35/10

U.S. Cl. 313-60

8 Claims

A rotating anode for X-ray tubes having a supporting rotatable shaft carrying fixed swing weights which may be initially

positioned as necessary to achieve balance of the anode, and



3,735,178

**CATHODE RAY TUBE COMPRISING AT LEAST ONE ELECTRON GUN FOR PRODUCING A NUMBER OF ELECTRON BEAMS**

Jan Peper, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

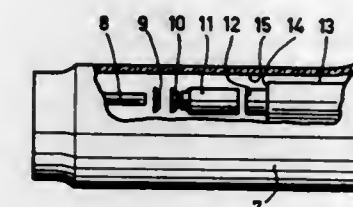
Filed Mar. 1, 1972, Ser. No. 230,762

Claims priority, application Netherlands, Mar. 16, 1971, 7103464

Int. Cl. H01j 29/56

U.S. Cl. 313-70

4 Claims



A cathode ray tube, in particular a color tube, in which two or more electron beams are produced, focused, and converged on a picture display screen. A part of each electron beam is intercepted and reflected against a given part of the neck as a result of which the potential thereof rapidly adjusts at an equilibrium value after switching on the tube.

3,735,179

**FACE PANEL ASSEMBLY FOR COLOR CATHODE-RAY TUBE**

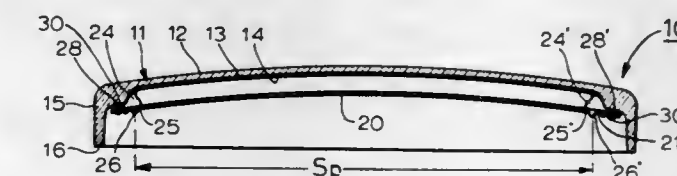
Sam H. Kaplan, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Apr. 3, 1972, Ser. No. 240,562

Int. Cl. H01j 1/96, 19/50, 29/46

U.S. Cl. 313-92 B

9 Claims



A face panel assembly for a color picture tube has a face panel formed of a glass having a predetermined coefficient of thermal expansion and a cylindrically shaped target surface that supports a screen. An aperture mask formed of a material having a different coefficient of thermal expansion has a plurality of index stations and a pair of end-mounted strips which are formed of the material having a coefficient of thermal expansion substantially the same as that of the face panel. A plurality of pedestals having upstanding posts are affixed to the face panel and cooperate with the index stations of the mask to support the mask in a predetermined spaced relation to the target surface, to conform the mask to a contour that matches the target surface and to prevent lateral displacement of the mask. Finally, frit means are employed to secure the mask mounting strips to the flange of the face panel.

3,735,180

**DATA DISPLAY DEVICE OF THE GAS DISCHARGE TYPE**

Maurice Coulon, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sept. 22, 1971, Ser. No. 182,763

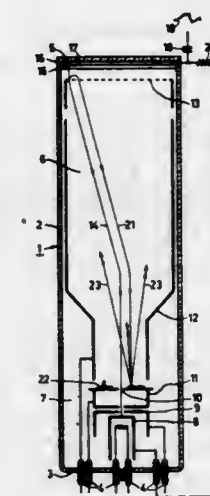
Claims priority, application France, Sept. 24, 1970, 70/34663

Int. Cl. H01j 61/66; H01k 7/04

U.S. Cl. 313-109.5

4 Claims

A gas discharge type data display device is formed of a stack of alternately conductive and insulating elements for localiz-



A camera tube whose target plate is stabilized by slow electrons and whose dark current is comparatively low, is provided with a luminescent material which is arranged in the viewing field of the target plate at the area where the electrons returning from the target plate are captured so that the luminescent light produced by said electrons illuminate the target plate more or less uniformly.



ing the discharge by proper potential distribution, the control of which is effected by a conductive screen electrode positioned between anode and cathode. Discharge is confined in a



plurality of cavities provided in said stack. The device permits a storage of data in said cavities for an indefinite period of time.

3,735,181

#### SEGMENT TYPE DISPLAY TUBE FOR SELECTIVELY DISPLAYING ONE OR MORE OF A PLURALITY OF ALPHA-NUMERICAL CHARACTERS

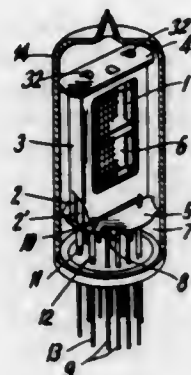
Masaki Kobayakawa, and Takashi Yoshii, both of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed June 28, 1971, Ser. No. 157,119

Claims priority, application Japan, June 29, 1970, 45/64610; July 7, 1970, 45/67261; Aug. 8, 1970, 45/80955; Oct. 23, 1970, 45/105364

Int. Cl. H01J 61/66

U.S. Cl. 313-109.5



A display tube for use in displaying various characters comprises an electrode assembly sealed in a container. The electrode assembly has a first electrode and a set of character segment electrodes. The tube further comprises a first stem lead connected to the first electrode and a set of second stem leads connected to the set of character segment electrodes, respectively through a set of lead-wires. The set of lead-wires are secured to an insulator frame means defining an opening providing a discharge space so that the set of character segment electrodes may be arranged in one common plane in the opening. The lead-wires and second stem leads may integrally extend from the character segment electrodes.

3,735,182  
GRAY SCALE GAS PANEL

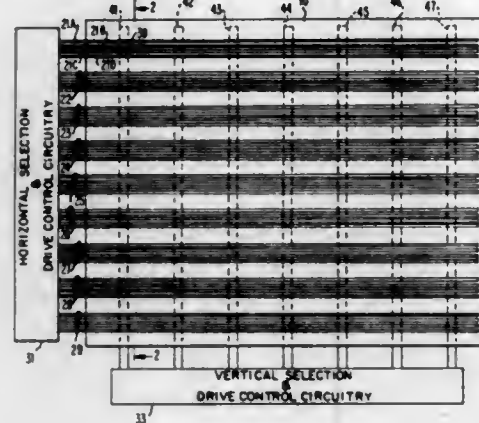
John J. Dalton, Rhinebeck, and Marvin B. Skolnik, Woodstock, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 12, 1972, Ser. No. 271,097

Int. Cl. H01J 17/04

U.S. Cl. 313-188

4 Claims



An improved gaseous discharge display arrangement is disclosed for providing a gray scale display capability with nominal modification of existing gaseous display apparatus. Conductor patterns of different resolution are utilized in the conductor drive configurations which are positioned on opposite sides of the panel in a conventional gaseous panel construction. By controlling the selective energization of the higher resolution lines associated with one of the driving configurations, a variation of intensities is provided depending on the ratio of the resolutions and the number of higher resolution conductors selected for each of the lower resolution conductors.

3,735,183

#### GASEOUS DISCHARGE DISPLAY DEVICE WITH A LAYER OF ELECTRICALLY RESISTIVE MATERIAL

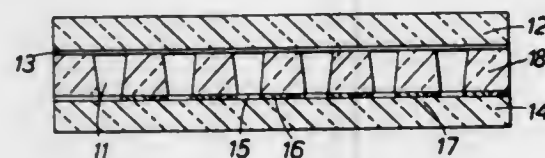
Frank Walters, Bury, England, assignor to Ferranti Limited, Hollinwood, England

Filed May 19, 1971, Ser. No. 144,872

Int. Cl. H01J 61/04

U.S. Cl. 313-188

28 Claims



A visual display device incorporates an array of direct-current discharge devices. A block of electrically insulating material has a plurality of gas-filled cavities, each forming a discharge space for one discharge device, or a single gas-filled cavity common to all discharge devices. A plurality of transparent anode conductors on a face of a second block of electrically insulating material, sealed to the first block, and in registration with the cavities, form anode electrodes for one co-ordinate of the array. Cathode electrodes are carried by a face of a third block of electrically insulating material, also sealed to the first block, and those cathode electrodes of the other co-ordinate of the array are connected by way of electrically resistive material to one of a plurality of cathode conductors. The cathode conductors, which are isolated from the discharge space or spaces, cathode electrodes and electrically resistive material are all carried on said face of the third block.

3,735,184  
CONTINUOUS DYNODE CHANNEL TYPE SECONDARY ELECTRON MULTIPLIER

Haruo Maeda, Setagaya-ku, Tokyo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 790,744, Jan. 13, 1969, abandoned.

This application Aug. 19, 1971, Ser. No. 173,229

Int. Cl. H01J 43/20

U.S. Cl. 313-105

5 Claims



A continuous dynode channel type secondary electron multiplier wherein an electric field is established in the axial direction, and a secondary-electron emissive surface is provided on the inner surfaces of the channel dynode, said secondary electron multiplier being so constructed that an electric field component perpendicular to the axis is varied along the axial direction to increase the total number of impacts of electrons with the secondary-electron emissive surfaces per unit axial length, thereby enhancing the multiplication factor.

3,735,185

#### LAMP ASSEMBLY

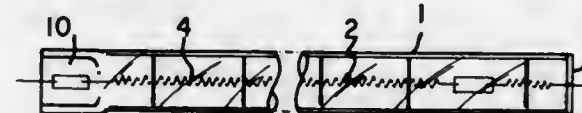
Robert P. Bonazoli, Hamilton, and James P. Keenan, Reading, both of Mass., assignors to Sylvania Electric Products Inc., Danvers, Mass.

Division of Ser. No. 741,066, June 28, 1968, abandoned. This application Mar. 5, 1971, Ser. No. 121,519

Int. Cl. H01J 1/92, 19/48; H01K 1/24

U.S. Cl. 313-278

3 Claims



A tubular tip-less lamp is manufactured by exhausting and filling the lamp through an open end of an extra long tubular envelope, the other end being sealed. The envelope is then press-sealed at a section thereof located a short distance from the open end and the extra length of the envelope is then removed.

3,735,186

#### FIELD EMISSION CATHODE

Anton Martin Klopfer, Aachen, and Georg Dittmer, 5101 Roetgen, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

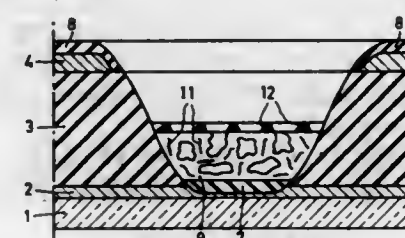
Filed Mar. 10, 1971, Ser. No. 122,851

Claims priority, application Germany, Mar. 14, 1970, P 20 121.9

Int. Cl. H01J 1/30, 31/08, 1/02

U.S. Cl. 313-346 R

7 Claims



A field emission cathode comprises a glass substrate in combination with an insulating layer sandwiched between two

conducting layers functioning as electrodes. Cavities extending through one of the electrodes and the insulating layer to the surface of the other electrode contain highly compacted and porous electron emissive layers which provide high electrical resistance between said electrodes and are diffused with metallic gold to form needle-shaped metal deposits on the surface as well as within the emissive layers. Such cathodes are used in image converters and image display tubes.

3,735,187

#### CATHODE BLADE FOR A FIELD EMISSION X-RAY TUBE

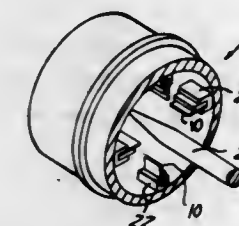
W. Leslie Rogers, Ann Arbor, Mich., and Ralph C. Ayres, Mission, Kans., assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 22, 1971, Ser. No. 210,796

Int. Cl. H01J 35/06

U.S. Cl. 313-355

4 Claims



A cathode blade comprising a thin electron emitting layer formed from tungsten that projects from a copper support layer. The tungsten layer is extremely thin so that electrons will be readily emitted from the edge of the blade without requiring that the portion of the blade proximate the electron emitting edge be tapered. The copper support layer is spaced from the electron emitting edge of the tungsten layer, and therefore, does not reduce the sharpness of that edge. The blade is formed by vapor depositing a thin tungsten layer on a copper layer that is somewhat larger than the desired blade. The copper and tungsten layers are covered with coatings that are unaffected by electro-etching processes for removing unwanted portions of those layers. The portions of the copper and tungsten layers having outlines corresponding to the desired outlines of the copper and tungsten layers respectively of the desired blade are masked. The protective coating is removed from the remaining unmasked surfaces. The exposed portion of each layer is then removed by electro-etching.

3,735,188

#### TRAVELING WAVE TUBE WITH COAX TO HELIX IMPEDANCE MATCHING SECTIONS

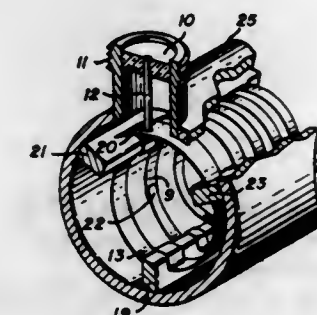
Charles Elmore Anderson, San Carlos, and Clarence Anthony Cardoza, Menlo Park, both of Calif., assignors to Litton Systems, Inc., San Carlos, Calif.

Filed July 3, 1972, Ser. No. 268,797

Int. Cl. H01J 25/34

U.S. Cl. 315-3.5

10 Claims

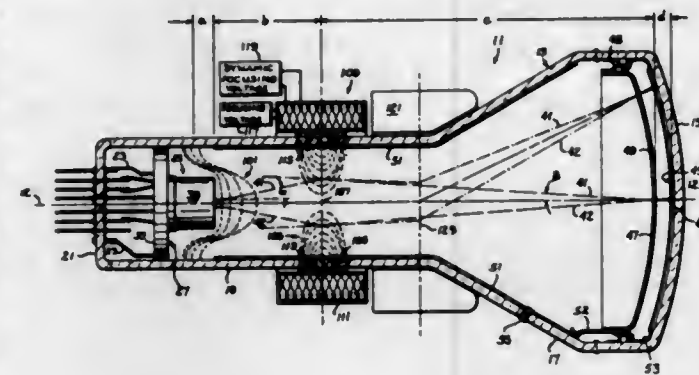


A traveling wave tube includes an elongated hollow cylinder of nonmagnetic metal which serves as a container and an elongated conductive wire helix of predetermined diameter which serves as a slow wave structure, located in the cylinder. A plu-



ality of straight elongated dielectric support rods of a length greater than the helix length are spaced about, contact, and extend along the inner walls of the cylinder substantially parallel with the axis of the cylinder. The rods contact the outer periphery of the helix and thereby support the helix concentric with the axis of the cylinder. A matching helix section of a relatively small number of turns and relatively short length is located at an end of the elongated helix and is supported by the support rods. A coaxial input connector includes a center conductor which extends into the metal cylinder and is connected to one end of the matching helix. The other end of the matching helix is connected to an end of the elongated helix. The matching helix is of a diameter larger than the diameter of the elongated helix to permit the turns of the matching helix to be more proximate the inner surface of the metal cylinder than the turns of the elongated helix and the matching helix includes indented portions which fold around each of said plurality of dielectric support rods.

which is greater than the final anode potential, effects a divergent electron lens that influences the individual beams emerging from the common anode. External magnetic focusing means, positioned ahead of the gun, provides an internal con-

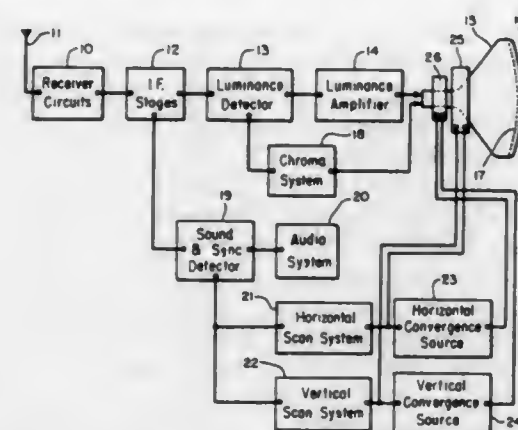


**3,735,189**  
**BLUE DROOP CORRECTION CIRCUIT WITH A SINGLE SUPPLEMENTAL CORRECTION COIL**  
Steven Karlovics, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Mar. 19, 1971, Ser. No. 126,096  
Int. Cl. H01J 29/50

U.S. Cl. 315-13 CG

7 Claims



A supplemental dynamic field structure is associated primarily only with the blue gun of a tri-color cathode-ray tube having three guns in a delta array with the blue gun disposed above the plane of the red and green guns. The supplemental field structure is energized by the horizontal-frequency component of exciting current applied to the conventional blue dynamic convergence electromagnet, providing a field ahead of the principal convergence system which prebends the blue beam in an opposite sense to that of the principal convergence system. As used here, the expression "blue beam" is intended to define the electron beam designated to excite the blue phosphor dots of the phosphor dot triads of the image screen.

The field of the supplemental electromagnetic structure may be confined to prebend the blue beam alone or it may be permitted to extend to and occasion prebending of reduced magnitude of both the red and green beams but in a sense opposite that experienced by the blue beam.

**3,735,190**  
**COLOR CATHODE RAY TUBE**  
Donald L. Say, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Aug. 31, 1971, Ser. No. 176,502  
Int. Cl. H01J 29/50

U.S. Cl. 315-13 CG

7 Claims

A multiple beam color cathode ray tube utilizes a compact electron gun to provide a compact bundle of closely spaced individually controlled electron beams emergent from a common final anode. A neck related coating, at screen potential

vergent magnetic focusing lens which influences the individual diverging beams by effecting convergence thereof at the apertures in the mask to produce a high resolution luminescent display in the patterned screen therebeneath.

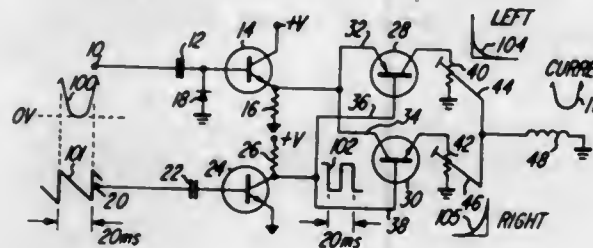
**3,735,191**  
**DYNAMIC CONVERGENCE CIRCUITS**  
Rene Peter, Basel, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Apr. 15, 1971, Ser. No. 134,384  
Claims priority, application Great Britain, Apr. 27, 1970, 20,090/70

Int. Cl. H01J 29/50

U.S. Cl. 315-13 C

8 Claims



A vertical rate dynamic convergence circuit for a multibeam color television kinescope incorporates a set of controls that permits adequate adjustment of the convergence currents to adapt the corrections afforded to the particular pattern of misconvergence errors encountered. The controls are associated with a pair of switching transistors which divide a parabolic voltage signal into substantially equal half portions. Such controls are effective to independently vary the amplitude of each half portion for combination in forming the convergence current. Master and differential controls are provided to cause beam convergence at most points of a scanned raster by confining the effects of each control to the red and green vertical convergence winding or to the blue vertical convergence winding, and to particular halves of the reproduced picture.

**3,735,192**  
**VERTICAL DEFLECTION CIRCUITS UTILIZING BOTH REGENERATIVE AND DEGENERATIVE FEEDBACK FOR GENERATING PARABOLIC VOLTAGES**  
Leslie Ronald Avery, Byfleet, England, assignor to RCA Corporation, New York, N.Y.

Filed Apr. 14, 1971, Ser. No. 133,864  
Claims priority, application Great Britain, Apr. 22, 1970, 19,351/70

Int. Cl. H01J 29/70

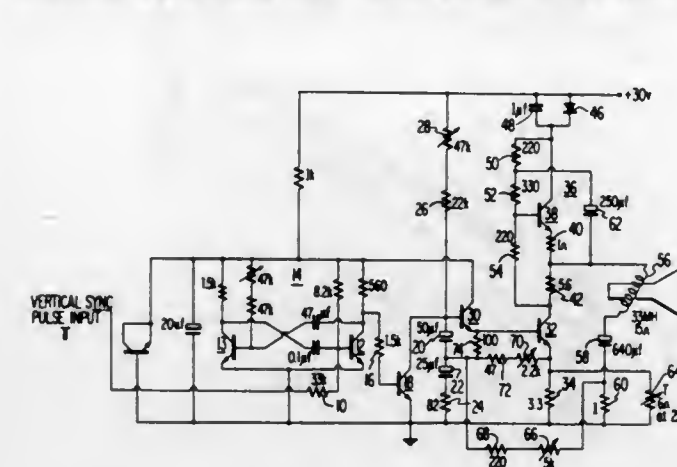
U.S. Cl. 315-27 TD

7 Claims

S-shaping is introduced into a sawtooth waveform by a combination of positive and negative feedback of separately ad-

justable, generally parabolic voltage waveforms so as to provide a suitable field (vertical) deflection signal for a wide deflection angle kinescope. Output and drive transistors are

enable-signal voltage coding transistors, an I.C. transistor drive amplifier and a thermionic electron tube cathode-fol-



cut off relatively rapidly at the end of scan and are returned to conduction at the beginning of scan by coupling capacitive elements in the sawtooth generating circuit to the inputs of the transistors.

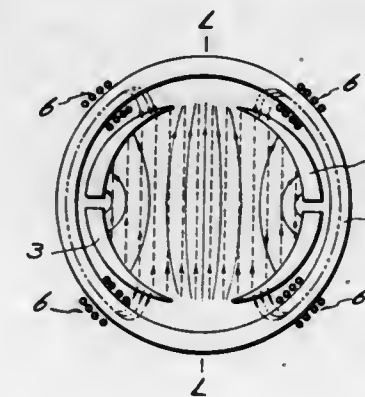
**3,735,193**  
**DEFLECTION YOKE**  
Hiroshi Ikeuchi, Yokohama, Japan, assignor to Denki Onkyo Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1971, Ser. No. 212,059  
Claims priority, application Japan, Dec. 26, 1970, 45/129602

Int. Cl. H01J 29/70

U.S. Cl. 315-27 XY

7 Claims



A deflection yoke with four compensation coils which are provided at the core inside which a pair of horizontal deflection coils are mounted and act on the magnetic flux generated from said horizontal deflection coils to generate a compensation field which makes the horizontal deflection field pin cushion fields at both right and left areas of the beam scanning range and a barrel field at the middle area of the range.

**3,735,194**  
**ELECTRONIC SWITCHING CIRCUIT ARRANGEMENTS**  
Martin G. Humphreys, Aylesbury, England, assignor to Redifon Limited, London, England

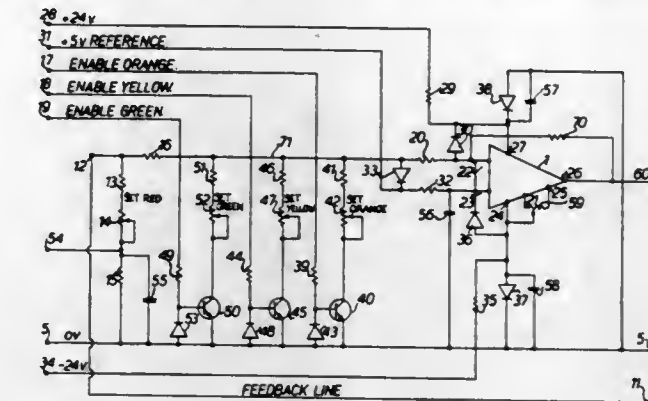
Filed Aug. 3, 1971, Ser. No. 168,679  
Claims priority, application Great Britain, Aug. 14, 1970, 39,373/70

Int. Cl. H01J 29/52

U.S. Cl. 315-30

6 Claims

An electronic, high-voltage switching arrangement for switching the final anode voltage of a beam-penetration type color C.R. tube. The arrangement comprises separate color-



lower providing feedback from a tapped cathode potentiometer.

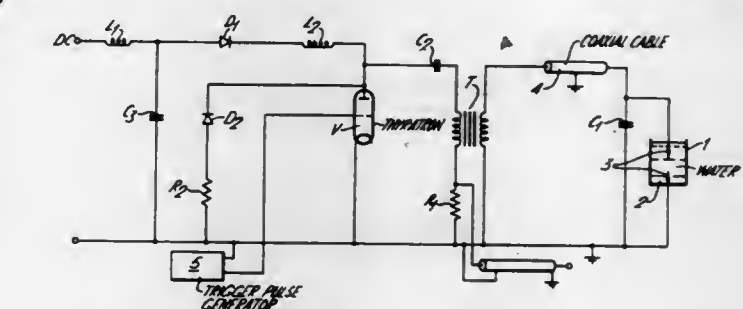
**3,735,195**  
**SPARK-DISCHARGE APPARATUS FOR ELECTROHYDRAULIC CRUSHING**  
Elmer Thomas Jenkins, and Geoffrey Marcus Ward, both of c/o United Kingdom Atomic Energy Authority, 11 Charles 11 St., London, S. W. 1, England

Continuation-in-part of Ser. No. 748,695, July 30, 1968. This application Dec. 4, 1970, Ser. No. 95,145  
Claims priority, application Great Britain, Aug. 7, 1967, 36,097/67; July 29, 1968, 4,890/68

Int. Cl. H05b 37/02

U.S. Cl. 315-111

4 Claims



In existing apparatus of the above kind, a capacitor is discharged through the liquid-immersed gap via a self-triggered or externally triggered switch device. In the present invention an initially uncharged capacitor is connected directly across the gap without any intervening switch device. This first capacitor is pulse-charged to the breakdown voltage of the gap via a step-up pulse transformer by discharging a second capacitor via a triggered switch device through the primary winding thereof. The two capacitors are approximately matched in value, as reflected by the transformer ratio, so that substantially all the energy stored in the second capacitor is transferred to the first capacitor at peak voltage thereon. A principal advantage is that the triggered switch device, eg a thyatron, does not require either to withstand the high gap voltage or to carry the high gap current.

**3,735,196**  
**FLASHER CIRCUIT WITH OUTAGE INDICATION**  
John F. Bolinger, and Wilhelm K. Kolster, deceased, both of Michigan City, Ind. (by Christel E. Kolster, executrix) assignor to Meridian Industries, Inc., Southfield, Mich.

Continuation of Ser. No. 40,288, May 25, 1970, abandoned. This application Mar. 23, 1972, Ser. No. 237,569

Int. Cl. H03b 3/282; H05b 39/09

U.S. Cl. 315-200 A

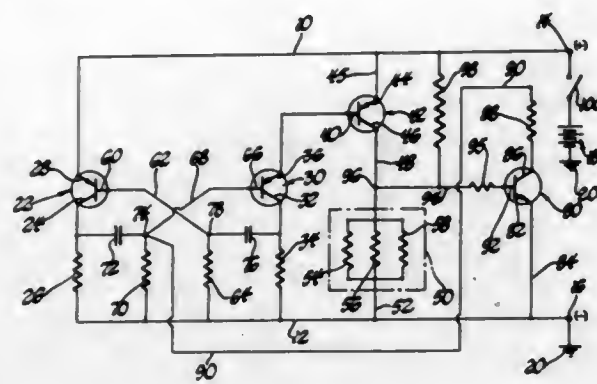
6 Claims

A flasher circuit has a power transistor controlling a circuit with a load therein; a multivibrator produces a timed pulse



signal to the power transistor for turning the power transistor "on"; and an additional transistor sensitive to the occurrence

incorporated between and isolate the body portion from the ceramic stand-offs so that all portions of the body portion are



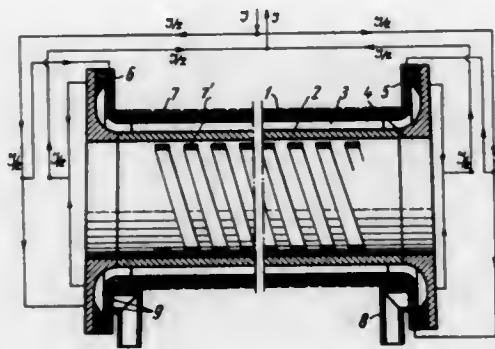
### 3,735,197 RECTIFIER

Vadim Nikolaevich Pakin, Zhemchuzhnaya ulitsa 24, kv. 35; Novosibirsk, U.S.S.R.

Filed Aug. 13, 1971, Ser. No. 171,588  
Int. Cl. H01j 17/14

U.S. Cl. 315-348

2 Claims



A rectifier which consists of two coaxial cylindrical electrodes separated by a working gap filled with a low pressure gas and which is controlled by a magnetic field having an axial component; said rectifier being provided with at least one control winding disposed on the external surface, with respect to the working gap, of any of the electrodes and fed with a pulse current, the duration of the current pulses being such that the control magnetic field is removed by the instant the working current pulse switched by the rectifier terminates.

### 3,735,198

#### ELECTROSTATIC DISCHARGE DEVICES WITH HIGH TEMPERATURE ARC RESISTANCE

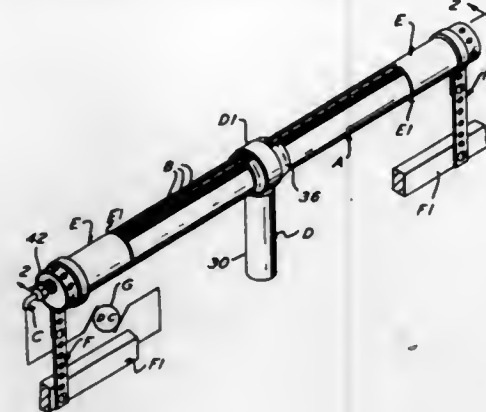
Guy F. Barnett, Warminster; Warren W. Levy, Cynwyd, and Dolph Simons, Philadelphia, all of Pa., assignors to The Simco Company, Inc., Lansdale, Pa.

Filed Aug. 17, 1971, Ser. No. 172,499  
Int. Cl. H05f 3/00; H01t 19/04

U.S. Cl. 317-2 F

8 Claims

High voltage static discharge device utilizes an insulative body portion of conventional plastic material for supporting conductive discharge points and ceramic stand-offs resistant to high temperature deterioration from arcing to space the body portion from an adjacent ground. Conductive elements which are connected to the same high voltage as the points are



at substantially the same voltage whereas the high voltage is imposed across the stand-offs.

### 3,735,199

#### SUPPLY DEVICE FOR AN OUTLET NOZZLE IN AN INK JET WRITING METHOD

Enzo Ascoli, Lausanne, Switzerland, assignor to Pallard S.A., Sainte-Croix (Vaud), Switzerland

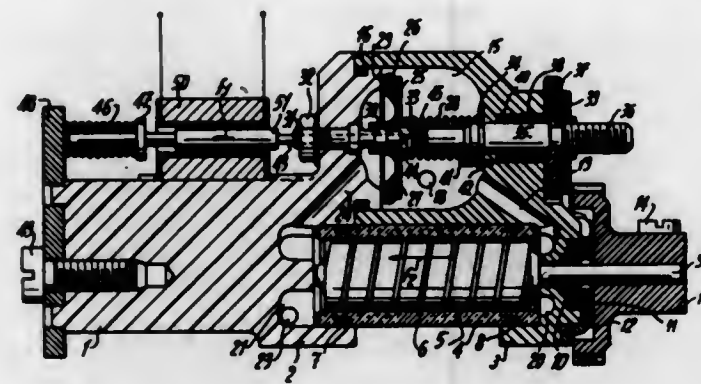
Filed Dec. 21, 1971, Ser. No. 210,481

Claims priority, application Switzerland, Jan. 6, 1971, 111/71; Apr. 30, 1971, 6394/71

Int. Cl. G01d 15/18

U.S. Cl. 317-3

9 Claims



A convex ink meniscus is obtained at the outlet of the nozzle by hydrostatic pressure created by a pump situated between the ink reservoir and the nozzle. The ink jet is obtained by an electric field. The pump is of the continuous type, means being provided to reduce the operational pressure at the level of the nozzle from the value necessary to create a convex meniscus to a value for which the ink remains substantially contained inside the nozzle. A control device acts on these means to render them inoperative and ensures the re-establishment of the meniscus-forming pressure at the beginning of each period of writing. The pump may have a member having a surface of revolution in which a spiral passage is hollowed, a second member with a second surface of revolution is applied against the first and movable by electromagnetic means.

### 3,735,200

#### WHEEL SLIP SENSOR

Jacob A. Kritz, Westbury, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 8, 1971, Ser. No. 205,960

Int. Cl. B60t 8/06

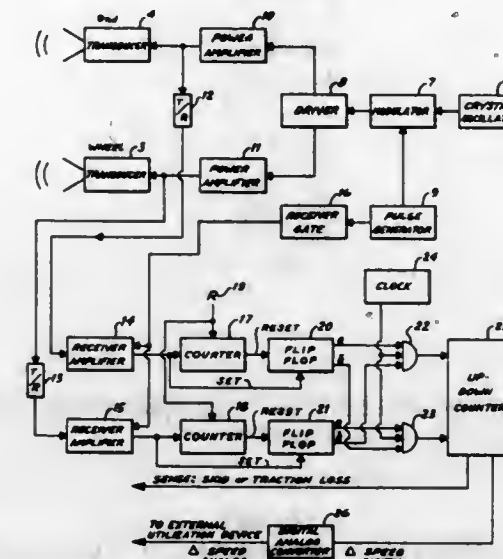
U.S. Cl. 317-5

7 Claims

Slippage of a drive wheel in a land vehicle is detected by means of doppler shifts induced in pulsed ultrasonic beams. First and second transducers transmit bursts of ultrasonic

energy which are directed at the wheel surface and the ground surface, respectively. The doppler shifted return pulses are detected by respective transducers and processed in separate channels. Counters in each channel generate gate signals indicative of the length of time that is required for the cor-

two inputs of logic means. One input resets itself with a time



responding transducer to receive a predetermined number of cycles of reflected energy. An up-down counter operates from a high frequency clock in response to the two gate signals. The difference in duration of the two gate signals leaves a differential count accumulated in the up-down counter which represents the slip between wheel and ground surfaces.

### 3,735,201

#### ARCING TIME RELAY

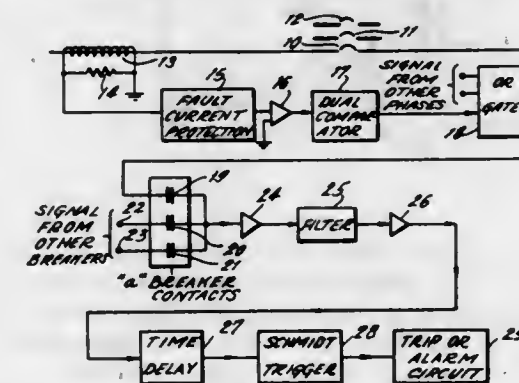
William E. May, Levittown, Pa., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed July 18, 1972, Ser. No. 272,724

Int. Cl. H02h 7/22

U.S. Cl. 317-11 R

10 Claims



An arcing time relay is provided for vacuum circuit breakers, and measures the length of time that arcing occurs after the circuit breaker contacts are open, or measures the time that excessive leakage current flows while the contacts are open, and provides an output signal if arcing time or leakage current exceeds given bounds which indicate improper vacuum conditions.

### 3,735,202

#### MOTOR CONTROL SYSTEM WITH POWER FAILURE PROTECTOR

James W. Grygera, Racine, Wis., assignor to Eaton Corporation, Cleveland, Ohio

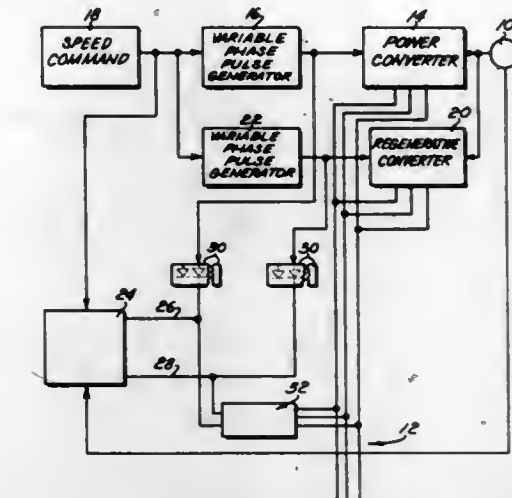
Filed July 26, 1971, Ser. No. 165,894

Int. Cl. H02h 7/08

U.S. Cl. 317-13 R

21 Claims

Motor control system in which a signal is derived indicating zero voltage on the line to the motor. The signal is applied to



delay and if the other input still has the signal applied thereto the energizing circuit for the motor is inhibited.

### 3,735,203

#### PROTECTIVE CIRCUIT

Seljiro Fujie, Yokohama, and Yoshifumi Saei, Tokyo, both of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

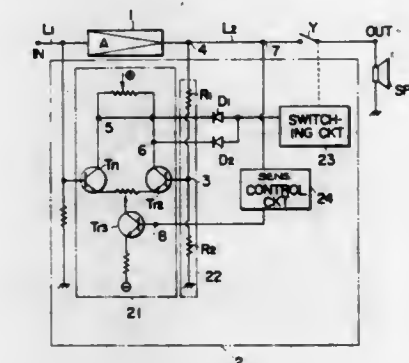
Filed , Ser. No. 199,182

Claims priority, application Japan, Nov. 16, 1970, 45/113494

Int. Cl. H02h 3/28

U.S. Cl. 317-27 R

3 Claims



A protective circuit for protecting an output circuit and a load circuit of a signal amplifier from abnormal conditions, and including a differential amplifier for detecting the abnormal conditions, and a sensitivity control circuit for reducing the amplification factor of the differential amplifier for the input signal so that the output signal of the signal amplifier is clipped.

### 3,735,204

#### CIRCUIT ARRANGEMENT FOR DETERMINING THE DISTANCE OF FAULT LOCATIONS IN LINE SHORT-CIRCUITS

Eckart Maencke, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed June 25, 1971, Ser. No. 156,733

Claims priority, application Germany, June 26, 1970, P 20 32 578.4

Int. Cl. H02i 3/28

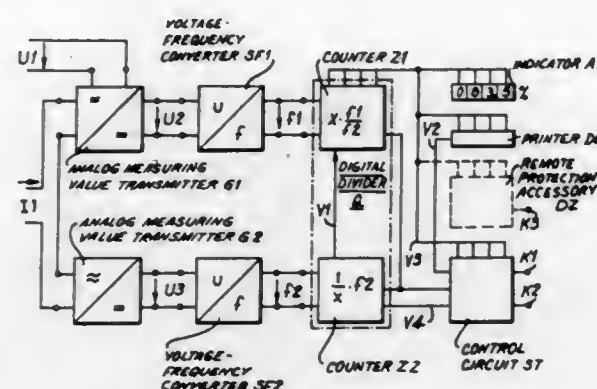
U.S. Cl. 317-27 R

17 Claims

In a circuit arrangement for determining the distance of the fault location during short-circuits on a line, an analog measuring data transmitter used for obtaining a direct voltage which is proportional to the line voltage and another analog measuring data transmitter which is influenced by the line cur-



rent used to obtain another DC voltage proportional to the line current, are connected to the input of a voltage-frequency converter connected to a device for digital division or quotient



formation. The device has a control circuit which, upon the occurrence of a short-circuit, initiates the measurement or determination of the distance of the fault location, in response to an initiating signal.

3,735,205

# HOLDER FOR ELECTRICAL AND/OR ELECTRONIC COMPONENTS

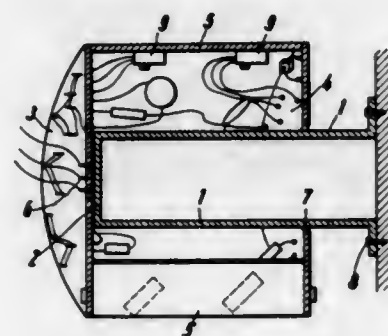
Karl-Dieter Friedrich, Berlin 27, Germany, assignor to Schleicher GmbH & Co. Relaisbau KG, Berlin, Germany  
Filed Apr. 2, 1971, Ser. No. 130,588

Claims priority, application Germany, Apr. 27, 1970, P 20 21 978.7

Int. Cl. H05k 7/20

U.S. Cl. 317-100

2 Claims



An inexpensive and easily made holder for electrical and/or electronic components of motor-driven time relays consists of a cage-like structure surrounding the motor casing and consisting of parallel plates of insulating material on which some at least of the components are located, with interposed spacers of thermally conducting material; one or more of the plates having a central aperture enabling it to be fitted over the casing of the electric motor while an end solid plate of the cage abuts against the end of the motor casing. The thermally conducting spacers can be used as heat sinks for transistors.

3,735,206

# CIRCUIT BOARD PACKAGE WITH WEDGE SHAPED COVERS

Clarence T. Pesek, Anoka, Minn., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 28, 1971, Ser. No. 193,456

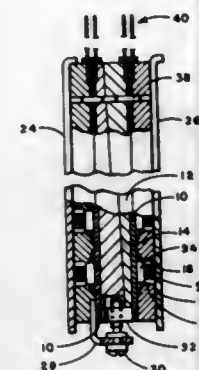
Int. Cl. H05k 5/03, 7/20

U.S. Cl. 317-100

5 Claims

A circuit board mounting and packaging technique wherein

each board is encased within a wedge-shaped foam package



and the packages are combined in complementary pairs and inserted in chassis compartments.

3,735,207

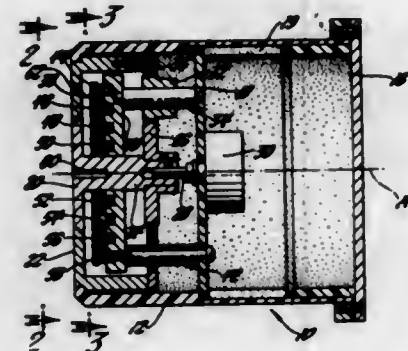
VEHICLE OPERATION INHIBITOR CONTROL SYSTEM  
Paul D. Agarwal, Birmingham; Richard W. Johnson, Troy, and John G. Neuman, Grosse Pointe, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 26, 1971, Ser. No. 202,144

Int. Cl. E05b 49/00

U.S. Cl. 317-134

5 Claims



A manually operable switch mechanism for enabling a control device which normally inhibits operation of the vehicle includes inner and outer rotatably supported concentrically mounted plate members provided with slots adapted to receive the vehicle ignition key. The inner and outer members are coupled so that rotation of the inner member in one direction produces rotation of the outer member in the opposite direction to reorient the positions of the slots in the two members. Circuitry is provided for energizing the control means and permitting operation of the vehicle in response to insertion of the ignition key in the slot in a predetermined sequence and within a predetermined time duration.

3,735,208

# THERMAL FATIGUE LEAD-SOLDERED SEMICONDUCTOR DEVICE

Arthur Edward Roswell, Somerville, N.J., and Gerald Kenneth Clymer, Sellersville, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 26, 1971, Ser. No. 175,196

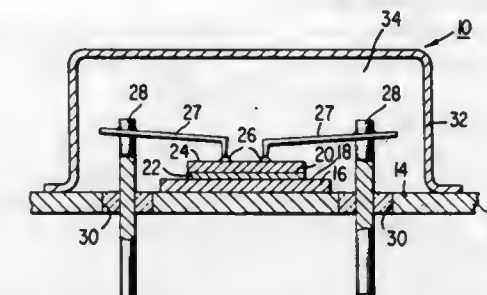
Int. Cl. H011 3/00, 5/00

U.S. Cl. 317-234 R

7 Claims

The device includes a semiconductor die joined to a thermally conductive substrate with a solder having a high lead

content. An enclosure surrounds the die and is sealed to the between the second region and the high impurity concentration portion. The electrical contact to the second region is



substrate. A substantially nonoxidizing atmosphere is provided within the enclosure.

3,735,209

# SEMICONDUCTOR DEVICE PACKAGE WITH ENERGY ABSORBING LAYER

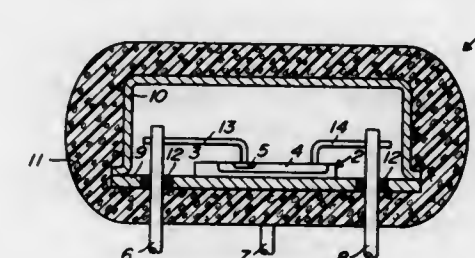
Ivan R. Saddler, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Feb. 10, 1972, Ser. No. 225,043

Int. Cl. H011 3/00, 5/00

U.S. Cl. 317-234 R

5 Claims



There is disclosed a semiconductor device comprising a body of semiconductor material having at least one region of P conductivity type and a second region of N conductivity type defining a P-N junction therebetween. The body is bonded to a header having electrically isolated terminals extending therefrom. A lead wire is bonded to at least one of said conductivity regions and to one of said terminals. A closure member is secured to said header and the closure member and the header are surrounded by an energy absorbing layer of high atomic number particle impregnated resilient material. The particles have a diameter of between 0.25 and 1.0 mil and are approximately 50 percent by volume of said layer. The resilient material is preferably a highly plastisized polyvinyl chloride and the high atomic number particles are preferably tungsten carbide.

3,735,210

# ZENER DIODE FOR MONOLITHIC INTEGRATED CIRCUITS

Israel Haim Kalish, Plainfield, and Heshmat Khajezadeh, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 831,883, June 6, 1969, abandoned.

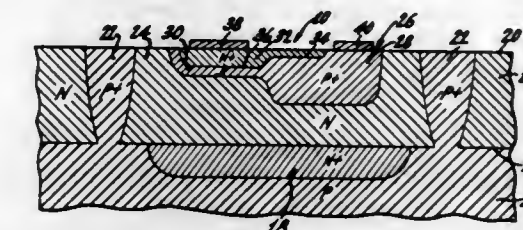
This application June 7, 1971, Ser. No. 150,795

Int. Cl. H011 9/00

U.S. Cl. 317-234 R

4 Claims

An improved zener diode for monolithic integrated circuits includes a first diffused region of one type conductivity having two portions, one of which portions has a significantly higher maximum impurity concentration than the other portion. A second diffused region of opposite type high conductivity is disposed within both portions of the first region and is separated from each by a PN junction, the PN junction between the second region and the lower conductivity portion being at a significantly greater depth than the PN junction



made only over the lower impurity concentration portion where the PN junction is at a significantly greater depth.

3,735,211

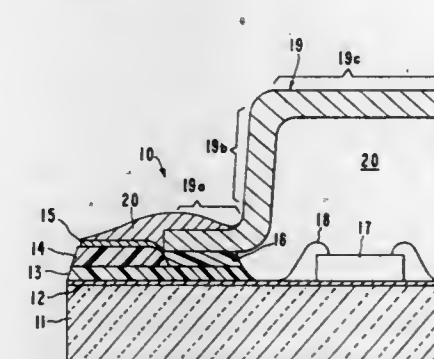
SEMICONDUCTOR PACKAGE CONTAINING A DUAL EPOXY AND METAL SEAL BETWEEN A COVER AND A SUBSTRATE, AND METHOD FOR FORMING SAID SEAL  
Demetrios E. Kapnias, Santa Clara, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed June 21, 1971, Ser. No. 155,174

Int. Cl. H011 3/00, 5/00

U.S. Cl. 317-234 R

9 Claims



A cover is hermetically sealed to a substrate by first joining the cover to the substrate by epoxy and then soldering the exposed edge of the cover to a metal film on the substrate to provide an hermetic seal. The epoxy prevents flux used during the soldering operation from entering the cavity formed between the cover and substrate and there degrading the performance of any semiconductor device placed in the cavity.

3,735,212

P-N JUNCTION SEMICONDUCTOR DEVICES  
Zoltan K. Kun, Lincolnwood, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

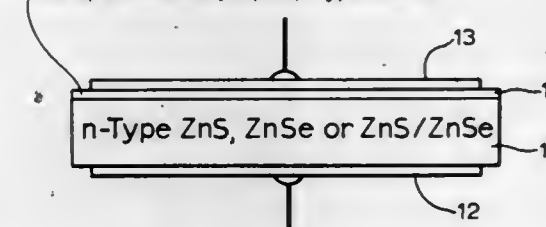
Division of Ser. No. 118,744, Feb. 25, 1971, Pat. No. 3,705,059, which is a continuation-in-part of Ser. No. 819,960, April 28, 1969, abandoned. This application Feb. 2, 1972, Ser. No. 222,772

Int. Cl. H011 3/22

U.S. Cl. 317-234 R

2 Claims

Surface Layer Containing Atoms of Group III and Group V Elements, Doped p-Type with Zn.



To produce a P-conductivity type wide band gap semiconductor material, a III-V compound semiconductor layer is first vacuum evaporated onto and then diffused into a crystal-



line II-VI compound semiconductor substrate, specifically a zinc chalcogenide. The resulting crystalline material is doped by simultaneous or sequential infusion of zinc atoms in substitution for atoms of the Group III element. The process may be used for the direct production of P-N junctions in zinc chalcogenides by employing an N-type rather than an intrinsic substrate.

3,735,213

### A NONPOROUS VITREOUS BODY FOR SUPPORTING ELECTRONIC DEVICES

Evgen Kansky, Ljubljana, Yugoslavia, assignor to Institut za Elektroniku in Vakuumsko Tehniku, Teslova, Ljubljana, Yugoslavia

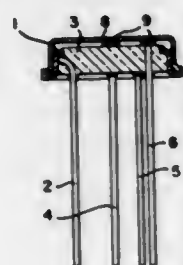
Filed Aug. 10, 1970, Ser. No. 62,459

Claims priority, application Yugoslavia, Aug. 8, 1969, P 2068/69

Int. Cl. H0113/00, 5/00

U.S. Cl. 317-234 R

2 Claims



A support for electronic circuitry comprises a generally cylindrical metallic frame to which a ground lead is attached and a body of homogeneous glass, ceramic, pyroceram or other vitreous hard homogeneous electrically insulated material filling the frame. Other leads are embedded in the glass layer which has a polished surface at which the leads terminate flush therewith. Circuit elements are applied to the polished surface by vacuum-depositing, sputtering or print-circuit techniques and the entire assembly is closed in a can. The method involves heating a plug of the vitreous material to fill the frame, grinding the surface of the resulting vitreous body and optically polishing same to receive the circuit elements.

3,735,214

### A HEADER FOR MOUNTING CIRCUIT ELEMENTS FOR INCORPORATION IN AN ELECTRIC CIRCUIT

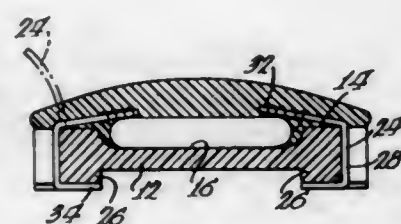
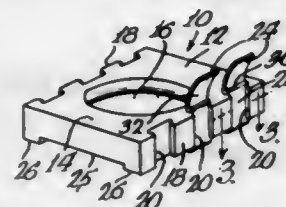
John O. Renskers, and Charles E. Jensen, both of Crystal Lake, Ill., assignors to Colcraft Inc., Cary, Ill.

Filed Jan. 27, 1972, Ser. No. 221,364

Int. Cl. H0113/00, 5/00

U.S. Cl. 317-234 R

11 Claims



A miniature component mounting header for those circuit elements which do not lend themselves to printed or to IC fabrication, for connection into hybrid microcircuits.

### 3,735,215 SELF-POWERED RELAY TARGET CIRCUIT

Richard R. Conrad, Bristol, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.

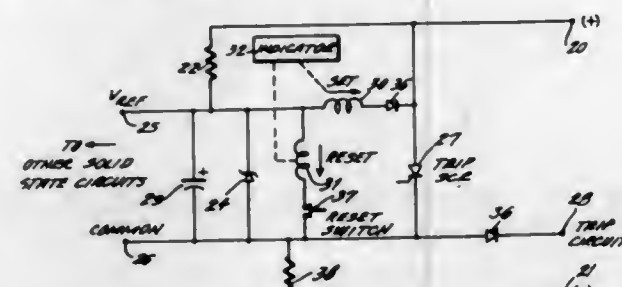
Continuation of Ser. No. 41,420, May 28, 1970, abandoned.

This application June 8, 1972, Ser. No. 260,750

Int. Cl. H02b 7/00

U.S. Cl. 317-33 SC

3 Claims



A relay target circuit is operated directly from the stored energy in a solid state relay circuit, after the relay circuit becomes conductive. Circuits are provided in which a-c and d-c control voltage sources are used and in which a diode is connected to the trip circuit to prevent a false set signal by transients in the tripping circuit. Parallel indicator circuits are used with a common reset switch.

3,735,216

### MOTOR CONTROL SYSTEM

Saburo Uemura, Kanazawa-ku, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

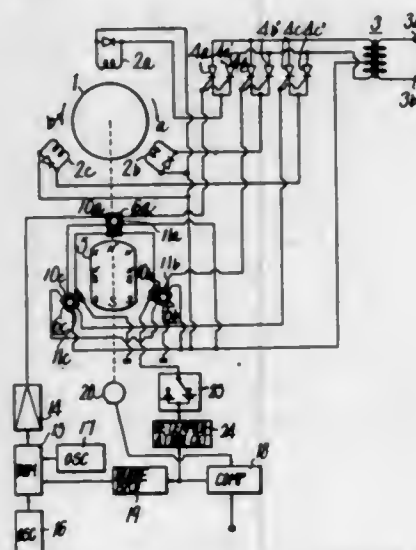
Filed Feb. 14, 1972, Ser. No. 225,923

Claims priority, application Japan, Feb. 13, 1971, 46/6323; Feb. 13, 1971, 46/6324

Int. Cl. H02k 29/00

U.S. Cl. 318-138

18 Claims



A motor control system including a modulator consisting of a saturable reactor, a magnet means and a control means. The magnet means produces a magnetic flux to be supplied to the reactor, which is controlled by the control means, so that the switching means is controlled through the magnet means by the saturable reactor.

3,735,217

### TWIN MOTOR DRIVE SYSTEM

Lee A. Kilgore, Export; Bernard S. Stralt, Jr., and Eugene C. Whitney, both of Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 1, 1971, Ser. No. 194,746

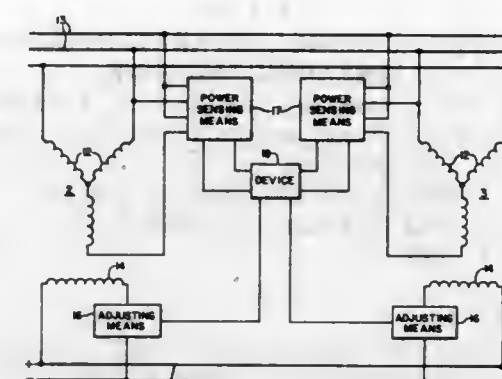
Int. Cl. H02p 5/50

U.S. Cl. 318-100

5 Claims

A twin motor drive system having two synchronous motors

of usual construction driving a common load. Means are provided for controlling the field excitation of the motors in a manner to maintain equal division of the load.



vided for controlling the field excitation of the motors in a manner to maintain equal division of the load.

3,735,218

### DEVICE FOR THE COMPARISON OF TWO PULSE-SERIES FREQUENCIES

Heinz-Peter Kunnert, Tangstedt, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

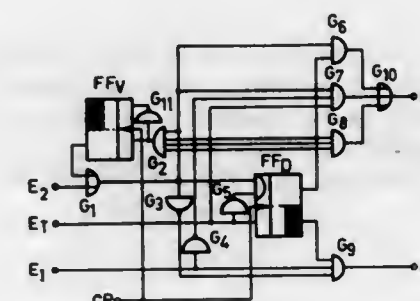
Filed May 14, 1971, Ser. No. 143,564

Claims priority, application Germany, Aug. 8, 1970, P 20 39 557.7

Int. Cl. H03k 5/20, 9/06

U.S. Cl. 328-134

6 Claims



A plurality of interconnected AND-gates and flip-flops provide a first output pulse in response to an input pulse series having a frequency higher than a fixed frequency source and a second output in response to a measuring pulse series having a frequency lower than the fixed frequency source. Inputs to the device include a clock pulse signal and a timing pulse signal, both synchronized with the fixed frequency pulse source.

3,735,219

### THERMAL PROTECTION DEVICE FOR LINEAR MOTOR

Michael Edwin Kahn, Palo Alto; William Frank Krajewski, Los Altos Hills, and Terry Gordon Johnson, San Jose, all of Calif., assignors to Memorex Corporation, Santa Clara, Calif.

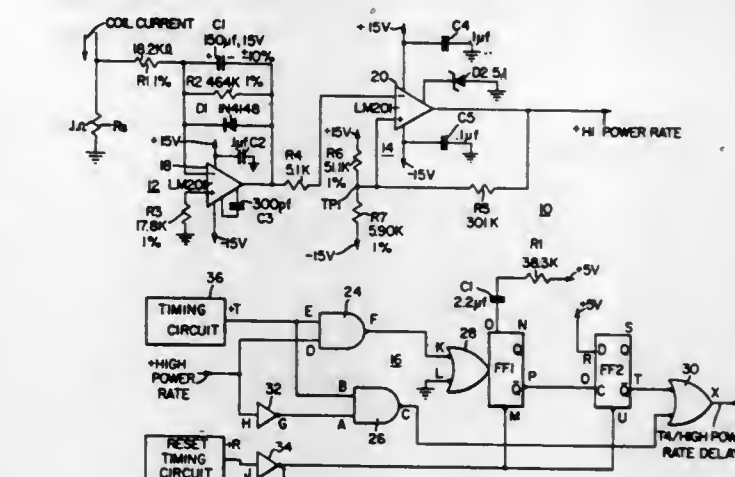
Filed Aug. 25, 1971, Ser. No. 174,809

Int. Cl. H02k 41/02

U.S. Cl. 318-135

13 Claims

Thermal protection apparatus is disclosed for electrical motors and, in particular, for a linear motor as, for example, the type used in magnetic disc recording drive systems. An electrical circuit, the analog of the thermal characteristics of the armature coil, provides electrical signals indicative of the temperature of the armature coil. Safety or protection means



preferred embodiment, reducing the average power input to the motor.

3,735,220

### CONTROL CIRCUIT FOR A D.C. MOTOR

Stefan Renner, Silberberg; Wulf Bayha, Hoefingen; Alwin Burgholte, Geisingen; Holger Schweizer, Stuttgart, and Rainer Wirtz, Uterriexingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

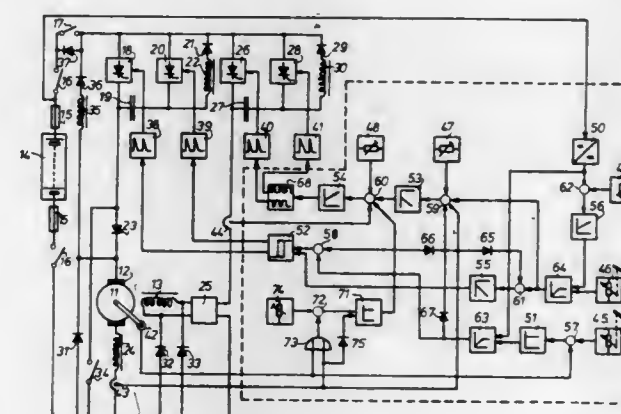
Filed Mar. 12, 1971, Ser. No. 123,529

Claims priority, application Germany, Mar. 14, 1970, P 12 230.9

Int. Cl. H02p 3/14

U.S. Cl. 318-139

12 Claims



The field and armature currents are for the shunt-wound vehicle motor and are controlled in dependence on signals representing the actual and desired operating states of the motor. A series-connection regulating stage is provided for giving the motor a series-connection characteristic during acceleration up to a predetermined nominal speed.

3,735,221

### ELECTRICAL HOIST CONTROL SYSTEM

Hans K. Bell, Oshkosh, and Gilbert Hay, Jr., Wauconda, both of Ill., assignors to Symons Corporation, Des Plaines, Ill.

Continuation-in-part of Ser. No. 766,270, Oct. 9, 1968, abandoned. This application Mar. 8, 1971, Ser. No. 121,772

Int. Cl. H02k 7/34

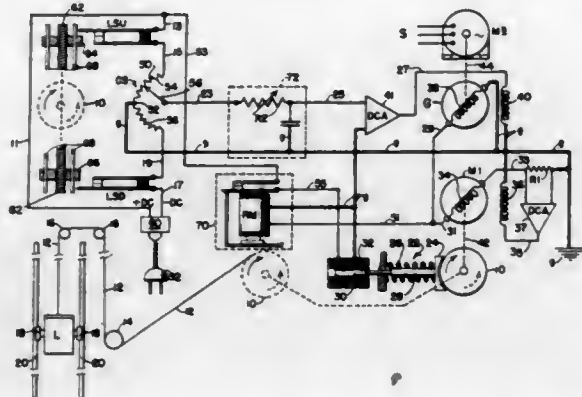
U.S. Cl. 318-151

9 Claims

An electrical control system for raising and lowering a drum-and-cable supported load. A reversible shunt wound drive motor which is connected to the drum is operable under the control of a continuously driven shunt wound generator. By measuring the amount of current flowing in the armature coil of the drive motor and varying the flow of current in the



field coil thereof in relation to such armature current, the speed of the drive motor will become a direct function of the load which is placed on the latter. By reversing the polarity of the voltage which is supplied to the field coil of the generator, the direction of rotation of the drive motor may be reversed



without disturbing the relationship between the load and the motor speed. Thus, whether the load is rising or descending, the greater its magnitude, the slower its speed. An electromechanical brake arrangement becomes automatically effective to lock the cable drum in a fixed position when load speed drops substantially to zero.

### 3,735,222 SPEED CONTROL SYSTEM FOR ALTERNATING CURRENT INDUCTION MOTORS

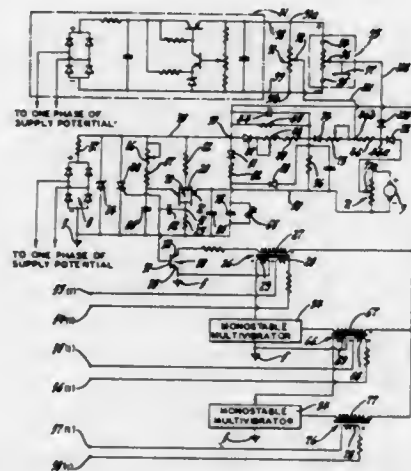
Bohdan I. Pryjmak, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 11, 1971, Ser. No. 170,765

Int. Cl. H02p 5/40

U.S. Cl. 318—227

4 Claims



A speed control system for alternating current induction motors wherein a reference potential, which is a rectified phase of the alternating current supply potential, is connected across the series combination of a charge circuit resistor and the timing capacitor of a unijunction transistor type relaxation oscillator circuit and a direct current control potential, which is a function of motor speed, is connected across the charge circuit resistor through a speed control resistor in series. The unijunction transistor type relaxation oscillator circuit and associated circuitry produces a trigger signal at the electrical angle of each potential cycle of each phase of the alternating current supply potential as determined by the difference of magnitude between the reference potential and the control potential impressed across the charge circuit resistor which trigger respective silicon controlled rectifiers conductive to complete an energizing circuit for the corresponding phase winding of the motor. An external source of electrical signals which vary in magnitude in response to changes of conditions which require a change of motor speed is connected across the

speed control resistor for varying the speed of the controlled motor.

### 3,735,223 HIGH-SPEED CONTROL APPARATUS FOR CLOTH SPREADING MACHINE

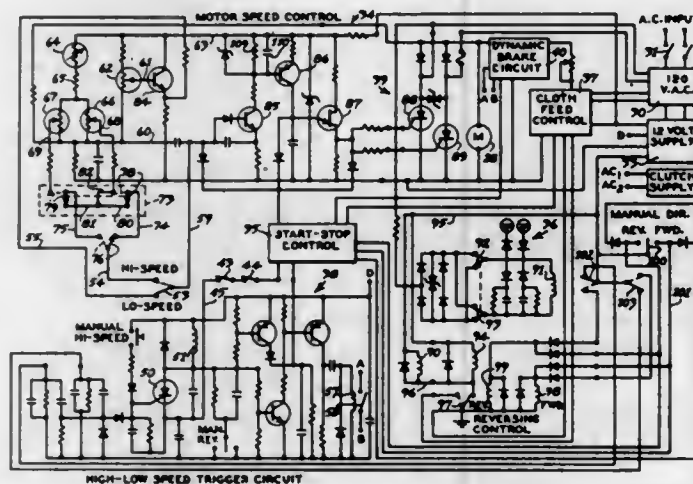
Johnny L. Fort, Nashville, and Cecil S. Frederick, Murfreesboro, both of Tenn., assignors to Cutters Machine Company, Inc., Nashville, Tenn.

Filed May 17, 1972, Ser. No. 254,272

Int. Cl. H02p 7/00; B65h 29/46

U.S. Cl. 318—258

6 Claims



An electrically driven and controlled cloth spreading machine including means for controlling the high and low speeds of the machine, and also for selectively controlling and presetting high speeds of the machine in its forward and reverse directions of movement.

### 3,735,224 RELAY CIRCUIT FOR MOTOR CONTROL

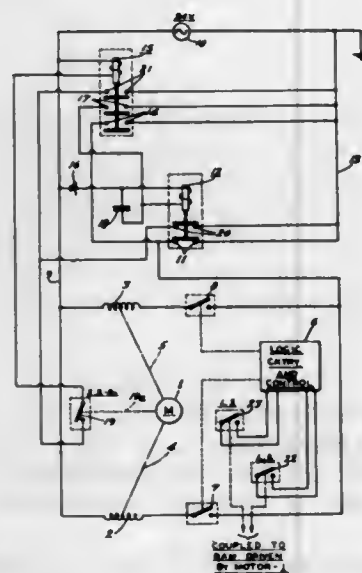
Henry L. Bachofer, Newtown Square, and Robert C. C. Chang, Wayne, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Apr. 12, 1972, Ser. No. 243,260

Int. Cl. H02p 3/20

U.S. Cl. 318—284

6 Claims



In order to precisely position a machine driven by a rotating prime mover, the prime mover (electric motor) is electrically reversed to bring it to a stop. A zero speed switch, mounted on the motor shaft, senses when the shaft comes to a stop and at that time deenergizes a relay to open a pair of contacts in series with the motor contactor to stop the motor. The switch also opens the circuit to the winding of a slow-acting relay

which, after a time delay, closes a pair of contacts connected in parallel with the previously-mentioned contacts, to prepare the motor for the next operation.

### 3,735,225 CONTROL DEVICE FOR SWITCHING RECTIFIER SYSTEMS

Eckart Raatz, Berlin, Germany, assignor to Licentia Patent-Verwaltungs G.m.b.H., Frankfurt, Germany

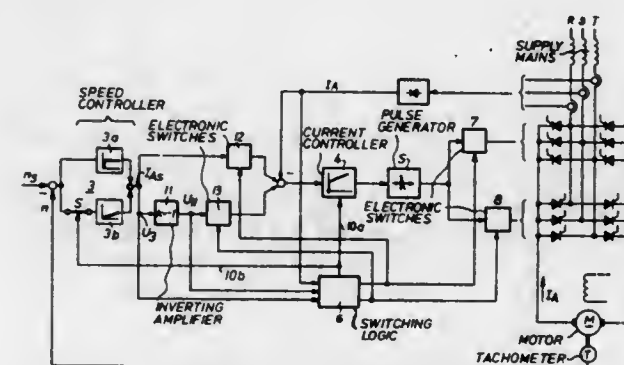
Filed Aug. 25, 1971, Ser. No. 174,736

Claims priority, application Germany, Aug. 28, 1970, P 20 43 709.0

Int. Cl. H02p 5/16

U.S. Cl. 318—332

3 Claims



In a system for directing a current controller of the type employing two groups of controlled rectifiers for delivering current in respectively opposite directions, the system including a current controller for directly operating the rectifiers and a higher order controller connected for influencing the current controller and having an integrating component, means are provided for blocking the integrating component input during the changeover of operation from one rectifier group to another.

### 3,735,226 CONSTANT TORQUE AND INERTIA CONTROL FOR ARMATURE CURRENT REGULATED DC MOTOR WITH FIELD WEAKENING

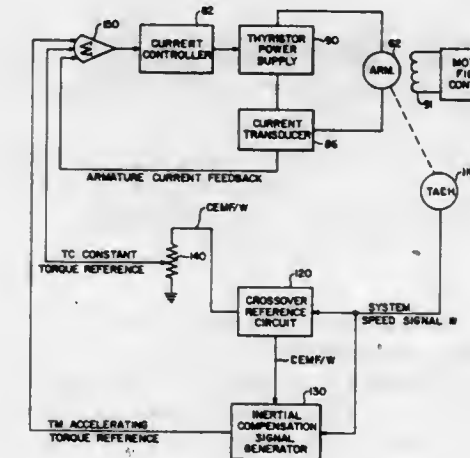
John R. Pittner, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 4, 1972, Ser. No. 223,638

Int. Cl. H02p 7/14

U.S. Cl. 318—338

9 Claims



Constant and acceleration torque (inertia) compensating signals are combined with armature current feedback to develop a current control signal for regulating the armature current of a direct current motor so that output torque both is kept constant for and weakened motor shunt fields, and during system speed changes.

### 3,735,227 DIRECT CURRENT MOTOR STARTER CIRCUIT

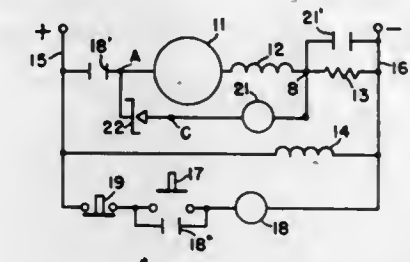
George H. Gill, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 24, 1972, Ser. No. 220,001

Int. Cl. H02p 1/20

U.S. Cl. 318—394

6 Claims



A starting circuit for a direct current motor employs a zener diode to sense the back e.m.f. The zener diode is connected to a switch which effectively disconnects a current limiting impedance out of the armature circuit when the motor has obtained operating speed. In one arrangement, two zener diodes are used in combination to provide an adjustable control for the switching point. Another disclosed arrangement includes a current amplifier connected between the zener diode and the switch to provide for operation of the switch having a relatively high operating power requirement.

### 3,735,228 NON-ELECTRONIC SERVO ACTUATOR

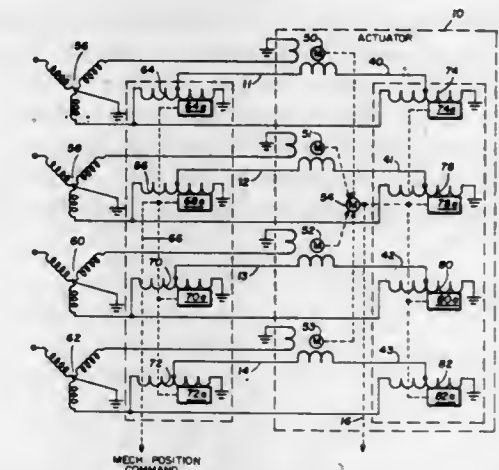
William G. Redmond, Dallas, Tex., assignor to E-System, Inc., Dallas, Tex.

Filed Jan. 3, 1972, Ser. No. 215,064

Int. Cl. G05b 9/02

U.S. Cl. 318—564

17 Claims



In a multiplex channel actuator for developing a linear output motion four servomotors are coupled together in a velocity summing arrangement to produce the required output. Each of the servomotors of the actuator has a control phase winding and a fixed phase winding with the latter connected to a source of energizing AC voltage. The control phase winding of each channel servomotor is interconnected as part of a balanceable circuit including an input movable core transformer and a feedback movable core transformer. A mechanical input motion positions the movable core of the input transformer to generate a control voltage related to the input motion. This voltage, in each of the actuator channels, causes the respective servomotor to be energized thereby developing a mechanical output motion. The mechanical output motion positions the movable core of the feedback transformer, for each actuator channel, to develop a feedback voltage for balancing out the input transducer voltage. Each channel servomotor continues to run until the voltage at the input



transducer is balanced by a voltage from the feedback transducer.

3,735,229

# ELECTRICAL OSCILLATING SERVO MOTOR CONTROL CIRCUIT ARRANGEMENT

Ingo Brockmüller, Uerikon, Switzerland, assignor to EMA AG, Meilen, Switzerland

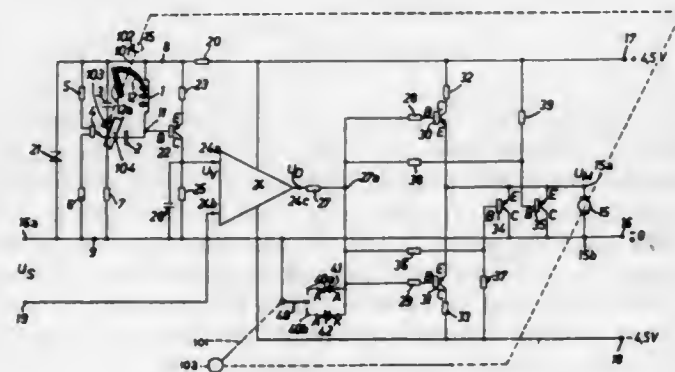
Filed Feb. 11, 1972, Ser. No. 225,496

Claims priority, application Switzerland, Feb. 18, 1971, 2342/71

Int. Cl. G05b 5/01

U.S. Cl. 318—611

2 Claims



An electrical oscillating circuit arrangement with variable degree of damping, comprising an oscillating or tank circuit incorporating an inductive circuit element, and an eddy current body which can be introduced into the magnetic field of said inductive circuit element for changing the degree of damping.

3,735,230

# MOTOR DRIVEN SURFACE MEASURING APPARATUS

Werner Gerighausen, Ronnenberg; Bernhard Heimbrecht, Garbsen, and Johannes Perthen, Hanover, all of Germany, assignors to Johannes Perthen, Hanover, Germany

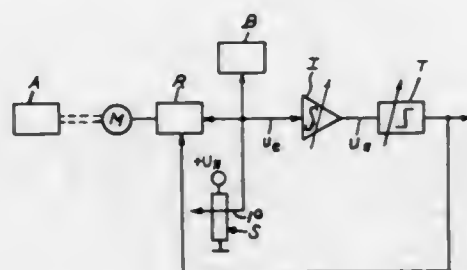
Continuation-in-part of Ser. No. 14,124, Feb. 25, 1970, abandoned. This application Sept. 29, 1971, Ser. No. 184,681

Claims priority, application Germany, Feb. 26, 1969, P 19 09 683.4

Int. Cl. G05b 11/01

U.S. Cl. 318—637

3 Claims



A sensing element and a surface to be measured are moved relative to one another at a controllable speed and throughout a controllable distance, and at least one electrical driving motor is provided for performing such movement. A source of reference voltage is applied to a regulator for maintaining the speed of rotation of the driving motor proportional to the reference voltage. An integrator is connected to measure the speed of rotation of the driving motor and produces an electrical output proportional to the time integral of such speed, a trigger circuit being connected to the output of the integrator.

## 3,735,231 LINEAR MAGNETIC DRIVE SYSTEM

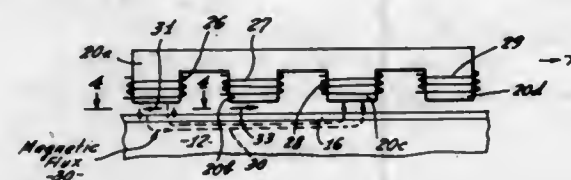
Bruce A. Sawyer, 20120 Allentown Drive, Woodland Hills, Calif.

Filed June 28, 1971, Ser. No. 157,558

Int. Cl. G05b 11/00

U.S. Cl. 318—687

33 Claims



This invention relates to a system in which a head is displaced from, but is in contiguous relationship to, a platen and is driven relative to the platen along either a single axis or a pair of coordinate axes relative to the platen. The head and the platen constitute a motor which is energized to drive the head relative to the platen by generating a force as a result of a change of vector caused by translating a magnetomotive vector. For example, the motor may be induction or hysteresis motor. Means are associated with the head to detect the position of the head relative to the platen as the head is moved relative to the platen. Means may also be associated with the head for preventing the head from rotating as it is moved along the platen. A servo loop may further be included for producing controlled displacements of the head relative to the platen.

## 3,735,232 LOW COST UNIVERSAL BATTERY CHARGER FOR SMALL TYPE NICKEL-CADMIUM OR ALKALINE BATTERIES

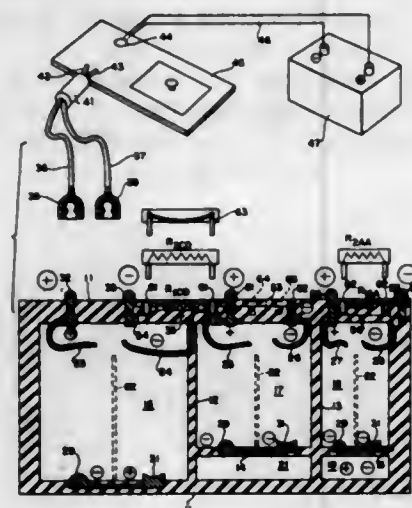
Karoly G. Fister, 5701 Louise Drive, Mentor, Ohio

Filed June 8, 1971, Ser. No. 151,078

Int. Cl. H01m 45/04

U.S. Cl. 320—2

10 Claims



A low cost universal battery charger for recharging different size rechargeable small batteries of the "A-A", "C", and "D" nickel-cadmium, alkaline or "dry cell" type directly from an automobile or other 6-12 volt battery source of direct current using only passive components. The battery charger comprises a molded insulating housing a plurality of separate different size compartments each dimensioned to receive respective different ones of the small batteries to be recharged. Internal contacts are secured within each of the compartments for physically engaging the terminals of the respective size batteries to be recharged in that compartment and to establish a closed electrical circuit through the battery. External contacts are mounted on the exterior of the insulating housing and are electrically connected to respective ones of the internal con-

tacts for connecting the different size batteries disposed in the compartments in circuit relationship with a recharging direct current voltage source that preferably comprises an automobile battery of 6-12 volt rating. Conductors having readily detachable terminal connectors serve to connect the external contacts to the automobile battery serving as a recharging direct current voltage source to thereby energize the different size battery receiving compartments within the housing. A plurality of different value current adjusting (voltage dropping) resistors preferably are molded within the battery housing and means are provided for selectively connecting a desired value current adjusting resistor in circuit relationship with the automobile battery recharging direct current voltage source and the internal contact means of the different size battery receiving compartments for adjusting the value of the charging current supplied to each of the compartments to a preselected desired value in accordance with the rating of the small battery to be recharged in that compartment. Additionally, plug-in resistors and suitable receptacles are provided in certain forms of the invention for connecting additional resistors in parallel circuit relationship with the molded-in current adjusting resistors for appropriately adjusting the current value supplied to a given battery receiving compartment to a different current value whereby the battery receiving compartment can accommodate batteries of the same physical size but requiring different value recharging currents. Also, a second receptacle can be formed in the insulating housing for receiving detachable thermally sensitive switches which are connected in series circuit relationship with the internal contacts of at least one of the battery receiving compartments whereby the thermally sensitive switch physically senses the temperature of the battery being recharged and interrupts the recharging current upon an over-temperature condition being sensed. If desired the thermally sensitive switch can be permanently built into the battery recharger rather than making it in the form of a detachable attachment and preferably comprises a bimetal switch. In still a different form of the invention the plurality of different value current adjusting resistors are comprised by resistive cables which have different values of resistance and also serve as the conductor for selectively connecting the external contacts to the automobile battery serving as a recharging direct current voltage source. In still another form of the invention, the plurality of different value current adjusting resistors is comprised by a single multi-tap resistor and a selector switch is provided for connecting a desired value of current adjusting resistance in circuit relationship with the automobile battery serving as the recharging direct current voltage source and the internal contacts of a selected one of the different size battery receiving compartments.

## 3,735,233 BATTERY CHARGER APPARATUS HAVING MULTIPLE MODES OF OPERATION AND AUTOMATIC SWITCHING THEREBETWEEN

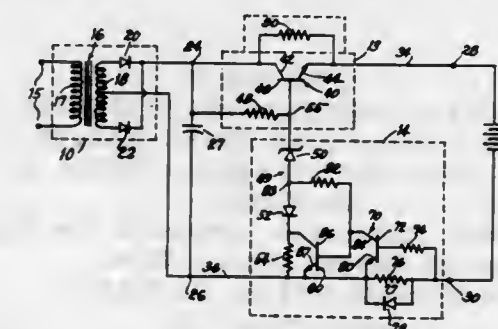
Richard Bertrem Ringle, Shorewood, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Aug. 24, 1970, Ser. No. 66,187

Int. Cl. H02j 7/10

U.S. Cl. 320—24

3 Claims



A battery charging device is disclosed which charges a normal battery first in a constant current mode to a first inter-

mediate terminal voltage, then in a modulated mode to a predetermined maximum terminal voltage, and then in a standby mode at a third predetermined float voltage. When the battery is attached to the charger in the standby mode and the terminal voltage falls below a predetermined level, the charger is automatically recycled to recharge the battery. If the charge cycle is interrupted by a momentary line voltage failure or other external malfunction, the charge cycle resumes when the malfunction is corrected. A small current is applied to any battery connected to the circuit regardless of its state of charge or the immediate past history of the charger or battery in previous cyclic operation; thus an abnormally discharged battery which may exhibit a very high input impedance and does not easily accept charge is charged by this device for gradual reinstatement and subsequent normal cyclic operation.

## 3,735,234 APPARATUS FOR RECHARGING AN EMERGENCY BATTERY

Pierre Godard, Tremblay-les-Gonnesse, France, assignor to Societe des Accumulateurs Fix et de Traction, Romainville, France

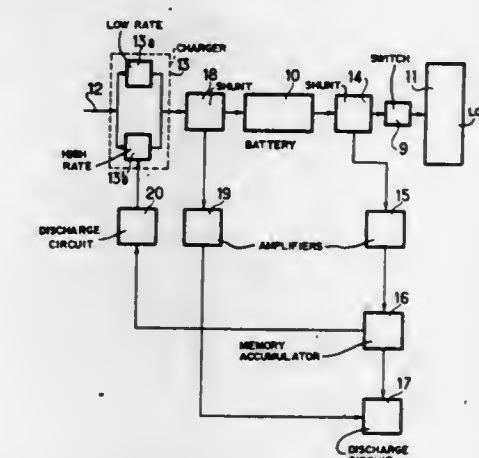
Filed Apr. 26, 1972, Ser. No. 247,684

Claims priority, application France, Apr. 30, 1971, 7115676

Int. Cl. H02j 7/04

U.S. Cl. 320—44

9 Claims



Battery emergency charging device comprising a memory accumulator charged with an intensity proportional to the battery discharge intensity, characterized in that the discharge circuit of the memory accumulator comprises means for making the memory accumulator discharge intensity proportional to the battery charge intensity.

## 3,735,235 DC TO DC CONVERTER WITH VOLTAGE REGULATION FEEDBACK LOOP ACHIEVING ISOLATION BETWEEN INPUT AND OUTPUT BY TIME DOMAIN TECHNIQUES

Billy Harold Hamilton, Summit, and Helmut Wilhart, Whippany, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Oct. 19, 1971, Ser. No. 190,594

Int. Cl. H02m 3/32

U.S. Cl. 321—2

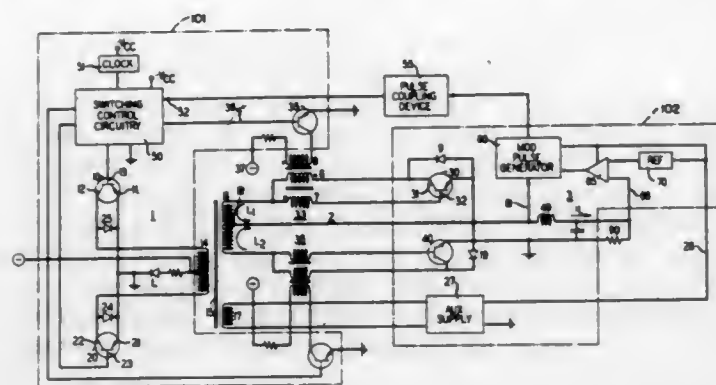
9 Claims

A DC to DC converter includes a digital type voltage regulation control circuit which permits complete isolation between the input and output circuits. The regulation signals comprise timing pulses coupled by a pulse transformer from voltage monitoring circuitry on the output side of the converter to switching control circuitry on the input side of the converter.

The rectifier of the converter utilizes synchronous rectifying transistors driven by a proportional base drive arrangement which utilizes the regenerative action of a current transformer to transform the collector current of the transistor into a base



drive current. This proportional base drive arrangement includes a third stored charge sweep-out winding and a diode to



permit high frequency operation of the converter rectifier with low voltage high current saturation transistors.

3,735,236

### TV HORIZONTAL OSCILLATOR HAVING A STABILIZED AUXILIARY DC OUTPUT

Heinz Richter, and Werner Thiele, both of Kronach, Germany, assignors to Loewe-Opta GmbH, Berlin, Germany

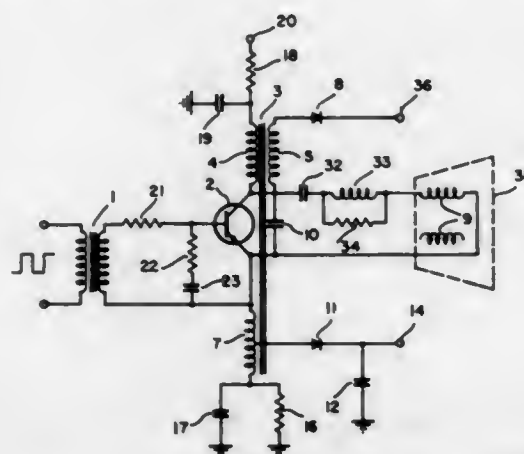
Filed Jan. 14, 1972, Ser. No. 217,767

Claims priority, application Germany, Jan. 16, 1971, P 21 03 501.8

Int. Cl. H02m 3/22

U.S. Cl. 321—2

4 Claims



A TV horizontal oscillator having an output transformer is arranged to supply a principal AC output to the horizontal deflection yoke of a picture tube. In order to provide stabilized DC voltage to other transistor stages in the TV receiver, an auxiliary winding of the transformer is connected in series with the parallel combination of a resistance and a capacitance. A voltage proportional to the difference between the voltage across at least a portion of the auxiliary winding and that across the resistance-capacitance combination is rectified and filtered. The resulting DC output is substantially insulated from changes in current through the output transformer caused, e.g., by beam-current induced changes in the width of the TV picture.

3,735,237

### CYCLE CONVERTER POWER SUPPLY FOR MICROWAVE HEATING

Palmer P. Derby, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sept. 1, 1971, Ser. No. 177,026

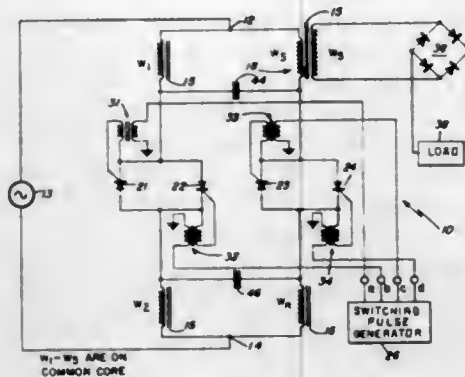
Int. Cl. H02m 7/00

U.S. Cl. 321—6

17 Claims

A cycle converter power supply circuit comprising four silicon controlled rectifiers (SCR's), electronic semiconductor switches, used to program current flow through four separate

legs of a transformer in a manner to produce an alternating current at a frequency considerably in excess of the prime power. A bridge rectifier circuit in the secondary of the transformer permits the power to be converted to a direct current



3,735,238

### PROCESS AND APPARATUS FOR PROVIDING IMAGE BRIGHTNESS OVER A WIDE RANGE OF DISCHARGE REPETITION RATES

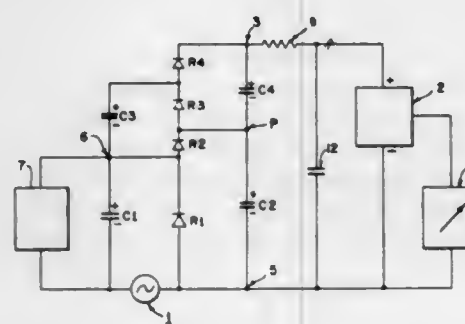
Charles E. Miller, Acton, Mass., assignor to General Radio Company, Concord, Mass.

Filed Sept. 17, 1971, Ser. No. 181,547

Int. Cl. H02m 7/00

U.S. Cl. 321—15

3 Claims



This disclosure deals with a novel voltage-multiplying power supply process and apparatus particularly adapted, through the use of a reactive voltage drop within the supply circuit, to produce substantially constant power in repetitive discharges of stored energy, irrespective of the variation in repetition rate of the discharges, within wide limits.

3,735,239

### LINE VOLTAGE REGULATOR UTILIZING LINE VOLTAGE RESPONSIVE TIMING CIRCUIT TO MODULATE DUTY CYCLE OF CONTROLLABLE RECTIFIER

Joseph La Duca, Stirling, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 24, 1971, Ser. No. 201,636

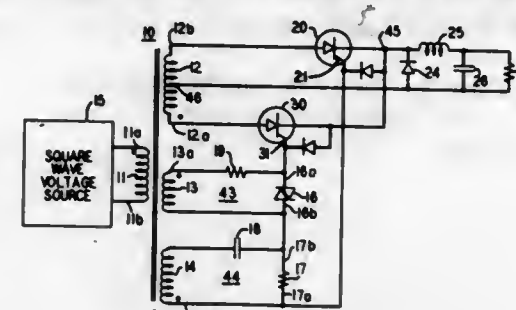
Int. Cl. H02m 7/22

U.S. Cl. 321—16

5 Claims

An AC to DC converter regulates its output voltage with respect to line voltage changes by utilizing a line voltage

responsive gating signal to control silicon controlled rectifiers in the output rectifier. The gating signals are generated by off-



setting a voltage generated by a line voltage responsive timing circuit against a reference voltage.

3,735,240

### INTEGRATED CIRCUIT CURRENT REGULATOR WITH DIFFERENTIAL AMPLIFIER CONTROL

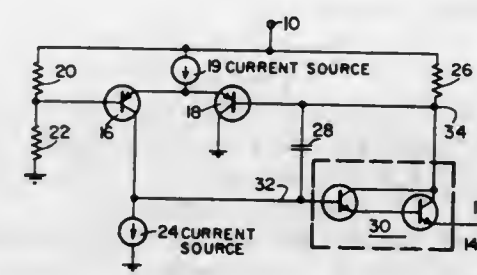
William F. Davis, Tempe; Ronald W. Russell, Scottsdale, both of Ariz.; Thomas M. Frederiksen, and Ernest L. Long, both of San Jose, Calif., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Oct. 15, 1971, Ser. No. 189,521

Int. Cl. G05f 1/56

U.S. Cl. 323—4

10 Claims



A current regulator for an automotive fuel injection system includes an integrated circuit chip having a differential amplifier with a control point to be coupled through an external impedance to the power supply. The differential amplifier drives a pair of Darlington connected transistors to control the current from the power supply to the load, which flows through the impedance. The collector electrodes of the Darlington transistors are connected to the control point, which is coupled to an input of the differential amplifier to form a closed negative feedback loop.

The transistors of the differential amplifier may have dual collector electrodes, and first and second Darlington pairs coupled thereto can control the current supplied to first and second loads. Switches are connected to the Darlington inputs for selectively enabling one output or the other.

3,735,241

### POLY-PHASE DIGITAL CONTROLLER

George O'Sullivan, Pottersville, N.J., assignor to Tenney Engineering, Inc., Union, N.J.

Filed Dec. 28, 1971, Ser. No. 213,027

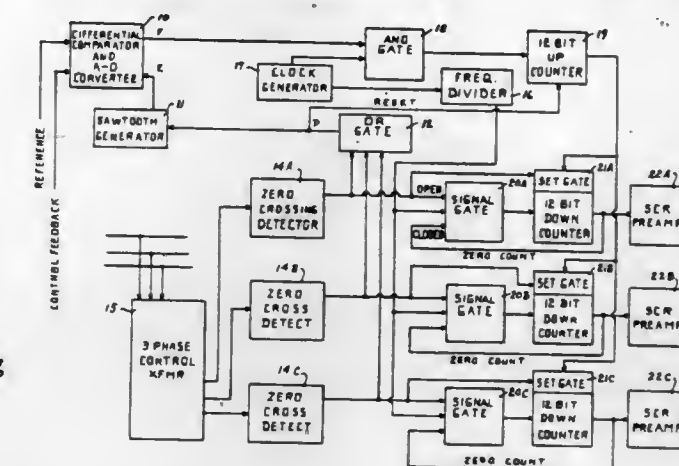
Int. Cl. G05f 1/44

U.S. Cl. 323—22 SC

4 Claims

A polyphase digital controller comprised of circuitry to generate and count a group of digital clock pulses with the first pulse being counted after the zero crossing of the primary voltage. The number of pulses in the group is proportional to the control function representing (SCR) silicon controlled rectifiers off time. These clock pulses are counted by an up counter which is used to set an individual down counter in each phase. The up counter operates six times during each 360° of the input line. This setting of the down counters occurs

when the primary voltage associated with the individual phase of each counter crosses zero. This zero crossing also starts the down counter associated with that phase, counting a clock



3,735,242

### SERIES VOLTAGE REGULATOR WHEREIN AN FET SUPPLIES A CONSTANT CURRENT REFERENCE VOLTAGE TO A DIFFERENTIAL COMPARATOR

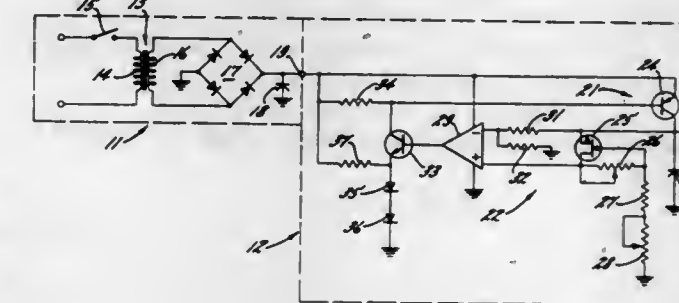
Marinus Leland Andersen, Nevada, Iowa, assignor to Hach Chemical Company, Ames, Iowa

Filed Oct. 29, 1971, Ser. No. 193,933

Int. Cl. G05f 1/56, 1/64

U.S. Cl. 323—22 T

7 Claims



A series-type dc. voltage regulator includes an operational amplifier as a very sensitive differential comparator for comparing the regulated output voltage against a very stable reference so as to provide an error signal for correctively adjusting the collector-emitter impedance of a series regulating transistor in response to even very small deviations of the output voltage from its set point. The reference voltage is developed internally by using a field effect transistor, biased to operate in a temperature stabilized constant current mode, to drive current through a voltage dropping resistance. The operational amplifier is powered by the dc. source with which the voltage regulator is employed and has an output offset to foreshorten the rise time of the regulated output voltage.

3,735,243

### CONTROL SYSTEM FOR TAP CHANGER WITH VACUUM INTERRUPTER

Clifford L. Downs, Lenox, and Richard D. Blackburn, Dalton, both of Mass., assignors to General Electric Company

Filed Apr. 3, 1972, Ser. No. 240,573

Int. Cl. G05f 1/14

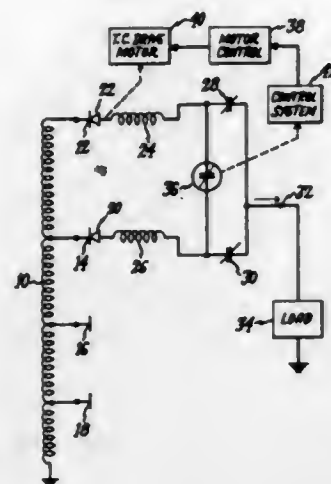
U.S. Cl. 323—43.5 R

6 Claims

A control system for a tap changer using a vacuum interrupter. The control system has provisions for monitoring the vacuum interrupter to detect any failure of such interrupter



and thus prevent further operation of the tap changer. Should the interrupter fail to open on a tap change, the tap changer motor is reversed returning the changer to the starting position and locking the changer. Should the interrupter be open at the start of a tap change, the tap changer is reversed return-



ing the tap changer to the starting position and then locking the tap changer. In another embodiment, should the interrupter fail to close after a tap change has been initiated, the tap change is completed and the changer locked in that position.

3,735,244

## DISPLACEMENT PICK-UP

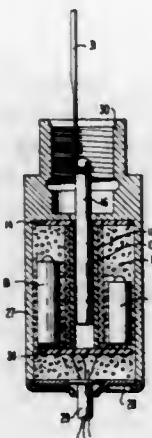
Hanns Dieter Gumtau, Neustadt, and Rainer Kowarsch, Aldingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany  
Filed Sept. 17, 1971, Ser. No. 181,464

Claims priority, application Germany, Sept. 19, 1970, P 20 46 336.9

Int. Cl. G01r 33/00

U.S. Cl. 323-51

22 Claims



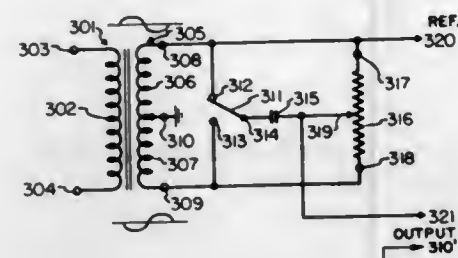
An electronic motion pick-up in which a core made of ferromagnetic material and displaceable in accordance with the motion to be measured, is adapted to be immersed into a coil forming part of a tuned circuit of a transistorized oscillator whose rectified output voltage is used as electrical measuring magnitude; the permeability of the core is thereby limited to such a value that the oscillations are not stopped also with the deepest immersion of the coil into the core which is possible during the operation.

3,735,245  
PHASE SHIFTER CIRCUIT  
Albert Charles Stigvils, Glendale Heights, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 20, 1971, Ser. No. 209,516  
Int. Cl. H03b 3/04

U.S. Cl. 323-109

1 Claim



A phase shift circuit capable of shifting the phase of an input signal over a 360° range. It consists of a center tapped feed transformer with its outer terminals connected across the outer terminals of a potentiometer. The movable arm of the potentiometer is connected through a capacitor to one or the other of the outer terminals of the transformer, with the phase shifted output taken from the potentiometer arm and a center tap of the transformer.

3,735,246

## SPIN-COUPLING NUCLEAR MAGNETIC RESONANCE MAGNETOMETER UTILIZING THE SAME COIL FOR EXCITATION AND SIGNAL PICK-UP AND USING TOROIDAL SAMPLES

Henri Glenat, Biviers, and Antoine Salvi, Fontaine, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France

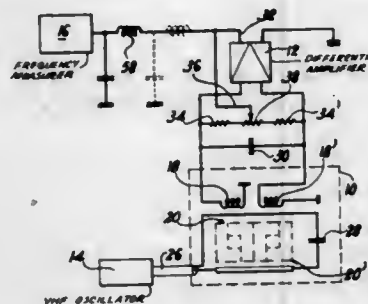
Filed July 7, 1971, Ser. No. 160,277

Claims priority, application France, July 22, 1970, 7027009

Int. Cl. G01r 33/08

U.S. Cl. 324-0.5 R

11 Claims



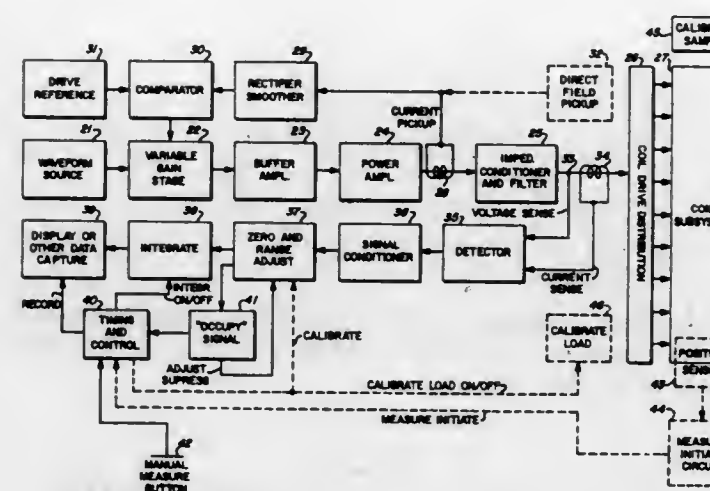
The magnetometer comprises two samples which are subjected to the field to be measured and contain the same atomic nuclei having a non-zero magnetic moment and kinetic moment; two aligned coils each associated with a sample; means for producing an electromagnetic field at the electron resonance frequency in order to saturate one line of one of the samples which increases energy absorption at the resonant frequency of the atomic nuclei and one line of the other sample so as to produce an energy emission at said resonant frequency; a differential amplifier associated with two coils, each half-coil being connected to a fixed reference voltage and to a respective input of the amplifier, and means for measuring the frequency at the output of the amplifier.

3,735,247  
METHOD AND APPARATUS FOR MEASURING FAT CONTENT IN ANIMAL TISSUE EITHER IN VIVO OR IN SLAUGHTERED AND PREPARED FORM  
Wesley H. Harker, Paradise Valley, Ariz., assignor to The Emme Company, Glendale, Ariz.

Filed Oct. 4, 1971, Ser. No. 186,058  
Int. Cl. G01r 33/12

U.S. Cl. 324-34 R

11 Claims



A method is presented and apparatus disclosed which permits very accurate measurement of the fat-to-lean ratio of meat, whether in vivo or in prepared form. The animal or meat package to be analyzed is subjected to a varying electromagnetic field generated by applying a radio frequency signal to a solenoidal coil through which the sample passes longitudinally. Because of difference of electroconductivity and dielectric properties between various body components, the load observed by the source which drives the solenoidal coil takes on a different value from that of the empty sample zone. By utilizing other predetermined parameters of the sample, the load difference may be utilized to infer the fat-to-lean ratio to a commercially acceptable standard.

3,735,248

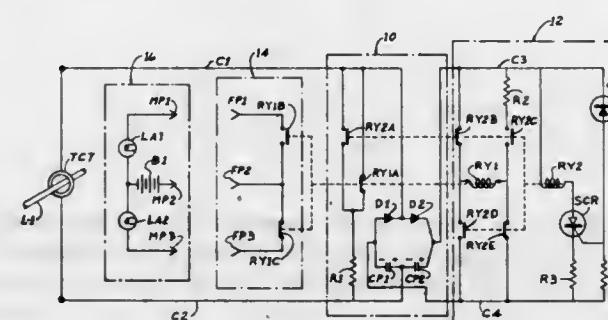
## APPARATUS HAVING AUTOMATIC RE-SET MEANS FOR DETECTING A FAULT CURRENT

Robert L. Reese, 1009 Bryan Drive, South Euclid, Ohio  
Filed Mar. 31, 1970, Ser. No. 24,302

Int. Cl. G01r 31/02, 31/08

U.S. Cl. 324-51

3 Claims



A device for detecting fault current. The device senses the current in a line and converts it to a proportional voltage signal. The voltage signal is used to switch a solenoid to first and second positions depending upon the value of the signal. The device will re-set itself after sensing a fault current when normal line current is restored.

3,735,249  
SPOKED ELECTRODE FOR MONITORING EARTH CURRENTS

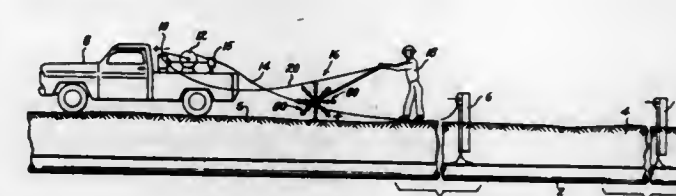
Donald F. Stoll, Vernal, Utah, assignor to El Paso Natural Gas Company, El Paso, Tex.

Filed July 1, 1971, Ser. No. 158,869

Int. Cl. G01v 3/08

U.S. Cl. 324-9

8 Claims



A monitoring device for use in measuring earth potentials, including a hub carried by a handle unit and having a plurality of spokes extending therefrom. Each spoke has an electrolytic solution cell on its outer end, into which a spoke-mounted electrode extends. The outer end of the cell has a porous tip mounted thereon, which is wetted by the solution and engages the earth. The spokes and the hub are made of conductive material, and a brush-type electrical pickup on the handle unit engages the hub for transmitting signals detected by the wetted porous tips as they progressively engage the earth when the device is rolled along.

3,735,250

## FAULT DETECTING APPARATUS FOR A CAPACITOR TYPE POTENTIAL DIVIDER HAVING AN AMPLIFIER

Michio Masui, Kitatama-gun, Tokyo, Japan, assignor to Tokyo Shibaura Electric Company, Ltd., Kawasaki-shi, Japan

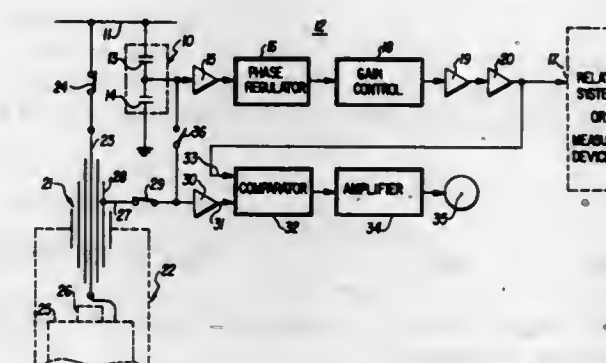
Filed July 1, 1971, Ser. No. 158,832

Claims priority, application Japan, July 8, 1970, 45/59212

Int. Cl. G01r 31/02

U.S. Cl. 324-51

7 Claims



A capacitor type potential divider having an amplifier is provided with a pair of capacitor units respectively connected to the same phase line of A.C. polyphase power lines. A divided voltage derived from one of the capacitor units is applied through an amplifier to a protecting relay system and/or a voltage measuring device for the polyphase power lines. The output of the amplifier and the divided voltage derived from the other capacitor unit are applied to a comparator for enabling a difference voltage therebetween to be obtained. The difference voltage is then employed to energize a fault detection relay for enabling a fault in the capacitor type potential divider to be detected.



3,735,251

**SCRATCH PROBE FOR MANUAL TESTING OF ELECTRICALLY INSULATING COATINGS**

Orson J. Britton, Pittsford, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Sept. 23, 1971, Ser. No. 182,947

Int. Cl. G01r 31/12, 1/06

U.S. Cl. 324-54

2 Claims



A scratch proof probe for electrical testing of coatings such as plastic, glass or the like is provided by sandwiching a number of spring wire reinforcing members between two strips of conductive rubber.

3,735,252

**AUTOMATIC TESTER FOR TESTING RESISTANCE AND INDUCTANCE OF COIL WINDINGS**

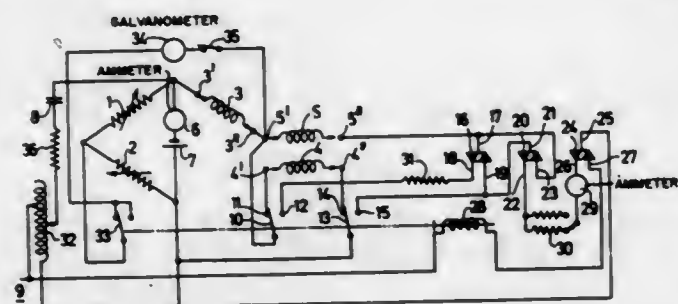
Koichi Azuma, 22 Miyuki, Shikamaku, Himeji, Japan

Filed July 2, 1971, Ser. No. 159,260

Int. Cl. G01r 11/52

U.S. Cl. 324-59

1 Claim



A coil winding tester has a bridge circuit with two variable resistors connected to the two adjoining sides and two standard coil windings connected to the other two sides. A power source, it further has D.C. and A.C. connected in parallel to the bridge circuit. A coil winding to be tested, when connected to this invention's circuit, causes a control signal to set one of the thyristors to work an electric magnet, connected to the A.C. power source, via another thyristor. This electric magnet is linked to a change-over switching device to disconnect automatically, via two thyristors, the circuit for the standard coil and forms a circuit for the test coil for testing/measuring the inductance and resistance of the test coil by a galvanometer.

3,735,253

**METHOD AND MEANS FOR MEASURING ELECTRODE RESISTANCE**

Edward J. Seger, Apollo, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Sept. 23, 1971, Ser. No. 183,117

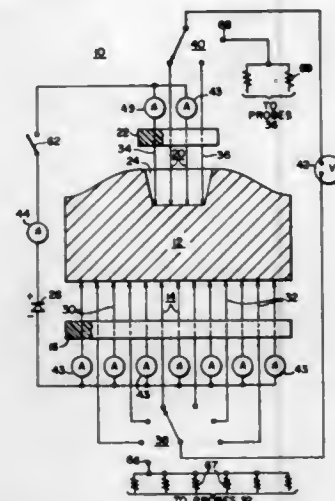
Int. Cl. G01r 27/14

U.S. Cl. 324-64

6 Claims

A method and apparatus for measuring the electrical resistance of a carbonaceous electrode. The apparatus includes a plurality of current carrying and voltage measuring probes for electrically contacting a surface of the electrode over a broad area. A second current carrying means is placed in electrical contact with the electrode at a location spaced from the surface contacted by the probes, and a voltage source is connected between the second current carrying means and the probes to apply a potential across the electrode and thereby direct current through the electrode. Current flows through the electrode along a plurality of paths between the current carrying means and the plurality of probes. The amount of

current flow in each path, and the voltage drop across the electrode are measured to determine the electrical resistance



of the electrode between the location on the surface contacted by the current carrying means and the electrode surface contacted by the probes.

3,735,254

**METHOD OF DETERMINING THE SHEET RESISTANCE AND MEASURING DEVICE THEREFOR**

Petrus Johannes Wilhelmus Severin, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

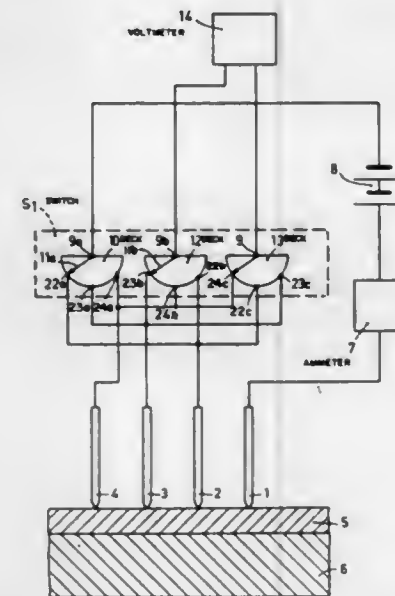
Filed June 3, 1971, Ser. No. 149,533

Claims priority, application Netherlands, June 6, 1970, 7008274

Int. Cl. G01r 27/14

U.S. Cl. 324-64

12 Claims



The invention relates to the determination of the sheet resistance (resistance per square) of a layer which changes into a second layer via a rectifying junction. In this determination, four or more electrodes are arranged on the layer to be measured, for example on a straight line. In a first step, a current is conveyed through two electrodes at a comparatively low voltage and the voltage associated with said current is determined between two other electrodes as is usual in a normal four point measurement. In a second step of the measurement the same measurement is carried out without changing the place of the electrodes but while changing a current supply and a voltage take-off electrode, with the difference that at least electrodes for current supply or voltage measurement have a different distance as compared with that of the first measurement. The

sheet resistance or a quantity associated therewith is obtained in an accurate manner from the results.

3,735,255

**APPARATUS AND METHOD FOR TESTING A MULTI-TERMINAL LOGIC CIRCUIT CAPABLE OF DETECTING FIXED AND INTERMITTANT FAULTS**

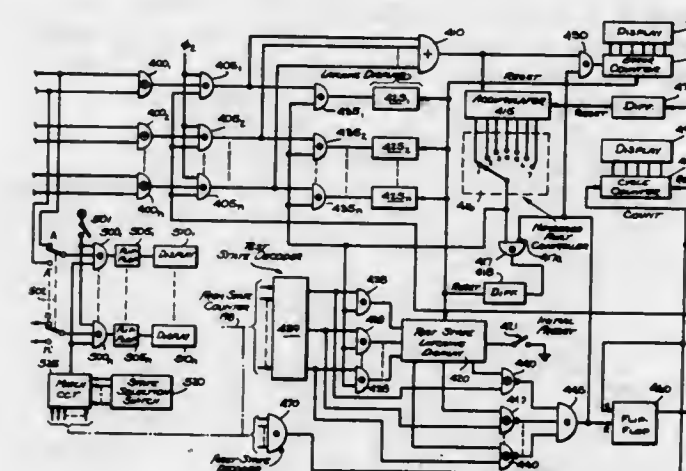
Alvin Goldman, 190 East 72nd Street, New York, N.Y.

Continuation-in-part of Ser. No. 816,244, April 15, 1969, abandoned. This application Aug. 6, 1971, Ser. No. 169,620

Int. Cl. G01r 15/12

U.S. Cl. 324-73 R

8 Claims



A programmed test arrangement for electronic assemblies compares the output of an array (generally of integrated circuits) to be tested against either the output from another similar array or a model output. Circulating shift registers containing the test data provide a sequence of two state test signals. These test signals together with various unchanging signals are connected as inputs to the arrays. The registers are loaded in accordance with a program that is a function of the circuit being tested.

Fixed and intermittent faults on the electrical arrangement under test are identified by particular patterns of fault indications generated responsive to the two state logic output signals. The test data cycled through the circulating registers is a function of the type of array to be tested. The fault indicated is a function of the error in the particular array being tested.

3,735,256

**SIGNAL SPECTRUM ANALYZER**

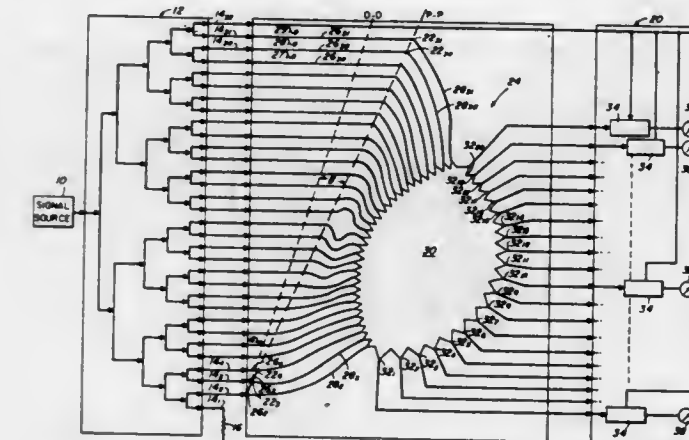
Donald H. Archer, and Robert J. Prickett, both of Santa Barbara, Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Aug. 26, 1971, Ser. No. 175,302

Int. Cl. G01r 23/16, 27/02

U.S. Cl. 324-77 D

9 Claims



A radio frequency signal spectrum analyzer, suitable for fabrication on a single substrate and adapted to provide a sub-

stantially instantaneous indication of the frequency of a signal is disclosed. The spectrum analyzer includes a two dimensional constrained electromagnetic lens system having each one of its input ports coupled to the signal source through an electrical path of different predetermined electrical lengths. The energy of the signal passes through each one of the electrical paths to each one of the input ports and then is focused by the lens system to particular output ports of such antenna in accordance with the frequency of the signal. The frequency of the signal is determined by measuring the energy level in the various output ports of the lens system.

3,735,257

**TACHOMETER PROCESSING CIRCUIT USING LOGIC DEVICE TO GENERATE EQUAL WIDTH PULSES**

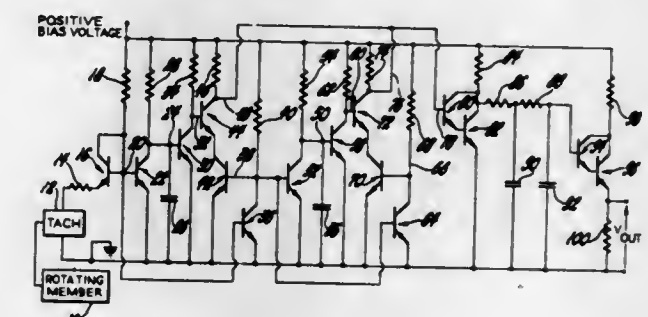
Bruce B. Roesner, Lafayette, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 12, 1971, Ser. No. 188,088

Int. Cl. G01r 23/02; H03k 5/20

U.S. Cl. 324-78 E

4 Claims



A voltage level analog of the frequency of a rotating member is developed by a tachometer processing circuit using a NAND logic device. A first pulse train related in frequency with the frequency of the rotating member is applied to an RC timing circuit to control a transistor switching device to develop a second pulse train at the transistor output at the same frequency as the first pulse train, but having pulse widths differing by a fixed predetermined amount of dwell. The second pulse train and an inverted version of the first pulse train are applied to a NAND logic device to develop a pulse train having pulses with widths equal to the dwell by which pulses in the second train exceed pulses in the first train. The pulses developed by the NAND logic device are averaged by an RC filter to provide a DC analog of frequency.

3,735,258

**ELECTRO-MECHANICAL DEFLECTOR FOR LIGHT BEAMS**

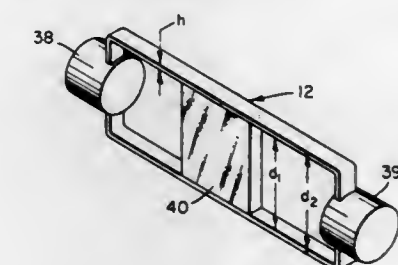
John W. Corcoran, Los Altos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Aug. 17, 1971, Ser. No. 172,483

Int. Cl. G01r 13/38, 1/00

U.S. Cl. 324-97

5 Claims



A specific galvanometer structure, designed to maximize the coil/mirror inertia torsional resonance and the inductance/inertia resonance, includes a galvanometer coil and a mirror integrally bonded therewith. The coil itself acts as the mechanical beam for the mirror, and is made of many layers of.



anodized aluminum ribbon bonded together with epoxy. Increasing the cross-sectional width of the coil raises the coil/mirror inertia torsional resonance but lowers the inductance/inertia resonance. Accordingly, optimized operating frequency occurs when the two resonant frequencies are equal. A drive circuit coupled to the coil via a flexure-pivot coil suspending means, produces a current pulse doublet of the same form as the acceleration desired at the mirror.

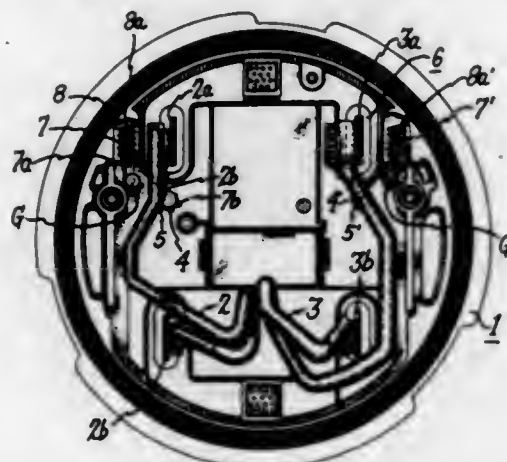
3,735,259

**OVERVOLTAGE SURGE ARRESTER FOR A METER**  
Ansell W. Palmer, Hampton, N.H., assignor to General Electric Company

Filed Oct. 14, 1971, Ser. No. 189,458  
Int. Cl. G01r 1/00; H01J 17/20

U.S. Cl. 324-110

4 Claims



An insulating base plate for a meter, such as a watt-hour meter, is provided with an integral housing for a helically coiled electrical resistance wire that forms part of a current limiting sparkgap assembly which is enclosed completely within the meter base plate and its associated meter cover. The housing arrangement for the helical resistance wire is characterized by embodying spacing means for maintaining the individual coils of the helix separated from one another when they are subjected to magnetic forces due to the discharge of an overvoltage surge through the sparkgap assembly. A further characteristic feature of the sparkgap assembly is the provision of a novel means for accurately and inexpensively mounting the respective electrodes of the sparkgap in a predetermined relationship with respect to one another.

3,735,260

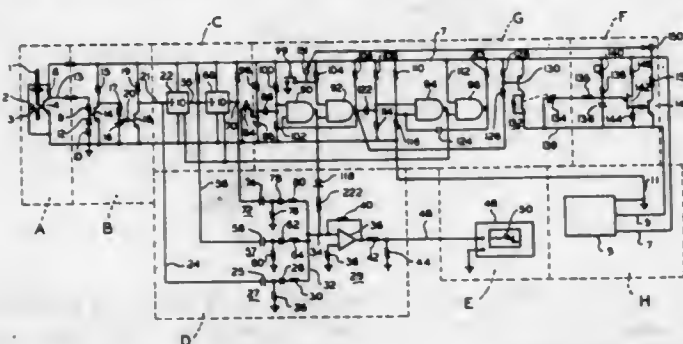
**PULSE COUNTING LINEAR MEASURING DEVICE**

Rolland L. Hartline, Buchanan, and Charles E. Kramer, Three Oaks, both of Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Aug. 11, 1971, Ser. No. 170,879  
Int. Cl. G01p 3/66

U.S. Cl. 324-175

6 Claims



This is a pulse counting linear measuring and recording device utilizing a "fifth wheel" associated with a photocell to

produce an electrical pulse each 0.1 foot of linear travel. The electrical pulses are counted and a larger pulse produced for each 1 foot of travel and a still larger pulse produced for each 10 feet of travel. These pulses are then presented vertically on a chart moving at a horizontal uniform rate. Provision is made for time interval presentation on the chart. The time interval may be automatically set at 6.82 seconds so that the counting of the 10 foot pulses gives equivalent miles per hour speed. The time interval also may be mechanically set at a desired starting event and ending event for a particular cycle.

3,735,261

**PULSE ANALYZER**

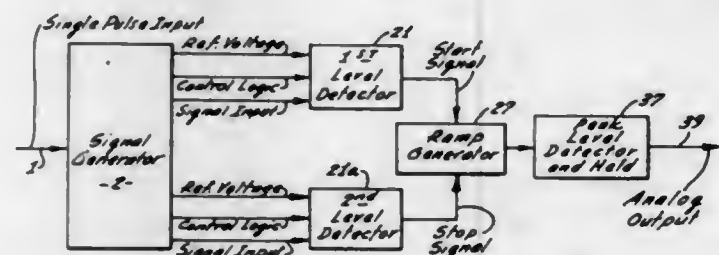
Richard E. Vahlstrom, Villa Park; Donald C. Nutten, Newport Beach; Lyle V. Rennick, Costa Mesa; Dennis R. Bayne, Placentia, and Stanley Oster, Anaheim, all of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed June 7, 1971, Ser. No. 150,377

Int. Cl. G04f 9/00; H03k 5/20; G01r 19/00

U.S. Cl. 324-181

16 Claims



Rise time, fall time, and width of a single short duration pulse are measured with no a priori knowledge of the pulse. First and second level detectors are used to respectively start and stop a ramp generator. The level detectors are biased to fire at certain defined percentages of the leading and/or trailing edge of the pulse depending upon which time parameter the detectors are measuring. A peak level detector and hold circuit connected to the ramp generator output gives a voltage amplitude proportional to the "on" time of the generator and thus indicative of the time interval being measured. To supply the level detectors with the proper information, an input and logic section produces from the incoming (positive) pulse its peak amplitude, negative peak amplitude, a delayed positive pulse, a delayed negative pulse, and timing signals for enabling and disabling the level detectors as necessary.

3,735,262

**APPARATUS FOR MEASURING REVOLUTION SPEED OF A BODY**

Peter Orth, Mercklinghausstr. 54, D-478 Lippstadt, Germany

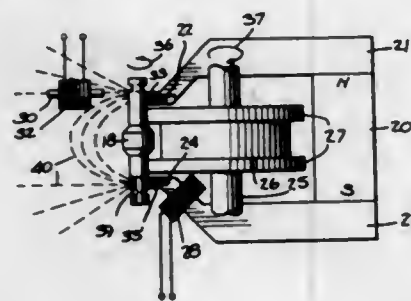
Continuation of Ser. No. 872,491, Oct. 30, 1969, Pat. No. 3,665,306. This application Nov. 5, 1971, Ser. No. 196,079

Claims priority, application Switzerland, Nov. 18, 1968, 17200/68

Int. Cl. G01p 3/48

U.S. Cl. 324-174

6 Claims



Apparatus for the electromagnetic measurement of the speed of revolution of a twist tube of a false twisting device, the twist tube being fabricated from magnetically susceptible

material and having an opening extending transversely of the axis thereof, the twist tube being mounted between opposite poles of a magnet so that a magnetic field extends substantially perpendicularly across the axis of the shaft, a coil mounted in the range of influence of the magnetic field for sensing the field variations induced by the periodical variations of the magnetic resistance of the rotating shaft.

3,735,263

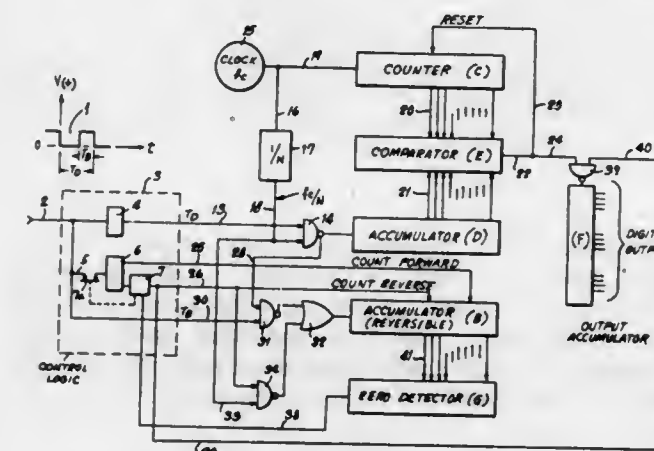
**DIGITAL ANALYSIS OF ELECTRIC WAVE SIGNALS**  
John T. Boatwright, Hopkinton, N.H., assignor to Northeast Electronics Corporation, Concord, N.H.

Filed July 12, 1972, Ser. No. 271,077

Int. Cl. G04f 9/00

U.S. Cl. 324-186

4 Claims



Digitally measuring the duty cycle of a repetitive signal having a fractional active portion by producing and accumulating a summation of a first series of pulses of total duration equal to the period of the signal, producing and accumulating a summation of a second series of pulses of total duration equal to the active portion of the signal, reversibly counting back to zero over an interval equal to the duration of the fractional period and counting the number of pulses of the first series during the interval.

3,735,264

**COMPANDING PULSE CODE MODULATION SYSTEM**  
Robert R. Mauduech, 7, rue du Docteur Roux, Perros-Guirec, France

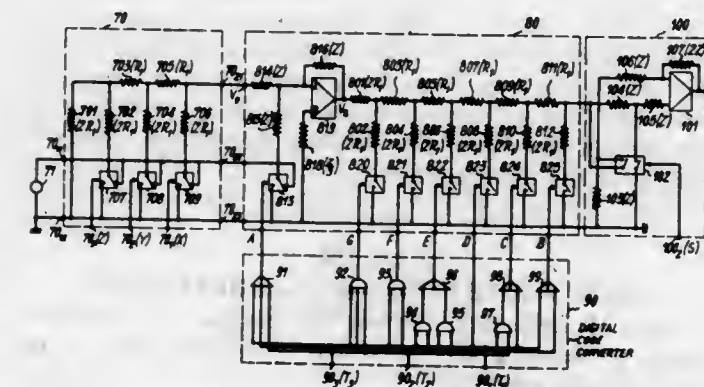
Filed Sept. 8, 1969, Ser. No. 855,881

Claims priority, application France, Sept. 11, 1968, 68165786

Int. Cl. H03k 13/00

U.S. Cl. 325-38

1 Claim



A plurality of cascaded attenuators, comparators, and switching means develops from an analogue signal a set of successive "one" digits and an adjacent set of successive "zero" digits. These digits correlate with the P.M.C. code as determined by a computer.

**RADIO COMMUNICATION/CONTROL SYSTEM FOR RESTRICTED RANGE SIGNALING NEAR THE EARTH'S SURFACE**

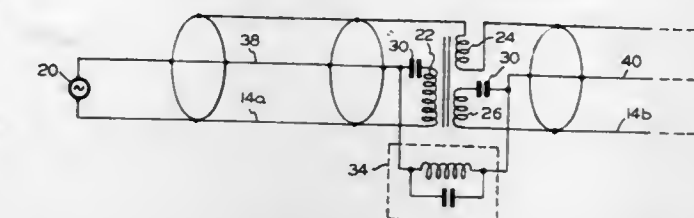
James J. Karaganis, Rockville, Md., assignor to Peter V. Gureckis, Potomac, Md.

Filed Nov. 24, 1970, Ser. No. 92,389

Int. Cl. H04h 1/00

U.S. Cl. 325-28

8 Claims



A communications and control system for providing radio signaling between one or more fixed terminals, transmitting and/or receiving radio frequency signals through a system of conductors located at or below the surface of the earth and so juxtaposed mechanically and electrically (in terms of relative current amplitude and phase) as to provide relatively strong radio frequency field intensities in the immediate vicinity of the conductor system, while creating greatly attenuated fields outside said vicinity for purposes of minimizing interference with other signaling systems or for denying access to the subject communication and control network, and one or more other transmitting and/or receiving terminals, fixed or mobile (such as may be represented by a suitably equipped vehicle or ambulatory person), as well as certain means for optimizing the distribution of the radio frequency field within the useful range of the system.

3,735,266

**METHOD AND APPARATUS FOR REDUCING CROSSTALK ON CROSS-POLARIZED COMMUNICATION LINKS**

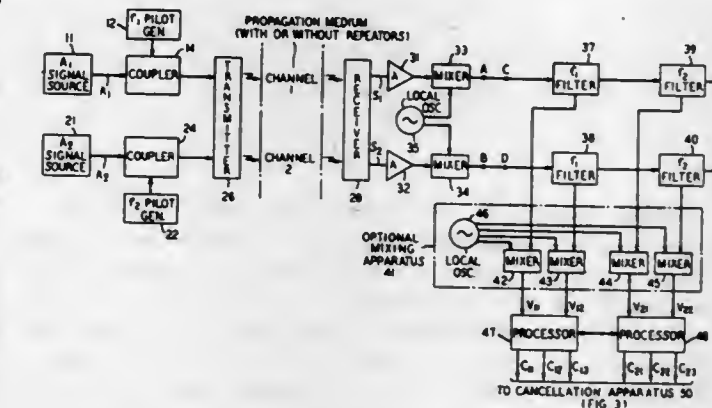
Noach Amitay, Livingston, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 20, 1971, Ser. No. 209,652

Int. Cl. H04b 1/00

U.S. Cl. 325-60

6 Claims



A method and apparatus for reducing crosstalk in microwave transmission systems in which information is transmitted in two cross-polarizations or channels. Utilizing a frequency-diversity system, a pilot signal is transmitted with each of the channels; and the receivers are equipped with means for detecting components of the pilots received in each channel to indicate the level of crosstalk. The components of the pilots are processed at the receiver in a predetermined manner to generate control signals proportional to the degree of correction required to cancel the crosstalk. The cancellation is accomplished by RF or IF control circuits in either feedback or feed-forward arrangements which, in response to the control signals, operate directly upon the received signals



to cancel the crosstalk automatically. The technique is theoretically adaptable to any number of distinct linear polarizations or channels and is particularly suited for use in satellite communication links.

3,735,267

## BALANCED MIXER

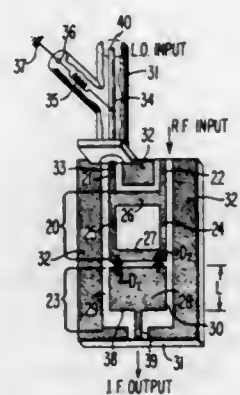
Louis Sebastian Napoli, Hamilton Square, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 23, 1971, Ser. No. 165,490

Int. Cl. H01p 1/32, 3/08; H04b 1/26

U.S. Cl. 325-446

5 Claims



Coplanar and slot transmission lines are used to provide an improved microwave balanced mixer.

3,735,268

## DUPLEX TUNING FOR RADIO RECEIVERS

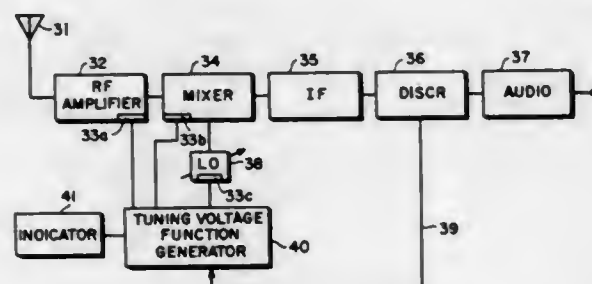
Charles M. Dorsey; Harold J. Laurent; Michael Slavin, all of Baltimore, and Reuben Laverne Stauffer, Timonium, all of Md., assignors to The Bendix Corporation, Southfield, Mich.

Filed Sept. 15, 1970, Ser. No. 72,470

Int. Cl. H04b 1/34

U.S. Cl. 325-464

9 Claims



A tuning system for a radio receiver is disclosed in which manual tuning is performed by means of mechanically slug-tuned coils and automatic, signal-seeking tuning is performed by all-electronic means including a varactor. The coil and varactor form a resonant circuit which can be tuned over the entire frequency range of interest by variation of one tuning element, the other being held at a constant reactance value. For manual tuning, the varactor is held at a constant reactance value while the coil is tuned. For automatic tuning, the varactor is tuned and the coil is held fixed. A zone type electronic display is disclosed for use with the automatic tuning function.

3,735,269

## DIGITAL FREQUENCY SYNTHESIZER

Leland B. Jackson, Monsey, N.Y., assignor to Rockland Systems Corporation, West Nyack, N.Y.

Filed Oct. 29, 1971, Ser. No. 193,826

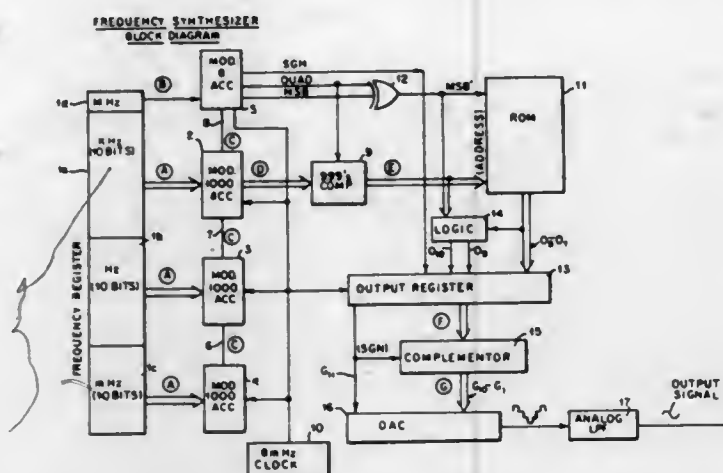
Int. Cl. H03b 19/00

U.S. Cl. 328-14

40 Claims

A digital frequency synthesizer using modulo  $10^N$  accumulator means for receiving signals corresponding to a predeter-

mined frequency output and for successively generating signals corresponding to addresses in a storage means, each of the addresses corresponding to a storage location which stores digital values corresponding to at least the magnitude of a plurality of digital samples of the output signal from the synthesizer. A digital-to-analog converter converts the output of the



storage means into a step-type waveform which is passed through a low pass filter to generate a smooth output waveform from the system. In order to reduce the size of the required storage device, sign and quadrature symmetry may be taken advantage of by making use of the redundancy of the magnitude of values in a sinusoidal signal generator.

3,735,270

## DELAYED PULSE GENERATOR

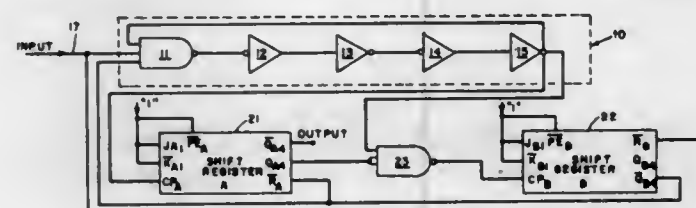
George J. Holub, Dix Hills, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 20, 1972, Ser. No. 236,016

Int. Cl. H03k 5/153

U.S. Cl. 328-55

8 Claims



A delayed pulse signal of a predetermined pulse width is obtained by having a free running clocking pulse generator provide a series of pulses to a first shift register. The first shift register provides a time delay for a predetermined number of pulses before supplying the delayed pulse signal and an enabling signal to a second shift register. The second shift register provides a time delay for a predetermined number of pulses and then supplies an output signal that inhibits the clock and at the same time inhibits the delayed pulse by resetting the first shift register.

3,735,271

## PULSE WIDTH CODED SIGNAL DETECTOR

Lawrence M. Leibowitz, Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 22, 1971, Ser. No. 191,698

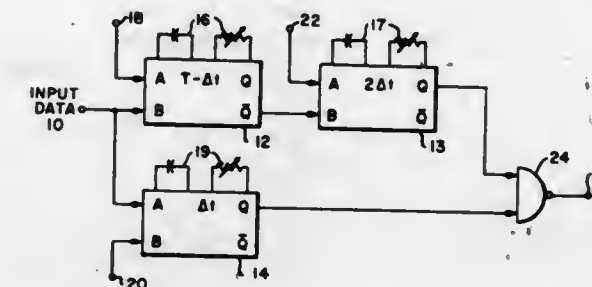
Int. Cl. H03k 5/18

U.S. Cl. 328-112

3 Claims

Two one-shot circuits are triggered by an input data pulse to be interrogated. At the leading edge of the input pulse, one of the two one-shot circuits generates a pulse of the specified width minus the specified tolerance. The other one-shot cir-

cuit generates a pulse width equal to the specified tolerance at the trailing edge of the interrogated pulse. The output of the first one-shot circuit triggers a third one-shot circuit which in turn generates a pulse of a width equal to twice the specified tolerance. The outputs of the second and third one-shot circuits are combined in a NAND gate which generates the detection pulse to indicate that the interrogated pulse is within the specified tolerance. The detection pulse is generated as



soon as the trailing edge of the interrogated pulse is received. Thus, two input data pulses can be placed as close together as possible as long as the individual pulse identity is maintained, making it possible to maximize the data rate. A multiplicity of detector circuits may be connected in a parallel manner, each generating a detection pulse upon the reception of a pulse specified length, thus permitting the decoding of an entire pulse-width-coded message.

3,735,272

## AUTOMATIC GAIN CONTROL

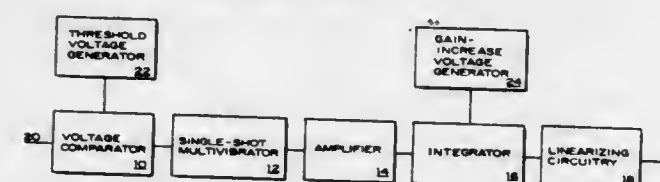
Rueben E. Nyswander, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 20, 1971, Ser. No. 191,047

Int. Cl. H03g 3/20

U.S. Cl. 328-132

5 Claims



An automatic gain control wherein the gain is maintained at a level just low enough to prevent saturation by noise and clutter. The gain slowly increases at a highly linear rate until a threshold value is exceeded; then the gain is rapidly reduced. Likewise, when a signal exceeding the threshold value is received, the gain is rapidly reduced to maintain a level below saturation.

3,735,273

## OFFSET SIGNAL CORRECTION SYSTEM

Donald J. Wright, 2411 Northfields Road, and Gerald E. Fisher, Sheffield Road, W. Leigh, both of Charlottesville, Va.

Filed Apr. 6, 1972, Ser. No. 241,557

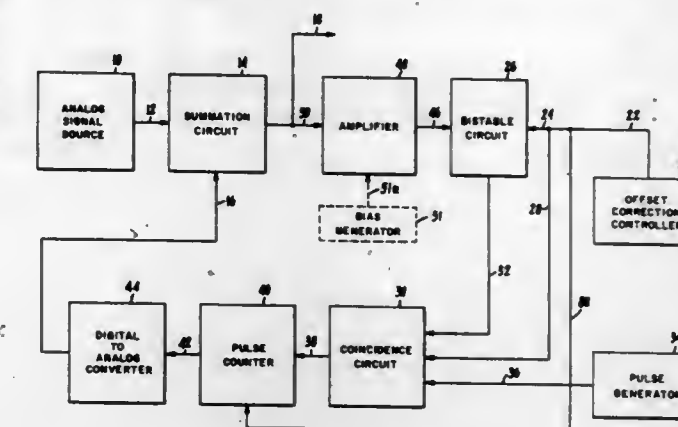
Int. Cl. H03k 5/18

U.S. Cl. 328-163

6 Claims

A system for correcting offset in analog signal generator output is responsive to simple pulse signal request for correction. A bistable circuit is set upon receiving the correction

request and thereupon enables a coincidence circuit to gate pulses to a counter. The counter output is converted by a



digital-to-analog converter whose output signal is combined subtractively with the offset signal. Upon nulling of the offset signal the bistable circuit is reset.

## ERRATUM

For Class 328-134 see:  
Patent No. 3,735,218

3,735,274

## THERMOCOUPLE SIGNAL AMPLIFIER

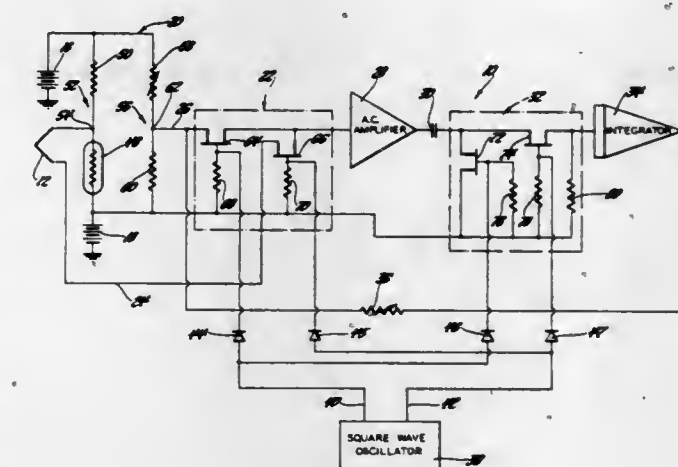
Robert E. Nelson, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 10, 1971, Ser. No. 170,562

Int. Cl. H03f 1/02

U.S. Cl. 330-1 A

2 Claims



Apparatus for generating an amplified DC voltage signal that is (a) proportional to a DC voltage generated by a thermocouple, (b) of an amplitude determined by a feedback impedance, and (c) substantially independent of instrumentation drift. A temperature compensating and summation network generates a control signal. A modulator alternately applies the control signal and a reference signal to an AC amplifier. A demodulator intermittently applies the AC component of the amplified signal to an integrator. An oscillator controls the modulator and demodulator so the integrator output signal is a DC signal proportional to the thermocouple voltage, the DC signal being returned through the feedback impedance to control system gain.



3,735,275

**DYNAMIC PRESENCE FILTER**

Richard G. Allen, Pound Ridge, N.Y., and Emil Torick, Darien, Conn., assignors to Columbia Broadcasting System, Inc., New York, N.Y.

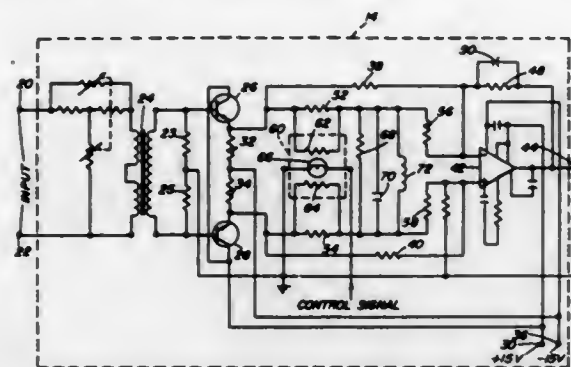
Division of Ser. No. 47,214, June 18, 1970, Pat. No. 3,668,322.

This application Mar. 15, 1972, Ser. No. 234,913

Int. Cl. H03f 17/00

U.S. Cl. 330—59

3 Claims



A speech processing device operative to correct deficiencies in speech programs caused by inadequate energy in the "presence band". The device determines the relative amount of total signal energy in the presence band, and, if it is inadequate, automatically boosts the amplitude of presence band components to a level to obtain a more optimum spectral distribution. The circuit is designed to operate with an automatic speech-music discriminator which inhibits control action during music programming.

3,735,276

**OSCILLATOR SYSTEM**

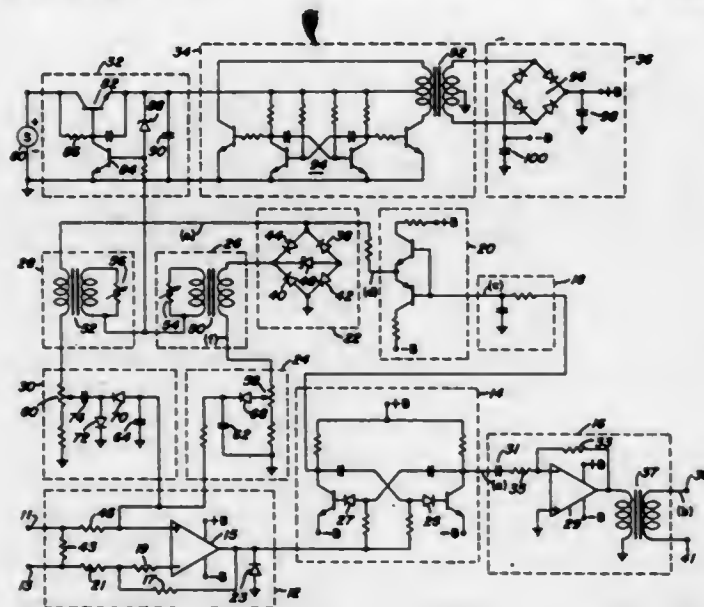
Richard Apolant, Irondequoit, N.Y., assignor to S.C.J. Associates Inc., Rochester, N.Y.

Filed Apr. 12, 1972, Ser. No. 243,318

Int. Cl. H03b 3/02

U.S. Cl. 331—11

10 Claims



A current controlled oscillator system is described which is isolated electrically from external systems and sources. The system includes a voltage controlled oscillator to which a control voltage related to the input control current is supplied for varying its frequency. A pair of alternating current channels respond to the oscillator signals and produce control signals which preset the frequency limits over which the oscillator frequency may be varied and to control the oscillator frequency so as to vary linearly with the input control current within such limits. The channels separately have a peak detector and a discriminator which develop control signals of opposite

polarity from limited oscillator output signals. Isolation is provided both from control devices and from external power supplies by coupling these devices and power supplies to the system through transformers; the external power supply being coupled through a transformer which is part of a DC to AC inverter connected to the external supply.

3,735,277

**MULTIPLE PHASE CLOCK GENERATOR CIRCUIT**

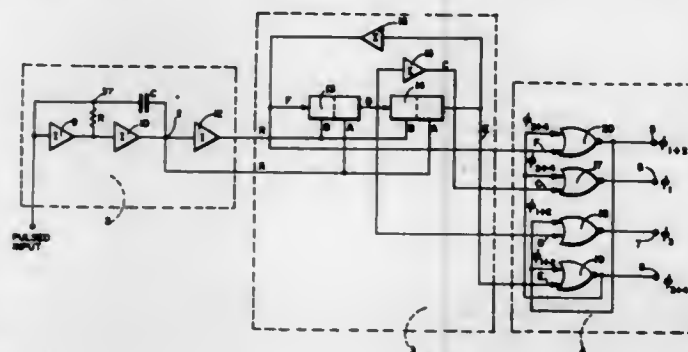
Frank M. Wanlass, Cupertino, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed May 27, 1971, Ser. No. 147,557

Int. Cl. H03b 5/20, 19/12; H03k 23/08

U.S. Cl. 331—45

11 Claims



A clock signal generating circuit including an oscillator circuit for supplying complementary square wave gating signals to a multi-bit shift register. One shift register bit is required for each two clock pulse phases. Output signals from each bit position of the shift register are provided as input signals to NOR gates which also receive feedback input signals from the output terminals of certain of the NOR gates to synchronize the phase relationship between the multiple phase clock signals produced by the output logic gates. The output signals from the NOR gates comprise the multiple phase clock signals.

3,735,278

**DEVICE FOR WAVELENGTH SELECTION IN LASERS WITH BROAD-BAND EMISSION**

Fritz Peter Schafer, Marburg (Lahn), and Werner Schmidt, Aalen, both of Germany, assignors to Carl Zeiss-Stiftung, Heidenheim (Brenz) Wuertemberg, Germany

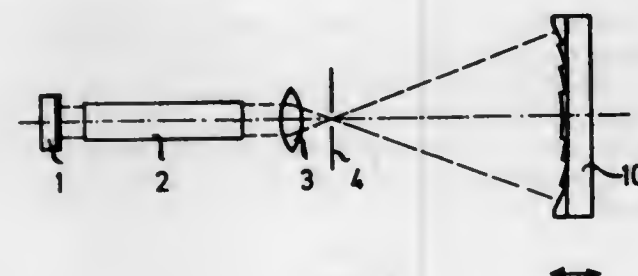
Filed Oct. 12, 1971, Ser. No. 188,073

Claims priority, application Germany, Oct. 20, 1970, P 20 51 328.4

Int. Cl. H01s 3/10

U.S. Cl. 331—94.5

5 Claims



In a device for wavelength selection in dye lasers with a broad-band emission, and which comprises in axial alignment a light source, a laser cell, a directional filter including an apertured stop, the improvement comprises a focusing lens system having a wavelength-dependent focal length arranged behind said directional filter and which with the assistance of a mirror images said apertured stop in itself by reflection.

3,735,279

**COLINEAR HETERODYNE FREQUENCY MODULATOR**

Melvin E. Pedinoff, Canoga Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

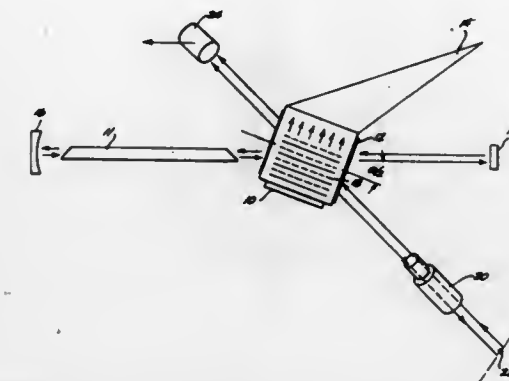
Continuation of Ser. No. 646,867, June 19, 1967, abandoned.

This application Dec. 10, 1970, Ser. No. 97,003

Int. Cl. H01s 3/10

U.S. Cl. 331—94.5

6 Claims



An apparatus to produce Brillouin scattering by means of two oppositely directed colinear optical beams, frequency-translated and of varying power level, in a time sequence suitable for processing doppler-shifted radar target echoes by means of a simplified optical heterodyne detection system.

3,735,280

**WHITE-LIGHT LASER USING DYE COUPLING**

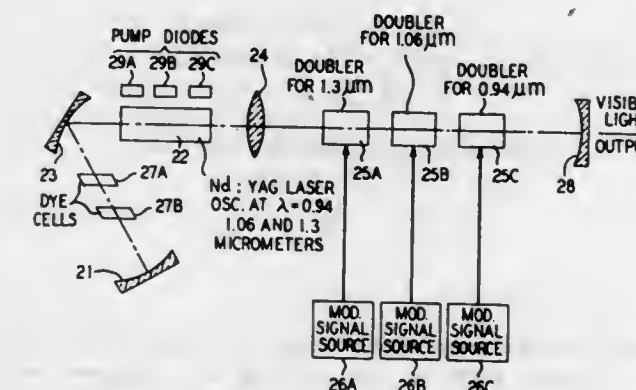
Wilbur Dexter Johnston, Jr., Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 11, 1971, Ser. No. 170,767

Int. Cl. H01s 3/00

U.S. Cl. 331—94.5

6 Claims



There are disclosed several arrangements for balanced three-color laser light sources. Also disclosed is a modulation arrangement which makes a three-color source readily adaptable for use in a color television receiver. The arrangements are based upon the use of a broadband gain medium, such as a dye laser medium, to modify the intensity relationship between two or more independent transitions or two or more competing transitions of a single laser medium. The same technique can be used with cascaded laser transitions.

3,735,281

**GAS DISCHARGE LASER**

Gilbertus Bouhuis; Petrus Franciscus Antonius Haans, and Theodorus Hendrikus Peek, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

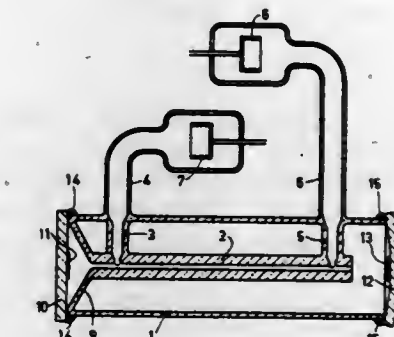
Filed May 19, 1972, Ser. No. 254,886

Claims priority, application Netherlands, May 26, 1971, 7107210

Int. Cl. H01s 3/08

U.S. Cl. 331—94.5

5 Claims



A laser having a wavelength of 6,328 Å is constructed from a quartz capillary which is connected by side tubes to a supporting outer tube and electrode spaces. Double conical edges are ground on the outer tube, the line of intersection of which constitutes the support for the reflector plate. The laser is of the nearly hemispherical type and single mode.

3,735,282

**LIQUID-COOLED, SEGMENTED GLASS LASER**

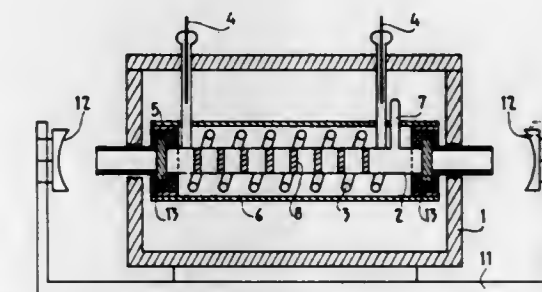
Francois F. Gans, 38 rue Gustav Vatonne, Gif-sur-Yvette, France

Filed June 14, 1972, Ser. No. 262,600

Int. Cl. H01s 3/04

U.S. Cl. 331—94.5

3 Claims



Laser device of the neodymium doped glass disc array type. The discs are spaced apart from one another and are immersed in a liquid whose refractive index is equal, for the emission wavelength of the laser, to the refractive index of the glass forming the discs. The disc inclination angle with respect to the disc alignment direction can take any desired value. To pump the discs in the whole volume thereof, the spacing is given a value higher than a predetermined minimal value and an inclination angle of 45° is selected. The immersion liquid is a mixture of a brominated saturated acyclic hydrocarbon and a saturated acyclic alcohol.



3,735,283

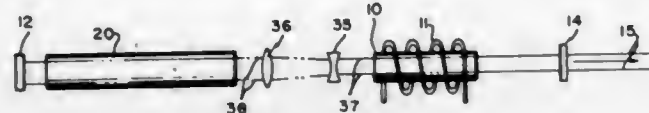
**BEAM DIAMETER CONTROL FOR P LASER HAVING IMPROVED COHERENCE**

Ralph Frederick Wuerker, and Lee Opert Heflinger, both of Los Angeles, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed June 23, 1971, Ser. No. 155,730  
Int. Cl. H01s 3/10

U.S. Cl. 331-94.5

4 Claims



A pulsed laser and preferably one with a solid laserable material is caused to oscillate substantially in a single mode to increase its coherence length. This is accomplished by the provision of one or more dye cells containing a saturable absorber for the optical radiation of the laser. This combined dye cell has a length of no less than  $\frac{1}{4}$  and no more than  $\frac{1}{2}$  that of the optical cavity and preferably a length of approximately  $\frac{1}{2}$  that of the cavity. Due to the provision of such a long dye cell the initial mode of oscillation of the laser is favored and the dye cell discriminates to a substantial extent against all other oscillating modes. Discrimination against unwanted modes is improved by controlling the size of the beam diameter passing through the dye cell. This permits independent control of the initial transmission of the dye cell by controlling the concentration of the dye, and the extent of bleaching during the pulse by controlling the beam diameter and hence light intensity within the cell.

3,735,284

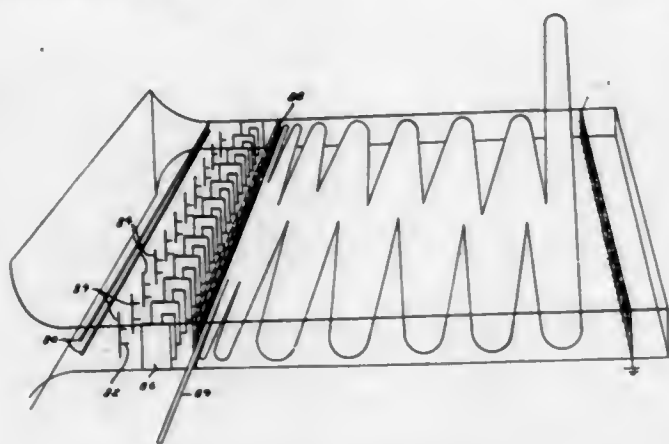
**AERODYNAMIC LARGE VOLUME GASEOUS ELECTRIC DISCHARGE SYSTEM**

Alan E. Hill, Box 5444-A Rte. 5, Albuquerque, N. Mex.  
Continuation-in-part of Ser. No. 7,935, Feb. 2, 1970. This application Mar. 29, 1971, Ser. No. 128,845

Int. Cl. H01s 3/22, 3/09

U.S. Cl. 331-94.5

15 Claims



A large volume gaseous discharge system such as used in lasers has a plurality of electrodes at one end of the channel. A plurality of separate discharges are established adjacent the plurality of electrodes. A fast-moving gas stream within the channel aerodynamically controls the ion spacial distribution, and therefore indirectly the electron spacial distribution within the channel. In one system the geometry of the system and velocity of the stream are made such that the transit time between the plurality of electrodes at one end of the channel, and an electrode at the other end of the channel, is of the order of the diffusion time from one current stream and the next. In another embodiment rods are positioned to rapidly diffuse the plasma with nozzles provided to further aid in the mixing. A transverse folded optical path is used for laser operation.

3,735,285

**SOLID-STATE LASER**

Felix Romain Pawlak, Paris, France, assignor to U.S. Phillips Corporation, New York, N.Y.

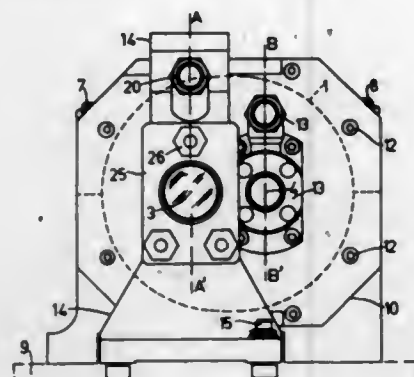
Filed May 1, 1972, Ser. No. 249,370

Claims priority, application France, Dec. 4, 1970, 7043668

Int. Cl. H01s 3/02

U.S. Cl. 331-94.5

3 Claims



A crystal laser in which the laser crystal and the mirrors of the interferometer are uncoupled mechanically from the pumping cavity. Due to this uncoupling, the stability of the laser is considerably improved. The construction of the pumping cavity is preferably such that part of it can be mounted or dismantled around the crystal without disturbing the critical adjustment of the mirrors and the crystal.

3,735,286

**VARACTOR TUNED COAXIAL CAVITY NEGATIVE RESISTANCE DIODE OSCILLATOR**

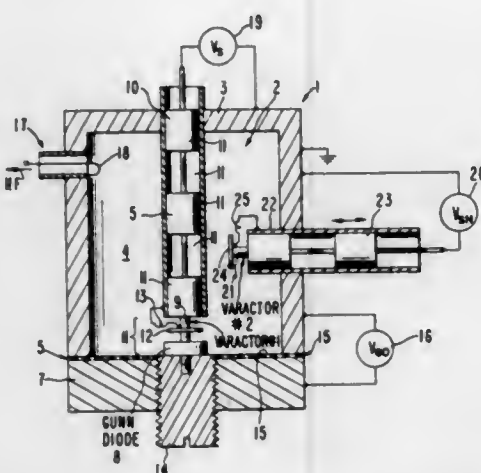
Arthur B. Vane, Menlo Park, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed May 1, 1972, Ser. No. 249,063

Int. Cl. H03b 7/14

U.S. Cl. 331-101

8 Claims



A Gunn diode is connected in series with the center conductor of coaxial resonator for exciting the resonator with microwave energy. A first voltage variable capacitor is disposed within the resonator in series with the Gunn diode for tuning thereof. The voltage variable capacitor is carried at the inner end of a choke structure disposed within the hollow interior of a conductive sleeve in DC insulated relation to the sleeve. An inductive wire is parallel resonated with the package capacitance of the series voltage variable capacitor and connects the inner terminal of the voltage variable capacitor to the sleeve of the choke for applying a variable bias voltage to the voltage variable capacitor for tuning the resonator. A similar second voltage variable capacitor and choked sleeve support is connectable for shunt tuning of the Gunn diode.

3,735,287

**RF/DC GENERATOR FOR QUADRUPOLE MASS ANALYZER**

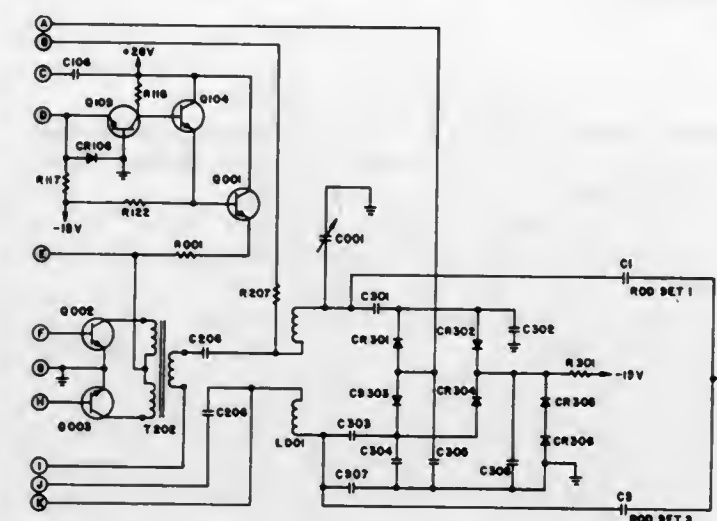
Richard Douglas Lowe, Sunnyvale, Calif., assignor to Electronic Associates Inc., Long Branch, N.J.

Filed May 3, 1971, Ser. No. 139,414

Int. Cl. H03b 3/02

U.S. Cl. 331-106

3 Claims



The specification discloses an improved radio frequency-direct current (RF/DC) generating circuit for use with a quadrupole mass analyzer. A free-running oscillator is employed to generate the radio frequency signal, the oscillator having diode means in the feedback circuit for limiting the dynamic range over which the oscillator must operate. The output of the oscillator is connected through a coil to the rods of the quadrupole mass analyzer which, in conjunction with the coil function as a tuned circuit, thereby the magnitude of the radio frequency applied to the rods is obtained by Q multiplication. A detector circuit is connected to the output of the coil for producing a feedback signal which is compared with a ramp voltage for driving the output of the oscillator as a function of the control ramp input. The detector output is also fed back to the input of two similar circuits for generating equal magnitude with opposite polarity direct current potentials which magnitude varies as a function of the output of the detector and thereby under control of the input control ramp. Additional diodes are provided in the detector circuit to enable the detector to operate near zero volts.

3,735,288

**PHASE MODULATOR**

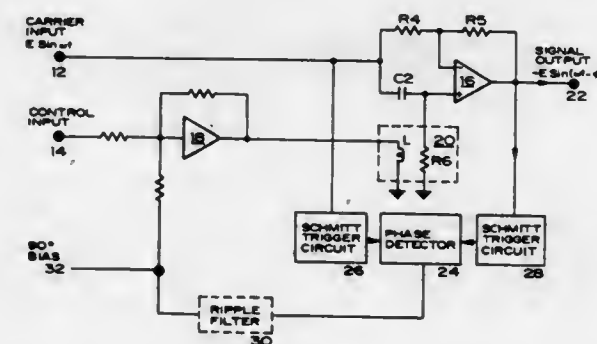
George M. Strauss, Elmhurst, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 29, 1971, Ser. No. 213,664

Int. Cl. H03c 3/08

U.S. Cl. 332-18

5 Claims



A phase or frequency modulator having an operational amplifier with inverting and noninverting terminals, an RC net-

work wherein R is light responsive, a control signal for controlling the light intensity, and a phase detector for comparing the phase of the modulated and unmodulated signal and feeding back an error signal to the light source.

3,735,289

**TRANSMITTER COMBINER HAVING COUPLED TUNED CIRCUITS**

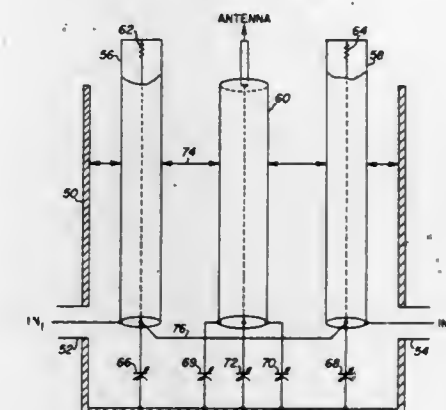
Warren B. Bruene, Dallas, Tex., assignor to Collins Radio Company, Dallas, Tex.

Filed Nov. 26, 1971, Ser. No. 202,330

Int. Cl. H01p 5/12

U.S. Cl. 333-5

4 Claims



A hybrid coupler for coupling a plurality of transmitters to a single antenna. Inductive coupling through use of variable length transmission line stubs affords tuning over a wide transmission frequency range.

3,735,290

**COMPRESSING AND/OR EXPANDING SYSTEM COMPRISING FIXED AND VARIABLE FREQUENCY CHARACTERISTIC CHANGING CIRCUITS**

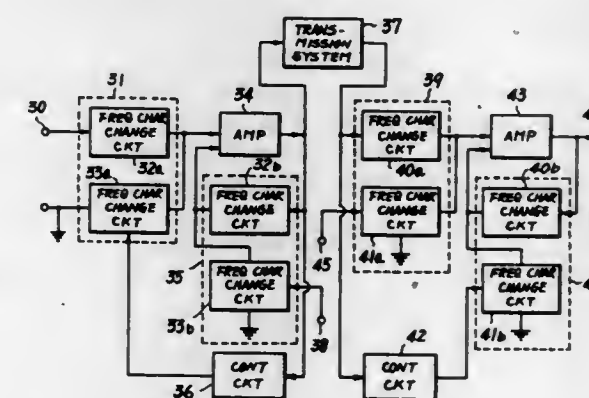
Nasami Yamazaki, Zama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Kanagawa, Japan

Filed Apr. 18, 1972, Ser. No. 245,124

Int. Cl. H04b 1/64

U.S. Cl. 333-14

11 Claims



A compressing and/or expanding circuit comprises a first circuit consisting of a frequency characteristic changing circuit having a specific fixed frequency-response characteristic and a frequency characteristic changing circuit including a control element and having a frequency response characteristic variable between a characteristic complementary with said specific fixed frequency response characteristic and a flat characteristic, an amplifier connected in series with the first circuit, and a second circuit provided in a feedback loop associated with the amplifier, which has the same circuit structure as the first circuit. In the compressing circuit, the first circuit, applied with a control signal voltage in response to the level of an input signal, causes its frequency response to vary,



whereas the second circuit, applied with a constant voltage, manifests a flat frequency response characteristic. In the expanding circuit, the first circuit, applied with a constant voltage, manifests a flat frequency response characteristic, whereas the second circuit, applied with a control signal voltage corresponding to the signal level, causes its frequency response to vary.

3,735,291

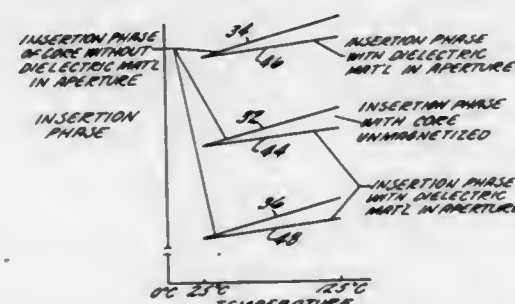
# TEMPERATURE COMPENSATED LATCHING PHASE SHIFTER HAVING COMPENSATING DIELECTRIC IN APERTURE OF FERRITE CORE

Peter W. Smith, Norwalk, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Oct. 4, 1971, Ser. No. 185,974

Int. Cl. H01p 1/32

U.S. Cl. 333-24.1



A ferrite core latching phase shifter uses the long remanent state as a reference state and thereby provides inherent temperature compensation of the reference phase. The temperature compensation is further augmented by placing in the aperture of the phase shifter a dielectric material selected to have an appropriate dielectric constant and temperature coefficient thereof, thereby providing a core comprised of a composite of the dielectric material and the ferrite. The addition of the dielectric material causes changes of the insertion phase attributable to thermally induced changes of the dielectric constant of the composite core, to offset changes of the insertion phase attributable to thermally induced changes of the remanent magnetization.

3,735,292

# ULTRASONIC DELAY LINE HAVING OFFSET BOUNDARY SURFACES AT POINT WHERE BEAM STRIKES SURFACE

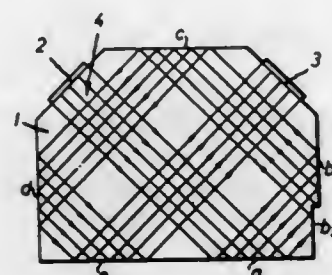
Helmut Probst, Ulm/Danube, Germany, assignor to Licentia Patent-Verwaltungs GmbH, Frankfurt, Germany

Filed Aug. 26, 1971, Ser. No. 175,203

Claims priority, application Germany, Aug. 28, 1970, P 20 42 865.3

Int. Cl. H03h 9/30

U.S. Cl. 333-30 R



A delay member in which the path of travel of an ultrasonic wave beam from an input transducer to an output transducer associated with the member is lengthened by reflection of the beam from at least one of the planar boundary surfaces of the member. At least one of these surfaces is divided into at least

two substantially parallel, but offset, surfaces so that a wave beam from the input transducer impinging on these offset surfaces is separated into at least two wave beams which travel over paths of different lengths to the output transducer. At least one of the separate beams is effective, at certain frequencies, to produce a counter voltage at the output transducer to attenuate, to the desired degree, the voltage developed at the output transducer and improve the transmission characteristic of the delay line.

3,735,293

# HIGH FREQUENCY CABLE

Otto Breitenbach, Nurnberg, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

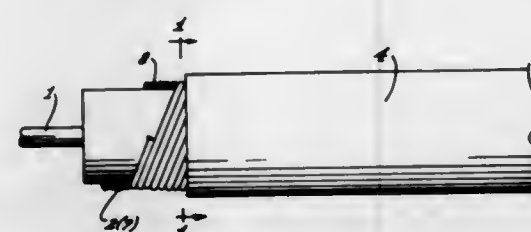
Filed May 12, 1971, Ser. No. 142,574

Claims priority, application Germany, May 12, 1970, P 20 22 990.7

Int. Cl. H01p 1/00; H01q 13/22

U.S. Cl. 333-84 R

8 Claims



A high frequency conductor systems for development of a partial external field with one or two inner conductors extending along a center line and surrounded by a dielectric substance; a tubular outer conductor or shield, physically encloses the inner conductor and the substance completely, and is constructed from serially interconnected, axially juxtaposed conductor loops providing a closed tube as well as a helical conduction path around said center line.

3,735,294

# MULTI-CONTACT TERMINAL SUPPORT ASSEMBLY FOR AN ELECTROMAGNETIC RELAY

Josef Altmann, Wien-Atzgersdorf, Austria, assignor to Telephon-und Telegraphen-Fabriks-Aktiengesellschaft Kapsch & Sohne, Wien, Austria

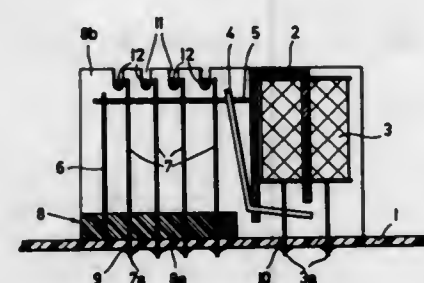
Filed Aug. 27, 1971, Ser. No. 175,650

Claims priority, application Austria, Aug. 28, 1970, A 7821/70

Int. Cl. H01h 63/02

U.S. Cl. 335-134

7 Claims



Disclosed is a switching assembly including a plurality of relay elements arranged on a printed circuit board. Each relay element has a plurality of movable contacts with anchored ends projecting through the circuit board, and an array of parallel wires supported between the movable contacts to form fixed contacts of the relay element. The free ends of the wires are bent towards and projecting through the circuit board to be soldered together with the projecting ends of the movable contacts, to assigned strip conductors of the printed circuit.

3,735,295

# ELECTRIC CONTROL DEVICES WITH MECHANICAL INTERLOCK

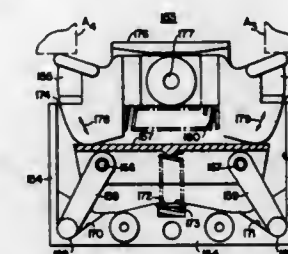
Kurt A. Grunert, John P. Conner, and John J. Dauer, Jr., all of Beaver, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 28, 1972, Ser. No. 238,839

Int. Cl. H01h 9/26

U.S. Cl. 335-160

14 Claims



An electric control system characterized by at least two control devices and interlock means therebetween, each control device comprising a stationary contact structure, a movable contact structure, and electromagnetic means associated with the movable contact structure for moving the movable contact structure between open and closed positions with respect to the stationary contact structure, the movable contact structure comprising a cross bar, the interlock means comprising a housing having a base, a cross beam, a pair of links, and a pair of actuators pivotally mounted within the housing, one actuator being disposed in the path of movement of the cross bar of one control device and the other actuator being disposed in the path of movement of the cross bar of the other control device, the upper ends of the link being pivotally attached to the cross beam at spaced locations from each other, and the lower ends of the links being pivotally mounted on the base at spaced distances greater than the space between the pivotal attachments of the upper ends of the links to the cross beam.

# 3,735,296 SEQUENCE RELAY

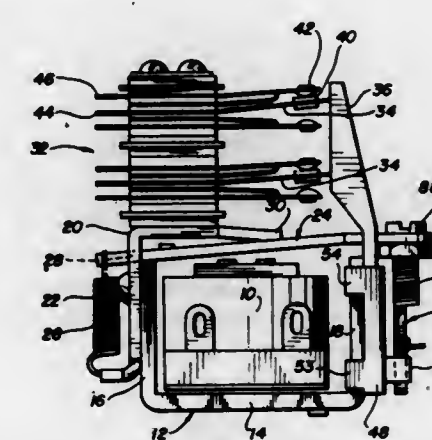
Theodore J. Obszarny, Chicago, Ill., assignor to Guardian Electric Manufacturing Company, Chicago, Ill.

Continuation-in-part of Ser. No. 185,240, Sept. 30, 1971, Pat. No. 3,689,857. This application Aug. 3, 1972, Ser. No. 277,767

Int. Cl. H01h 9/24

U.S. Cl. 335-165

3 Claims



A sequence relay includes a coil mounted on a frame. Current through the coil will drive an armature from a first position to a second position. Attached to the frame is a biased lifter which may translate from a biased first position to a second position by operation of the armature. A pawl mounted on the frame engages the lifter in the second position to hold it in that position even though the armature is released

3,735,297

# RELAY, ESPECIALLY MINIATURE RELAY

Hans Pfennig, Lauffen, Germany, assignor to Bach & Co., Heilbronn, Germany

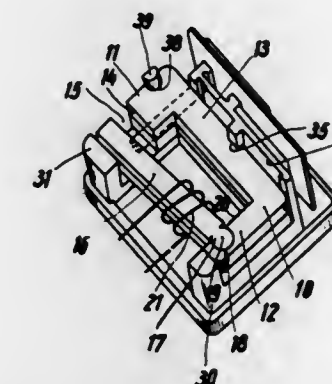
Filed July 14, 1971, Ser. No. 162,524

Claims priority, application Germany, July 16, 1970, P 20 35 197.7

Int. Cl. H01h 51/06

U.S. Cl. 335-203

9 Claims



A relay, especially a miniature relay, in which a U-shaped magnetic frame has an armature pivoted on one of the end legs and extending over the other end leg and with a coil surrounding the moveable armature mounted on a stationary coil body. A base plate is provided supporting the magnetic frame and coil body and is provided with switch means operated in response to movement of the armature. The magnetic frame may include a permanent magnet giving the magnetic frame a permanent magnetic bias in one direction.

3,735,298

# ONE-WAY MOTION DETECTION SWITCH

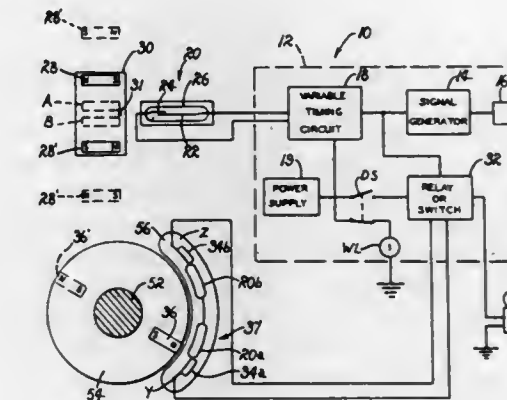
Charles E. Colby, 740 S. Locan Street, Fresno, Calif.

Division of Ser. No. 686,660, Nov. 29, 1967, Pat. No. 3,559,205. This application Sept. 28, 1970, Ser. No. 76,330

Int. Cl. H01h 36/00

U.S. Cl. 335-206

3 Claims



Apparatus including a signal generator for activating warning devices to alert the operator of a motor vehicle, the signal generator being controlled by circuitry including reed switch systems opened and closed by the movement of magnets with the N-S axis thereof passing across the longitudinal axis of the switch system or perpendicular to such axis for controlling a variable timing circuit or a relay.



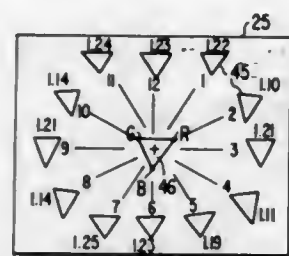
3,735,299

**COLOR TELEVISION DEFLECTION YOKE HAVING REDUCED VARIATION IN BEAM TRIO DISTORTION**  
Josef Gross, Princeton, and William Henry Barkow, Pennsauken, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 4, 1971, Ser. No. 186,168  
Int. Cl. H01f 5/00

U.S. Cl. 335-213

6 Claims



A deflection yoke for a color television receiver utilizing a delta gun shadow mask color picture tube has its winding distribution selected for minimizing the variations of the beam trio distortion around the picture tube display face for permitting use of a shadow mask yielding a greater and more uniform brightness over the viewed area of the tube.

3,735,300

**MAGNETIC CODING DEVICE FOR MOVING BODIES SUCH AS CONVEYOR CARRIERS**

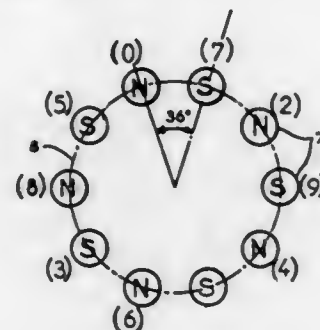
Jean-Rene Benner; Pierre Dop, both of Seine-et-Marne, and Marcel Caron, Seine-Saint-Denis, all of France, assignors to Jervis B. Webb International Company, Detroit, Mich.

Filed May 10, 1972, Ser. No. 252,002

Claims priority, application France, May 10, 1971, 7116866  
Int. Cl. H01h 41/10

U.S. Cl. 335-206

10 Claims



A magnetic coding device including a selector mounted on a conveyor carrier and registerable with a code reader mounted along the path of travel of the carrier, the code reader having a group of alternately oppositely polarized reed switches (e.g., ten) spaced around a circumference in code positions. The selector has a pair of oppositely polarized permanent magnets movable to corresponding code positions by a selector dial and shiftable between active and inactive positions relative to the reed switches. In each code position of the selector dial one of the permanent magnets is active relative to one of the reed switches, while the other permanent magnet is inactive and shielded.

3,735,301

**ALTERNATING CURRENT RELAYS**

Gregor L. Lang, 295 East Street, Suffield, Conn.  
Filed Jan. 4, 1971, Ser. No. 103,429

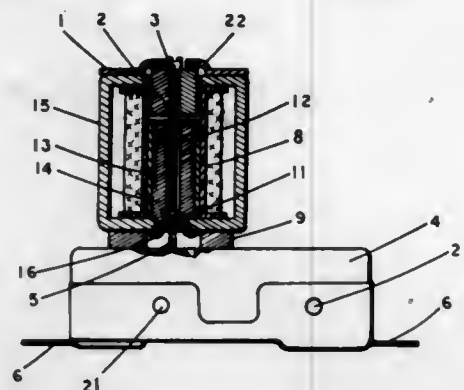
Int. Cl. H01f 7/10

U.S. Cl. 335-244

6 Claims

A solenoid construction for use as a power relay in which a phase-splitting magnetic core element in combination with a

bi-stable snap-switch element enables a compact relay construction yielding a forward power control ratio of 4,800 : 1,



or an equivalent power gain in excess of 36 decibels, without amplification.

3,735,302

**ELECTROMAGNET**

Konrad Eckert, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

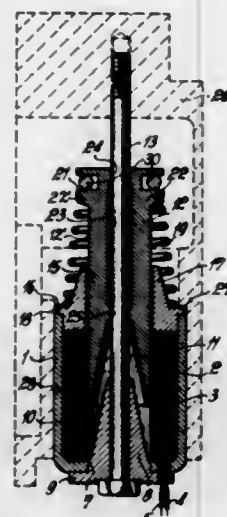
Filed Jan. 3, 1972, Ser. No. 215,067

Claims priority, application Germany, Mar. 17, 1971, P 21 12 799.1

Int. Cl. H01f 7/08

U.S. Cl. 335-262

10 Claims



An electromagnet has a pot-shaped enclosure having a cylindrical portion and consisting of magnetizable material, and an elongated guide means which consists of non-magnetizable material and extends substantially centrally of the pot-shaped enclosure. A winding is mounted in the enclosure. An armature is slidably mounted for movement lengthwise on the guide means in response to changes in condition of energization of the winding. The enclosure has a pole piece which defines an internal surface and the armature has an external surface defining, with said internal surface, a clearance whose width remains substantially unchanged while the armature moves with reference to the guide means. The enclosure and armature have conical pole faces which define a conical gap which varies in response to movement of the armature with reference to the guide means.

3,735,303

**ROTARY MAGNETIC POSITION INDICATOR HAVING ODD NUMBER OF POSITIONS**

Phillip L. Harden, Fort Wayne, Ind., assignor to Bowmar Instrument Corporation, Fort Wayne, Ind.

Filed Oct. 18, 1971, Ser. No. 190,150

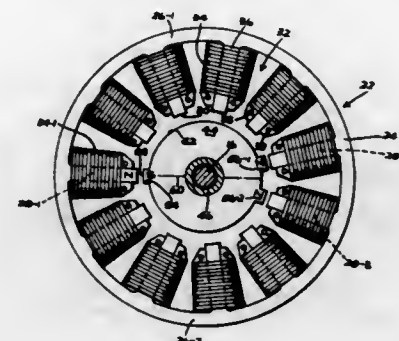
Int. Cl. H01f 7/14

U.S. Cl. 335-272

6 Claims

A rotary magnetic position indicator which provides an odd number, such as eleven, positions. A magnetic stator structure

is provided including an odd number of radially inwardly extending, equally angularly spaced polar projections respectively having inner ends which define a bore, and an equal number of coils is positioned on the stator structure. A permanent magnet rotor member is rotatably mounted in the bore and has one polar projection of one polarity, and two polar projections of the opposite polarity equally spaced on opposite sides of a diameter of the rotor member which ex-



tends through the one polar projection. The two rotor member polar projections are respectively aligned with two adjacent stator polar projections when the one rotor member polar projection is aligned with another stator polar projection. Means are provided for selectively energizing the coils, one at a time, thereby to polarize the respective stator polar projection oppositely from the polarization of the one rotor member polar projection thus causing the one rotor member polar projection to align itself with the energized stator polar projection.

3,735,304

**ARRANGEMENT FOR ASSEMBLING TWO GROUPS OF COMPONENTS IN A PREDETERMINED RELATIVE POSITION**

Horst Hanenkamp, Heidmühle, and Helmut Wolken-Mohlmann, Esens, both of Germany, assignors to Olympia Werke A.G., Wilhelmshaven, Germany

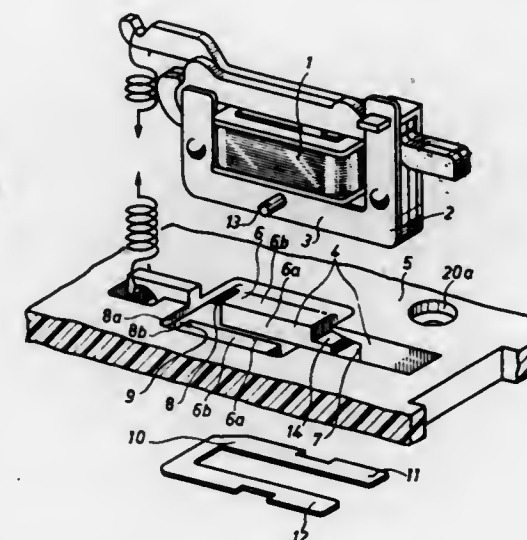
Filed May 12, 1972, Ser. No. 252,677

Claims priority, application Germany, July 10, 1971, P 21 34 503.9

Int. Cl. H01f 7/00

U.S. Cl. 335-278

10 Claims



An electromagnet has a yoke with an attaching portion fitting into a guideway in a mounting plate and projecting from the rear face of the plate, a U-shaped leaf spring is mounted in recesses of the mounting plate and engages pins projecting from the attaching portion to hold the electromagnet on the front face of the mounting plate. When a second mounting plate, forming part of another device, is secured to the rear face of the first mounting plate, the attaching portion is

resiliently pushed to a position flush with the rear face of the first mounting plate so that the electromagnet is placed in the correct relative position to the other device due to the fact that the position of the electromagnet is determined by the face of the second mounting plate.

3,735,305

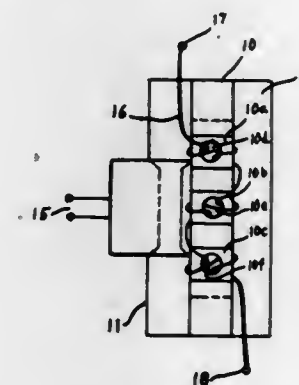
**HIGH POWER ELECTRICALLY VARIABLE INDUCTOR**  
Norbert C. Sinnott, Adelphi, Md., and Harold A. Jones, Jr., Thousand Oaks, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 20, 1972, Ser. No. 290,603

Int. Cl. H01f 21/00

U.S. Cl. 336-110

2 Claims



A high power electrically variable inductor includes a U-shaped ferrite core with an electromagnet and a permanent magnet attached to the U-core. The RF variable inductor winding is wound on a multiplicity of separate sections of the U-core. The area of the ferrite material at the RF winding is reduced to minimize the DC magnetic field.

3,735,306

**MAGNETIC FIELD SHIM COIL STRUCTURE UTILIZING LAMINATED PRINTED CIRCUIT SHEETS**

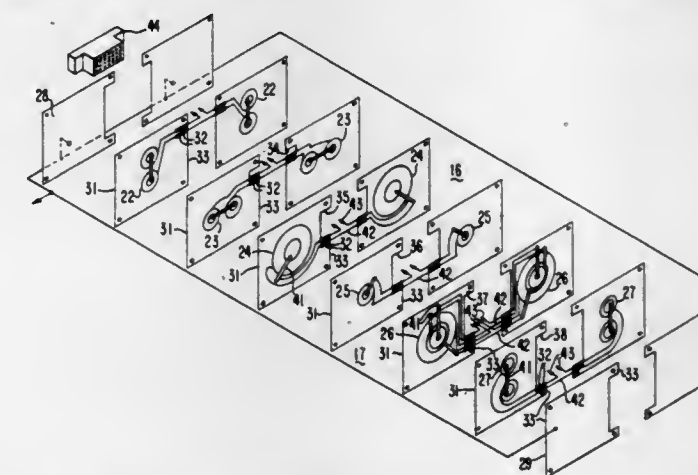
Donald J. Kabler, Fremont; Robert E. Gang, Sunnyvale, and William O. Reeser, Jr., Fremont, all of Calif., assignors to Varian Associates, Palo Alto, Calif.

Continuation-in-part of Ser. No. 82,878, Oct. 22, 1970, abandoned. This application Sept. 15, 1971, Ser. No. 180,685

Int. Cl. H01f 15/10, 27/28

U.S. Cl. 336-192

20 Claims



A plurality of separate electrical circuits, for example, electrical coils each formed by printed circuit techniques on a plurality of insulating sheets mounted together in laminated fashion. The terminals of each circuit are brought out to one edge of its mounting sheet at a location displaced from the position of the terminals of the other circuits in the laminated structure, recesses in the terminal edges of the upper sheets in the laminated stack exposing the terminals on the sheets



below. Two separate sets of the laminated structure are employed, matching terminals being in alignment between the two sets for easy electrical interconnection.

### 3,735,307 COIL SUPPORT

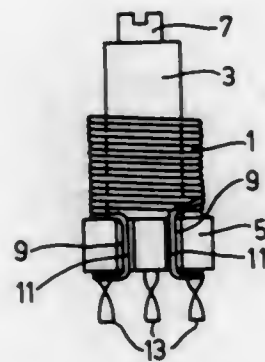
Jacob DeGroot, Emmasingel, Elsdhoven, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.  
Filed Sept. 24, 1971, Ser. No. 183,451

Claims priority, application Netherlands, Oct. 3, 1970, 7014556

Int. Cl. H01J 15/10

U.S. Cl. 336-192

2 Claims



A support made of a thermoplastic synthetic resin, for an electrical component, such as a coil, having a base with cylindrical apertures in which connecting pins are inserted. The pins comprise strips of twisted metal the width of which is equal to the diameter of the apertures.

### 3,735,308 ENERGY REGULATORS

George Ronald Shepherd, Norfolk, England, assignor to Harper-Wyman Company, Hinsdale, Ill.

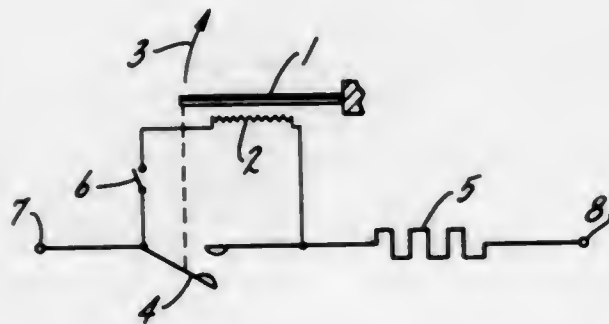
Filed Oct. 12, 1971, Ser. No. 188,125

Claims priority, application Great Britain, Sept. 27, 1968, 46,070/68; Oct. 15, 1970, 49,162/70

Int. Cl. H01h 61/08

U.S. Cl. 337-13

2 Claims



An energy regulator for the intermittent supply of power to a load at high effective power levels. It includes contacts adapted to be connected in series with an electrical supply and a load, a bimetal element mechanically coupled to the contacts, and a heater for the bimetal element connected across the contacts, the contacts being closed, in use, in response to deflection of the bimetal element when it is heated.

### 3,735,309 VAPOR-STATE LIMITER WITH HIGH PRESSURE HOUSING

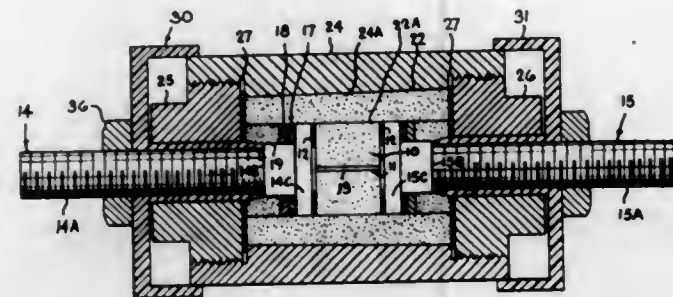
Ralph L. Hurtle, West Hartford, Conn., assignor to General Electric Company, Plainville, Conn.

Filed Aug. 6, 1971, Ser. No. 169,680

Int. Cl. H01h 87/00

U.S. Cl. 337-21

2 Claims



A vaporizing-recondensing type current limiter including a main generally cylindrical ceramic body with at least one hole therethrough, filled with a low-melting point fuse metal. Terminal members and a strong metallic enclosing casing are included, together with insulating means for insulating at least one of the terminal members from the enclosing casing. The insulating means includes a generally cup-shaped insulating plastic cap with a hollow stem having its end tapered and received in wedged relation between a rod-shaped terminal member and a surrounding ring-shaped ceramic member.

### 3,735,310 TEMPERATURE RESPONSIVE ELECTRICAL SWITCH ASSEMBLY

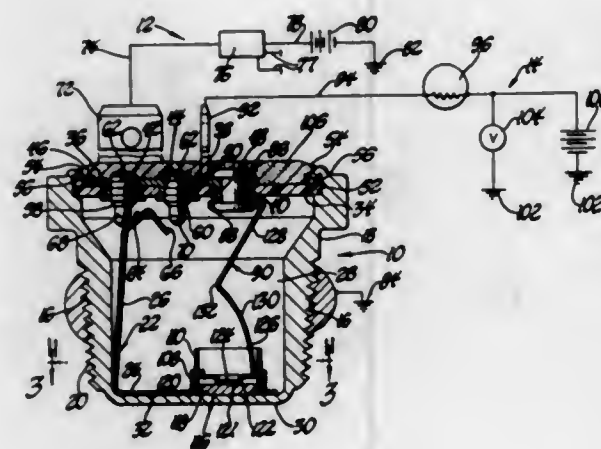
Aloysius J. Kochanski, 27312 Spring Arbor Dr., Southfield, Mich.

Continuation of Ser. No. 66,227, Aug. 24, 1970, abandoned. This application Aug. 10, 1971, Ser. No. 170,633

Int. Cl. H01h 71/16

U.S. Cl. 337-107

10 Claims



A temperature responsive electrical switch assembly has a single housing containing a bimetallic switching member and a thermistor; a plurality of adjustable contact members, electrically connected to a first terminal member, are positioned as to be alternately engageable with the bimetallic switching member; the thermistor is resiliently held against and in electrically conductive relationship to the housing by one end of an electrically conductive spring member which has its other end connected to a second electrical terminal member.

### 3,735,311 VIBRATOR TYPE ELECTRICAL CIRCUIT INTERRUPTER

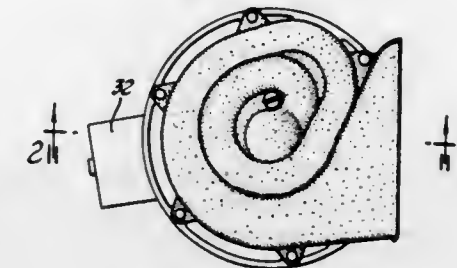
Clark E. Sloan, Jr., Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 30, 1971, Ser. No. 203,223

Int. Cl. H01h 37/52

U.S. Cl. 337-108

1 Claim



A vibrator type electrical circuit interrupter having normally closed breaker contacts which establish an energizing circuit for an associated electrical coil and which are operated to an electrical circuit open condition upon the energization of the coil to interrupt the energizing circuit. A bimetallic element of the type which deflects in a predetermined direction when subjected to heat is positioned in a location at which it is subjected to the heat of the electrical arc across the breaker contacts upon each interruption of the energizing circuit and at which the deflection thereof reduces the length of time the breaker contacts are closed.

### 3,735,313 FUSE PLUG FOR ELECTRICAL INSTALLATIONS

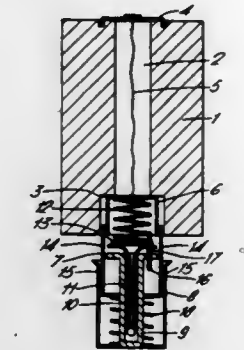
Arthur Eugen Heyerdahl, Martin Borrebekkens vei 39, Oslo 5, Norway  
Filed May 19, 1972, Ser. No. 255,072

Claims priority, application Norway, May 21, 1971, 1911/71

Int. Cl. H01h 85/16

U.S. Cl. 337-268

3 Claims



A fuse plug for electrical installations, one contact member of which is formed as two cylindrical, concentric metal sleeves slidably one upon the other against a spring between the sleeves. The sleeves are lockable together in tensioned condition and a release member axially slidable in the sleeves is pushed into the sleeves when disposing the fuse plug into a holder for the fuse plug, and thereby releases instantaneously the spring force, so that the outer sleeve makes a resilient contact with the corresponding contact member in the holder.

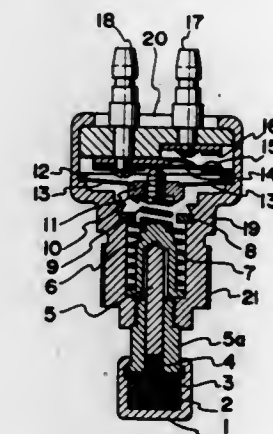
### 3,735,314 THERMO-SWITCH FOR TEMPERATURE CONTROL

Yukio Onishi, 59-2, 6-chome, Nakasato, Kiyose City, Tokyo, Japan  
Filed June 26, 1972, Ser. No. 266,379

Int. Cl. H01h 37/46

U.S. Cl. 337-382

6 Claims



A thermo-switch using the thermal expansion of a wax for closing the switch has a snapping structure for providing an abrupt closing and opening of the switch increasing the wear of the switch contacts.

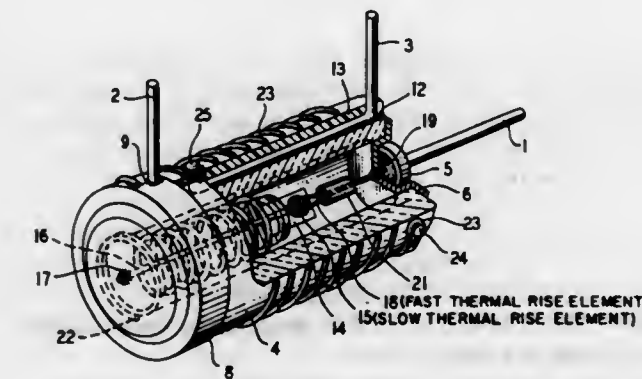
### 3,735,312 THREE TERMINAL FUSE-RESISTOR DEVICE

Harry Henry Nagel, Westwood, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Dec. 30, 1971, Ser. No. 213,942

Int. Cl. H01h 85/04

U.S. Cl. 337-164

5 Claims



A three terminal fuse-resistor protective device adapted for forming both a shunt connection and a low impedance series connection between the input and load portions of an electric circuit for protecting the circuit against overvoltage conditions and also against both low and high overcurrents. The overvoltage protective means is coupled between two terminals of the device which form the shunt connection. The overcurrent protective means are coupled between a different pair of terminals which define the low impedance series connection.

### 3,735,315 FUSE LINKS FOR DROPOUT EXPULSION FUSES

John Atkinson Swarbrick, Ringwood, and Vaclav Pata Thornbury, Victoria, both of Australia, assignors to Stanger & Co. Ltd., Victoria, Australia

Filed Oct. 15, 1971, Ser. No. 189,625

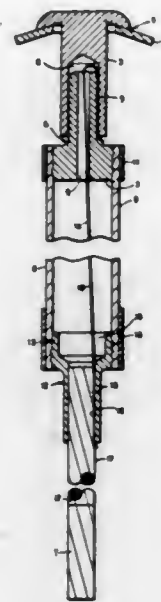
Int. Cl. H01h 85/04

A fuse link for dropout expulsion fuses (distribution cut out fuses) which comprises a vulcanized fiber tube having top and

10 Claims



bottom arcing contacts secured in its ends and a fusible element extending between and held in electrical contact with said top and bottom arcing contacts. The fusible element comprises a plurality of thin silver wires which are coated with a



mixture of a compound which burns and a compound which decomposes to produce oxygen at temperatures in the region of the fusing temperatures of silver. On fusion an arc is created and the coating explodes to ensure vaporization of the fusible element and also expulsion of the bottom arcing terminal.

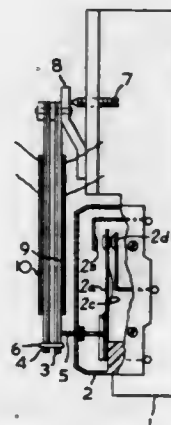
3,735,316

## CARRIER CURRENT RELAY

John B. Thorsteinsson, Box 550, Brandon, Canada  
Filed Sept. 30, 1971, Ser. No. 185,036  
Int. Cl. H01h 37/52

U.S. Cl. 337—335

3 Claims



The disclosed bistable relay has a bistable switch operable into either stable state from the other by an actuator comprising two bimetals arranged to deflect in opposite directions due to selective heating. The switch-actuating ends of the bimetals are constrained to deflect together and yet they can slide in relation to each other. Brief selective energization of heaters causes operation of the relay — and the switch — in opposite directions. Thereafter the switch remains set, and the bimetals compensate mutually for ambient temperature variations. The common mount of both bimetals is adjustable for proper relationship between the actuating bimetals and the bistable switch.

3,735,317  
ELECTRIC MULTIBREAK FORMING CARTRIDGE FUSE  
Philip C. Jacobs, Jr., Newtonville, Mass., assignor to The Chase-Shawmut Company, Newburyport, Mass.  
Filed May 1, 1972, Ser. No. 249,707  
Int. Cl. H01h 85/04

U.S. Cl. 337—291

4 Claims



A fuse for elevated circuit voltages has a fuse link provided with a link-severing low fusing point overlay which forms a break on the occurrence of very small overloads the duration of which is in the order of, or exceeds, one hour. The fuse further includes means forming series breaks upon formation of an initial break in the fuse link. These means include a shunt across the overlay portion of the fuse link adapted to generate relatively large amounts of heat at the ends thereof conductively connected to the fuse link and adapted to generate relatively small amounts of heat per unit of shunt length in the center region of the shunt.

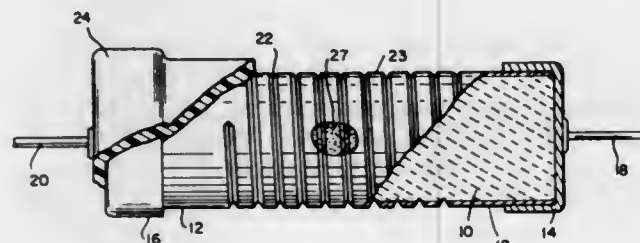
3,735,318  
FUSING RESISTOR  
James B. Bucklin, Brazil, and Jay Utken, Frankfort, both of Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Nov. 4, 1971, Ser. No. 195,689

Int. Cl. H01h 85/04

U.S. Cl. 337—296

8 Claims



A layer of material is disposed over at least a portion of a resistive film of a resistor, the material having a melting point lower than the melting point of the resistive film and when melted, chemically reacts with the resistive film to render at least a portion of the film non-conductive.

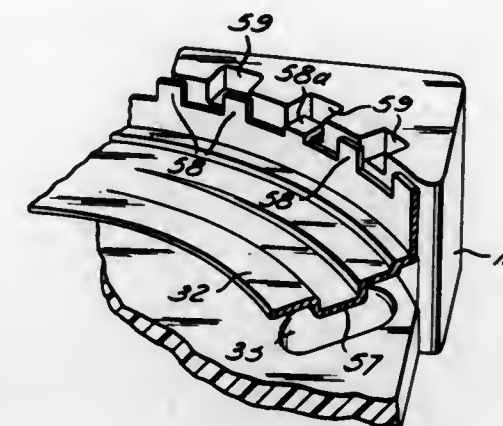
3,735,319  
ADJUSTABLE THERMOSTAT  
Howard W. Bletz, Mansfield, Ohio, assignor to Therm-o-Disc, Incorporated, Mansfield, Ohio  
Division of Ser. No. 117,443, Feb. 22, 1971, Pat. No. 3,676,817. This application Apr. 20, 1972, Ser. No. 245,750  
Int. Cl. H01h 37/18

U.S. Cl. 337—347

14 Claims

An adjustable thermostat in which an adjusting spring applies an adjustable force to a bimetal snap disc. The adjusting spring is also formed of bimetal and its temperature induced forces add to the temperature induced forces of the disc so that the sum thereof is available for switch operation. The spring rate of the adjusting spring can be adjusted by moving a fulcrum lengthwise of the adjusting spring to provide the thermostat with the desired differential temperature in operation. Such differential temperature adjustment does not materially alter the temperature adjusting range provided by a cam

which engages the end of the adjusting spring. The bimetal snap disc is supported in a cup element having cam surfaces by positioning contacts in the mass and sintering at a tempera-



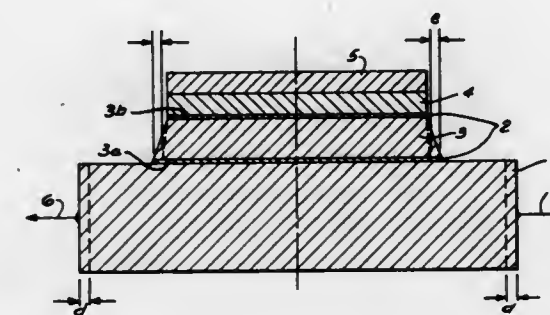
along one side so that the position of the snap disc is adjusted by rotating the support cup, thus minimizing or reducing the necessity of selective fitting of the thermostat elements.

3,735,320  
DEVICE FOR COMPENSATING ELASTIC AFTER-EFFECTS OR CREEPING  
Gottfried Birkholtz, Weiterstadt, Germany, assignor to Firma Carl Schenck Maschinenfabrik GmbH, Darmstadt, Germany  
Filed Sept. 13, 1971, Ser. No. 179,976  
Claims priority, application Germany, Sept. 23, 1970, P 20 46 855.7

U.S. Cl. 338—2

Int. Cl. G011 1/22

5 Claims



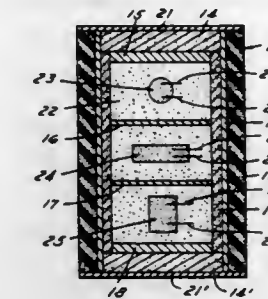
The present device prevents the transmission of creeping from a structural element to another structural element such as a measuring device, by means of an intermediate member positioned between the measuring device and the structural element. The material of the intermediate member is selected so that its creeping characteristics compensate the creeping of the structural element. The intermediate member may be further selected to also compensate for creeping due to temperature changes.

3,735,321  
THERMISTOR  
Harold P. Bovenkerk, Worthington, Ohio, assignor to General Electric Company, Southfield, Mich.  
Filed June 18, 1971, Ser. No. 154,271  
Int. Cl. H01c 7/04

U.S. Cl. 338—22 R

8 Claims

A thermistor is formed from a mass of fine particle diamonds, cubic boron nitride, silicon carbide, or mixtures thereof, the particles being doped with boron or beryllium to

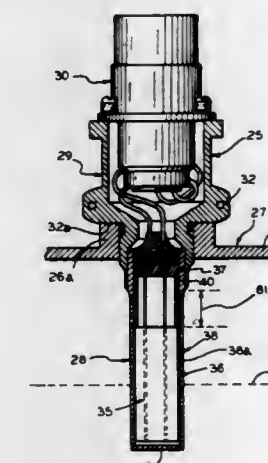


ture of at least 1,300° C under pressure conditions such that the particles are stable in the crystalline form they had immediately prior to the sintering step.

3,735,322  
TEMPERATURE SENSOR  
Steven J. Heiress, Chicago, Ill., assignor to Vapor Corporation, Chicago, Ill.  
Filed July 13, 1970, Ser. No. 54,106  
Int. Cl. H01c 7/00

U.S. Cl. 338—28

5 Claims



A temperature sensor for sensing the temperature of air moving at low velocity including a transducer assembly having a temperature transducer element in association with a shield or case capable of having fast response and a high degree of accuracy at a specified temperature. The temperature transducer element includes a bobbin of plastic film over which wire sensitive to temperature is wound. A cover is provided over the wire, also of plastic film, and is bonded to the wire as is the bobbin to provide a stable assembly capable of withstanding severe shock and vibration. The invention also includes a method of making a temperature transducer assembly and in mounting it within a shield or case to avoid contamination with the air, while not sacrificing performance.

3,735,323  
PRESSURE-TO-ELECTRIC, LONG LIFE TRANSDUCER  
William D. Marscher, Ithaca, and Harry P. Wertheimer, Horseheads, both of N.Y., assignors to The Bendix Corporation, Elmhurst, N.Y.  
Filed Sept. 22, 1971, Ser. No. 182,781  
Int. Cl. H01c 13/00

U.S. Cl. 338—41

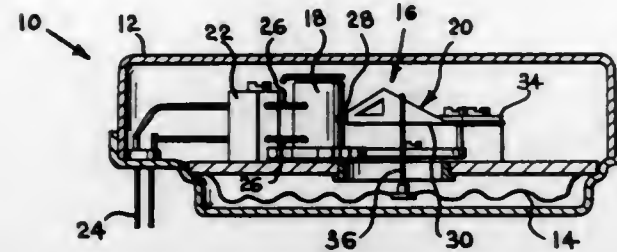
10 Claims

A pressure-to-electric transducer having increased life potential is disclosed herein. The transducer is comprised of a canister having a movable wall member, electrical means for generating an electrical signal indicative of wall movement, and means to cause displacement of the movable wall member in response to a pressure variation on one side of said wall. The improvement is comprised of means for periodically ad-



justing the relationship of the electrical means so that wear caused by relative movement within the electrical means is uniformly distributed. In particular, the electrical means are comprised of a wound coil of resistive wire and a movable

about a support axis; a rotatable contact in wiping engagement with the component; a rotary member carried by the support



wiper means for sliding engagement with said coil. Means are provided to alter the relative angular position of the wiper means relative to the coil so that wear caused by the wiping action is uniformly distributed around the coil.

3,735,324

## DIGITAL FREQUENCY DISCRIMINATOR

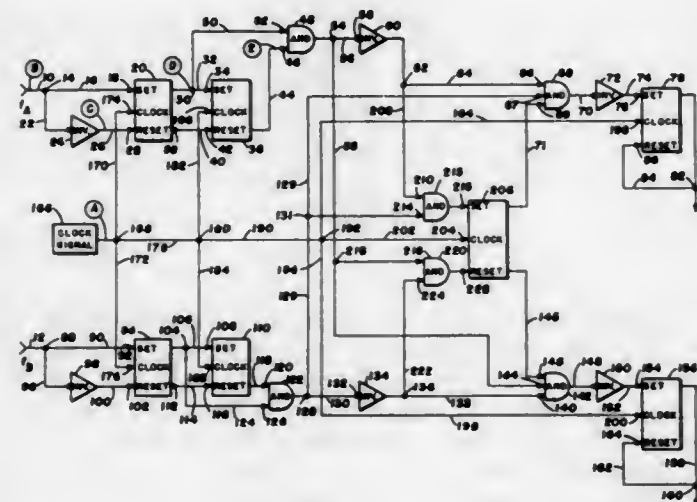
T. H. Phillips, Minneapolis, Minn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 2, 1971, Ser. No. 204,236

Int. Cl. H03d 13/00

U.S. Cl. 328-133

6 Claims



A digital frequency comparator for determining the difference in frequency between two time-dependent input waveforms and for further determining the sign relationship therebetween. Each of the input waveforms is applied to a bistable circuit arrangement which, through the use of logical coincidence gates, modulates the input data into a time-ordered format. A memory bistable circuit in conjunction with further logical coincidence circuit arrangements determines from the time reordered input waveform which one of said waveforms has the greater frequency along with the frequency difference therebetween.

3,735,325

## ROTARY POTENTIOMETER WITH FINE ADJUSTMENT

Robert Akashi, 2059 West 161st Street, Gardena, Calif.

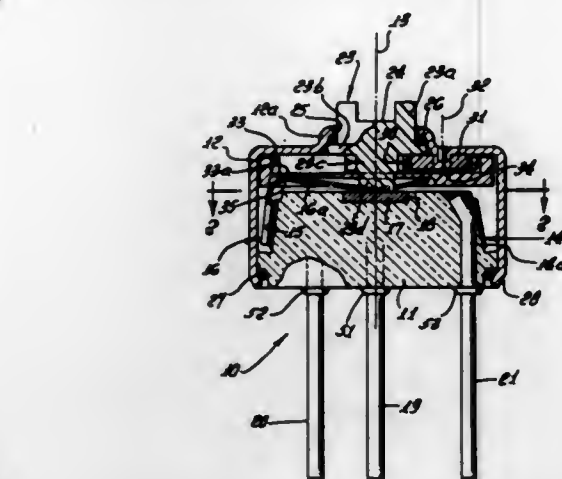
Filed May 12, 1972, Ser. No. 252,544

Int. Cl. H01c 9/02

U.S. Cl. 338-164

7 Claims

A miniature potentiometer of high accuracy comprises a support carrying an electrically resistive component extending



to be rotatably adjusted; rotary gearing including sun, planet and ring gears to transmit rotation between the member and contact with mechanical advantage; and electrical terminals.

3,735,326

## ADJUSTABLE ELECTRICAL DEVICES WITH LEADSCREW AND SEALING MEANS

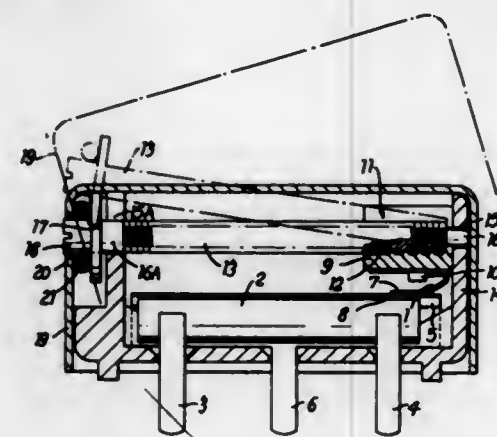
Trevor Frank John Gooding, Guildford, and Geoffrey David Stuart Howse, Farnborough, both of England, assignors to Electrooil Limited, Durham, England

Filed Oct. 26, 1971, Ser. No. 192,385

Int. Cl. H01c 5/02

U.S. Cl. 338-180

5 Claims



An adjustable resistance comprises a support for an adjusting shaft and a casing having an access aperture for the shaft, an O-ring acting between facing surfaces, one fixed to the shaft and the other being at an inner wall of the casing about said aperture, to seal the aperture and to oppose by compression withdrawal forces on the shaft, and the shaft being pivotally mounted on the support so that it may be displaced from its operating position during assembly to facilitate the engagement of the shaft in the aperture of the casing.

3,735,327

## VARIABLE RESISTANCE CONTROL

Arthur L. Rozema; Wilbert H. Budd, both of Elkhart, Ind., and William L. Kever, Cassopolis, Mich., assignors to CTS Corporation, Elkhart, Ind.

Filed Jan. 7, 1972, Ser. No. 216,136

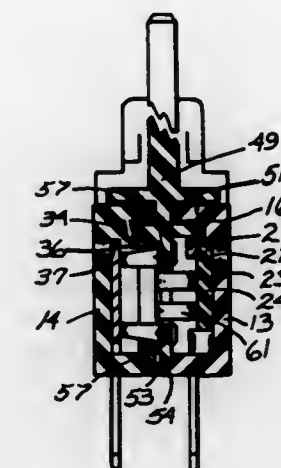
Int. Cl. H01c 1/02

U.S. Cl. 338-183

21 Claims

A variable resistance control employs a contactor wipably engaging a resistance element and a collector supported by a pair of split housing sections. Positioning tabs extend from the resistance element and collector into undercut portions in the

housing section. Control operating means for moving the contactor relative to the resistance element is positioned in a slot in the housing and provided with parallel longitudinal grooves receiving the side walls of the slot. A contactor having a pair of spaced bars has a continuous strip connecting the spaced bars and extending through an opening in the control operating means for engaging the resistance element. The contactor



resiliently biases the control operating means against one side wall of a channel formed in the bottom wall of the housing. End walls of the housing are provided with a groove extending therearound such that a U-shaped mounting bracket having a pair of spaced legs and a connecting portion is disposed in each of the grooves. The legs have ends bent toward each other to firmly engage the housing and maintain the housing section in assembled relationships.

3,735,328

## SHEATHED ELECTRICAL RESISTANCE HEATING ELEMENT

Motohiko Yagi, Odawara, Japan, assignor to Fuji Photo Film Co., Inc., Kanagawa, Japan

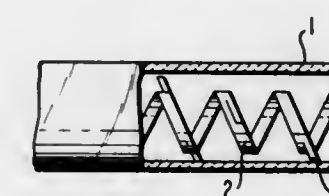
Filed Nov. 16, 1971, Ser. No. 199,191

Claims priority, application Japan, Nov. 16, 1970, 45/100912

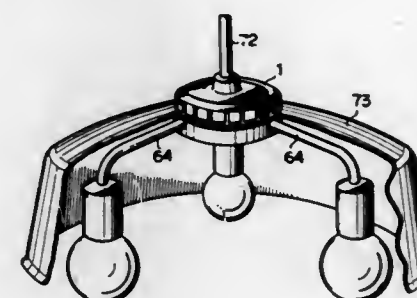
Int. Cl. H01c 1/02

U.S. Cl. 338-270

8 Claims



A sheathed electrical resistance heating element consisting of a helical electrically resistant heating strip having segmented portions projecting outwardly in a tangential direction along the helices of the coil strip. The helical heating coil is placed in a heat resisting sheath of a transparent crystalline tube. The helical heating coil strip is positioned within the heat resisting tube by the segmented portions which project from the surface of the coil and contact the inner wall of the tube.



3,735,329  
DISTRIBUTOR APPARATUS  
Tadao Funabashi, Kawasaki, and Kazuaki Murata, Tokyo, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kanagawa and Moriyama Industrial Co., Ltd., Tokyo, Japan

Filed Jan. 24, 1972, Ser. No. 220,340

Claims priority, application Japan, July 3, 1971, 46/48969

Int. Cl. H01r 17/00

U.S. Cl. 339-89 R

10 Claims

A distributor apparatus adapted to mechanically and electrically connect a plurality of distributor members thereto and allow the latter to extend from the apparatus, comprising a base, cover covering the base, and a clamp ring secured and fixed to the base, characterized in that the base and cover are provided with oppositely disposed first and second annular electrodes electrically led to a power line, the base being at its periphery wall formed with a plurality of openings spaced from each other and provided with a plurality of compartments opposite to the respective openings for suitably receiving a terminal fixture whereby the terminal fixture is received in the compartment to allow the distributor member to pass through the opening and to extend the distributor member from the apparatus and the first and second annular electrodes are in contact with the respective contact terminals in the apparatus by covering the cover over the base and screwing the clamp ring over the base.

3,735,330

## KINESCOPE ANODE CONNECTOR

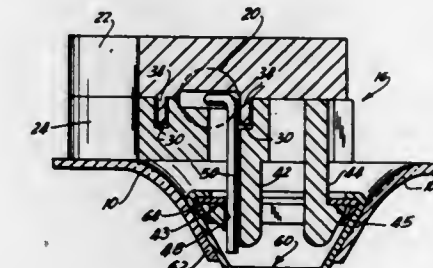
Seymour Offerman, New York, N.Y., and Robert B. Pittman, River Edge, N.J., assignors to Industrial Electronic Hardware Corp., New York, N.Y.

Filed Oct. 22, 1971, Ser. No. 191,608

Int. Cl. H01r 13/54

U.S. Cl. 339-91 R

22 Claims



A connector has a body with a means for receiving a wire. Operatively connected to the body is a means for disposing the wire adjacent a receptacle and a means for resiliently urging the wire into a direct engagement with the receptacle without using any intervening conducting elements. The body can be made in two sections, and the disposing and bias means can be lugs integrally formed with one of the sections.



3,735,331

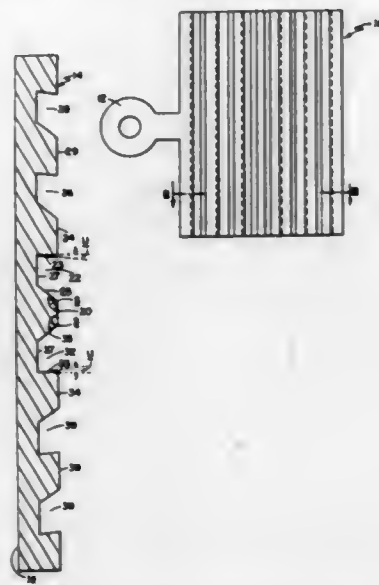
## ELECTRICAL CONNECTOR

Paul E. O'Donnell, Whitman, and H. Vincent Leaf, Marshfield, both of Mass., assignors to Ark-Les Switch Corporation, Watertown, Mass.

Filed Apr. 19, 1972, Ser. No. 245,523

Int. Cl. H01r 9/08

U.S. Cl. 339-97 C



An electrical connector for crimping onto wires including a ferrule-forming portion having its inner surface formed with a plurality of grooves with generally flat land surfaces therebetween, at least some of said grooves having an undercut side surface, preferably of at least about 1° to 6° for the purpose of shearing portions of wire crimped therein to expose the bare metal underlying any layer of insulation, corrosion, etc. thereon in order to provide the necessary low ohmic electrical path between wire and connector as well as a superior mechanical connection therebetween.

3,735,332

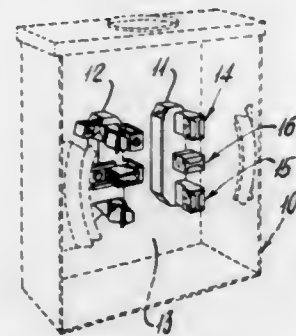
## INSULATING MEANS FOR A JAW OF A STAB-MOUNTED ELECTRICAL METER OR THE LIKE

James R. Tirrell, Charlottesville, Va., assignor to Arrow-Hart, Inc., Hartford, Conn.

Filed Oct. 12, 1971, Ser. No. 187,998

Int. Cl. H01r 9/08

U.S. Cl. 339-217 R



The invention contemplates an integral rectangularly prismatic cup-shaped insulating jacket having a cavity shape which is adaptable for end-wise insertion over the projecting end of a stab-type meter jaw or the like. The jacket has integral formations having detent interference with the jaw over which it is inserted, thereby rendering the jacket self-retaining in its assembled relation to the jaw. The "closed" end of the jacket is characterized by a limited stab-receiving and guiding opening, between end-wall portions which effectively cover the projecting outer limits of the jaw.

3,735,333

## AIRCRAFT VORTEX DETECTION SYSTEM

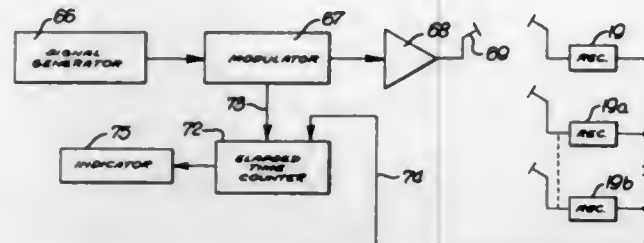
Martin Baker, Covina; Arthur E. Nagy, Los Angeles, and Andrew P. Proudian, Chatsworth, all of Calif., assignors to Xonics Inc., Van Nuys, Calif.

Filed Dec. 23, 1971, Ser. No. 211,478

Int. Cl. G01s 9/66

10 Claims U.S. Cl. 340-1 R

12 Claims



An improved system for detection and measurement of aircraft wing tip vortices over a wide area. An acoustic echo system with transmitter and receiver spaced from each other in a plane perpendicular to the flight path for illuminating the vortex and picking up scattering of the transmitter signal produced by the vortex, using Doppler frequency spectrum analysis with the maximum and minimum frequencies providing a measure of vortex intensity. A plurality of receivers operating with a common transmitter providing coverage of an area of interest along a flight path. A transmitter covering a broad area by a broad beam acoustic transducer or a plurality of narrow beams, and means for identifying a specific zone within the broad area occupied by the vortex being analyzed.

3,735,334

## METHOD AND SYSTEM FOR THE POSITIONALLY CORRECT RECORDING OF TWO ECHO SIGNALS FROM RESPECTIVE ECHO SOUNDINGS TAKEN IN MUTUALLY OPPOSED SOUNDING DIRECTIONS

Erhard Ahrens; Christian Prill, both of Kiel, and Hans H. Wendorff, Heikendorf, all of Germany, assignors to Electroacoustic GmbH, Kiel, Germany

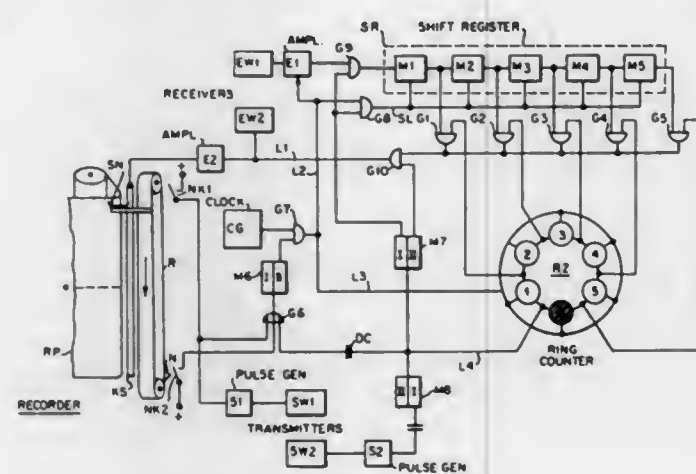
Filed Jan. 6, 1971, Ser. No. 104,302

Claims priority, application Germany, Jan. 7, 1970, P 20 00 405.1; Jan. 7, 1970, P 20 00 404.0

Int. Cl. G01s 9/70

U.S. Cl. 340-3 R

10 Claims



In echo sounding methods and systems for recording on a chart recorder the two echo signals stemming from echo soundings taken in mutually opposed sounding directions, the two echo signals are written into the chart recorder in the same writing direction. One of the two signals is immediately stored in a memory, preferably a shift register, and is thereafter transferred in the reverse sequence from the memory into the recorder.

3,735,335

## ELECTRONIC FENCE VEHICLE LOCATOR TRANSMITTER AND SYSTEM USING SAME

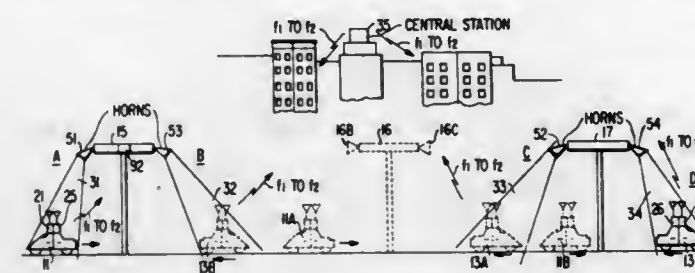
Gerald Stanley Kaplan, Trenton, and Joshua Shefer, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 20, 1971, Ser. No. 209,961

Int. Cl. G08g 1/12; G01s 9/00

U.S. Cl. 340-23

5 Claims



A vehicle location system in which two different messages are sent in opposite directions from a common vehicle locator transmitter. Vehicle location and direction is determined by the vehicle storing the different messages and, when interrogated, replying with a message that indicates on which side of the vehicle locator transmitter the vehicle is located.

3,735,336

## ACOUSTIC LENS

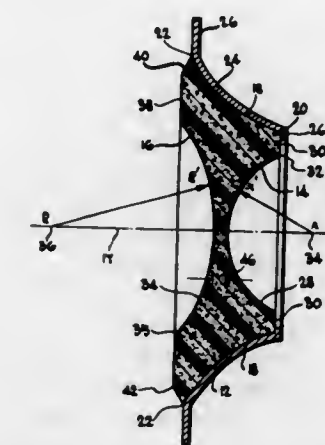
Edward M. Long, Oakland, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 10, 1971, Ser. No. 122,887

Int. Cl. H04b 13/00; H04r 7/02

U.S. Cl. 340-8 L

11 Claims



An acoustic lens for dispersing sound waves transmitted therethrough comprising a biconcave, plano-concave or negative meniscus shaped, open celled plastic foam. Lens is preferably biconcave and formed from an explosively reticulated polyurethane foam, and is particularly useful in dispersing high frequency sound waves from loudspeaker systems to provide balanced response.

3,735,337

## MINIMIZING MULTIPLE REFLECTING

Moses B. Widess, Houston, Tex., assignor to Amco Production Company, Tulsa, Okla.

Filed July 22, 1971, Ser. No. 165,258

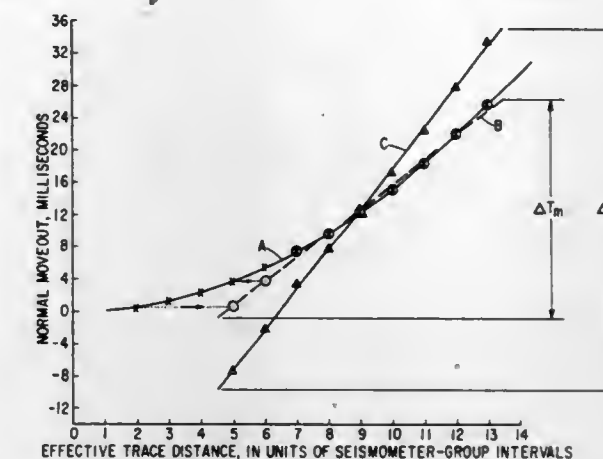
Int. Cl. G01r 1/28

U.S. Cl. 340-15.5 TD

7 Claims

Seismic traces obtained using the common depth point technique are time-corrected first to remove normal moveout corresponding to primary reflections, then further time-corrected to increase the variation of time at which multiple reflections occur on the various traces. The traces are then

summed, which decreases the amplitude of multiple reflections relative to those of the primary reflections. Preferably before the second time correction, selection is made of traces such that there is approximately a linear residual normal



moveout of multiple reflections on the traces selected. The second time correction does not seriously affect the primary reflections either in amplitude or arrival time. After the second time correction, the selected traces are summed for visual presentation.

3,735,338

## FORWARD LOOKING SONIC WELLBORE INSPECTOR

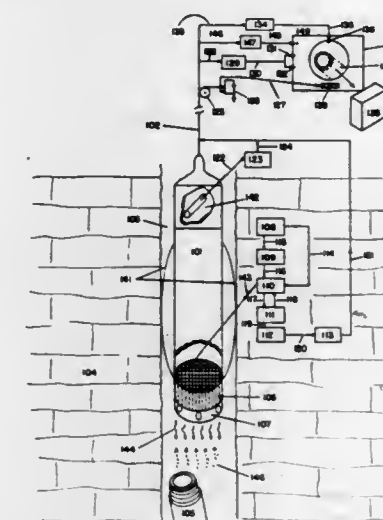
Charles A. Aldrich, and Karl M. Land, both of Tulsa, Okla., assignors to Cities Service Oil Company, Tulsa, Okla.

Filed July 30, 1971, Ser. No. 167,720

Int. Cl. G01v 1/00

U.S. Cl. 340-18 R

8 Claims



A forward looking sonic wellbore inspector comprising a segmented acoustic transceiver utilizing oriented piezoelectric crystals to produce seismic energy which is reflected by a fish lost within the wellbore. Reflected energy waves from the fish are received by the piezoelectric crystals, the associated stress generates a voltage which is received by a transducer segmented scanner amplified and filtered into a signal utilized in conjunction with an orientation device and depth indicator to locate the fish and project a visual display at the earth's surface of the exact orientation of the fish in the wellbore.



3,735,339

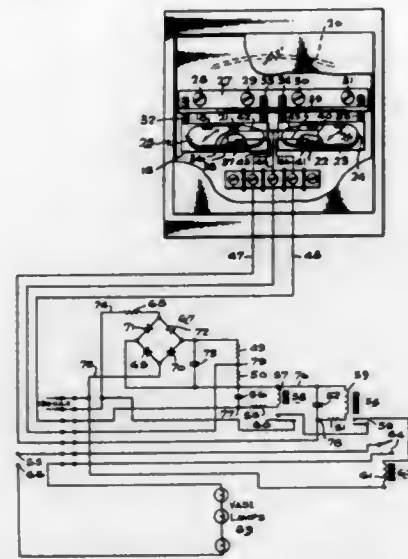
## SAFETY SYSTEM FOR VISUAL APPROACH

Clarence B. Knudson, Inglewood, Calif., assignor to Hughey and Phillips, Inc., Burbank, Calif.

Filed Nov. 15, 1971, Ser. No. 198,509

Int. Cl. B64f 1/18; G08g 5/02

U.S. Cl. 340-25



An improved safety system for visual approach slope indicator installations at airports is described which does not disable the installation when transient displacements of the key visual elements occur but does disable the installation when long term displacements of the key visual elements occur in such magnitude as to make dangerous reliance on the installation by the pilot of an approaching aircraft.

3,735,340

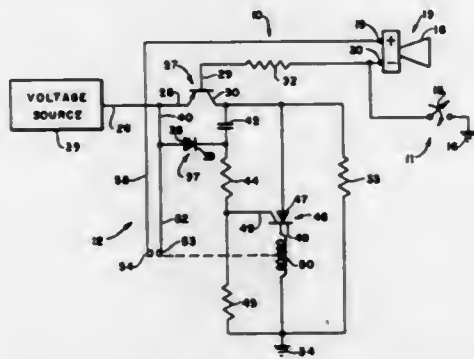
## STALL WARNING SYSTEM UTILIZING AN ELECTRONIC TIME DELAY

Thomas S. Donnelly, Willoughby, and William C. Seidel, Chagrin Falls, both of Ohio, assignors to American Aviation Corporation, Cleveland, Ohio

Filed Apr. 10, 1970, Ser. No. 27,380

Int. Cl. B21o 45/00

U.S. Cl. 340-27 SS



A stall warning system for an aircraft including means for providing a signal indicating that the airflow at an airfoil on the aircraft is about at its stagnation point, means for providing a warning signal responsive to the condition sensed by the sensing means, and means for inhibiting the actuation of the warning means for a predetermined short period of time after the stall condition is sensed. In a preferred embodiment, the inhibiting means includes an electronic time delay circuit comprising a source of electrical potential, a transistor switch in circuit with the source of potential and with the sensing means, and charge storage means in circuit with the transistor switch for storing a charge having a first magnitude when the transistor switch is non-conductive and a second magnitude when the transistor switch is conductive. The conductivity of

the transistor switch is controlled by the sensing means. The storage of charge at the second magnitude by the charge storage means causes a controlled transistor to conduct at a predetermined time after the transistor switch becomes conductive. When the controlled transistor conducts, the coil of a relay is energized to actuate a contactor switch in circuit with the warning device. Thus, the actuation of the warning device is delayed for a predetermined short period of time to eliminate inadvertent operation due to the sensing of a gusting air condition by the sensing means.

8 Claims

3,735,341

## ALTITUDE ALERTING APPARATUS

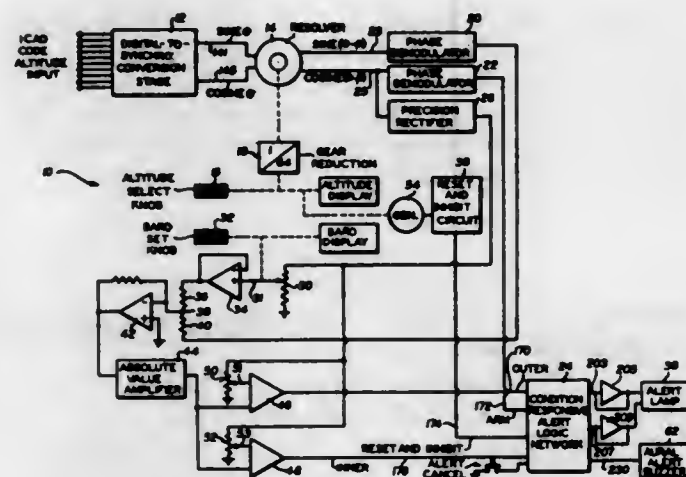
Geoffrey S. Hedrick, Katonah, N.Y., assignor to Lear Siegler, Inc., Armonk, N.Y.

Filed Aug. 27, 1970, Ser. No. 67,543

Int. Cl. G08g 5/00

U.S. Cl. 340-27 R

32 Claims



An indication of altitude variation about a preselected altitude is provided from a real-time altitude digital code information input signal in response to an altitude alert control signal which is proportional to a first pair of complementary sinusoidal functions of the altitude variation. A second pair of complementary sinusoidal functions of altitude is provided from the altitude digital input signal. The first pair of sinusoidal functions is a function of the second pair of sinusoidal functions and the preselected altitude. A digital-to-synchro conversion for the input signal is provided by means of a pair of read-only memories which have been programmed to each provide a complementary sinusoidal function of the input and a binary scaling means, such as an R-2R ladder network connected to the outputs of each of the respective memories, whereby the second pair of complementary signals is provided. Each memory has an operating state and a protection state, an output being producible only in the operating state. A source of reference potential which has a value sufficient to maintain the memories in the operating state is connected to the scaling means. A single-shot which includes an operational amplifier and a capacitive charging network for changing the input potentials to the operational amplifier to turn it on and off is included as a trigger for an alert indication in response to a particular condition of the altitude alert control signals.

3,735,342

## ALERTING SYSTEM RESPONSIVE TO A PLURAL TONE SIGNAL

Conrad Dean Helliker, Tulsa, and Terry E. Wilkinson, Bixby, both of Okla., assignors to La Borge, Inc., St. Louis, Mo.

Filed Mar. 10, 1971, Ser. No. 122,939

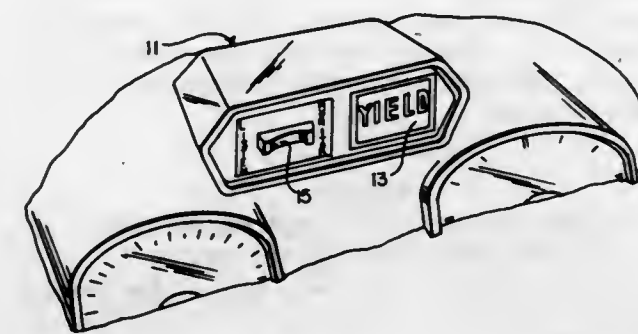
Int. Cl. G08g 1/00

U.S. Cl. 340-34

20 Claims

An alerting signal responsive to the receiving of a signal characterized by a sequence of tones. There is a plurality of

frequency-selective circuits each operative in response to the receiving of a respective preselected one of the tones and sequence-detecting means is responsive to operation of the frequency-selective circuits in predetermined sequence for providing an output signal indicative of the receiving of said



signal. Circuitry is provided for resetting the sequence-detecting means at predetermined regular periodic intervals so that the output signal is not provided unless the respective preselected tones are each received in the predetermined interval between resetting.

3,735,343

## BRAKE LINING WEAR WARNING SYSTEM

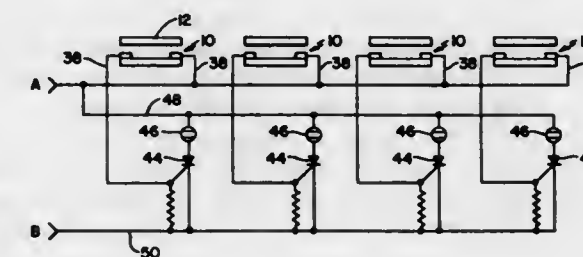
Buddy F. Lane, and Donald E. Church, both of Richmond, Ind., assignors to Avco Corporation, Richmond, Ind.

Filed Aug. 12, 1971, Ser. No. 171,071

Int. Cl. B60t 17/22

U.S. Cl. 340-52 A

8 Claims



A brake lining wear warning system for indicating when brake linings are dangerously worn and require replacement and provides a warning signal to a vehicle operator when the brake lining has worn a predetermined amount. Engagement of a detector with the brake drum initiates an operator warning signal.

3,735,344

## TIRE PRESSURE MEASUREMENT SYSTEM

Arthur Weintraub; Wendell A. Cook, both of Fort Wayne; Robert K. Gatwood, Churubusco, and Kenneth L. De Brosse, Fort Wayne, all of Ind., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed May 20, 1971, Ser. No. 145,372

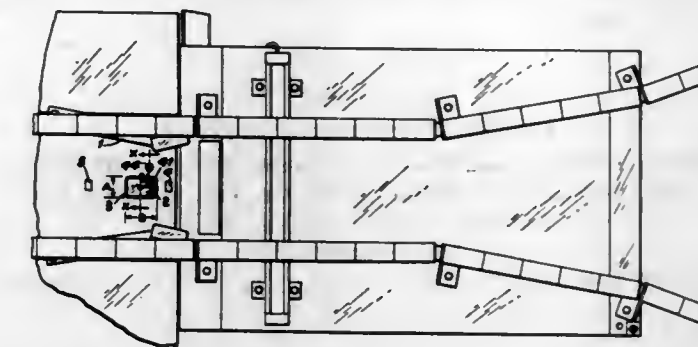
Int. Cl. G01l 9/00; B60c 23/06

U.S. Cl. 340-58

8 Claims

A measurement system for pneumatic vehicle tires wherein a narrow probe aligned with the center rib of a vehicle tire is

depressed by said tire against the force of a spring. A sufficiently inflated tire will depress said probe thereby pivoting a



lever causing the closing of a microswitch. A logic circuit is connected to said microswitch to distinguish between front and rear tires and to start, cycle and reset the system.

3,735,345

## AUTOMATIC STOP LAMP DEVICE OF A CAR

Yoshimi Morozumi, 2319, Obiori, Sakae-mura, Minamikanbara-gun, Niiigata-ken, Japan

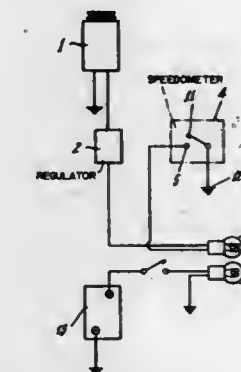
Filed Feb. 24, 1971, Ser. No. 118,375

Claims priority, application Japan, Mar. 3, 1970, 45/21073

Int. Cl. B60g 1/50

U.S. Cl. 340-62

1 Claim



A stop lamp device of a car for preventing rear-end collisions by turning on a stop lamp automatically when the speedometer indicates 0, which is done through contacts in the speedometer with electric circuitry.

3,735,346

## SECURITY SYSTEM FOR A VEHICLE

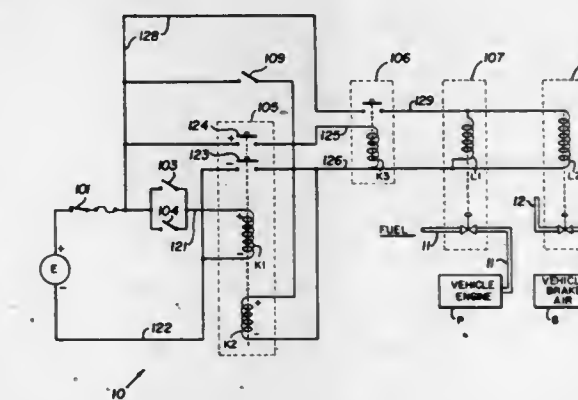
Ralph W. Fox, 116 Hallett Avenue, Port Jefferson, N.Y.

Filed Sept. 23, 1970, Ser. No. 74,728

Int. Cl. B60r 25/10

U.S. Cl. 340-63

5 Claims



A security system for a vehicle in which the opening of any sealed door establishes an alert signal that is applied to a time



delay controller that operates a pair of disabler devices to halt the vehicle at a preselected time interval after initiation of the alert signal. One disabler device shuts off fuel to the vehicle propulsion engine and the other disabler device activates the vehicle brakes.

3,735,347

## CHANGE DETECTOR SYSTEM

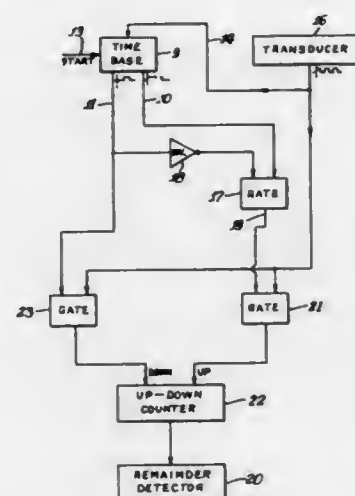
John A. Whitney, and Peter F. Sorensen, both of Fort Wayne, Ind., assignors to Franklin Electric Co., Inc., Bluffton, Ind.

Filed Nov. 2, 1971, Ser. No. 194,858

Int. Cl. G06f 7/02

U.S. Cl. 340—146.2

7 Claims



This disclosure deals with a system for detecting a change in a parameter represented by an analog signal. Integrating means receives the signal during a first time period and again during a second time period. The two time periods are preferably equal in duration and are adjoining. The results of the integration during the first period is compared with that of the second period. When the two time periods are equal, the results will be equal if the parameter has not changed during the two periods. If the results are different, a change in the parameter is indicated.

3,735,348

## TAPE RECORDING EDITING SYSTEM

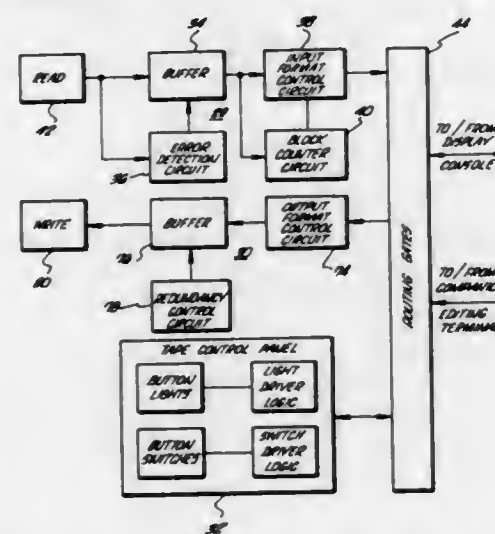
Clark Cornell, Pasadena; Gary J. Himler, Granada Hills, and John F. Ahlstrom, Canoga Park, all of Calif., assignors to Legalprint, Lynwood, Calif.

Filed June 1, 1971, Ser. No. 148,333

Int. Cl. G06k 5/00

U.S. Cl. 340—146.1 R

23 Claims



A system for editing records is disclosed. The system generally includes a pair of editing terminals each including a

display console having a display screen, a data memory and a keyboard which is operatively connected to allow access to the data memory and to enable characters to be displayed on the screen. Also included at each of the terminals is a data transfer subsystem and a tape deck for a pair of tape cassettes, employed as a read cassette and a write cassette. The data transfer subsystem includes a manually operated control panel and essentially functions to allow tape recorded data to be transferred from the read cassette to the data memory and stored data to be transferred from the data memory to the write cassette. The editing terminals are connected to allow intercommunication.

3,735,349

## METHOD OF AND DEVICE FOR PREPARING CHARACTERS FOR RECOGNITION

Matthijs Beun, and Pieter Reijntse, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

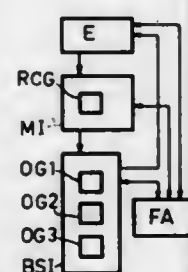
Filed Nov. 9, 1971, Ser. No. 196,950

Claims priority, application Netherlands, Nov. 12, 1970, 7016539

Int. Cl. G06k 9/00

U.S. Cl. 340—146.3 H

11 Claims



A method and device for character recognition. A character is imaged on a matrix. Skeletonizing is effected in that first character positions are marked, an indispensability criterion being used to determine whether a marked character position may be removed. Various indispensability criteria are possible. Skeletonizing is effected in cycles, while in a final cycle, all character positions are tested against an indispensability criterion. Subsequently, significant points are marked to facilitate recognition. Significant points are, inter alia, end points and junctions of series of character positions. The same method is used for matrices of different construction. Finally, series of character positions which are too short, and which start from a junction, are removed. The length can be defined as the number of character positions in a series, or as the number of character positions of the shortest possible series connecting the end points of a series to the first junction of that series. The procedure may start from a junction as well as from an end point.

3,735,350

## CODE SCANNING SYSTEM

Jerome H. Lemelson, 85 Rector Street, Metuchen, N.J.

Continuation-in-part of Ser. No. 806,398, March 12, 1969, abandoned, which is a continuation-in-part of Ser. Nos. 665,526, Sept. 5, 1967, and Ser. No. 526,546, Feb. 10, 1966, Pat. No. 3,499,650, which is a continuation of Ser. No. 826,370, Aug. 10, 1954, abandoned. This application July 6, 1971, Ser. No. 160,007

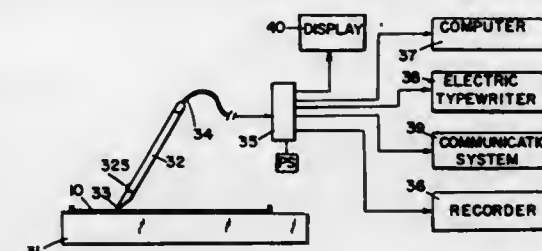
Int. Cl. G06k 7/10

U.S. Cl. 340—146.3 SY

7 Claims

An apparatus and method are provided for generating code signals of information for recording or immediately using said information to control a computer, process or machine. In a preferred form of the invention, the apparatus includes a hand-held implement which may be selectively positioned and moved across a selected code by manual manipulation to generate said code on an output as one or more electrical

signals which are fed immediately to a recorder, computer, electric typewriter, machine or other device for controlling its operation or presetting same. Printed or otherwise recorded codes to be scanned are predeterminedly positioned on a record member with respect to respective characters, words, groups of words or groups of characters which provide not only a human readable form of information but also means for indicating the location of respective codes representative of such characters, words or groups of words so that the codes



may be selectively reproduced by visually locating the associated characters or words and thereby positioning the hand held implement to reproduce just the codes representative of the selected characters. The codes may be recorded across, beneath or above the characters or words they represent so that positioning the reading implement on, beneath or above the words or characters are properly moving same will result in reproducing codes of information selected to the exclusion of other codes existing immediately adjacent thereto.

3,735,351

## REMOTE STATION ADDRESS VERIFICATION USING ADDRESS CONDITIONED ENCODING

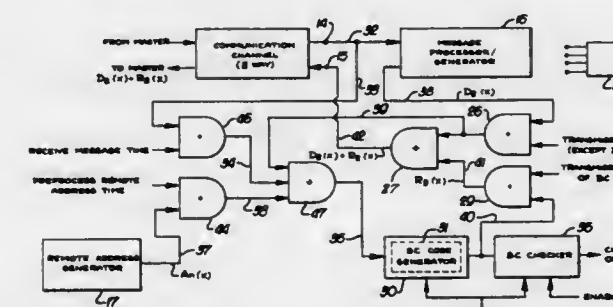
Gary W. Macheel, Anaheim, Calif., assignor to Hydri Company, Los Angeles, Calif.

Filed June 29, 1971, Ser. No. 157,923

Int. Cl. G08c 25/00

U.S. Cl. 340—146.1 C

6 Claims



A selective calling system incorporating a master station and multiple remote stations includes a means for generating the desired remote station address and properly constituted message at the master station, and a means for generating properly constituted response at the remote station. The response from the remote station is generated in a unique and new way and processed at the master station in a unique and new way, such that the validity of the responding remote station's address may be verified without the necessity of including the remote station's address as part of the return message.

3,735,352

## COMMUNICATION TECHNIQUE FOR CONTROLLING CRANE OPERATIONS

Logan L. Pease, Bountiful, Utah, assignor to Eaton Corporation, Cleveland, Ohio

Filed July 22, 1971, Ser. No. 165,296

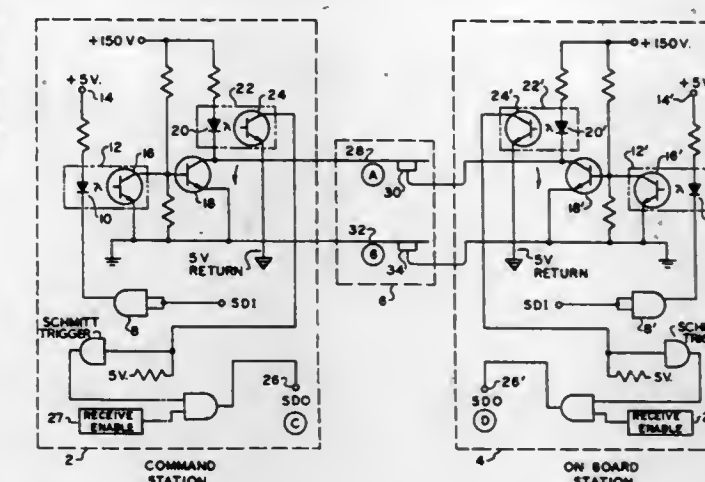
Int. Cl. B611 3/00; H03k 17/56

U.S. Cl. 340—147 R

7 Claims

A communication system for controlling a mobile vehicle comprising a trolley system transmitting communication

signals between an on-board station carried by said vehicle and a command station and including photoelectric coupling



means serving to pass signals between said trolley system and said stations, while electrically isolating said stations from said trolley system.

3,735,353

## ALARM TRANSMISSION LINE SECURITY SYSTEM UTILIZING PSEUDO RANDOM ENCODING

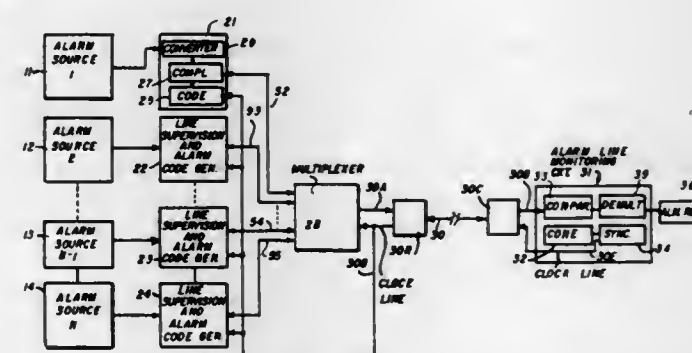
John C. Donovan, Whitefish Bay; Ramesh Krishnaiyer, Milwaukee, and Frank J. Esser, Wauwatosa, all of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Oct. 28, 1971, Ser. No. 193,450

Int. Cl. G08b 13/08

U.S. Cl. 340—164 R

22 Claims



An alarm line security system wherein areas to be protected each include an alarm source having an intrusion detector and an alarm source monitoring circuit including a code generator for generating a code comprised of a pseudo-random sequence of bits for transmission over an alarm transmission line to alarm monitoring circuits at a central monitoring area, and a code complementor circuit controlled by the intrusion detector for modifying the generated code prior to transmission to the central monitoring area whenever an unauthorized entry is detected. A multiplexer circuit interposed between the alarm source monitoring circuits for all of the protected areas and the transmission line enables transmission of one or more of the bits which comprise the pseudo-random codes generated at each alarm source to be transmitted over a common transmission line. The alarm monitoring circuits at the central monitoring area include a reference code generator which generates the same pseudo-random code as the code generators associated with the alarm sources, and a code comparator circuit which compares the code received from each source to the reference code and provides an alarm indication whenever codes from one or more of the alarm sources differ with the reference code.



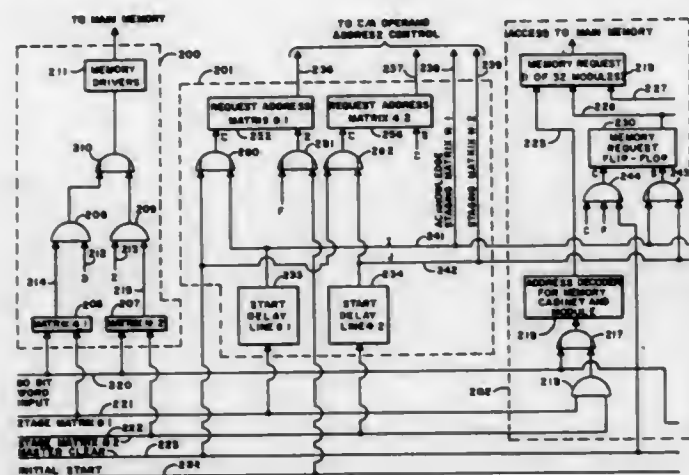
3,735,354

**MULTIPLEXED MEMORY REQUEST INTERFACE**  
Lyle F. Delaney, Coon Rapids, and Leon A. Mager, St. Paul,  
both of Minn., assignors to Sperry Rand Corporation, New  
York, N.Y.

Filed Apr. 7, 1972, Ser. No. 242,030  
Int. Cl. G06f 9/00

U.S. Cl. 340-172.5

8 Claims



A multiplexed memory request interface capable of staging one memory access request while an immediately previously received memory access request is being received and processed in the memory, and employing a common memory access path and other common circuitry for both address requests.

3,735,355

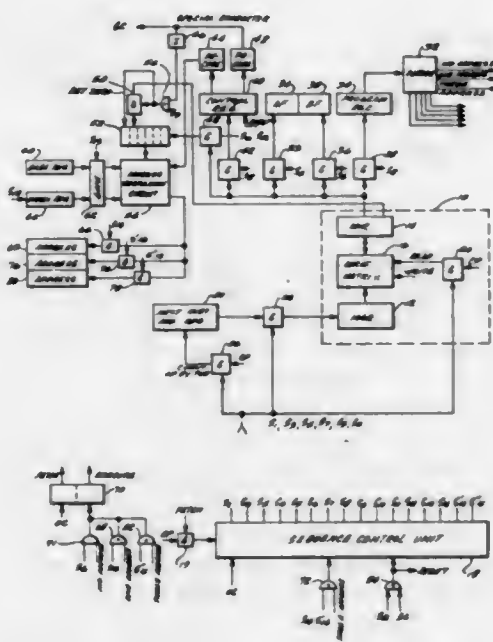
**DIGITAL PROCESSOR HAVING VARIABLE LENGTH ADDRESSING**

Edward Balogh, Jr., Diamond Bar, and Darwen J. Cook, Monrovia, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 12, 1971, Ser. No. 142,446  
Int. Cl. G06f 9/20

U.S. Cl. 340-172.5

10 Claims



A data processor in which the address fields within the instructions may be of two different lengths in terms of the number of address digits in the field. The number of digits in the address field is determined by the digit in the most significant digit position of the address. If the most significant digit is coded to be a special character, the next six digits are used as the address. If the most significant digit is not coded to be the

special character but a decimal digit, it is used together with the next four digits as the address.

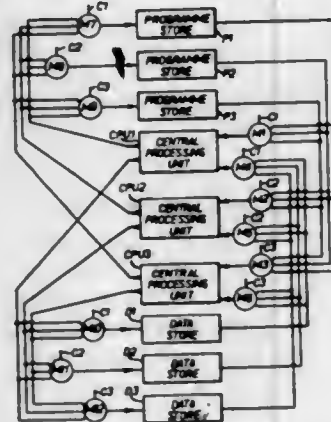
3,735,356

**DATA PROCESSING ARRANGEMENTS HAVING CONVERTIBLE MAJORITY DECISION VOTING**  
Michael Harold John Yates, Writtle, England, assignor to The Marconi Company Limited, Chelmsford, Essex, England  
Filed Sept. 13, 1971, Ser. No. 179,764  
Claims priority, application Great Britain, Sept. 25, 1970, 45,796/70

Int. Cl. G06f 11/00

U.S. Cl. 340-172.5

6 Claims



A triplicated data processing arrangement has majority decision elements between the different portions of each processor. The arrangement is provided with the facility that it can be divided into an independent processor and two remaining processors by the application of a control signal to the majority decision elements. The two remaining processors will still apply data signals to the majority decision elements in the normal manner while the independent processor is tested in isolation without affecting the operation of the remaining system.

3,735,357

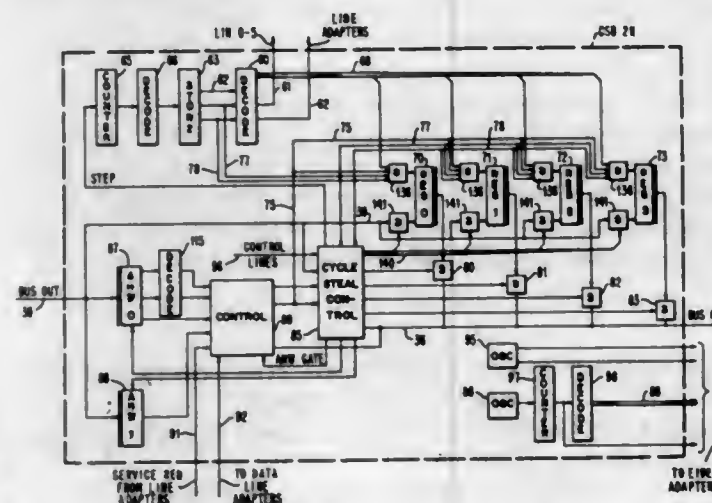
**PRIORITY SYSTEM FOR A COMMUNICATION CONTROL UNIT**

Andrew Walter Maholick, Raleigh; Frank Allen Newlin, III, Cary; Ramon Eugene Snyder, and Stanley Ray Stager, III, both of Raleigh, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 73,485, Sept. 18, 1970, abandoned. This application Sept. 19, 1970, Ser. No. 290,429  
Int. Cl. G06f 9/18

U.S. Cl. 340-172.5

4 Claims



A priority system is described for a communications controller having a large number of attached communication

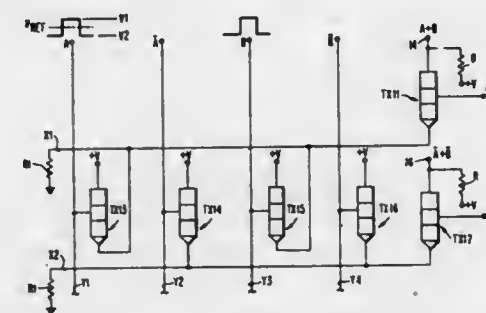
lines. The communication lines are divided into groups of lines having substantially the same service requirements. All lines within a higher priority group will be given service before any service is granted to lines having a lower priority. Within each group, service will generally be accorded to the lines on a first come, first served priority scheme.

3,735,358

**SPECIALIZED ARRAY LOGIC**  
Irving T. Ho, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed Dec. 31, 1970, Ser. No. 103,087  
Int. Cl. G11c 11/40, 17/00

U.S. Cl. 340-173 R

10 Claims



A read only memory comprising a plurality of semiconductor device cells arranged in rows and columns. Spaced conductive lines extending in a Y direction are connected to a first cell terminal. A plurality of second cell terminals defining a row or column are selectively interconnected to one or the other of a pair of adjacent X lines. The semiconductor device cells interconnected between the adjacent X line pair are responsive to digital input signals applied on the plurality of Y lines to generate distinct logical signals on the pair of adjacent X lines.

3,735,359

**DIGITAL CONFERENCE BRIDGE**

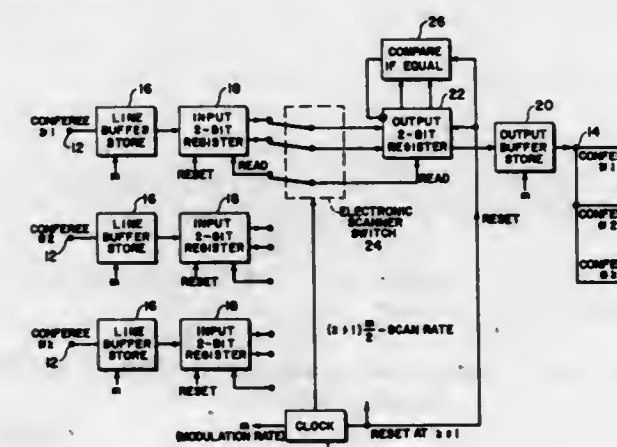
Leo H. Wagner, Oceanport, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 30, 1971, Ser. No. 167,740

Int. Cl. G06f 3/04; H04m 3/56

U.S. Cl. 340-172.5

5 Claims



This invention concerns operating a plurality of spaced digital voice communication equipments of the same type in a conference hookup at a digital conference bridge. All of the communication equipments are known in the art and operate at the same sampling or modulation rate. The novel digital conference bridge has a line buffer store and an input character register per conferee, an electronic scanner switch and logic circuit for selecting an output signal from among the input registers at programmed time intervals and to transfer

the selected output signal to all of the conferees through one output character register and one output buffer store.

3,735,360

**HIGH SPEED BUFFER OPERATION IN A MULTI-PROCESSING SYSTEM**

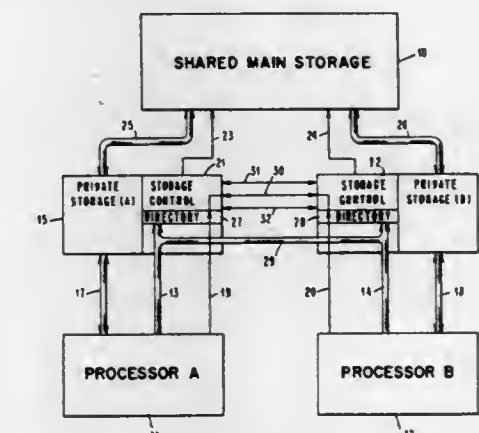
David W. Anderson, Poughkeepsie; Richard N. Gustafson, Hyde Park; Lance H. Johnson, and Francis J. Sparacio, both of Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 25, 1971, Ser. No. 174,824

Int. Cl. G06f 15/16

U.S. Cl. 340-172.5

8 Claims



Described is an interlocking scheme which permits multiprocessing in a shared storage configuration with each central processing unit (CPU) having a private high-speed buffer storage utilizing the store-in-buffer concept. The basic problem solved is insuring that all processors access the latest copy of common data with minimum performance impact. The system allows fetch-only copies of the same shared storage block to exist simultaneously in all private storages, but only one private store is allowed to contain a block of data currently being stored into. Disclosed, in addition to the normal controls necessary to search a high speed buffer to determine whether or not the data required by the processor is in the buffer, is means for interconnecting the processors sharing a main storage. The interconnection is for broadcasting address information from one processor to the storage control mechanism of other processors for the purpose of invalidating data in other private storages or insuring that data obtained by one processor from the shared storage is the most current value. That is, if data has been modified in the buffer of another processor, that data must be returned to the shared storage in its modified form to insure that the one processor receives the most current data.

3,735,361

**INFORMATION STORE SYSTEM HAVING DATA BLOCK SHIFT REGISTERS**

Joseph N. Tasso, 18 rue de la Glaciere, 75 Paris 130, France

Filed Aug. 30, 1971, Ser. No. 176,117

Int. Cl. G11c 9/00

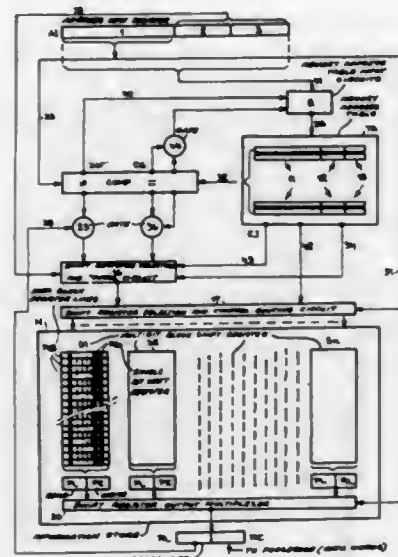
U.S. Cl. 340-172.5

7 Claims

In an information processing system operating under the control of programmes of instruction-words on data blocks each of which is an orderly assembly of bits, an optimized average access store system comprises a plurality of block shift registers, each addressable as a memory section and each having a number of shift block positions at least equal to the total number of information block lines which may be stored in the memory section, and a selection device which upon reception of an address of a section and of an address of a block in said section controls a shift of the block lines in said section up to the coincidence of the addressed block with a read/write station associated with the addressed memory section. The selection device includes an addressing table which



may or not be an associative address store or a random-access store and means for determining the optimal direction to impart to said controlled shift when the shift register constituting



said section is shiftable in both directions. At least one index block may be provided in a block shift register, when desired, for easing and/or speeding the selection operations.

3,735,362

## SHIFT REGISTER INTERCONNECTION SYSTEM

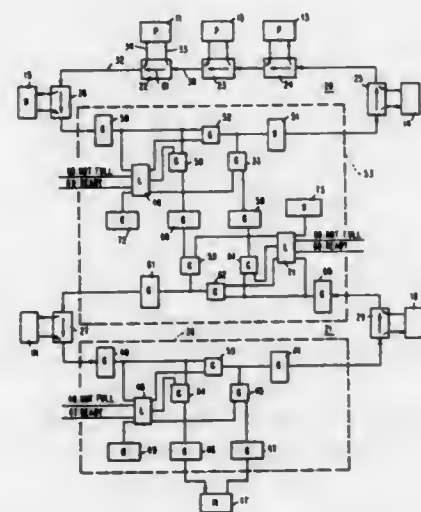
Roy Ashany; Leo M. Audretsch, Jr., and Michael J. Pisterzi, all of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 22, 1971, Ser. No. 182,775

Int. Cl. G06F 13/00

U.S. Cl. 340—172.5

10 Claims



Units of a data processing system communicate on a ring connection of shift register stages. The number of stages in a shift register is made small to avoid the delays that accompany the long data paths of a large ring system. Interconnecting stages are provided to direct a message on a first ring to a second ring according to an address contained in the message. Several useful configurations are disclosed. With this arrangement, a system of small rings can be expanded without correspondingly lengthening the average time for transmitting a message in the system.

### 3,735,363 INFORMATION PROCESSING SYSTEM EMPLOYING STORED MICROPROGRAMMED PROCESSORS AND ACCESS FREE FIELD MEMORIES

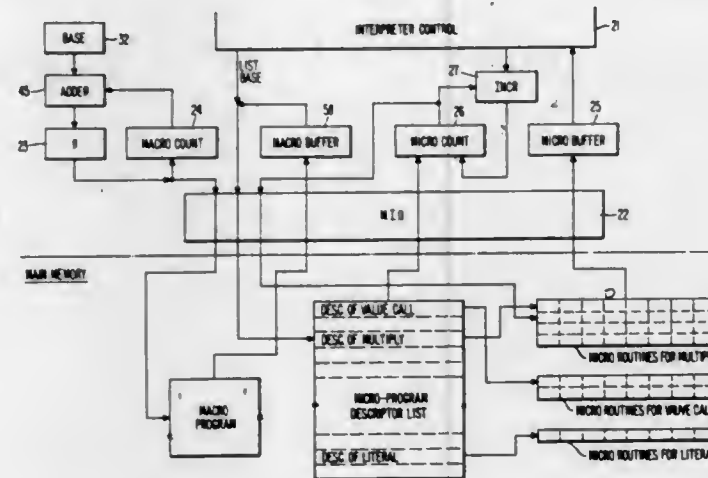
Leroy Walter Beers, Exton, and Alfred John DeSantis, Norristown, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 7, 1971, Ser. No. 131,889

Int. Cl. G06F 9/16

U.S. Cl. 340—172.5

19 Claims



This disclosure relates to an information processing system having a free field storage array to accommodate operands and data segments of any size and format and also employing processors wherein program instructions are executed through the implementation of strings of micro instructions which are also initially stored in the main memory and fetched therefrom when required for the implementation of a program instruction. Each processor is provided with a program buffer to hold those micro instructions required for immediate execution and also with a second buffer that may be used as though it were a fixed set of registers in the form of a read only memory to hold those micro instructions required for the fetching of new strings of micro instructions. Processors are also provided with subroutine return stacks and local data storage registers. While each of the main memory units are, in fact, structure oriented, such storage units are provided with isolation units having the capability of extracting and inserting fields of information independent of the memory structure. In this manner, the processing system is not limited to the implementations of only a few specific program languages having particular data formats and algorithmic operations.

3,735,364

### DATA HANDLING SYSTEM FOR HANDLING DATA IN COMPLIANCE WITH NORMAL AND SPECIAL DESCRIPTORS

Hiroshi Hatta, and Yoshiteru Ishii, Tokyo, Japan, assignors to Nippon Electric Company, Tokyo, Japan

Filed June 2, 1971, Ser. No. 149,252

Claims priority, application Japan, June 3, 1970, 45/47131

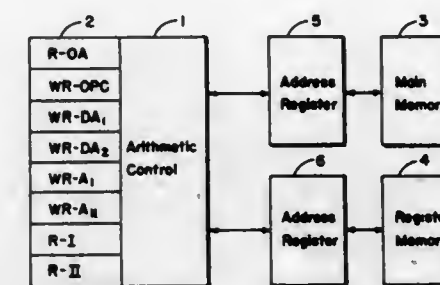
Int. Cl. G06F 9/20

U.S. Cl. 340—172.5

9 Claims

A computing system in accordance with the present invention processes data in compliance with an instruction and descriptor specified by respective instructions, each descriptor specifying a group of data having at least one characteristic. Each characteristic is composed of an invariable component and, sometimes also, a variable component. Each of the normal and special descriptors includes characteristic information specifying the invariable component. Each of the data and the descriptors includes a tag for determining whether the word is a datum or a normal or a special descriptor. Each instruction including the address of a descriptor further includes, if any, variable information specifying the

variable component. The control unit comprises structure for deriving the characteristic from a read-out descriptor, means responsive to the variable information, if any, for modifying



the derived characteristic, and means for handling the data in compliance with the unmodified or the so modified characteristic.

3,735,365

## DATA EXCHANGE SYSTEM

Hideo Nakamura, Hachioji; Kazuo Takasugi, Higashiyama; Minoru Hiroshima, and Fumiyuki Inose, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

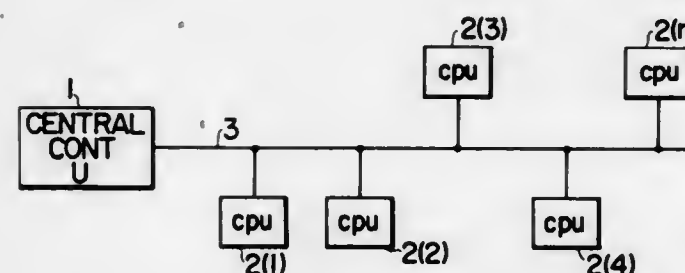
Filed Sept. 27, 1971, Ser. No. 183,807

Claims priority, application Japan, Sept. 25, 1970, 45/83412

Int. Cl. G06F 15/16

U.S. Cl. 340—172.5

16 Claims



A system for data exchange among a plurality of electronic computers in which all the computers are connected to a bus, and a central control device, for assigning a bus available time to a computer making a request for data exchange communication with another computer, is connected to one end of the bus. A computer, when making such request, sends one bit of information to the control device. Upon receiving this information, the control device supplies the bus with a signal for checking which computer is making the communication request to which computer. When the pair of the computers to exchange data are determined, the addresses of these computers are registered, and the central control device supplies in sequence the registered pair of computers with a signal for permitting the computers to use the bus. Thus, on a time-sharing basis, a plurality of computers communicate with each other.

3,735,366

## ELECTRONIC DATA PROCESSING SYSTEM

Harold B. Abrams, Olivette; Benjamin O. Haynes, St. Louis, and Glynn P. Williams, St. Charles, all of Mo., assignors to Myles Digital Sciences, Inc., Maryland Heights, Mo.

Continuation-in-part of Ser. No. 876, Jan. 6, 1970, abandoned.

This application May 10, 1971, Ser. No. 141,741

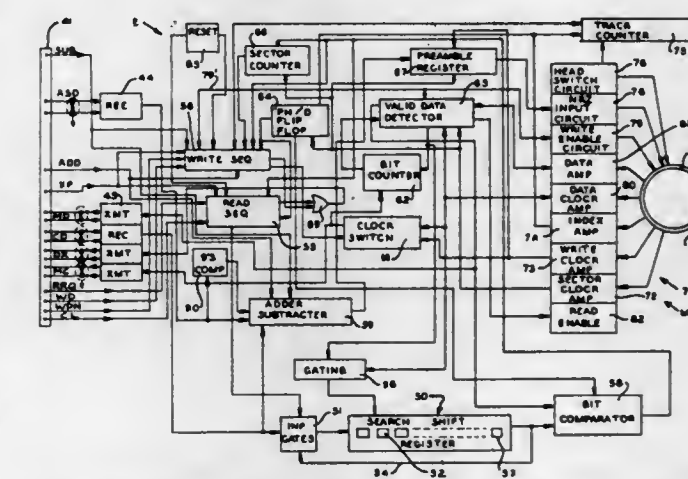
Int. Cl. G06F 13/00

U.S. Cl. 340—172.5

79 Claims

A data storage and retrieval system capable of performing various arithmetic functions such as adding and subtracting and which includes two principal units. The first of these units is a console which contains a keyboard for introducing data, a

display readout, and various switches to perform the data introduction, storage, retrieval, and the various arithmetic functions, as well as certain modifications to the data. The second unit, which forms part of the system, is a central electronics unit which includes a memory section. The memory section includes input/output electronics as well as track selection electronics. The central electronics unit provides for addition and subtraction functions as well as control of the memory section through actuation of the various switches on the console unit. The data which is to be stored in the memory section and which is to be processed via the various arithmetic function is preceded by an identification number which may represent a stock or part number or other logical identification indicia of the stored data. This data is stored randomly in the memory section and discoverable by systematic searching. The central electronics unit includes devices for introducing



clock pulses needed in the extraction of data in the memory section. In order to achieve high speed data transfer over substantial cable length, an early clocking mechanism is employed. Information on the various tracks of the memory element is compared with the address or identification number manually introduced into a storage register. In essence, the system operates on the basis of a modified form of associative addressing. An embodiment of the system utilizes a combination of a modified form of associative and direct addressing. Corresponding addresses will enable the comparator to generate an output at a clock pulse time. The system is designed so that more than one console unit may be used with a single central electronics unit. Provision is made to prevent simultaneous change of data at a particular address by two different console units. The system of the present invention may also be operated with either numeric or alpha numeric codes.

3,735,367

## ELECTRONIC RESISTANCE MEMORY

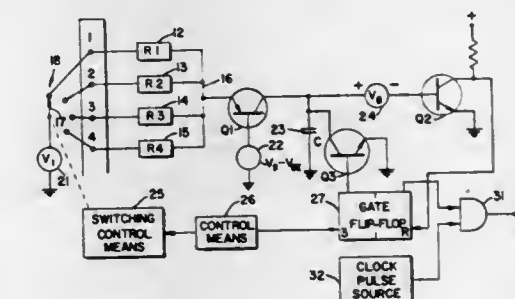
Victor A. Bennett, Jr., Gloucester, Mass., assignor to Carrier-Smith Corporation, Lexington, Mass.

Filed Apr. 29, 1970, Ser. No. 32,978

Int. Cl. G11C 13/00, 5/02

U.S. Cl. 340—173 SP

10 Claims



A resistance value represents a digit. A voltage difference applied across each resistance in predetermined sequence



produces a current inversely proportional to the resistance value. This current charges a capacitor until the voltage across the capacitor reaches a predetermined biasing potential that causes a following transistor to conduct at a time inversely proportional to current, and, hence, directly proportional to the resistance. The time interval thus defined may gate through a number of pulses from a pulse source that may function as telephone dialing pulses, the number being proportional to the selected resistor.

3,735,368

# FULL CAPACITY MONOLITHIC MEMORY UTILIZING DEFECTIVE STORAGE CELLS

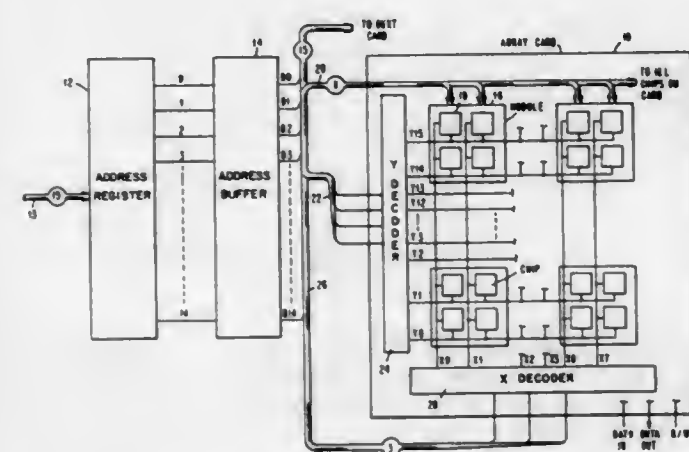
William F. Beausoleil, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 25, 1971, Ser. No. 156,637

Int. Cl. G11c 11/00

U.S. Cl. 340-173 R

17 Claims



A computer memory, most particularly a monolithic memory, may be constructed of components which contain defective bit cells. During the production process, the monolithic chips are sorted into groups in accordance with the chip sector which contains one or more defective cells. The chips are then mounted on memory cards, with all of the chips having a defect in a given chip sector being mounted on a corresponding card sector. The cards, each of which is produced in a substantially identical manner, are then assembled into a complete memory. The address wiring of the memory is provided in such a manner as to ensure that no given memory word, or defined group of bits within a memory word, contains within it more than one memory cell that is known or suspected to be defective. Means are also provided for deriving from the address of any given memory word the bit location within said word of a defective or suspicious bit. In one embodiment shown herein, the suspect bit is bypassed in favor of a redundant bit provided within the memory system. In another embodiment described herein, the suspect bit is utilized just as if it were a good bit, but, upon detection of an error, the suspect bit will be presumed to be in error.

3,735,369

# MAGNETIC MEMORY EMPLOYING FORCE DETECTING ELEMENT

Shuichi Iida, No. 23-11-4-chome, Funabashi, Setagaya-ku, Tokyo, Japan

Filed Sept. 24, 1970, Ser. No. 75,102

Claims priority, application Japan, Oct. 2, 1969, 44/78794

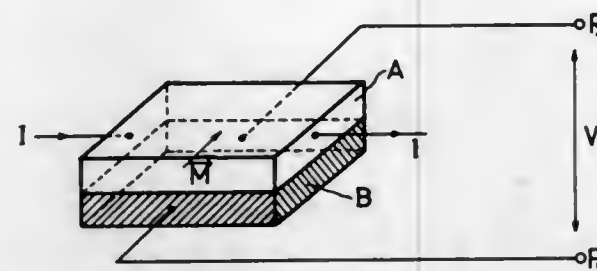
Int. Cl. G11c 11/02

U.S. Cl. 340-174 R

5 Claims

This invention relates to a memory device using a magnetized ferromagnetic element of an arbitrary shape, a current

path penetrating through or closely contacting said element and a force-detecting means which detects a force  $F$ , resulting



from said ferromagnetic element when a current flows through said path and being represented by

$$\vec{F} = \vec{F}_1 + \vec{F}_2 = \int [(-\nabla \cdot \vec{M}) \vec{H}_1 + (i/c) \times \vec{H}_1] dv \quad (1)$$

where  $\vec{M}$  is the magnetization

$i$  is the current density

$\vec{H}$  is the total magnetic field

$\vec{H}_1$  is the magnetic field produced by the current  $i$

$\vec{H}'$  is the magnetic field obtained from the total field  $\vec{H}$  by

subtracting  $\vec{H}_1$  ( $\vec{H}' = \vec{H} - \vec{H}_1$ )

$c$  is the light velocity.

3,735,370

# INPUT FOR SINGLE-WALL DOMAIN ARRANGEMENT

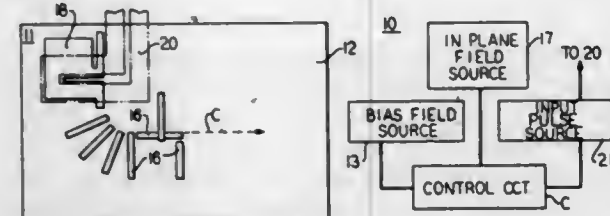
Paul Charles Michaels, Watchung, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 9, 1971, Ser. No. 196,901

Int. Cl. G11c 11/14

U.S. Cl. 340-174 TF

3 Claims



The geometry of a magnetically soft input which defines the path of a seed domain employed to generate information-representative domains for movement in a field access single-wall domain memory is modified to ensure that the seed domain be retained at the input when the drive field which causes domain movement in such arrangements is terminated.

3,735,371

# ARRANGEMENT FOR MULTIPLEXING OF A PLURALITY OF REMOTELY-LOCATED CAPACITIVE PROBES

Julius Lerner, Broomall, and Robert Mayer, Ardmore, Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed June 2, 1971, Ser. No. 149,216

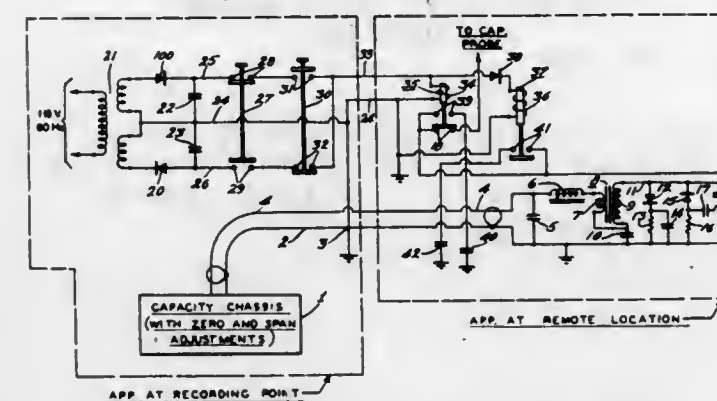
Int. Cl. G08c 15/06

U.S. Cl. 340-177 CA

3 Claims

A switching system for selectively switching in, from a recording point or control room, capacitors which are physically located at a remote point and which are utilized for circuit adjustment in a measuring apparatus utilizing a capaci-

tive-type sensor. Discloses also a multiplexing arrangement for a plurality of sensors, wherein the circuit adjustments of the



individual sensors may be made selectively, and wherein the sensors may be selectively and individually connected to common capacitance measuring and indicating equipment.

3,735,372

# SEVEN OR NINE CHANNEL READOUT WITH ADJUSTABLE THRESHOLD

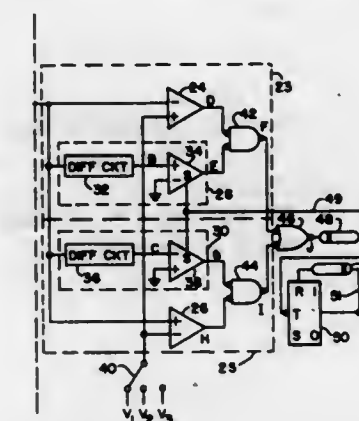
Edmund G. Coccagna, Villanova, Pa., assignor to Mohawk Data Sciences Corporation, Herkimer, N.Y.

Filed July 2, 1971, Ser. No. 159,313

Int. Cl. G11b 5/44

U.S. Cl. 340-174.1 H

8 Claims



A circuit for reading digital information recorded on magnetic tape. Nine transducers are arranged to sense information recorded on nine-channel magnetic tape and seven other transducers are arranged to sense data recorded on seven-channel magnetic tape. The circuit includes means for selecting the outputs of either the first or the second group of transducers so that data from either seven or nine-channel magnetic tape may be read. The input signal obtained from each transducer in the appropriate selected group is fed to a pair of subcircuits, one of the pair providing a signal in response to each negative pulse in the input signal at that pulse's peak and the other subcircuit providing a signal in response to each positive pulse in the input signal at that pulse's peak. Each of these subcircuits contains a threshold circuit which indicates each pulse that is greater (higher or lower) than a predetermined threshold and the output of the threshold circuit is gated with the output of a peak-detecting circuit so subcircuit each subcircuit provides a signal at the peak of each pulse which is greater than a predetermined threshold. The outputs of both subcircuits are fed to an output circuit which provides a signal in response to receiving a pulse-indicating signal from either of the subcircuits. The circuit includes means for adjusting the threshold level of the threshold circuits so that the sensitivity of the circuit may be adjusted. Preferably, the threshold adjustment may be made to a 100 percent threshold level to aid in tuning the circuit.

3,735,373

# MAGNETIC MEMORY

Michel Barberon, Paris; Elane Fruchard, nee Triquet; Robert Fruchart, both of l'Hay-les-Roses; Gerard Louis Lortholr, Vitry-sur-Seine, and Roland Madar, Rabat, all of France, assignors to Agence Nationale De Valorisation De La Recherche, Paris, France

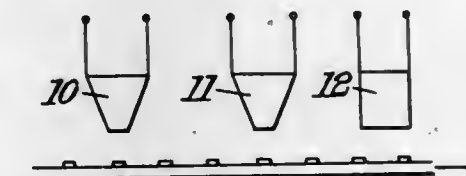
Filed July 21, 1971, Ser. No. 164,520

Claims priority, application France, July 24, 1970, 7027403

Int. Cl. G11c 11/02

U.S. Cl. 340-174 NA

12 Claims



An information support for a magnetic store provides storage locations made of a storage material of the formula  $M_n Rh N_x$  in which  $x$  has a value from 0.5 to 0.95 and is preferably in the region of 0.8. The storage material may be deposited as a thin layer or at discrete locations on a substrate such as glass or may be uniformly dispersed as fine particles within a matrix of plastics material forming a thin sheet. The storage material assumes a ferromagnetic state on being heated from a first temperature to a second temperature and then being cooled in a magnetic field to a temperature above a critical temperature. Recording of information is carried out by locally heating the information support material, for example by a laser beam, sufficiently for the ferromagnetic state to appear at the recording location on subsequent cooling in a magnetic field. Read-out is achieved by detecting the magnetization at the recording location directly or indirectly, and erasure can be obtained by cooling to below a critical temperature at which the magnetic state disappears.

3,735,374

# HOLOGRAM IDENTIFICATION SYSTEM

Michel Rembault, Paris, France, assignor to Thomson CSF, Paris, France

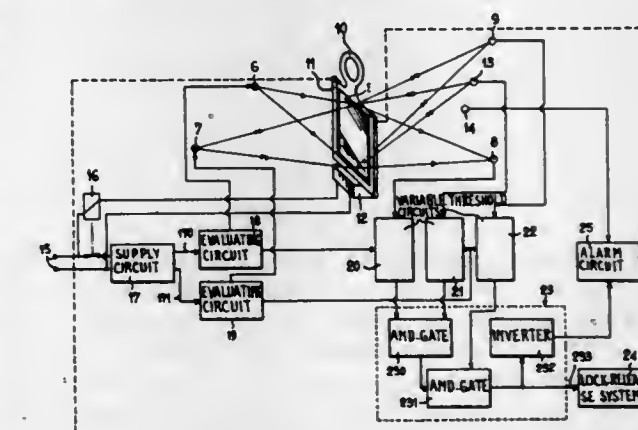
Filed June 25, 1970, Ser. No. 49,612

Claims priority, application France, July 9, 1969, 6923274

Int. Cl. G08b 21/00

U.S. Cl. 340-213 R

9 Claims



An identification arrangement comprises light sources and photo-detectors arranged in accordance with a predetermined correspondence code. An appropriate key hologram produces, in respect of each of these sources, respective real images on the above photo-detector. Threshold circuits are connected to these photo-detectors and an assembly of coincidence circuits produces a signal when signals of predetermined levels are simultaneously applied to the outputs of all the photo-detectors.



3,735,375

**CIRCUIT FOR DETECTION OF SMALL RESISTANCE CHANGES IN IONIZATION CHAMBER DEVICES**

Lyman L. Blackwell, Denver, Colo., assignor to Central Investment Corporation, Denver, Colo.

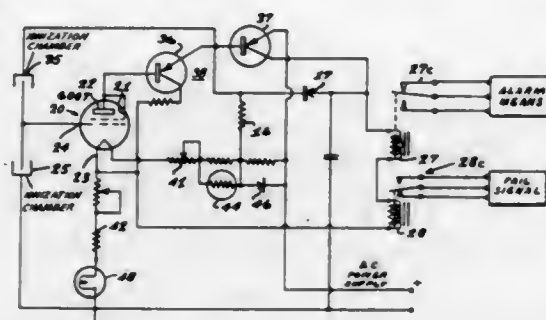
Continuation of Ser. No. 546,663, May 2, 1966, abandoned.

This application Dec. 4, 1969, Ser. No. 876,156

Int. Cl. G08b 17/10; H01j 39/28

U.S. Cl. 340-237 S

3 Claims



Electronic circuit for detecting small resistance changes in conductors of high resistance wherein the conductor is connected between grid and cathode of a tube connected as a triode and the grid bias is adjusted almost to the point necessary for tube current cut-off, such that some significant amount of grid current flows at all times. The high resistance conductor may be a sensing element such as an ion chamber. The level of grid current serves to identify an alarm, no-alarm or an outage condition with such a sensing device.

3,735,376

**LEAKAGE INDICATOR FOR A FIRE EXTINGUISHER**

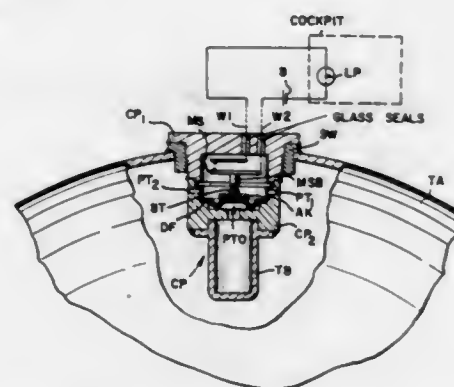
Jack M. Kermer, Los Angeles, and Abdul N. Sitabkhan, El Monte, both of Calif., assignors to HTL Industries, Inc., Monrovia, Calif.

Filed Mar. 5, 1971, Ser. No. 121,452

Int. Cl. A62c 39/02; H01h 35/34

U.S. Cl. 340-242

13 Claims



A temperature compensated alarm mechanism for a fire extinguisher suitable for use on aircraft or other vehicles for determining whether the pressure of the fire extinguishing fluids within the main container has dropped below a predetermined value due to leakage or to other conditions. The mechanism includes, in addition to the main container, a miniaturized container which may be inserted into the main container and is filled with like fluids and arranged so that a diaphragm effectively separates the fluids of the two containers from each other. The diaphragm may be actuated in response to a predetermined drop in the pressure of the main container to produce a signal indicating that the fire extinguisher may have been rendered incapable of responding with sufficient force to a condition requiring prompt attention for extinguishing or suppressing a fire. The mechanism is substantially non-responsive to wide variations in the temperature of the media external to the fire extinguisher.

3,735,377

**MONITORING AND SHUTDOWN APPARATUS**

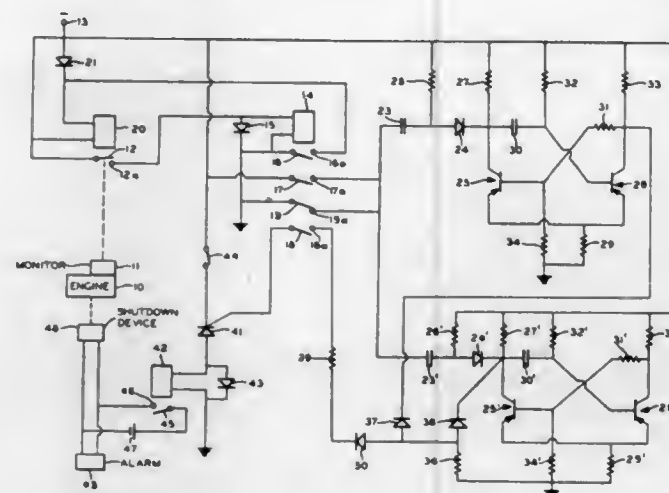
Carl Christopher Kaufman, Houston, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 19, 1971, Ser. No. 126,045

Int. Cl. G08b 23/00

U.S. Cl. 340-248 P

6 Claims



A shutdown and/or alarm system is actuated by a monitor. The system includes an AND circuit which comprises a switch and two multivibrators. The multivibrators have different reset times. A signal from the monitor closes the switch for a given time interval, and triggers and initiates resetting of the multivibrators at the end of this interval. Signals from the multivibrators are passed through the switch to energize a shutdown device and/or an alarm.

3,735,378

**LAMP FAILURE INDICATING APPARATUS**

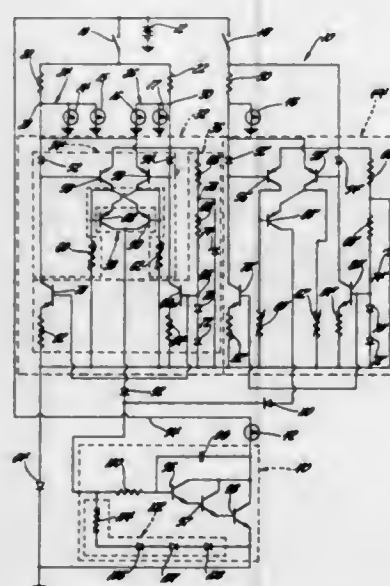
James W. McNamee, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 29, 1971, Ser. No. 138,602

Int. Cl. G08b 29/00

U.S. Cl. 340-251

4 Claims



Apparatus for indicating inoperativeness of a lamp in any of several lamp arrays. Each lamp array includes one or more parallel connected lamps having predetermined electrical characteristics such that each operative lamp effects a certain voltage drop across the lamp array. A detector network monitors the voltage across each lamp array, which voltage is almost the same as the supply voltage, and generates a certain control signal when one of the lamps has become inoperative. An output amplifier that is responsive to the control signal effects energization of an indicator lamp to indicate that a lamp is inoperative when the certain control signal is generated.

3,735,381

**TESTING APPARATUS FOR SELECTIVELY ENABLING CONTROLLED EQUIPMENT**

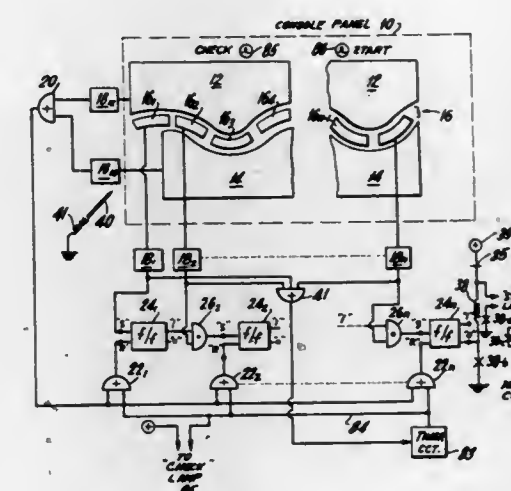
Ernest A. Zadig, Box 425, South Norwalk, Conn.

Filed June 1, 1971, Ser. No. 148,383

Int. Cl. B60k 27/08

U.S. Cl. 340-279

3 Claims



Electronic apparatus requires that the operator of a motor vehicle accurately trace the full course of a segmented undulating serpentine path as a condition precedent to starting a motor vehicle. The path segments must be engaged in seriatim to enable the automobile ignition circuit via intermediate cascaded bistable electronic circuitry.

3,735,382

**ELECTRONIC MONITORING CONTROL AND DISPLAY APPARATUS FOR BREATHING GAS SYSTEM**

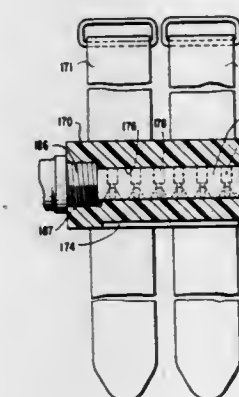
Charles J. Soult, Willingboro, N.J., assignor to Biomarine Industries, Inc., Devon, Pa.

Filed May 27, 1970, Ser. No. 40,891

Int. Cl. G08b 21/00, 23/00

U.S. Cl. 340-279

8 Claims



3,735,379

**CAPACITANCE RESPONSIVE CONTROL CIRCUITS**

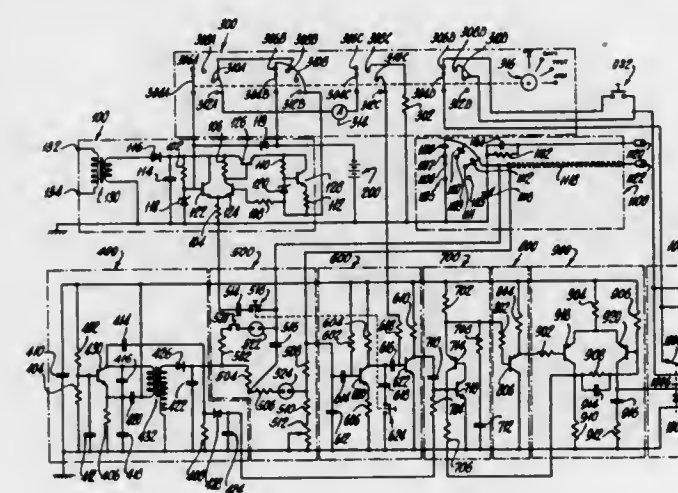
Carl E. Atkins, Montclair, N.J., assignor to Wagner Electric Corporation, Newark, N.J.

Filed Dec. 22, 1970, Ser. No. 100,586

Int. Cl. G08b 13/26

U.S. Cl. 340-258 C

18 Claims



Capacitance-responsive control circuits operable with a low-voltage DC power source and operative to change the energization state of a relay in response to either an increase or decrease in detected capacitance. These circuits include the following features: positive hysteresis, the capability of measuring the capacitance to ground of the protected object which acts as the antenna, and the capability of providing an indication of the magnitude of leakage current in the event that said protected object is not properly insulated from ground.

3,735,380

**SEAT SENSING MECHANISM**

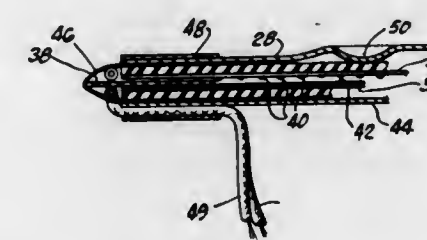
Walter A. Wolf, and Prentice R. Corn, both of Logansport, Ind., assignors to Switches, Incorporated, Logansport, Ind.

Filed Mar. 2, 1971, Ser. No. 120,263

Int. Cl. G08b 5/00; H01h 3/02

U.S. Cl. 340-278

18 Claims



A seat sensing mechanism incorporated into an automobile seat and forming part of a circuit having a warning device and a switch cooperating with seat belts for maintaining an occupant within the seat. The seat sensing mechanism includes an elongated switch consisting of a pair of elongated electrically conductive contact strips that are normally held in spaced relation by a resilient member having a passage for receiving the strips. An elongated actuating member having depressions extending towards the switch is held adjacent the switch and the entire sensing mechanism is enclosed in a casing.

Apparatus for providing a visual display of sensed conditions in a breathing gas system and including a housing having an elongated viewing window and a plurality of miniature color coded lamps mounted on a carrier member within the housing adjacent the viewing window. The lamps are connected to a source of operating current, through a connector which seals the housing, and means are provided for selectively electrically energizing the lamps in accordance with digital signals applied thereto.



3,735,383

## DISPLAY APPARATUS UTILIZING CATHODE RAY TUBES

Katsushi Naka, Ise, Japan, assignor to Ise Electronics Corporation, Ise, Japan

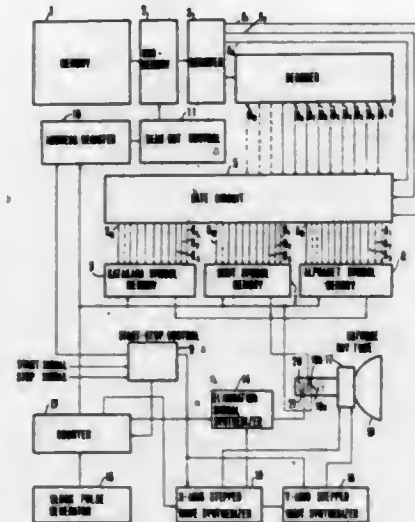
Filed Jan. 25, 1971, Ser. No. 109,129

Claims priority, application Japan, Jan. 30, 1970, 45/7957

Int. Cl. G06f 3/14

U.S. Cl. 340—324 A

10 Claims



In a display apparatus utilizing a cathode ray tube, the tube is provided with a dot matrix electrode and the apparatus is provided with a plurality of memories for different types of patterns and connected with the matrix electrode, an address register for storing the positions on the screen at which selected patterns are to be displayed, a memory for storing the information regarding the patterns to be displayed, means responsive to the outputs from the address register and the memory for selectively driving the plurality of memories and means for supplying deflection current to the deflection coil of the cathode ray tube in synchronism with the outputs from the plurality of memories.

3,735,384

## CIRCUIT ARRANGEMENT FOR CHARACTER DISPLAY ON A TELEVISION DISPLAY SCREEN

Hans-Georg Nussbaum, and Reimer Von Osten, both of Bremen, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

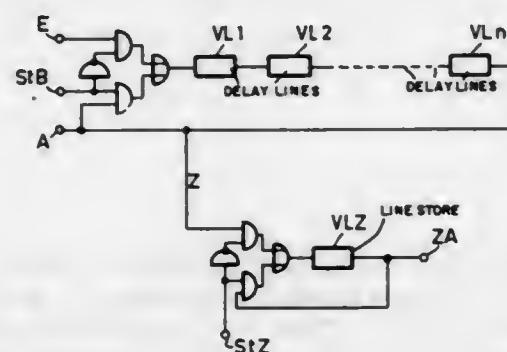
Filed Aug. 13, 1970, Ser. No. 63,410

Claims priority, application Germany, Sept. 19, 1969, P 19 47 532.2

Int. Cl. G06f 3/14

U.S. Cl. 340—324 AD

8 Claims



A circulating storage device for TV character generating apparatus using a separate circulating storage element for each line of the TV scan.

3,735,385

## CIRCUIT ARRANGEMENT FOR CHARACTER DISPLAY

Jurgen Schroder; Reimer Von Osten; Hans-Georg Nussbaum, and Ulrich Bartels, all of Bremen, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

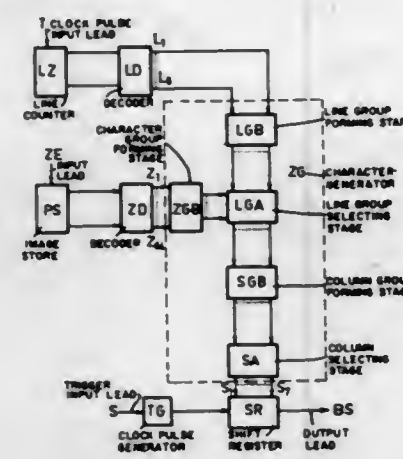
Filed May 14, 1971, Ser. No. 143,346

Claims priority, application Germany, June 13, 1970, P 20 29 247.1

Int. Cl. G06f 3/14

U.S. Cl. 340—324 AD

5 Claims



A device for forming image signals for a cathode-ray tube wherein signals are generated corresponding to line segments and column segments of characters to be displayed and wherein the line segment and the column segment signals are combined and stored in a shift register that contains the information corresponding to a plurality of characters whereby the character forming apparatus may operate asynchronously with the display apparatus.

3,735,386

## ELECTRICAL MEMORANDUM

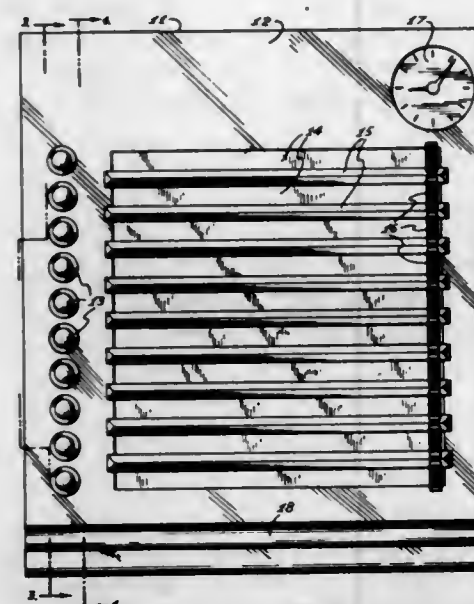
Cristoban Manuel Acuna, Astronomos No. 54, Col Escandon, Mexico City, Mexico

Continuation-in-part of Ser. No. 737,419, June 17, 1968. This application July 9, 1971, Ser. No. 161,116

Int. Cl. G08b 5/36

U.S. Cl. 340—323

9 Claims



An electrical memorandum including data recording means comprising first and second sheets disposed one atop the other, pressure being applied to the first sheet to trace an image which appears on the recording means; means to separate the first and second sheets to erase the recorded image; luminous indicating means for indicating the presence of data recorded on the recording means; and power supply

means for supplying power to the luminous indicating means, the power supply means automatically switching from AC to DC upon a failure of the AC supply.

3,735,387

## MEANS FOR INHIBITING FLUTTER IN A NUMERICAL DISPLAY

David E. Miller, Beverly, Mass., assignor to General Electric Company, Wilmington, Mass.

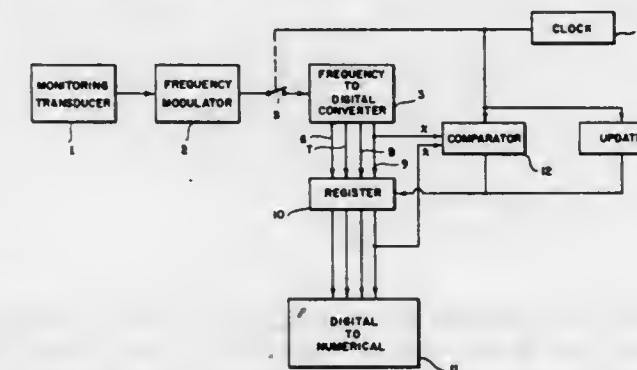
Division of Ser. No. 852,050, Aug. 21, 1969, Pat. No.

3,621,391. This application Sept. 7, 1971, Ser. No. 178,178

Int. Cl. G08b 5/36

U.S. Cl. 340—324 R

6 Claims



Rapid oscillation between consecutive numbers displayed by a numerical display device is prevented by comparing an incoming digitally-coded signal with one representing the numeral currently registered by the device. If the incoming signal corresponds to a numeral consecutive to the one being displayed, the system inhibits the registration of the new signal by the device. At predetermined intervals the comparison system is bypassed and the device is "updated" by allowing registration of new signals, regardless of their relationship to prior signals.

3,735,388

## PATTERN DISPLAY APPARATUS

Katsushi Naka, Ise, Japan, assignor to Ise Electronics Corporation, Ise, Japan

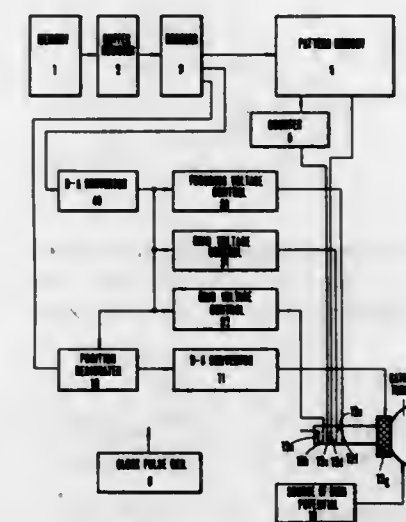
Filed July 13, 1971, Ser. No. 162,156

Claims priority, application Japan, July 16, 1970, 45/61976

Int. Cl. G06f 3/14

U.S. Cl. 340—324 AD

12 Claims



Apparatus for displaying patterns on an enlarged or reduced scale comprising a cathode ray tube including a cathode electrode, a plurality of matrix electrodes arranged in a matrix, a fluorescent screen, focusing means and deflection means which are disposed between the matrix electrode and the fluorescent screen; a pattern memory connected to the matrix electrodes for storing the patterns of letters, digits, symbols,

etc. to be displayed; a memory for supplying an enlargement or reduction signal and a position designation signal of the information of the pattern to be displayed; an enlargement-reduction control connected to the supply memory for controlling the potential applied to the focusing means in accordance with the enlargement or reduction signal supplied from the memory; and a position designator connected to the memory for converting the position designation signal into an analogue signal and for applying the analogue signal to the deflecting means, whereby said focusing means operates to enlarge or reduce the pattern displayed on the fluorescent screen in accordance with the enlargement or reduction signal supplied from the memory and said position designator operates to position said pattern on said screen.

3,735,389

## DIGITAL GRAPHIC DISPLAY APPARATUS, SYSTEM AND METHOD

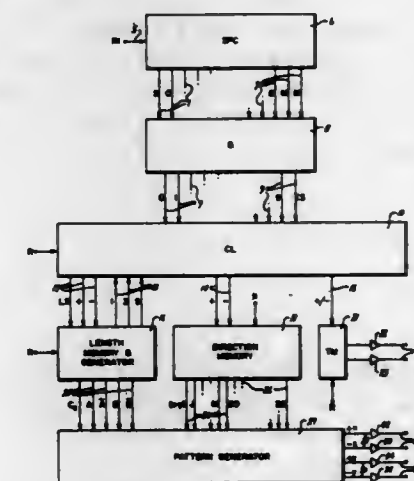
Zoltan Tarczy-Hornoch, Berkeley, Calif., assignor to Zeta Research, Inc., Lafayette, Calif.

Filed Feb. 24, 1970, Ser. No. 13,570

Int. Cl. G06f 3/14

U.S. Cl. 340—324 A

27 Claims



Apparatus, system and method is provided for operating graphic display devices at high speed while receiving digitally coded data at a low input rate. The display is synthesized from line segments of predetermined lengths and finely quantized directions, generated by a pattern generator. Straight lines in any direction and a variety of curves can be displayed at or near the maximum speed of the display device, such as a plotter. The dominant input information consists of incremental update instructions for the length and direction parameters memorized by respective memory means, and the updated parameters are utilized by the pattern generator for generating subsequent line segments.

3,735,390

## METHOD AND CIRCUIT FOR CONVERTING AN ANALOG SIGNAL INTO A SIMULTANEOUS DIGITAL SIGNAL

Karsten E. Drangeid, Hedingen, and Andreas Moser, Thalwil, both of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1971, Ser. No. 129,823

Claims priority, application Switzerland, Apr. 7, 1970, 5087/70

Int. Cl. H03k 13/02

U.S. Cl. 340—347 AD

15 Claims

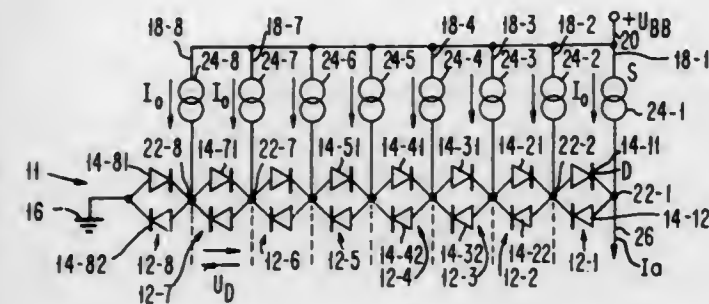
The present invention relates to a method for converting an analog signal into a simultaneous digital signal and to a circuit for carrying out the method. Therefore, the complete digital representation of any analog signal is currently available for further use.

In the practice of this analog to digital conversion method, an electrical scale is generated having a number of n steps for



evaluating amplitudes of analog signals. The amplitudes are measured by comparison to the electrical scale. At any time during measurement, a signal indicates the highest step of the scale being exceeded.

An analog to digital converter circuit hereof has at least  $n-1$  pairs of diodes which are connected in parallel with opposed



polarity. A calibrated constant current is fed to each pair of diodes for generating a stepped electrical scale. At least one electronic switch is included for each step of the scale which is responsive to the potential difference between the terminals of a diode pair and which controls the digital representative of measured values.

3,735,391

## MAGNETIC SYNCHRO ANGLE RESOLVER

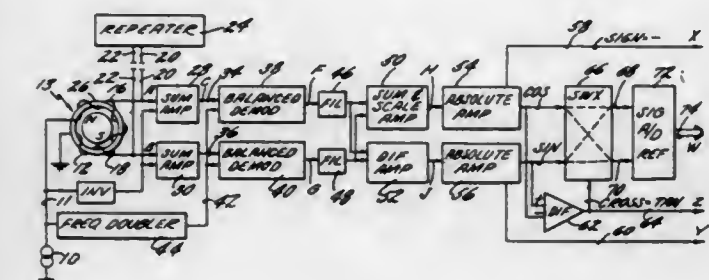
John E. Games, Granby, and Clarence Casper, Jr., Windsor, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 5, 1971, Ser. No. 169,387

Int. Cl. H03k 13/02

U.S. Cl. 340-347 SY

8 Claims



A magnetic synchro second harmonic generator has line voltage bucked out in current summing means, and is synchronously rectified in balanced demodulators utilizing double the line frequency as a reference. Filtering removes remaining odd harmonics, and functions of the sum and difference of the two filtered outputs provide signals comprising quadrature related sine and cosine functions of the desired rotor angle. By sensing the sign of the quadrature components, and which of them has a greater absolute magnitude, all eight octants of a circle can be identified; within each octant, a digital word representing the tangent or cotangent (chosen so that either is always less than one, when used) together with the sign and magnitude bits comprise a complete digital resolution of the angle. The tangent and cotangent are derived by applying the sine and cosine to correct related ones of the signal and reference inputs of an analog to digital converter, to take ratios thereof.

### 3,735,392 BIPOLAR ANALOG-TO-DIGITAL CONVERTER WITH DOUBLE DETECTION OF THE SIGN BIT

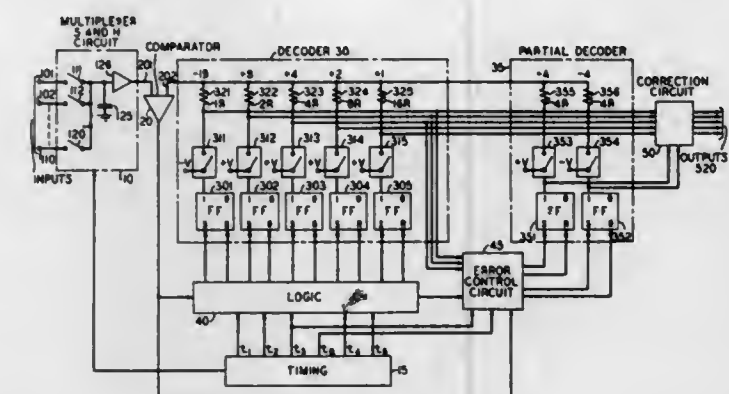
Hisashi Kaneko, Tokyo, Japan, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 8, 1971, Ser. No. 205,793

Int. Cl. H03k 13/02

U.S. Cl. 340-347 AD

8 Claims



A bipolar sequential analog-to-digital converter is designed to have two sign bit checks. When the first few encoded bits indicate an input signal near zero, the sign bit is rechecked and the result is compared with the first sign bit detection. When the two are the same, the encoder continues to generate the remaining bits of the code. However, when the sign bits do not match, the previously generated bits are corrected before the encoder generates the remaining bits.

3,735,393

## SELF COMPANDING PULSE CODE MODULATION SYSTEMS

Robert L. Carby, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

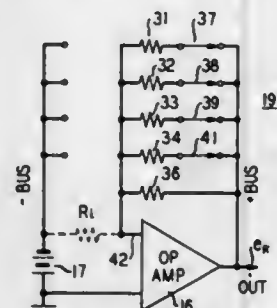
Continuation of Ser. No. 879,661, Nov. 25, 1969, abandoned.

This application Nov. 22, 1971, Ser. No. 200,781

Int. Cl. H03k 13/04

U.S. Cl. 340-347 DA

6 Claims



A self companding analog digital system produces a desired compression expansion curve by switching the gain ratio of an operational amplifier in accordance with a binary code.

3,735,394

## INTEGRATING A-D CONVERSION SYSTEM

Tetutaro Eto, No. 841-2 chome Soshigoya, Setagaya-ku, Tokyo, Japan

Filed Oct. 27, 1970, Ser. No. 84,399

Claims priority, application Japan, Oct. 30, 1969, 44/86638

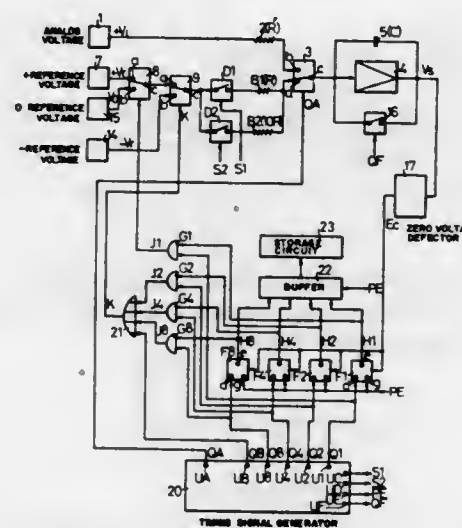
Int. Cl. H03k 13/20

U.S. Cl. 340-347 NT

5 Claims

An integrating A-D conversion system which is adapted to provide an analog input voltage in the form of a binary-coded decimal digital output indicated by a code 8-4-2-1 and comprises the steps of (1) positively integrating a positive analog input voltage for a period of time  $2T$ , (2) subtracting from the

resulting voltage  $-V_r$  in (1) a voltage produced by integrating a negative reference voltage for a period of time  $T$ , (3) adding the resulting voltage in (2) with a negative (or positive) voltage produced by integrating the voltage  $-V_r$  (or  $+V_r$ ) for a period of time  $T/2$  according as the resulting voltage in (2) is positive (or negative), (4) adding the resulting voltage in (3) with a negative (or positive) voltage produced by integrating the voltage  $-V_r$  (or  $+V_r$ ) for a period of time  $T/4$  according as the resulting voltage in (3) is positive (or negative), (5) adding the resulting voltage in (4) with a negative (or positive) voltage produced by integrating the voltage  $-V_r$  (or  $+V_r$ ), for



a period of time  $T/8$  according as the resulting voltage in (4) is positive (or negative), (6) adding the resulting voltage in (5) with a negative (or positive) voltage produced by integrating the voltage  $-V_r$  (or  $+V_r$ ) for a period of time  $T/8$  according as the resulting voltage in (5) is positive (or negative), (7) obtaining a digital output representing the first digit of a binary-coded decimal number in the form of a four-bit code of "1" and "0" according as each of the resulting voltages in (2), (3), (4) and (5) is positive or negative, and (8) thereafter repeating the same operations as in (2) to (7) to obtain digital outputs representing a second, third, . . . digits in the form of binary-coded decimal numbers.

3,735,395

## PROJECTION TYPE KEYBOARD DEVICE

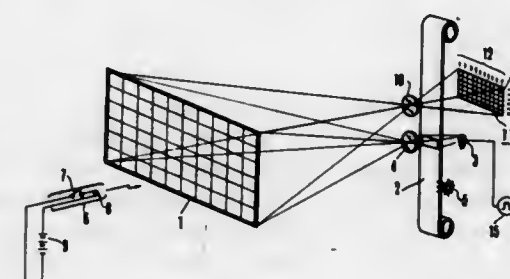
Yasuo Iwabuchi, Hino City, Tokyo, and Tomonori Yoshioka, Kokubunji City, Tokyo, both of Japan, assignors to Iwatsu Electric Company, Limited, Tokyo, Japan

Filed Jan. 4, 1971, Ser. No. 103,680

Int. Cl. G08b 5/36

U.S. Cl. 340-365 P

4 Claims



In a projection type keyboard device of the type wherein desired information is selected by means of a light pen on a keyboard upon which the information of the desired letter, digit, symbol and the like are selectively projected, the light for projecting the desired information and the light of the light pen are prevented from occurring simultaneously.

3,735,396

## ALARM SIGNALLING NETWORK

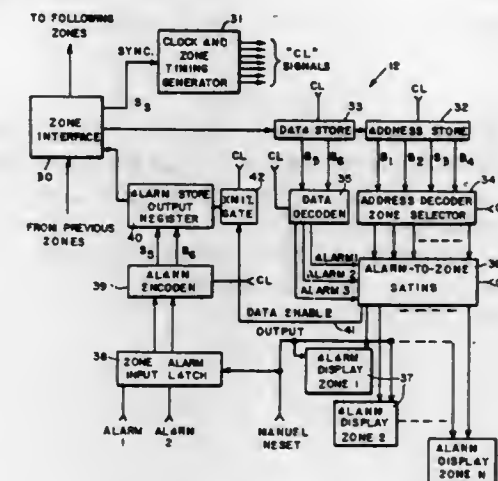
Edward H. Gatchell, Lexington, Mass., assignor to Signatron, Inc., Lexington, Mass.

Filed Aug. 10, 1971, Ser. No. 170,558

Int. Cl. G08b 29/00

U.S. Cl. 340-413

24 Claims



An alarm signalling network which monitors the alarm status of a plurality of separate zones under surveillance. A control station supplies a composite signal for transmission to a receptor station at each of the zones, which signal includes interrogation portions to which the receptor stations respond. Each receptor station thereupon produces an alarm status signal, which are included as alarm status signal portions of the composite signal. The composite signal is transmitted via a common transmission link between the control station and receptor stations, at least one of the receptor stations having means for displaying the alarm status from one or more of the other receptor stations, and the operations of the control and receptor stations are appropriately synchronized.

3,735,397

## A SPEED HEATING AND/OR TIME SIGNAL GENERATING SYSTEM FOR A SHIP

Tomiji Nirasawa, No. 660-2, Miyazawa-cho, Totsuka-ku, Yokohama, Japan

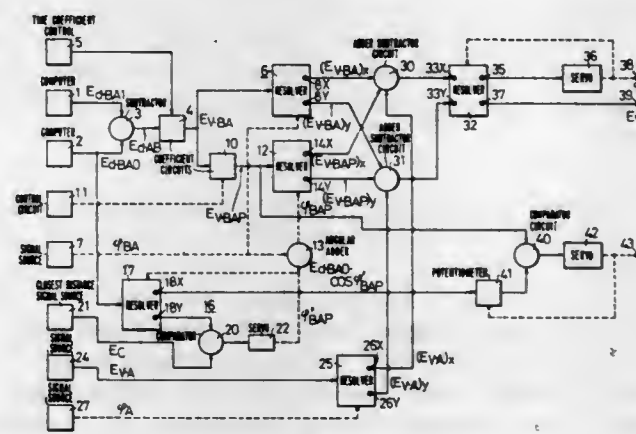
Filed July 13, 1970, Ser. No. 54,313

Claims priority, application Japan, July 15, 1969, 44/55574

Int. Cl. G01s 9/48, 9/04

U.S. Cl. 343-5 ST

16 Claims



A speed, heading and time signal generating system for a ship comprising means for producing a speed signal for controlling the speed of the ship, means for producing a heading signal for controlling the heading of the ship, such that when the ship is in danger of a collision with other objects, a collision is avoided. This is accomplished by setting into the system a signal representative of the distance of the closest point of approach between the ship and the other object as well as speed

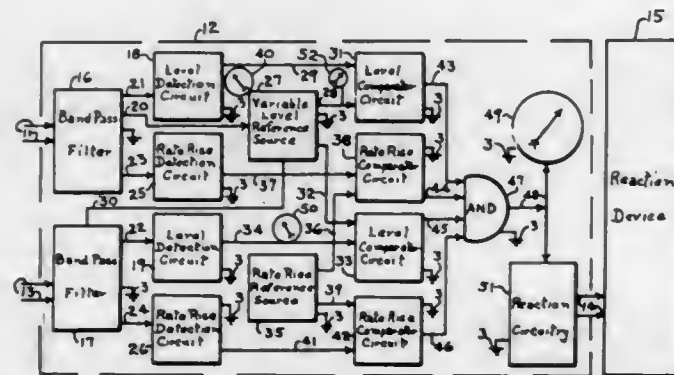






passive directional receiving antennas aimed toward the sky for receiving electromagnetic energy radiated from the earth and reflected from the surfaces of metallic objects within the cones of reception of the antennas. This system makes use of passive receiving antennas discretely arrayed for receiving radiation in the microwave region of the electromagnetic radiation spectrum. The radiation signals received by each antenna are inputs to a like number of frequency band pass filters whereby a metallic object is detected and/or located by radiometric techniques when a certain predetermined level of radiation at a predetermined rate is received.

This invention makes use of the law of Planck which sets forth that a black body radiates electromagnetic radiation at



all frequencies as a function of the absolute temperature of the body. Therefore, the earth which approximates a black body, radiates electromagnetic radiation as a function of its surface temperature, approximately 300° Kelvin. When the electromagnetic energy radiated from the earth is reflected from a metallic body above the earth into the cone of reception of an antenna directed toward the sky, there will be an increase in the received radiation toward the 300° Kelvin. A continuing background "noise" radiation is received from the outer sky as a result of the sky's radiometric temperature, approximately 30° Kelvin. The increase toward 300° Kelvin at a rate indicative of the speed of entry of the metallic object into the cone denotes that a metallic body is indeed within such cone of reception.

3,735,406

## NAVIGATION AID

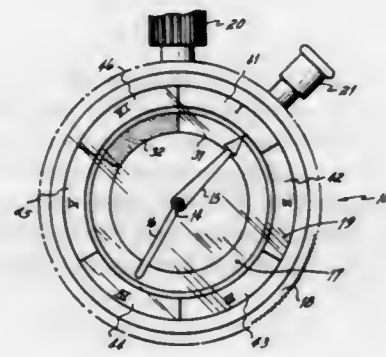
Morton B. Curley, 457 Melissa Court, Gahanna, Ohio

Filed July 7, 1970, Ser. No. 52,937

Int. Cl. G01s 1/68

U.S. Cl. 343-101

7 Claims



A device for systematic and continuous identification of radio beacon transmissions used in navigation by reference to the relationship of a pointer to indicia on the bezel of the apparatus. The indicia on the bezel correspond to the number of sequentially transmitting beacons and the bezel is rotatable to allow synchronization. When a beacon transmission is

identified, the bezel is rotated such that the indicia corresponding to the next beacon in the sequence is aligned with the reference position on the device. When the beacon terminates transmission, the device is started, causing the pointer to rotate such that the successive beacons transmission can be identified by observing the position of the pointer relative to the indicia.

3,735,407

## STEPPED BEAM INSTRUMENT LANDING SYSTEM

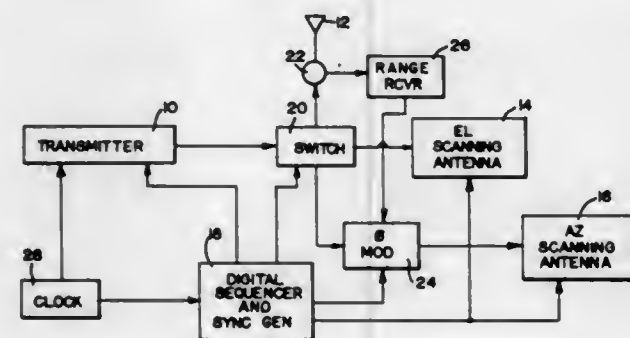
Maurice A. Meyer, Natick, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 3, 1970, Ser. No. 25,393

Int. Cl. G01s 1/54

U.S. Cl. 343-106 R

16 Claims



A signal processing system for use in an instrument landing system and operative to continuously measure aircraft position from stepped antenna patterns. Time sequential spatially stepped overlapping antenna beams are generated in the azimuth and elevation planes, and logic circuitry provided for measuring the power spectra of adjacent stepped antenna beams and for deriving precise and continuous position information therefrom.

3,735,408

## COMMON AZIMUTH SECTOR INDICATING SYSTEM

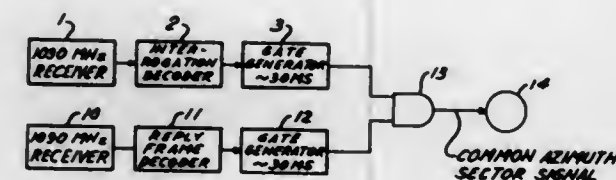
George B. Litchford, Northport, N.Y., assignor to Litchstreet Co., Northport, N.Y.

Filed Apr. 5, 1971, Ser. No. 130,952

Int. Cl. G01s 9/56

U.S. Cl. 343-112 CA

10 Claims



A proximity warning system for aircraft, using only the signals emitted by secondary surveillance radar and cooperating transponder equipped aircraft, to indicate presence of an intruder in a defined common azimuth sector which is wider than the radar beam, and to provide range information regarding such an intruder based on a side lobe suppression signal transmitted by the radar.

3,735,409

## ELECTROMAGNETIC WAVE RECEIVER

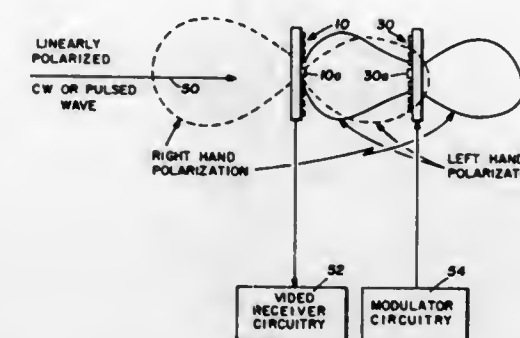
David N. Gershberg, Rockville, Md., and Alex Y. Lee, Arlington, Va., assignors to E-Systems, Inc., Dallas, Tex.

Filed Feb. 22, 1972, Ser. No. 228,193

Int. Cl. G01s 5/02

U.S. Cl. 343-113 R

16 Claims



Video pulse radio frequency receivers are rendered sensitive to continuous waves by means of an amplitude modulation technique involving coupling between circularly polarized antennas. The circularly polarized antennas incorporate semiconductor diodes as an integral part of the antenna structure. Two circularly polarized antennas with diodes incorporated therein are mounted in tandem with counter rotating faces directed toward a source of linearly polarized electromagnetic wave. One circularly polarized component of the electromagnetic wave excites the first antenna, while the counter rotating component passes through the first antenna and excites the second antenna. The integral diode of the antennas acts respectively as a detector and modulator, with radio frequency coupling being provided by the tandem arrangement which locates the antenna faces of like polarization sense adjacent each other. By arranging a multiple of the pairs of tandem mounted antennas in a distributed pattern, direction finding capabilities are provided.

3,735,410

## DIRECTION FINDER GAIN CALIBRATION UPDATING SYSTEM

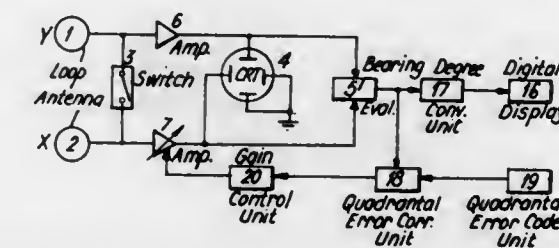
Dag Poppe, 1346 Gjettem, and Odd Mathiesen, Oslo 5, both of Norway, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 27, 1971, Ser. No. 212,531

Int. Cl. G01s 3/10

U.S. Cl. 343-114

6 Claims



A calibration (updating) system for dual channel direction finders having two receiver channels associated with a corresponding pair of loop antennas. A cathode ray tube having orthogonal deflection elements is connected to present the two receiver channel outputs as an index line at the bearing angle. Means are included for calibrating the gain and phase characteristics of the channels automatically. A signal evaluation circuit employing self-adjusting feedback arrangement automatically injects a bearing offset during the gain and phase calibration (updating) process to correct for quadrantal errors.

3,735,411

## HIGH-RANGE RESOLUTION RADAR REAL-TIME DISPLAY APPARATUS

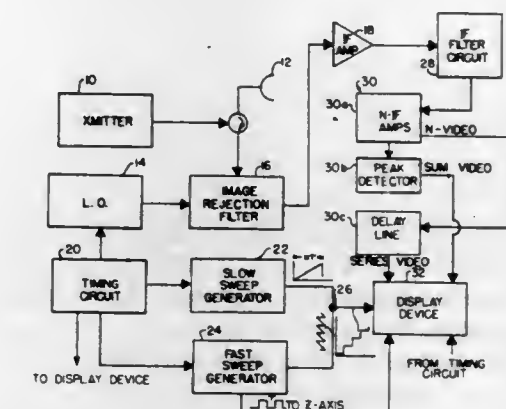
Richard G. Whitnah, Bremerton, Wash., and Abe Goldstein, Santa Ana, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 11, 1971, Ser. No. 170,688

Int. Cl. G01s 9/02, 9/12

U.S. Cl. 343-17.2 R

5 Claims



A high-range resolution radar display apparatus for generating a composite coarse and fine real-time radar display simultaneously without an intermediate storage system. One display comprises an extended length display which allows an operator to search an extended delta range and is generated by peak detecting range information from narrow bandwidth IF filters. The other display is a limited extent display featuring the maximum resolution capability of the correlation radar system for detailed target examination and is generated by feeding the information from each of the IF filters to common delay line circuitry for making the information, which represents contiguous range samples, contiguous in time.

3,735,412

## REMOTE CONTROL SYSTEMS

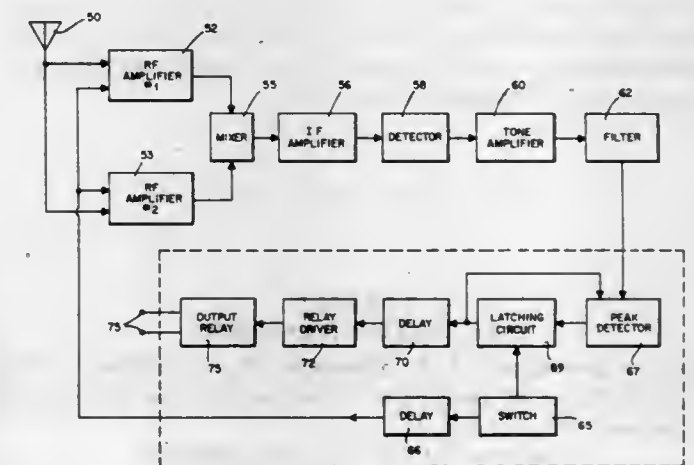
Roy Kampmeyer, Ambler, Pa., assignor to Ambler Electronics, Ambler, Pa.

Filed July 13, 1971, Ser. No. 162,094

Int. Cl. H04b 7/00

U.S. Cl. 343-225

8 Claims

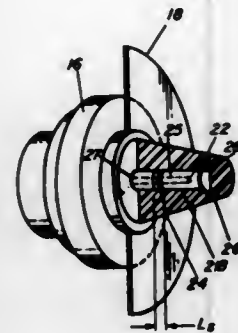


A mechanically actuated, radio frequency transmitter capable of providing radio frequency transmissions, without the



need of stored electrical energy or external electrical energy, for utilization in remote control systems, consisting of an AC generator comprising a mechanically actuated rotor which is caused to rotate in close proximity to a stator assembly by rack and pinion means thereby resulting in induced electrical energy in the form of a sine wave; a tone generator; radio frequency oscillator means; and a single antenna for transmitting at least one signal generated by the radio frequency oscillator means. A receiver system eliminates the necessity for conventional oscillator by combining signals received from the transmitter, producing an intermediate frequency signal and demodulating the resulting signal by tone amplifier and filter means.

ground plane, having one end in abutment with said ground plane, wherein said cable comprises an elongated hollow

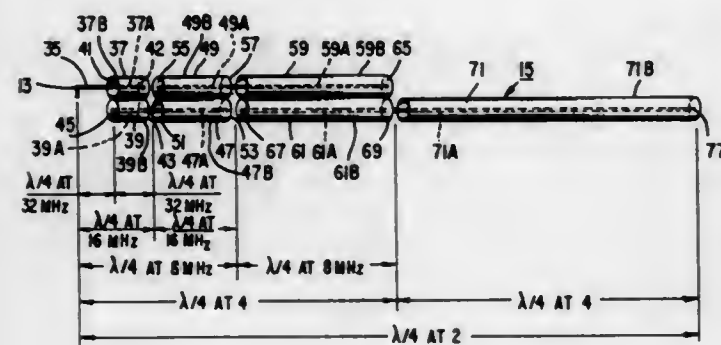


**3,735,413**  
**MULTIFREQUENCY ANTENNA SYSTEM INCLUDING AN ISOLATION SECTION OPEN CIRCUITED AT BOTH ENDS**  
Oakley McDonald Woodward, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 19, 1971, Ser. No. 173,109  
Int. Cl. H01q 1/00, 9/16

U.S. Cl. 343-730

6 Claims



A multifrequency antenna system including a center fed dipole element one-half wavelength long at the lowest frequency of operation is described. This dipole element has circuit elements at appropriate positions along the element on each side of the center feed such that the center section of the dipole is effectively "cut" to form higher frequency dipoles one-half wavelength long at the higher harmonic frequencies of the lowest frequency of operation. Mutual coupling between the center section associated with a higher frequency dipole and the adjacent section is essentially zero by the adjacent sections including a quarter wave section at the higher frequency open circuited at each end.

**3,735,414**  
**SLOT FED STUB ANTENNA**  
Murray Rosenbluth, Lake Hiawatha, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 13, 1971, Ser. No. 207,295  
Int. Cl. H01q 13/12

U.S. Cl. 343-769

3 Claims

A slot fed stub antenna comprising a ground plane and a cable geometrically centered and normally aligned with said

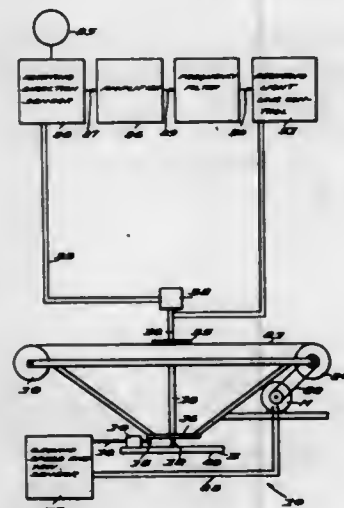
member, dielectrically supported, having a circumferentially slotted cross section and a wire axially centered within said hollow member.

**3,735,415**  
**EMITTER LOCATION MAPPING DEVICE**  
Dwin R. Craig, Gaithersburg, Md., assignor to Ingenuics, Inc., Gaithersburg, Md.

Filed Jan. 9, 1970, Ser. No. 1,639  
Int. Cl. G01d 9/42

U.S. Cl. 346-33 B

5 Claims



An emitter location mapping device in which a vehicle mounted rotating direction finding sensor of emitter radiations is actuated by the emitter radiation to supply trigger pulses to a synchronously rotated line source of light which underexposes film that is moved past the exposing head at a rate proportional to ground speed. The intersection of a plurality of underexposures for each emitter location produces a localized exposure on the film at the location of the radiation emitter. The ratio of film speed to ground speed determines the scale of the resulting map.

**3,735,416**  
**MAGNETIC PRINTING SYSTEM**  
Owen J. Ott, Brookfield, and David W. Ginn, Newton, both of Conn., assignors to Data Interface Associates, Brookfield, Conn.

Filed Apr. 30, 1971, Ser. No. 138,924  
Int. Cl. G03g 19/00; H04n 1/28  
U.S. Cl. 346-74 MP

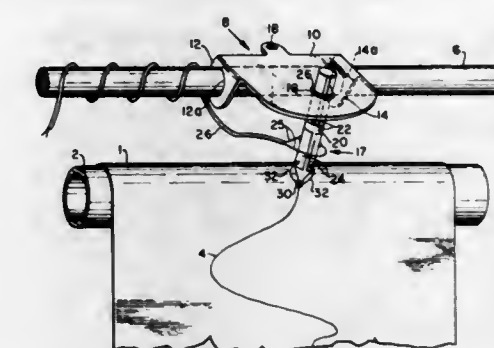
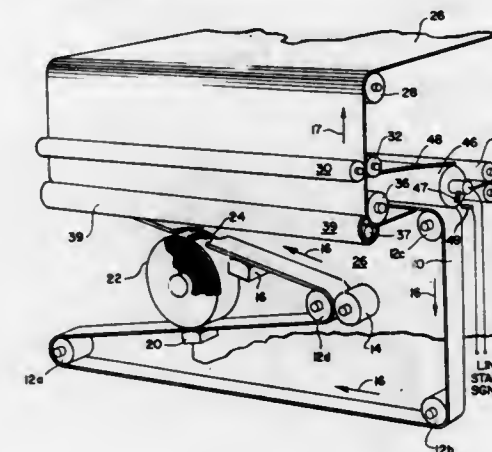
30 Claims

**3,735,417**  
**TEMPERATURE REGULATING HEAT-RECORDING STYLUS**  
Emil A. Holzhauser, Fort Washington, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 26, 1971, Ser. No. 192,391  
Int. Cl. G01d 15/10

U.S. Cl. 346-139 C

8 Claims



A high speed non-impact printing system in which data to be printed is recorded on a magnetic tape as an array of elements to which a magnetic toner is applied and subsequently transferred onto an associated page. The system can be employed to print alphanumeric characters, symbols and the like, as well as pictorial or graphical information, and individual characters or entire lines can be printed during a print cycle.

A recording apparatus for recording on heat-sensitive material including a recording stylus having a mandrel of an electrically insulating material capable of withstanding an elevated recording temperature. Electrical conductors are deposited on the surface of the mandrel to electrically connect a source of electrical power to a thermister forming a characterized recording end of the mandrel and having a positive temperature coefficient of resistance. The mandrel is attached to a stylus support arranged to be selectively driven across a recording material with the electrical conductors being electrically isolated from the stylus support.



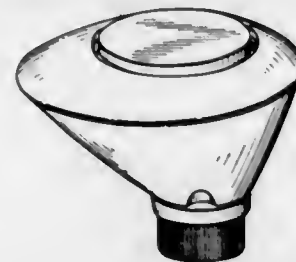
# DESIGNS

MAY 22, 1973

226,941

**ELECTRIC SKIN HYGIENE BRUSH**  
John L. Benty, Scotch Plains, N.J., and Dominic Defano, Palatine, Ill., assignors to Clairol Incorporated, New York, N.Y.  
Filed May 27, 1971, Ser. No. 147,730  
Term of patent 14 years  
Int. Cl. D4—02

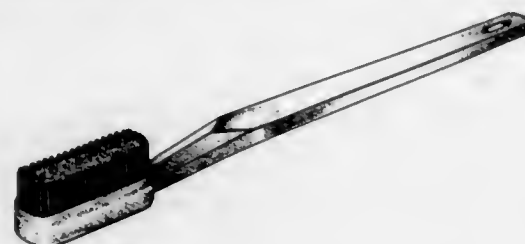
U.S. Cl. D4—14



226,942

**TOOTH BRUSH**  
Sakuji Okuda, 42-3, 1-chome Sugamo, Toshima-ku, Tokyo, Japan  
Filed May 11, 1971, Ser. No. 142,430  
Term of patent 14 years  
Int. Cl. D4—02

U.S. Cl. D4—25



226,943

**CLOTHES HANGER**  
Tom Erik Torbjorn Ahlström and Hans Otto Georg Ehrich, both of 13 Brannkyrkagatan, S-117 20 Stockholm, Sweden  
Filed Aug. 11, 1971, Ser. No. 171,041  
Claims priority, application Sweden May 6, 1971  
Term of patent 14 years  
Int. Cl. D6—08

U.S. Cl. D6—248



226,944

**DOOR CHAIN LOCK**  
Louis G. Bobrowski, Berlin, Conn., assignor to The Stanley Works, New Britain, Conn.  
Filed Sept. 8, 1971, Ser. No. 178,854  
Term of patent 14 years  
Int. Cl. D8—07

U.S. Cl. D8—131



226,945

**COMBINED CAN CLOSURE AND POURING SPOUT**  
Albert E. Burkhardt, 5 Sunnysfield, Rolling Hills Estates, Calif. 90274  
Filed Aug. 23, 1971, Ser. No. 174,284  
Term of patent 14 years  
Int. Cl. D9—07

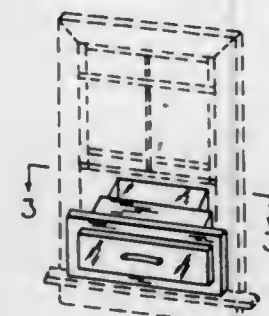
U.S. Cl. D9—275



226,946

**RETRACTABLE WINDOW CASE STRUCTURE AND SUPPORT THEREFOR**  
John P. Francis, 20 Boston St., Haverhill, Mass. 01830  
Filed Sept. 9, 1971, Ser. No. 179,243  
Term of patent 14 years  
Int. Cl. D25—02

U.S. Cl. D13—1 M



MAY 22, 1973

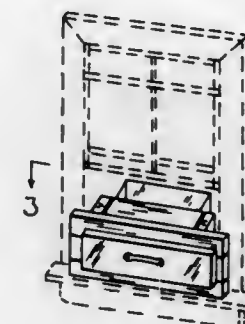
U. S. PATENT OFFICE

1445

226,947

**RETRACTABLE WINDOW CASE STRUCTURE AND SUPPORT THEREFOR**  
John P. Francis, 20 Boston St., Haverhill, Mass. 01830  
Filed Sept. 9, 1971, Ser. No. 179,244  
Term of patent 14 years  
Int. Cl. D25—02

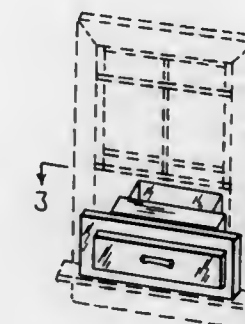
U.S. Cl. D13—1 M



226,948

**RETRACTABLE WINDOW CASE STRUCTURE AND SUPPORT THEREFOR**  
John P. Francis, 20 Boston St., Haverhill, Mass. 01830  
Filed Sept. 9, 1971, Ser. No. 179,245  
Term of patent 14 years  
Int. Cl. D25—02

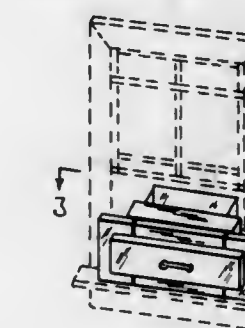
U.S. Cl. D13—1 M



226,949

**RETRACTABLE WINDOW CASE STRUCTURE AND SUPPORT THEREFOR**  
John P. Francis, 20 Boston St., Haverhill, Mass. 01830  
Filed Sept. 9, 1971, Ser. No. 179,246  
Term of patent 14 years  
Int. Cl. D25—02

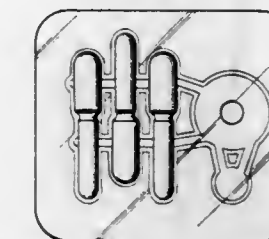
U.S. Cl. D13—1 M



226,950

**DETECTOR FOR BLOOD ANALYSIS**  
James J. Sirago, 910 Enterprise, Inglewood, Calif. 90302, and Edward B. Walton, 3129 Yale Ave., Marina Del Rey, Calif. 90291  
Filed Aug. 27, 1971, Ser. No. 175,796  
Term of patent 14 years  
Int. Cl. D24—02; D9—04

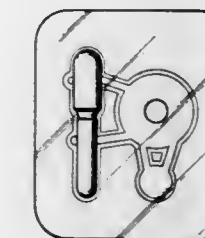
U.S. Cl. D16—1 R



226,951

**DETECTOR FOR BLOOD ANALYSIS**  
James J. Sirago, 910 Enterprise, Inglewood, Calif. 90302, and Edward B. Walton, 3129 Yale Ave., Marina Del Rey, Calif. 90291  
Filed Aug. 27, 1971, Ser. No. 175,795  
Term of patent 14 years  
Int. Cl. D24—02

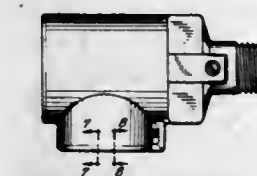
U.S. Cl. D16—2 B



226,952

**PRESSURE RELIEF VALVE**  
Frederick J. Brindisi, Rochester, N.Y., assignor to Qualitrol Corporation, Fairport, N.Y.  
Filed July 23, 1971, Ser. No. 165,869  
Term of patent 14 years  
Int. Cl. D23—01

U.S. Cl. D23—19



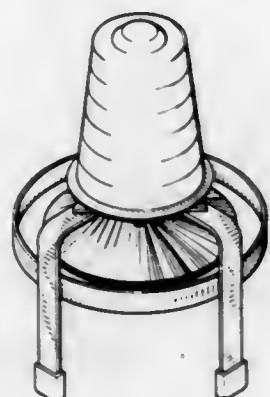


226,953

**HUMIDIFIER**

Robert T. Martin, 1708 East 4800 South,  
Salt Lake City, Utah 84117  
Filed Sept. 2, 1971, Ser. No. 177,541  
Term of patent 14 years  
Int. Cl. D23—09

U.S. Cl. D23—146



226,954

**TEACHING AID FOR MEASURING THE ACCELERATION OF A FALLING BODY**

Roger D. Stephenson, Overland Park, Kans., assignor to  
Physics Apparatus Research, Inc., Overland Park, Kans.  
Filed Aug. 16, 1971, Ser. No. 172,372  
Term of patent 14 years  
Int. Cl. D19—07

U.S. Cl. D25—1



226,955

**MEDALLION**

Elaine J. Papavasiliou, Shoreham, N.Y., assignor to  
Symbolics, Inc., Port Jefferson, N.Y.  
Filed July 21, 1971, Ser. No. 164,963  
Term of patent 3½ years  
Int. Cl. D11—03

U.S. Cl. D29—19



226,956

**MEDALLION**

Elaine J. Papavasiliou, Shoreham, N.Y., assignor to  
Symbolics, Inc., Port Jefferson, N.Y.  
Filed July 21, 1971, Ser. No. 164,965  
Term of patent 3½ years  
Int. Cl. D11—03

U.S. Cl. D29—19



226,957

**TOY TRACKWAY**

Toshikatsu Arai, Tokyo, Japan, assignor to Tomy  
Kogyo Co., Ltd., Tokyo, Japan  
Filed Aug. 20, 1971, Ser. No. 173,713  
Term of patent 14 years  
Int. Cl. D21—01

U.S. Cl. D34—15 MM

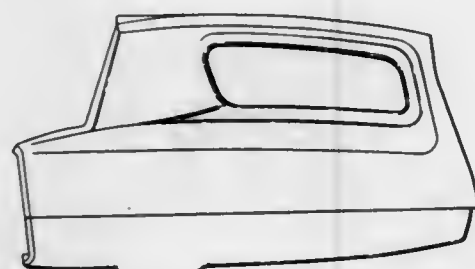


226,958

**ELECTRIC MIXER HOUSING**

Gordon W. Florian, Fairfield, Conn., assignor to General  
Signal Corporation, Rochester, N.Y.  
Filed May 17, 1971, Ser. No. 144,389  
Term of patent 14 years  
Int. Cl. D7—04

U.S. Cl. D44—1 C

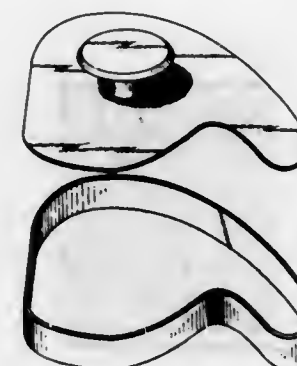


226,959

**FOOD MOLD**

Michael J. Pasquale, 115 Grove St.,  
Middletown, Conn. 06457  
Filed July 21, 1971, Ser. No. 164,969  
Term of patent 14 years  
Int. Cl. D7—04

U.S. Cl. D44—1 L

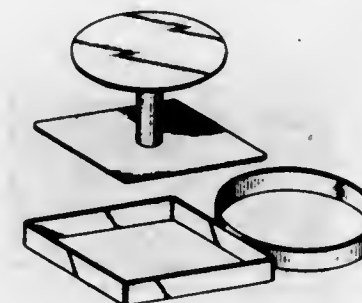


226,960

**FOOD MOLD**

Michael J. Pasquale, 115 Grove St.,  
Middletown, Conn. 06457  
Filed July 21, 1971, Ser. No. 164,975  
Term of patent 14 years  
Int. Cl. D7—04

U.S. Cl. D44—1 L



226,961

**DRINKING CUP**

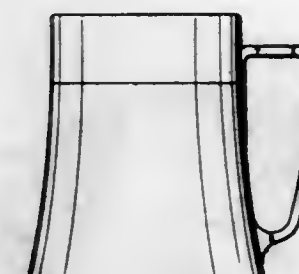
Lyle E. King, R.R. 1, Homer, Ill. 61849  
Filed June 24, 1971, Ser. No. 156,589  
Term of patent 14 years  
Int. Cl. D7—01

U.S. Cl. D44—9 B

226,962  
CUP

Albert W. Krock, Fremont, Ohio, assignor to The Scott &  
Fetzer Company  
Filed Dec. 16, 1971, Ser. No. 209,012  
Term of patent 14 years  
Int. Cl. D7—01

U.S. Cl. D44—9 A

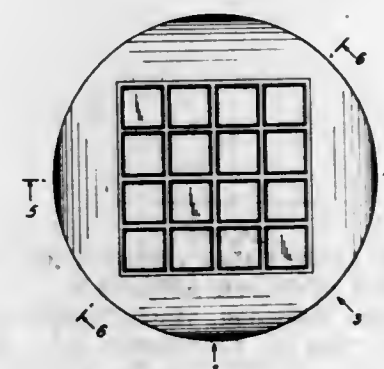


226,963

**COASTER**

Nicholas P. Angelakos, Brooklyn, N.Y., assignor to  
Lancaster Colony Corporation  
Filed Sept. 15, 1971, Ser. No. 180,941  
Term of patent 14 years  
Int. Cl. D7—99

U.S. Cl. D44—10 D



226,964

**DISH**

Robert W. Schier, Glenview, Ill., assignor to Design  
Dynamics, Inc., Northfield, Ill.  
Filed Dec. 23, 1971, Ser. No. 211,836  
Term of patent 14 years  
Int. Cl. D7—01

U.S. Cl. D44—10 A





226,965

## PLATE OR SIMILAR ARTICLE

Johanna Grams, Bremen, Germany, assignor to Porzellan-Handels-G.m.b.H., Berlin, Germany  
 Filed July 27, 1971, Ser. No. 166,653  
 Claims priority, application Germany Feb. 1, 1971  
 Term of patent 14 years  
 Int. Cl. D7—01

U.S. Cl. D44—15 J



226,967

## EXPANSIBLE LINK CHAIN FOR A BRACELET OR SIMILAR ARTICLE

Raymond C. Fontaine, Greenville, R.I., assignor to Textron, Inc., Providence, R.I.  
 Filed Mar. 17, 1972, Ser. No. 235,883  
 Term of patent 14 years  
 Int. Cl. D11—01

U.S. Cl. D45—4 E

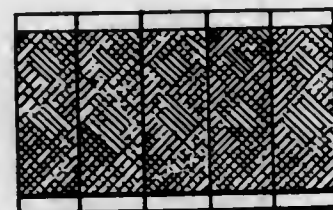


226,968

## EXPANSIBLE LINK CHAIN FOR A BRACELET OR SIMILAR ARTICLE

Murray L. Cowan, Norwood, Mass., assignor to Textron, Inc., Providence, R.I.  
 Filed July 3, 1972, Ser. No. 268,886  
 Term of patent 14 years  
 Int. Cl. D11—01

U.S. Cl. D45—4 E

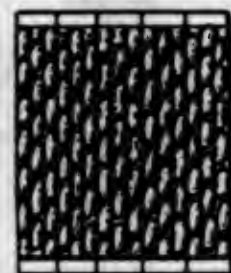


226,966

## EXPANSIBLE LINK CHAIN FOR A BRACELET OR SIMILAR ARTICLE

Murray L. Cowan, Norwood, Mass. (Speldel A Textron Company, 70 Ship St., Providence, R.I. 02903)  
 Filed Mar. 17, 1972, Ser. No. 235,881  
 Term of patent 14 years  
 Int. Cl. D11—01

U.S. Cl. D45—4 E

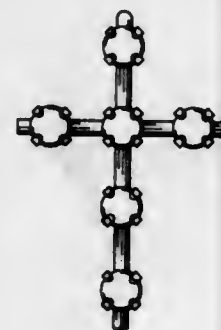


226,969

## CROSS PENDANT OR THE LIKE

Jeneane M. Quigley, Waterloo, Iowa, assignor to The Witness Cross, Waterloo, Iowa  
 Filed Mar. 20, 1972, Ser. No. 236,578  
 Term of patent 14 years  
 Int. Cl. D11—01

U.S. Cl. D45—16 B

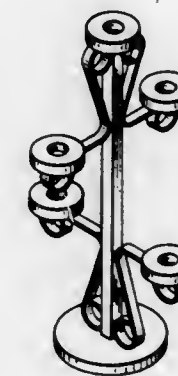


226,970

## CANDLE HOLDER

James D. Boyd, 3231 Washington Ave., St. Joseph, Mich. 49085  
 Filed July 19, 1972, Ser. No. 273,180  
 Term of patent 14 years  
 Int. Cl. D26—01

U.S. Cl. D48—2

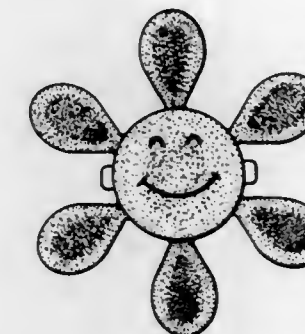


226,972

## NIGHT LIGHT

Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.  
 Filed Feb. 17, 1972, Ser. No. 227,321  
 Term of patent 14 years  
 Int. Cl. D26—05

U.S. Cl. D48—20 E



226,973

## CEILING MOUNTED FLUORESCENT LIGHT FIXTURE

Ernest Monte, Pasadena, Calif., assignor to Sunbeam Lighting Co., Los Angeles, Calif.  
 Filed June 24, 1971, Ser. No. 156,213  
 Term of patent 14 years  
 Int. Cl. D26—05

U.S. Cl. D48—23 A

226,971  
LAMP

Andrew P. MacNair, 152 Nassau St., Princeton, N.J. 08540  
 Filed July 12, 1971, Ser. No. 161,413  
 Term of patent 7 years  
 Int. Cl. D26—05

U.S. Cl. D48—20 A





226,974

## SPOON OR SIMILAR ARTICLE

Ellen B. Manderfield, Syracuse, N.Y., assignor to  
Oneida Ltd., Oneida, N.Y.

Filed Jan. 14, 1972, Ser. No. 218,051

Term of patent 14 years

Int. Cl. D7-03

U.S. Cl. D54-12 R



226,976

## SPOON OR SIMILAR ARTICLE

Colin B. Richmond II, Oneida, N.Y., assignor to  
Oneida Ltd., Oneida, N.Y.

Filed Feb. 24, 1972, Ser. No. 229,249

Term of patent 14 years

Int. Cl. D7-03

U.S. Cl. D54-12 A



226,975

## SPOON OR SIMILAR ARTICLE

Ellen B. Manderfield, Syracuse, N.Y., assignor to  
Oneida Ltd., Oneida, N.Y.

Filed Jan. 24, 1972, Ser. No. 220,559

Term of patent 14 years

Int. Cl. D7-03

U.S. Cl. D54-12 R



226,977

## SPOON OR SIMILAR ARTICLE

Ellen B. Manderfield, Syracuse, N.Y., assignor to  
Oneida Ltd., Oneida, N.Y.

Filed May 19, 1972, Ser. No. 255,318

Term of patent 14 years

Int. Cl. D7-03

U.S. Cl. D54-12 R



226,978

## SPOON OR SIMILAR ARTICLE

Colin B. Richmond II, Oneida, N.Y., assignor to  
Oneida Ltd., Oneida, N.Y.

Filed May 24, 1972, Ser. No. 256,631

Term of patent 14 years

Int. Cl. D7-03

U.S. Cl. D54-12 A



226,980

## SPOON OR SIMILAR ARTICLE

Frank R. Perry, Oneida, N.Y., assignor to  
Oneida Ltd., Oneida, N.Y.

Filed June 12, 1972, Ser. No. 262,125

Term of patent 14 years

Int. Cl. D7-03

U.S. Cl. D54-12 A



226,979

## SPOON OR SIMILAR ARTICLE

Colin B. Richmond II, Oneida, N.Y., assignor to  
Oneida Ltd., Oneida, N.Y.

Filed May 24, 1972, Ser. No. 256,631

Term of patent 14 years

Int. Cl. D7-03

U.S. Cl. D54-12 A



226,981

## SPOON OR SIMILAR ARTICLE

Ellen B. Manderfield, Syracuse, N.Y., assignor to  
Oneida Ltd., Oneida, N.Y.

Filed June 15, 1972, Ser. No. 263,189

Term of patent 14 years

Int. Cl. D7-03

U.S. Cl. D54-12 A



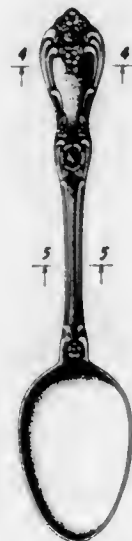


226,982

**SPOON OR SIMILAR ARTICLE**

Ellen B. Manderfield, Syracuse, N.Y., assignor to  
Oneida Ltd., Oneida, N.Y.  
Filed July 27, 1972, Ser. No. 275,691  
Term of patent 14 years  
Int. Cl. D7-03

U.S. Cl. D54-12 A



226,984

**STRINGED MUSICAL INSTRUMENT**

Walter J. Pelensky, 19C Manheim Gardens,  
Philadelphia, Pa. 19144  
Filed Sept. 20, 1971, Ser. No. 182,283  
Term of patent 14 years  
Int. Cl. D17-03

U.S. Cl. D56-1 A

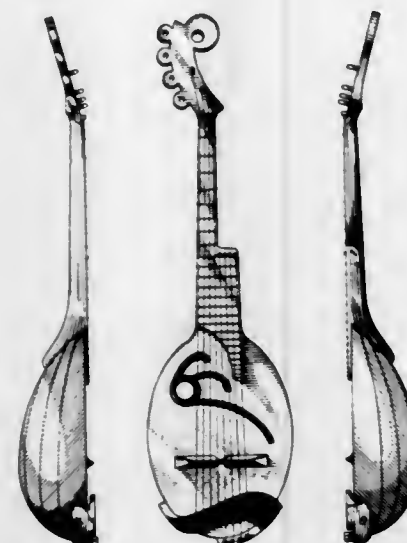


226,985

**STRINGED MUSICAL INSTRUMENT**

Walter J. Pelensky, 19C Manheim Gardens,  
Philadelphia, Pa. 19144  
Filed Sept. 20, 1971, Ser. No. 182,284  
Term of patent 14 years  
Int. Cl. D17-03

U.S. Cl. D56-1 A



226,983

**COMBINED CYMBAL MOUNT AND MUFFLER OR SIMILAR ARTICLE**

Robert M. Grauso, Bayside, and John J. Morena, Levittown, N.Y., assignors to C. F. Martin & Co., Nazareth, Pa.

Filed Apr. 30, 1971, Ser. No. 139,309  
Term of patent 14 years  
Int. Cl. D17-04

U.S. Cl. D56-1 E

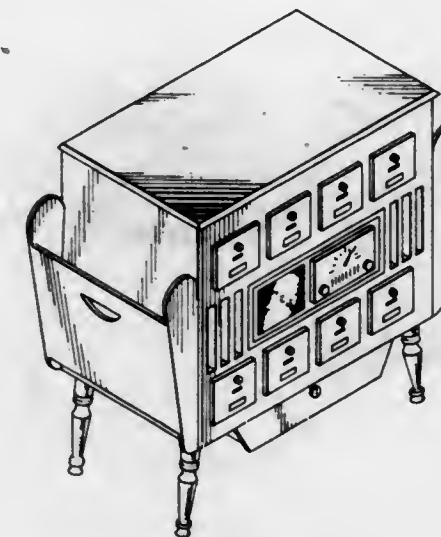


226,986

**COMBINED RADIO, CHEST AND MAGAZINE RACK OR SIMILAR ARTICLE**

Angelo J. Ladatta, 3719 Summer St.,  
Shreveport, La. 71109  
Filed Apr. 23, 1971, Ser. No. 137,094  
Term of patent 14 years  
Int. Cl. D14-03

U.S. Cl. D56-4 C

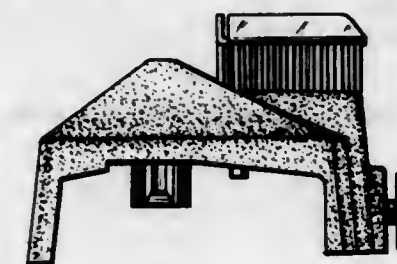


226,987

**ELECTRONIC FLASH ADAPTER FOR CAMERAS**

Keisuke Kitagawa, Tokyo, Japan, assignor to  
Kallmar, Inc., St. Louis, Mo.  
Filed June 25, 1971, Ser. No. 157,079  
Term of patent 7 years  
Int. Cl. D16-05

U.S. Cl. D61-1 F

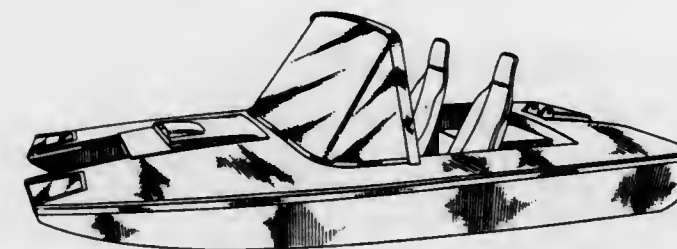


226,988

**WATER VEHICLE**

Robert V. Albertson, Wayzata, Minn., assignor to  
Massey-Ferguson Inc., Detroit, Mich.  
Filed July 12, 1971, Ser. No. 161,383  
Term of patent 14 years  
Int. Cl. D12-06

U.S. Cl. D71-1 Q

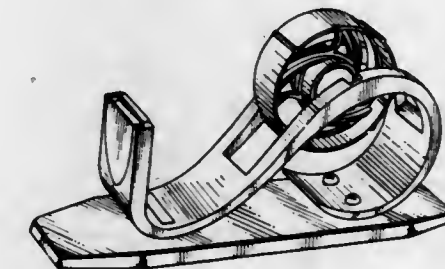


226,989

**ADHESIVE TAPE DISPENSER OR THE LIKE**

Tatsuo Kikuchi and Takashi Toyama, Tokyo, Japan, assignors to Nichiban Co., Ltd., Tokyo, Japan  
Filed July 30, 1971, Ser. No. 167,885  
Term of patent 14 years  
Int. Cl. D19-02

U.S. Cl. D74-1 B

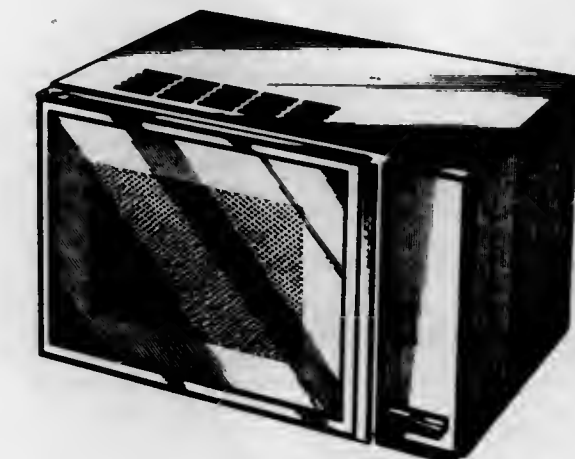


226,990

**MICROWAVE OVEN**

Donald G. Wolfe, Lake Barrington, Ill., and William Raymond Tapper, New Brighton, Minn., assignors to  
Litton Systems, Inc., Beverly Hills, Calif.  
Filed June 26, 1972, Ser. No. 266,118  
Term of patent 14 years  
Int. Cl. D7-02

U.S. Cl. D81-4

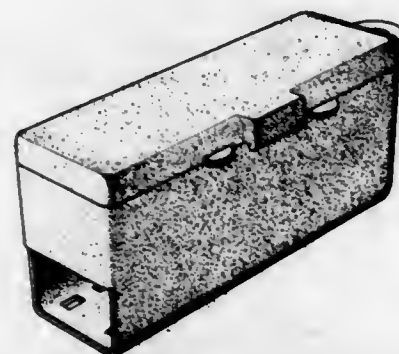




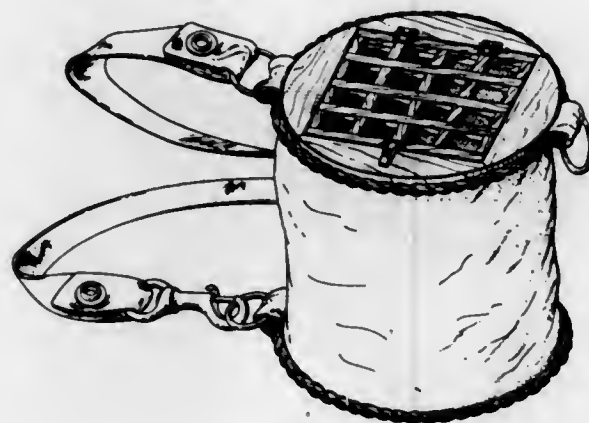
**226,991**  
**MOBILE HOUSING FOR CONDUCTING**  
**HEARING TESTS**  
 Carl-Axel Tegner, Majorsgatan 17, Stockholm, Sweden  
 Filed July 29, 1971, Ser. No. 167,563  
 Claims priority, application Sweden Feb. 12, 1971  
 Term of patent 14 years  
 Int. Cl. D24-01  
 U.S. Cl. D83-1 F



**226,992**  
**TOOTHBRUSH CONTAINER**  
 Roy G. Bridges, 641 S. 4th Ave.,  
 Los Angeles, Calif. 91746  
 Filed June 24, 1971, Ser. No. 156,577  
 Term of patent 14 years  
 Int. Cl. D3-99  
 U.S. Cl. D87-1 R



**226,993**  
**HANDBAG**  
 Arthur J. Fox, Edgewater Drive, Rte. 2, Box 234B,  
 Edgewater, Md. 21037  
 Filed Oct. 13, 1971, Ser. No. 189,075  
 Term of patent 14 years  
 Int. Cl. D3-01  
 U.S. Cl. D87-3 F



**226,994**  
**COMBINED FLUID DISPENSER AND**  
**CABINET THEREFOR**  
 Donald W. Bradley, 5625 Winston Drive,  
 Indianapolis, Ind. 46226  
 Filed Nov. 4, 1971, Ser. No. 195,894  
 Term of patent 14 years  
 Int. Cl. D7-99  
 U.S. Cl. D94-3 B



## LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 22d DAY OF MAY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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- Aba-Geigy Corporation: See—  
 Dexter, Martin, 3,734,926.
- Abbey, Inc.: See—  
 Abramowitz, Lorne, 3,733,614.
- Abernathy, William D. Wall frame construction apparatus. 3,734,376, Cl. 227-111.000.
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- Ace Tank and Heater Company: See—  
 Cancilla, Edward; and Lanahan, Bernard E., 3,734,064.
- ACF Industries Incorporated: See—  
 Natho, Paul J.; and Vicari, Felix J., 3,734,455.
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- Adamovske Strojirny, narodni podnik: See—  
 Jiruse, Jaroslav, 3,734,016.
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 Patterson, William L., 3,734,342.
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- Aerojet-General Corporation: See—  
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- Afga-Gevaert Aktiengesellschaft: See—  
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- Agence Nationale de Valorisation de la Recherche (Anvar): See—  
 Barberon, Michel; Fruchard, Elaine, nee Triquet; Eruchart, Robert; Lorthoir, Gerard Louis; and Madar, Roland, 3,735,373.
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- Wick, Richard; Winkler, Alfred; and Von Fischern, Bernhard, 3,733,989.
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- Agfa-Gevaert N.V.: See—  
 Bories, Jacques Elie, 3,734,735.
- Poot, Albert Lucien; Van Besauw, Jan Frans; and Ghys, Theofiel Hubert, 3,734,733.
- Stievenart, Emile Frans; and Verbruggen, Herman Fernand, 3,733,992.
- Aglitsky, Vladimir Efimovich: See—  
 Alexandrov, Adolf Moritsovich; Isimbler, Yury Abramovich; Lachinov, Alexandr Alexandrovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; and Topolyansky, Yury
- Arnoldovich, 3,734,428.
- Ahl, Nils Boran: See—  
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- Ahlstrom, John F.: See—  
 Cornell, Clark; Himler, Gary J.; and Ahlstrom, John F., 3,735,348.
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- Aintabian, Avedis A., to International Systems Management. Use of composted refuse to make construction products. 3,734,988, Cl. 264-82.000.
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 Hungate, Ernest C.; Ogletree, Harold A.; and Nickell, Grason T., 3,733,778.
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 De Baun, Kenneth W., 3,733,900.
- Air Preheater Company, Inc.: See—  
 Anderson, William M.; and Dervay, John R., 3,733,784.
- Air Products and Chemicals, Inc.: See—  
 Biskis, Edward G., 3,734,293.
- Danzig, Meyer H.; and Carlson, Allen W., 3,734,806.
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 Soya, Masahiro; Aizawa, Kensuke; and Hasegawa, Hiroaki, 3,733,896.
- Akashi, Robert. Rotary potentiometer with fine adjustment. 3,735,325, Cl. 338-164.000.
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 Nilsson, John Martin; and Palicka, Jadwiga, 3,734,956.
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- Aladdon Manufacturing Company: See—  
 Wintz, Donald E., 3,734,439.
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- Aldrich, Charles A.; and Land, Karl M., to Cities Service Oil Company. Forward looking sonic wellbore inspector. 3,735,338, Cl. 340-18.00r.
- Alecci, Donald E.: See—  
 Sinnott, David J.; and Alecci, Donald E., 3,733,983.
- Alexandrov, Adolf Moritsovich; Isimbler, Yury Abramovich; Lachinov, Alexandr Alexandrovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; and Topolyansky, Yury Arnoldovich. Carriage for containers. 3,734,428, Cl. 243-33.000.
- Alfa-Laval AB: See—  
 Larsen, Hans Christian, 3,734,741.
- Alicot, Marie-Joséphine Jeanne: See—



- Roe, Rene Pierre Victor; Levavasseur, Andre Adolphe Rene; Sureau, Robert Frederic Michel; and Alicot, Marie-Josephe Jeanne, 3,734,905.
- Allan, John W.: See—  
Walden, Ernest J.; and Allan, John W., 3,734,786.
- Allegheny Ludlum Industries, Inc.: See—  
Kozak, Larry M.; and Southern, Raymond L., 3,734,384.  
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- Allen, Irving, to Sargent and Company. Compound action tool with wire stripper and bolt cutter. 3,733,626, Cl. 7-5.300.
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Lipscomb, Walter Peter; and Shelburne, Eli Bently, Sr., 3,734,803.  
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- Allis, Lewis, Company, The: See—  
Wickersheimer, Jack C., 3,735,167.
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Curtis, Donald R., 3,734,821.
- Almegard, Svante G.; and Ericson, Harry A. H., to Nordner AB. Cleaning devices for chemical or electro-chemical surface treatment plants. 3,734,108, Cl. 134-76.000.
- Alongi, John R.: See—  
Elders, Gerald W.; Schneider, Thomas E.; and Alongi, John R., 3,734,380.
- Alpine Aktiengesellschaft: See—  
Kaiser, Fritz W., 3,734,413.
- Alps Electric Co., Ltd.: See—  
Yanaga, Makoto; and Shimoto, Takemi, 3,735,063.
- Altadonna, James. Liquid processing system. 3,734,854, Cl. 210-203.000.
- Altman, Josef, to Telephon- und Telegraphen-Fabriks Aktiengesellschaft. Multi-contact terminal support assembly for an electromagnetic relay. 3,735,294, Cl. 335-134.000.
- Aluminium Suisse S.A.: See—  
La Roche, Rene, 3,734,782.
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Anderson, Arvid N.; and Batterman, Richard H., 3,733,878.  
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- Alza Corporation: See—  
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- Amada Company Limited: See—  
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- Amana Refrigeration, Inc.: See—  
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- Amaral, Wallace: See—  
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- Ambler Electronics: See—  
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- Ambrogio, Vittorio; Logemann, Willy; Parenti, Marcantonio; and Tommasini, Raffaele, to Erba, Carlo, S.p.A. Certain diazylcarbox-amidoethylbenzenesulfonfylureas. 3,734,910, Cl. 260-250.00a.
- Amerel Company, Inc.: See—  
Brummet, Paul L.; and Isley, Sigmund G., 3,734,027.
- American Air Filter Company, Inc.: See—  
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- American Aniline Products, Inc.: See—  
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- American Cyanamid Company: See—  
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- American Express Investment Management Company: See—  
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- American Home Products Corporation: See—  
Alburn, Harvey E.; and Dvonch, William, 3,734,949.  
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- American Hospital Supply Corporation: See—  
Murdough, Charles P.; and Neely, Alfred W., 3,734,077.
- American Seating Company: See—  
Barecki, Chester J.; and Henrikson, Bror W., 3,734,561.
- American Spin-A-Batch Company: See—  
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- American Store Equipment Corporation: See—  
Schulte, Donald W.; and Logie, Charles F., 3,733,759.
- Amex Phosphates, Inc.: See—  
Burns, Tom V., 3,734,708.
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- Amoco-Production Company: See—  
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- Ampex Corporation: See—  
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- Anaconda Wire and Cable Company: See—  
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- Anchor Hocking Corporation: See—  
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- Anderson, Perry W.: See—  
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- Anderson, William M.; and Dervay, John R., to Air Preheater Company, Inc., The. Electro-bag dust collector. 3,733,784, Cl. 55-117.000.
- Anderson, Henry; Dahl, Goran; and Arnell, C. G. Powder propellant cartridge. 3,734,024, Cl. 102-100.000.
- Anderson, Louis. Combustion gas generator. 3,733,820, Cl. 60-39.770.
- Anderson, Per Lennart: See—  
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- Andresen, Jens Nicolai, to Danfoss A/S. Snap-action electric switch. 3,735,069, Cl. 200-67.00d.
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- Andrews, Robert S., to McDonnell Douglas Corporation. Hydraulic system. 3,733,969, Cl. 91-421.000.
- Anikanov, Nikolai Ivanovich: See—  
Duchinsky, Yakov Efimovich; Radutsky, Grigory Avramovich; Kheifets, Rafail Efimovich; Zax, Grigory Iosifovich; Anikanov, Nikolai Ivanovich; and Grachev, Leonid Pavlovich, 3,733,774.
- Annis, Robert E., to General Motors Corporation. Transmission and hydraulic source. 3,733,920, Cl. 74-763.000.
- Annis, Robert E.; and Cheek, Forrest R., to General Motors Corporation. Hydrodynamic unit with mechanical drive clutch. 3,734,251, Cl. 192-3.300.
- Anthes Equipment Limited: See—  
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- Anti-pick tumbler lock device: See—  
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- Aoba, Takashi: See—  
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- Apolant, Richard, to S.C.J. Associates Inc. Oscillator system. 3,735,276, Cl. 331-11.000.

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- Arai, Shinichiro: See—  
Ueno, Ryuzo; Miyazaki, Tetsuya; Matsuda, Toshio; and Arai, Shinichiro, 3,734,748.
- Arbeitland, Erich: See—  
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- Arbiter, William: See—  
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- Arcair Company: See—  
McCall, Kenneth E.; and Reese, Donald H., 3,735,085.
- Archer, Donald H.; and Prickett, Robert J., to Raytheon Company. Signal spectrum analyzer. 3,735,256, Cl. 324-77.00d.
- Ares, Roland A.; Bullard, Russell H.; and Spear, Ernest L., to Singer Company, The, meane. Coil for air duct installation. 3,734,171, Cl. 165-54.000.
- Arimura, Tohru; Okado, Masaru; Fukuma, Yuji; and Ido, Yoshimitsu, to Nippon Kokan Kabushiki Kaisha. Method of controlling a continuous hot rolling mill. 3,733,866, Cl. 72-6.000.
- Ark-Les Switch Corporation: See—  
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- Arman, Dario. Windshield wiper for automobiles. 3,733,643, Cl. 15-250.420.
- Armitage, Firth Kay. Methods of preparing wall covering. 3,733,689, Cl. 29-559.000.
- Armours Pharmaceutical Company: See—  
Rubino, Andrew M., 3,734,940.
- Armstrong, Clarence J.; and Cronin, Alvin, to Ittek Corporation. Apparatus for washing of photographic material. 3,733,994, Cl. 95-97.000.
- Armstrong, James E. Pipe pallet. 3,734,281, Cl. 206-65.00b.
- Arnell, C. G.: See—  
Andersson, Henry; Dahl, Goran; and Arnell, C. G., 3,734,024.
- Arnett, Samuel E., to Bendix Corporation, The. Thrust control mechanism. 3,733,825, Cl. 60-235.000.
- Arnoldy, Roman F., to R. I. Patents, Inc. Method and apparatus for adjustable metering. 3,735,087, Cl. 219-73.000.
- Arrow-Hart, Inc.: See—  
Tirrell, James R., 3,735,332.
- Arthur, Eric Richard. Dressmaking forms. 3,734,362, Cl. 223-68.000.
- Arythioanthraquinones: See—  
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- Asahi-Dow Limited: See—  
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- Asano, Kazuo; Furukawa, Minoru; and Kanda, Nobuo, to Daiichi Seiyaku Company, Limited. Novel antibiotics produced from the strains of streptomyces phaeovorticillatus and their method of preparation. 3,735,006, Cl. 424-122.000.
- Asberg, Sture Lennart; and Timmer, Hendrikus Jacobus Maria, to SKF Industrial Trading and Development Company N.V. Bearing assembly for a swivel castor. 3,733,648, Cl. 16-21.000.
- Ascoli, Enzo, to Paillard S.A. Supply device for an outlet nozzle in an ink jet writing method. 3,735,199, Cl. 317-3.000.
- Ashany, Pon; Andreisch, Leo M., Jr.; and Pisterzi, Michael J., to International Business Machines Corporation. Shift register interconnection system. 3,735,362, Cl. 340-172.500.
- Asher, William J.: See—  
Li, Norman N.; and Asher, William J., 3,733,776.
- Ashfield, Herbert Edward, to Brown, David, Tractors Limited. Liquid cooled clutches. 3,734,259, Cl. 192-113.000.
- Ashley, Eugene; Jarvis, Francis L.; Clark, Burton P.; Kontis, George E.; and Spoor, Paul A., to General Electric Company. Article handling system. 3,733,960, Cl. 89-33.0mc.
- Ashmore, Benson, Pease & Company, Limited: See—  
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- Asmus, Richard W.; and Jecker, Andrew E. Sealed container assembly and method of making same. 3,734,044, Cl. 113-121.00c.
- Assenza, John S.: See—  
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- Astheimer, Robert W., to Barnes Engineering Company. Infrared two gas analyzer. 3,735,127, Cl. 250-43.50r.
- Atchley, Frank W. Demand delivery watering valve for animals. 3,734,063, Cl. 119-72.500.
- Ateliers Diederichs: See—  
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- Atkins, Carl E., to Wagner Electric Corporation. Capacitance responsive control circuits. 3,735,379, Cl. 340-258.00c.
- Atkinson, Donald Alan, to Ashmore, Benson, Pease & Company, Limited. Hollow vessel with annular external support ring. 3,734,479, Cl. 266-36.000.
- Atkinson, Louis D., to Johnson Service Company. Fluid diaphragm modulator. 3,734,117, Cl. 137-82.000.
- Atlantic Design & Development Corporation: See—  
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- Audreisch, Leo M., Jr.: See—  
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- Auphan, Michel Joseph; and Perilhou, Jean Robert, to U.S. Philips Corporation. Device for measuring the flow rate of a liquid. 3,733,899, Cl. 73-204.000.
- Austermann, Herbert, to Rappold, Hermann, & Co., GmbH. Reinforced pig iron wear plate. 3,734,699, Cl. 29-191.400.
- Auto-Time Distributors, Inc.: See—  
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- Autoelectron Corporation: See—  
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- Automation Industries, Inc.: See—  
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- Automation Systems, Incorporated: See—  
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- Automobiles Peugeot: See—  
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- Avalear, Gary Powell, to Topper Corporation. Measuring devices having means to control the motion of the free spindle. 3,733,705, Cl. 33-147.00r.
- Avco Corporation: See—  
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Lane, Buddy F.; and Church, Donald E., 3,735,343.
- Avery, Leslie Ronald, to RCA Corporation. Vertical deflection circuit utilizing both regenerative and degenerative feedback for generating parabolic voltages. 3,735,192, Cl. 315-27.00d.
- Aydin, Kemal M.; and Selnick, Lester L., to Singer Company, The. Dual purpose character generator. 3,735,042, Cl. 178-15.000.
- Ayiles, Sergeant E.; Hillhouse, Mial T.; Kyriakis, Alexander; and Pengilly, Brian W., to Goodyear Tire & Rubber Company, The. Preparation of polymeric aromatic compositions. 3,734,866, Cl. 260-2.00r.
- Ayres, Ralph C.: See—  
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- Aziende Colori Nazionali Affini Acna S.p.A.: See—  
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- Azuma, Koichi. Automatic tester for testing resistance and inductance of coil windings. 3,735,252, Cl. 324-59.000.
- Babunovic, Momir; and Faant, Siamac, to Barry-Wehmiller Company. Container flaw inspection apparatus. 3,735,144, Cl. 250-223.00b.
- Bach & Co.: See—  
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- Bach, Lloyd G., to Bendix Corporation, The. Brake pedal travel limiter for hydraulic brake booster. 3,733,968, Cl. 91-391.00r.
- Bachofer, Henry L.; and Chang, Robert C. C., to Sun Oil Company of Pennsylvania. Relay circuit for motor control. 3,735,224, Cl. 318-284.000.
- Bade, Heribert; Bellefontaine, August; and Kienast, Gerhard, to Farbenfabriken Bayer Aktiengesellschaft. Preparation of titanium dioxide concentrates an iron oxide pigments from ilmenite. 3,734,996, Cl. 423-83.000.
- Badische Anilin- & Soda-Fabrik Aktiengesellschaft: See—  
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- Badische Anilin- & Soda-Fabrik Aktiengesellschaft: See—  
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- Bagley, Richard O. Aquatic sporting device. 3,733,630, Cl. 9-311.000.
- Bailey, Allen N. Tie rod assembly. 3,734,453, Cl. 249-213.000.
- Bailey, Robert J., to Grace, W. R., & Co. Silverless photographic printing paper. 3,734,725, Cl. 96-35.100.
- Bailey, Todd D. Trough structure. 3,733,832, Cl. 61-15.000.
- Baker, Fred E., to General Electric Company. Electrically heated hair curling apparatus. 3,735,091, Cl. 219-400.000.
- Baker, Henry Louis; Quinton, Kenneth Charles; and Smart, Daniel Henry, to Communications Patents Limited. Television demodulator with short and long time constants. 3,735,037, Cl. 178-7.30r.
- Baker, Richard L., to Colts Inc. Shell extractor for firearm with falling breechblock. 3,733,729, Cl. 42-23.000.
- Baker, Richard L., to Colts Inc. By-pass hand connection. 3,733,730, Cl. 42-65.000.
- Balke, Roy Leonard; and Cipriani, Domenico, to General Electric Company. Channel, shaped, laminated, high temperature slot wedge for dynamoelectric machines. 3,735,169, Cl. 310-214.000.
- Balle, Walter, to Herbert, Leonhard, Maschinenfabrik. Tyre vulcanizing press. 3,734,656, Cl. 425-34.000.
- Ballmer, Ernst, to Hutebaur, F. B., AG. Method and apparatus for compression forging of components. 3,733,873, Cl. 72-332.000.
- Balogh, Arbad: See—  
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- Balser, Martin; Nagy, Arthur E.; and Proudian, Andrew P., to Xonics Inc. Aircraft vortex detection system. 3,735,333, Cl. 340-1.00r.
- Balzer, Norbert R.: See—  
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Bard, Douglas C., to Beatrice Foods Co. Bucket chassis. 3,734,527, Cl. 280-79.100.

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Barnett, Roy F.; Levy, Warren W.; and Simons, Dolph, to Simco Company, Inc. The Electrostatic discharge devices with high temperature arc resistance. 3,735,198, Cl. 317-2.00f.

Barnhardt, Robert W.; and Grubbs, William J., to Zellweger AG. Method and apparatus for the continuous withdrawal of samples from industrial process baths or the like for analysis. 3,733,906, Cl. 73-421.00b.

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Beck, Richard, Jr., to Sundstrand Corporation. Centrifugal. 3,734,637, Cl. 415-122.00r.

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Bergeron, John A., to General Electric Company. Means for applying suction having automatic cutoff of displacement volume. 3,734,358, Cl. 222-326.000.

Bergmeier, Dieter: See—  
Reisacher, Josef; Klauke, Hans Joachim; Jacoby, Ewald; and Bergmeier, Dieter, 3,734,650.

Bergum, Bernard C.: See—  
Bilhorn, John M.; Bergum, Bernard C.; and Anderson, Kent V., 3,734,780.

Bernier, Edgar R.: See—  
Hayner, Paul F.; and Bernier, Edgar R., 3,734,130.

Bernstein, Bernard J. Barbecue spit and drive mechanism. 3,733,999, Cl. 99-337.000.

Bernstein, Jack; and Losee, Kathryn A., to Squibb, E.R., & Sons, Inc. Tri-triiodisophtalamic acids, and derivatives. 3,734,953, Cl. 260-501.110.

Berthelemy, Jacques; Boul, Pierre Germain R.; and Sauvan, Jacques Louis, to Societe Anonyme: Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. System for discovering a critical path in a network. 3,735,109, Cl. 235-185.000.

Bertoni, Luigi; Pizzamiglio, Giancarlo; Fava, Renato; and Cimarosti, Giordano, to Montecatini Edison S.p.A. Equipment for the control and the regulation of an alkali-chlorine electrolysis plant with mercury-cathode cells. 3,734,848, Cl. 204-220.000.

Besson, Rene: See—  
Nikles, Francois; and Besson, Rene, 3,733,917.

Bestian, Walter. Dialkyl-xanthine derivatives. 3,734,911, Cl. 260-256.000.

Beun, Matthijs; and Reinijer, Pieter, to U.S. Philips Corporation. Method of and device for preparing characters for recognition. 3,735,349, Cl. 340-146.30h.

Beyer, Rolf R.: See—  
Goetze, Gerhard W.; and Beyer, Rolf R., 3,735,032.

Bickford, Harry G.; Kiery, Leonard A., Jr.; and Peltier, Lewis G., Jr., to International Business Machines Corporation. Surface characterization. 3,733,893, Cl. 73-73.000.

Bieber, George F.: See—  
Kearney, Thomas J.; and Bieber, George F., 3,733,710.

Bienert, Klaus; Lang, Winfried; and Nordt, Egon, to Wacker-Chemtronik Gesellschaft fur Elektronik Grundstoffe m.b.H. Treated quartz vessels for use in producing and further processing III-V semiconductor bodies low in silicon. 3,734,817, Cl. 161-192.000.

Biland, Hans Rudolf: See—  
Dunnenberger, Max; and Biland, Hans Rudolf, 3,734,884.

Bilhorn, John M.; Bergum, Bernard C.; and Anderson, Kent V., to ESB Incorporated. Flat cell battery with both terminals on one face. 3,734,780, Cl. 136-111.000.

Billi, G., & C. S.p.A.: See—  
Gasparri, Mario, 3,733,858.

Bilton, John, to Fluidrive Engineering Company, Limited. Scoop-trimmed fluid couplings. 3,733,821, Cl. 60-351.000.

Biomarine Industries, Inc.: See—  
Soul, Charles J., 3,735,382.

Biorex Laboratories Limited: See—  
Turner, John Cameron, 3,734,944.

Birch, Richard J.: See—  
Willis, Frederick Gordon, Jr., 3,733,616.

Birkholtz, Gottfried, to Schenck, Carl, Maschinenfabrik GmbH, Firma. Device for compensating elastic after-effects or creeping. 3,735,320, Cl. 338-2.000.

Bishop Freeman Company: See—  
Davis, Harvey L., 3,733,724.

Biskis, Edward G., to Air Products and Chemicals, Inc. Thermoelectric adsorber. 3,734,293, Cl. 210-185.000.

Blach, Heribert: See—  
Blach, Joseph; and Blach, Heribert, 3,734,635.

Blach, Joseph; and Blach, Heribert. Shaft in particular screw shaft for feeding or kneading of raw materials by example synthetic material. 3,734,635, Cl. 415-72.000.

Black and Decker Manufacturing Company, The: See—  
Brucker, William S., 3,733,663.

Sauerwein, William D.; Meloni, Robert A.; and Walter, Harvey J., 3,734,459.

Black Clawson Company, The: See—  
Bennett, Weston T.; Coveney, Donald B.; Lamb, Charles A.; and Hanson, Jonathan Leslie, 3,734,822.

Harmon, Paul E.; and Mainstone, Kenneth A., 3,734,662.

Black Engineering, Inc.: See—  
Hirschfeld, Tomas, 3,734,769.

Black, James Whyte; Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, to Smith Kline & French Laboratories, Limited. Carboxamidines. 3,734,924, Cl. 260-309.000.

Blackburn, Denis Edward: See—  
Rhodes, Arthur Neville; and Blackburn, Denis Edward, 3,734,431.

Blackburn, Richard D.: See—  
Downs, Clifford L.; and Blackburn, Richard D., 3,735,243.

Blackwell, Lyman L., to Central Investment Corporation. Circuit for detection of small resistance changes ionization chamber devices. 3,735,375, Cl. 340-237.00c.

Blair, George R.; and Ricaud, Francois J., to Hughes Aircraft Company. Method of hardening polished aluminum surfaces. 3,734,837, Cl. 204-36.000.

Blancett, Joe H. Clock for meters. 3,735,102, Cl. 235-94.00r.

Blasch, Earl B.; Klingaman, Richard M.; and Page, Daniel M., to United States of America, Army, mesne. Compacted and sintered powder mass having a discrete cavity in the mass and method of forming. 3,734,723, Cl. 75-214.000.

Blatt, Leland F. Travel cylinder and gripper actuator with triple guide rods. 3,734,303, Cl. 214-1.00b.

Blecha, Dennis Leonard, to Du Pont de Nemours, E. I., and Company. Two-stage uniaxial orientation of polyethylene terephthalate films. 3,734,994, Cl. 264-288.000.

Bletz, Howard W., to Therm-O-Disc, Incorporated. Adjustable thermostat. 3,735,319, Cl. 337-347.000.

Blevio, Henry L. Apparatus for adhering and interlocking mitered molding strips to a panel. 3,734,381, Cl. 227-148.000.

Bliss-Hill, Herbert Brian; and Tewsley, Eric William, to Stibbe Machinery Limited. Electronically controlled needle selection system for knitting machines. 3,733,855, Cl. 66-50.00r.

Blocher, Hans-Joachim: See—  
Boesch, Lothar; and Blocher, Hans-Joachim, 3,735,174.

Blocher Motor KG, Firma: See—  
Boesch, Lothar; and Blocher, Hans-Joachim, 3,735,174.

Blohm, Arthur M. Machine aligning device. 3,733,706, Cl. 33-180.00r.

Blomgren, Oscar C., Jr., to Inter-Probe, Inc. Method and apparatus for removing heat from within a vacuum and from within a mass. 3,735,175, Cl. 313-60.000.

Bloom, Leonard: See—  
Rebold, Jerome I., 3,734,282.

Blore, William E.; Zivanovic, Sbrislav V.; and Charest, Bernard, to United States of America, Air Force. Nanosecond pulse modulator. 3,735,146, Cl. 307-106.000.

Bloxham, Alden T.; and Fischer, Harry C., to Kellogg-America, Inc. Heat exchanger for compressed air. 3,734,174, Cl. 165-154.000.

Bly, Vincent T., to United States of America, Army. Large, two dimension, screen for converting an optical image projected on one side to an identical infrared image display on the other side. 3,735,137, Cl. 250-83.3hp.

Boatwright, John T., to Northeast Electronics Corporation. Digital analysis of electric wave signals. 3,735,263, Cl. 324-186.000.

Bock, John W.; and Sivertsen, Marvin L., to General Electric Company. Diaphragm-type high speed spot film device. 3,735,130, Cl. 250-66.000.

Bock, Rudolf. Hydraulically actuated cutting machine for rods and the like. 3,733,699, Cl. 30-180.000.

Bock, Willy: See—  
Schneider, Theodor; Bock, Willy; and Schubert, Karl-Friedrich, 3,733,913.

Bodor, Nicolae Stefan: See—



Hodosan, Francisc Petru; Serban, Nicolae; Balogh, Arbad; Jude, Ioan; Mantach, Carol; and Bodor, Nicolae Stefan, 3,734,938.

Boeing Company, The: See—  
McDonald, Glen L., 3,735,158.  
Whetham, William J., 3,735,157.

Bohannon, William D., Jr.; and Church, Hoye D., to Western Electric Company, Incorporated. Apparatus for automatically inserting components in a workpiece. 3,733,672, Cl. 29-203.00b.

Bolinger, John F.; and Kolster, Wilhelm K.; deceased (by Kolster, Christel E.; executrix), to Meridian Industries, Inc. Flasher circuit with outage indication. 3,735,196, Cl. 315-200.00a.

Bolt, Durk Jan; and Reitsma, Jogchum, to U.S. Philips Corporation. Coded decimal divider with pre-conditioning of division. 3,735,107, Cl. 235-159.000.

Bolt, Durk Jan; and Reitsma, Jogchum, to U.S. Philips Corporation. Coded decimal non-restoring divider. 3,735,108, Cl. 235-159.000.

Bolton, Douglas R., to Cadaco, Inc. Magnetic game structure. 3,734,502, Cl. 273-95.00r.

Bolton-Emerson Inc.: See—  
Danforth, Donald W., 3,733,888.

Bonazoli, Robert P.; and Keenan, James P., to Sylvania Electric Products, Inc. Lamp assembly. 3,735,185, Cl. 313-278.000.

Bone, Arnold R.; and Krohn, Ronald W., to Dennison Manufacturing Company. Fastener inserting machine. 3,734,375, Cl. 227-67.000.

Bonis, David Raynes; and Foster, Eric, to Northern Electric Company Limited. Electrically conducting pivotal joint. 3,735,021, Cl. 174-86.000.

Bonner, Joseph A.: See—  
Evans, Howard J.; Lofink, Joseph P.; and Bonner, Joseph A., 3,733,910.

Bonner, Joseph A.; and Evans, Howard J., to Rockwell Manufacturing Company. Temperature compensated gas meter register. 3,733,904, Cl. 73-233.000.

Bonteil, Robert C., to Matsushita Electric Works, Ltd. Lyophilisation installation. 3,733,716, Cl. 34-92.000.

Borden, A. Gale. Waste disposal assembly. 3,734,852, Cl. 210-152.000.

Borden, Inc.: See—  
Dooley, Donald David, 3,734,798.

Borg-Warner Corporation: See—  
Stanley, Marland L.; and Reich, Allen D., 3,733,887.

Borghese, Marco, to Wagman, N., & Company, Inc. Capless wig. 3,734,105, Cl. 132-53.000.

Bories, Jacques Elie, to Agfa-Gevaert N.V. Colour radiography. 3,734,735, Cl. 96-55.000.

Borror, Alan L., to Polaroid Corporation. Silver halide emulsions sensitized with cyanic dyes containing a quaternary group. 3,734,739, Cl. 96-132.000.

Borutta, Robert A.; and Koenig, Elmer A., to Sherwood Medical Industries, Inc. Manual syringe filling apparatus. 3,734,147, Cl. 141-27.000.

Bosch, Lothar; and Blocher, Hans-Joachim, to Gesellschaft Kernforschung m.b.H. and Blocher Motor KG, Firma. Electric motor with hollow rotor and method of fabricating the hollow rotor. 3,735,174, Cl. 310-266.000.

Bosch, Paul, to Bosch, Robert, G.m.b.H. Axial piston machine with adjustable swash plate. 3,733,970, Cl. 91-506.000.

Bosch, Robert, G.m.b.H.: See—  
Bosch, Paul, 3,733,970.  
Eckert, Konrad, 3,735,302.  
Glockler, Otto; Schmid, Hermann; and Eichler, Dieter, 3,734,067.  
Kobald, Walter; and Reichel, Eckehart, 3,734,225.  
Renner, Stefan; Bayha, Wulf; Burgholte, Alwin; Schweizer, Holger; and Wirtz, Rainer, 3,735,220.

Bosund, Sven Ingmar Walton: See—  
Bengtsson, Bengt Lennart; Bosund, Sven Ingmar Walton; and Hylmo, Bertil, 3,734,751.

Boysky, William, to Package Machinery Company. Solenoid operated door opener for plastic molding machines. 3,734,664, Cl. 425-151.000.

Bottomley, Robert Richard: See—  
Schillinger, Joseph F.; and Bottomley, Robert Richard, 3,734,284.

Botz, Roland, to Plasti-fiber formulations, Inc. Bagasse fiber product and process. 3,734,766, Cl. 117-100.00a.

Boul, Pierre Germain R.: See—  
Berthelemy, Jacques; Boul, Pierre Germain R.; and Sauvan, Jacques Louis, 3,735,109.

Bourns, Inc.: See—  
Frey, Sydney W., Jr.; and Gaines, Robert W., 3,733,695.

Bouwhuys, Gijbertus; Haans, Petrus Franciscus Antonius; and Peek, Theodorus Hendrikus, to U.S. Philips Corporation. Gas discharge laser. 3,735,281, Cl. 331-94.500.

Bovenkerk, Harold P., to General Electric Company. Thermistor. 3,735,321, Cl. 338-22.00r.

Bowen, Jonathan L.; and Dexter, Theodore H., to Hooker Chemical Corporation. Cleaning compositions. 3,734,860, Cl. 252-158.000.

Bowers, Russell E.; and Warpenburg, Norman L., to Avco Corporation. Sequentially interlocked arming device. 3,734,022, Cl. 102-78.000.

Bowmar Instrument Corporation: See—  
Harden, Phillip L., 3,735,303.

Brabander, Herbert Joseph: See—  
Wright, William Blythe, Jr.; and Brabander, Herbert Joseph, 3,734,915.

Wright, William Blythe, Jr.; and Brabander, Herbert Joseph, 3,734,916.

Bradley, Edward C., to CTS Corporation. Piezoelectric crystal assembly. 3,735,166, Cl. 310-9.400.

Bradley, John J., to Paper Converting Machine Company, Inc. Noise reduction strip for shear cut perforator. 3,733,949, Cl. 83-348.000.

Bradshaw, William L., to Dow Chemical Company, The. Magnesium-magnesium chloride bath separation. 3,734,718, Cl. 75-63.000.

Brainard, Allan H.: See—  
Fitzgibbons, William O.; Scherwko, Elaine M.; and Brainard, Allan H., 3,734,943.

Brandinger, Jay Jerome, to RCA Corporation. Television camera system with enhanced frequency response. 3,735,033, Cl. 178-5.4st.

Brandt, Siegfried: See—  
Schmitt, Karl; Gude, Fritz; and Brandt, Siegfried, 3,734,887.

Brandt, Thomas F., Jr.; and Netzel, Philip C., to I-T-E Imperial Corporation. Low profile circuit breaker with staggered terminals. 3,735,065, Cl. 200-50.00a.

Branson Instruments Incorporated: See—  
Obeda, Edward G.; and Parry, Frank, 3,734,805.

Bratschitsch, John, to Lely Corporation, The. Applying a preservative to grain or the like. 3,734,777, Cl. 134-132.000.

Brauer, Edwin Henry. Automatic press brake back gauge. 3,733,885, Cl. 72-461.000.

Braun, Bernard G., to Case, J. I., Company. Control system for fluid cylinder. 3,733,965, Cl. 91-275.000.

Bravi, Jean-Claude; Poulain, Claude; and Viallet, Claude, to Societe Anonyme dite: Aquitaine Total Organico. Process to improve the efficiency of photochemical reactions. 3,734,845, Cl. 204-162.0xm.

Bray, Douglas: See—  
Porter, David H.; Kemmerer, Wayne; and Bray, Douglas, 3,735,123.

Bredoux, Francois Jean-Marie; Mercier, Claude Andre; and Philpot, Georges Achille, to Eastman Kodak Company. Neutron detector of the track-damage type. 3,735,135, Cl. 250-83.100.

Bremer, Norman C. Chemical thermometer and holder. 3,733,905, Cl. 73-356.000.

Breslow, Jeffrey D., to Glass, Marvin, & Associates. Target and adjustable trajectory disc launcher. 3,734,503, Cl. 273-101.000.

Breslow, Jeffrey D., to Glass, Marvin, & Associates. Simultaneous launching game. 3,734,504, Cl. 273-126.00r.

Breslow, Jeffrey D., to Glass, Marvin, & Associates. Matching answer game. 3,734,510, Cl. 273-152.00r.

Brettenbach, Otto, to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft. High frequency cable. 3,735,293, Cl. 333-84.00r.

Bricmont & Associates, Inc.: See—  
Bricmont, Francis H., 3,734,834.

Bricmont, Francis H., to Bricmont & Associates, Inc. Apparatus and method for applying a foam coating to ejected hot coke. 3,734,834, Cl. 201-39.000.

Bridford, Hugh H. Automatically opening frozen dough box and baking pan. 3,734,749, Cl. 99-172.000.

Briggs, Walton Ellis, to Varian Associates. Valve structure for collecting multiple samples. 3,733,907, Cl. 73-421.50r.

Bristol-Myers Company: See—  
Craut, Leonard Bruce, Jr., 3,734,907.

Lapidus, Herbert; and Mackles, Leonard, 3,735,007.

British Aircraft Corporation Limited: See—  
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Rhodes, Arthur Neville; and Blackburn, Denis Edward, 3,734,431.

British Oxygen Company Limited, The: See—  
Lobb, Alexander James, 3,733,837.

British Steel Piling Company Limited, The: See—  
Last, Anthony Edward Walter, 3,734,206.

Britton, Orson J., to Sybron Corporation. Scratch proof probe for manual testing of electrically insulating coatings. 3,735,251, Cl. 324-54.000.

Brockmuller, Ingo, to EMA AG. Electrical oscillating servo motor control circuit arrangement. 3,735,229, Cl. 318-611.000.

Broderne Gram A/S: See—  
Gram, Hans, 3,733,846.

Brooks, Paul, Jr.; and Tettters, Clarence O. Mounting step for automotive vehicle. 3,734,534, Cl. 280-163.000.

Brown & Root, Inc.: See—  
Morgan, William A., 3,733,676.

Brown, Arthur King, Jr., to Bendix Corporation, The. Hydraulic power brake booster. 3,733,966, Cl. 91-372.000.

Brown Boveri-Sulzer Turbomachinery Limited: See—  
Strub, Rene, 3,734,645.

Brown, Byron T.; and Stahmer, B. Oil or like transportation system and pipeline support. 3,734,138, Cl. 138-106.000.

Brown, Carlton E., to Lear Siegler, Inc. Slot diffuser. 3,733,995, Cl. 98-40.00d.

Brown, Ced F., 1/2 to Torosian, Mike. Catch basin cleaning system and method. 3,734,775, Cl. 134-10.000.

Brown Company: See—  
Buttery, Kenneth T.; and Haas, Richard G., 3,734,390.

Brown, David, Tractors Limited: See—  
Ashfield, Herbert Edward, 3,734,259.

Brown, Donald G., to United States of America, Air Force. Rocket chamber and injector segmentation and supersonic. 3,733,828, Cl. 60-258.000.

Brown, Frank: See—

Wickham, William T.; Brown, Frank; Kleykamp, Donald L.; and Kossuth, Otto, 3,733,697.

Brown, Lloyd H.; and Eftax, Daniel S. P., to Quaker Oats Company, The. Process of producing a foundry core composition. 3,734,936, Cl. 260-39.05b.

Brown, Philip H., to Inland Container Corporation. Package corner post. 3,734,389, Cl. 229-14.00c.

Brown, Richard L., to Midway Manufacturing Company. Apparatus for simulating cross-country driving conditions. 3,734,497, Cl. 273-1.00e.

Brown, Roland Clough. Instant dial-a-flow cap. 3,734,360, Cl. 222-537.000.

Brown, S. G., Limited: See—  
Adams, John, 3,734,483.

Brown, William Henry. Apparatus for stripping fluid from well pipe. 3,733,641, Cl. 15-210.00b.

Brown, William W.; Loose, Robert A.; and Vogel, John A., to Westinghouse Electric Corporation. Nuclear reactor loop reactivation system. 3,734,823, Cl. 176-26.000.

Bruce, Roger K.; Marhold, Werner; and Adickes, Cecil F., to Sterigard Corporation. Pressurized container dispensing valve having excessive pressure safety feature. 3,734,125, Cl. 137-495.000.

Brucker, Henry J.; Brucker, Robert J.; and Klausmann, Milton H., to Seal-Spout Corporation. Pouring spout lock. 3,734,361, Cl. 222-556.000.

Brucker, Robert J.: See—  
Brucker, Henry J.; Brucker, Robert J.; and Klausmann, Milton H., 3,734,361.

Brucker, William S., to Black and Decker Manufacturing Company, The. Corner shaping tool. 3,733,663, Cl. 29-78.00r.

Bruene, Warren B., to Collins Radio Company. Transmitter combiner having coupled tuned circuits. 3,735,289, Cl. 333-5.000.

Brummet, Paul L.; and Isley, Sigmund G., to Amerel Company, Inc. Intra-factory system and method for utilizing powered and free conveyor systems. 3,734,027, Cl. 104-172.00s.

Bruneau, Louis O., to Polaroid Corporation. Photographic cassette loading. 3,733,679, Cl. 29-431.000.

Brunetti, Heimo: See—  
Muller, Helmut; Rosenberger, Siegfried; and Brunetti, Heimo, 3,734,885.

Brunnmuller, Friedrich: See—  
Suter, Hubert; Jahn, Juergen; Janka, Franz; Brunnmueller, Friedrich; and Claren, Otto Bernd, 3,734,951.

Bruno, Leonard, to Stanadyne, Inc. Pulsating spray head. 3,734,410, Cl. 239-102.000.

Bryan, Anthony G., to Motorola, Inc. Compensated crosspoint switching system. 3,735,057, Cl. 179-186.00f.

Bryson, Robert A.; Kennicott, Thomas C.; and Sarring, Ernest J., to Harris-Intertype Corporation. Book trimming machine. 3,733,947, Cl. 83-280.000.

Bucalo, Brian D. Toilet paper roll having a cleansing composition. 3,734,277, Cl. 206-58.000.

Buchanan, Chester L., to United States of America, Navy. Lens protective system for deep sea camera. 3,733,981, Cl. 95-11.0uw.

Buchanan, William Michaux; and Madures, John W., to Morris, Philip, Incorporated. Method for expanding tobacco stems. 3,734,104, Cl. 131-140.00p.

Buchner, Robert Bertold; and Maat, Jan Philippus, to U.S. Philips Corporation. Telecommunication system with time division multiplex. 3,735,049, Cl. 179-15.00q.

Buckley, Stanley G., to Dunlop Holdings Limited. Air cooled brake assembly. 3,734,247, Cl. 188-264.00a.

Bucklin, James B.; and Utken, Jay, to Mallory, P. R., & Co., Inc. Fusing resistor. 3,735,318, Cl. 337-296.000.

Bucyrus-Erie Company: See—  
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Haisch, Albert C.; Perlewitz, Ralph L.; and Otto, George, 3,734,211.

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Bullard, Russell H.: See—  
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Bunker-Ramo Corporation, The: See—  
Kaczmarek, Leonard J., 3,733,883.

Burba, Christian; Drawert, Manfred; Voigt, Hartmut; and Griebisch, Eugen. Polyurethane foams produced from nitrogenous polyethers. 3,734,871, Cl. 260-2.50q.

Burenga, Thomas I.; and Elliott, Everett, to TSC Industries, Inc. Rotary roller pumps. 3,734,654, Cl. 418-152.000.

Burger, Harry Fred, to Walworth Company. Gate valve with thin walled hubs. 3,734,461, Cl. 251-366.000.

Burger, Philip M.; and Carson, David E., to Carson & Burger, Incorporated. Lid orienting assembly. 3,734,268, Cl. 198-33.00ad.

Burgholte, Alwin: See—  
Renner, Stefan; Bayha, Wulf; Burgholte, Alwin; Schweizer, Holger; and Wirtz, Rainer, 3,735,220.

Burklund, Vernon D.: See—  
Rentz, Albert W.; Jackson, Lloyd J.; Willard, Robert C.; and Burklund, Vernon D., 3,734,019.

Burnett, George R.; and Burnett, Jessie E. Low pressure control switch with bridging contacts. 3,735,071, Cl. 200-83.00j.

Burnett, Jessie E.: See—  
Burnett, George R.; and Burnett, Jessie E., 3,735,071.

Burney, Ivan T., to Westinghouse Electric Corporation. Electrostatic precipitator. 3,733,783, Cl. 55-104.000.

Burns, Mark T. Prefabricated structure adapted to be attached to a vehicle top. 3,734,110, Cl. 135-1.00a.

Burns, Tom V., to Amex Phosphates, Inc. Method for making ammonium phosphate fertilizer. 3,734,708, Cl. 71-34.000.

Burrough, Donald E.: See—  
Wood, William Robert; and Burrough, Donald E., 3,733,796.

Burroughs Corporation: See—  
Balogh, Edward, Jr.; and Cook, Darwen J., 3,735,355.

Beers, Leroy Walter; and De Santis, Alfred John, 3,735,363.

Beery, Jack; and Templeton, William B., 3,734,491.

Shukla, Narendra M., 3,735,153.

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Burroughs, Elvin O. Air actuated truck-trailer hitch. 3,734,541, Cl. 280-506.000.

Bursa, Stanislaw: See—  
Pischinger, Ernest; Bursa, Stanislaw; Koneczny, Henryk; and Straszko, Jerzy, 3,734,709.

Burton, James R. Detachable dinghy or tender for sail boats. 3,734,047, Cl. 114-39.000.

Bush, Robert E.: See—  
Degelleke, Gerrit; and Bush, Robert E., 3,734,307.

Bushnell, Sherman W., Jr. Control system for multi-stage lift. 3,734,464, Cl. 254-93.00r.

Buss A.G.: See—  
Franz, Peter; and Maier, Andreas, 3,734,415.

Butler, David R., to Loewy, Raymond and Snaith, William, Inc. Bracket standard and base rail system. 3,733,755, Cl. 52-36.000.

Butler, John Francis; Jordan, John William; and Orbeck, Finn, to Doxford and Sunderland Limited. Opposed piston two-stroke cycle internal combustion engines. 3,734,074, Cl. 123-119.0cb.

Butler, R. B., Inc.: See—  
Wallace, James L., 3,734,204.

Buttery, Kenneth T.; and Haas, Richard G., to Brown Company. Front-opening carton with unique end flap arrangement. 3,734,390, Cl. 229-27.000.

Byers, Clifton A., to Goodyear Tire & Rubber Company, The. Carbon disk quality processing. 3,734,797, Cl. 156-253.000.

Byers, Edward Victor. Orrery. 3,733,720, Cl. 35-45.000.

Byrd, Lucid Lincoln, to Carter Precision Electric Company. Electrical switch assembly. 3,735,061, Cl. 200-16.00r.

Bysouth, Raymond: See—  
Robertson, Peter Struan; Bysouth, Raymond; and New Zealand Dairy Research Institute, 3,733,702.

Cabaniss, Julian C. Machine for handling aircraft brake assemblies. 3,734,304, Cl. 214-1.0bd.

Cadaco, Inc.: See—  
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Cade, Paul E., to International Business Machines Corporation. Multiple bank atomic absorption apparatus for simultaneously measuring different physical parameters of a material. 3,734,620, Cl. 356-73.000.

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 Dahl, Eileen C. Vehicle wheel position indicator. 3,734,051, Cl. 116-31.000.  
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 Davis, Harvey L., to Bishop Freeman Company. Ironing board pad. 3,733,724, Cl. 38-140.000.  
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- Girauldon, Jean-Claude, to Societe Anonyme D.B.A. Composite caliper for a disc brake. 3,734,243, Cl. 188-72.400.
- Glabe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergois, to Food Technology, Inc. Extrusion die for dough. 3,734,672, Cl. 425-462.000.
- Glanzer, Stefan, to Vereinigte Osterreichische Eisen- und Stahlwerke Aktiengesellschaft. Apparatus for oiling continuously moving stock. 3,734,055, Cl. 118-8.000.
- Glaser, Karl; and Stengle, Ernst, to EBE Elektro-Bau-Elemente GmbH. Sliding switch assembly with spring-biased contact and multi-sectional housing. 3,735,059, Cl. 200-16.00c.
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- Glenat, Henri; and Salvi, Antoine, to Commissariat a l'Energie Atomique. Spin-coupling nuclear magnetic resonance magnetometer utilizing the same coil for excitation and signal pick-up and using toroidal samples. 3,735,246, Cl. 324-50r.
- Glesner, William K.; and Thompson, Clifford E., to Dow Chemical Company, The. Process for the manufacture of corrugated glass fiber reinforced polyvinyl chloride sheets. 3,734,990, Cl. 264-137.000.
- Glessner, Lee S., Sr. Bubble blowing toy gun. 3,733,736, Cl. 46-7.000.
- Glitz, Georgia E. Collapsible bed shampoo basin with throw away liner. 3,733,620, Cl. 4-159.000.
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- Godard, Pierre, to Societe des Accumulateurs Fixes et de Traction. Apparatus for recharging an emergency battery. 3,735,234, Cl. 320-44.000.
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- Gogarty, William B., to Marathon Oil Company. Hydraulic fracturing process using a temperature-inverted fracturing fluid. 3,734,189, Cl. 166-308.000.
- Golbe, Alvin Victor, to Clairol Incorporated. Electric skin hygiene brush. 3,733,634, Cl. 15-28.000.
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- Goldstein, Arnold M.; Effron, Edward; and Hochman, Jack M., to Esso Research and Engineering Company. Reactor vessel and up-down mixer. 3,734,469, Cl. 259-8.000.
- Goldstein, Frederick A. Racket with resilient surface. 3,734,499, Cl. 273-73.00e.
- Goldsworthy Engineering, Inc.: See—  
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- Goldsworthy, William B.: See—  
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- Gooch, John Henry. Resilient railway vehicle transmission. 3,734,029, Cl. 105-131.000.
- Goodfellow, Robert D., to Kennametal Inc., mesne. Rotary cutter for excavation, especially for use with raise boring and tunnel boring machines. 3,734,213, Cl. 175-374.000.
- Gooding, Trevor Frank John; and Howse, Geoffrey David Stuart, to Elestroil Limited. Adjustable electrical devices with leadscrew and sealing means. 3,735,326, Cl. 338-180.000.
- Goodman, Charles Jimmie. Navigational aid. 3,733,708, Cl. 33-355.000.
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- Goodrich, Eugene A.; and Johnson, Robert H. Economical automatic balancer for rotating masses. 3,733,923, Cl. 74-573.000.
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- Graflex, Inc.: See—  
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- Grainger, Lewis M. D. Antipollution jet engine with reversible auxiliary jet engines operable independently to serve as auxiliary thrusters and brakes. 3,733,824, Cl. 60-224.000.
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- Greenberg, Walter H. Glass fiber reinforced thermoplastic cellular plastics. 3,734,985, Cl. 264-45.000.
- Greene, Oliver W., III. Display and shipping container for flowers. 3,734,275, Cl. 206-45.310.
- Greenwald, Harry; and Kidde, Walter, & Company, Inc., to Anti-pick tumbler lock device. 3,733,864, Cl. 70-363.000.
- Greenwald, Harry; and Tuppo, Robert, to Kidde, Walter, & Company, Inc. Switching device for a coin controlled machine. 3,735,066, Cl. 200-52.00r.
- Gregoire, Clyde G. Roller bender for outset printing plates. 3,733,872, Cl. 72-213.000.
- Grelck, Leonard. Fork lift truck tines. 3,734,329, Cl. 214-750.000.
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- Griesinger, Wolfgang, to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Supercooled electric cable. 3,735,018, Cl. 174-28.000.
- Griffith, David W., to Lindsay Wire Weaving Company, The. Patch and seam for plastic belts. 3,734,795, Cl. 156-98.000.
- Griffith, Edwin D., to Owens-Illinois, Inc. Easy-open composite container. 3,734,343, Cl. 220-47.000.
- Griffiths, Victor Sidney; and Howes, Roydon. Instrument for determining the optical density of fluids. 3,734,629, Cl. 356-201.000.
- Grigorenko, Donald O., to Shape Form, Inc. Method and apparatus for making deep drawn metal shells. 3,733,881, Cl. 72-349.000.
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- Grossman, Phillip A.: See—  
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- Grunert, Kurt A.; Conner, John P.; and Dauer, John J., Jr., to Westinghouse Electric Corporation. Electric control devices with mechanical interlock. 3,735,295, Cl. 335-160.000.
- Grygera, James W., to Eaton Corporation. Motor control system with power failure protector. 3,735,202, Cl. 317-13.00r.
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- Guest, Pal R.; and Kontz, Robert F., to Owens-Illinois, Inc. Part removal apparatus. 3,734,666, Cl. 425-186.000.
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- Gulf & Western Industrial Products Company: See—  
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- Gupta, Virendra N.; and Lafond, Renald L., to Canadian International Paper Company. Flameproofing of cellulose. 3,734,683, Cl. 8-116.00r.
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- Gutierrez, Thomas; and Amaral, Wallace. Article abrading apparatus. 3,734,700, Cl. 51-61.000.
- Gyongyosi, Laszlo. Automatic feed control system. 3,734,202, Cl. 173-4.000.
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- Hach Chemical Company: See—  
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- Haisch, Albert C.; Perlewitz, Ralph L.; and Otto, George, to Bucyrus-Erie Company. Well drilling rod and casing assembling method. 3,734,209, Cl. 175-57.000.
- Haisch, Albert C.; Perlewitz, Ralph L.; and Otto, George, to Bucyrus-Erie Company. Mobile drilling unit. 3,734,211, Cl. 175-85.000.
- Hale, Chester A. Drive on no slip block. 3,734,241, Cl. 188-32.000.
- Hales, John H. Dry cleaning machine. 3,733,715, Cl. 34-82.000.
- Haley, Boyd E. Process for selectively purifying sugar beet diffusion juice and by-product recovery of valuable organic acids therefrom. 3,734,773, Cl. 127-48.000.
- Hall, Homer H., to General Electric Company. Brazing method and apparatus. 3,735,088, Cl. 219-85.000.
- Hall, Jeffrey, to Houdaille Industries, Inc., mesne. Torsional vibration damper. 3,734,484, Cl. 267-137.000.
- Halmi, Dezsoe, to General Signal Corporation. Flow metering device of the pressure differential producing type. 3,733,901, Cl. 73-213.000.
- Halmi, Dezsoe, to General Signal Corporation. Minimum length high quality differential pressure producing flow meter. 3,733,902, Cl. 73-213.000.
- Halmi, Dezsoe, to General Signal Corporation. Differential pressure producing flow meter. 3,733,903, Cl. 73-213.000.
- Halpern, Alfred; and Sasmor, Ernest J., to Synergistics, mesne. Deproteinizing protein-containing solutions. 3,734,734, Cl. 99-48.000.
- Halvin Products Co., Inc.: See—  
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- Hamilton, Billy Harold; and Wilhart, Helmut, to Bell Telephone Laboratories, Incorporated. DC to DC converter with voltage regulation feedback loop achieving isolation between input and output by time domain techniques. 3,735,235, Cl. 321-2.000.
- Hamilton, Joel A., to Jones, R. A., & Company, Inc. Apparatus including reciprocating web feeding means for a continuously feeding web. 3,733,773, Cl. 53-184.000.
- Hammann, Ingeborg: See—  
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- Hamrin, Bjorn Staffan Artur, to Aktiebolaget Forenede Superfosfatfabriker. Gel capsules for small units and methods of encapsulating such units. 3,734,987, Cl. 264-54.000.
- Hancock Industries, Inc.: See—  
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- Hanley, Donald E., to Red Devil Engineering, Inc. Racing vehicle wheel having improved cooling structure. 3,734,566, Cl. 301-6.00a.
- Hannon, Charles N.: See—  
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- Hannon, Warren W.; and Hannon, Charles N. (said Hannon, Charles N., assor. to), 3,734,488.
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- Hanson, Jonathan Leslie: See—
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- Hansson, Ants, to Continental Can Company, Inc. Apparatus for and method of facilitating the stripping of cans from a punch and the article formed thereby. 3,733,880, Cl. 72-344.000.
- Hanze, Arthur R.; deceased (by Hanze, Janice W.; administratrix), to Upjohn Company. The Certain pyrimido(1,2-a)(1,4)benzodiazepin-1 (5H)-ones. 3,734,912, Cl. 260-256.50r.
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- Harman, Julius; and Norman, Michael Eric, to Herbert, Alfred, Limited. Lathes. 3,733,940, Cl. 82-21.00r.
- Harmes, Lee D.: See—
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- Harris, Robert W., to United States of America, Navy. Low noise phase detector. 3,735,150, Cl. 307-232.000.
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- Knopka, William N., to FMC Corporation. Transesterification catalysts for production of poly(C<sub>2</sub> to C<sub>12</sub> alkylene terephthalate). 3,734,891, Cl. 260-75.00r.
- Knudson, Clarence B., to Hughey and Phillips, Inc. Safety system for visual approach. 3,735,339, Cl. 340-25.000.
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- Kuhnelt, Herbert F., to Hoerbiger Ventilwerke Aktiengesellschaft. Shuttle valve. 3,734,132, Cl. 137-625.490.
- Kukla, Cassimer M.; and Warnick, Alan, to Ford Motor Company. Sensing system for a chemiluminescent instrument. 3,734,691, Cl. 23-253.00r.
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 Morewood, William Henry. Self-feeding device for handicapped persons. 3,734,306, Cl. 214-1.00t.  
 Morgan, Dean T., to Thermo Electron Corporation. Vapor generator. 3,734,402, Cl. 236-21.00b.  
 Morgan, Grant T. Photographic type-composing machines. 3,733,977, Cl. 95-4.50r.  
 Morgan, Wendell D., to Feeders Corporation. Height adjustment means. 3,734,589, Cl. 312-351.000.  
 Morgan, William A., to Brown & Root, Inc. Method for connecting pipelines. 3,733,676, Cl. 29-407.000.  
 Mori, Akihiko: See—  
 Yasui, Yukio; Ikoga, Wataru; Mori, Akihiko; and Adachi, Tadaaki, 3,734,746.  
 Mori, Iwao, to Sony Corporation. Plural-microscope with light indicator. 3,734,593, Cl. 350-31.000.  
 Morimoto, Tadashi: See—  
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 Morine, Richard L.; and Hokes, James J., to Tedco, Inc. Direct transfer seeder. 3,734,356, Cl. 222-199.000.  
 Morishita, Harumi: See—  
 Sakato, Yajiro; Ina, Kazuo; Yamamoto, Yukitsune; and Morishita, Harumi, 3,734,932.  
 Moritz, Konrad Gustav, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschränkter Haftung. Arrangement for transmitting heat. 3,734,173, Cl. 165-105.000.  
 Moriya, Hisanori; and Hosho, Yukio, to Hitachi, Ltd. Air valve type carburetor. 3,734,473, Cl. 261-44.00r.  
 Morozumi, Yoshihimi. Automatic stop lamp device of a car. 3,735,345, Cl. 340-62.000.  
 Morris, Philip, Incorporated: See—  
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 Morrison, Charles R., to Truck-Lite Co., Inc. Rail mounted sidemarker and clearance light. 3,735,116, Cl. 240-8.200.  
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 Mosher, Richard K., to Kimball Products Company, Inc. Portable radar system. 3,735,402, Cl. 343-14.000.  
 Mosier, James A., to Modine Manufacturing Company. Heat exchanger with internal turbulator. 3,734,135, Cl. 138-38.000.  
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 Moy, Bertram K.; Mac Kenzie, Gerald L.; and Pisacane, Frank J., to United States of America, Navy. Gas generating solid containing 5-aminotetrazole nitrate. 3,734,789, Cl. 149-19.000.  
 MPC/KurgiSil: See—  
 Walker, Robert D.; Bazell, Seymour; Goldberg, Edward M.; and Ostensen, Ralph G., 3,734,100.  
 Mueller, Arthur Thomas, to Gulf & Western Industrial Products Company. Feed mechanism. 3,734,265, Cl. 198-24.000.  
 Mueller Co.: See—  
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 Muller, Helmut; Rosenberger, Siegfried; and Brunetti, Heimo, to Ciba-Geigy Corporation. Stabilising homo- or copolymeric polyolefins with diacyl dihydrazides. 3,734,885, Cl. 260-45.85b.  
 Munn, Ben. Part feeding attachment for fastener driving tools. 3,734,377, Cl. 227-120.000.  
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 Murdough, Charles P.; and Neely, Alfred W., to American Hospital Supply Corporation. Heat-retaining food server. 3,734,077, Cl. 126-246.000.  
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 Murry, Edward J. Method and apparatus for translating ultrasonic energy. 3,735,159, Cl. 310-8.300.  
 Mushines, Anthony. System for converting heat to kinetic energy. 3,733,819, Cl. 60-108.000.  
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- Naka, Katsushi, to Ise Electronics Corporation. Pattern display apparatus. 3,735,388, Cl. 340-324.0ad.  
 Naka, Katsushi, to Ise Electronics Corporation. Display apparatus utilizing cathode ray tubes. 3,735,383, Cl. 340-324.00a.  
 Nakamura, Hideo; Takasugi, Kazuo; Hiroshima, Minoru; and Inose, Fumiyuki, to Hitachi, Ltd. Data exchange system. 3,735,365, Cl. 340-172.500.  
 Nakamura, Hisashi; and Tanaka, Masatoshi, to Sumitomo Metal Industries Limited. Cross-rifled vapor generating tube. 3,734,140, Cl. 138-177.000.  
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 Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid: See—  
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 Nix, William R. Method and apparatus for cutting openings in paneling or the like. 3,733,707, Cl. 33-180.00r.  
 Noack, Eolf; Kromer, Karl; and Hillmann, Paul, to Veb Pentacon Dresden Kamera-und Kinowerke. Photographic focal-plane shutter. 3,733,990, Cl. 95-55.000.  
 Noel, Eugene M. Muffin perforating machine. 3,733,942, Cl. 83-2.000.  
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Notaras, John Arthur; and Notaras, Angelo Lambrinos. Dual grip handle for power tools. 3,733,700, Cl. 30-381.000.  
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Oda, Osamu, to Dainippon Screen Seizo Kabushiki Kaisha. Inking arrangement in offset proof press for multicolor printing. 3,734,014, Cl. 101-186.000.  
Odman, Tor Axel, to Aktiebolaget Tudor. Apparatus for arranging and soldering together electrode sets for lead accumulators. 3,734,167, Cl. 164-324.000.  
O'Donnell, Paul E.; and Leaf, H. Vincent, to Ark-Les Switch Corporation. Electrical connector. 3,735,331, Cl. 339-97.00c.  
Offerman, Seymour; and Pittman, Robert B., to Industrial Electronic Hardware Corporation. Kinescope anode connector. 3,735,330, Cl. 339-91.00r.  
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- Skatron Electronics & Television Corporation: See—  
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- Skolnik, Marvin B.: See—  
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- Skripsky, Harold O. Portable workbench. 3,734,151, Cl. 144-1.00r.
- Slade, Harry Boone, to Hendrix Wire and Cable Corporation. Apparatus and method for spreading apart electric power cable wires. 3,734,462, Cl. 254-1.000.
- Slagle, William L., to United States of America, Atomic Energy Commission. Method of suppressing the formation of methyl iodide in a water-cooled nuclear reactor. 3,734,826, Cl. 176-37.000.
- Slavin, Michael: See—  
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- Slettinger, Meyer: See—  
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- Sloan, Clark E., Jr., to General Motors Corporation. Vibrator type electrical circuit interrupter. 3,735,311, Cl. 337-108.000.
- Sloane, Jack: See—  
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- Small, Augustus B.; Gorman, Paul T.; and McGarry, Frederick J., to EMO Research and Engineering Company. Laminated construction of cellular plastic material. 3,734,811, Cl. 161-37.000.
- Smart, Daniel Henry: See—  
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- Smatko, Joseph S., to McDonnell Douglas Corporation. Low-gassing high strength battery separator and method of production. 3,734,781, Cl. 136-146.000.
- Smedley, William L. Well packer and pump apparatus. 3,734,179, Cl. 166-106.000.
- Smedley, William L. Method of increasing capacity in a well. 3,734,190, Cl. 166-315.000.
- Smith, A. O., Corporation: See—  
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- Smith, Ashley P., to Northrop Carolina, Inc. Apparatus for crimping thermosetting fiber. 3,733,659, Cl. 28-1.700.
- Smith, Bernard L. Plural bung tool. 3,733,938, Cl. 81-119.000.
- Smith, Clyde W.; and Mc Mann, Renville H., to Columbia Broadcasting System, Inc. Automatic color corrector for a color video signal. 3,735,026, Cl. 178-5.40r.
- Smith, Dorman, Switchgear Limited: See—  
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- Smith, Forrest D. Ventilated toilet. 3,733,619, Cl. 4-72.000.
- Smith, Frank A. Metal coated with a silicone elastomer containing monocellular particles for ablative purposes. 3,734,768, Cl. 117-132.00s.
- Smith, Frank T.; and Smith, Robert D. Self-cleaning filter assembly. 3,734,295, Cl. 210-278.000.
- Smith, James M., to Great Western Sugar Company, The. Continuous flow scale with alternating volumetric measuring and weighing chambers. 3,734,215, Cl. 177-59.000.
- Smith Kline & French Laboratories, Limited: See—  
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- Smith, Peter W., to United Aircraft Corporation. Temperature compensated latching phase shifter having compensating dielectric in aperture of ferrite core. 3,735,291, Cl. 333-24.100.
- Smith, Richard H. Self-propelled platform tower having mechanical and hydraulic supporting means. 3,734,220, Cl. 180-8.00e.
- Smith, Robert D.: See—  
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- Smith, Theodore M. Chuck assembly for tool holders. 3,734,516, Cl. 279-75.000.
- Smith, Thomas R., to Maytag Company, The. Clothes drier having moisture sensing control. 3,733,712, Cl. 34-45.000.
- Smith, Willis R., to General Signal Corporation. Control of multiple highway crossings. 3,734,434, Cl. 246-125.000.
- Smith-Berger Manufacturing Corporation: See—  
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- Soykan, Ferhun H., to Special Metals Corporation. Circular refractory brick construction. 3,735,011, Cl. 13-35.000.
- Spanjer, Keith G., to Motorola, Inc. Apparatus for control of welding apparatus. 3,734,382, Cl. 228-1.000.
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- Spiecker, Karl Heinz, to Demag AG. Wire mill in block form. 3,733,874, Cl. 72-235.000.
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- Sztankay, Zoltan G.; Holland, Richard J.; and Swirczynski, John P., to United States of America, Army. High intensity light limiting device. 3,734,592, Cl. 350-17.000.
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- Williams, Bert B., to Esso Production Research Company. Method for acidizing subterranean formations, 3,734,186, Cl. 166-282.000.
- Williams, Edgar L., Jr. Portable electric flashlight, 3,735,119, Cl. 240-10.60r.
- Williams, Glynn P.: See—  
Abrams, Harold B.; Haynes, Benjamin O.; and Williams, Glynn P., 3,735,366.
- Williams, Joel L.; and Stannett, Vivian T. Stopcock-joint assembly, 3,734,127, Cl. 137-583.000.
- Williams, Laurence Lyman: See—  
Coscia, Anthony Thomas; and Williams, Laurence Lyman, 3,734,977.
- Williams, Patrick Robert, to Temtool Pty., Limited. Method of and apparatus for sharpening small hand tools, 3,733,751, Cl. 51-3.000.
- Williams, Richard M., to Burroughs Corporation. Document encoding apparatus, 3,734,011, Cl. 101-91.000.
- Williamson, Harry, Jr. Apparatus for processing a bed of fluidized solids, 3,733,713, Cl. 34-57.00a.
- Williamson, Hugh C., to Universal Metal Products, Inc. Hose clamp, 3,733,654, Cl. 24-20.0tt.
- Willis, Frederick Gordon, Jr., 30% to Birch, Richard J. Electromagnetically actuated artificial heart, 3,733,616, Cl. 3-1.000.
- Willy, Glenn R., to Standard Pressed Steel Co. Collar assembly for use with a rivet, 3,733,958, Cl. 85-37.000.
- Wills, Karl-Heinz, to Optische Werke G. Rodenstock. Slit lamp, 3,735,125, Cl. 240-413.000.
- Wilson, David A.: See—  
Moody, Robert E.; and Wilson, David A., 3,734,621.
- Wilson, Geoffrey: See—  
Foster, John; and Wilson, Geoffrey, 3,733,884.
- Wilt, Ted. Suitcase divider, 3,734,249, Cl. 190-41.00b.
- Winckles, Harvey T.: See—  
Hillman, Arnold R.; and Winckles, Harvey T., 3,734,507.



Windle, William K., to Universal Water Corporation. Module for reverse osmosis apparatus. 3,734,297, Cl. 210-321.000.

Windmoller & Holscher: See—  
Schmedding, Herbert; and Helbig, Helmut, 3,734,849.

Winkler, Alfred: See—  
Wick, Richard; Winkler, Alfred; and Von Fischern, Bernhard, 3,733,989.

Winningham, Truman, to Truman Smog Control Inc. Method, apparatus and systems for separating particulate matter from gases laden therewith and accumulating the particulate matter. 3,733,787, Cl. 55-228.000.

Wintz, Donald E., to Aladdon Manufacturing Company. Beverage container receptacle and clamp. 3,734,439, Cl. 248-224.000.

Wirchansky, Anastasia C.: See—  
Cassanelli, Robert R.; Wauters, Ronald P.; Wirchansky, Anastasia C.; and Wyss, Clement R., 3,734,745.

Wirt, Leslie S., to Lockheed Aircraft Corporation. Sound absorption structure. 3,734,234, Cl. 181-33.00g.

Wirtz, Rainer: See—  
Renner, Stefan; Bayha, Wulf; Burgholte, Alwin; Schweizer, Holger; and Wirtz, Rainer, 3,735,220.

Wisconsin Alumni Research Foundation: See—  
Larsen, Edwin M.; and Gil-Amaro, Francisco C., 3,734,689.

Wiser, Joseph E.: See—  
Chestnut, Benjamin F.; and Wiser, Joseph E., 3,735,062.

Wisniewski, Jules, to Simmonds Precision Products, Inc. Electric motor construction. 3,735,173, Cl. 310-242.000.

Wisser, Otto, to Jahresuhren-Fabrik GmbH. Alarm device. 3,733,802, Cl. 58-16.500.

Witco Chemical Corporation: See—  
Barker, Graham; and Gordon, Ronald H., 3,734,858.

Wittmann, Christoph J., to Darlington Fabrics Corporation. Warp knit elastic fabric. 3,733,859, Cl. 66-193.000.

Wolber, Robert; King, Josef; and Kern, Eckhart, to Gebruder Junghans G.m.b.H. Device for the precision adjustment of a balance. 3,733,808, Cl. 58-112.000.

Wolber, William G., to Bendix Corporation. The. Interferometer utilizing a tunable laser or similar frequency variable wave energy generator. 3,734,623, Cl. 356-110.000.

Wold, Leslie D.: See—  
Bender, Herman G.; Page, Robert N.; and Wold, Leslie D., 3,734,099.

Wolf, Konrad; and Bambold, Hermann, to Vereinigte Flugtechnische Werke-Fokker GmbH. Air brake for jets. 3,734,411, Cl. 239-265.290.

Wolf, Milton: See—  
Diebold, James L.; Sanet, Joel S.; and Wolf, Milton, 3,734,903.

Diebold, James L.; and Wolf, Milton, 3,734,906.

Wolf, Robert L.; and McGann, Rodney, to Texaco Experiment Incorporated. Fuel cooled ram air reaction propulsion engine. 3,733,826, Cl. 60-263.000.

Wolf, Walter A.; and Corn, Prentice R., to Switches Incorporated. Seat sensing mechanism. 3,735,380, Cl. 340-278.000.

Wolken-Mohlmann, Helmut: See—  
Hananekamp, Horst; and Wolken-Mohlmann, Helmut, 3,735,304.

Wood Industries, Inc.: See—  
Trier, James J.; and Enz, John H. F., 3,734,017.

Wood, Richard P.: See—  
Davis, Carlton J., Sr.; Wood, Richard P.; and Miller, Everett R., 3,734,814.

Wood, Thomas E. Pack frame. 3,734,366, Cl. 224-25.00a.

Wood, William Robert; and Burroughs, Donald E., to Deere & Company. Header having harvester reel with tangle-preventing filler plates thereon. 3,733,796, Cl. 56-220.000.

Woodward, Oakley McDonald, to RCA Corporation. Multifrequency antenna system including an isolation section open circuited at both ends. 3,735,413, Cl. 343-730.000.

Worthington, Stanley W. Apparatus for controlling direction of movement of refuse body compacting and unloading blade. 3,734,316, Cl. 214-82.000.

Wright, Alan Carl: See—  
Schaefer, Frederic Charles; and Wright, Alan Carl, 3,734,939.

Wright, Allen C., to Haws Drinking Fountain Company. Vandal-proof drinking fountain. 3,734,408, Cl. 239-29.000.

Wright, Donald J.; and Fisher, Gerald E. Offset signal correction system. 3,735,273, Cl. 328-163.000.

Wright, William Blythe, Jr.; and Brabander, Herbert Joseph, to American Cyanamid Company. N-[2-(4 Phenyl-1-piperazinyl)alkyl]benzo [b]thiophene or benzofuran 2-carboxamides. 3,734,915, Cl. 260-268.00f.

Wright, William Blythe, Jr.; and Brabander, Herbert Joseph, to American Cyanamid Company. N-(tert-amino alkyl)-2-indenecarboxamides and methods of preparing the same. 3,734,916, Cl. 260-268.00c.

Wuerker, Ralph Frederick; and Heflinger, Lee Opert, to TRW Inc. Beam diameter control for P laser having improved coherence. 3,735,283, Cl. 331-94.500.

Wulff, Rafael T.: See—  
Christensen, Frank G.; and Wulff, Rafael T., 3,734,219.

Wurlitzer Company, The: See—  
Osborne, Fred H.; Tuttle, Robert S.; and Corbett, Michael J., 3,734,512.

Wyeth, William Albert: See—  
Eastcott, Peter de Hertel; Messervey, William Albert; and Wyeth, William Albert, 3,734,257.

Wyland, Alvin D., to General Electric Company. Electrically energizable control system for a fuel burner. 3,734,676, Cl. 431-79.000.

Wys, Clement R.: See—  
Cassanelli, Robert R.; Wauters, Ronald P.; Wirchansky, Anastasia C.; and Wyss, Clement R., 3,734,745.

Culpepper, George O., Jr.; and Wyss, Clement R., 3,734,774.

Xerox Corporation: See—  
Camis, Thomas; and Goss, Steven A., 3,734,015.

Davis, Howard C.; Trumbull, Harold E.; and Cummings, Charles A., 3,734,607.

O'Connell, Richard P.; and Zucker, Edwin, 3,734,610.

Punt, Vernon E.; Van Neil, Charles G.; and Hatzmann, John F., 3,735,040.

Reithmeier, Alton F.; and Fahey, Frank R., 3,735,043.

Traister, Robert L., 3,735,092.

Xonics Inc.: See—  
Balsor, Martin; Nagy, Arthur E.; and Proudian, Andrew P., 3,735,333.

Yagi, Motohiko, to Jufi Photo Film Co., Inc. Sheathed electrical resistance heating element. 3,735,328, Cl. 338-270.000.

Yamada, Harumi, to Koyo Lindberg Hevi-Duty Company. Apparatus for feeding articles at constant rate. 3,734,355, Cl. 222-167.000.

Yamamoto, Hiroshi; Okuda, Kunitaru; and Nomoto, Hiroaki, to Oval Engineering Co., Ltd. Flow conditioning apparatus. 3,733,898, Cl. 73-198.000.

Yamamoto, Osamu, to Kawaguchi Shoichi. Electric can opener. 3,733,698, Cl. 30-4.00r.

Yamamoto, Yukitsune: See—  
Sakato, Yajiro; Ina, Kazuo; Yamamoto, Yukitsune; and Morishita, Harumi, 3,734,932.

Yamanaka, Akira, to Minolta Camera Kabushiki Kaisha. Device for firing flashlamps in camera. 3,733,987, Cl. 95-11.50r.

Yamanaka, Tsuneo: See—  
Sakano, Nozomu; Yamanaka, Tsuneo; Shibagaki, Kumekichi; and Kawabe, Katsumi, 3,735,401.

Yamanishi, Isamu: See—  
Murayama, Yoshinobu; Morimoto, Tadashi; Kinoshita, Mikio; and Yamanishi, Isamu, 3,733,912.

Yamazaki, Masami, to Victor Company of Japan, Limited. Compressing and/or expanding system comprising fixed and variable frequency characteristic changing circuits. 3,735,290, Cl. 333-14.000.

Yamda, Shoji. Fuel control means for a model engine. 3,734,072, Cl. 123-73.00a.

Yanaga, Makoto; and Shimojo, Takemi, to Alps Electric Co., Ltd. Push-button switch with resilient conductive contact member and with helical conductive networks. 3,735,068, Cl. 200-159.00b.

Yanikoshi, Florian F., to Sigma Instruments, Inc. Stepping motor with automatic brake. 3,734,254, Cl. 192-16.000.

Yano, Yukio: See—  
McRae, James; Van Dyke, Donald C.; and Yano, Yukio, 3,735,001.

Yasui, Yukio; Ikoga, Wataru; Mori, Akihiko; and Adachi, Tadaaki, to Kewpie Jyozo Kabushiki Kaisha. Process for continuous production of vinegar by surface fermentation. 3,734,746, Cl. 99-147.000.

Yata, Kotaro, to Minolta Camera Kabushiki Kaisha. Exposure control systems for single reflex cameras having a detachable housing. 3,733,984, Cl. 95-10.00c.

Yates, John; and Devlin, Barry R. J., to Shell Oil Company. Herbicidal composition and method. 3,734,711, Cl. 71-118.000.

Yates, Michael Harold John, to Marconi Company Limited, The. Data processing arrangements having convertible majority decision voting. 3,735,356, Cl. 340-172.500.

Yazawa, Masahide, to Polymer Processing Research Institute Ltd. and Nippon Petrochemicals Co., Ltd. Laminate product of crossed stretched tapes having perforations for air permeation and method for preparing the same. 3,734,812, Cl. 161-57.000.

Yenni, Donald M.: See—  
Fietz, William A.; and Yenni, Donald M., 3,733,692.

Yevick, George J., to Personal Communications, Inc. Mechanical optical scanner. 3,734,605, Cl. 353-30.000.

Yingst, Thomas O., to Polyvend, Inc. Lock blocking device for vending machine closures. 3,734,346, Cl. 221-101.000.

York, William C., to Eastman Kodak Company. Developed image transfer. 3,734,724, Cl. 96-1.400.

Yoshida, Makoto: See—  
Hiraga, Michio; and Yoshida, Makoto, 3,733,803.

Yoshida, Mikihiro: See—  
Hijiyu, Hiromi; and Yoshida, Mikihiro, 3,734,760.

Yoshii, Takashi: See—  
Kobayakawa, Masaki; and Yoshii, Takashi, 3,735,181.

Yoshimura, Kazuo, to Tokyo Shibaura Electric Co., Ltd. Tape recorder-operating device with automatic exchange from rewind or quick feed to reproduction by sensing nonrecorded section. 3,735,054, Cl. 179-100.20a.

Yoshioka, Tomonori: See—  
Iwabuchi, Kasuo; and Yoshioka, Tomonori, 3,735,395.

Young, Einar T., to Sun Oil Company. Gasoline dispensing nozzle. 3,734,339, Cl. 222-56.000.

Young, Fred M.; and Jones, Ronald E., to Young Radiator Company. Heat-exchange core assembly machine. 3,733,673, Cl. 29-202.00r.

Young, George W., to American Air Filter Company, Inc. Filter latch. 3,733,793, Cl. 55-493.000.

Young, Joe W.: See—

Kossoff, Joseph; Liedtke, Ronald R.; and Young, Joe W., 3,733,743.

Young, John P.; and Ng, Wahling H., to United States of America, Army. Method for retarding the decomposition of hydrazine rocket fuels in contact with maraging steels. 3,734,792, Cl. 149-36.000.

Young, John R.; and McElwain, John C., to North American Rockwell Corporation. Shielded angular drive transmitting joint and shielded quickly detachable coupling thereof. 3,733,854, Cl. 64-32.000.

Young Radiator Company: See—  
Christensen, Donald W., 3,734,175.

Young, Fred M.; and Jones, Ronald E., 3,733,673.

Young, Roland L.: See—  
Hug, Leonard F.; Grossman, Phillip A.; Young, Roland L.; and Stark, Robert E., 3,734,778.

Zachariae, Barbara L.: See—  
Johnson, Lu Wanna M.; and Zachariae, Barbara L., 3,733,852.

Zadig, Ernest A. Testing apparatus for selectively controlled equipment. 3,735,381, Cl. 340-279.000.

Zaffaroni, Alejandro, to Alza Corporation. Therapeutic adhesive tape. 3,734,097, Cl. 128-268.000.

Zafiroglu, Dimitri P., to Du Pont de Nemours, E. I., and Company. Composite thermoplastic structure. 3,734,139, Cl. 138-146.000.

Zahn, Wolfgang, to Agfa-Gevaert Aktiengesellschaft. Photographic copying apparatus. 3,734,614, Cl. 355-67.000.

Zanis, Charles A.; and Heflerich, Richard L., to United States of America, Navy. Lamellar crucible for induction melting titanium. 3,734,480, Cl. 266-39.000.

Zanoni, Paul; and Shunta, Richard F., to Bennett Pump Incorporated. Staged throttling float valve. 3,734,124, Cl. 137-430.000.

Zaun, Richard David, to Deere & Company. Rotary hoe. 3,734,201, Cl. 172-551.000.

Zax, Grigory Iosifovich: See—  
Duchinsky, Yakov Efimovich; Radutsky, Grigory Avramovich; Kheifets, Rafail Efimovich; Zax, Grigory Iosifovich; Anikanov, Nikolai Ivanovich; and Grachev, Leonid Pavlovich, 3,733,774.

Zehring, Claude D., Jr., to Rental Equipment Manufacturing Company. Knife structure for a knife reel. 3,734,197, Cl. 172-21.000.

Zeiss-Stiftung, Carl, d/b/a Zeiss, Carl: See—  
Schafer, Fritz Peter; and Schmidt, Werner, 3,735,278.

Zeitlin, Richard A., to Autolelectron Corporation. Embossment reader. 3,735,097, Cl. 235-61.11f.

Zellweger AG: See—  
Barnhardt, Robert W.; and Grubbs, William J., 3,733,906.

Zenith Radio Corporation: See—  
Dietch, Leonard, 3,733,976.

Kachel, Irwin, 3,734,728.

Kaplan, Sam H., 3,735,179.

Karlovics, Steven, 3,735,189.

Kun, Zoltan K., 3,735,212.

Trzyna, William A., 3,735,039.

Zenos, Stevens. Continuous food cooking device. 3,734,740, Cl. 99-1.000.

Zentz, Robert J.; and Stutler, Robert A., to Sundstrand Corporation. Hydromechanical transmission. 3,733,924, Cl. 74-687.000.

Zepp, Philip H., to Hoover Company, The. Methods of and apparatus for transferring bodies. 3,734,314, Cl. 214-38.00r.

Zerbe, James J. Pollutant recovery system. 3,734,294, Cl. 210-242.000.

Zeta Research, Inc.: See—  
Tarczy-Hornoch, Zoltan, 3,735,389.

Ziegler, Max, to Heraeus, W. C., GmbH. Process for the quantitative recovery of gold from aqueous solutions. 3,734,722, Cl. 75-118.000.

Ziener, Otto, to Lackstone, Allan John and Handelman, Adele. Meat processing and separating apparatus. 3,734,000, Cl. 99-539.000.

Zieringer, Rudolf, to List, Hans. Method for the manufacture of a piezoelectric transducer and transducer manufactured by the method. 3,733,661, Cl. 29-25.350.

Zifka, Donald K.: See—  
Lynch, Peter D.; Oldfield, Dempsey R.; and Zifka, Donald K., 3,734,324.

Zimmer, Gerhard; and Stein, Hermann. Aerosol hair-setting composition comprising an interpolymers of an N-3-oxoalkylamide and  $\alpha,\beta$ -unsaturated aliphatic acid. 3,735,003, Cl. 424-47.000.

Zimmerman, D. W., Mfg., Inc.: See—  
Stone, Charles W., 3,734,325.

Zimmerman, Eli. Toothbrush mouthwash rinser kit. 3,734,106, Cl. 132-79.000.

Zinser-Textilmaschinen Gesellschaft mit beschränkter Haftung: See—  
Roethke, Ernst, 3,733,799.

Zivanovic, Sbrislav V.: See—  
Blorc, William E.; Zivanovic, Sbrislav V.; and Charest, Bernard, 3,735,146.

Zlupko, John E.: See—  
Frind, Gerhard; Korte, Richard M.; and Zlupko, John E., 3,735,074.

Zschocke, Albrecht: See—  
Fischer, Adolf; Koenig, Karl-Heinz; Steinbrunn, Gustav; and Zschocke, Albrecht, 3,734,712.

Zucker, Edwin: See—  
O'Connell, Richard P.; and Zucker, Edwin, 3,734,610.

Zumchak, Eugene M.: See—  
Reinagel, Frederick G.; and Zumchak, Eugene M., 3,733,955.

Zurn, Gordon F., Jr.: See—  
Holt, Lloyd J.; Myers, Harry L.; and Zurn, Gordon F., Jr., 3,734,429.

Zvl Vyzkumny ustav pro Valiva Ioziska: See—  
Hosnedl, Vaclav; Rajisigl, Zdenek; Rathusky, Jiri; Prokopec, Miroslav; and Mladek, Milos, 3,734,583.



# LIST OF PLANT PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF MAY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Armstrong, David L., to Armstrong Nurseries, Inc. Rose plant. 3,340, 5-22-73, Cl. 19.  
Armstrong Nurseries, Inc.: See—  
Armstrong, David L. 3,340.  
Bosley, Paul R. Pieris Japonica. 3,339, 5-22-73, Cl. 54.  
Duffett, William E.: See—  
Nishimoto, Yoshio, Jessel, and Duffett. 3,343.  
Jessel, Walter H.: See—  
Nishimoto, Yoshio, Jessel, and Duffett. 3,343.  
Lewis, Helen H.: See—  
Lewis, Hubert B. and H. H. 3,338.  
Lewis, Hubert B. and H. H. Azalea plant. 3,338, 5-22-73, Cl. 56.  
Nishimoto, Yoshio: See—  
Nishimoto, Yoshio, Jessel, and Duffett. 3,343.  
Nishimoto, Yoshio, W. H. Jessel, Jr., and W. E. Duffett, to Yoshio Nishimoto. Chrysanthemum plant. 3,343, 5-22-73, Cl. 78.  
Pratt, Wilfred A. Peach tree. 3,342, 5-22-73, Cl. 43.  
Quinn, Vincent P. Carnation plant. 3,341, 5-22-73, Cl. 70.

# LIST OF DESIGN PATENTEEES

Albertson, Robert V., to Massey-Ferguson Inc. Water vehicle. 226,988, 5-22-73, Cl. D71—1.  
Angelakos, Nicholas P., to Lancaster Colony Corp. Coaster. 226,963, 5-22-73, Cl. 44—10.  
Arai, Toshikatsu, to Tomy Kogyo Co., Ltd. Toy trackway. 226,957, 5-22-73, Cl. D34—15.  
Benty, John L., and D. Defano, to Clairol Inc. Electric skin hygiene brush. 226,941, 5-22-73, Cl. D4—14.  
Bobrowski, Louis G., to The Stanley Works. Door chain lock. 226,944, 5-22-73, Cl. D3—131.  
Boyd, James D. Candle holder. 226,970, 5-22-73, Cl. D48—2.  
Bradley, Donald W. Combined fluid dispenser and cabinet therefor. 226,994, 5-22-73, Cl. D94—3.  
Bridges, Roy G. Toothbrush container. 226,992, 5-22-73, Cl. D87—1.  
Brindisi, Frederick J., to Qualitrol Corp. Pressure relief valve. 226,952, 5-22-73, Cl. D23—19.  
Burkhardt, Albert E. Combined can closure and pouring spout. 226,945, 5-22-73, Cl. D9—275.  
Cable Electric Products, Inc.: See—  
Schwartz, Frederic W. 226,972.  
Clairol Inc.: See—  
Benty, John L., and Defano. 226,941.  
Cowan, Murray L. Expandable link chain for a bracelet or similar article. 226,966, 5-22-73, Cl. D45—4.  
Cowan, Murray L., to Textron Inc. Expandable link chain for a bracelet or similar article. 226,968, 5-22-73, Cl. D45—4.  
Defano, Dominic: See—  
Benty, John L., and Defano. 226,941.  
Design Dynamics, Inc.: See—  
Schier, Robert W. 226,964.  
Ehrlich, Hans O. G.: See—  
Torbjorn, Tom E., and Ehrlich. 226,943.  
Florian, Gordon W., to General Signal Corp. Electric mixer housing. 226,958, 5-22-73, Cl. D44—1.  
Fontaine, Raymond C., to Textron, Inc. Expandable link chain for a bracelet or similar article. 226,967, 5-22-73, Cl. D45—4.  
Fox, Arthur J. Handbag. 226,993, 5-22-73, Cl. D87—3.  
Francis, John P. Retractable window case structure and support therefor. 226,946, 5-22-73, Cl. D13—1.  
Francis, John P. Retractable window case structure and support therefor. 226,947, 5-22-73, Cl. D13—1.  
Francis, John P. Retractable window case structure and support therefor. 226,948, 5-22-73, Cl. D13—1.  
Francis, John P. Retractable window case structure and support therefor. 226,948, 5-22-73, Cl. D13—1.  
General Signal Corp.: See—  
Florian, Gordon W. 226,958.  
Grams, Johanna, to Porzellan-Handels-GmbH. Plate or similar article. 226,965, 5-22-73, Cl. D44—15.  
Grauso, Robert M., and J. J. Norena, to C. F. Martin & Co. Combined cymbal mount and muffler or similar article. 226,983, 5-22-73, Cl. D56—1.  
Kallmar, Inc.: See—  
Kitagawa, Kelsuke. 226,987.  
Kikuchi, Tatsuo, and T. Toyama, to Nichiban Co., Ltd. Adhesive tape dispenser. 226,989, 5-22-73, Cl. D74—1.  
Klad, Lyle E. Drinking cup. 226,961, 5-22-73, Cl. D44—9.  
Kitagawa, Kelsuke, to Kallmar, Inc. Electronic flash adapter for cameras. 226,987, 5-22-73, Cl. D61—1.  
Krock, Albert W., to The Scott & Fetzer Co. Cup. 226,962, 5-22-73, Cl. D44—9.  
Ladatta, Angelo J. Combined radio, chest and magazine rack or similar article. 226,986, 5-22-73, Cl. D56—4.  
Lancaster Colony Corp.: See—  
Angelakos, Nicholas P. 226,963.  
Litton Systems, Inc.: See—  
Wolff, Donald G., and Tapper. 226,990.  
MacNair, Andrew P. Lamp. 226,971, 5-22-73, Cl. D48—20.  
Manderfield, Ellen B., to Onelda Ltd. Spoon or similar article. 226,974, 5-22-73, Cl. D54—12.  
Manderfield, Ellen B., to Onelda Ltd. Spoon or similar article. 226,975, 5-22-73, Cl. D54—12.  
Manderfield, Ellen B., to Onelda Ltd. Spoon or similar article. 226,977, 5-22-73, Cl. D54—12.  
Manderfield, Ellen B., to Onelda Ltd. Spoon or similar article. 226,981, 5-22-73, Cl. D54—12.  
Manderfield, Ellen B., to Onelda Ltd. Spoon or similar article. 226,982, 5-22-73, Cl. D54—12.  
Martin, C. F. & Co.: See—  
Grauso, Robert M., and Norena. 226,983.  
Martin, Robert T. Humidifier. 226,953, 5-22-73, Cl. D23—146.  
Massey-Ferguson Inc.: See—  
Albertson, Robert V. 226,988.  
Monte, Ernest, to Sunbeam Lighting Co. Ceiling mounted fluorescent light fixture. 226,973, 5-22-73, Cl. D48—23.  
Nichiban Co., Ltd.: See—  
Kikuchi, Tatsuo, and Toyama. 226,989.  
Norena, John J.: See—  
Grauso, Robert M., and Norena. 226,983.  
Okuda, Sakuji. Tooth brush. 226,942, 5-22-73, Cl. D4—25.  
Onelda Ltd.: See—  
Manderfield, Ellen B. 226,974.  
Manderfield, Ellen B. 226,975.  
Manderfield, Ellen B. 226,977.  
Manderfield, Ellen B. 226,981.  
Manderfield, Ellen B. 226,982.  
Perry, Frank R. 226,980.  
Richmond, Colin B. 226,976.  
Richmond, Colin B. 226,978.  
Richmond, Colin B. 226,979.  
Papavasiliou, Elaine J., to Symbologies, Inc. Medallion. 226,955, 5-22-73, Cl. D29—19.  
Papavasiliou, Elaine J., to Symbologies, Inc. Medallion. 226,956, 5-22-73, Cl. D29—19.  
Pasquale, Michael J. Food mold. 226,959, 5-22-73, Cl. D44—1.  
Pasquale, Michael J. Food mold. 226,960, 5-22-73, Cl. D44—1.  
Pelensky, Walter J. Stringed musical instrument. 226,984, 5-22-73, Cl. 56—1.  
Pelensky, Walter J. Stringed musical instrument. 226,985, 5-22-73, Cl. D56—1.  
Perry, Frank R., to Onelda Ltd. Spoon or similar article. 226,980, 5-22-73, Cl. D54—12.  
Physics Apparatus Research, Inc.: See—  
Stephenson, Roger D. 226,954.  
Prozellan-Handels-GmbH: See—  
Grams, Johanna. 226,965.  
Qualitrol Corp.: See—  
Brindisi, Frederick J. 226,952.  
Quigley, Jeneane M., to The Witness Cross. Cross pendant or the like. 226,969, 5-22-73, Cl. D45—16.  
Richmond, Colin B., II, to Onelda Ltd. Spoon or similar article. 226,976, 5-22-73, Cl. D54—12.  
Richmond, Colin B., II, to Onelda Ltd. Spoon or similar article. 226,978, 5-22-73, Cl. D54—12.  
Richmond, Colin B., II, to Onelda Ltd. Spoon or similar article. 226,979, 5-22-73, Cl. D54—12.  
Schier, Robert W., to Design Dynamics, Inc. Dish. 226,964, 5-22-73, Cl. D44—10.  
Schwartz, Frederic W., to Cable Electric Products, Inc. Night light. 226,972, 5-22-73, Cl. D48—20.  
Scott & Fetzer Co., The: See—  
Krock, Albert W. 226,962.  
Sirago, James J., and E. B. Walton. Detector for blood analysis. 226,950, 5-22-73, Cl. D16—1.  
Sirago, James J., and E. B. Walton. Detector for blood analysis. 226,951, 5-22-73, Cl. D16—2.  
Stanley Works, The: See—  
Bobrowski, Louis G. 226,944.  
Stephenson, Roger D., to Physics Apparatus Research, Inc. Teaching aid for measuring the acceleration of a falling body. 226,954, 5-22-73, Cl. D25—1.  
Sunbeam Lighting Co.: See—  
Monte, Ernest. 226,973.

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Symbologies, Inc.: See—  
Papavasiliou, Elaine J. 226,955.  
Papavasiliou, Elaine J. 226,956.  
Tapper, William R.: See—  
Wolff, Donald G., and Tapper. 226,990.  
Tegner, Carl-Axel. Mobile housing for conducting hearing tests. 226,991, 5-22-73, Cl. D83—1.  
Textron, Inc.: See—  
Cowan, Murray L. 226,968.  
Fontaine, Raymond C. 226,967.  
Tomy Kogyo Co., Ltd.: See—  
Arai, Toshikatsu. 226,957.  
Torbjorn, Tom E., and H. O. G. Ehrlich. Clothes hanger. 226,943, 5-22-73, Cl. D6—248.  
Toyama, Takashi: See—  
Kikuchi, Tatsuo, and Toyama. 226,989.  
Walton, Edward B.: See—  
Sirago, James J., and Walton. 226,950.  
Sirago, James J., and Walton. 226,951.  
Witness Cross, The: See—  
Quigley, Jeneane M. 226,969.  
Wolff, Donald G., and W. R. Tapper, to Litton Systems, Inc. Microwave oven. 226,990, 5-22-73, Cl. D81—4.



# CLASSIFICATION OF PATENTS

ISSUED MAY 22, 1973

NOTE.—First number, class; second number, subclass; third number, patent number

|        |           |         |           |       |           |        |           |      |           |       |           |           |
|--------|-----------|---------|-----------|-------|-----------|--------|-----------|------|-----------|-------|-----------|-----------|
| 144    | CLASS 2   | 57      | 3,733,662 | 7     | CLASS 46  | 35     | CLASS 59  | 239  | 3,733,876 | 2     | CLASS 83  | 3,733,942 |
| 232    | 3,733,614 | 78R     | 3,733,663 | 44    | 3,733,736 | 35     | 3,733,811 | 241  | 3,733,877 | 2     | 3,733,943 | 3,733,943 |
|        | 3,733,615 | 95      | 3,733,664 | 79    | 3,733,740 | 6      | CLASS 60  | 245  | 3,733,878 | 7     | 3,733,944 | 3,733,945 |
|        | CLASS 3   | 105R    | 3,733,665 | 91    | 3,733,737 | 39,09P | 3,733,812 | 328  | 3,733,879 | 24    | 3,733,946 | 3,733,947 |
| 1      | 3,733,616 | 149,5NM | 3,733,666 | 175AR | 3,733,741 | 39,16R | 3,733,815 | 332  | 3,733,880 | 98    | 3,733,948 | 3,733,949 |
| 10     | 3,733,617 | 149,5B  | 3,733,667 | 202   | 3,733,742 | 39,28R | 3,733,816 | 344  | 3,733,881 | 129   | 3,733,950 | 3,733,951 |
| 51R    | 3,734,617 | 155R    | 3,734,697 | 206   | 3,733,739 | 39,77  | 3,733,820 | 349  | 3,733,882 | 280   | 3,733,952 | 3,733,953 |
| 72     | 3,734,618 | 182.7   | 3,733,668 | 228   | 3,733,743 | 54,5R  | 3,733,822 | 391  | 3,733,883 | 348   | 3,733,954 | 3,733,955 |
| 159    | 3,733,619 | 191     | 3,734,698 | 243E  | 3,733,744 | 54,6R  | 3,733,823 | 402  | 3,733,884 | 425.3 | 3,733,956 | 3,733,957 |
| 172.19 | 3,733,620 | 191.4   | 3,734,699 |       |           |        | 3,733,819 | 429  | 3,733,885 | 474   | 3,733,958 | 3,733,959 |
| 191    | 3,733,621 | 200A    | 3,733,670 | 37    | 3,733,745 |        | 3,733,824 | 461  | 3,733,886 | 484   | 3,733,960 | 3,733,961 |
|        | 3,733,622 | 200J    | 3,733,671 | 38    | 3,733,746 |        | 3,733,825 | 469  | 3,733,887 | 789   | 3,733,962 | 3,733,963 |
|        | CLASS 5   | 202R    | 3,733,673 |       |           |        | 3,733,828 |      | 3,733,888 |       | 3,733,964 | 3,733,965 |
| 58     | 3,733,624 | 203HC   | 3,733,674 | 30    | 3,733,747 |        | 3,733,829 | 15A  | 3,733,889 | 1.01  | 3,733,966 | 3,733,967 |
| 63     | 3,733,623 | 203B    | 3,733,675 | 103   | 3,733,748 |        | 3,733,830 | 23   | 3,733,890 | 1.16  | 3,733,968 | 3,733,969 |
| 354    | 3,733,625 | 403     | 3,733,676 | 193   | 3,733,749 |        | 3,733,831 | 63   | 3,733,891 | 1.24  | 3,733,970 | 3,733,971 |
|        | CLASS 7   | 407     | 3,733,677 | 379   | 3,733,750 |        | 3,733,832 | 67.2 | 3,733,892 | 1.25  | 3,733,972 | 3,733,973 |
| 5.3    | 3,733,626 | 411     | 3,733,678 |       |           |        | 3,733,833 | 67.5 | 3,733,893 | 312   | 3,733,974 | 3,733,975 |
| 5.4    | 3,733,627 | 429     | 3,733,679 | 3     | 3,733,751 |        | 3,733,834 | 67.9 | 3,733,894 | 471   | 3,733,976 | 3,733,977 |
|        | CLASS 8   | 431     | 3,733,680 | 8     | 3,733,752 |        | 3,733,835 | 71.4 | 3,733,895 |       | 3,733,978 | 3,733,979 |
| 116R   | 3,734,683 | 447     | 3,733,681 | 34E   | 3,733,753 |        | 3,733,836 | 73   | 3,733,896 |       | 3,733,980 | 3,733,981 |
| 129    | 3,734,685 | 450     | 3,733,682 | 375   | 3,733,754 |        | 3,733,837 | 117  | 3,733,897 |       | 3,733,982 | 3,733,983 |
| 137    | 3,734,686 | 470.1   | 3,733,683 |       |           |        | 3,733,838 | 161  | 3,733,898 |       | 3,733,984 | 3,733,985 |
| 159    | 3,734,688 |         | 3,733,684 | 36    | 3,733,755 |        | 3,733,839 | 193R | 3,733,899 |       | 3,733,986 | 3,733,987 |
| 183    | 3,734,684 |         | 3,733,685 | 105   | 3,733,756 |        | 3,733,840 | 194B | 3,733,900 |       | 3,733,988 | 3,733,989 |
| 188    | 3,734,687 |         | 3,733,686 | 113   | 3,733,757 |        | 3,733,841 | 198  | 3,733,901 |       | 3,733,990 | 3,733,991 |
|        | CLASS 9   |         | 3,733,687 | 122   | 3,733,758 |        | 3,733,842 | 204  | 3,733,902 |       | 3,733,992 | 3,733,993 |
| 1T     | 3,733,628 |         | 3,733,688 | 126   | 3,733,759 |        | 3,733,843 | 212  | 3,733,903 |       | 3,733,994 | 3,733,995 |
| 8R     | 3,733,629 |         | 3,733,689 | 192   | 3,733,760 |        | 3,733,844 | 213  | 3,733,904 |       | 3,733,996 | 3,733,997 |
| 311    | 3,733,630 |         | 3,733,690 | 220   | 3,733,761 |        | 3,733,845 | 233  | 3,733,905 |       | 3,733,998 | 3,733,999 |
| 340    | 3,733,631 |         | 3,733,691 | 224   | 3,733,762 |        | 3,733,846 | 235  | 3,733,906 |       | 3,733,999 | 3,733,999 |
|        | CLASS 12  |         | 3,733,692 | 263   | 3,733,763 |        | 3,733,847 | 236  | 3,733,907 |       | 3,733,999 | 3,733,999 |
| 1R     | 3,733,632 |         | 3,733,693 | 279   | 3,733,764 |        | 3,733,848 | 237  | 3,733,908 |       | 3,733,999 | 3,733,999 |
| 25     | 3,733,633 |         | 3,733,694 | 280   | 3,733,765 |        | 3,733,849 | 238  | 3,733,909 |       | 3,733,999 | 3,733,999 |
| 29     | 3,733,634 |         | 3,733,695 | 429   | 3,733,766 |        | 3,733,850 | 239  | 3,733,910 |       | 3,733,999 | 3,733,999 |
| 35     | 3,733,635 |         | 3,733,696 | 529   | 3,733,767 |        | 3,733,851 | 240  | 3,733,911 |       | 3,733,999 | 3,733,999 |
|        | CLASS 13  |         | 3,733,697 |       |           |        | 3,733,852 | 241  | 3,733,912 |       | 3,733,999 | 3,733,999 |
| 25     | 3,733,636 |         | 3,733,698 |       |           |        | 3,733,853 | 242  | 3,733,913 |       | 3,733,999 | 3,733,999 |
| 29     | 3,733,637 |         | 3,733,699 |       |           |        | 3,733,854 | 243  | 3,733,914 |       | 3,733,999 | 3,733,999 |
| 35     | 3,733,638 |         | 3,733,700 |       |           |        | 3,733,855 | 244  | 3,733,915 |       | 3,733,999 | 3,733,999 |
|        | CLASS 15  |         | 3,733,701 |       |           |        | 3,733,856 | 245  | 3,733,916 |       | 3,733,999 | 3,733,999 |
| 21A    | 3,733,639 |         | 3,733,702 |       |           |        | 3,733,857 | 246  | 3,733,917 |       | 3,733,999 | 3,733,999 |
| 28     | 3,733,640 |         | 3,733,703 |       |           |        | 3,733,858 | 247  | 3,733,918 |       | 3,733,999 | 3,733,999 |
| 49R    | 3,733,641 |         | 3,733,704 |       |           |        | 3,733,859 | 248  | 3,733,919 |       | 3,733,999 | 3,733,999 |
| 93R    | 3,733,642 |         | 3,733,705 |       |           |        | 3,733,860 | 249  | 3,733,920 |       | 3,733,999 | 3,733,999 |
| 111    | 3,733,643 |         | 3,733,706 |       |           |        | 3,733,861 | 250  | 3,733,921 |       | 3,733,999 | 3,733,999 |
| 193    | 3,733,644 |         | 3,733,707 |       |           |        | 3,733,862 | 251  | 3,733,922 |       | 3,733,999 | 3,733,999 |
| 210B   | 3,733,645 |         | 3,733,708 |       |           |        | 3,733,863 | 252  | 3,733,923 |       | 3,733,999 | 3,733,999 |
| 250.32 | 3,733,646 |         | 3,733,709 |       |           |        | 3,733,864 | 253  | 3,733,924 |       | 3,733,999 | 3,733,999 |
| 250.42 | 3,733,647 |         | 3,733,710 |       |           |        | 3,733,865 | 254  | 3,733,925 |       | 3,733,999 | 3,733,999 |
| 256.53 | 3,733,648 |         | 3,733,711 |       |           |        | 3,733,866 | 255  | 3,733,926 |       | 3,733,999 | 3,733,999 |
| 257R   | 3,733,649 |         | 3,733,712 |       |           |        | 3,733,867 | 256  | 3,733,927 |       | 3,733,999 | 3,733,999 |
| 304    | 3,733,650 |         | 3,733,713 |       |           |        | 3,733,868 | 257  | 3,733,928 |       | 3,733,999 | 3,733,999 |
| 369    | 3,733,651 |         | 3,733,714 |       |           |        | 3,733,869 | 258  | 3,733,929 |       | 3,733,999 | 3,733,999 |
| 402    | 3,733,652 |         | 3,733,715 |       |           |        | 3,733,870 | 259  | 3,733,930 |       | 3,733,999 | 3,733,999 |
|        | CLASS 16  |         | 3,733,716 |       |           |        | 3,733,871 | 260  | 3,733,931 |       | 3,733,999 | 3,733,999 |
| 16     | 3,733,653 |         | 3,733,717 |       |           |        | 3,733,872 | 261  | 3,733,932 |       | 3,733,999 | 3,733,999 |
| 21     | 3,733,654 |         | 3,733,718 |       |           |        | 3,733,873 | 262  | 3,733,933 |       | 3,733,999 | 3,733,999 |
| 137    | 3,733,655 |         | 3,733,719 |       |           |        | 3,733,874 | 263  | 3,733,934 |       | 3,733,999 | 3,733,999 |
| 160    | 3,733,656 |         | 3,733,720 |       |           |        | 3,733,875 | 264  | 3,733,935 |       | 3,733,999 | 3,733,999 |
| 178    | 3,733,657 |         | 3,733,721 |       |           |        | 3,733,876 | 265  | 3,733,936 |       | 3,733,999 | 3,733,999 |
|        | CLASS 17  |         | 3,733,722 |       |           |        | 3,733,877 | 266  | 3,733,937 |       | 3,733,999 | 3,733,999 |
| 32     | 3,733,658 |         | 3,733,723 |       |           |        | 3,733,878 | 267  | 3,733,938 |       | 3,733,999 | 3,733,999 |
| 35     | 3,733,659 |         | 3,733,724 |       |           |        | 3,733,879 | 268  | 3,733,939 |       | 3,733,999 | 3,733,999 |
|        | CLASS 23  |         | 3,733,725 |       |           |        | 3,733,880 | 269  | 3,733,940 |       | 3,733,999 | 3,733,999 |
| 230C   | 3,734,690 |         | 3,733,726 |       |           |        | 3,733,881 | 270  | 3,733,941 |       | 3,733,999 | 3,733,999 |
| 253PC  | 3,734,691 |         | 3,733,727 |       |           |        | 3,733,882 | 271  | 3,733,942 |       | 3,733,999 | 3,733,999 |
| 253R   | 3,734,692 |         | 3,733,728 |       |           |        | 3,733,883 | 272  | 3,733,943 |       | 3,733,999 | 3,733,999 |
| 254R   | 3,734,693 |         | 3,733,729 |       |           |        | 3,733,884 | 273  | 3,733,944 |       | 3,733,999 | 3,733,999 |
| 262    | 3,734,694 |         | 3,733,730 |       |           |        | 3,733,885 | 274  | 3,733,945 |       | 3,733,999 | 3,733,999 |
| 301SP  | 3,734,695 |         | 3,733,731 |       |           |        | 3,733,886 | 275  | 3,733,946 |       | 3,733,999 | 3,733,999 |
| 312ME  | 3,734,696 |         | 3,733,732 |       |           |        | 3,733,887 | 276  | 3,733,947 |       | 3,733,999 | 3,733,999 |
|        | CLASS 24  |         | 3,733,733 |       |           |        | 3,733,888 | 277  | 3,733,948 |       | 3,733,999 | 3,733,999 |
| 20TT   | 3,733,654 |         | 3,733,734 |       |           |        | 3,733,889 | 278  | 3,733,949 |       | 3,733,999 | 3,733,999 |
| 73P    | 3,733,655 |         | 3,733,735 |       |           |        | 3,733,890 | 279  | 3,733,950 |       | 3,733,999 | 3,733,999 |
| 137R   | 3,733,656 |         | 3,733,736 |       |           |        | 3,733,891 | 280  | 3,733,951 |       | 3,733,999 | 3,733,999 |
| 150FP  | 3,733,657 |         | 3,733,737 |       |           |        | 3,733,892 | 281  | 3,733,952 |       | 3,733,999 | 3,733,999 |
| 152    | 3,733,658 |         | 3,733,738 |       |           |        | 3,733,893 | 282  | 3,733,953 |       | 3,733,999 | 3,733,999 |
|        | CLASS 26  |         | 3,733,739 |       |           |        | 3,733,894 | 283  | 3,733,954 |       | 3,733,999 | 3,733,999 |
| 420.5  | 3,733,678 |         | 3,733,740 |       |           |        | 3,733,895 | 284  | 3,733,955 |       | 3,733,999 | 3,733,999 |
|        | CLASS 28  |         | 3,733,741 |       |           |        | 3,733,896 | 285  | 3,733,956 |       | 3,733,999 | 3,733,999 |
| 1.7    | 3,733,659 |         | 3,733,742 |       |           |        | 3,733,897 | 286  | 3,733,957 |       | 3,733,999 | 3,733,999 |
|        | CLASS 29  |         | 3,733,743 |       |           |        | 3,733,898 | 287  | 3,733,958 |       | 3,733,999 | 3,733,999 |
| 25.35  | 3,733,661 |         | 3,733,744 |       |           |        | 3,733,899 | 288  | 3,733,959 |       | 3,733,999 | 3,733,999 |
| 25.41  | 3,733,660 |         | 3,733,745 |       |           |        | 3,733,900 | 289  | 3,733,960 |       | 3,733,999 | 3,733,999 |



|           |           |           |        |           |     |           |         |           |        |           |
|-----------|-----------|-----------|--------|-----------|-----|-----------|---------|-----------|--------|-----------|
| CLASS 99  | 123B      | 3,734,767 | 583    | 3,734,127 | 29  | 3,734,810 | 90B     | 3,735,050 | 39     | 3,734,834 |
| 1         | 132BS     | 3,734,768 | 596    | 3,734,129 | 39  | 3,734,192 | 100.22A | 3,735,053 | 7      | CLASS 203 |
| 28        |           | 3,734,769 | 596.1  | 3,734,130 | 51  | 3,734,170 | 100.2C  | 3,735,052 |        | 3,734,835 |
| 48        |           | 3,734,770 | 596.2  | 3,734,128 | 54  | 3,734,171 | 100.2S  | 3,735,054 |        | CLASS 204 |
| 90S       |           | 3,734,771 | 608    | 3,734,131 | 96  | 3,734,172 | 170E    | 3,735,056 | 15     | 3,734,836 |
| 107       |           | 3,734,772 | 625.49 | 3,734,132 | 105 | 3,734,173 | 170.2   | 3,735,055 | 36     | 3,734,837 |
| 130       | CLASS 118 |           | 637.2  | 3,734,134 | 154 | 3,734,174 |         |           | 43R    | 3,734,838 |
| 147       |           | 3,734,746 | 836    | 3,734,116 | 158 | 3,734,175 |         |           | 49     | 3,734,840 |
| 148R      |           | 3,734,747 |        |           | 166 | 3,734,177 |         |           | 55Y    | 3,734,841 |
| 150R      | CLASS 119 |           |        |           | 170 | 3,734,178 |         |           | 66     | 3,734,842 |
| 172       |           | 3,734,749 |        |           |     |           |         |           | 159.14 | 3,734,843 |
| 178       |           | 3,734,750 |        |           |     |           |         |           |        | 3,734,844 |
| 193       |           | 3,734,751 |        |           |     |           |         |           |        | 3,734,845 |
| 233.11    |           | 3,733,997 |        |           |     |           |         |           |        | 3,734,846 |
| 233.3     |           | 3,734,752 |        |           |     |           |         |           |        | 3,734,847 |
| 330       |           | 3,733,998 |        |           |     |           |         |           |        | 3,734,848 |
| 337       |           | 3,733,999 |        |           |     |           |         |           |        |           |
| 462       |           | 3,733,702 |        |           |     |           |         |           |        |           |
| 532       |           | 3,734,001 |        |           |     |           |         |           |        |           |
| 539       |           | 3,734,000 |        |           |     |           |         |           |        |           |
| 543       |           | 3,734,002 |        |           |     |           |         |           |        |           |
| 588       |           | 3,734,003 |        |           |     |           |         |           |        |           |
| 637       |           | 3,734,004 |        |           |     |           |         |           |        |           |
| CLASS 100 |           |           |        |           |     |           |         |           |        |           |
| 52        |           | 3,734,005 |        |           |     |           |         |           |        |           |
| 53        |           | 3,734,006 |        |           |     |           |         |           |        |           |
| 152       |           | 3,734,007 |        |           |     |           |         |           |        |           |
| 218       |           | 3,734,008 |        |           |     |           |         |           |        |           |
| 229A      |           | 3,734,009 |        |           |     |           |         |           |        |           |
| CLASS 101 |           |           |        |           |     |           |         |           |        |           |
| 79        |           | 3,734,010 |        |           |     |           |         |           |        |           |
| 91        |           | 3,734,011 |        |           |     |           |         |           |        |           |
| 93C       |           | 3,734,012 |        |           |     |           |         |           |        |           |
|           |           | 3,734,013 |        |           |     |           |         |           |        |           |
| 186       |           | 3,734,014 |        |           |     |           |         |           |        |           |
| 229       |           | 3,734,015 |        |           |     |           |         |           |        |           |
| 232       |           | 3,734,016 |        |           |     |           |         |           |        |           |
| 378       |           | 3,734,017 |        |           |     |           |         |           |        |           |
| CLASS 102 |           |           |        |           |     |           |         |           |        |           |
| 20        |           | 3,734,018 |        |           |     |           |         |           |        |           |
| 27R       |           | 3,734,019 |        |           |     |           |         |           |        |           |
| 40        |           | 3,734,020 |        |           |     |           |         |           |        |           |
| 70.2R     |           | 3,734,021 |        |           |     |           |         |           |        |           |
| 78        |           | 3,734,022 |        |           |     |           |         |           |        |           |
| 79        |           | 3,734,023 |        |           |     |           |         |           |        |           |
| 100       |           | 3,734,024 |        |           |     |           |         |           |        |           |
| CLASS 104 |           |           |        |           |     |           |         |           |        |           |
| 88        |           | 3,734,025 |        |           |     |           |         |           |        |           |
| 167       |           | 3,734,026 |        |           |     |           |         |           |        |           |
| 172S      |           | 3,734,027 |        |           |     |           |         |           |        |           |
| 245       |           | 3,734,028 |        |           |     |           |         |           |        |           |
| CLASS 105 |           |           |        |           |     |           |         |           |        |           |
| 131       |           | 3,734,029 |        |           |     |           |         |           |        |           |
| 164       |           | 3,734,030 |        |           |     |           |         |           |        |           |
| 367       |           | 3,734,031 |        |           |     |           |         |           |        |           |
| CLASS 106 |           |           |        |           |     |           |         |           |        |           |
| 19        |           | 3,734,032 |        |           |     |           |         |           |        |           |
| 47R       |           | 3,734,033 |        |           |     |           |         |           |        |           |
| 73.4      |           | 3,734,034 |        |           |     |           |         |           |        |           |
| 74        |           | 3,734,035 |        |           |     |           |         |           |        |           |
| 186       |           | 3,734,036 |        |           |     |           |         |           |        |           |
| 193R      |           | 3,734,037 |        |           |     |           |         |           |        |           |
| 193       |           | 3,734,038 |        |           |     |           |         |           |        |           |
| 210       |           | 3,734,039 |        |           |     |           |         |           |        |           |
| 300       |           | 3,734,040 |        |           |     |           |         |           |        |           |
| CLASS 108 |           |           |        |           |     |           |         |           |        |           |
| 111       |           | 3,734,041 |        |           |     |           |         |           |        |           |
| CLASS 110 |           |           |        |           |     |           |         |           |        |           |
| 1F        |           | 3,734,042 |        |           |     |           |         |           |        |           |
| 7R        |           | 3,734,043 |        |           |     |           |         |           |        |           |
| 8R        |           | 3,734,044 |        |           |     |           |         |           |        |           |
| 93.31     |           | 3,734,045 |        |           |     |           |         |           |        |           |
| 165R      |           | 3,734,046 |        |           |     |           |         |           |        |           |
| CLASS 112 |           |           |        |           |     |           |         |           |        |           |
| 121.15    |           | 3,734,047 |        |           |     |           |         |           |        |           |
| 153       |           | 3,734,048 |        |           |     |           |         |           |        |           |
| 176       |           | 3,734,049 |        |           |     |           |         |           |        |           |
| 212       |           | 3,734,050 |        |           |     |           |         |           |        |           |
| CLASS 113 |           |           |        |           |     |           |         |           |        |           |
| 8         |           | 3,734,051 |        |           |     |           |         |           |        |           |
| 120BB     |           | 3,734,052 |        |           |     |           |         |           |        |           |
| 121C      |           | 3,734,053 |        |           |     |           |         |           |        |           |
| CLASS 114 |           |           |        |           |     |           |         |           |        |           |
| 5R        |           | 3,734,054 |        |           |     |           |         |           |        |           |
| 39        |           | 3,734,055 |        |           |     |           |         |           |        |           |
| 222       |           | 3,734,056 |        |           |     |           |         |           |        |           |
| CLASS 115 |           |           |        |           |     |           |         |           |        |           |
| 6.1       |           | 3,734,057 |        |           |     |           |         |           |        |           |
| 35        |           | 3,734,058 |        |           |     |           |         |           |        |           |
| CLASS 116 |           |           |        |           |     |           |         |           |        |           |
| 31        |           | 3,734,059 |        |           |     |           |         |           |        |           |
| 114       |           | 3,734,060 |        |           |     |           |         |           |        |           |
| 137       |           | 3,734,061 |        |           |     |           |         |           |        |           |
| 148       |           | 3,734,062 |        |           |     |           |         |           |        |           |
| CLASS 117 |           |           |        |           |     |           |         |           |        |           |
| 37R       |           | 3,734,063 |        |           |     |           |         |           |        |           |
| 72        |           | 3,734,064 |        |           |     |           |         |           |        |           |
| 94        |           | 3,734,065 |        |           |     |           |         |           |        |           |
| 100A      |           | 3,734,066 |        |           |     |           |         |           |        |           |

|           |           |           |           |           |           |           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 87        | 3,735,089 | 34.5      | 3,734,405 | 267       | 3,734,458 | 465B      | 3,734,942 | CLASS 277 | 305       | 3,735,158 |           |
| 146       | 3,735,090 | 87        | 3,734,403 | 285       | 3,734,459 | 465.3     | 3,734,943 | 233       | 3,734,514 | CLASS 308 |           |
| 400       | 3,735,091 | 99        | 3,734,409 | 321       | 3,734,460 | 468E      | 3,734,945 | CLASS 279 | 10        | 3,734,578 |           |
| 501       | 3,735,092 |           |           | 366       | 3,734,461 | 468.5     | 3,734,944 | 1A        | 20        | 3,734,579 |           |
| CLASS 220 |           | 10E       | 3,734,404 | CLASS 252 |           | 471C      | 3,734,946 | 48        | 3,734,513 | 36.3      | 3,734,580 |
| 394       | 3,734,342 | 8.5M      | 3,734,856 | 51.5A     | 3,734,856 | 473R      | 3,734,947 | 75        | 3,734,516 | 160       | 3,734,581 |
| 4R        | 3,734,335 | 51.5R     | 3,734,857 | 51.5R     | 3,734,857 | 482B      | 3,734,948 | 81        | 3,734,517 | 173       | 3,734,582 |
| 21        | 3,734,336 | 90        | 3,734,858 | 108       | 3,734,859 | 484A      | 3,734,950 | 5.3       | 3,734,518 | 189R      | 3,734,583 |
| 22        | 3,734,337 | 158       | 3,734,860 | 158       | 3,734,860 | 485R      | 3,734,951 | 11.13R    | 3,734,519 | 213       | 3,734,584 |
| 47        | 3,734,343 | 180       | 3,734,861 | 180       | 3,734,861 | 501.11    | 3,734,952 | 11.35T    | 3,734,520 | 238       | 3,734,585 |
| 54        | 3,734,338 | 188       | 3,734,863 | 188       | 3,734,863 |           | 3,734,953 |           | 3,734,521 | 6         | 3,735,160 |
| 63R       | 3,734,340 | 188.3CL   | 3,734,862 | 188.3CL   | 3,734,862 | 502.4P    | 3,734,954 |           | 3,734,522 | 8.3       | 3,735,159 |
| 97D       | 3,734,341 | 315       | 3,734,864 | 315       | 3,734,864 | 515P      | 3,734,955 | 16        | 3,734,523 | 9.4       | 3,735,166 |
| CLASS 221 |           |           |           | CLASS 254 |           |           | 3,734,956 | 25        | 3,734,524 | 9.5       | 3,735,161 |
| 14        | 3,734,344 | 1         | 3,735,111 | 1         | 3,734,462 | 515R      | 3,734,957 | 30        | 3,734,525 | 13        | 3,735,162 |
| 81        | 3,734,345 | 30        | 3,734,463 | 30        | 3,734,463 | 539R      | 3,734,958 | 33.99T    | 3,734,526 |           | 3,735,163 |
| 101       | 3,734,346 | 84        | 3,734,465 | 84        | 3,734,465 | 543P      | 3,734,959 | 42        | 3,734,528 | 41        | 3,735,164 |
| 134       | 3,734,347 | 89        | 3,734,466 | 89        | 3,734,466 | 544M      | 3,734,958 | 79.1      | 3,734,527 | 49        | 3,735,165 |
| CLASS 222 |           | 93R       | 3,734,464 | 93R       | 3,734,464 | 545R      | 3,734,960 | 80B       | 3,734,529 | 168       | 3,735,167 |
| 1         | 3,734,348 | 65        | 3,734,467 | 65        | 3,734,467 | 553A      | 3,734,961 | 81.5      | 3,734,530 | 200       | 3,735,168 |
| 3         | 3,734,349 | 6         | 3,734,468 | 6         | 3,734,468 | 556F      | 3,734,962 | 150A      | 3,734,532 | 214       | 3,735,169 |
| 56        | 3,734,339 | 6         | 3,734,471 | 6         | 3,734,471 | 563R      | 3,734,963 | 150B      | 3,734,533 | 219       | 3,735,170 |
| 92        | 3,734,350 | 8         | 3,734,470 | 8         | 3,734,470 | 566A      | 3,734,964 | 150.5     | 3,734,531 | 235       | 3,735,171 |
| 103       | 3,734,351 | 89        | 3,734,472 | 89        | 3,734,472 | 570.5P    | 3,734,965 | 163       | 3,734,534 | 239       | 3,735,172 |
| 103       | 3,734,351 | 192       | 3,734,472 | 192       | 3,734,472 | 586R      | 3,734,967 | 204       | 3,734,536 | 242       | 3,735,173 |
| 148       | 3,734,352 | CLASS 260 |           | CLASS 256 |           | 609D      | 3,734,968 | 215       | 3,734,535 | 266       | 3,735,174 |
| 153       | 3,734,353 | 2R        | 3,734,866 | 2R        | 3,734,866 |           | 3,734,969 | 421       | 3,734,537 |           | CLASS 312 |
| CLASS 223 |           | 2.5AM     | 3,734,867 | 2.5AM     | 3,734,867 | 611A      | 3,734,970 | 426       | 3,734,538 | 39        | 3,734,586 |
| 68        | 3,734,362 | 2.5AQ     | 3,734,871 | 2.5AQ     | 3,734,871 | 618F      | 3,734,971 | 477       | 3,734,539 | 186       | 3,734,587 |
| 116       | 3,734,363 | 2.5N      | 3,734,872 | 2.5N      | 3,734,872 | 665R      | 3,734,972 | 482       | 3,734,540 | 247       | 3,734,588 |
|           | 3,734,364 | 2.5R      | 3,734,867 | 2.5R      | 3,734,867 |           | 3,734,973 | 506       | 3,734,541 | 322       | 3,734,590 |
| CLASS 224 |           | 22CB      | 3,734,872 | 22CB      | 3,734,872 | 674SA     | 3,734,974 | 47        | 3,734,542 | 351       | 3,734,589 |
| 8R        | 3,734,365 | 29.2E     | 3,734,874 | 29.2E     | 3,734,874 | 683.1SD   | 3,734,975 | CLASS 281 |           | CLASS 313 |           |
| 25A       | 3,734,366 | 29.3      | 3,734,878 | 29.3      | 3,734,878 | 823       | 3,734,976 | CLASS 282 | 60        | 3,735,175 |           |
| CLASS 226 |           | 29.6H     | 3,734,873 | 29.6H     | 3,734,873 | 874       | 3,734,977 | 23R       | 3,734,543 | 3,735,176 |           |
| 44        | 3,734,368 | 31.2R     | 3,734,875 | 31.2R     | 3,734,875 | 878B      | 3,734,978 | 56        | 3,734,544 | 3,735,177 |           |
| 109       | 3,734,371 | 32.6PO    | 3,734,878 | 32.6PO    | 3,734,878 | 897R      | 3,734,979 | CLASS 283 |           | 3,735,178 |           |
| 114       | 3,734,372 | 32.8N     | 3,734,894 | 32.8N     | 3,734,894 | 944       | 3,734,980 | CLASS 285 |           | 3,735,179 |           |
| 119       | 3,734,373 | 33.6R     | 3,734,876 | 33.6R     | 3,734,876 | 959       | 3,734,981 | 5         | 3,734,545 | 105       | 3,735,180 |
| 134       | 3,734,369 | 37SB      | 3,734,877 | 37SB      | 3,734,877 | CLASS 261 |           | 49        | 3,734,546 | 109.5     | 3,735,181 |
| 196       | 3,734,373 | 37N       | 3,734,879 | 37N       | 3,734,879 | 44R       | 3,734,473 | 357       | 3,734,547 | 188       | 3,735,182 |
| 199       | 3,734,374 | 39SB      | 3,734,880 | 39SB      | 3,734,880 | 95        | 3,734,474 | CLASS 287 |           | 3,735,183 |           |
| CLASS 227 |           | 45.8N     | 3,734,883 | 45.8N     | 3,734,883 | CLASS 264 |           | 20.92G    | 3,734,549 | 278       | 3,735,185 |
| 67        | 3,734,375 | 45.8SB    | 3,734,885 | 45.8SB    | 3,734,885 | 3C        | 3,734,983 | 53R       | 3,734,548 | 346R      | 3,735,186 |
| 111       | 3,734,376 | 45.9NC    | 3,734,886 | 45.9NC    | 3,734,886 | 30R       | 3,734,982 | 189.36A   | 3,734,550 | 355       | 3,735,187 |
| 120       | 3,734,377 | 45.9R     | 3,734,887 | 45.9R     | 3,734,887 | 40        | 3,734,984 | CLASS 289 |           | CLASS 315 |           |
| 124       | 3,734,378 | 47EN      | 3,734,887 | 47EN      | 3,734,887 | 45        | 3,734,985 | 2         | 3,734,285 | 3.5       | 3,735,188 |
| 127       | 3,734,379 | 47R       | 3,734,888 | 47R       | 3,734,888 | 49        | 3,734,986 | CLASS 292 |           | 13CG      | 3,735,189 |
| 140       | 3,734,380 | 75R       | 3,734,890 | 75R       | 3,734,890 | 54        | 3,734,987 | 17        | 3,734,551 |           | 3,735,190 |
| 148       | 3,734,381 | 77G       | 3,734,432 | 77G       | 3,734,432 | 82        | 3,734,988 | 67        | 3,734,552 | 13C       | 3,735,191 |
| CLASS 228 |           | CLASS 246 |           | CLASS 244 |           | 137       | 3,734,990 | 251.5     | 3,734,553 | 27TD      | 3,735,192 |
| 1         | 3,734,382 | IR        | 3,734,429 | IR        | 3,734,429 | 157       | 3,734,991 | CLASS 293 |           | 27XY      | 3,735,193 |
| 2         | 3,734,383 | 125       | 3,734,434 | 125       | 3,734,434 | 159       | 3,734,992 | 71R       | 3,734,557 | 30        | 3,735,194 |
| 4         | 3,734,384 | CLASS 248 |           | CLASS 243 |           | 177F      | 3,734,993 | 88        | 3,734,554 | 111       | 3,735,195 |
| 5         | 3,734,385 | 2         | 3,734,435 | 2         | 3,734,435 | 288       | 3,734,994 | CLASS 294 |           | 200A      | 3,735,196 |
| 6         | 3,734,386 | 58        | 3,734,436 | 58        | 3,734,436 | 322       | 3,734,995 | 81SF      | 3,734,555 | 348       | 3,735,197 |
| CLASS 229 |           | 205R      | 3,734,437 | 205R      | 3,734,437 | CLASS 266 |           | 88F       | 3,734,556 | CLASS 317 |           |
| 7         | 3,734,388 | 221       | 3,734,438 | 221       | 3,734,438 | 12        | 3,734,475 | CLASS 296 |           | 2F        | 3,735,198 |
| 14C       | 3,734,389 | 224       | 3,734,439 | 224       | 3,734,439 | 23M       | 3,734,477 | 23C       | 3,734,559 | 3         | 3,735,199 |
| 20R       | 3,734,401 | 265       | 3,734,440 | 265       | 3,734,440 | 23R       | 3,734,476 | 50R       | 3,734,560 | 5         | 3,735,200 |
| CLASS 230 |           | 354C      | 3,734,441 | 354C      | 3,734,441 | 36        | 3,734,479 | CLASS 297 |           | 11R       | 3,735,201 |
| 3         | 3,734,398 | 361R      | 3,734,442 | 361R      | 3,734,442 | 93.7      | 3,734,899 | 216       | 3,734,562 | 13R       | 3,735,202 |
| 7         | 3,734,399 | 239.3T    | 3,734,919 | 239.3T    | 3,734,919 | 34        | 3,734,901 | 239       | 3,734,561 | 27R       | 3,735,203 |
| 11        | 3,734,400 | 243C      | 3,734,907 | 243C      | 3,734,907 | 52        | 3,734,902 | 8         | 3,734,563 | 33SC      | 3,735,204 |
| 20R       | 3,734,401 | 244R      | 3,734,908 | 244R      | 3,734,908 | 65        | 3,734,903 | 9         | 3,734,564 | 100       | 3,735,205 |
| CLASS 231 |           | 247.2A    | 3,734,905 | 247.2A    | 3,734,905 | 137       | 3,734,484 | CLASS 298 |           | 134       | 3,735,206 |
| 3         | 3,734,398 | 249.6     | 3,734,909 | 249.6     | 3,734,909 | CLASS 269 |           | 21B       | 3,734,572 | 234R      | 3,735,207 |
| 7         | 3,734,399 | 250A      | 3,734,910 | 250A      | 3,734,910 | 228       | 3,734,481 | 5R        | 3,734,565 |           | 3,735,208 |
| 11        | 3,734,400 | 256.5B    | 3,734,913 | 256.5B    | 3,734,913 | 302.1     | 3,734,486 | 6CS       | 3,734,566 |           | 3,735,209 |
| 20R       | 3,734,401 | 268BC     | 3,734,916 | 268BC     | 3,734,916 | CLASS 270 |           | 2R        | 3,734,567 |           | 3,735,210 |
| CLASS 232 |           | 268FT     | 3,734,915 | 268FT     | 3,734,915 | 52        | 3,734,487 | 39        | 3,734,569 |           | 3,735,211 |
| 3         | 3,734,398 | 270R      | 3,734,917 | 270R      | 3,734,917 | 58        | 3,734,488 | 47        | 3,734,568 |           | 3,735,212 |
| 7         | 3,734,399 | 283P      | 3,734,914 | 283P      | 3,734,914 | CLASS 271 |           | CLASS 303 |           | 100       | 3,735,217 |
| 11        | 3,734,400 | 295.5B    | 3,734,921 | 295.5B    | 3,734,921 | 51        | 3,734,491 | 6C        | 3,734,570 | 135       | 3,735,219 |
| 20R       | 3,734,401 | 296T      | 3,734,922 | 296T      | 3,734,922 | IB        | 3,734,492 | 20        | 3,734,571 | 138       | 3,735,220 |
| CLASS 233 |           | 306.8R    | 3,734,923 | 306.8R    | 3,734,923 | 58        | 3,734,494 | 21BE      | 3,734,572 | 139       | 3,735,221 |
| 3         | 3,734,398 | 310.9     | 3,734,924 | 310.9     | 3,734,924 | 65        | 3,734,495 | 21F       | 3,734,573 | 151       | 3,735,222 |
| 7         | 3,734,399 | 326N      | 3,734,925 | 326N      | 3,734,925 | 84        | 3,734,493 | 22R       | 3,734,574 | 227       | 3,735,223 |
| 11        | 3,734,400 | 326.5FM   | 3,734,927 | 326.5FM   | 3,734,927 | CLASS 273 |           | 33        | 3,734,575 | 258       | 3,735,224 |
| 20R       | 3,734,401 | 332.2R    | 3,734,928 | 332.2R    | 3,734,928 | 1E        | 3,734,497 | CLASS 305 |           | 284       | 3,735,225 |
| CLASS 234 |           | 343.6     | 3,734,929 | 343.6     | 3,734,929 | 63E       | 3,734,498 | 4D        | 3,734,577 | 332       | 3,735,226 |
| 3         | 3,734,398 | 345.3     | 3,734,930 | 345.3     | 3,734,930 | 73E       | 3,734,499 | 37        | 3,734,576 | 338       | 3,735,227 |
| 7         | 3,734,399 | 347.8     | 3,734,932 | 347.8     | 3,734,932 | 80R       | 3,734,500 | 88LC      | 3,735,145 | 394       | 3,735,228 |
| 11        | 3,734,400 | 371       | 3,734,933 | 371       | 3,734,933 | 93R       | 3,734,501 | 106       | 3,735,146 | 611       | 3,735,229 |
| 20R       | 3,734,401 | 395       | 3,734,938 | 395       | 3,734,938 | 95R       | 3,734,502 | 119       | 3,735,147 | 687       | 3,735,230 |
| CLASS 235 |           | 397.1     | 3,734,935 | 397.1     | 3,734,935 | 101       | 3,734,503 | 133       | 3,735,148 |           | 3,735,231 |
| 3         | 3,734,398 | 404.5     | 3,734,939 | 404.5     | 3,734,939 | 126R      | 3,734,504 | 230       | 3,735,149 | 2         | 3,735,232 |
| 7         | 3,734,399 | 448B      | 3,734,940 | 448B      | 3,734,940 | 130E      | 3,734,506 | 232       | 3,735,150 | 24        | 3,735,233 |
| 11        | 3,734,400 | 453P      | 3,734,941 | 453P      | 3,734,941 | 134A      | 3,734,507 | 235R      | 3,735,151 | 44        | 3,735,234 |
| 20R       | 3,734,401 |           |           |           |           | 134C      | 3,734,508 | 237       | 3,735,152 |           | CLASS 320 |
| CLASS 236 |           |           |           |           |           | 139       | 3,734,509 | 246       | 3,735,153 | 2         | 3,735,235 |
| 3         | 3,734,398 |           |           |           |           | 152R      | 3,734,510 | 273       | 3,735,154 | 6         | 3,735,236 |
| 7         | 3,734,399 |           |           |           |           | CLASS 274 |           | 279       | 3,735,155 | 15        | 3,735,237 |
| 11        | 3,734,400 |           |           |           |           | 1R        | 3,734,511 | 304       | 3,735,156 | 16        | 3,735,238 |
| 20R       | 3,734,401 |           |           |           |           | 23R       | 3,734,512 |           |           |           | 3,735,239 |



|           |           |           |           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| CLASS 323 | 101       | 3,735,286 | CLASS 340 | 324A      | 3,735,383 | CLASS 355 | 407       | 3,734,650 |
| 4         | 3,735,240 | 106       | 3,735,287 | 1R        | 3,735,389 | 4         | 420       | 3,734,651 |
| 22SC      | 3,735,241 |           |           | 3R        | 3,735,394 | 14        |           |           |
| 22T       | 3,735,242 | CLASS 332 | 3,735,288 | 8L        | 3,735,396 | 4         | CLASS 418 |           |
| 43.5R     | 3,735,243 | 18        | 3,735,288 | 15-5TD    | 3,735,397 | 16        | 70        | 3,734,652 |
| 51        | 3,735,244 | CLASS 333 |           | 18R       | 3,735,398 | 40        | 88        | 3,734,653 |
| 109       | 3,735,245 | 5         | 3,735,289 | 23        | 3,735,399 | 41        | 152       | 3,734,654 |
| CLASS 324 | 14        | 3,735,290 |           | 347NT     | 3,735,399 | 41        | CLASS 423 |           |
| .5R       | 3,735,246 | 24.1      | 3,735,291 | 347NT     | 3,735,394 | 47        | 71        | 3,734,689 |
| 9         | 3,735,249 | 30R       | 3,735,292 | 365P      | 3,735,395 | 67        | 83        | 3,734,996 |
| 34R       | 3,735,247 | 34R       | 3,735,293 | 413       | 3,735,396 | 76        | 290       | 3,734,997 |
| 51        | 3,735,248 | CLASS 335 |           |           |           | 89        | 406       | 3,734,998 |
|           | 3,735,250 | 134       | 3,735,294 | CLASS 343 |           |           | 450       | 3,734,999 |
| 54        | 3,735,251 | 160       | 3,735,295 | SST       | 3,735,397 | CLASS 356 | 613       | 3,735,000 |
| 59        | 3,735,252 | 165       | 3,735,296 | 7ED       | 3,735,398 | 27        |           |           |
| 64        | 3,735,253 | 203       | 3,735,297 | 7.7       | 3,735,399 | 73        | CLASS 424 |           |
|           | 3,735,254 | 206       | 3,735,298 | 11R       | 3,735,401 | 95        | 1         | 3,735,001 |
| 73R       | 3,735,255 |           | 3,735,300 | 14        | 3,735,402 | 103       | 3         | 3,735,002 |
| 77D       | 3,735,256 | 213       | 3,735,299 | 16M       | 3,735,404 | 110       | 47        | 3,735,003 |
| 78E       | 3,735,257 | 244       | 3,735,301 | 16R       | 3,735,405 | 118       | 89        | 3,735,004 |
| 97        | 3,735,258 | 262       | 3,735,302 | 17.2R     | 3,735,411 | 120       | 101       | 3,735,005 |
| 110       | 3,735,259 | 272       | 3,735,303 | 100ME     | 3,735,405 | 153       | 122       | 3,735,006 |
| 174       | 3,735,262 | 278       | 3,735,304 | 101       | 3,735,406 | 201       | 158       | 3,735,007 |
| 175       | 3,735,260 | CLASS 336 |           | 106R      | 3,735,407 | 201       | CLASS 425 |           |
| 181       | 3,735,261 | 110       | 3,735,305 | 112CA     | 3,735,408 | 203       | 33        | 3,734,655 |
| 186       | 3,735,263 | 192       | 3,735,306 | 113R      | 3,735,409 | 205       | 34        | 3,734,656 |
| CLASS 325 |           |           | 3,735,307 | 114       | 3,735,410 | 226       | 62        | 3,734,657 |
| 28        | 3,735,265 | CLASS 337 |           | 225       | 3,735,412 | 246       | 78        | 3,734,658 |
| 38        | 3,735,264 | 13        | 3,735,308 | 769       | 3,735,414 | 259       | 123       | 3,734,660 |
| 60        | 3,735,266 | 21        | 3,735,309 | CLASS 346 |           |           | 129       | 3,734,661 |
| 446       | 3,735,267 | 107       | 3,735,310 | 33B       | 3,735,415 | CLASS 401 | 131       | 3,734,662 |
| 464       | 3,735,268 | 108       | 3,735,311 | 74MP      | 3,735,416 | 259       | 145       | 3,734,659 |
| CLASS 328 |           | 164       | 3,735,312 | 139C      | 3,735,417 |           | 147       | 3,734,663 |
| 14        | 3,735,269 | 268       | 3,735,313 |           |           | 56        | 151       | 3,734,664 |
| 55        | 3,735,270 | 290       | 3,735,315 | CLASS 350 |           |           | 174       | 3,734,666 |
| 112       | 3,735,271 | 291       | 3,735,317 | 6         | 3,734,591 | CLASS 415 | 186       | 3,734,667 |
| 132       | 3,735,272 | 296       | 3,735,318 | 17        | 3,734,592 | 72        | 190       | 3,734,668 |
| 133       | 3,735,324 | 335       | 3,735,316 | 37        | 3,734,593 | 88        | 330       | 3,734,668 |
| 134       | 3,735,218 | 347       | 3,735,319 | 96B       | 3,734,594 | 114       | 373       | 3,734,669 |
| 163       | 3,735,273 | 382       | 3,735,314 | 97        | 3,734,595 | 122R      | 405H      | 3,734,670 |
| CLASS 330 |           | CLASS 338 |           | 140       | 3,734,596 | 213       | 450       | 3,734,671 |
| 1A        | 3,735,274 | 2         | 3,735,320 | 160LC     | 3,734,597 |           | 458       | 3,734,672 |
| 59        | 3,735,275 | 22R       | 3,735,321 |           |           | CLASS 416 | 462       | 3,734,672 |
| CLASS 331 |           | 28        | 3,735,322 |           |           | 4         |           |           |
| 11        | 3,735,276 | 41        | 3,735,323 |           |           | 61        | CLASS 431 |           |
| 45        | 3,735,277 | 164       | 3,735,325 |           |           | 77        | 12        | 3,734,675 |
| 94.5      | 3,735,278 | 180       | 3,735,326 |           |           | 114       | 79        | 3,734,676 |
|           | 3,735,279 | 183       | 3,735,327 |           |           | 214       |           |           |
|           | 3,735,280 | 270       | 3,735,328 |           |           | 220       | 88        | 3,734,677 |
|           | 3,735,281 | CLASS 339 |           |           |           |           | 93        | 3,734,678 |
|           | 3,735,282 | 89R       | 3,735,329 |           |           | CLASS 417 | 132       | 3,734,679 |
|           | 3,735,283 | 91R       | 3,735,330 |           |           | 269       | 132       | 3,734,680 |
|           | 3,735,284 | 97C       | 3,735,331 |           |           | 310       | 242       | 3,734,681 |
|           | 3,735,285 | 217R      | 3,735,332 |           |           | 370       | 324       | 3,734,682 |
|           |           |           |           |           |           | 370       |           |           |
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|           |           |           |           |           |           | 380       |           |           |

## CLASSIFICATION OF DESIGNS

[illegible]

## CLASSIFICATION OF PLANTS

|         |        |         |        |         |        |         |        |         |        |         |        |
|---------|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|--------|
| P. — 19 | 03,340 | P. — 43 | 03,342 | P. — 54 | 03,339 | P. — 56 | 03,338 | P. — 70 | 03,341 | P. — 78 | 03,343 |
|---------|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|--------|

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|---|---|-----------|-----------|-----------|---------------|----------------|----------------|
| 1 | : | 3,734,198 | 3,733,953 | 3,734,417 | 3,734,982     | 3,734,137      | 3,734,003      |
|   |   | 3,734,374 | 3,733,954 | 3,734,421 | 3,734,988     | 3,734,183      | 3,734,139      |
|   |   | 3,734,895 | 3,733,956 | 3,734,426 | 3,735,001     | 3,734,185      | 3,734,295      |
| 2 | : | 3,734,045 | 3,733,958 | 3,734,429 | 3,735,005     | 3,734,187      | 3,734,839      |
|   |   | 3,734,779 | 3,733,963 | 3,734,433 | 3,735,015     | 3,734,189      | 3,734,891      |
| 4 | : | 3,733,852 | 3,733,978 | 3,734,438 | 3,735,036     | 3,734,197      | 11 : 3,733,974 |
|   |   | 3,733,995 | 3,734,002 | 3,734,442 | 3,735,038     | 3,734,215      | 12 : 3,733,708 |
|   |   | 3,733,998 | 3,734,013 | 3,734,443 | 3,735,058     | 3,734,437      | 3,733,817      |
|   |   | 3,733,999 | 3,734,019 | 3,734,461 | 3,735,079     | 3,734,453      | 3,733,830      |
|   |   | 3,734,138 | 3,734,021 | 3,734,465 | 3,735,113     | 3,734,475      | 3,733,977      |
|   |   | 3,734,153 | 3,734,048 | 3,734,476 | 3,735,122     | 3,734,637      | 3,734,085      |
|   |   | 3,734,382 | 3,734,049 | 3,734,477 | 3,735,131     | 3,734,778      | 3,734,226      |
|   |   | 3,734,770 | 3,734,059 | 3,734,481 | 3,735,134     | 3,734,856      | 3,734,235      |
|   |   | 3,735,057 | 3,734,061 | 3,734,492 | 3,735,136     | 3,734,869      | 3,734,501      |
|   |   | 3,735,063 | 3,734,063 | 3,734,494 | 3,735,139     | 3,735,375      | 3,734,525      |
|   |   | 3,735,151 | 3,734,064 | 3,734,495 | 3,735,142     | 3,735,393      | 3,734,535      |
|   |   | 3,735,209 | 3,734,073 | 3,734,499 | 3,735,145     | 9 : 3,733,626  | 3,734,587      |
|   |   | 3,735,240 | 3,734,083 | 3,734,514 | 3,735,146     | 3,733,666      | 3,734,618      |
|   |   | 3,735,247 | 3,734,084 | 3,734,546 | 3,735,148     | 3,733,729      | 3,734,649      |
| 5 | : | 3,734,126 | 3,734,088 | 3,734,552 | 3,735,161     | 3,733,730      | 3,734,800      |
|   |   | 3,734,346 | 3,734,095 | 3,734,558 | 3,735,188     | 3,733,735      | 13 : 3,733,622 |
|   |   | 3,734,640 | 3,734,097 | 3,734,564 | 3,735,211     | 3,733,804      | 3,733,769      |
|   |   | 3,735,071 | 3,734,110 | 3,734,567 | 3,735,267     | 3,733,815      | 3,733,938      |
| 6 | : | 3,733,619 | 3,734,125 | 3,734,588 | 3,735,227     | 3,733,816      | 3,734,162      |
|   |   | 3,733,630 | 3,734,128 | 3,734,591 | 3,735,231     | 3,733,891      | 3,734,194      |
|   |   | 3,733,649 | 3,734,172 | 3,734,598 | 3,735,256     | 3,733,980      | 3,734,289      |
|   |   | 3,733,670 | 3,734,181 | 3,734,621 | 3,735,258     | 3,734,286      | 3,734,304      |
|   |   | 3,733,690 | 3,734,207 | 3,734,626 | 3,735,261     | 3,734,350      | 3,734,528      |
|   |   | 3,733,695 | 3,734,208 | 3,734,631 | 3,735,272     | 3,734,359      | 3,735,088      |
|   |   | 3,733,696 | 3,734,209 | 3,734,647 | 3,735,277     | 3,734,381      | 3,735,099      |
|   |   | 3,733,722 | 3,734,211 | 3,734,668 | 3,735,279     | 3,734,487      | 15 : 3,734,058 |
|   |   | 3,733,738 | 3,734,214 | 3,734,674 | 3,735,283     | 3,734,543      | 3,734,506      |
|   |   | 3,733,743 | 3,734,220 | 3,734,694 | 3,735,286     | 3,734,544      | 3,735,123      |
|   |   | 3,733,744 | 3,734,229 | 3,734,700 | 3,735,287     | 3,734,642      | 16 : 3,733,795 |
|   |   | 3,733,760 | 3,734,234 | 3,734,743 | 3,735,298     | 3,734,643      | 3,733,887      |
|   |   | 3,733,767 | 3,734,241 | 3,734,769 | 3,735,306     | 3,734,805      | 3,734,568      |
|   |   | 3,733,787 | 3,734,269 | 3,734,781 | 3,735,325     | 3,734,835      | 3,734,826      |
|   |   | 3,733,819 | 3,734,294 | 3,734,786 | 3,735,333     | 3,734,844      | 3,735,342      |
|   |   | 3,733,828 | 3,734,297 | 3,734,788 | 3,735,336     | 3,734,939      | 17 : 3,733,635 |
|   |   | 3,733,832 | 3,734,300 | 3,734,808 | 3,735,339     | 3,734,977      | 3,733,680      |
|   |   | 3,733,834 | 3,734,312 | 3,734,809 | 3,735,348     | 3,735,031      | 3,733,710      |
|   |   | 3,733,835 | 3,734,329 | 3,734,819 | 3,735,351     | 3,735,127      | 3,733,713      |
|   |   | 3,733,842 | 3,734,335 | 3,734,824 | 3,735,355     | 3,735,176      | 3,733,724      |
|   |   | 3,733,845 | 3,734,357 | 3,734,837 | 3,735,366     | 3,735,275      | 3,733,727      |
|   |   | 3,733,848 | 3,734,360 | 3,734,842 | 3,735,376     | 3,735,291      | 3,733,739      |
|   |   | 3,733,850 | 3,734,377 | 3,734,850 | 3,735,389     | 3,735,301      | 3,733,742      |
|   |   | 3,733,853 | 3,734,379 | 3,734,851 | 3,735,394     | 3,735,309      | 3,733,747      |
|   |   | 3,733,869 | 3,734,387 | 3,734,855 | 8 : 3,733,628 | 3,735,381      | 3,733,757      |
|   |   | 3,733,892 | 3,734,392 | 3,734,902 | 3,733,674     | 3,735,416      | 3,733,838      |
|   |   | 3,733,900 | 3,734,404 | 3,734,969 | 3,733,731     | 10 : 3,733,686 | 3,733,840      |
|   |   | 3,733,934 | 3,734,408 | 3,734,980 | 3,733,768     | 3,733,839      | 3,733,872      |



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|-----------|-----------|-----------|-----------|-----------|-----------|
| 3,733,880 | 3,735,303 | 3,734,798 | 3,734,309 | 3,735,033 | 3,734,745 |
| 3,733,883 | 3,735,311 | 3,734,816 | 3,734,328 | 3,735,045 | 3,734,753 |
| 3,733,924 | 3,735,318 | 3,734,930 | 3,734,457 | 3,735,055 | 3,734,754 |
| 3,733,976 | 3,735,327 | 3,735,024 | 3,734,466 | 3,735,097 | 3,734,755 |
| 3,734,031 | 3,735,343 | 3,735,141 | 3,734,532 | 3,735,105 | 3,734,787 |
| 3,734,039 | 3,735,344 | 3,735,153 | 3,734,625 | 3,735,156 | 3,734,791 |
| 3,734,043 | 3,735,347 | 3,735,185 | 3,734,625 | 3,735,172 | 3,734,793 |
| 3,734,076 | 3,735,380 | 3,735,237 | 3,735,138 | 3,735,173 | 3,734,794 |
| 3,734,077 | 3,735,620 | 3,735,238 | 3,735,206 | 3,735,210 | 3,734,838 |
| 3,734,102 | 3,733,712 | 3,735,243 | 3,735,324 | 3,735,235 | 3,734,852 |
| 3,734,103 | 3,733,796 | 3,735,317 | 3,735,354 | 3,735,239 | 3,734,853 |
| 3,734,112 | 3,733,868 | 3,735,331 | 3,733,718 | 3,735,241 | 3,734,854 |
| 3,734,145 | 3,733,997 | 3,735,367 | 3,734,054 | 3,735,266 | 3,734,860 |
| 3,734,176 | 3,734,078 | 3,735,387 | 3,734,118 | 3,735,267 | 3,734,861 |
| 3,734,177 | 3,734,151 | 3,735,396 | 3,733,625 | 3,735,269 | 3,734,866 |
| 3,734,195 | 3,734,201 | 3,735,398 | 3,733,964 | 3,735,280 | 3,734,876 |
| 3,734,199 | 3,734,223 | 3,735,399 | 3,733,969 | 3,735,299 | 3,734,877 |
| 3,734,200 | 3,734,290 | 3,735,400 | 3,734,147 | 3,735,312 | 3,734,879 |
| 3,734,249 | 3,734,316 | 3,735,402 | 3,734,192 | 3,735,335 | 3,734,907 |
| 3,734,250 | 3,734,490 | 3,735,403 | 3,734,451 | 3,735,350 | 3,734,925 |
| 3,734,278 | 3,734,563 | 3,735,407 | 3,734,488 | 3,735,359 | 3,734,926 |
| 3,734,284 | 3,734,818 | 3,733,617 | 3,734,695 | 3,735,370 | 3,734,931 |
| 3,734,308 | 3,735,081 | 3,733,646 | 3,735,103 | 3,735,379 | 3,734,933 |
| 3,734,373 | 3,735,242 | 3,733,651 | 3,735,124 | 3,735,382 | 3,734,955 |
| 3,734,380 | 3,733,798 | 3,733,685 | 3,735,128 | 3,735,413 | 3,734,964 |
| 3,734,394 | 3,734,046 | 3,733,748 | 3,735,144 | 3,735,414 | 3,734,976 |
| 3,734,425 | 3,734,268 | 3,733,754 | 3,734,182 | 3,735,461 | 3,734,984 |
| 3,734,463 | 3,734,615 | 3,733,759 | 3,734,566 | 3,735,461 | 3,734,985 |
| 3,734,502 | 3,734,682 | 3,733,762 | 3,734,060 | 3,735,462 | 3,735,004 |
| 3,734,503 | 3,733,793 | 3,733,822 | 3,734,263 | 3,735,467 | 3,735,011 |
| 3,734,504 | 3,733,841 | 3,733,854 | 3,734,497 | 3,735,631 | 3,735,026 |
| 3,734,509 | 3,734,086 | 3,733,920 | 3,733,946 | 3,735,692 | 3,735,027 |
| 3,734,510 | 3,734,115 | 3,733,967 | 3,734,261 | 3,735,709 | 3,735,032 |
| 3,734,515 | 3,734,416 | 3,733,972 | 3,734,406 | 3,735,741 | 3,735,042 |
| 3,734,542 | 3,734,881 | 3,733,975 | 3,734,462 | 3,735,755 | 3,735,043 |
| 3,734,565 | 3,734,034 | 3,734,006 | 3,735,259 | 3,735,756 | 3,735,052 |
| 3,734,569 | 3,734,634 | 3,734,011 | 3,735,263 | 3,735,772 | 3,735,066 |
| 3,734,576 | 3,734,684 | 3,734,036 | 3,733,615 | 3,735,779 | 3,735,092 |
| 3,734,589 | 3,734,685 | 3,734,042 | 3,733,621 | 3,735,780 | 3,735,093 |
| 3,734,606 | 3,734,708 | 3,734,056 | 3,733,624 | 3,735,781 | 3,735,116 |
| 3,734,653 | 3,733,985 | 3,734,124 | 3,733,634 | 3,735,788 | 3,735,133 |
| 3,734,654 | 3,733,663 | 3,734,129 | 3,733,638 | 3,735,809 | 3,735,162 |
| 3,734,659 | 3,733,981 | 3,734,170 | 3,733,645 | 3,735,818 | 3,735,182 |
| 3,734,672 | 3,734,047 | 3,734,179 | 3,733,662 | 3,735,843 | 3,735,190 |
| 3,734,676 | 3,734,116 | 3,734,190 | 3,733,684 | 3,735,860 | 3,735,200 |
| 3,734,686 | 3,734,276 | 3,734,222 | 3,733,701 | 3,735,861 | 3,735,232 |
| 3,734,697 | 3,734,282 | 3,734,245 | 3,733,737 | 3,735,864 | 3,735,251 |
| 3,734,728 | 3,734,310 | 3,734,251 | 3,733,773 | 3,735,905 | 3,735,255 |
| 3,734,744 | 3,734,480 | 3,734,265 | 3,733,776 | 3,735,915 | 3,735,270 |
| 3,734,752 | 3,734,489 | 3,734,292 | 3,733,851 | 3,735,937 | 3,735,276 |
| 3,734,758 | 3,734,511 | 3,734,303 | 3,733,859 | 3,735,955 | 3,735,288 |
| 3,734,833 | 3,734,572 | 3,734,311 | 3,733,865 | 3,735,982 | 3,735,323 |
| 3,734,873 | 3,734,601 | 3,734,313 | 3,733,962 | 3,735,993 | 3,735,330 |
| 3,734,901 | 3,734,627 | 3,734,315 | 3,733,983 | 3,736,015 | 3,735,341 |
| 3,734,936 | 3,734,725 | 3,734,325 | 3,734,017 | 3,736,032 | 3,735,346 |
| 3,734,974 | 3,734,789 | 3,734,367 | 3,734,052 | 3,736,068 | 3,735,358 |
| 3,735,009 | 3,734,792 | 3,734,390 | 3,734,080 | 3,736,090 | 3,735,360 |
| 3,735,035 | 3,734,863 | 3,734,403 | 3,734,101 | 3,736,096 | 3,735,362 |
| 3,735,039 | 3,734,875 | 3,734,424 | 3,734,133 | 3,736,106 | 3,735,404 |
| 3,735,048 | 3,735,112 | 3,734,439 | 3,734,154 | 3,736,122 | 3,735,408 |
| 3,735,061 | 3,735,115 | 3,734,440 | 3,734,301 | 3,736,155 | 3,735,459 |
| 3,735,078 | 3,735,140 | 3,734,452 | 3,734,306 | 3,736,163 | 3,735,472 |
| 3,735,089 | 3,735,150 | 3,734,491 | 3,734,307 | 3,736,169 | 3,735,497 |
| 3,735,119 | 3,735,154 | 3,734,507 | 3,734,334 | 3,736,260 | 3,735,703 |
| 3,735,120 | 3,735,120 | 3,735,265 | 3,734,361 | 3,736,262 | 3,735,778 |
| 3,735,159 | 3,735,268 | 3,735,268 | 3,734,435 | 3,736,277 | 3,735,801 |
| 3,735,160 | 3,735,305 | 3,735,305 | 3,734,469 | 3,736,336 | 3,735,906 |
| 3,735,166 | 3,735,409 | 3,735,409 | 3,734,527 | 3,736,340 | 3,735,945 |
| 3,735,175 | 3,735,415 | 3,735,415 | 3,734,561 | 3,736,353 | 3,735,948 |
| 3,735,179 | 3,733,616 | 3,733,616 | 3,734,570 | 3,736,358 | 3,735,950 |
| 3,735,189 | 3,733,657 | 3,733,657 | 3,734,590 | 3,736,387 | 3,736,027 |
| 3,735,212 | 3,733,660 | 3,733,660 | 3,734,617 | 3,736,388 | 3,736,093 |
| 3,735,214 | 3,733,679 | 3,733,679 | 3,734,623 | 3,736,391 | 3,736,127 |
| 3,735,221 | 3,733,732 | 3,733,732 | 3,734,652 | 3,736,396 | 3,736,171 |
| 3,735,245 | 3,733,771 | 3,733,771 | 3,734,663 | 3,736,427 | 3,736,197 |
| 3,735,274 | 3,733,814 | 3,733,814 | 3,734,763 | 3,736,434 | 3,736,229 |
| 3,735,296 | 3,733,888 | 3,733,888 | 3,734,742 | 3,736,436 | 3,736,297 |
| 3,735,322 | 3,733,907 | 3,733,907 | 3,734,749 | 3,736,447 | 3,736,393 |
| 3,735,370 | 3,733,942 | 3,733,942 | 3,734,761 | 3,736,496 | 3,736,501 |
| 3,735,371 | 3,733,994 | 3,733,994 | 3,734,840 | 3,736,500 | 3,736,537 |
| 3,735,372 | 3,733,752 | 3,733,752 | 3,734,882 | 3,736,512 | 3,736,575 |
| 3,735,373 | 3,733,825 | 3,733,825 | 3,734,912 | 3,736,523 | 3,736,580 |
| 3,735,376 | 3,733,936 | 3,733,936 | 3,734,919 | 3,736,551 | 3,736,602 |
| 3,735,377 | 3,733,966 | 3,733,966 | 3,734,922 | 3,736,555 | 3,736,608 |
| 3,735,378 | 3,733,968 | 3,733,968 | 3,734,928 | 3,736,577 | 3,736,677 |
| 3,735,379 | 3,734,022 | 3,734,022 | 3,734,942 | 3,736,612 | 3,736,681 |
| 3,735,380 | 3,734,026 | 3,734,026 | 3,734,942 | 3,736,622 | 3,736,777 |
| 3,735,381 | 3,734,029 | 3,734,029 | 3,734,942 | 3,736,624 | 3,736,862 |
| 3,735,382 | 3,734,034 | 3,734,034 | 3,734,942 | 3,736,636 | 3,736,881 |
| 3,735,383 | 3,734,034 | 3,734,034 | 3,734,942 | 3,736,651 | 3,736,885 |
| 3,735,384 | 3,734,034 | 3,734,034 | 3,734,942 | 3,736,662 | 3,736,919 |
| 3,735,385 | 3,734,034 | 3,734,034 | 3,734,942 | 3,736,692 | 3,736,933 |
| 3,735,386 | 3,734,034 | 3,734,034 | 3,734,942 | 3,736,714 | 3,736,957 |
| 3,735,387 | 3,734,034 | 3,734,034 | 3,734,942 | 3,736,716 | 3,736,999 |
| 3,735,388 | 3,734,034 | 3,734,034 | 3,734,942 | 3,736,717 | 3,737,012 |
| 3,735,389 | 3,734,034 | 3,734,034 | 3,734,942 | 3,736,723 | 3,737,033 |
| 3,735,390 | 3,734,034 | 3,734,034 | 3,734,942 | 3,736,724 | 3,737,044 |
| 3,735,391 | 3,734,034 | 3,734,034 | 3,734,942 | 3,736,726 | 3,737,057 |
| 3,735,392 | 3,734,034 | 3,734,034 | 3,734,942 | 3,736,734 | 3,737,065 |
| 3,735,393 | 3,734,034 | 3,734,034 | 3,734,942 | 3,736,736 | 3,737,148 |
| 3,735,394 | 3,734,034 | 3,734,034 | 3,734,942 | 3,736,738 | 3,737,152 |

|           |           |           |                |                |                |
|-----------|-----------|-----------|----------------|----------------|----------------|
| 3,734,168 | 3,735,083 | 3,733,875 | 3,734,903      | 3,733,775      | 3,735,332      |
| 3,734,205 | 3,735,085 | 3,733,876 | 3,734,904      | 3,733,782      | 3,735,405      |
| 3,734,238 | 3,735,094 | 3,733,878 | 3,734,906      | 3,733,914      | 52 : 3,735,410 |
| 3,734,248 | 3,735,126 | 3,733,897 | 3,734,935      | 3,733,922      | 53 : 3,733,639 |
| 3,734,256 | 3,735,165 | 3,733,904 | 3,734,949      | 3,733,923      | 3,733,726      |
| 3,734,258 | 3,735,168 | 3,733,910 | 3,735,014      | 3,734,018      | 3,733,770      |
| 3,734,280 | 3,735,222 | 3,733,926 | 3,735,017      | 3,734,028      | 3,733,931      |
| 3,734,291 | 3,735,248 | 3,733,929 | 3,735,019      | 3,734,053      | 3,734,007      |
| 3,734,314 | 3,735,319 | 3,733,939 | 3,735,020      | 3,734,062      | 3,734,109      |
| 3,734,317 | 3,735,321 | 3,733,941 | 3,735,022      | 3,734,161      | 3,734,237      |
| 3,734,333 | 3,735,340 | 3,733,943 | 3,735,029      | 3,734,186      | 3,734,366      |
| 3,734,338 | 3,735,378 | 3,733,944 | 3,735,065      | 3,734,196      | 3,734,369      |
| 3,734,343 | 3,735,406 | 3,733,947 | 3,735,073      | 3,734,204      | 3,734,464      |
| 3,734,356 | 3,733,734 | 3,733,996 | 3,735,074      | 3,734,281      | 3,734,534      |
| 3,734,393 | 3,733,797 | 3,734,004 | 3,735,084      | 3,734,432      | 3,734,577      |
| 3,734,444 | 3,733,833 | 3,734,010 | 3,735,087      | 3,734,455      | 3,734,764      |
| 3,734,448 | 3,734,111 | 3,734,020 | 3,735,100      | 3,734,539      | 3,734,773      |
| 3,734,454 | 3,734,180 | 3,734,025 | 3,735,111      | 3,734,613      | 3,735,157      |
| 3,734,517 | 3,734,184 | 3,734,094 | 3,735,169      | 3,734,704      | 3,735,158      |
| 3,734,518 | 3,734,188 | 3,734,098 | 3,735,198      | 3,734,718      | 54 : 3,733,699 |
| 3,734,536 | 3,734,232 | 3,734,105 | 3,735,201      | 3,734,896      | 3,733,736      |
| 3,734,538 | 3,734,233 | 3,734,113 | 3,735,215      | 3,734,929      | 3,733,761      |
| 3,734,573 | 3,734,283 | 3,734,149 | 3,735,217      | 3,735,002      | 3,734,202      |
| 3,734,579 | 3,734,323 | 3,734,174 | 3,735,224      | 3,735,102      | 3,734,878      |
| 3,734,597 | 3,734,675 | 3,734,213 | 3,735,226      | 3,735,106      | 3,734,959      |
| 3,734,655 | 3,734,696 | 3,734,293 | 3,735,253      | 3,735,129      | 3,734,979      |
| 3,734,666 | 3,734,774 | 3,734,326 | 3,735,295      | 3,735,228      | 3,734,998      |
| 3,734,681 | 3,734,899 | 3,734,339 | 3,735,363      | 3,735,289      | 55 : 3,733,636 |
| 3,734,702 | 3,734,972 | 3,734,341 | 3,735,371      | 3,735,337      | 3,733,647      |
| 3,734,705 | 3,734,973 | 3,734,348 | 3,735,372      | 3,735,377      | 3,733,671      |
| 3,734,706 | 3,735,338 | 3,734,370 | 3,735,412      | 49 : 3,733,689 | 3,733,673      |
| 3,734,729 | 3,735,353 | 3,734,384 | 3,735,417      | 3,733,715      | 3,733,717      |
| 3,734,730 | 3,734,099 | 3,734,385 | 3,735,417      | 3,734,648      | 3,733,791      |
| 3,734,731 | 3,734,107 | 3,734,398 | 43 : 3,734,275 | 3,734,657      | 3,733,794      |
| 3,734,732 | 3,734,244 | 3,734,407 | 3,734,766      | 3,735,046      | 3,733,813      |
| 3,734,740 | 3,734,321 | 3,734,446 | 3,734,784      | 3,735,249      | 3,733,863      |
| 3,734,759 | 3,734,324 | 3,734,450 | 44 : 3,733,901 | 3,735,352      | 3,733,879      |
| 3,734,762 | 3,734,352 | 3,734,458 | 3,733,902      | 3,735,352      | 3,733,949      |
| 3,734,765 | 3,734,401 | 3,734,486 | 3,733,903      | 3,733,893      | 3,733,965      |
| 3,734,795 | 3,734,418 | 3,734,498 | 3,735,118      | 3,733,960      | 3,734,081      |
| 3,734,797 | 3,734,456 | 3,734,524 | 45 : 3,733,644 | 3,734,585      | 3,734,100      |
| 3,734,802 | 3,734,541 | 3,734,550 | 3,734,267      | 3,734,620      | 3,734,117      |
| 3,734,807 | 3,734,545 | 3,734,571 | 3,734,859      | 3,733,629      | 3,734,135      |
| 3,734,810 | 3,734,560 | 3,734,581 | 47 : 3,733,889 | 3,733,746      | 3,734,175      |
| 3,734,814 | 3,735,147 | 3,734,581 | 3,734,040      | 3,733,824      | 3,734,212      |
| 3,734,868 | 3,733,640 | 3,734,595 | 3,734,305      | 3,733,826      | 3,734,236      |
| 3,734,880 | 3,733,652 | 3,734,667 | 3,734,327      | 3,734,001      | 3,734,540      |
| 3,734,894 | 3,733,664 | 3,734,670 | 3,734,332      | 3,734,104      | 3,734,554      |
| 3,734,900 | 3,733,669 | 3,734,679 | 3,734,345      | 3,734,136      | 3,734,689      |
| 3,734,921 | 3,733,704 | 3,734,698 | 3,734,405      | 3,734,337      | 3,734,750      |
| 3,734,943 | 3,733,704 | 3,734,701 | 3,734,874      | 3,734,592      | 3,734,780      |
| 3,734,945 | 3,733,750 | 3,734,715 | 3,735,010      | 3,734,630      | 3,735,130      |
| 3,734,994 | 3,733,764 | 3,734,756 | 3,735,023      | 3,734,707      | 3,735,167      |
| 3,734,997 | 3,733,783 | 3,734,776 | 3,735,223      | 3,734,803      | 3,735,202      |
| 3,734,999 | 3,733,785 | 3,734,820 | 48 : 3,733,633 | 3,734,892      | 3,735,233      |
| 3,735,064 | 3,733,831 | 3,734,823 | 3,733,637      | 3,735,072      | 3,735,353      |
| 3,735,067 | 3,733,836 | 3,734,834 | 3,733,658      | 3,735,137      | 3,735,353      |
| 3,735,082 | 3,733,847 | 3,734,847 | 3,733,676      | 3,735,271      | 56 : 3,734,529 |
|           | 3,733,849 | 3,734,849 | 3,733,706      | 3,735,273      |                |



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# PATENT OFFICE NOTICES

## Board of Appeals Decisions Rendered in the Month of March 1973

|                           |     |
|---------------------------|-----|
| Examiner affirmed         | 150 |
| Examiner affirmed in part | 20  |
| Examiner reversed         | 35  |
| Total                     | 205 |

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**3,282,469**, A. W. Skonberg, HEATED DISPENSING APPARATUS, filed Sept. 25, 1972, D.C., W.D. Ky. (Louisville), Doc. 7416-A, *Albert W. Skonberg v. General Electric Corp.*

**3,298,550**, B. D. Schlitz, HAYSTACK TRANSPORTING DEVICE, filed Apr. 17, 1972, D.C. S. Dak. (Sioux Falls), Doc. C-72-1020, *Farmhand Inc. v. Lahman Manufacturing Co. and Robert Anderson, doing business as Platte Implement*.

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**3,315,464**, P. M. Hayden, HEAT-EXCHANGE SYSTEM, filed Sept. 22, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72-2262-AAH, *Dunham-Bush Inc. v. Hayden Trans-Cooler Inc.*

**3,339,744**, A. Ginsberg, TIE RACK, filed Oct. 24, 1972, D.C., S.D.N.Y., Doc. 72-C-4519, *Royal London Ltd. v. Swank Inc.*

**3,341,247**, W. W. Martinmaas, TRACTOR CAB, filed June 25, 1970, D.C. S. Dak. (Sioux Falls), Doc. C-70-80S, *Koehn Manufacturing Inc. v. Campbell Supply Co. and Tractor Supply Co.*

**3,349,285**, N. L. Belkin, SURGICAL GOWN WITH STATIC ELECTRICITY DISCHARGE MEANS, filed Oct. 13, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2579, *Angelica Corp. v. Opelika Manufacturing Corp.*

**3,361,150**, J. E. Horner, WATER CONDITIONING CONTROL SYSTEM, filed June 10, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71-1394-CC, *Universal Interloc Inc. v. Hawkins Chemical Co. et al.* Decision: Stipulation for settlement and final judgment (by consent) permanently enjoining defendants. All counterclaims are dismissed with prejudice, Aug. 18, 1972.

**3,368,811**, B. B. Finney, INTERLOCKING GLOVE AND HANDLE, filed July 24, 1972, D.C. (District of Columbia), Doc. 297-72, *Basil B. Finney v. National Aeronautics and Space Administration*.

**3,417,753**, M. Mattler, DISPOSABLE CATHETER AND METHOD FOR FORMING SAME, filed Aug. 11, 1972, D.C., E.D. Mich. (Detroit), Doc. 38743, *E-Z-Em Co. v. Multi-Med Industries Inc. and Martin Mattler*.

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**3,441,214**, D'Avignon and Power, METHOD AND APPARATUS FOR SEEDING CLOUDS, filed Sept. 8, 1972, D.C. (District of Columbia), Doc. 343-72, *Weather Engineering Corp. and Weather Engineering Corp. Ltd. v. United States of America*.

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**3,459,302**, D. S. Ross, APPARATUS AND METHOD OF FILTERING SOLIDS FROM A LIQUID EFFLUENT, filed Aug. 5, 1969, D.C., N.D. Ohio (Cleveland), Doc. C-69-597, *Hydro-Clear Corporation v. Kligler Enterprises Inc., Arthur Kligler, Sylvia Kligler*. Decision: Consent judgment dismissing complaint and counterclaims with prejudice, July 13, 1972. Same, filed Aug. 5, 1969, D.C., N.D. Ohio (Cleveland), Doc. C-69-598, *Hydro-Clear Corporation v. Union Oil Co., Terrance L. McMichel*. Decision: Consent judgment dismissing complaint and counterclaims with prejudice, July 13, 1972.

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**3,679,512**, F. W. Maccone, LAMINATED CARD ENVELOPE, filed Dec. 26, 1972, D.C. Mass. (Boston), Doc. 72-3892-F, *Avant Incorporated v. Polaroid Corporation*.

MAY 29, 1973

U. S. PATENT OFFICE

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## Certificates of Correction for the Week of May 29, 1973

|            |           |           |           |
|------------|-----------|-----------|-----------|
| P.P. 3,252 | 3,682,908 | 3,700,726 | 3,708,559 |
| Re. 27,494 | 3,683,052 | 3,700,769 | 3,708,601 |
| Re. 27,562 | 3,683,380 | 3,700,907 | 3,708,615 |
| D. 225,854 | 3,683,606 | 3,701,050 | 3,708,685 |
| D. 226,059 | 3,684,364 | 3,701,516 | 3,708,785 |
| 3,502,712  | 3,684,645 | 3,701,667 | 3,708,794 |
| 3,539,616  | 3,684,828 | 3,701,694 | 3,708,805 |
| 3,541,465  | 3,684,921 | 3,701,718 | 3,708,849 |
| 3,550,735  | 3,685,554 | 3,701,777 | 3,708,991 |
| 3,560,948  | 3,685,610 | 3,701,834 | 3,709,325 |
| 3,563,909  | 3,685,870 | 3,702,003 | 3,709,455 |
| 3,565,077  | 3,686,313 | 3,702,178 | 3,709,522 |
| 3,576,923  | 3,686,515 | 3,702,352 | 3,709,543 |
| 3,600,533  | 3,686,527 | 3,702,393 | 3,709,565 |
| 3,610,304  | 3,687,239 | 3,702,397 | 3,709,589 |
| 3,610,675  | 3,687,705 | 3,702,540 | 3,709,594 |
| 3,611,223  | 3,687,958 | 3,702,566 | 3,709,684 |
| 3,615,286  | 3,689,083 | 3,702,576 | 3,709,752 |
| 3,629,579  | 3,689,270 | 3,702,598 | 3,709,777 |
| 3,633,000  | 3,689,498 | 3,702,770 | 3,709,796 |
| 3,635,907  | 3,689,686 | 3,702,950 | 3,709,867 |
| 3,636,346  | 3,690,664 | 3,702,973 | 3,709,908 |
| 3,636,986  | 3,690,755 | 3,702,993 | 3,709,911 |
| 3,637,735  | 3,690,873 | 3,703,001 | 3,709,962 |
| 3,637,844  | 3,691,389 | 3,703,308 | 3,710,028 |
| 3,638,214  | 3,691,442 | 3,703,363 | 3,710,068 |
| 3,640,656  | 3,691,446 | 3,703,403 | 3,710,084 |
| 3,644,430  | 3,691,496 | 3,703,452 | 3,710,136 |
| 3,644,729  | 3,691,806 | 3,704,246 | 3,710,138 |
| 3,645,156  | 3,692,084 | 3,704,826 | 3,710,173 |
| 3,647,072  | 3,692,519 | 3,705,051 | 3,710,216 |
| 3,651,074  | 3,692,833 | 3,705,129 | 3,710,262 |
| 3,651,100  | 3,693,166 | 3,705,139 | 3,710,283 |
| 3,654,325  | 3,693,465 | 3,705,224 | 3,710,316 |
| 3,655,619  | 3,693,530 | 3,705,301 | 3,710,395 |
| 3,661,355  | 3,693,729 | 3,705,302 | 3,710,424 |
| 3,663,284  | 3,693,825 | 3,705,312 | 3,710,582 |
| 3,663,506  | 3,694,473 | 3,705,771 | 3,710,619 |
| 3,663,712  | 3,694,523 | 3,705,821 | 3,710,678 |
| 3,666,002  | 3,694,530 | 3,705,906 | 3,710,760 |
| 3,667,214  | 3,695,906 | 3,705,927 | 3,710,815 |
| 3,668,220  | 3,697,296 | 3,706,058 | 3,710,847 |
| 3,669,115  | 3,697,302 | 3,706,091 | 3,711,180 |
| 3,670,242  | 3,697,332 | 3,706,124 | 3,711,332 |
| 3,671,242  | 3,697,353 | 3,706,176 | 3,711,446 |
| 3,672,217  | 3,697,452 | 3,706,201 | 3,711,462 |
| 3,673,096  | 3,697,490 | 3,706,231 | 3,711,463 |
| 3,673,139  | 3,697,508 | 3,706,235 | 3,711,466 |
| 3,673,294  | 3,697,509 | 3,706,311 | 3,711,475 |
| 3,673,316  | 3,697,619 | 3,706,369 | 3,711,607 |
| 3,674,629  | 3,697,697 | 3,706,426 | 3,711,645 |
| 3,674,857  | 3,697,852 | 3,706,550 | 3,711,770 |
| 3,675,069  | 3,697,870 | 3,706,581 | 3,711,813 |
| 3,675,202  | 3,698,251 | 3,706,605 | 3,712,032 |
| 3,675,244  | 3,698,417 | 3,706,717 | 3,712,236 |
| 3,675,267  | 3,698,569 | 3,706,734 | 3,712,292 |
| 3,675,804  | 3,698,617 | 3,706,777 | 3,712,321 |
| 3,676,458  | 3,698,743 | 3,706,990 | 3,712,461 |
| 3,677,927  | 3,698,776 | 3,707,058 | 3,712,590 |
| 3,678,667  | 3,699,051 | 3,707,089 | 3,712,740 |
| 3,679,000  | 3,699,173 | 3,707,363 | 3,712,747 |
| 3,679,332  | 3,699,319 | 3,707,427 | 3,712,757 |
| 3,679,422  | 3,699,320 | 3,707,561 | 3,712,766 |
| 3,679,426  | 3,699,418 | 3,707,595 | 3,712,915 |
| 3,679,466  | 3,699,456 | 3,707,615 | 3,713,019 |
| 3,679,537  | 3,699,862 | 3,707,906 | 3,713,209 |
| 3,679,797  | 3,700,022 | 3,708,025 | 3,713,276 |
| 3,679,944  | 3,700,055 | 3,708,068 | 3,713,638 |
| 3,680,366  | 3,700,059 | 3,708,077 | 3,713,699 |
| 3,680,560  | 3,700,126 | 3,708,082 | 3,714,105 |
| 3,680,661  | 3,700,206 | 3,708,255 | 3,714,309 |
| 3,681,076  | 3,700,372 | 3,708,333 | 3,714,375 |
| 3,681,127  | 3,700,457 | 3,708,409 | 3,714,463 |
| 3,681,269  | 3,700,458 | 3,708,436 | 3,718,579 |
| 3,682,805  | 3,700,543 | 3,708,483 |           |
| 3,682,879  | 3,700,557 | 3,708,557 |           |

## National Technical Information Service

### GOVERNMENT-OWNED INVENTIONS

#### Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for licensing in accordance with the GSA Patent Licensing Regulations.

Copies of patent applications, either paper copy (PC) or microfiche (MF), can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22151, at the prices cited. Requests for copies of patent applications must include the patent-application number and the title. Requests for licensing information should be directed to the address cited with each copy of the patent application.

Paper copies of patents cannot be purchased from NTIS but are available from the Commissioner of Patents, Washington, D.C. 20231, at \$0.50 each. Requests for licensing information should be directed to the address cited below for each agency.

DOUGLAS J. CAMPION,  
Patent Program Coordinator,  
National Technical Information Service.

### DEPARTMENT OF COMMERCE

Assistant General Counsel for Administration,  
Washington, D.C. 20230

Patent 3,611,130. Power Measuring and Leveling System Using a Self-Balancing Bridge. Filed Mar. 17, 1970. Patented Oct. 5, 1971. Not available NTIS.

Patent 3,617,925. Simulator for Atmospheric Radio Noise. Filed June 9, 1970. Patented Nov. 2, 1971. Not available NTIS.

Patent 3,699,518. Method and Machine for Reading Handwritten Cursive Characters. Filed Jan. 18, 1971. Patented Oct. 17, 1972. Not available NTIS.

Patent 3,305,674. Device for Determining an Angle From a Set of Orthogonal Components. Filed Mar. 14, 1966. Patented Feb. 21, 1967. Not available NTIS.

Patent 3,300,066. Sorting Machine Providing Self-Optimizing Inventory Reduction. Filed June 21, 1963. Patented Jan. 24, 1967. Not available NTIS.

Patent 3,281,679. Modulated Subcarrier System for Measuring Attenuation and Phase Shift. Filed May 11, 1965. Patented Oct. 25, 1966. Not available NTIS.

Patent 3,270,189. Device for Determining an Angle From a Set of Orthogonal Components. Filed July 7, 1961. Patented Aug. 30, 1966. Not available NTIS.

Patent 3,264,739. Apparatus for Measuring Area. Filed Nov. 15, 1963. Patented Aug. 9, 1966. Not available NTIS.

Patent 3,318,797. Method of Oxidizing Asphalt Flux With Oxides of Nitrogen. Filed July 21, 1965. Patented May 9, 1967. Not available NTIS.

Patent 3,327,239. Four-Terminal Direct-Current Amplifier. Filed Jan. 6, 1964. Patented June 20, 1967. Not available NTIS.

Patent 3,371,036. Method and Apparatus for Growing Single Crystals of Slightly Soluble Substances. Filed Oct. 20, 1965. Patented Feb. 27, 1968. Not available NTIS.

### DEPARTMENT OF THE INTERIOR

Branch of Patents, U.S. Department of the Interior,  
Washington, D.C. 20240

Patent 3,714,010. Preparation of Anion Exchange Membranes From Cellulosic Sheets. Filed Jan. 6, 1972. Patented Jan. 30, 1973. Not available NTIS.

Patent 3,717,700. Process and Apparatus for Burning Sulfur-Containing Fuels. Filed Aug. 25, 1970. Patented Feb. 20, 1973. Not available NTIS.

Patent 3,716,615. Process for the Production of Cuprous Oxide. Filed Aug. 24, 1971. Patented Feb. 13, 1973. Not available NTIS.

Patent application 337,342. Simultaneously Removing Sulfur and Nitrogen Oxides From Gases. Filed Mar. 2, 1973. PC \$3/MF \$0.95.

Patent application 326,646. Decomposition of Carbonyl Sulfide (SCO) in Electric Charge. Filed Jan. 26, 1973. PC \$3/MF \$0.95.

Patent application 227,172. Improved Pulse Processing System. Filed Feb. 17, 1972. PC \$3/MF \$0.95.

### U.S. DEPARTMENT OF TRANSPORTATION

Patent Counsel, 400 7th Street SW., Washington D.C. 20590

Patent application 327,953. Keyboard and Message System. Filed Jan. 30, 1973. PC \$3.75/MF \$0.95.

[FR Doc. 73-9008; Filed 5-8-73; 8:45 am]



## Disclaimers

2,836,619.—James C. Kirk and Warren W. Woods, Ponca City, Okla. PURIFICATION OF ALKARYL SULFONATES. Patent dated May 27, 1958. Disclaimer filed Jan. 26, 1973, by the assignee, *Continental Oil Company*.

Hereby disclaims the remaining term of said patent.

3,640,734.—Seymour Oppenheimer, Chicago, and Albin F. Turbak, Danville, Ill. PREPARATION OF FIBROUS REINFORCED CASING FROM ALKALI SOLUBLE POLY-VINYL ALCOHOL COPOLYMERS. Patent dated Feb. 8, 1972. Disclaimer filed Dec. 7, 1971, by the inventors, the assignee, *Tec-Pak, Inc.*, consenting.

Hereby disclaim the portion of the term of the patent subsequent to Feb. 8, 1989.

3,654,307.—Joel D. Jamison, Wilmington, Del. O,O-DIALKYL S - [2 - HALO - 1 - (N - SUCCINIMIDO)ETHYL]PHOSPHOROTHIOATES AND PHOSPHORODITHIOATES AND INSECTICIDAL COMPOSITIONS CONTAINING THEM. Patent dated Apr. 4, 1972. Disclaimer filed Aug. 11, 1971, by the assignee, *Hercules Incorporated*.

Hereby disclaims the portion of the term of the patent subsequent to Nov. 28, 1984.

3,671,495.—Henry L. King and Eugene L. Ringwald, Cary, N.C., and James C. Randall, Jr., Bartlesville, Okla.

THERMALLY STABLE POLYESTER FIBERS HAVING INHERENT DISPERSE DYE UPTAKE AND SUPERIOR OIL STAIN RELEASE PROPERTIES. Patent dated June 20, 1972. Disclaimer filed June 1, 1971, by the assignee, *Monsanto Company*.

Hereby disclaims the portion of the term of the patent subsequent to June 6, 1989.

3,709,657.—Norman R. S. Holtes, Bethesda, and Steven R. Chafetz, Rockville, Md. WET FIXATION OF RESINS IN FIBER SYSTEMS FOR DURABLE PRESS. Patent dated Jan. 9, 1973. Disclaimer filed June 22, 1972, by the assignee, *Cotton, Incorporated*.

Hereby disclaims the portion of the term of the patent subsequent to Oct. 14, 1986.

3,721,072.—Thomas Miller Clapham, Pittsburgh, Pa. BONDED ACTIVATED CARBON AIR FILTER. Patent dated Mar. 20, 1973. Disclaimer filed May 1, 1972, by the inventor, the assignee, *Calgon Corporation*, concurring.

Hereby disclaims the portion of the term of the patent subsequent to Feb. 29, 1989.

3,716,993.—Maurice N. Sumner, Houston, Tex. MODULAR OFFSHORE STRUCTURES SYSTEM. Patent dated Feb. 20, 1972. Disclaimer filed May 1, 1972, by the inventor.

Hereby disclaims the portion of the term of the patent subsequent to Apr. 13, 1988.

## PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner  
WILLIAM FELDMAN, Deputy Assistant Commissioner

## CONDITION OF PATENT APPLICATIONS AS OF MAY 15, 1973

| PATENT EXAMINING GROUPS                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Actual Filing Date of Oldest New Case Awaiting Action |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| <b>CHEMICAL EXAMINING GROUPS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                       |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director.....<br>Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.                                                                                                                                       | 1-27-72                                               |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director.....<br>Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.                                                                                                                                                                                                     | 4-04-72                                               |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director.....<br>Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.                                                               | 1-14-72                                               |
| COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director.....<br>Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.                                                                                                                                                                             | 2-07-72                                               |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director.....<br>Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | 1-10-72                                               |
| <b>ELECTRICAL EXAMINING GROUPS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                       |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director.....<br>Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.                                                                                                                                                                     | 10-04-72                                              |
| SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director.....<br>Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.                                                                                                                                                                                               | 8-23-72                                               |
| INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director.....<br>Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Device; and Related Arts.                                                                                                                                                                                                                                                               | 7-03-72                                               |
| RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director.....<br>Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.                                                                                                                                                                     | 2-09-72                                               |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director.....<br>Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.                                                                                                                                                                                                                                       | 2-25-72                                               |
| DESIGNS, GROUP 290—R. L. CAMPBELL, Director.....<br>Industrial Arts; Household, Personal and Fine Arts.                                                                                                                                                                                                                                                                                                                                                                                   | 7-06-71                                               |
| <b>MECHANICAL EXAMINING GROUPS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                       |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director.....<br>Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.                                                                      | 5-31-72                                               |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director.....<br>Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.                           | 3-03-72                                               |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director.....<br>Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavation; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletary; Printing; Typewriters; Stationery; Information Dissemination.                                                                                                                    | 4-13-72                                               |
| HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director.....<br>Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.                                                                              | 3-06-72                                               |
| MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director.....<br>Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.                                                                                | 4-14-72                                               |

Expiration of patents: The patents within the range of numbers indicated below expire during May 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,743,442 to 2,748,387, inclusive  
Plant Patents..... Numbers 1,472 to 1,480, inclusive



# REISSUES

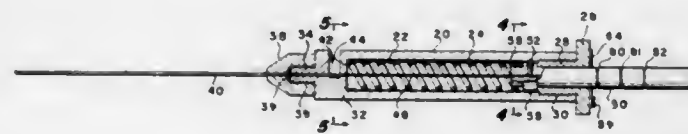
MAY 29, 1973

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

**27,644**  
**DECORATIVE LAMINATE BACKCOATED WITH A POLYVINYL ACETATE COMPOSITION**  
Peter Bernard Kelly and Gene Edward Grosheim, Cincinnati, Ohio, assignors to Formica Corporation, Cincinnati, Ohio  
No Drawing. Original No. 3,620,899, dated Nov. 16, 1971, Ser. No. 721,589, Apr. 16, 1968. Application for reissue Mar. 1, 1972, Ser. No. 231,037  
Int. Cl. B32b 27/10, 27/30, 27/42

**U.S. Cl. 161-162** **9 Claims**  
A decorative heat and pressure consolidated laminate in which the back most core sheet is coated on its exposed flat surface before the heat and pressure consolidation step with a [an adherable surface] coating composition consisting essentially of an aqueous latex dispersion of (A) a water dispersible polyvinyl acetate composition having a molecular weight between about 20,000 and 250,000 having a cold flow test value of from about 20 to 2,000, and having a particle size range from about 0.1 to 25 microns, containing from about 0% to about 15%, by weight, based on the weight of the polyvinyl acetate composition solids of a plasticizer, (B) from about 1% to about 10%, by weight, based on the weight of the polyvinyl acetate composition solids, of a protective colloid for (A), and (C) from about 0.1% to about 3%, by weight, based on the total weight of the dispersion of a water soluble starch [and decorative laminates coated on their back sides with said coating composition].

**27,645**  
**MICRODISPENSING DEVICE**  
Michael E. Drummond, West Chester, and John E. Robinson, Springfield, Pa., assignors to Drummond Instrument Co., Broomall, Pa.  
Original No. 3,606,086, dated Sept. 20, 1971, Ser. No. 875,082, Nov. 10, 1969. Application for reissue Feb. 11, 1972, Ser. No. 225,683  
Int. Cl. B67d 5/22  
**U.S. Cl. 222-49** **12 Claims**



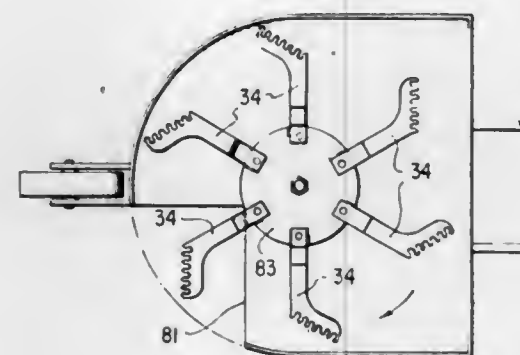
This invention is a microdispensing device into which a precision amount of liquid may be drawn and dispensed. The device includes a barrel having a bore and a disposable capillary tube removably held in communication with one terminal of the bore. A plunger moves through the barrel and the capillary tube, the plunger extending through an end cap in the opposite terminal of the barrel. Uniformly spaced annular recesses in the outer periphery of a plunger holder selectively engage a wire spring detent for determining by "feel" the amount of liquid dispensed. Travel limiting inserts removably positioned in the barrel regulate the length of the plunger stroke and consequently the amount of liquid drawn into and dispensed from the device.

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**27,646**  
**PROCESS FOR PRESERVING CITRUS FRUIT FOOD PRODUCTS**  
Herman Cohen, 3604 Lake Sarah Drive, Orlando, Fla. 32804  
Original No. 3,396,040, dated Aug. 6, 1968, Ser. No. 381,783, July 10, 1964, which is a continuation of Ser. No. 766,357, Aug. 27, 1968, which in turn is a continuation-in-part of Ser. No. 348,489, Mar. 2, 1964. Application for reissue Aug. 25, 1971, Ser. No. 174,900  
Int. Cl. A23b 7/00

**U.S. Cl. 99-186** **4 Claims**  
Preservation of peeled and sectionized citrus fruits by cooking the fruit in a closed, partially vacuumized glass container at gauge pressures of between [5 and 15] 2 and 20 p.s.i. and at temperatures between [225° F. and 250° F.] 219° F. and 259° F. with subsequent cooling of the container and its contents.

**27,647**  
**MOWER CUTTING DEVICE**  
Eugene V. Stair, Box 238, Rte. 1, Caddo, Okla. 74720  
Original No. 3,482,380, dated Dec. 9, 1969, Ser. No. 483,203, Aug. 27, 1965. Application for reissue Nov. 23, 1970, Ser. No. 92,333  
Int. Cl. A01d 55/18  
**U.S. Cl. 56-295** **8 Claims**



The present invention relates to a cutting device for use with rotary power mowers. More particularly the cutting device for such use is comprised of a cutting plate having the combination of a straight cutting edge and a series of saw-teeth along its outer end arranged in a particularly advantageous configuration. This particular combination of a leading knife-like cutting edge combined with the particular sawtooth configuration provides a cutting means which will not become bound up with the cuttings and also avoids wedging and binding experienced with straight knife-like cutting edges.

**27,648**  
**PLASTIC BOTTLE CAP WITH INTEGRAL HANDLE**  
Jean Grussen, 6 Rue Adolphe Yvon, Paris, France  
Original No. 3,462,035, dated Aug. 19, 1969, Ser. No. 747,635, July 25, 1968. Application for reissue June 3, 1971, Ser. No. 149,867  
Int. Cl. B65d 41/22

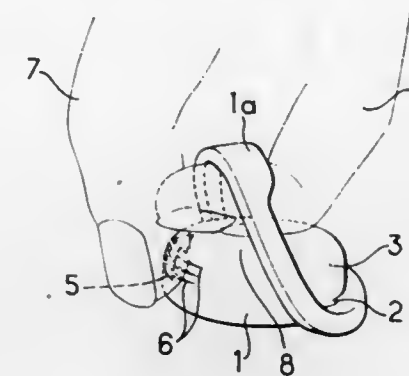
**U.S. Cl. 215-41** **25 Claims**  
A one-piece plastic bottle cap comprising a crown-shaped main part encircled by a reinforcing ring which

MAY 29, 1973

U. S. PATENT OFFICE

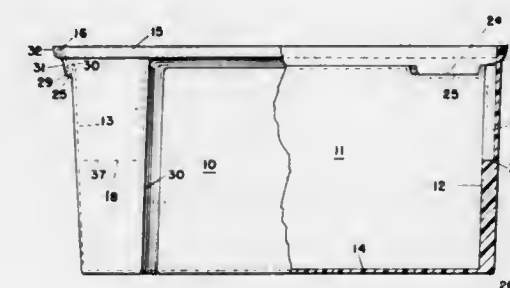
1461

holds the main part on the bottle and is integral therewith over a 60° sector, but may be swung upwardly and used to pull the cap off the bottle. The cap has two depending signal for a light-emitting source. The system of the present invention provides for the disposition of the light emitted responsive to the signal applied thereto to be



skirts and the inside of the outer skirt is provided with retaining means for engagement over the peripheral ridge on the mouth of a bottle.

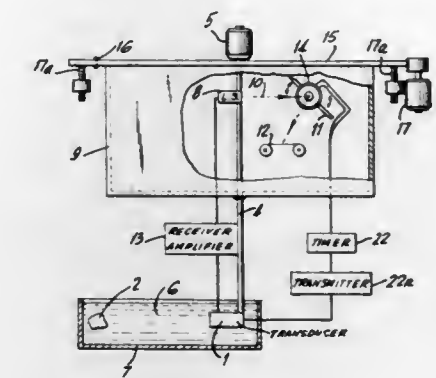
**27,649**  
**NESTING AND STACKING TRAY**  
Alvin W. Levenhagen, Linesville, Pa., assignor to North American Rockwell Corporation  
Original No. 3,409,169, dated Nov. 5, 1968, Ser. No. 683,058, Oct. 12, 1967, which is a continuation-in-part of Ser. No. 480,606, Aug. 18, 1965. Application for reissue Nov. 4, 1970, Ser. No. 87,367  
Int. Cl. B65d 21/04  
**U.S. Cl. 220-97 D** **4 Claims**



The container is made up of four planar walls made of relatively thin material and has four long legs that are integrally attached to the walls and extend from the top to the very bottom thereof. These long legs have an upwardly facing shoulder about midway between the top and the bottom of the container. Four short legs are attached to the sides of the box, likewise adjacent corners, and these short legs terminate at the bottom in a downwardly facing shoulder approximately midway between top and bottom of the container and an upwardly facing shoulder is formed at the upper end of the leg adjacent the rim of the box; thus, the long leg will rest on the upper end of the short legs during stacking and the long legs will nest in the pockets formed at the upper end of the long legs during nesting.

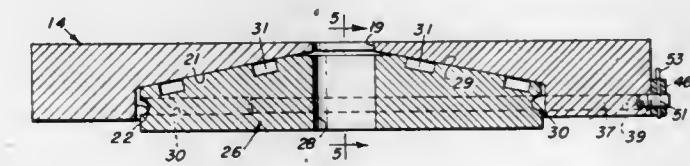
**27,650**  
**METHOD AND APPARATUS FOR THE DISPLAY AND RECORDATION OF SIGNALS**  
Gilbert Baum, 152 Brite Ave., Scarsdale, N.Y. 10583  
Original No. 3,543,229, dated Nov. 24, 1970, Ser. No. 764,795, Oct. 3, 1968. Application for reissue Apr. 5, 1971, Ser. No. 131,185  
Int. Cl. G01s 9/66

**U.S. Cl. 340-3 R** **33 Claims**  
The present invention provides apparatus and methods for signal display and recordation by employing the signal carrying the information to be displayed as a modulating



spatially correlated on a display surface to the area of emanation of such signal. The present invention contemplates the initiating signal to be an ultrasonic signal.

**27,651**  
**CENTER PLATE ASSEMBLY**  
Charles W. Artzer, 631 Freeman St. 66616, and Alexander M. Di Cicco, 1120 W. 31st St. 66611, both of Topeka, Kans.  
Original No. 3,510,180, dated May 5, 1970, Ser. No. 743,097, July 8, 1968. Application for reissue Oct. 19, 1971, Ser. No. 190,542  
Int. Cl. F16c 17/00  
**U.S. Cl. 308-137** **5 Claims**



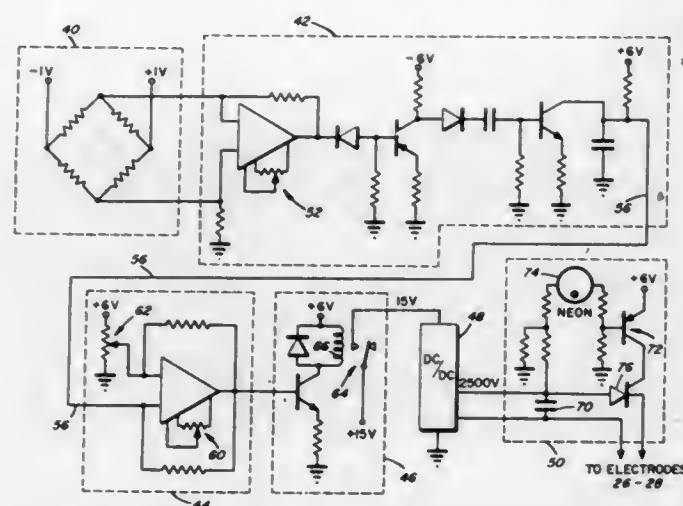
Structure surrounding the king pin of a railway vehicle supporting an end of the car body on a truck bolster and accommodating relative rotation of the truck bolster relative to the vehicle body. The structure insures prolonged lubrication of the center plate assembly and the structural arrangement reduces relative lateral and longitudinal movements of the interfitting plates and reduces shock that would otherwise be transmitted to the bearings, wheels and the track.

**27,652**  
**ELECTRONIC STANDBY DEFIBRILLATOR**  
Mieczyslaw Mirowski, Owings Mills, Morton M. Mower, Baltimore, and William S. Staewen, Belair, Md., assignors to Mieczyslaw Mirowski, Owings Mills, Md.  
Original No. 3,614,954, dated Oct. 26, 1971, Ser. No. 9,934, Feb. 9, 1970. Application for reissue Feb. 25, 1972, Ser. No. 229,593  
Int. Cl. A61n 1/36

**U.S. Cl. 128-419 D** **13 Claims**  
A method and means for automatically defibrillating a malfunctioning heart. With the present invention, the heart function is continuously monitored. When the function



becomes abnormal, the malfunctioning heart is automatically shocked by a voltage of substantial size. If the



heart does not return to its normal functions after a given interval, then it is again shocked. Normal heart activity ensures that the shocking mechanism remains inert.

#### 27,653 ELECTRIC ADJUSTING MEANS FOR AZIMUTH AND ELEVATION ADJUSTMENT

Aane Adriaan Oskam, De Meern, Netherlands, assignor to Technische Industrie A. C. Koot N.V., Montfoort, Netherlands

Original No. 3,552,836, dated Jan. 5, 1971, Ser. No. 833,890, June 11, 1969, which is a continuation-in-part of Ser. No. 701,353, Jan. 29, 1968. Application for reissue June 18, 1971, Ser. No. 154,549

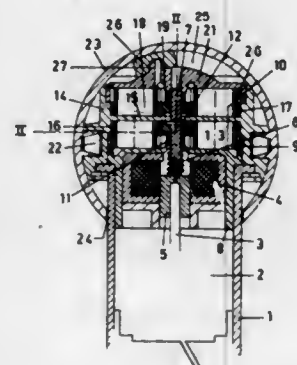
Int. Cl. G02b 17/00

U.S. Cl. 350-289

14 Claims

An adjusting means for azimuth and elevation adjustment comprising a hollow support and a universal joint

connected to the support and to the part to be adjusted. A reversible electric motor is mounted in the support having a shaft, a reduction gear and an electro-magnetically controlled coupling. Planetary transmission [means] systems are provided [and means] whereby the shaft may



optionally be coupled with each of said transmission [means] systems by a reduction gear and [an] the electro-magnetically controlled coupling. The transmission [means] systems are capable of acting on the universal joint to [bring about a rotation around] effect rotational adjustment relative to two different axes.

## PLANT PATENTS

GRANTED MAY 29, 1973

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,344

#### PYRACANTHA PLANT

Conrad Andrew Skimlma, Claremont, Calif., assignor to Monrovia Nursery Company, Azusa, Calif.

Filed July 7, 1971, Ser. No. 160,575

Int. Cl. A01h 5/00

U.S. Cl. Plt.—54

1 Claim

A new variety of pyracantha plant is disclosed characterized by its pink flowers, red fruit, an extremely prostrate habit, and its ability to survive complete winter periods as low as Zone 4b (—20° F.) on the Plant Hardiness Zone Chart of the U.S. National Arboretum.

3,345

#### APRICOT TREE

John M. Garabedian, Fresno, Calif., assignor to Superior Farming Company

Filed Aug. 9, 1971, Ser. No. 170,394

Int. Cl. A01h 5/03

U.S. Cl. Plt.—39

1 Claim

An apricot tree which is of medium size, vigorous, upright, open, vase formed, hardy, and a regular and productive bearer of uniform, large, early ripening, firm fleshed fruit which is of good shipping, keeping and eating quality; the fruit being further characterized by its ability to remain on the tree for a substantial period of time without impairment of its commercial quality, and additionally characterized by skin which is golden yellow to golden overlaid to a substantial extent with a pinkish-red blush.

3,346

#### MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Sept. 7, 1971, Ser. No. 178,514

Int. Cl. A01h 5/00

U.S. Cl. Plt.—7

1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, rounded, much branched, bush type, as illustrated and described, characterized by resemblance to the "Yellow Doll" miniature rose (U.S. Plant Patent No. 2,450) in general form of bud and flower but with color more orange than yellow, the general color effect of the freshly opened flower being an all over shade or blend of orange; and further characterized by a plant which is vigorous and compact in growth, easy to propagate by budding and from cuttings; with small medium green foliage, an abundance of bloom borne almost continuously throughout the growing season with flowers borne singly and in loose clusters.

3,347

#### ROSE PLANT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Co., Medford, Oreg.

Filed Sept. 10, 1971, Ser. No. 179,599

Int. Cl. A01h 5/00

U.S. Cl. Plt.—28

1 Claim

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of an extremely vigorous habit of growth; excellent suitability as a cut flower because of a brilliant vermilion flower color, and unusually long vase life (often more than 7 or 8 days); and near immunity to attacks by rose powdery mildew.

3,348

#### ROSE PLANT

David L. Armstrong, Upland, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Sept. 30, 1971, Ser. No. 185,455

Int. Cl. A01h 5/00

U.S. Cl. Plt.—15

1 Claim

A new variety of rose plant of the Hybrid Tea class, of medium to tall growth habit, vigorous and much branched, with strong moderate length upright stems, usually each bearing only one bloom. The peduncles are unusually strong, and each will hold a fully opened flower in upright position, even though the flowers are relatively large, measuring from 4½" to 7" in diameter.

The buds have foliaceous appendages extending beyond the tip a distance equal to from one-third to full bud length. As the bud opens, the outer surface of the petals displays a deep golden yellow color, heavily overlaid with a strong orangish-red.

The general color effect of the fully opened flower is a creamy yellow, with light orangish-pink overtones. There are from 30 to 40 petals, with 10 to 16 petaloids.

A particularly desirable characteristic is the relative longevity of the flowers, when grown outdoors. On the bush, they last from 5 to 10 days in moderately cloudy weather in southern California. As cut flowers, at living-room temperatures, they will last for from 4 to 7 days. The flower has a pleasing moderately strong fragrance.

3,349

#### RAPHIOLEPIS PLANT

Charles H. Lee, Azusa, Calif., assignor to Monrovia Nursey Company, Azusa, Calif.

Filed Oct. 7, 1971, Ser. No. 187,583

Int. Cl. A01h 5/00

U.S. Cl. Plt.—54

1 Claim

A new variety of Raphiolepis plant characterized by exceptionally large coriaceous leaves and a profusion of very large pale pink flower clusters.



# PATENTS

GRANTED MAY 29, 1973

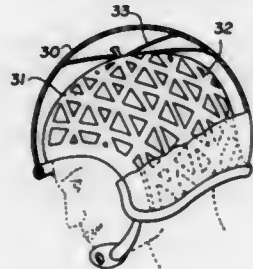
## GENERAL AND MECHANICAL

3,735,418  
HELMET

Frank J. Kavanagh, 406 No. Cayuga Street, and Solomon C. Hollister, 201 Hallister Building, both of Ithaca, N.Y.  
Filed Dec. 27, 1971, Ser. No. 212,077  
Int. Cl. A42b 3/00

U.S. Cl. 2-3 R

16 Claims



A rigid shell helmet has an improved way of holding the shell uniformly over the head of the wearer. This includes a cap formed of a network of non-stretchable bands arranged in arcs passing closely over the head and crossing each other at many points to form the legs of triangles arranged in hexagonal groups over the head with the bands in tension between the apexes of the triangles. The cap provides a firm grip on the head at all angles, and is centered within the helmet shell by a plurality of non-stretchable straps extending tangentially in tension from the cap to the shell. Several of these straps are preferably in the zenith region of the cap, and the lower region of the cap is secured to the lower region of the shell.

3,735,419  
SHIN GUARD

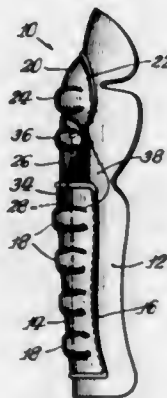
Roy Thomas Byrd, Wilmette, Ill., assignor to SVT, Inc., Buffalo, N.Y.

Filed Apr. 30, 1971, Ser. No. 138,931

Int. Cl. A61d 13/06

U.S. Cl. 2-22

3 Claims



A shin guard for use in ice hockey and the like which includes a generally rigid intermediate protector member overlying the open area between the conventional shin and knee cap protector members. The intermediate protector member is secured to the lower shin protector member and partially overlies the knee cap protector member such that a force striking the intermediate protector member is distributed over the full length of the shin guard.

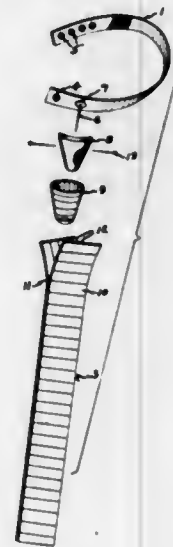
1464

3,735,420  
NECK BAND WITH REVERSIBLE TIE ASSEMBLY

John A. New, 1562 Wilson, Lincoln Park, Mich.  
Filed Aug. 9, 1971, Ser. No. 169,945  
Int. Cl. A41d 25/02

U.S. Cl. 2-150

2 Claims



A neck band provided with means to adjustably attach it to accommodate the neck of a wearer, a pivot means projecting from said neck band at a desired angle, a simulated tie knot, including a body pivotally secured upon said pivot member, a tie member having an upper end portion thereof received upon said body, and a sleeve member enclosing said end portion and said body to complete said simulated knot, with means to secure the end portion, sleeve, and body together in assembly.

3,735,421  
FUR SKIN HAND MITTEN

Ernest Graf, Port Washington, N.Y., assignor to Ben Kahu Furs Corp., New York, N.Y.

Filed Feb. 25, 1972, Ser. No. 229,538

Int. Cl. A41d 19/00, 13/10

U.S. Cl. 2-158

1 Claim



A fur skin hand mitten as disclosed is comprised entirely of fur skin comprising a back portion including the back of the thumb and a front or palm portion including the front side of the thumb. The mitten is primarily for protection against the

MAY 29, 1973

GENERAL AND MECHANICAL

1465

cold and the fur side of the skin is on the outside of the back portion of the mitten and on the inside of the front portion of the mitten including the front or opposing portion of the thumb, thereby improving the method of manufacture in that it is only necessary to handle a single material, that is animal fur skin to provide the above structure, and which is particularly advantageous for certain winter sport activities.

3,735,422

STAIN PROOF TIE CONSTRUCTION  
Israel Shemtov, 1594 Carroll Street, Brooklyn, N.Y.  
Filed May 27, 1971, Ser. No. 147,354  
Int. Cl. A41d 25/06

U.S. Cl. 2-146

3 Claims



A tie construction in the form of a composite including thin flexible outer layers of synthetic resin sheeting and a layer of synthetic resin foam between the outer layers; the composite being heat sealed and simultaneously die cut to a desired necktie pattern; the outer layers of the tie being impermeable to stains of all kinds; the stains being readily removed therefrom.

3,735,423

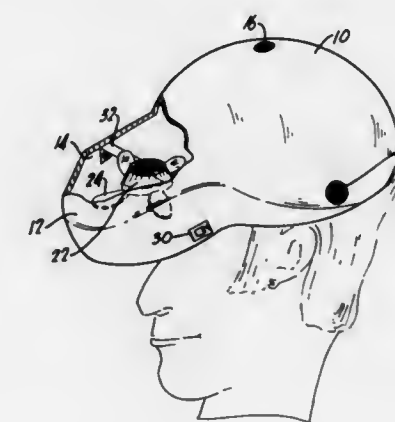
HAT WITH VENTILATING MEANS  
Jullus Droz, Brooklyn, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Aug. 25, 1971, Ser. No. 174,869

Int. Cl. A42c 5/04

U.S. Cl. 2-171.3

1 Claim



A hat provided with a hollow chamber having top mounted intake ports, and a front section having an adjustable vaned discharge port directed downward, with a miniature battery powered electric fan within the front section.

3,735,424

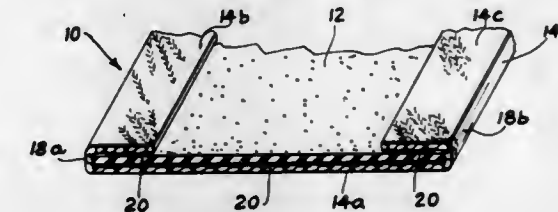
MULTI-PLY BELT FOR WAISTBAND CONSTRUCTION  
Joseph P. Maggio, Commack, and Herbert Richter, Kew Gardens, both of N.Y., assignors to Elastic Systems Corporation, Farmingdale, N.Y.

Filed Feb. 22, 1971, Ser. No. 117,297

Int. Cl. A41d 1/06, 1/14

U.S. Cl. 2-221

9 Claims



A multi-ply belt adapted to be sewn into a garment to form a waistband, and consisting of a knitted fabric sheath and a rubber core separably attached thereto by means of a temporary band which is sufficient to hold the sheath and core together while they are sewn to a garment, but insufficient to hold them together after they are sewn to the garment and under conditions of normal use and laundering of the garment.

3,735,425

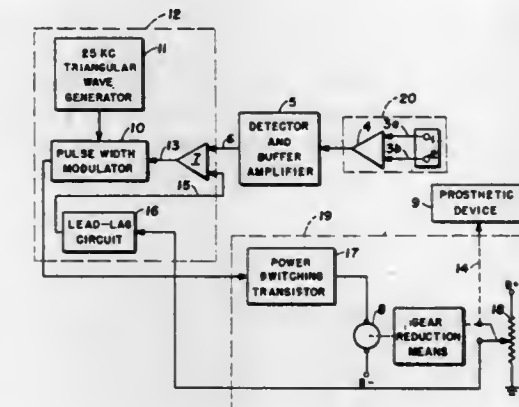
MYOELECTRICALLY CONTROLLED PROTHESIS  
Charles H. Hoshall, Burtonsville; Woodrow Seamone, Rockville, and Robert L. Konigsbert, Baltimore, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 10, 1971, Ser. No. 114,262

Int. Cl. A61f 1/00, 1/06

U.S. Cl. 3-1.1

22 Claims



A control system that is suitable for use with prosthetic and orthotic systems utilizing a single site, closed-loop servo system. The closed-loop, position servo system comprises a sensor unit, signal amplifier, control unit, and a power pack unit. The terminal device opens in direct proportion to control signal amplitude as the muscles contract. The control unit conserves battery power by minimizing quiescent current when it is not necessary that the drive motor be powered.

3,735,426

AUXILIARY DEVICE FOR HAND PROTHESIS  
Eduard Horvath, Duderstadt, Germany, assignor to Otto Bock Orthopadische Industrie KG, Duderstadt, Germany

Filed Feb. 28, 1972, Ser. No. 229,673

Claims priority, application Germany, Mar. 2, 1971, P 21 09 753.0

Int. Cl. A61f 1/06

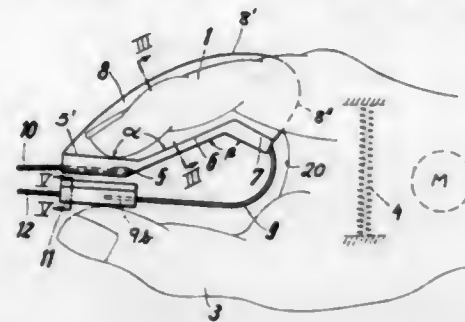
U.S. Cl. 3-12.8

10 Claims

A device for assisting in the holding of elongated bodies and small articles, for use with a hand prosthesis (artificial hand)



comprises a band-type spring urging apart an upper and a lower member, one of which is engaged by the thumb while the other is engaged by the index finger and middle finger of



the artificial hand. The upper member has a web received between these fingers. A pair of pincer-type extensions project from the upper and lower members.

3,735,427

**SEMI-PORTABLE SWIMMING POOL**

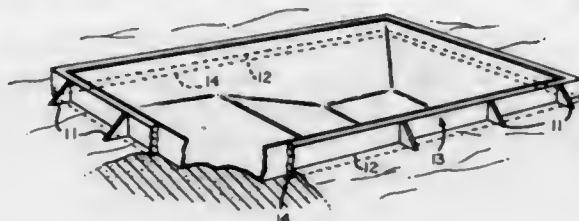
Walter J. Anczewicz, 4828 Kingwood Way, San Jose, Calif., and Orville H. Marsh, 6125 Prospect Road, San Jose, Calif.

Filed July 21, 1971, Ser. No. 164,726

Int. Cl. E04h 3/16, 3/18

U.S. Cl. 4—172.19

5 Claims



A semi-portable low profile readily expandable therapy pool or swimming pool is disclosed in which the side wall height is reduced while desirable pool depth is maintained by using virgin ground as a portion of the side wall and in which side wall structural strength requirements are reduced by constructing the side walls partially above and partially below ground level.

3,735,428

**COMBINATION TOILET AND URINAL**

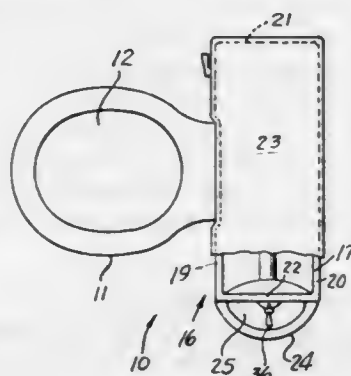
Carlo F. Olivero, 66 Saunders Street, Daltzell, Ill.

Filed Jan. 21, 1972, Ser. No. 219,780

Int. Cl. E03d 13/00

U.S. Cl. 4—97

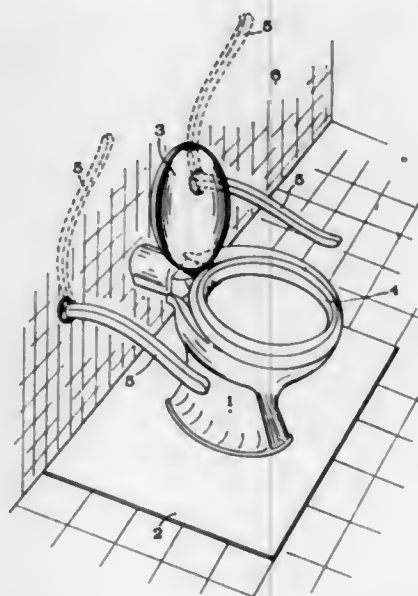
5 Claims



A combination toilet and urinal in which the urinal is formed as an integral part of the flush tank at one end, the back of and/or both ends thereof or in a modified form of the invention on one corner thereof. The urinal is provided with a flush valve using a portion of the water from the flush tank and has a separate drain to the sewage outlet portion of the toilet.

3,735,429  
**AUTOMATIC TOILET INSTALLATION**  
Ernesto Bondonio, Via Michele Lessona 89, Torino, Italy  
Filed Feb. 14, 1972, Ser. No. 225,975  
Claims priority, application Italy, Feb. 25, 1971, 67657 A/71; Feb. 8, 1972, 67371 A/72  
Int. Cl. E03d 9/04, 13/00; A47k 3/22  
U.S. Cl. 4—213

7 Claims



An automatic toilet installation comprising switch means arranged below the toilet seat to produce operation of an exhaust fan system for exhausting air from the toilet bowl, and of means for spraying water in the toilet bowl in response to pressure exerted on the toilet seat by a person sitting thereon, and for operation of flushing means and a perfume atomizer in response to release of said pressure, and means arranged below a platform surrounding the base of the toilet bowl so that as said platform is depressed the lid of the toilet bowl is automatically opened.

3,735,430

**CARRIER**

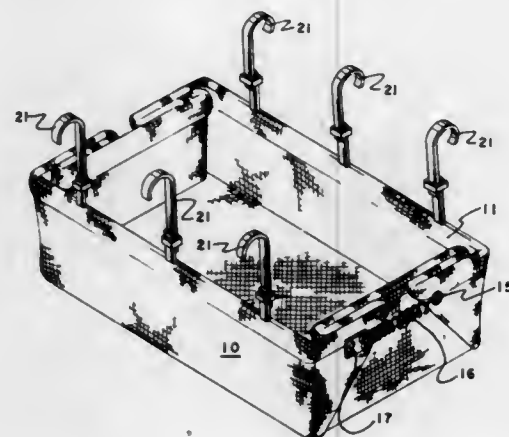
Cloyce W. Platz, 448 Franklin Street, Bend, Oreg.

Filed July 17, 1972, Ser. No. 272,593

Int. Cl. A47c 27/08

U.S. Cl. 5—118

2 Claims

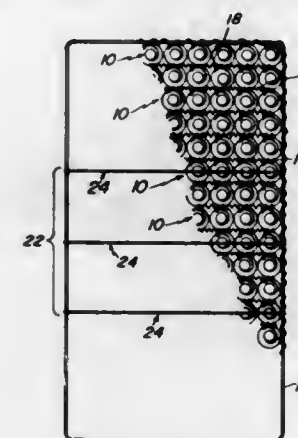


The carrier comprises a frame assembly, including a substantially rectangular base and wall-forming rods pivotally mounted at the terminal edges of the base and carrier hanger means, and a cover disposed about the exterior of the frame assembly and having fastening means operable to hold walls of the carrier in a folded configuration.

3,735,431  
**SPRING CONSTRUCTION**  
George Zocco, South Braintree, Mass., assignor to Slumberland Products Co., Woburn, Mass.  
Filed Oct. 21, 1971, Ser. No. 191,530  
Int. Cl. A47c 23/02

U.S. Cl. 5—267

3 Claims



A furniture spring construction comprised of an array of hour glass coil springs arranged in parallel rows and surrounded by edge wires, and with at least one stringer having a central portion interwoven with the end turns of coil springs in one or more selected rows and fastened at its opposite ends to the edge wire to impart greater stiffness to the mattress at selected regions.

This invention relates to box springs and mattresses, and more particularly comprises a new and improved construction for providing additional support at selected areas of a box spring or mattress.

3,735,432

**COLLAPSIBLE WATER MATTRESS FRAME**

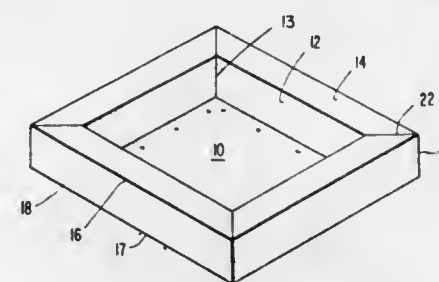
Bernhard Kreten, 3311 Felter St., Philadelphia, Pa., and Louis J. Cutillo, 1085 Camphill Road, Fort Washington, Pa.

Filed Jan. 6, 1971, Ser. No. 104,427

Int. Cl. A47c 27/08, 19/00

U.S. Cl. 5—348

10 Claims



A water mattress frame comprising a semi-rigid resilient frame of rectangular cross section covered with a sheet of flexible, pliant plastic such that the plastic extends as a membrane between the lower edges of the frame members, wrapping around said frame members the edges being suitably sealed and thereby forming a hollow watertight recess into which a water mattress is placed giving proper support to the sides of the mattress.

3,735,433

**MACHINE FOR UNCAPPING WAX HONEYCOMB**

John T. Smith, P.O. Box 786, Blountstown, Fla.

Filed July 13, 1971, Ser. No. 162,115

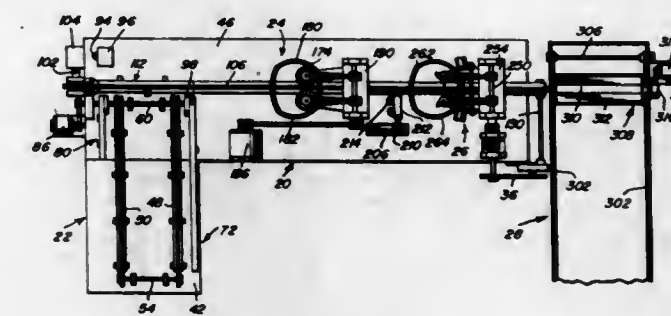
Int. Cl. A01k 59/02

U.S. Cl. 6—12 A

16 Claims

A machine for uncapping honeycombs including a feeding mechanism for depositing honeycombs on a conveyor chain in

sequential relation with the conveyor chain conveying the honeycomb through a buffing or cleaning station in which the



honeycombs are cleaned, through a cutting station where the honeycombs are uncapped and then supporting the honeycombs in overlying relation to a drain tank.

3,735,434  
**ICE AXE**

Harvey Larry Penberthy, 5624 S. W. Admiral Way, Seattle, Wash.

Continuation of Ser. No. 113,936, Feb. 9, 1971, abandoned.

This application Apr. 25, 1972, Ser. No. 247,452

Int. Cl. B25f 1/00; B25c 5/16

U.S. Cl. 7—8.1 R

6 Claims



Disclosed is an ice axe for use by mountaineers having improved ice chopping action and an increased bite into hard snow and ice during self-arrest. The pick portion of the axe head is provided with a hatchet-like blade having an increased maximum swinging radius. The upper and lower edges of the pick diverge so that the lower edge forms an acute angle with the axis of the shaft for improved hooking capability. The cutting edge of the blade has positive clearance.

3,735,435

**ROTARY HULL SINGLE BUOY OFFSHORE LOADING TERMINAL**

Gunther M. Mikulicic, 3923 1/2 Bluff Place; Yoram Katz, 710 W. 40th Street, both of San Pedro, Calif., and Charles A. Sada, 5437 Radford Street, North Hollywood, Calif.

Filed June 2, 1970, Ser. No. 42,802

Int. Cl. B63b 21/52, 35/44

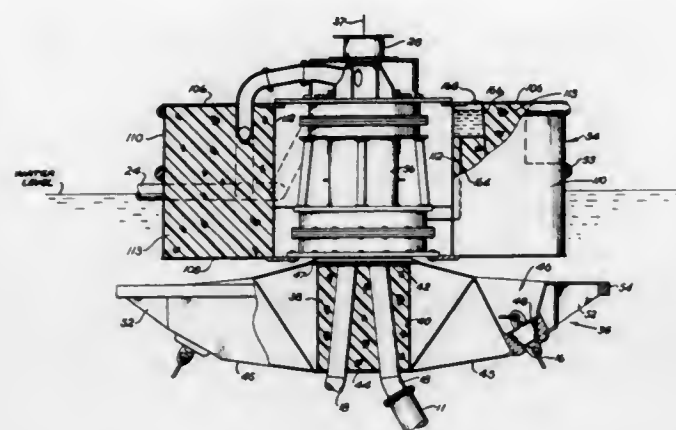
U.S. Cl. 9—8 P

10 Claims

An outer buoyant rotary hull structure fixedly mounts an upper conduit system for rotation therewith. Flow communication is established between the lower end of the rotatable, upper conduit system and the upper end of a stationary lower conduit system through a central swivel coupling. The upper end of the lower conduit system is supported within a moored lower base structure that is held stationary in a fixed position by an anchor system. A bearing assembly wholly enclosed



within a watertight closure at the center of the buoyant rotary hull rotatably supports the lower base structure to maintain



the upper and lower conduit systems rotatably aligned within the central swivel coupling.

3,735,436

# ARRANGEMENT FOR DISENGAGING THREADING DIES IN A THREADING DIE HEAD

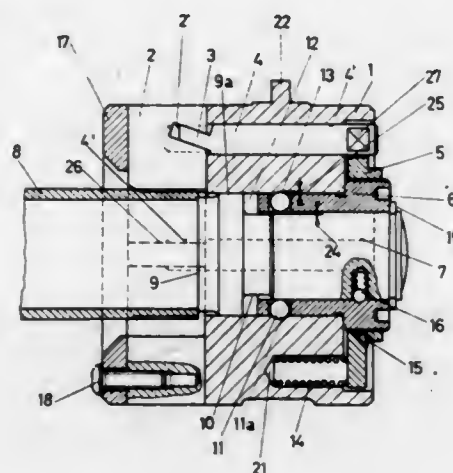
Georges Louys, Schaffhausen, Switzerland, assignor to Georg Fisher Aktiengesellschaft, Schaffhausen, Switzerland  
Filed June 9, 1972, Ser. No. 261,531

Claims priority, application Switzerland, June 14, 1971, 8625/71

Int. Cl. B23g 5/12

U.S. Cl. 10-96 R

16 Claims



For disengageably securing threading dies in the head of a thread-cutting machine or a similar device, axially extending holding bolts are provided in a die carrier for locating the dies in the threading position. The ends of the holding bolts spaced from the dies are secured to a flange displaceably mounted on the die carrier. A slide bushing is in threaded engagement with the flange and extends axially through a bore in the die carrier. A sensing bolt extends through the slide bushing and has a contact surface on one end for contacting a workpiece being threaded. Springs are located in the die carrier for biasing the flange away from the dies. While the workpiece is being threaded, the slide bushing is held against displacement in the axial direction relative to the die carrier, however, when the threading action is completed the sensing bolt is displaced axially and releases the locking action between the slide bushing and the die carrier. As a result, the flange connected to the slide bushing is biased by the spring so that the holding bolts release the dies from the threading position.

3,735,437

# UPPER ROUGHING DEVICE

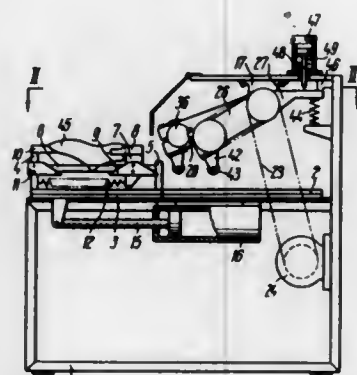
Boris Zakharovich Krollkov, Nevsky prospekt, 153, kv.; Jury Petrovich Krylov, Strelna, ulitsa Vokzalnaya, 2, kv. 2; Ilya Iosifovich Brod, prospekt Kosmonavtov, 52, korpus 1, and Boris Isaacovich Pripshstein, ulitsa Zhukovskogo, 20, kv. 41, all of Leningrad, U.S.S.R.

Filed June 11, 1971, Ser. No. 152,108

Int. Cl. A43d

U.S. Cl. 12-1 R

1 Claim



A device, wherein the last fixing arrangement is made in the form of a toe and a heel rests, one of which is capable of moving towards the second one, thus providing for the clamping and the release of the last, while the starting and the end templates are rigidly secured to the heel and the toe rests, respectively.

3,735,438

# MACHINE FOR TURNING THE SHANK EDGE ON AND SECURING IT TO THE INSOLE OF A SHOE

Tilo Löffler, Pirmasens-Winzeln, and Herbert Schindler, Pirmasens, both of Germany, assignors to Schon & Cie Gesellschaft mit beschränkter Haftung, Pirmasens, Germany

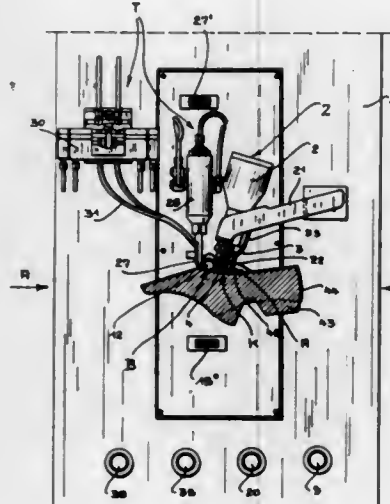
Filed May 3, 1971, Ser. No. 139,805

Claims priority, application Germany, May 2, 1970, P 20 21 495.3

Int. Cl. A43d 21/00

U.S. Cl. 12-8.3

11 Claims



In a shoemaking machine there is provided a draw roll mechanism, a pressing mechanism, an adhesive applicator mechanism and a nailing mechanism, all arranged in close juxtaposition and all having the same work range to operate in close succession on the same portion of a last advanced through the machine.

3,735,439

# HEEL NOTCHING MEANS

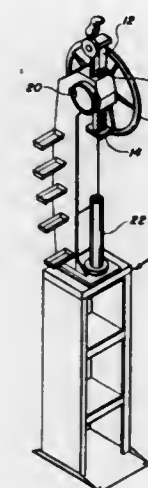
James M. Chaffin, Atlanta, and Henry R. Padovani, Austell, both of Ga., assignors to Textron Inc., Providence, R.I.

Filed Jan. 24, 1972, Ser. No. 220,288

Int. Cl. A43d 79/00

U.S. Cl. 12-42 R

9 Claims U.S. Cl. 15-150



Means is provided for notching a shoe heel block to accept a wedge-shaped metal wear piece. The notching means is arranged for use in pressure applying apparatus of a sort heretofore available and adapts such apparatus to effect the notching much more readily than has previously been possible.

3,735,440

# RAMP ENGAGEMENT DEVICE

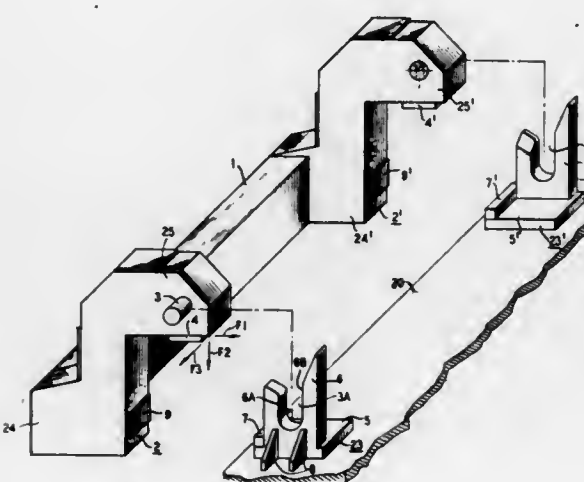
Carmir Hetmanski, 421 Kimball Avenue, Westfield, N.J.

Filed July 21, 1971, Ser. No. 164,629

Int. Cl. B65g 11/00

U.S. 14-71

11 Claims



An arrangement for releasably securing together heavy structures, such as a ramp and a ship, is taught utilizing a distributed engagement device. One portion of the device is carried on a free end of the ramp while the other portion of the device is mounted on the ship deck. The ramp portion of the device is constructed with a mating structure having a particular geometry, and the deck portion of the device is constructed with a mating surface having a negative geometry from that of the ramp mating structure. Bearing surfaces are positioned on the ramp portion of the device and on the ship deck in a manner substantially to eliminate the transmittal of loading forces through the mated device.

3,735,441

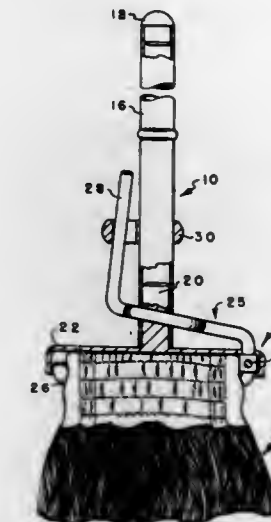
# MOP HEAD SUPPORT TOOL

Willard H. Shortte, Jr., La Grange, Ga., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Feb. 22, 1971, Ser. No. 117,518

Int. Cl. A471 13/24

4 Claims



Mop head support tool particularly designed for reception, support, quick release, and replacement of a wet-type mop head wherein first and second clamping means for retaining the mop head therebetween have first open unobstructed ends, and hand-manipulatable means attached to the second clamping means at a point remote from its open end for removing the second clamping means whereby a mop head may be readily released from the clamping means without interference.

3,735,442

# HAND MOUNTED ERASER

Joseph Lukas, 150 West 33rd Street, Hamilton, Ontario, Canada

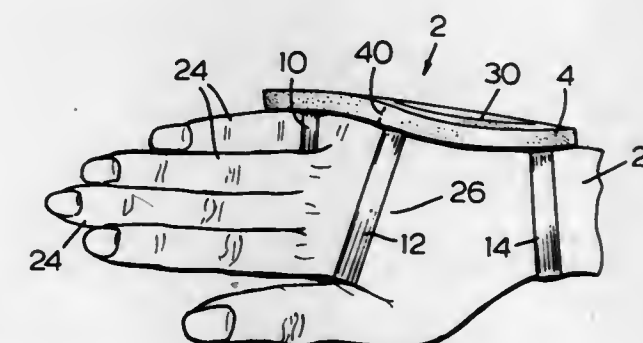
Filed May 20, 1971, Ser. No. 145,530

Claims priority, application Canada, May 14, 1971, 112,991

Int. Cl. B431 21/00

U.S. Cl. 15-227

7 Claims



A hand mounted chalk eraser has an elongated flexible felt pad and three fastening loops secured to the pad, one loop near each end and one in the middle. One end loop extends about the user's little finger; the other end loop extends about the user's wrist, and the middle loop extends about the palm and back of the user's hand, to hold the eraser securely on the edge of the user's hand remote from his thumb. In another embodiment, the pad is shortened and only the wrist loop and the middle loop are used.



3,735,443

**WINDSHIELD WIPER BLADE CONSTRUCTION**

Hans-Christian Deutscher, Ludwigsburg, and Kurt Bauer, Kleiningersheim, both of Germany, assignors to SWF Spezialfabrik Fuer Autozubehoer Gustav Rau GmbH, Bietigheim, Germany

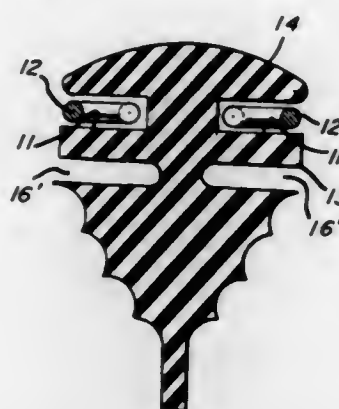
Filed Sept. 3, 1971, Ser. No. 177,707

Claims priority, application Germany, Nov. 27, 1970, P 20 58 389.5

Int. Cl. B60s 1/38

U.S. Cl. 15—250.36

7 Claims



A windshield wiper blade comprises a blade wiping band and includes an upper portion with a plurality of longitudinally spaced transversely extending grooves into which are placed spring elements. The spring elements are designed as flat wire springs bent undularly parallel to the wiping field.

3,735,444

**SEALING DEVICE FOR VACUUM EXTRACTOR**

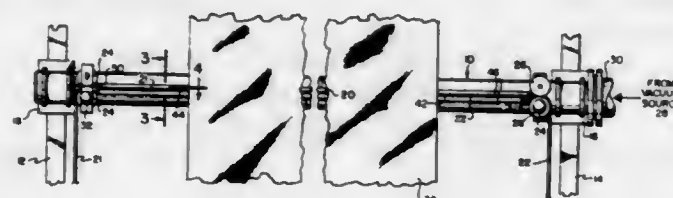
Andrew P. Cecere, Valley Stream, N.Y., assignor to Samco Holding Corporation, Woodside, N.Y.

Filed Dec. 9, 1971, Ser. No. 206,257

Int. Cl. A47I 5/38

U.S. Cl. 15—307

9 Claims



A sealing device for a vacuum extractor is provided for extracting moisture from a moving web passing adjacent the extractor. The vacuum extractor includes an elongated tube having a slot disposed therein for extracting the moisture therethrough, with the length of the tube being adjustable to accommodate different widths of a web to be treated by the adjustable longitudinal movement in the slot of an elongated, flexible, elastomeric rope-like substance which sealingly engages the edges of that portion of the slot not engaging a web to be treated.

3,735,445

**LOBSTER TAIL CUTTING DEVICE**

Frank C. Jurcak, c/o Sirlola House, Route 18 & 51, Lostart, Ill.

Filed July 22, 1971, Ser. No. 165,119

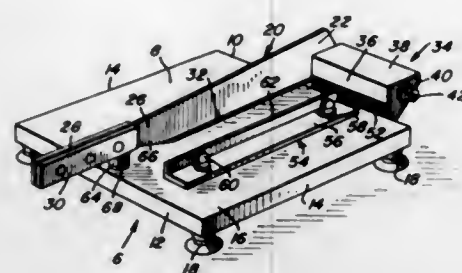
Int. Cl. A22c 29/00; B26d 04/34

U.S. Cl. 17—71

7 Claims

For cutting frozen or fresh lobster tails, a time and labor saving tail-holding and cutting device for safe use by restaurant cooks when preparing lobster tails. A non-corrodible plate provides a foundation for the ready-to-sever lobster tail. This plate is provided at the site of operation with positioning

and guide means for temporarily stabilizing and maintaining the tail in a localized captive state. A manually actuatable blade is operatively cooperable with the surface and has a cutting edge movable toward and from the plate surface in a manner to longitudinally cleave the tail. An adjustable adapter bracket is provided for pivotally anchoring the forward or



distal end of the cutting blade. The proximal end is provided with an appropriate handgrip and limit stop which prevents the cutting edge from coming into direct contact with the surface of the foundation plate. An upstanding portion of the bracket and coordinating guide means facilitates maintaining the lobster tail in a given position for safe and reliable cutting needs.

3,735,446

**CLEANING DEVICE FOR CIRCULAR COMBS ON A COMBING MACHINE**

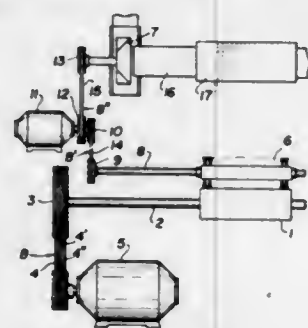
Henry Lorenz, and Hans-Joachim Scholz, both of Karl-Marx-Stadt, Germany, assignors to VEB Spinnermaschinenbau, Karl-Marx-Stadt, Germany

Filed Dec. 9, 1970, Ser. No. 96,558

Int. Cl. D01g 19/22

U.S. Cl. 19—218

1 Claim



A combing machine comprising a rotatable cylindrical comb and a rotatable cylindrical brush, the comb and brush rotating on respective substantially parallel axes so juxtaposed that the brush engages the comb thereby to remove waste accumulated on the comb, suction cleaning means positioned for withdrawing waste from the comb, a first motor operatively connected to the comb and a second motor operatively connected to the brush and the suction cleaning means.

3,735,447

**HOLDER AND FASTENER**

Frederick W. Abraham, Redwood, Calif., assignor to Fabel, Inc., Redwood City, Calif.

Filed Sept. 3, 1971, Ser. No. 177,683

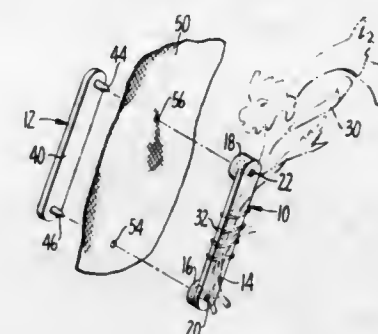
Int. Cl. A45I 5/08; A44b 9/08

U.S. Cl. 24—6

1 Claim

A device for holding an object and fastening same in a desired location. For example, the device may be used for securing a corsage or the like to an item of wearing apparel. The device includes a first element comprising a first body member adapted to have a corsage secured thereto and means defining a socket integrally connected to the first body member. The device further includes a second element comprising a second body member and fastener means in the form

of pins projecting outwardly therefrom. When the device is used in conjunction with a corsage, the second element is adapted for disposition on the inside of the wearing apparel



serted. One face of the strap is provided with a plurality of transverse teeth, each tooth having locking faces formed as a chevron. The lock member comprises a head having an aperture therethrough to pass the strap and a pawl carried therein, the distal faces of the pawl having a chevron configuration in correspondence to and for cooperative engagement with the chevron-formed tooth faces of the strap. The pawl is dependent from a ledge within the locking head aperture, the ledge having lateral faces extending between opposite walls of the aperture and spaced from said opposite walls to impart flexure to the pawl.

3,735,450

**DEVICE FOR FASTENING THE ENDS OF TUBES WHICH SUPPORT ELEMENTS FOR PROCESSING TEXTILE FIBERS**

Jean-Frederic Herubel, Guebwiller, France, assignor to N. Schlumberger & Cie, Guebwiller, Haut-Rhin, France

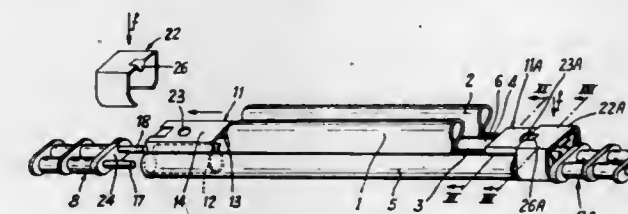
Filed June 15, 1972, Ser. No. 262,999

Claims priority, application France, June 29, 1971, 7123620

Int. Cl. F16g 13/00

U.S. Cl. 24—31 R

5 Claims



A device for fastening on two driving chains the longitudinally split ends of tubes for supporting elements employed for processing textile fiber, wherein the device is constituted by a coupling member comprising two elements slidably mounted within the ends of two successive supporting tubes and joined together by a connecting element, one portion of the said member which projects from the extremities of the said supporting tubes being engaged on extensions of the pivot-pins of two links of the corresponding chain while a detachable locking member engaged on the said portion of the coupling member forms an axial distance-piece between the end faces of the extremities of the said supporting tubes and the corresponding chain-link face.

3,735,451

**SEAM FOR PAPER FELTS**

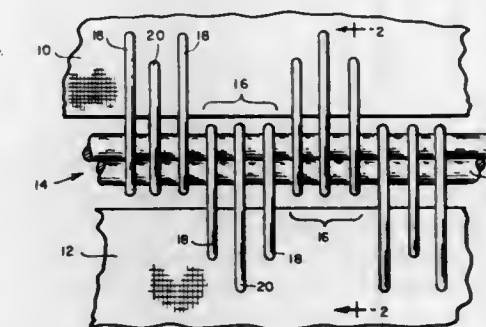
James Haythornthwaite, Joliette, Quebec, Canada, assignor to Seapa Dryers, Inc., Waycross, Ga.

Filed Oct. 14, 1971, Ser. No. 189,436

Int. Cl. F16g 3/02

U.S. Cl. 24—33

4 Claims



A clipper seam wherein the hooks for joining the ends of felts are arranged in alternating groups such that a limited number of hooks will be brought into rubbing engagement by lateral shifting or bowing of the ends of the felts.

3,735,448

**WIRE TIE**

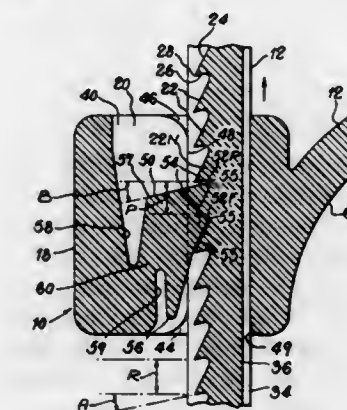
William T. Waddington, Fanwood, N.J., assignor to Buchanan Electrical Products Corporation, Union, N.J.

Filed Feb. 25, 1970, Ser. No. 14,023

Int. Cl. B65d 63/00

U.S. Cl. 24—16 PB

13 Claims



A unitary wire tie of the type in which spaced ratchet teeth are provided along the length of a strap portion for engagement with a pawl in a head portion to retain the wire tie in a looped configuration, the pawl being provided with at least a pair of teeth spaced apart slightly less than the spacing between adjacent ratchet teeth.

3,735,449

**CHEVRON BUNDLE TIE**

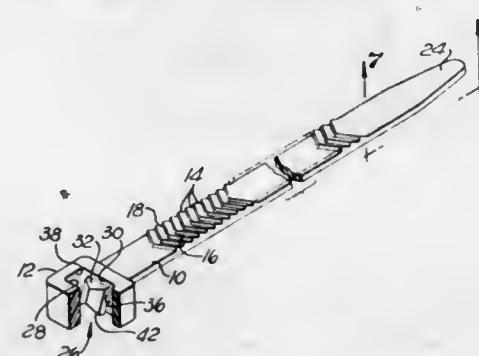
Louis A. Rosales, Manhattan Beach, Calif., assignor to Western Filament, Inc., Glendale, Calif.

Filed Feb. 28, 1972, Ser. No. 229,722

Int. Cl. B65d 63/00

U.S. Cl. 24—16 PB

8 Claims



A one-piece bundle tie comprising a strap having at one end a lock member into which the other end of the strap can be in-



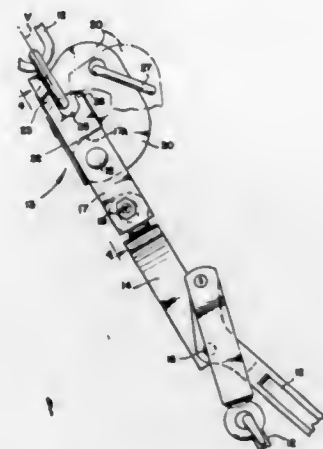
3,735,452

**RELEASEABLE HOOK MEANS FOR SECURING LOG LOADS**

Elvin O. Burroughs, Route 2, Box 204, Dexter, Oreg.  
Filed Feb. 28, 1972, Ser. No. 229,973  
Int. Cl. A44b 13/02

U.S. Cl. 24—68 CD

3 Claims



Hook means for use in conjunction with an over-center locking device for securing a cable or chain cincture about a load or raft of logs. A main body portion of the hook means swingably carries a hook element which is engageable at its outer end with a chain length or looped cable end. When in a closed, cincture engaging position the outer end of said hook occupies a recess formed within said body portion. Additionally, an appendage on the body portion restricts movement of the cable or chain end during hook opening movement to permit the hook to be swung open from a remote position away from an unstable log load.

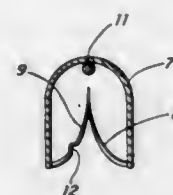
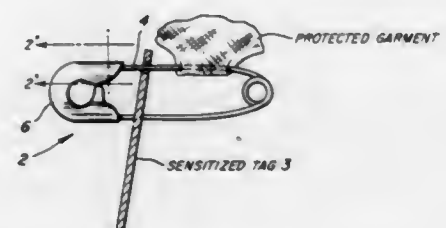
3,735,453

**SAFETY PIN WITH PIN POINT GUARD FOR PREVENTING MANUAL REMOVAL OF SAID POINT FROM SAID GUARD**

Robert L. Nathans, 36 Stag Drive, Billerica, Mass.  
Filed Feb. 25, 1972, Ser. No. 229,527  
Int. Cl. A44b 9/12

U.S. Cl. 24—156 R

19 Claims



A special destructable or non-destructable safety pin is employed to mechanically couple a sensitized tag to an item to be protected against shoplifting. If a shoplifter carries the protected item through an exit area with the sensitized tag on the item, an alarm device will alert store personnel to apprehend or photograph the shoplifter. A sensitized tag is rapidly and easily applied strictly by hand to the protected garment by means of the special safety pin which upon being closed cannot be opened except by special devices at the cashier's station. Once the safety pin is closed, it cannot be opened by a shoplifter without cutting the pin portion which is made dif-

ficult, at least for the average shoplifter, because the pin portion is case hardened by well-known techniques; also shoplifters, particularly a large number of females, would be reluctant to use wire cutters, carry them about and be caught with them. Additionally, the special safety pin may be employed to attach ordinary price tags to the goods and would thwart price tag switching.

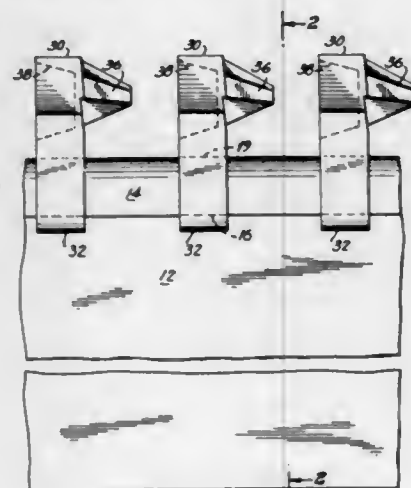
3,735,454

**ZIPPER STRINGER**

Barry Goldstein, Rockville Centre, N.Y., assignor to Stag Zipper Corp., Brooklyn, N.Y.  
Filed Apr. 13, 1971, Ser. No. 133,617  
Int. Cl. A44b 19/06

U.S. Cl. 24—205.13 R

4 Claims



A flexible stringer of integral construction for slide fasteners is shown. The flexible stringer includes a flat flange member and a bead. The bead cross-section is shaped to conform to the area defined by the closure arms of the fastener elements emplaced upon it. The stringer shown includes a substantially flat inner surface which extends outwardly at substantially right angles from the flange. A second right angle is defined at the juncture of the inner and outer surfaces of the bead. In the preferred embodiment the bead comprises a half cylindrical volume symmetrically positioned with respect to the flange and has a cylindrical void located symmetrically within it. A firm holding force between the stringer and the conventional fastener members is obtained.

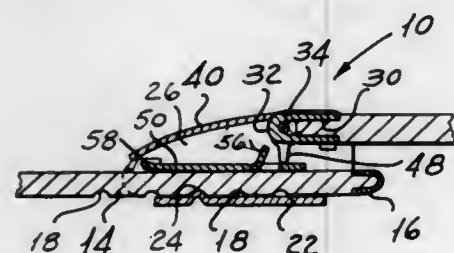
3,735,455

**SLIP-THROUGH BUCKLE**

Seymour Hauser, North Bergen, N.J., assignor to Kreisher Manufacturing Corporation, North Bergen, N.J.  
Filed May 20, 1971, Ser. No. 145,418  
Int. Cl. A47b 19/00

U.S. Cl. 24—191

6 Claims



A slip-through buckle for a semi-flexible non-expandable and non-resilient watch band in which a boss in the base of the buckle frame is adapted to be received in one of a number of spaced notches in the underside of the tongue end of the band and in which a resilient clamping plate retained on the frame and overlying the tongue end of the band and which is urged

into engagement with the upper side of the tongue end of the band by cams as the cover of the buckle is closed may flex to accommodate temporary misalignment between the boss and a recess, which misalignment can be corrected by pulling on the band and without damage to the parts of the buckle.

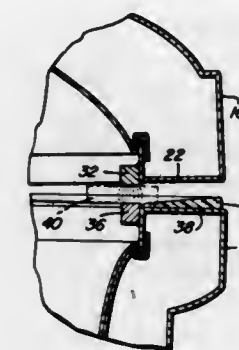
3,735,456

**MAGNETIC CASKET SEAL ASSEMBLY**

Lelon Cude, 1725 North Saint Mary's Street, San Antonio, Tex.  
Filed July 19, 1971, Ser. No. 163,770  
Int. Cl. A17g 61/00

U.S. Cl. 27—17

4 Claims



A unique magnetic casket sealing assembly is provided which eliminates the need for conventional sealing and locking hardware. The assembly includes a plurality of permanent magnets affixed to the casket base and hinged lid components and positioned adjacent to the closure surfaces with a gasketlike tapered seal of resilient, deformable material mounted on the closure surface of the casket base. The permanent magnets each extend slightly beyond the planes of the rigid closure surfaces, such that a slight gap is maintained therebetween when the magnets engage each other, allowing the gasket to deformably flow within the gap to maintain a constant seal without the use of conventional hardware.

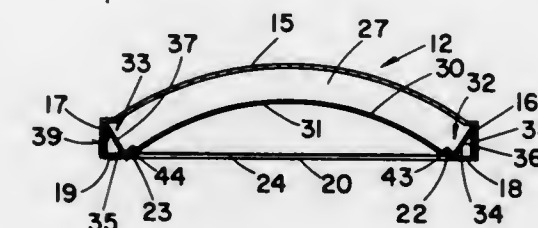
3,735,457

**CASKET LID**

Richard B. Esterdahl, P.O. Box 16BB, Prophetstown, Ill.  
Filed May 6, 1970, Ser. No. 35,107  
Int. Cl. A61g 17/04

U.S. Cl. 27—19

16 Claims



A liner used in combination with a casket lid that is composed of an upper layer of plastic material and a lower layer of a fabric bonded to the upper layer and having a design molded therein. The liner has edges that engage and fit against internal surfaces of the casket lid and the liner has molded therein a design that is appropriate for a casket liner. The plastic is of a resilient material so that the liner itself is biased into a relatively fixed position when inserted in the lid.

3,735,458

**METHOD OF MANUFACTURING ROTARY ANODES FOR USE IN X-RAY TUBE AND ROTARY ANODES MANUFACTURED BY SAID METHOD**

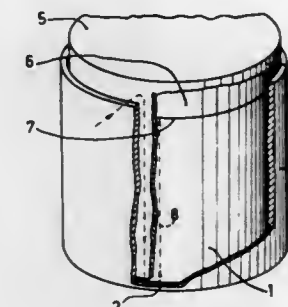
Frederik Magendans, and Bernard Josef Pieter Van Rhee, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Phillips Corporation, New York, N.Y.  
Filed Nov. 5, 1970, Ser. No. 87,097

Claims priority, application Netherlands, Nov. 8, 1969, 6916885

Int. Cl. H01j 9/16, 9/44

U.S. Cl. 29—25.18

6 Claims



A novel method of manufacturing a double-layer rotary anode for use in X-ray tubes, in which by means of a "high energy rate forming process" an anode portion mainly made of tungsten and a supporting portion mainly made of molybdenum are secured to each other by one stroke. The composition and the pretreatment of each of these portions may be chosen to the optimum with respect to the required properties such as mechanical strength and heat resistance, which properties are not adversely affected by this process of adhesion in contrast to the effect of known adhering techniques.

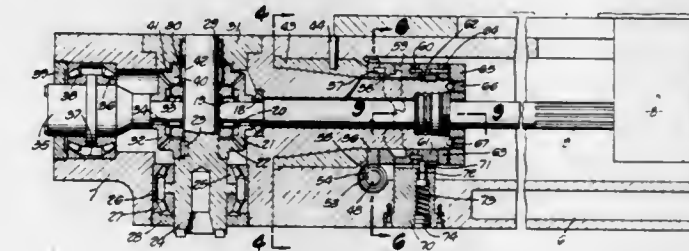
3,735,459

**MULTIPLE AXIS WORK HEAD WITH DUAL IN LINE WORK SPINDLES AS DISCLOSED**

William T. Allen, P.O. Box 4151, Downey, Calif.  
Filed Aug. 28, 1970, Ser. No. 67,798  
Int. Cl. B23c 1/10, 1/12; B23b 39/02

U.S. Cl. 29—26

15 Claims



A single machine tool work head having dual spindles, in which one spindle is in a horizontal position and the second spindle is in line (i.e. at right angles thereto). The spindles are contained in a tool head which rotates to any of four or more positive positions, with automatic unlock, index and lock features. Five or more tool positions are shown along the X, Y and Z axes of the machine. The machine has a single drive to perform work on workpieces and to permit exposure of different planes for machine operations such as milling, drilling, boring, grinding or three-dimensional contouring. The work head is self-contained and does not require adaptors to achieve the five tool positions.



3,735,460

**BEARING, CENTERING AND INDEXING MEANS FOR THE SPINDLE CARRIERS OF MULTIPLE SPINDLE MACHINES**

Radolf Crachy, Babenhausen, and Hans Jacoby, Gottwolshausen, both of Germany, assignors to Werkzeugmaschinenfabrik Gildemeister & Comp. Aktiengesellschaft, Bielefeld, Germany

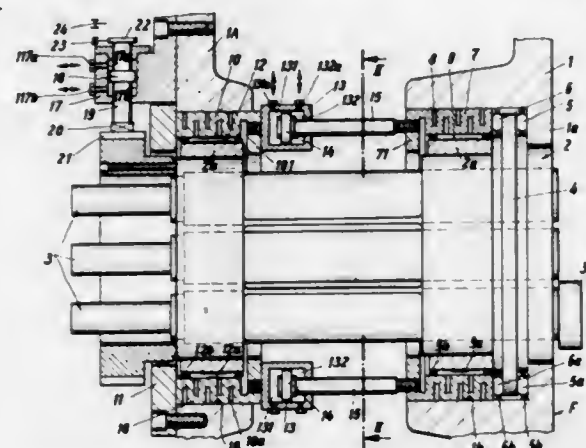
Filed Feb. 16, 1972, Ser. No. 226,915

Claims priority, application Germany, Feb. 18, 1971, P 21 07 735.0

Int. Cl. B23b 3/18

U.S. Cl. 29—48.5

22 Claims



A multiple spindle machine wherein the front portion of the spindle carrier is rotatable in two axial antifriction bearings and a radial antifriction bearing. The front axial bearing is adjacent to an abutment of the machine frame and the rear axial bearing is separated from the front axial bearing by a flange of the spindle carrier. The radial bearing surrounds the spindle carrier behind the rear axial bearing and is surrounded by an axially compressible clamping ring which can be biased by one or more cylinder and piston assemblies to bear against the rear axial bearing and to thereby undergo radial expansion. The rear axial bearing causes the flange to press the front axial bearing against the abutment to thus maintain the front portion of the spindle carrier in a predetermined axial position. The radially expanding clamping ring bears against a cylindrical internal surface of the frame and at least indirectly against the front portion of the spindle carrier so that the latter is accurately centered in the frame. A ring gear on the spindle carrier is engaged by a second gear which serves to rotate the spindle carrier between successive working positions. The ring gear can also be engaged by a gear segment which is movable radially of the spindle carrier by a cylinder and piston assembly and serves to lock the spindle carrier in an accurately determined position while the workpieces which are rotated by the work spindles in the carrier undergo treatment by one or more tools.

3,735,461

**TOOL HOLDER WITH ANGLE-INDEX**

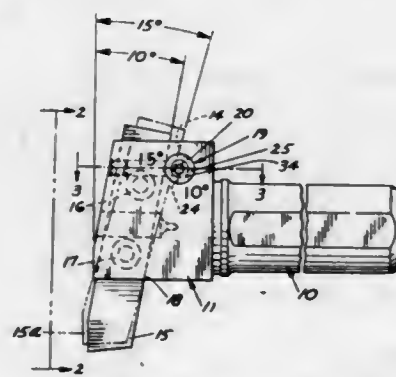
Edward N. Andrews, Sr., 6490 Malvern Drive, Troy, Mich.

Filed Feb. 16, 1971, Ser. No. 115,412

Int. Cl. B26d 1/00

U.S. Cl. 29—98

4 Claims



A turning tool holder for turret lathes, lathes, automatic turning machines, and similar tools, which is provided with an

angle-index dial and cam means for indexing the tool holder to accommodate turning tools having various side cutting edge angles.

3,735,462

**METHODS FOR THE MANUFACTURE OF BEARING SUPPORTS FOR ELECTRIC ROTARY MACHINES**

Stig Lennart Hallerback, 12, Blodbaksjatan, Vastrå Frolunda, Sweden

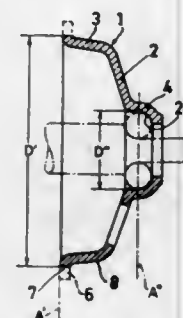
Filed Nov. 1, 1971, Ser. No. 194,140

Claims priority, application Sweden, Nov. 2, 1970, 14728/70

Int. Cl. B21h 1/12; B21k 1/04

U.S. Cl. 29—148.4 R

8 Claims



A method for precision manufacture of bearing supports for electric rotary machines such as electric motors, said bearing supports comprising a cup-shaped member the larger end of which forms a mounting portion for being secured in a permanent way, such as by bonding, to a stator end face inside the stator end windings, and the smaller end of which provides location for rotor bearing means, consisting of the steps of pressing sheet metal to form the support by multi-stage transfer pressing in continuous working stages, forming the larger end of the bearing support in one stage to provide an abutment surface parallel to a plane at substantially right angles to a rotor bearing-locating surface of generally cylindrical form in the smaller hub-like end of the bearing support, forming in another stage a generally cylindrical surface concentric with the rotor bearing-locating surface and forming in still another stage at least one bonding surface dependent of said surfaces determining dimensional and geometrical accuracy.

3,735,463

**METHOD OF FORMING TAPERED TUBULAR MEMBERS**

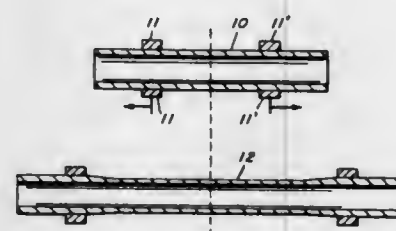
Anthony Merola, Pittsburgh, Pa., assignor to Amerola Products Corporation, Pittsburgh, Pa.

Filed Nov. 4, 1971, Ser. No. 195,794

Int. Cl. B23p 17/00

U.S. Cl. 29—155 C

12 Claims



A method of forming tapered, generally tubular members having a controlled wall thickness along the length of the tapered member, comprising elongating a portion of a hollow, cylindrical body to decrease the wall thickness of the elongated portion of the body, and thereafter tapering a selected portion of the body to a predetermined shape by reducing the diameter of the selected portion.

3,735,464

**APPARATUS FOR FABRICATING WALL PANELS AND THE LIKE FOR BUILDINGS**

Leonard J. Linzmeler, and Loren D. Kowling, both of c/o 301 S. Stoughton Rd., Madison, Wis.

Filed Nov. 24, 1971, Ser. No. 201,714

Int. Cl. B23p 19/00

U.S. Cl. 29—200 A

6 Claims



Multi-station apparatus for constructing and handling wall panels, floors and the like in a "house factory". The apparatus comprises a framing table having a rectangular flat workbed with an air-cylinder operated jig assembly for holding the work pieces in position during fabrication. The framing table has a series of conveyor rollers longitudinally spaced along each side of the workbed on a pivotable carriage whereby a rough wall panel fabricated on the workbed can be lifted above the bed by the elevating rollers for moving the rough wall panel to a finishing table where exterior siding is put on and window units are installed. The finishing table has a series of fixed axis rollers longitudinally spaced along each side for receiving the rough wall panel from the framing table with which it is aligned. The finishing table has a hydraulically operated tilt bed for standing the finished wall panel in a substantially upright position under an overhead crane extending longitudinally above the pivot axis of the tilt bed and beyond the finishing table for carrying the wall panel directly to the factory loading dock.

3,735,465

**ASSEMBLING APPARATUS FOR ROLLING AND CLAMPING A PART TO A TUBULAR MEMBER**

Alan R. Tibbetts, Costa Mesa, and Donald R. Tucker, Lakewood, both of Calif., assignors to Alcoa, Inc., New York, N.Y.

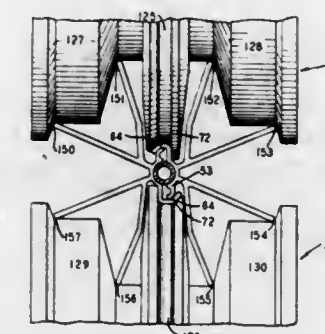
Division of Ser. No. 792,593, Jan. 21, 1969, Pat. No.

3,672,446. This application Feb. 7, 1972, Ser. No. 224,320

Int. Cl. B23p 15/26

U.S. Cl. 29—202 D

5 Claims



This invention relates to a finned assembly for a heat exchanger comprising an extended surface portion, an elongated tubular member, said extended surface portion comprising two identical parts, each having an internal cylindrical surface adapted to engage said tubular member and each having radially extending locking members adapted to engage locking members on the other of said parts. The invention further relates to methods and apparatus for attaching said extended surface portion to said member.

3,735,466

**APPARATUS FOR FASTENING CONTACT PINS TO A SUBSTRATE**

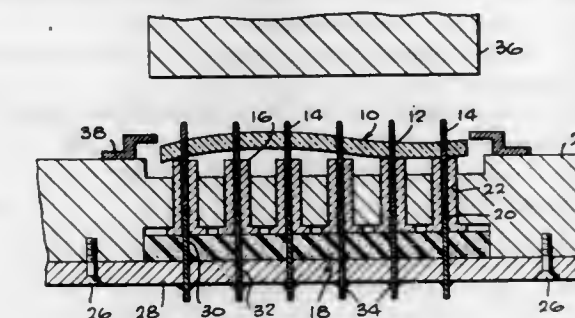
Neil F. Jensen, Phoenix, Ariz., assignor to Semiconductors Electronic Memories Incorporated, Phoenix, Ariz.

Filed May 3, 1971, Ser. No. 139,411

Int. Cl. H05k 13/04

U.S. Cl. 29—203 B

6 Claims



A die structure for fastening contact pins to a thin brittle ceramic substrate is disclosed. The structure includes a plurality of individual bushings, which are supported on a flexible pad, and which in turn support the substrate. The flexible pad represents an elastic foundation of particular spring constant. When a heading ram is lowered on contact pins to form pin heads, the substrate is in direct contact with the flexible bushings, since the bushings move in a plane parallel to the force and conform to the substrate irregularities, thereby eliminating any bending moments in the substrate which cause substrate cracking.

3,735,467

**FORM-CRIMPING APPARATUS FOR THE MANUFACTURE OF ELECTRICAL COMPONENTS**

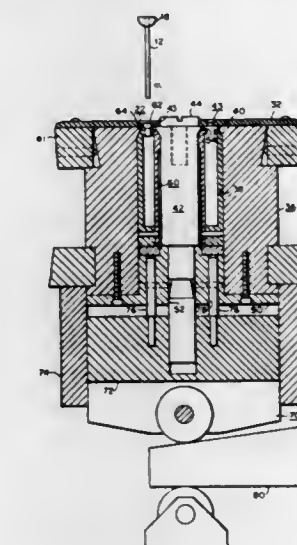
Ernest F. Smart, Horseheads, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 25, 1971, Ser. No. 146,750

Int. Cl. H01r 43/04

U.S. Cl. 29—203 D

6 Claims



An apparatus for the manufacture of electronic components and more particularly in the electronic tube art wherein bell-shaped eyelet shield members are threaded on and positioned accurately on stem lead members of an assembly used in electronic tubes. This is accomplished by the provision of a plurality of holding cavities for supporting and positioning the eyelet members and providing easy insertion of the stem lead members into the eyelets. In addition, means is provided for accurately positioning the stem with respect to the eyelet holding cavities and crimping means is provided for securing the eyelet to the stem lead wherein a force is simultaneously



applied to opposite sides of a portion of the eyelet members to crimp the eyelet members to the stem lead without the undesirable forces being applied to the stem lead assembly. Orientation cavities are provided for leading the eyelets into the holding cavities.

3,735,468

# APPARATUS FOR MAKING FLEXIBLE STRIPS OF MATERIAL HAVING A PILE OF HOOK-SHAPED ELEMENTS

George H. Erb, Rutland, Vt., assignor to American Velcro, Inc., New York, N.Y.

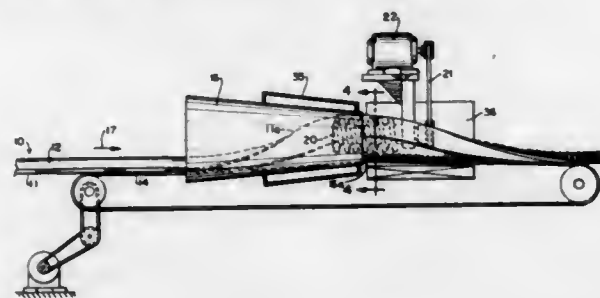
Division of Ser. No. 90,710, Nov. 18, 1970, Pat. No. 3,665,584.

This application Mar. 13, 1972, Ser. No. 234,235

Int. Cl. A41h 37/06; B23p 19/04

U.S. Cl. 29—207.5

3 Claims



An apparatus is disclosed for making the hook or loop part of a separable hook and loop type fastener by bending a flexible base strip having a plurality of unbroken hook-shaped rails protruding from one surface thereof into a generally tubular form with the rails extending radially inwardly thereof; and thereafter progressively subjecting spaced-apart cross-sectional segments of each rail alternately and periodically to a rotational cutting action to transform each rail into a row of individually spaced-apart resilient hooks or loops.

3,735,469

# APPARATUS FOR FORMING SLIDE FASTENERS

George B. Moertel, Conneautville, and James R. Wilson, Conneaut Lake, both of Pa., assignors to Textron Inc., Providence, R.I.

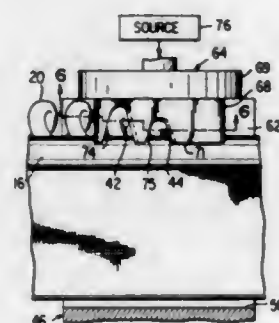
Division of Ser. No. 34,340, May 4, 1970, Pat. No. 3,672,008.

This application Jan. 24, 1972, Ser. No. 220,296

Int. Cl. B23p 19/04, 11/00

U.S. Cl. 29—207.5 R

32 Claims



Apparatus for forming a slide fastener having terminal elements reduced in size relative to the remaining fastener elements and two stop members adjacent the terminal fastener elements each being formed from a mass of fusible material fused onto the slide fastener including a support block having parallel channels for receiving separate slide fastener tapes, a forming anvil having a pair of spaced legs movable in the channels to capture the terminal fastener elements in cavities therein, a source for supplying ultrasonic energy to the forming anvil to reduce the size of the terminal fastener elements, a forming block supporting the separated slide fastener tapes

adjacent cavities defined therein by another forming anvil, a forming member engaging the forming block to move the forming block relative to the other forming anvil and shear blanks of fusible material in the cavities, and a source for supplying ultrasonic energy to the forming member to fuse the blanks onto the slide fastener tapes to form separate stop members.

3,735,470

# INDEXING TOOL TABLE

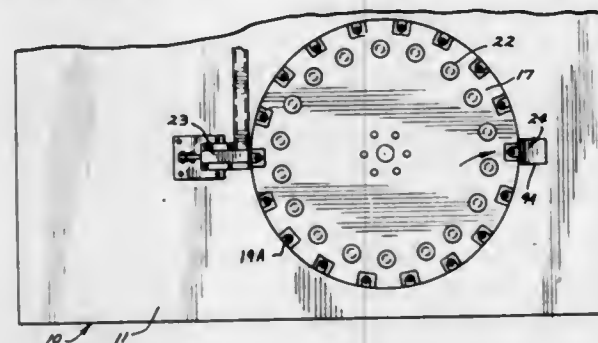
James W. Elmer, Osseo, and Donald C. Reschke, Wayzata, both of Minn., assignors to Inventors Engineering Inc., Minneapolis, Minn.

Filed July 19, 1971, Ser. No. 163,622

Int. Cl. B23p 19/04

U.S. Cl. 29—208 F

20 Claims



An indexing tool table which has a tooling plate or dial which rotates about a substantially upright axis and which has indexing means thereon and also utilizes interlocking pin and receptacle means located adjacent the periphery of the dial to hold the dial stable during use. The interlocking pin and receptacle means forming the holding device are disengaged during the indexing operations.

3,735,471

# DEVICE FOR REMOVING A FAN FROM A SHAFT

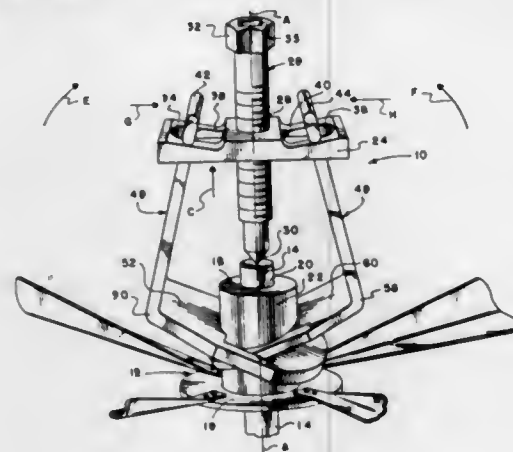
Donald L. Kappler, 1012 South Gloucester, Irving, Tex.

Filed Dec. 17, 1971, Ser. No. 209,248

Int. Cl. B23p 19/04

U.S. Cl. 29—261

11 Claims



A device for removing objects such as pulleys, fans, gears or the like from a shaft, having a body with a threaded bore extended therethrough, an elongated bolt in threaded engagement with said threaded bore, a pair of elongated slots extending through said body, said slots extending radially on opposite sides of said bore, and first and second elongated engagement means, each having a circular bore in one end thereof, said bores being of a size to allow said engagement means to be placed over an axially extending surface on said object, the other end of each of said engagement means being removably inserted through said slots.

3,735,472

# PIPE FITTING WELD ALIGNMENT APPARATUS

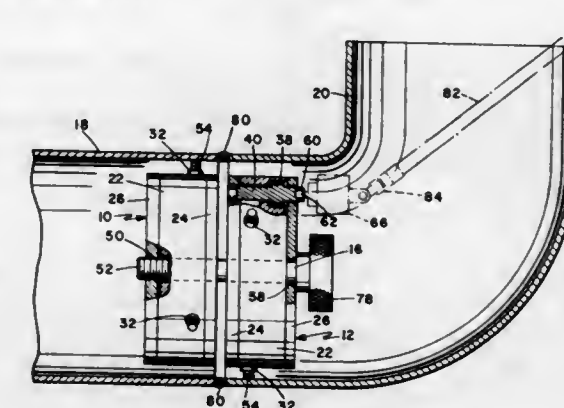
Irving Silverman, 5152 Walsh Way, San Diego, Calif.

Filed Mar. 26, 1971, Ser. No. 128,408

Int. Cl. B25b 27/14

U.S. Cl. 29—272

3 Claims



Apparatus for holding pipe sections in alignment during welding, particularly pipe fittings such as elbows and the like. Two compact chuck units are mounted by a simple jig in the confronting ends of the pipe sections to be joined, and are then coupled by an adjustable connector to set the position of the sections. After initial welding, the connector and chuck units are removed through the pipe fitting. The apparatus is adaptable to a wide range of pipe sizes.

3,735,473

# METHOD OF FABRICATING A HOLLOW BAT AND PRODUCT THEREOF

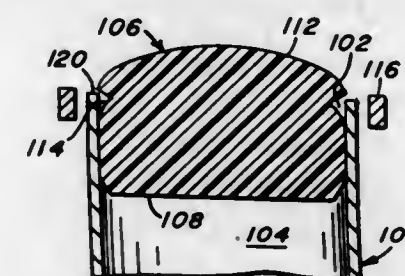
Richard C. Wilson, Arcadia, Calif., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 8, 1971, Ser. No. 121,824

Int. Cl. B23p 17/00

U.S. Cl. 29—421

4 Claims



A method of making a hollow bat including providing a hollow bat body having a handle portion at one end and a barrel portion at the other with at least one end terminating in an opening. Providing an end plug having a transverse end wall and a generally cylindrical depending body portion having at least one annular groove therein. Deforming the end plug or the end portion of the bat body defining the open end to establish an interlocking joint between the bat body and end plug. The bat body has a radially inwardly directed flange at the opening defining end of the bat in circumferential engagement with the annular groove of the end plug.

In one form of the method the open end of the hollow bat is provided with a radially inwardly directed flange at the open end. The end plug is composed of resiliently compressible material and is positioned in axial alignment with the bat body at a position spaced from the flange. Relative axial closing movement is established between the plug and the bat body in order to compress the resilient plug radially and establish entry of the plug into the bat body. Movement is terminated when the radial bat flange is seated in the annular groove.

In another form of the method the end plug is positioned partially within the open end of the bat and the joint is ef-

fectured by reforming the annular free edge of the open end radially inwardly to establish an inwardly directed flange in the bat body in circumferential engagement with the annular groove. The bat body may be composed of an electrically conductive material and the flange formation effected by a magnetic field generated by means not physically contacting the bat body.

A hollow metal bat body having a handle at one end and a barrel portion at the other end. An end plug having a transverse end wall and depending generally cylindrical body portion provided with an outwardly open annular recess. The body portion disposed within one end of the hollow metal bat and the open end within which said plug is disposed terminates in a radially inwardly directed flange which has its free end disposed within the annular recess.

3,735,474

# METHOD OF SECURING SEPARATOR IN CLUTCH DISC

Nils-Eric G. Bark, Lake Bluff, and Karl Kordas, Mudelein, both of Ill., assignors to International Harvester Company, Chicago, Ill.

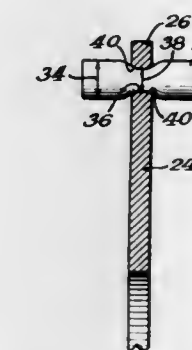
Division of Ser. No. 837,146, June 27, 1969, Pat. No.

3,584,720. This application Feb. 12, 1971, Ser. No. 114,928

Int. Cl. B23p 11/02

U.S. Cl. 29—451

2 Claims



A multiple disc clutch pack for transmitting and interrupting power flow between a drive member and a driven member. Alternating discs axially shiftable, but non-rotatably secured to one of the members, have elastomeric elements extending into engagement with adjacent discs on the said member to separate the discs when the power flow therethrough is interrupted, and are compressible to permit frictional engagement of all the discs when the power is being transmitted.

3,735,475

# METHOD OF MANUFACTURING VENTED LINED PIPE

Lee Walter Marriott, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

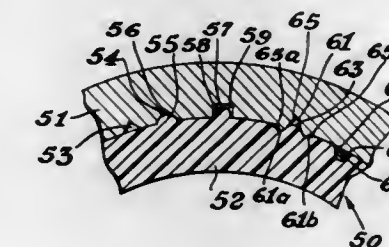
Continuation of Ser. No. 870,915, Aug. 19, 1969, abandoned, which is a division of Ser. No. 681,829, Nov. 9, 1967, Pat. No.

3,506,039. This application Oct. 8, 1971, Ser. No. 187,822

Int. Cl. B21d 39/00; B23p 19/04

U.S. Cl. 29—455

1 Claim



Lined pipe is conveniently and safely vented by providing a plurality of spaces disposed between the lining and the pipe and venting gases at the terminal portions of the pipe section either to another section or to a gas dispersal facility.



3,735,476

# METHOD OF MANUFACTURING COMPONENTS WITH CAVITIES BY EXPLOSIVE WELDING OF METAL BLANKS

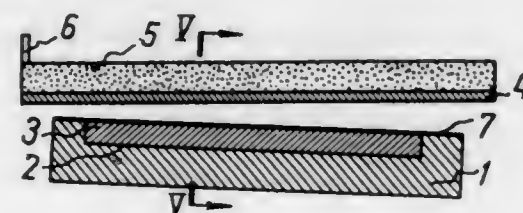
Andrei Andreevich Deribas, ulitsa Pravdy, 1, kv. 20, Novosibirsk; Vladimir Mikhailovich Kudinov, ulitsa Filatova, 1/22, kv. 51, Kiev; Felix Iovich Matveenko, ulitsa Pravdy, 1, kv. 24, Novosibirsk; Vladimir Ivanovich Oksak, Basseinaya ulitsa, 8, kv. 4, Kiev; Valery Alexandrovich Simonov, bulvar Molodezhni, 30, kv. 19, Novosibirsk; Nikolai Gerasimovich Ostapenko, deceased, late of Kiev; Klara Mikhailovna Ivanova, administrator, bulvar Lesi ukrainki, 2, kv. 20, Kiev, and Alexei Nikolaevich Ostapenko, administrator, ulitsa Molodezhnaya, 4, kv. 220, Moscow, all of U.S.S.R.

Filed Jan. 29, 1970, Ser. No. 6,797

Int. Cl. B23k 21/00

U.S. Cl. 29-470.1

3 Claims



A method of manufacturing multilayer components with inner hollows by the explosive welding of metal blanks, one of the blanks being provided with depressions filled with fusible or soluble materials which are removed after welding.

3,735,477

# METHOD OF USING AND REMOVING A PARTING COMPOUND

James J. McGlynn, Paoli, Pa., assignor to Lukens Steel Company, Coatesville, Pa.

Division of Ser. No. 795,044, Jan. 29, 1969, Pat. No. 3,658,565. This application Oct. 13, 1971, Ser. No. 188,995

Int. Cl. B23k 1/20

U.S. Cl. 29-470.9

5 Claims

A process of preparing a pack of composite metal plate assemblies wherein juxtaposed surfaces of stainless steel to be separated have applied thereto a parting composition comprising a mixture of an oxide of chromium and manganese dioxide in a ratio of about 0.01-5 parts of the chromium compound to 1 part of the manganese dioxide by volume. The assembly is thereafter hot worked. When separated the coatings formed on the surfaces of the stainless steel plates are removed without pretreating by means such as mechanical means or a caustic bath, such removing being with an acid pickle of nitric and hydrofluoric acids.

3,735,478

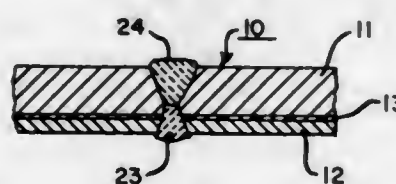
METHODS FOR MAKING BI-METALLIC PIPE  
Milton Porter, Pittsburgh, Pa.; Warren Kearns, Steubenville, Ohio; Conrad Washek, Doraville, and Paul Lambert, Savannah, both of Ga., assignors to L. B. Foster Company, Pittsburgh, Pa.

Filed Jan. 6, 1971, Ser. No. 104,263

Int. Cl. B23k 31/02

U.S. Cl. 29-477.3

4 Claims



A method for making bi-metallic pipe and a bi-metallic pipe are provided in which a strip of carbon steel having fixed

thereto a strip of corrosion resistant metal of the same width is spirally wound into a pipe and welded with a first weldment in the corrosion resistant metal extending into the carbon steel and a second weldment in the carbon steel extending into the first weldment.

3,735,479

# METHOD OF FUSION-BONDING PARTS BY PARTIAL LIQUID PHASE FORMATION

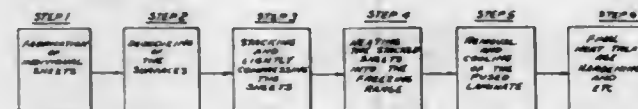
Seong K. Rhee, Livonia, and Robert S. Kiwak, Dearborn Heights, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 27, 1970, Ser. No. 93,330

Int. Cl. B23k 3/02, 35/24

U.S. Cl. 29-498

1 Claim



A method of fusion bonding parts which are of material comprised of two or more components such as aluminum-magnesium alloys so that the material experiences a "freezing range" as it is heated from its solid state to its liquid state. The method includes heating the assembled parts just into the freezing range so that they remain substantially unaltered in shape and size, while the small amount of liquid formed creates a rapid fusion of the parts so that the parts are fusion bonded together upon cooling of the assembly.

3,735,480

# POLYTETRAFLUOROETHYLENE END PLUG SEAL FOR ELECTROLYTIC CAPACITORS

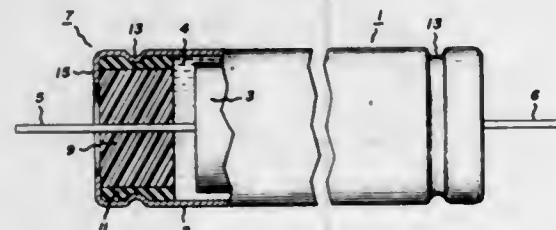
Wilfred Harold Yeamans, Seabrook, Tex., assignor to General Electric Company, Owensboro, Ky.

Continuation-in-part of Ser. No. 6,016, Jan. 22, 1970, which is a continuation of Ser. No. 753,332, June 28, 1968, abandoned, which is a division of Ser. No. 536,043, March 21, 1966, Pat. No. 3,422,319. This application Feb. 12, 1971, Ser. No. 115,107

Int. Cl. B01j 17/00

U.S. Cl. 29-570

1 Claim



A method for forming an end plug seal for an electrolytic capacitor, which includes formation of a plug through which the lead wire extends. The plug is formed of Teflon having an etch bonded layer or coating of a fluoroelastomer synthetic rubber simultaneously baked and cured in situ. The container for the capacitor, is formed around the periphery of the coating so that it grips the coating and extends across a portion of the Teflon end plug.

3,735,481

# METHOD OF MANUFACTURING AN INTEGRATED CIRCUIT HAVING A TRANSISTOR ISOLATED BY THE COLLECTOR REGION

Tsugio Makimoto, Kodaira-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 4,468, Jan. 19, 1970, Pat. No. 3,596,149, Continuation of Ser. No. 752,049, Aug. 12, 1968, abandoned.

This application Feb. 25, 1971, Ser. No. 118,615

Int. Cl. B01j 17/00

U.S. Cl. 29-578

7 Claims

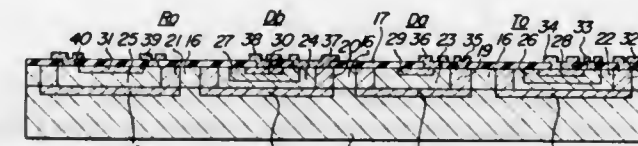
A method of manufacturing a semiconductor integrated circuit in which a P type semiconductor layer is epitaxially grown

MAY 29, 1973

GENERAL AND MECHANICAL

1479

in the surface of a P type semiconductor substrate containing N<sup>+</sup> buried layers therein, the P type layer is divided into a plurality of electrically isolated portions by N<sup>+</sup> type regions which are formed by diffusing a donor impurity into the surface of



said P type semiconductor layer towards the N<sup>+</sup> type buried layers, the divided P type semiconductor portions forming individually diodes and transistors with the N<sup>+</sup> type regions connected to said buried layers as their structural elements.

3,735,482

# METHOD OF MAKING AN MOS TRANSISTOR INCLUDING A GATE INSULATOR LAYER OF ALUMINUM OXIDE AND THE ARTICLE SO PRODUCED

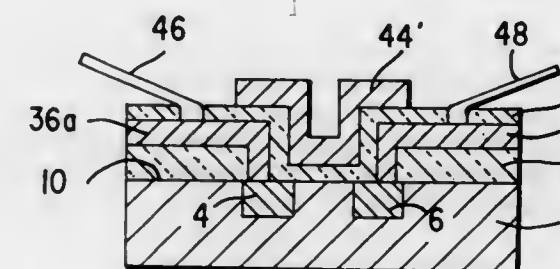
Peter Edward Norris, and Frank Benjamin Micheletti, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed June 16, 1971, Ser. No. 153,662

Int. Cl. B01j 17/00

U.S. Cl. 29-571

4 Claims



A method of making an MOS transistor which has a gate insulator layer composed of aluminum oxide made by plasma anodizing a thin layer of aluminum, in which the thin aluminum layer and the anodized layer are not defined by etching. The gate electrode insulator layer is formed by depositing a thin layer of aluminum over the entire surface of the device after the source and drain contacts are made and then converting the entire aluminum layer to aluminum oxide.

3,735,483

# SEMICONDUCTOR PASSIVATING PROCESS

Gary S. Sheldon, Union Springs, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Division of Ser. No. 21,373, March 20, 1970, Pat. No. 3,642,597, which is a division of Ser. No. 782,093, Dec. 9, 1968, abandoned. This application Aug. 25, 1971, Ser. No. 174,974

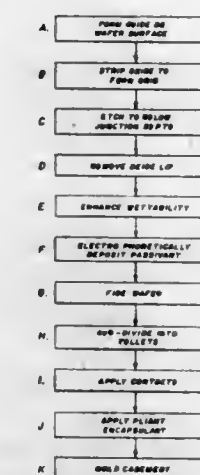
Int. Cl. B01j 17/00

U.S. Cl. 29-580

1 Claim

A semiconductor wafer is selectively protected and etched so that a grid of intersecting grooves is formed on one or both major surfaces. The grooves extend below junction depth. Oxide lip portions overhanging the grooves may be removed and the grooves may be treated to enhance wettability. A passivant is then selectively electrophoretically deposited into the grooves. Where glass is employed as the passivant it is fired after deposition. The wafer may be sub-divided into pellets before or after contacts are applied. A pliant supplemental passivant encapsulates the semiconductor pellet, and a casement is molded thereabout to complete the device. One semicon-

ductive element that may be obtained by the passivation process is characterized by a passivant coating on a beveled



periphery that progressively increases the thickness as it approaches a major surface intersecting the beveled periphery.

3,735,484

# NON-CORROSIVE COATING FOR THIN ALUMINUM METALLIZATION

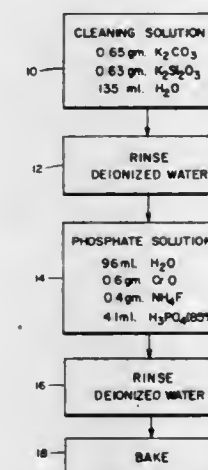
Harold S. Gurev, Paradise Valley, and Ralph W. Kirk, Phoenix, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 17, 1970, Ser. No. 99,012

Int. Cl. B01j 17/00

U.S. Cl. 29-588

4 Claims



To prevent corrosion of aluminum metallization of semiconductor devices, the device, including the aluminum metallization thereof is phosphated with a phosphate solution that includes no sodium. The phosphating may take place before the leads are provided or after. Portions of the phosphated surface may be covered by deposited glass. Then the phosphated semiconductor device or IC may be encapsulated in a plastic material in a known manner.

3,735,485

# METHOD OF PROVIDING THERMALLY CONDUCTIVE GROUND CONNECTIONS FOR INTEGRATED CIRCUITS

Richard W. Wilson, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 25, 1971, Ser. No. 109,451

Int. Cl. B01j 17/00

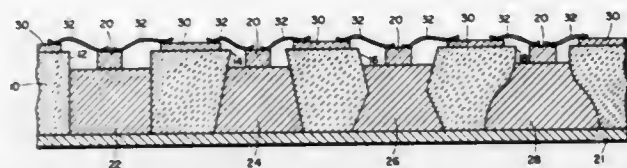
U.S. Cl. 29-591

7 Claims

A method for providing thermally conductive ground connections for semiconductor devices is provided in which a thermally and electrically conductive plug is put into a hole in a substrate before or after conductive material is deposited on the back of the substrate and then the conductive material is



made thick enough to provide a ground plane to retain the plug in place and to make thermal and electrical connections



between the plug and the ground plane. Then the integrated circuit may be bonded to the top of the plug.

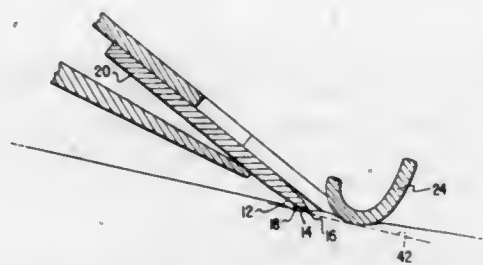
3,735,486

### RAZOR BLADE WITH INTEGRATED SUPPLEMENTAL GUARD

Frederick L. Risher, P. O. Box 1887, Laurel, Miss.  
Filed Apr. 5, 1971, Ser. No. 131,020  
Int. Cl. B26b 21/16, 21/54

U.S. Cl. 30-78

4 Claims



A razor blade including a supplemental guard in the form of an integral bead positioned in closely spaced, parallel relation to the cutting edge for coaction with the conventional razor guard to provide rigid skin bearing surfaces bridging the cutting edge. The purpose of the coacting structure is to provide a two point bearing surface, bridging the cutting edge, to thus decrease the instantaneous angle of attack made by the cutting edge with respect to the skin surface as the same is deformed by passage of the conventional razor guard thereacross.

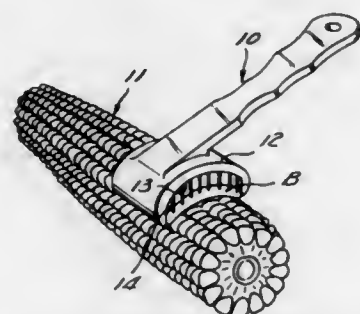
3,735,487

### CORN-ON-THE-COB BUTTERER

Joseph D. Wojcik, 128 Solon Road, Bedford, Ohio  
Filed May 15, 1972, Ser. No. 253,558  
Int. Cl. B26b 11/00

U.S. Cl. 30-124

4 Claims



A device for applying butter to corn-on-the-cob is disclosed. The device includes a base having a pair of spaced, parallel blades projecting therefrom and a multiplicity of relatively stiff, butter-impaling bristles located between the blades. The blades and bristles terminate at an imaginary cylindrical surface with the blades being parallel to a straight line generatrix of the surface so that the blades and bristles conform to the surface of an ear of corn. To apply butter to an ear of corn, the bristles are forced downwardly into a butter pat so that the pat is retained by the device. Preferably the bristles are formed

from a relatively poor heat conducting material so that the butter is melted by contact with the ear of corn and unmelted butter is retained by the bristles so that only a preselected amount of butter is applied to the corn. The blades facilitate removal of a pat of butter from a plate and prevent the butter from running down the cylindrical surfaces of the corn during use.

3,735,488

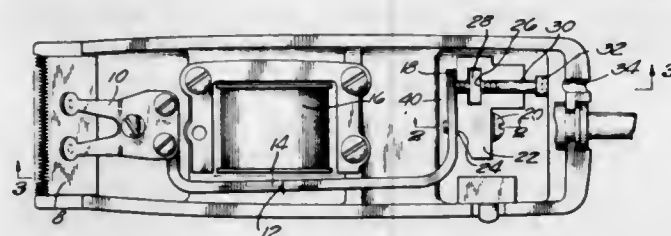
### TENSION ADJUSTMENT FOR VIBRATORY TOOL

Raymond B. Reynolds, Racine, Wis., assignor to Andis Clipper Co., Racine, Wis.

Filed Apr. 26, 1971, Ser. No. 137,457  
Int. Cl. B26b 19/02, 19/38

U.S. Cl. 30-210

6 Claims



For exemplification, the vibratory tool disclosed is a hair clipper with a spring connected with the blade and having an intermediate portion acting as an armature for an alternating current magnet. Near its rear end, the spring curves to extend transversely of the case and abuts an anchorage block. A bolt anchors the spring pivotally yieldably to this block. Accessible from the exterior of the case is a tension adjusting screw having its end in pressure engagement with the free end of the spring to vary the angle of the spring with regard to the block, thereby increasing or decreasing its tension.

In one embodiment, all magnetic portions of the vibratory tool are mounted on a primary unit about which is a case of relatively synthetic resin.

3,735,489

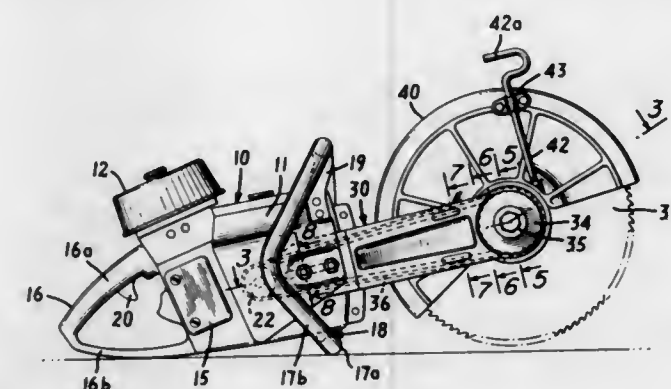
### HAND-HELD POWER TOOL WITH ROTARY TOOL DISC AT END OF REVERSIBLE FORWARDLY PROJECTING ARM

Nicholas Ignatius Zatorsky, Jr., Greenwich, Conn., assignor to Textron, Inc., Providence, R.I.

Filed Feb. 18, 1971, Ser. No. 116,333  
Int. Cl. B27b 9/00

U.S. Cl. 30-390

11 Claims



A hand-held power tool has a circular saw or other disc-shaped tool at the forward end of an arm projecting forwardly from the one side of the engine chassis. The arm is reversible so that the tool disc can be positioned either directly ahead of the engine chassis for normal use or at one side for cutting close to an obstruction. In both positions the tool disc is driven by a belt from a drive pulley on the engine drive shaft.

3,735,490

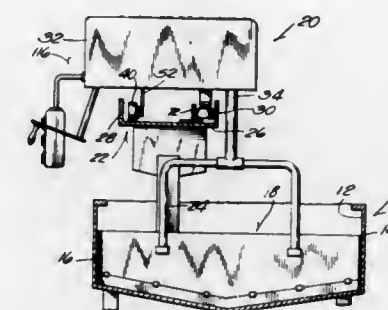
### CARRIAGE AND DRIVE ARRANGEMENT FOR CHEESE VATS AND CURD TABLES

Meredith C. Thomson, Oconomowoc, Wis., assignor to Stoelting Brothers Company, Klei, Wis.

Filed Mar. 2, 1971, Ser. No. 120,259  
Int. Cl. A01j 25/02

U.S. Cl. 31-47

18 Claims U.S. Cl. 32-60



A carriage for driving an agitator or pusher moves on an elongated, vat mounted track and has three wheel engagement with the track. The take-off for the agitator drive or the pusher connection is made over the side of the track and the track is completely closed. The track and carriage are laterally offset relative to the center of the vat and the take-off and pusher connection are located generally on the vat center. A chain extending the length of the track is connected at both ends to the track and passes over a motor driven sprocket located in the carriage to move the carriage along the track. Two guide wheels are located between an angle bracket and one side wall of the track and move between that bracket and wall generally in alignment with the chain. One end of the chain is anchored by means of a spring to maintain a taut chain and is associated with a limit switch arrangement for interrupting the carriage drive in response to an overload on the pusher or agitator.

3,735,491

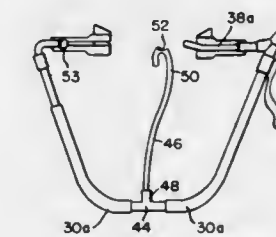
### DENTAL SHIELDING DEVICE

Javier A. Pabalan, Jr., Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed July 21, 1971, Ser. No. 164,774  
Int. Cl. A61c 17/04

U.S. Cl. 32-33

10 Claims



A dental device positionable about the head of the patient for protecting dental personnel during a dental procedure. The device includes a cheek retractor, means for tensing the cheek retractor, and reusable or disposable aspirator tubes carried by the cheek retractor. The aspirating tubes each have an orifice directed into the mouth of the patient with the other end of the tubes being connected to a vacuum source. With this arrangement, odors, aerosols and the like, such as finely divided tooth or filling material which are generated in the mouth during a dental procedure, are carried away by the aspirator tubes and are prevented from being discharged into the air towards the doctor. In another embodiment the tubes themselves function as cheek retractors.

3,735,492

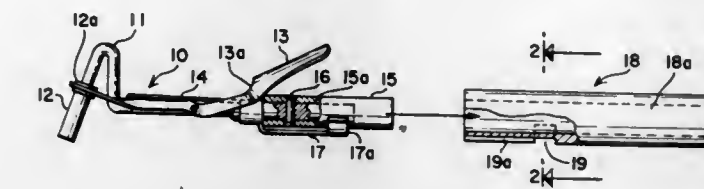
### DENTAL AMALGAM CARRIER

Jesse Karter, 7 Linden Lane, Old Westbury, Long Island, N.Y., and Patrick Cullen, 141-05 Northern Boulevard, Flushing, N.Y.

Filed July 29, 1971, Ser. No. 167,393  
Int. Cl. A61c 5/04

18 Claims U.S. Cl. 32-60

15 Claims



A lever-type dental amalgam carrier in which the amalgam tips of the carrier are unitized operating ends and are rapidly interchangeable. Various embodiments of spring locks, insert locks, thread locks, twist locks, collet locks and swivel locks for mounting the amalgam tips on the handle of the carrier are disclosed.

3,735,493

### HOPPLE MEASURING APPARATUS

Howard A. Hubbard, Sr., R.F.D. 1, Williston, Vt.

Filed Dec. 2, 1971, Ser. No. 204,051  
Int. Cl. G01d 5/00

U.S. Cl. 33-125 R

3 Claims



Hopple measuring apparatus comprising a frame having a pair of supports vertically spaced, the upper support in a fixed position and the lower support vertically moveable between a pair of positions remote from the upper support, a weight connected to the lower support and moveable therewith, the upper portion of said weight extending to a position intermediate the upper and lower supports, and indicia beside the upper portion of the weight, indicating, by the position of the weight, the distance between the upper and lower supports.

3,735,494

### DIP STICK NORMALLY HOUSED IN CURVED FILLER TUBE

Herbert A. Gumtow, Brookfield, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed June 4, 1971, Ser. No. 149,911  
Int. Cl. G01f 23/04

U.S. Cl. 33-126.7 R

2 Claims

A flat, rod-like dip stick, normally housed in a curved filler tube, and bowingly flexible to accommodate tube curvature, has a longitudinal slot therethrough above its indicating portion. A disc is anchored in the slot by abutments engaging the



flat faces of the dip stick. Projecting equally beyond said faces



and normally seated near the bottom of the tube, the disc prevents the tube from wiping the dip stick during withdrawal.

3,735,495

# MOBILE TRACK SURVEY APPARATUS FOR DETERMINING GRADE VARIATIONS

Franz Plasser, Vienna, and Franz Eglseder, Ohlsdorf, both of Austria, assignors to Franz Plasser Bahnbaumaschinen Industriegesellschaft m.b.H., Vienna, Austria

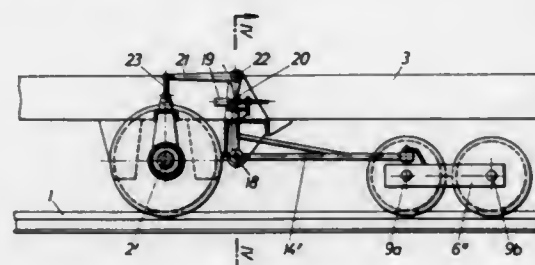
Filed June 23, 1971, Ser. No. 155,862

Claims priority, application Austria, July 2, 1970, 5960

Int. Cl. G01b 5/20

U.S. Cl. 33-144

10 Claims



A mobile chassis runs on a load-carrying running gear and carries a track sensing element which is mounted on the chassis for free vertical movement in respect thereto to sense the vertical position of the track it engages. A pair of bell crank levers are pivotally mounted on the chassis, with one arm of the levers connected respectively to the running gear and the sensing element while the other arm of the levers is connected to an electric measuring signal generator and transmitter which generates an electric measuring signal proportional to any pivotal movement of the bell crank levers.

3,735,496

# LOCK DECODER AND DECODING METHOD

David G. Lee, 2136 N. Orange Street, Stockton, Calif.

Filed July 6, 1971, Ser. No. 159,827

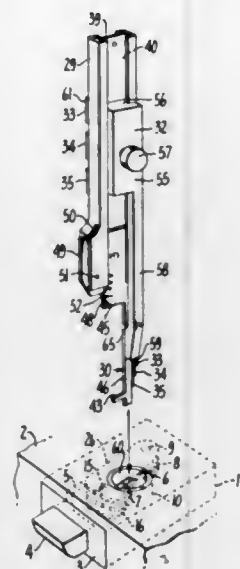
Int. Cl. B21k 13/00; B23c 1/16

U.S. Cl. 33-174 F

6 Claims

A decoder and method for decoding certain lever tumbler locks. The locks include a case having an inner surface, a bolt with a fence, a cylinder with a keyway, and a column of lever tumblers, each having a gate. It is essential that the spacings between said inner surface and the near edge thereto of each tumbler, when the tumbler gates are aligned with the fence, be known and identical. It is also essential that the possible depth settings of the tumblers be known. The method involves determining by trial and error the key bit heights which will pivot said near edge of each tumbler flush against said inner surface

and calculating the actual depth setting of each tumbler by subtracting said spacing between said inner surface and said near tumbler edge from said determined key bit heights. The decoder includes a pair of interchangeable gage keys each of which has a bit with a height equal to the sum of one of the possible depth settings and said spacing between the inner sur-



face and said near tumbler edge, means for adjusting the depth of said bit in the keyway to the plane of each tumbler and a trio of shims which are inserted into the keyway behind the bit to increase the bit height to heights equal to the sum of another one of the possible depth settings and said spacing between said inner surface and said near tumbler edge.

3,735,497

# FLOORING SPACERS

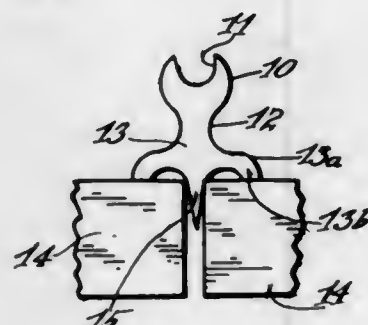
William A. Boettcher, 4507 North Clarke Street, Chicago, Ill.

Filed May 6, 1971, Ser. No. 140,833

Int. Cl. G01b 5/14

U.S. Cl. 33-180 R

3 Claims



A piece usable to maintain a slight space between groups of laid floor boards until the floor has been fully laid. The piece has a head adapted to be grasped between the fingers, a pendant tongue insertible into the space, and a wide base with feet seating the piece squarely on the floor boards adjoining the space.

3,735,498

# METHOD OF AND APPARATUS FOR FLUIDIZING SOLID PARTICLES

Yuichi Suzukawa, Hisashi Kono, Shigeyuki Nakai, Kohel Niinomiya, and Atsushi Kuribayashi, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi-ken, Japan

Filed Apr. 15, 1971, Ser. No. 134,276

Claims priority, application Japan, Apr. 21, 1970, 45/33460

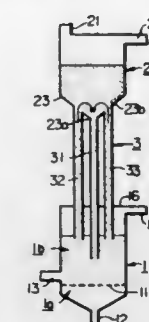
Int. Cl. F26b 17/10

U.S. Cl. 34-10

20 Claims

This invention relates to a method of and apparatus for fluidizing solid particles in such a manner that a large amount

of the particles in circulated continuously within the subsequent fluidized bed. Such circulation phenomenon of the fluidized particles is provided in a new fluidized bed vessel having a lower chamber provided with a perforated plate for forming the fluidized bed, an upper chamber and an inter-



mediate portion consisting of a plurality of conduits fluidly connected to both chambers. This technique may be employed effectively for catalytic reaction or sintering processes, mixing processes or drying processes of granulated particles, grain or the like, particularly for the processes requiring the transfer of a great amount of heat.

## ERRATUM

For Class 34-227 see:  
Patent No. 3,735,965

3,735,499

# OPERATOR RESPONSE ANALYSIS MEANS AND METHOD

Joan Rosengren Forsdale, 38 Fourth Avenue, Nyack, N.Y.

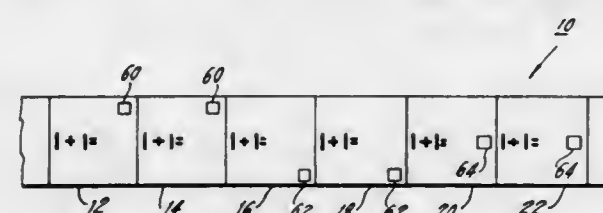
Continuation-in-part of Ser. No. 737,094, June 14, 1968,

abandoned. This application Dec. 24, 1970, Ser. No. 101,335

Int. Cl. G09b 3/02

U.S. Cl. 35-8 R

17 Claims



To determine how much information an operator receives before he responds to a stimulus, information is presented in a predetermined sequence. The information is programmed on an image source holding means, e.g. motion picture film. On each image is a response location, which is different for each image. The place where the operator responds shows how much information he received. The shifting response location also serves as a timing means for clocking the operator's response if the images are changed after predetermined intervals.

3,735,500

# EDUCATIONAL DEVICE

Teruo Matsumoto, Tokyo, Japan, assignor to Epoch Company Ltd., Tokyo, Japan

Filed Dec. 15, 1970, Ser. No. 98,382

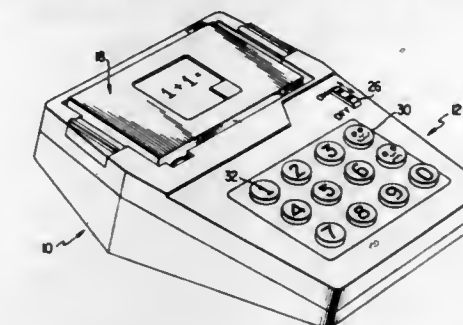
Int. Cl. G09b 7/06

U.S. Cl. 35-9 A

17 Claims

A toy for teaching young children basic educational and social concepts, e.g., arithmetic, time-telling, etc. The subject matter is visually presented as indicia on a movable tape positioned in a cassette. The cassette is adapted to be snapped into

a housing and interacts with the battery circuit provided therein. The tape is also coded to program the circuit, acting in conjunction with a keyboard. The tape is advanced only



when the correct keyboard button is depressed indicating to the user that the problem has been solved. Different cassettes are provided for each subject matter.

3,735,501

# EDUCATIONAL TOY

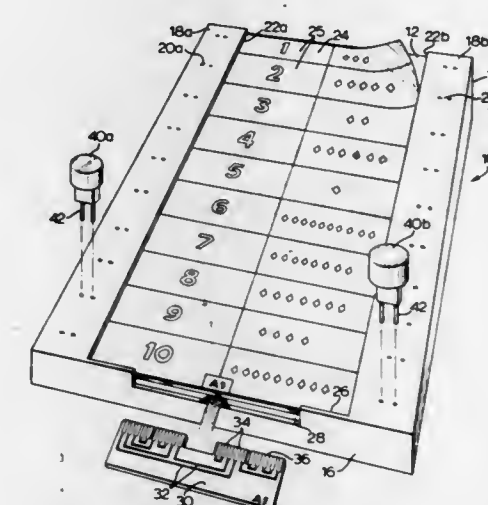
Edmund Ma, 20 Graydon Hall Drive, Apt. 209, Don Mills, Ontario, Canada

Filed Oct. 12, 1971, Ser. No. 188,134

Int. Cl. G09b 7/10

U.S. Cl. 35-9 C

5 Claims



A toy having a housing provided with at least two sets of double-pole electrical terminals on an exterior face. Two signalling lamps are provided and each may be electrically connected to any double-pole electrical terminal. A card imprinted with a different numeral or other indicium is removably mounted to the panel and when so mounted, each different indicium is positioned beside a different double-pole terminal. In one embodiment of the toy, a printed circuit board electrically inter-connects each double-pole terminal in one set with a different terminal in the other set. The lamps are illuminated when they are connected to double-pole terminals electrically inter-connected via the circuit board. In a second embodiment of the toy, the card is provided with teeth along one edge. When the card is mounted to the housing, the teeth serve to open some but not all of a number of switches each of which, in its normally closed position, interconnects pairs of double-pole terminals. The lamps are illuminated when they are connected to terminals electrically inter-connected via switches not opened by the teeth. In both embodiments, the card is matched with the circuit board or the teeth such that the indicia beside electrically inter-connected terminals bear some relationship to one another.



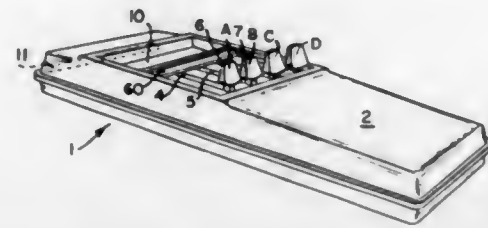
3,735,502

**HAND HELD TEACHING MACHINE**

David A. Horine, Santa Clara County, Richard B. Ball, Palo Alto, both of Calif., assignors to Enrich, Palo Alto, Calif.  
Filed Dec. 21, 1970, Ser. No. 100,312  
Int. Cl. G09b 3/06

U.S. Cl. 35-9 A

9 Claims



A hand held manually operable teaching machine is disclosed herein comprising a replaceable cartridge containing a web, typically an endless or Z-folded web and a plurality of manually operated slideable web-advancing means. The web is used for displaying frames of material to which a response is intended. Each frame of material on the web is provided with a web advancing hole at a predetermined location on a line transverse to the web in association with an appropriate one of several possible responses displayed with the material. The advancement of a pre-determined one of the web-advancing means will engage the hole associated with a correct response and advance the web for presenting another frame of material, thus indicating a correct response had been made by the operator.

3,735,503

**PROGRAMMED INSTRUCTIONAL SYSTEM**

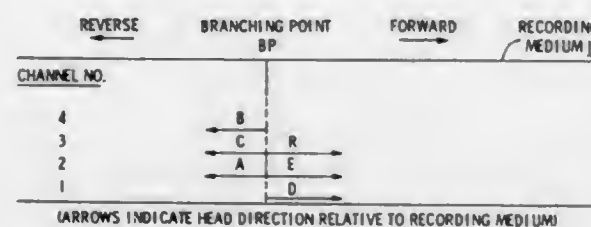
Bruce R. Dow, Altamonte Springs, Fla., and Francis T. Thompson, Murrysville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 30, 1971, Ser. No. 167,581

Int. Cl. G09b 7/04

U.S. Cl. 35-9 A

7 Claims



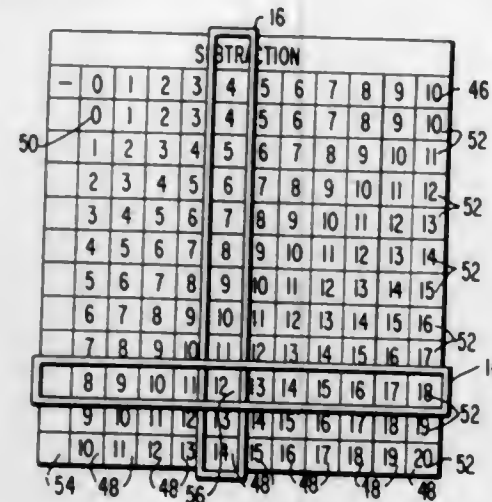
In an instructional system including a multi-channel recording/reproducing medium having stored thereon recorded material in the form of instructions, lectures, questions, remedial material, reinforcing material, channel transfer codes, etc. and including listener operated response switches for entering responses following reproduction of a lecture and question.

The listener response occurs at a branching point in the multichannel recording medium. The entering of a response by actuating listener selected switches results in the reproduction of material on a specific channel and in a predetermined direction. Each of the numerous possible listener responses results in the reproduction of material tailored specifically for that one response. The presence of recorded code signals following the segments of material reproduced following a listener's response serves as a transfer signal to assure reproduction of all the material on the various channels and in the proper direction necessary to complete the material appropriate to the response. The completion of the reproduction of this material reestablishes the system at the branching point.

3,735,504  
**ARITHMETIC TEACHING AID**  
Charles Fedyna, 32 Killeher Avenue, Youngstown, Ohio  
Filed June 29, 1971, Ser. No. 157,986  
Int. Cl. G09b 19/02

U.S. Cl. 35-31 C

2 Claims



An arithmetic teaching aid. A problem board has on its first side a plurality of rows and columns, the intersections of which define locations, and arithmetic designations within those locations and on its second side a like plurality of rows and columns, the intersections of which likewise define locations, and additional arithmetic designations within those locations. Indicating means permit the indication of selected ones of the first side arithmetic designations to present a problem to a student while simultaneously indicating to a tutor the problem and the answer to that problem on the problem board second side.

3,735,505

**RESPONSE CARD AND QUALITATIVE RESPONSE ANALYZER AND METHOD**

Charles R. Stein, Schenectady, N.Y., assignor to Instructional Industries, Inc., Ballston Lake, N.Y.

Filed May 3, 1971, Ser. No. 139,673

Int. Cl. G09b 7/00

U.S. Cl. 35-48

14 Claims

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00000 1234567890123456789012345
00001 1234512345123451234512345
11111 0000000000000000234500000
12000 0000000000000000000000000
12309 5432100000000000300000000
21212 5433200000000000000000000
23451 2340000000000000230000000
32111 2340000000000000220000000
34212 2350000000000000020000000
34567 4321500001000000200000000
44444 0000000000000000000000000
54321 3451223451000000000000004

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A response processing system and method are disclosed wherein responses to prepared questions are made by marking appropriate areas on a card. The card is then fed to a reader/processor where a unique character substitution is made. The reader/processor prints out, via a conventional teletypewriter, the nature of the response of each person answering the questions. The substitution of a unique character enables one viewing the print-out to obtain a "feel" for the nature of the responses to each question by each person without using a computer to evaluate the results. In addition, each card bears an identification number, marked by the respondent, utilizing a bi-quinary code. The identification number in this form enables the response information to be fed to a computer for quantitative analysis.

3,735,506

**TEACHING AND TESTING DEVICE**

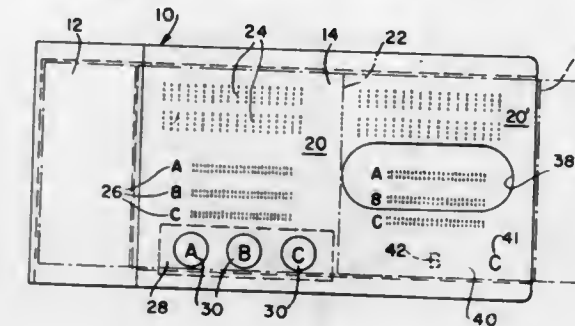
Helmut Kunert, Belvederestrasse 155, 5 Koln-Mungersdorf 41, Germany

Filed Apr. 16, 1971, Ser. No. 134,749

Int. Cl. G09b 3/08

U.S. Cl. 35-9 F

2 Claims



A teaching and testing device wherein the taught material is printed on an elongated strip of material, such as paper which is wound into a cassette. The printed matter is made available in stepwise increments from the cassette through a display sleeve from whence the knowledge is imparted. The sleeve has areas for marking answers to posed questions said areas may be marked with a perforation instrument affixed integrally to said sleeve.

3,735,507

**ATHLETIC SHOE SPIKE ANCHOR PLATE**

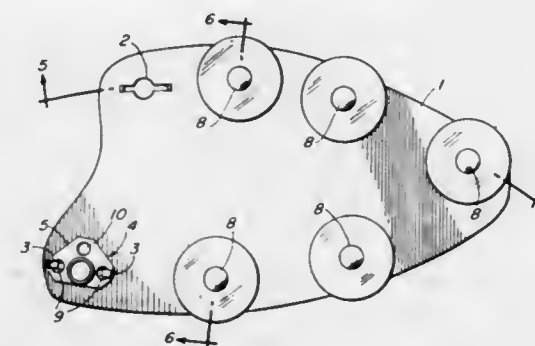
Edward H. Granger, South Yarmouth, Mass., assignor to F. C. Phillips Incorporated, Stoughton, Mass.

Filed June 2, 1972, Ser. No. 259,233

Int. Cl. A43b 23/28

U.S. Cl. 36-59 R

4 Claims



A spike anchor plate made of a flat thin sheet of metal bored with a plurality of holes corresponding substantially in number and position with spike receptacles to be mounted on said sheet. A pair of tabs is cut from said sheet at the sides of each of said holes and bent downwardly to extend solely from the lower face of said sheet. Spike receptacles to be mounted in the sheet are provided with a base plate having a pair of holes each slightly wider than the width of said tabs. These receptacles are mounted on the bottom of the sheet by having the tab project through such holes and being bent over the lower face of such base plate to retain the receptacle on such sheet with a substantial degree of freedom of motion with respect to the sheet. This freedom of motion permits the receptacles to move into accurate seating engagement with corresponding portions of a sole plate mold substantially independently of the accuracy of their positions on the sheet. Once in place on the mold, a shoe bottom of a moldable elastomer is molded around the spike anchor assembly. Spikes may be inserted into the receptacle either before or after molding.

3,735,508

**SKI BOOT HAVING A STIFFENING SLEEVE**

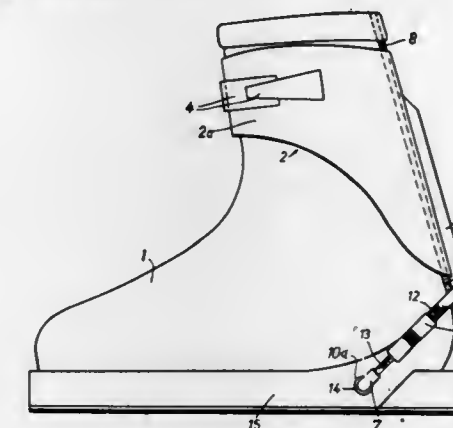
Ernst Gertsch, and Ulrich Gertsch, both of Bern, Switzerland, assignors to Gertsch AG, Interlaken, Switzerland  
Filed Sept. 28, 1971, Ser. No. 184,364

Claims priority, application Switzerland, Sept. 29, 1970, 14373/70

U.S. Cl. 36-2.5 AL

Int. Cl. A43b

11 Claims



A stiffening sleeve for ski boots surrounds the top portion of the upper of the ski boot and is composed of two like sleeve portions, parts which are attached at the rear of the boot to an elongate holding part formed as a rib or rod extending upwardly along the upper from the heel portion of the boot. A device for adjusting the position of the stiffening sleeve on the upper of the boot connects the lower end of said holding part at the rear of the boot with both sides of the sole of the boot to permit an adjustment of the stiffening sleeve on the boot in lateral direction or in up and down direction to adapt the stiffening sleeve to various sizes of boots. The connection of the adjusting device with the sole of the boot is detachable so as to allow easy removal of the sleeve from the boot when the sleeve is not desired.

**ERRATUM**

For Class 36-44 see:  
Patent No. 3,735,511

3,735,509

**ELEVATOR SUPPORT ADJUSTMENT FOR ELEVATING SCRAPER**

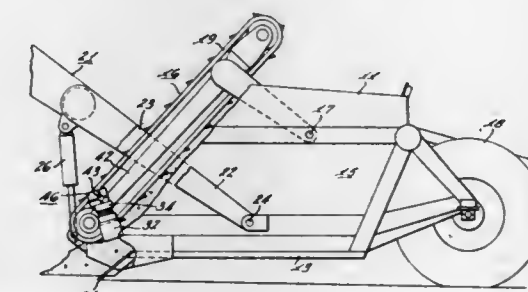
James Condra, Springfield, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Feb. 18, 1972, Ser. No. 227,432

Int. Cl. E02f 1/36; F16h 53/00

U.S. Cl. 37-8

2 Claims



The vertically swingable endless belt elevating mechanism disposed in the open front end of a scraper bowl has its lower end held at a selected height above the cutting edge by adjustable support members which may be rotated to effect different elevations for the lower end of the elevating mechanism.



3,735,510

## DEVICE FOR REMOVING SNOW

Leonard Robert Godfrey, and John Daniel Cook, both of Chepstow, South Wales, assignors to Dendix Brushes Limited, South Wales

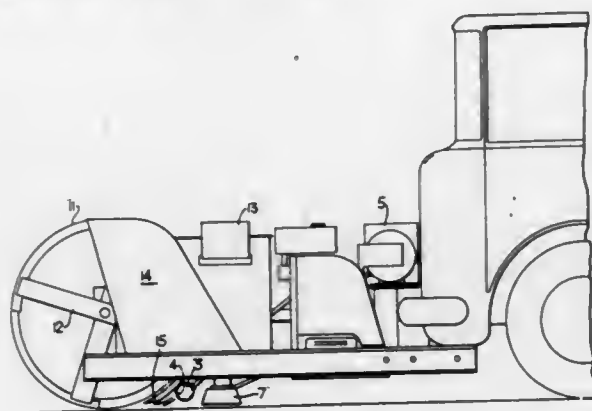
Filed Dec. 8, 1971, Ser. No. 205,974

Claims priority, application Great Britain, Dec. 10, 1970, 58,806/70

Int. Cl. E01h 5/00; B60v 1/00

U.S. Cl. 37-43 R

13 Claims



A device for removing snow comprises a chamber having a forward-facing horizontal slit in it from which air, supplied by a compressor, leaves, preferably with a velocity of at least 50 miles per hour, and lifts, by up to a few inches, snow on the surface to be cleared. Rotary displacing means, for example an auger or rotary brush, on the device displaces the lifted snow away from the path of movement of the device. The slit extends along substantially the whole length of the rotary displacing means, substantially parallel to the axis of rotation, and air from the slit passes, substantially perpendicular to said axis, under said rotary displacing means to lift the snow in front of the latter.

3,735,511

## FOOTWEAR

John H. Gilbert, Chepstow, and Donald Weight, Chalfont, St. Giles, Buckinghamshire, both of England, assignors to Monsanto Chemicals Limited, London, England

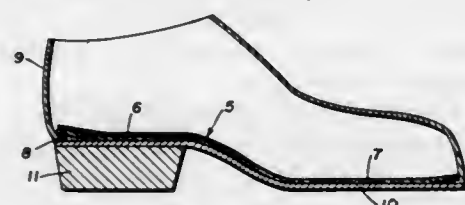
Filed Oct. 15, 1971, Ser. No. 189,558

Claims priority, application Great Britain, Oct. 23, 1970, 50504/70

Int. Cl. A43b 13/38

U.S. Cl. 36-44

16 Claims



This invention relates to footwear and particularly to an article of outer footwear, such as a boot or shoe, which comprises an insole assembly of novel construction. The invention also relates to the insole assembly itself. Said novel insole assembly comprises an extruded thermoplastic foamed sheet having bonded thereto a textile fabric which forms the lower surface of the insole assembly so as to improve the strength of the adhesive bond to the outer edge of the upper and the sole proper.

3,735,512

## SHEET FEEDER AND SPREADER MEANS

Abe D. Ross, 1400 West Tahiti Way, Marina Del Ray, Calif.

Filed June 18, 1971, Ser. No. 154,395

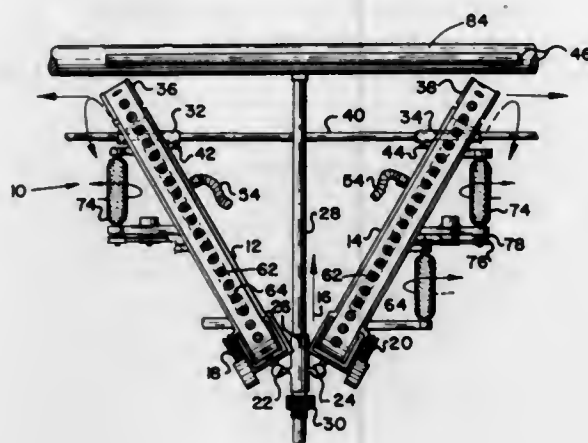
Int. Cl. D06f 67/04

U.S. Cl. 38-143

10 Claims

Flatwork handling apparatus for carrying laundered flatwork to ironing rollers comprises a pair of obliquely arranged

feeder and spreader members including a vacuum chamber which is utilized to apply a vacuum or suction force to the flatwork. As the flatwork is fed toward the ironing rollers, the



oblique relationship of the feeder and spreader members causes a transverse spreading action to be applied to eliminate creases and wrinkles in the laundered sheets, tablecloths, etc.

3,735,513

## DYNAMIC ADVERTISING DISPLAY SYSTEM

Paul C. Constant, Jr., Kansas City, Mo.; Walter Hodge, Shawnee Mission, Kans.; Frank Barker, Kansas City, Kans., and Edward S. Keller, Shawnee Mission, Kans., assignors to Don Feddersen Productions, Inc., Studio City, Calif.

Filed Feb. 25, 1971, Ser. No. 118,662

Int. Cl. G09f 11/28

U.S. Cl. 40-32

19 Claims



A display system for dynamically exhibiting a plurality of advertising signs, comprising a pair of supply magazines interconnected by a pair of tracks along which the signs are moved for display in a sequential manner. Each of the magazines supports a supply of stacked signs and has a sign discharge station wherein the signs are coupled with a drive cable one at a time and moved along one of the tracks, and also has a sign receiving station which receives the signs from the other track after display and uncouples the signs from the drive cable. A push frame assembly of the magazine automatically shifts each sign from the receiving station into the supply stack after the sign enters the magazine from one of the tracks and simultaneously positions a new sign from the supply stack in the discharge station for movement along the other track.

3,735,514

## BIRD FRIGHTENING DEVICE

John K. Asder, 310 W. Foothill Boulevard, Arcadia, Calif.

Filed Apr. 21, 1971, Ser. No. 135,961

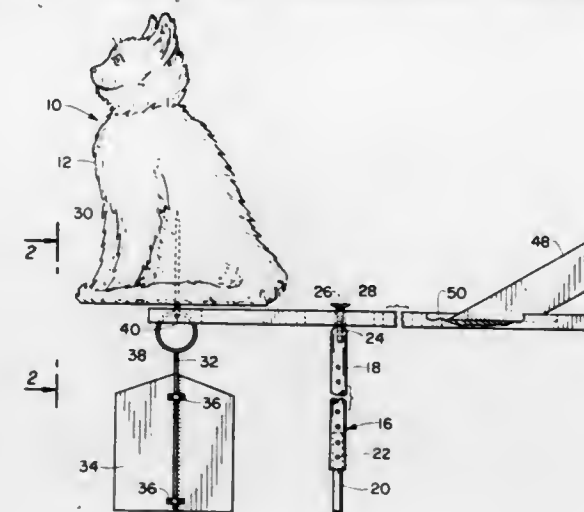
Int. Cl. G09f 11/02

U.S. Cl. 40-39

7 Claims

A bird frightening device including a likeness of a cat connected to a platform, the platform being horizontally balanced upon a stanchion, the platform being pivotable in a horizontal plane with respect to the stanchion, the cat likeness being connected to the platform by a pin and loop arrangement to permit low frictional three dimensional movement of the likeness

with respect to the platform, the movement of both the likeness and the platform being effected by wind currents contact- attachment members has hinge elements attached thereto to permit binding of each page to album covers. Each album



ing a vane, the vane being connected to both the likeness and the platform.

3,735,515

INDICATION CLIP FOR FILING CARDS OR THE LIKE  
Harry Lagert, Kalbakken, Oslo, Norway, assignor to Thorlag Mek Verksted, Oslo, Norway

Filed Apr. 22, 1971, Ser. No. 136,311

Claims priority, application Norway, Apr. 23, 1970, 1554/70

Int. Cl. B42f 21/06

U.S. Cl. 40-23 A

5 Claims



The present invention relates to indication clips comprising two separate sheet members which are held together at engaging portions in such a manner that a holding means is formed between them for an indication sheet as well as a slit for the insertion of an edge portion of a filing card or the like, the sheet members on both sides of the slit being urged by their inherent elastic force towards said edge portions so as to hold it.

3,735,516

## POCKETED ALBUM PAGE

Roger A. Wenstrom, St. Cloud, Minn., assignor to The Holes-Webway Company, St. Cloud, Minn.

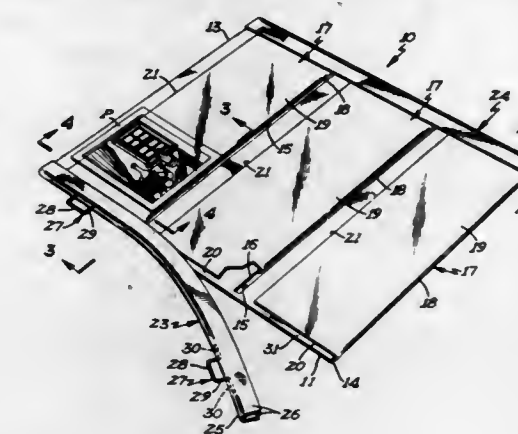
Filed Apr. 6, 1972, Ser. No. 241,514

Int. Cl. G09f 7/00

U.S. Cl. 40-104.18

3 Claims

A pocketed album page and process of making the same comprises the steps of the die-cutting a sheet of album page material to form slots in the sheet. The sheet is cut into page size blanks and folded transparent pocket forming member is applied through each slot in the page blank, and against the lower transverse edge of the blank. Attachment strips are secured to opposite longitudinal edges of each blank and to the edge portions of the pocket forming members. One of the



page has upwardly opening transparent pockets one each side of accommodating photographs and the like therein.

3,735,517

## FALLING BRECH BLOCK ACTION FOR A SINGLE SHOT FIREARM

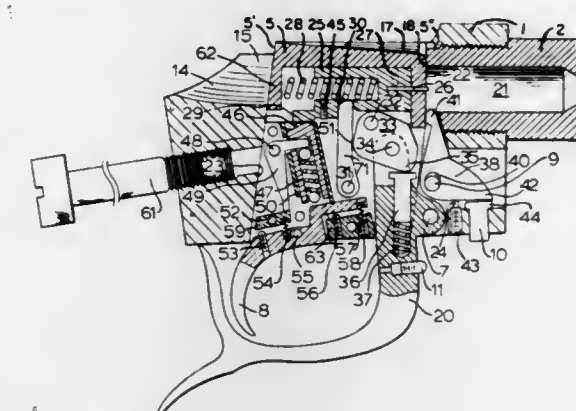
Frank De Haas, Orange City, Iowa, and Dean E. Miller, St. Onge, S. Dak.

Filed June 14, 1971, Ser. No. 152,535

Int. Cl. F41c 11/04

U.S. Cl. 42-23

8 Claims



A hammerless falling breech block action for a breech loading single shot firearm which has a breech block within a recess in the receiver and which is raised and lowered by a finger lever pivoted under the receiver.

## ERRATUM

For Class 42-70 see:  
Patent No. 3,735,519

3,735,518

## FISHING LURE HAVING DETACHABLY POSITIONED HOOKS

Richard A. Kleine, 6017 Trenton Lane, Peoria, Ill., and Stanley I. Meier, 821 Magdeline Drive, Madison, Wis.

Continuation-in-part of Ser. No. 829,355, June 2, 1969, abandoned. This application Mar. 19, 1971, Ser. No. 126,063

Int. Cl. A01k 85/02

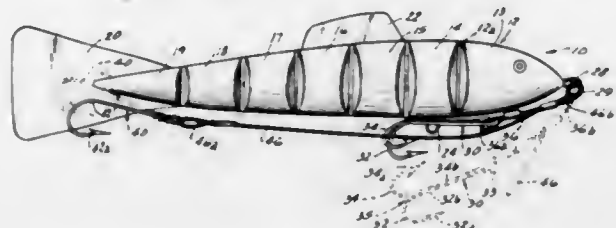
U.S. Cl. 43-42.04

31 Claims

A fishing lure having a series of jointed segments formed about a thin flexible gauze material and having the gauze material extend outwardly of the individual segments to form fin and tail portions for the lure. The lure has a flexible wire extending axially thereof and against the flexible gauze material. The wire has a series of loop portions formed at intervals along the length thereof and extending outwardly of the body



segments to form loop protrusions where hooks can be fastened to complete the lure. Variance in the motion of a fishing lure moving through the water as well as efficiencies of construction are effected by providing hook means attached to a lead ring at the head of the lure and detachably positioned along the body of the lure so that the hook means will remain in proximity to the life-like lure body to regulate the motion of the lure while it is being pulled through the water to attract the fish and may be disengaged from their position along the



length of the body by the striking or fighting fish with the further results that the leverage given by the lure body to the striking fish in assisting it in rejecting the hook is eliminated while at the same time the fight of the striking fish against the hook may be removed from the area of the lure body. A slot means in a double hook allows detachably connecting the hook means in various positions on the lure so that movement characteristics of the fishing lure as it is pulled through the water may be varied.

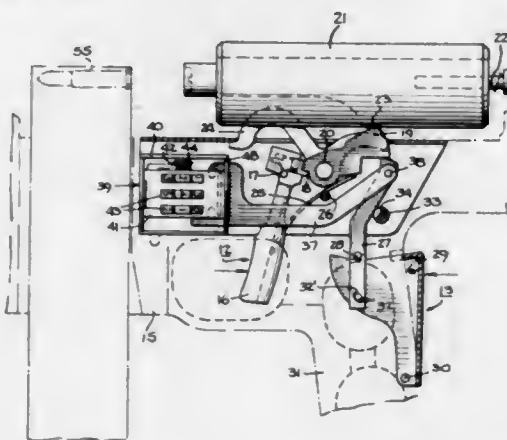
3,735,519

## LOCK MEANS FOR A FIREARM

Gerard J. Fox, 21 Shore Drive, Meriden, Conn.  
Filed Mar. 26, 1971, Ser. No. 128,356  
Int. Cl. F41c 17/08

U.S. Cl. 42-70 D

14 Claims



The lock slide is hinged to the safety bar and the combination lock is used to lock the lock slide against movement so as to prevent movement of the safety bar. This prevents the sear from pivoting away from the bolt. Upon release of the lock slide, the safety bar is free to be moved upon actuation of the grip safety if the thumb safety is off.

3,735,520

## LURE DISLODGING AND RETRIEVING DEVICE

Harry M. Jarrett, 20 Roberts St., Bradford, Pa.  
Filed Mar. 9, 1971, Ser. No. 122,363  
Int. Cl. A01k 97/00

U.S. Cl. 43-17.2

7 Claims

A lure dislodging and retrieving device comprising a cylindrical weighted body having a downwardly tapering conical bore opening through top and bottom ends and a line inserting slot permitting the body to be fitted over the fishing line. The respective top and bottom end portions are provided with encircling grooves for reception and retention of top and bottom assembling and keying lips carried by yieldable flanges on the

end caps. These caps are turnable and also provided with slots which can be registered with the line slot. A line wedging and releasing ball is normally lodged in the lower tapered end of



the bore. Selectively usable facilities are provided on the body and top end cap for attaching the lower end of a retrieving line.

3,735,521

## DEVICE FOR DISENGAGING AND RECOVERING FISHING GEAR

Constantin A. Krylov, Bld. 701, Apt. H, Garmisch-Breitenau, Germany

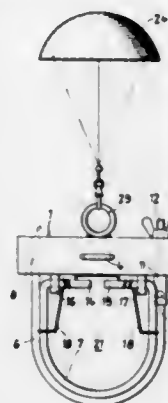
Filed Feb. 17, 1972, Ser. No. 227,526

Claims priority, application Germany, Nov. 20, 1971, P 21 57 717.3

U.S. Cl. 43-17.2

Int. Cl. A01k 97/00

6 Claims



A device for disengaging and recovering fishing gear entangled or hooked below the water surface comprising a frame, a recovery line, and a first ring member on said frame for fastening said recovery line. First and second jaw means of U-shaped form are at substantially right angles to said first ring member, said first jaw means being fastened to said frame, said second jaw means being hingeably connected to said frame so as to open opposite said first jaw means when actuated. A tiltable member is connected with said first jaw means and rotatable in the plane of said first jaw means for inserting the fishing line. After releasing the recovery line, the device slides forward and rotates and simultaneously part of the fishing gear moves between the two jaw means.

3,735,522

## FISHING LURE

Richard R. Thomas, 407 Ninth Avenue, Menlo Park, Calif.

Filed Aug. 24, 1970, Ser. No. 66,452

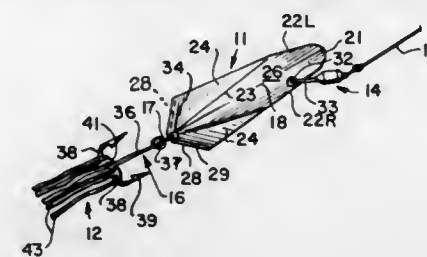
Int. Cl. A01k 85/00

U.S. Cl. 43-42.28

9 Claims

An attachment for a gang hook has a resilient ring with a plurality of integral, depending, thin, flexible legs. The ring is

stretched to slip over the hooks and loosely encircle the shank of the hook. The legs extend beyond the barbs and function to insure that the hook trails from the lure body during casting and retrieval. A fish lure body is formed from a metal sheet blank having outward-rearward diverging side edges. The rear



corners are oppositely bent at about 90° to provide propeller blades. The hook-connecting ring is attached between the rear corners. The swivel for the leader is attached along one side edge at a point rearward of the front end and is thus eccentric to the longitudinal central axis. An erratic spinning action results during retrieval.

3,735,523

## FISHING SINKERS

Richard L. Merrill, King City, Calif., assignor to The Lee, Raymond Organization, Inc., New York, N.Y.

Filed Jan. 25, 1971, Ser. No. 109,302

Int. Cl. A01k 91/00

U.S. Cl. 43-44.96

4 Claims



An elongated hollow tube has one flared end and an opposite conically shaped end. A rod extends axially through the tube with one end extending beyond the conically shaped tube end and having an eye. A lead weight is disposed within the tube adjacent the conical end. Tines extend through the flared end and guide grooves to a steel ring in the tube and slidable along the rod. A coil spring is disposed in the tube concentrically about the rod between disc and weight.

3,735,524

## WING ASSEMBLY FOR TOY AIRPLANES

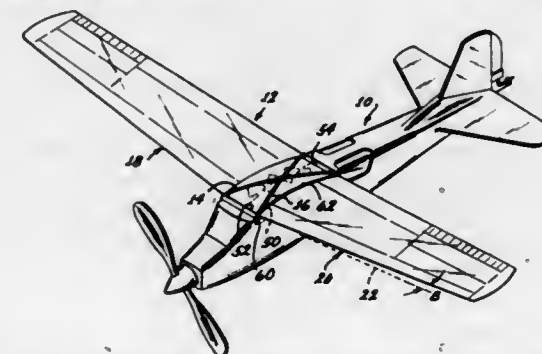
William A. Staats, Torrance, and Denis V. Bosley, Palos Verdes Peninsula, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed July 19, 1972, Ser. No. 273,081

Int. Cl. A63h 27/00

U.S. Cl. 46-76

11 Claims



A wing assembly for a toy airplane including a pair of wing halves with interfitting inner ends that lie on the airplane

fuselage, the inner end of each wing half including at least one projection with an enlarged head and at least one undercut recess so that the wing halves form an interlocking joint with each other.

3,735,525

## MOTOR-ACTUATED TOYS

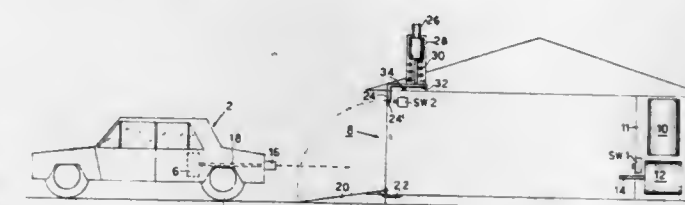
Marvin J. Freed, 8 Levitan Street, Tel Aviv, Israel

Filed Dec. 6, 1971, Ser. No. 205,187

Int. Cl. A63h 11/00, 33/26

U.S. Cl. 46-202

10 Claims



Motor-actuated toys comprise a first member simulating a movable object having a moving part and containing motive means for driving the moving part, and energy storage means for storing energy for the motive means; and a second member simulating a fixed object normally associated with the movable object and including recharging means for recharging the energy stored in the storage means when the simulated movable object member is placed at a predetermined location with respect to the simulated fixed object member. In one described embodiment, the first member simulates a wheeled vehicle actuated by a spring motor, and the second member simulates a garage containing an electric motor adapted to rewind the spring motor when the simulated vehicle member is placed within the garage. In a second described embodiment, the first member is also a wheeled vehicle, but the second member is a simulated gasoline station; and in a third described embodiment, the first member simulates an animal, and the second member simulates a cage for the animal.

3,735,526

## SPRING WIND-UP MECHANISM

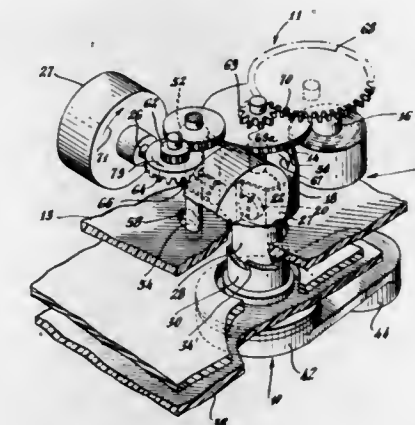
Burt Ensmann, Flushing, and Edwin Nielsen, Oceanside, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Mar. 22, 1971, Ser. No. 126,817

Int. Cl. A63h 11/10

U.S. Cl. 46-202

16 Claims



A mechanism is described for winding spring-driven toys. A clutch arrangement is employed wherein a driven clutch member of the toy spring drive is positively engaged by a driving clutch member of the wind-up mechanism. The clutch members are provided with teeth which engage in a positive and vertically retaining manner. The clutch arrangement provides a quickly engageable and releasable spring wind-up connection which is particularly useful as a fast "pit stop" with top vehicle racing games and with toy vehicle launchers. A



vehicle launcher utilizing the wind-up clutch is described, wherein a pivotally mounted platform is inclined to convert it from a spring wind-up support surface to a toy vehicle launch ramp.

3,735,527

## VARIABLE SPEED TOY TRANSMISSION

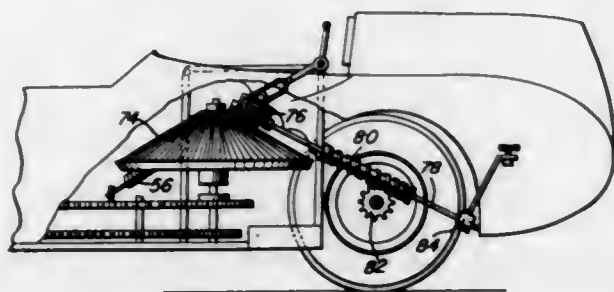
Joseph Lombardo, 1103 1st Avenue, New York, N.Y.

Filed Feb. 3, 1972, Ser. No. 223,263

Int. Cl. A63h 17/00

U.S. Cl. 46-206

7 Claims



A variable speed transmission for toy vehicles comprising a motor driven drive shaft mounting drive gear means of progressively changing diameter, the drive gear means selectively engaged at points of different diameter by a driven gear which drives a propulsion means through an elongated shaft. The driven gear is shifted relative to the drive gear means by a manually controlled lever spring biased to releasably retain an engagement of the drive and driven gears. The lever includes a selector bar which cooperates with positioning plates to set selected relationships between the drive and driven gears.

3,735,528

## LADDER FOR TOY FIRE ENGINE

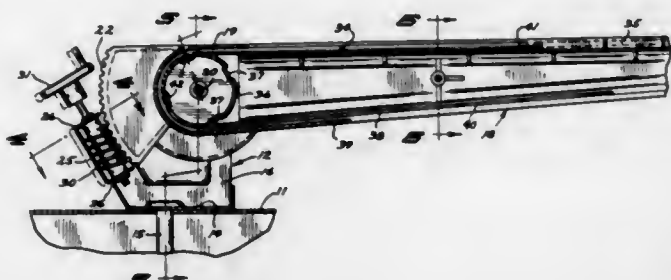
Theodore H. Zbikowski, Plymouth; Ronald R. Pauly, Mound, and Lee J. Pfeilsticker, Long Lake, all of Minn., assignors to Tonka Corporation, Minneapolis, Minn.

Filed Feb. 14, 1972, Ser. No. 226,095

Int. Cl. A63h 17/08

U.S. Cl. 46-215

3 Claims



An extension ladder for a toy fire engine having one end pivoted to the body of the engine for raising and lowering of the ladder about a horizontal axis, a crank and gear means acting between the body and ladder for effecting said movement, said crank and gear means including a spring means yieldably retaining gears in meshing engagement and allowing said gears to disengage when the ladder is forcibly moved about said axis to prevent breakage of the crank and gear means.

The base section of the extension ladder is formed of flexible material and is disposed in a track and trained over a reel to be wound outwardly or inwardly to respectively extend or retract the ladder.

3,735,529

## NOISE PRODUCING DEVICE

Georg Roelen, Nurnberg, Germany, assignor to Schuco-Spielwarenwerke Schreyer &amp; Co., Nurnberg, Germany

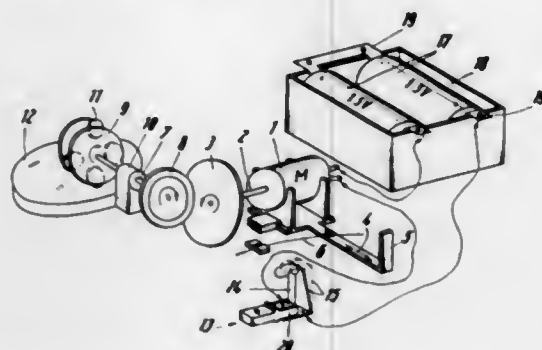
Filed Dec. 22, 1971, Ser. No. 211,009

Claims priority, application Germany, Dec. 24, 1970, P 20 63 882.8

Int. Cl. A63h 33/26

U.S. Cl. 46-232

11 Claims



Means for imitating the noises of an automobile engine for use in toy vehicles which include a simulated accelerator pedal as an adjusting means, an electric motor, a noise producing device driven by the motor under control of the pedal which is adjustable to change the frequency and the sound volume of the noise produced by the device.

3,735,530

## DEVICE FOR OPENING A SKYLIGHT

Pierre Emmanuel Bogaert, Wemmel, Belgium, assignor to Vic Chemicals, Inc.

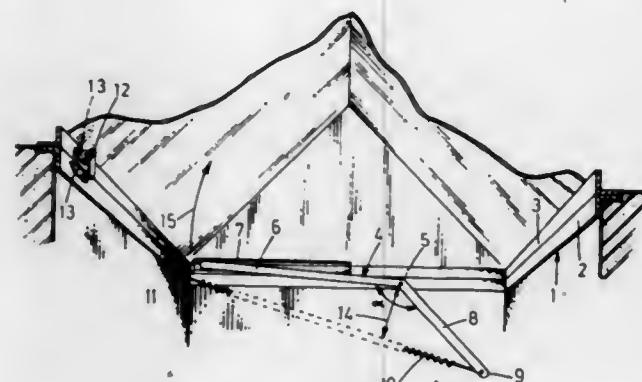
Filed Mar. 11, 1971, Ser. No. 123,287

Claims priority, application Belgium, Mar. 12, 1970, 86328

Int. Cl. E05f 15/20

U.S. Cl. 49-7

7 Claims



A device for opening a skylight, particularly for opening same automatically in case of fire. Use is made of a lever attached to the skylight casing and the leverage of which is so designed as to compensate the changing force of an operating spring.

3,735,531

## REMOTE CONTROL MECHANISM FOR A SLIDING DOOR

Wolfgang Kramer, Ribbesbittel, Germany, assignor to Volkswagenwerk, Aktiengesellschaft, Wolfsburg, Germany

Filed Feb. 24, 1971, Ser. No. 118,339

Claims priority, application Germany, Mar. 18, 1970, P 20 12 832.9

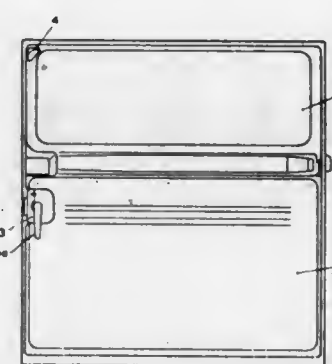
Int. Cl. E05f 11/54, 15/14

U.S. Cl. 49-362

12 Claims

A sliding door is closed by a reversible power-driven slide, movable horizontally and having a hook normally coupled to a

detent on the door for causing the door to move with the slide in a closing direction. A coupling hook pivoted on the slide, and spring loaded toward operative position, is retracted or uncoupled from the detent at the conclusion of the door closing movement by the engagement of a retracting lever arm on the hook with a fixed stop, thus releasing the door from the



slide so that it may be subsequently manually opened. For opening of the door by remote control, a return or reverse movement of the slide, and its abutting engagement with the detent, transmits opening movement to the door while, at the same time, reengaging the hook for use in subsequently closing the door by remote control.

## ERRATUM

For Class 51-181 see:  
Patent No. 3,735,542

3,735,532

## WORKPIECE TREATING APPARATUS

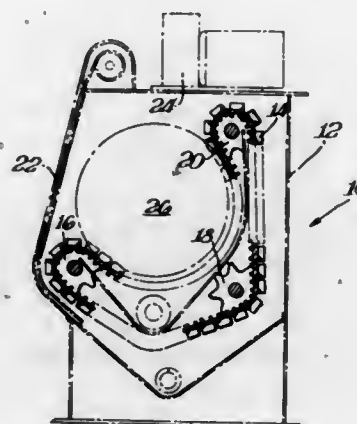
William W. Long, III, Hagerstown, Md., assignor to The Carborundum Company, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 859,991, Sept. 22, 1969, abandoned. This application May 4, 1971, Ser. No. 140,199

Int. Cl. B24c 3/14, 3/24, 3/30

U.S. Cl. 51-9

9 Claims



A workpiece treating apparatus includes an endless conveyor for moving the workpieces therein to expose them to treating means which projects treating media against the workpieces. The conveyor is made of individual slats extending perpendicular to its direction of movement and each slat has grooves to enhance the ricocheting action of the treating media.

3,735,533

## SHARPENING OF ICE SKATES

Mervyn Salberg, British Columbia, Canada, assignor to Merco International Ltd., British Columbia, Calif.

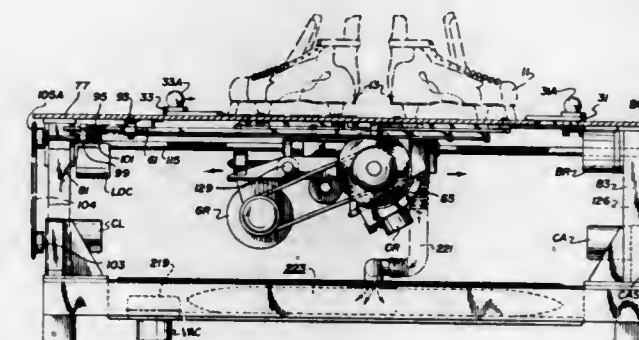
Filed Apr. 27, 1971, Ser. No. 137,789

Claims priority, application Canada, Feb. 12, 1971, 105211

Int. Cl. B24b 19/00

U.S. Cl. 51-34 E

10 Claims



A coin-operated automatic ice skate sharpening machine is disclosed. The two skates are arranged heel-to-heel and the two aligned edges ground by a thin, flat grinding wheel having a convex wheel edge profile. The wheel lies in the same plane as the skate blades. The wheel moves along the skates, so grinding a concave edge profile. The machine can be set grind either "figure" skates or "hockey" skates as desired. The grinding wheel is automatically dressed. The number of passes by the grinding wheel is preset by the operator to take into account present condition of skates.

3,735,534

## APPARATUS FOR CONTROLLED LAPPING OF OPTICAL SURFACES TO CORRECT DEVIATIONS FROM DESIRED CONTOURS

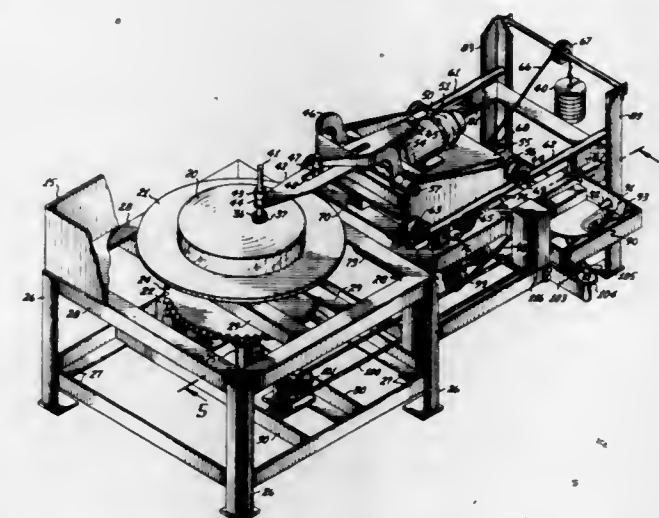
Marvin J. Mayo, Van Nuys, Calif., assignor to Altair Scientifics, Inc., Van Nuys, Calif.

Filed Feb. 10, 1971, Ser. No. 114,114

Int. Cl. B24b 13/00

U.S. Cl. 51-57

5 Claims



Apparatus for scanning an aspheric optical surface in a spiral pattern and lapping with short strokes is provided by rotating a table supporting the workpiece at a controlled rate, radially moving an arm carriage, and cyclically driving the arm on the carriage with a crank to produce short lapping strokes along the spiral scanning path. A program prepared from contour deviation plots along several diameters of the workpiece (made by knife-edge measurement techniques) control the rate of rotation of the workpiece inversely proportional to deviations from the desired surface contour. After repeated use of one program has reduced deviations by at least half, measurements are again made and a new program is prepared.



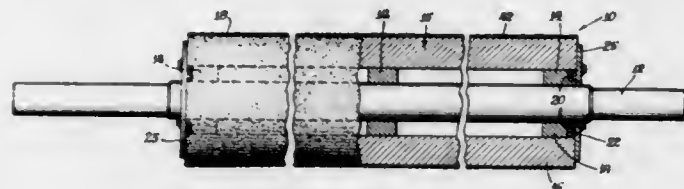
Each iteration of a given program is run at a rate which assures completion of the entire program in an interval of time during which the rate of material removal will not vary by more than 10 percent.

### 3,735,535 EXPANSIBLE WHEEL

Gustav Martin Waller, Geneva, Ill., assignor to Amsted Industries Incorporated, Chicago, Ill.  
Filed Feb. 11, 1972, Ser. No. 225,586  
Int. Cl. B24d 9/02

U.S. Cl. 51-374

8 Claims



A rotatable hub supports solid rim segments movable relative thereto between a first position relatively close to the hub in which a flexible, abrasive sleeve is not engaged, to a second position in which the sleeve is engaged, to a third position relatively far from the hub. Springs and centrifugal force both urge the rim segments away from the first position.

### ERRATA

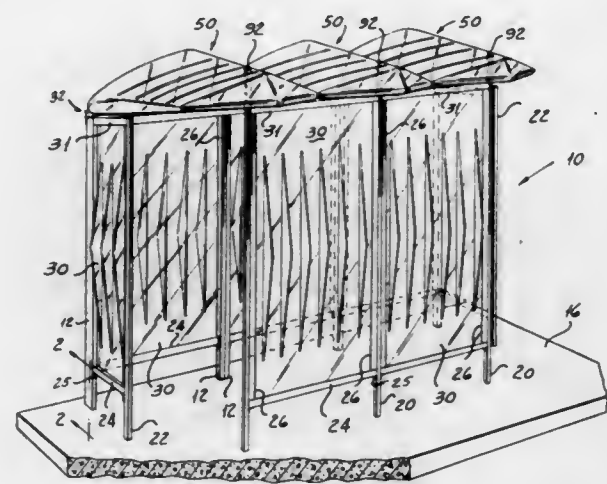
For Classes 51-225, 51-238, and 51-284 see:  
Patents Nos. 3,736,113 thru 3,736,115

### 3,735,536 BUS STOP SHELTER

Gerald J. Bellasalma, West Caldwell, N.J., assignor to Plastetics Inc., Fairfield, N.J.  
Filed May 7, 1971, Ser. No. 141,238  
Int. Cl. E04b 1/34; E04h 1/12

U.S. Cl. 52-73

7 Claims



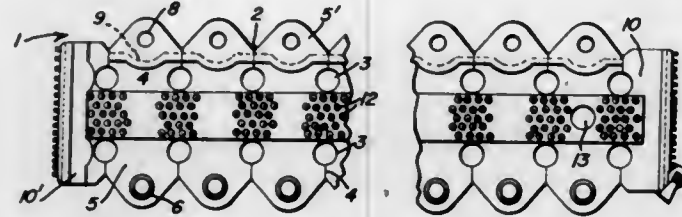
The invention relates to a modular building construction such as a bus shelter or the like in which each pair of adjacent spaced uprights carry an H-shaped extrusion providing an elongated upper channel in which an inwardly directed generally horizontal back flange of a molded plastic roof section rests. An elongated extruded retainer element is secured to the cross piece of the H so as to clamp the flange between the cross piece and the retainer with an upwardly and rearwardly extending portion of the retainer helping to support the roof section in cantilever fashion and with gutter-forming elements associated with adjacent edges of a pair of roof sections to carry water away from the shelter roof formed by the sections.

### 3,735,537 CARPET BASE ELEMENT

Bent Jorgen Panker, Bregnerodvej 3450, Allerød, Denmark  
Filed Dec. 17, 1970, Ser. No. 99,045  
Claims priority, application Denmark, Dec. 23, 1969, 6817  
Int. Cl. E04c 2/40

U.S. Cl. 52-660

10 Claims



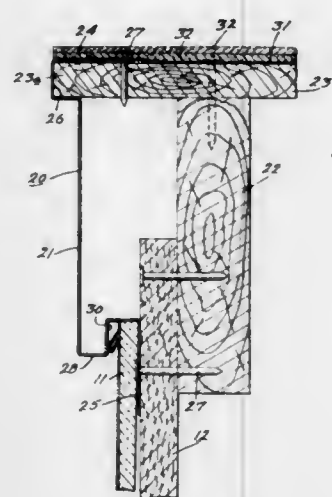
A carpet element has pile yarns wound round a backing material strip having narrow incisions along its side edges for receiving and holding the yarns. The strip is provided with connecting means along its edges for connecting the strip with other similar strips.

### 3,735,538 POCKET RAKE FOR GABLE SIDING CONCEALING A ROOF EDGE

Gunars H. Ramins, 1709 LaRue Lane, Warrington, Pa.  
Filed Sept. 15, 1971, Ser. No. 180,630  
Int. Cl. E04b 7/02

U.S. Cl. 52-94

2 Claims



A one-piece metal pocket rake element is provided for cooperating with metal siding on a gable to conceal an edge of a roof and an end one of its supporting rafters to provide a structure having a uniform appearance. The pocket rake element has a face web spaced from the end rafter, an upper nailing flange for securement to a top margin at the roof along its edge, and a lower nailing flange inset from the face web for securement to sheathing on the gable. A downwardly open recess is provided between the lower nailing flange and the face web for receiving the siding.

### 3,735,539 MOUNTING ASSEMBLY FOR ELEVATOR DOOR SILL

Alvin F. Pfund, Demarest, N.J., assignor to Dahlstrom Corporation, Jamestown, N.Y.

Filed Oct. 26, 1971, Ser. No. 192,530  
Int. Cl. E06b 1/70

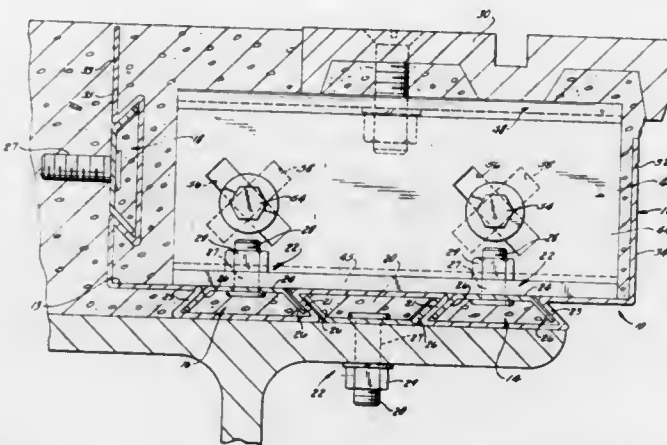
U.S. Cl. 52-98

8 Claims

A mounting assembly for accurately positioning an elevator door sill at the elevator opening after a concrete floor has been poured and dried is disclosed. The mounting assembly

includes a housing having means for accurately positioning the assembly prior to pouring a concrete floor and means for ad-

under pressure through an injection tube inserted inside the casing causes slits in the inner sleeves to open so that the cement fills the annular space containing the tie-rod or cable bars or strands and then causes bursting of the outer sleeves to



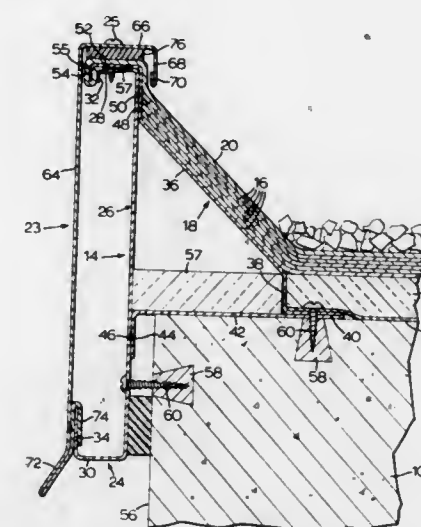
justably mounting the sill at the elevator opening in rigid fixed position.

### 3,735,540 BUILDING FASCIA

Kunibert Thaler, P.O. Box 53, Morningdew Road, Westhill, Ontario, Canada  
Filed Dec. 10, 1970, Ser. No. 96,985  
Int. Cl. E04d 13/15

U.S. Cl. 52-94

15 Claims



A combined cant strip and fascia support structure is provided for attachment to the edge of the roof and a roof flashing is gripped between the cant strip and fascia support when the structure is assembled. The roof flashing is adapted to extend from the structure over a portion of the roof adjacent the roof edge and a fascia is clipped over the structure and screwed in place to prevent damage to the waterproof covering and to improve the appearance of the structure.

### 3,735,541 METHOD AND DEVICE FOR ANCHORING TIE-RODS IN GROUND

Walpy Vanderlinde, Rua 7 de Abril 127-9th Flaar, Sao Paulo, Brazil

Filed July 8, 1971, Ser. No. 160,684  
Int. Cl. E02d 5/80

U.S. Cl. 52-98

14 Claims

A tie-rod or cable is anchored in the earth by drilling a hole in the soil or rock and placing in the hole a double-wall casing comprising spaced inner sleeves and outer sleeves. Annular spacers between successive sections of the inner and outer sleeves have longitudinal holes receiving strands or bars of the cable or the rod to be anchored. The inner and outer sleeves are weakened by longitudinal slits or cuts. Cement injected

A fish hook sharpener which includes a tube and a rod for holding a fish hook. A cap is removably mounted on the tube to hold the rod within the tube. The cap carries a formed abrasive means for sharpening the point of the fish hook. The rod is magnetized for retaining the fish hook after the rod is withdrawn from the tube.

### 3,735,542 FISHHOOK SHARPENER

Steve J. Kocian, Berwyn, Ill., assignor to Paul M. Komarec, Westchester Village, Ill., a part interest  
Filed July 16, 1971, Ser. No. 163,327  
Int. Cl. B24d 15/02

U.S. Cl. 51-181 R

5 Claims





3,735,543

**STRUCTURE FOR MAINTAINING A SPACE BETWEEN OVERLAPPING ROOF SHINGLES**

Hans Simon, Bruchhausener Strasse, 5463 Unkel (Rhine), Germany

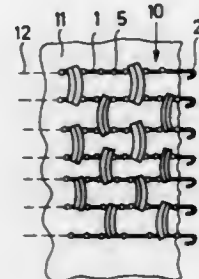
Continuation-in-part of Ser. No. 29,496, April 17, 1970. This application Mar. 24, 1972, Ser. No. 237,805

Claims priority, application Germany, Sept. 30, 1969, P 19 49 217.2

Int. Cl. E04d 1/06, 3/40

U.S. Cl. 52-553

11 Claims



A structure for maintaining between overlapping roof shingles a space through which air can circulate. An inclined roof has a shingle provided with an upper edge and inclined downwardly from its upper edge at the inclination of the roof over the shingle and has at an upper end a hook which is adapted to extend around the upper edge of the shingle so that the bar will remain over the shingle hooked to the upper edge thereof. A plurality of spacers are distributed along this bar and are pivotally connected thereto. The spacers extend laterally from the bar and are adapted to maintain a spaced relation between the shingle and another shingle situated thereover in partly overlapping relationship therewith, so that air may circulate between the shingles.

3,735,544

**PREFABRICATED BUILDING STRUCTURE INCLUDING METAL FRAMEWORK AND PREFABRICATED MOLDED PANELS OF CEMENTITIOUS MATERIAL**

Enrico Longinotti, Viale D. Giannotti 81, Firenze, Italy

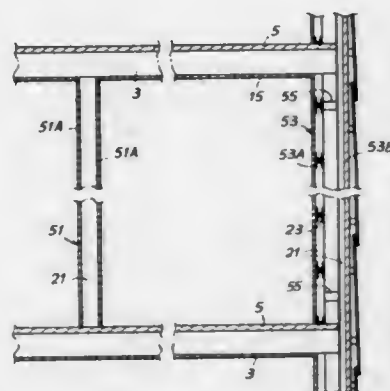
Filed Dec. 20, 1971, Ser. No. 209,627

Claims priority, application Italy, Dec. 23, 1970, 9798 A/70; June 12, 1971, 9550 A/71

Int. Cl. E04b 1/38, 2/88

U.S. Cl. 52-235

22 Claims



The open metal framework includes upright components, such as columns, pillars and posts having substantially flat side surfaces, and includes modular length transverse components, such as relatively heavy main beams and relatively lighter connecting beams having flat side and end surfaces. Connecting means, such as bolts and the like secure the flat end surfaces of the transverse components to the flat side surfaces of the upright components and to flat side surfaces of other transverse components to form skeleton wall and floor sections

having openings defined by substantially flat surfaces of the components. At least two sets of prefabricated molded modular length panels, of cementitious material, are mounted on the sections and close at least some of the openings therein. At least the transverse components have longitudinal lips, and mechanical means are engaged with these lips and secure the panels to at least the transverse components. The panels have a composition similar to conventional masonry and exterior panels may be formed in the same manner as ceramic tiles. The lower edges of the panels rest on projecting plates on lower transverse components of the framework.

3,735,545

**METHODS FOR GROUTING TILE**

Frank E. Bennett, Yardley, Pa., assignor to Tile Council of America, Inc., New York, N.Y.

Filed Mar. 31, 1971, Ser. No. 130,006

Int. Cl. E04f 13/00

U.S. Cl. 52-744

6 Claims

An improved method for grouting tile which comprises applying a property-improving material subsequent to trowelling of the grouting composition so as to advantageously modify the working properties and/or final performance properties of the grout initially used and supplied in the container.

3,735,546

**APPARATUS FOR LINING KILNS**

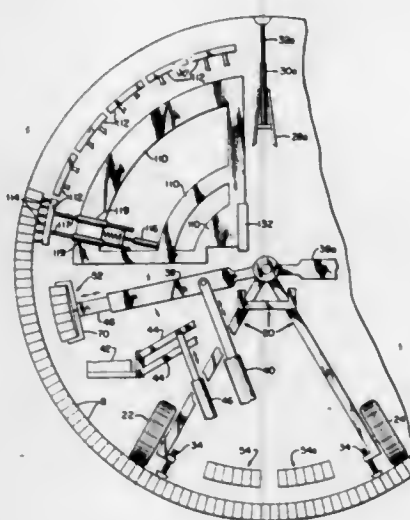
Vance W. Newman, 15442 Turner Road, Victorville, Calif.

Filed Apr. 22, 1971, Ser. No. 136,409

Int. Cl. E04g 21/14, 23/02

U.S. Cl. 52-749

10 Claims



Apparatus for installing adjacent rings of bricks against a cylindrical wall, such as a kiln shell, characterized by a wheel mounted frame, a main conveyor at the bottom of same for moving bricks longitudinally, a transverse group forming conveyor disposed at each side of the main conveyor, a swingable arm for each group forming conveyor having clamping apparatus for grasping a group, and a swingable operator platform for each clamping apparatus from which the movement of a group is controlled to its desired position in the ring. Certain parts of the apparatus which are disposed in the upper two quadrants, when in use, are foldable into the lower two quadrants to facilitate installation of the apparatus through an end aperture of a kiln having a cross section less than the kiln cross section and which also renders the apparatus more compact for transportation over roads to its various loci of use. In use, the kiln remains stationary and the bricks are retained by gravity in the lower two quadrants. After they reach the horizontal diameter they are retained in place in the upper two quadrants by suitable supports and until they are finally keyed together at the tops of the upper quadrants.

3,735,547

**HOLLOW BEAM**

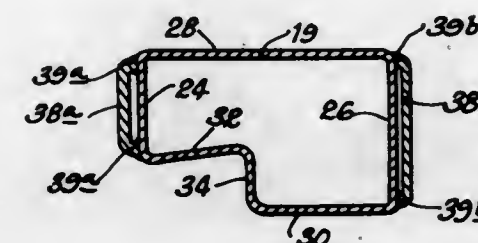
Harris P. Moyer, Deerfield, and Herbert H. Klein, Arlington Heights, both of Ill., assignors to Unarco Industries, Inc., Chicago, Ill.

Filed Sept. 21, 1970, Ser. No. 74,046

Int. Cl. E04c 3/32

U.S. Cl. 52-731

2 Claims



A hollow steel beam is formed of sheet metal by automated forming machines including a continuous welding operation. To provide sufficient material along the upper and lower surfaces of the beam, to develop the full potential strength of the beam in bending, reinforcing strips are welded to the upper and lower stringer sections of the beam in an automated machine operation.

3,735,548

**PREFABRICATED SELF-SUPPORTING REINFORCED CONCRETE SHELVING ELEMENT FOR FORMING STORAGE SPACES**

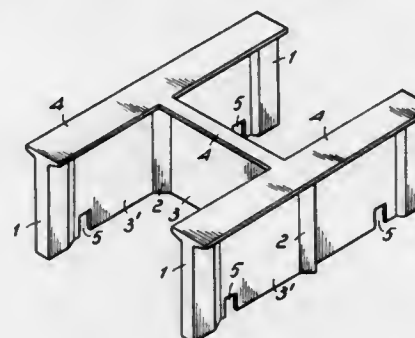
Arch Renzo Ferrari, Via Donizetti 39, Milano, and Luciano Ciccotelli, Via South Gottardo 76, Monza, both of Italy

Filed Sept. 10, 1970, Ser. No. 71,058

Int. Cl. B65d 19/18

U.S. Cl. 52-36

3 Claims



A prefabricated self-supporting reinforced concrete element, suitable for the construction of shelvings and the like for storage purposes has a pair of parallel flanges interconnected by a crossweb so that, in plan, the element has an H-shape. The upper edges of the flanges and web are formed with relatively wide ribs extending at right angles thereto from both sides thereof. The elements may be stacked to form a plurality of columns, and the columns may be juxtaposed with each other to form a plurality of storage spaces. Means are provided for securing adjacent elements to each other.

3,735,549

**BUILDING CONSTRUCTION**

Barry L. Stuart, 3739 West Ocotillo Road, Phoenix, Ariz.

Continuation-in-part of Ser. No. 848,828, Aug. 11, 1969. This application Dec. 28, 1970, Ser. No. 101,864

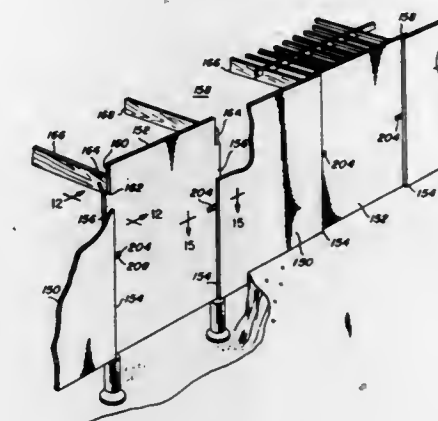
Int. Cl. E04b 2/00, 1/40, 1/54

U.S. Cl. 52-262

3 Claims

A building construction comprising a novel panel and column structure for supporting roof carrying beams, wherein substantially vertical wall panels are overlapped at their adjacent edges in order to provide a double thickness of the wall

and are secured together at the overlapped portions to afford and constitute column structure which may support beams, such as those carrying a building roof or said overlapped portions may brace a panel wall structure to resist stresses imposed by wind or other loading; the overlapped portions of the



panels forming such column structure greatly economizes in a construction of buildings due to the fact that the cost of casting columns is alleviated. Additionally, notches in the panels provide horizontal beam supporting ledges at vertical edges of some of the panels, and expansion joints allow relative movement of the panels.

3,735,550

**LOADING OF FUEL RODS**

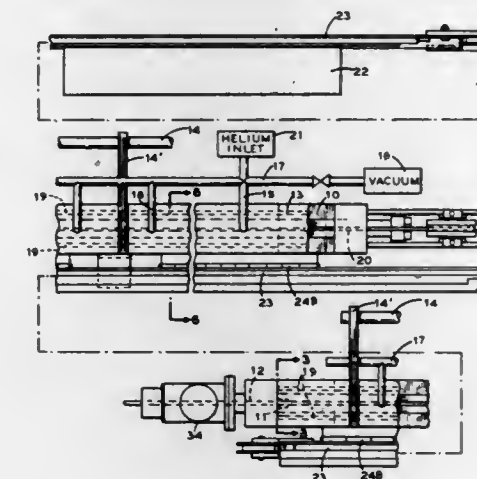
Claude A. Moore, Appomattox, and William F. Heer, Lynchburg, both of Va., assignors to The Babcock &amp; Wilcox Company, New York, N.Y.

Filed Jan. 11, 1971, Ser. No. 105,392

Int. Cl. B65b 31/02

U.S. Cl. 53-22 R

13 Claims



A method of loading fuel rods of the nuclear variety with radioactive pellets wherein the rod is evacuated, subsequently filled with an inert gaseous atmosphere, loaded with such pellets in linear array, and sealed. The pellets in this method are brought in linear array from a supply station to a predetermined situs and then are transferred in such array into a linear bed which is subsequently sealed, evacuated of atmosphere and then filled with helium. The pellets are then transferred in such linear array from the bed to a communicating fuel rod and the latter is sealed in form for use in the core of a nuclear reactor.



3,735,551

**APPARATUS FOR AND METHOD OF PACKAGING WITH GAS FLUSHING**

Robert H. Pratt, Milwaukee, Wis., assignor to Pratt Manufacturing Corp., Milwaukee, Wis.

Continuation-in-part of Ser. No. 69,301, Sept. 8, 1970, abandoned. This application Dec. 20, 1971, Ser. No. 210,055 Int. Cl. B65b 31/00

U.S. Cl. 53—22 A

21 Claims



Upper and lower web portions of sealable material are continuously fed and guided, while products which are to be packaged are delivered in longitudinally spaced relationship therebetween. There is skip-sealing means for sealing the web together on at least one side edge while leaving unsealed side gas outlets at regular intervals. Gas injecting means which extends between the webs has a discharge end located a substantial distance downstream of the skip-sealing means, and there is a cross sealer immediately downstream of the outlet end of the gas injecting means. A first set of soft pressure rolls downstream of the cross sealer presses the webs against the product and exhausts gas and air from the side gas outlets, there being a second set of soft pressure rolls between the cross sealer and skip-seal wheel forming a dam against further upstream travel of the gas, to confine the gas travel to a distance equal to less than the length of one package. Downstream of the first set of pressure rolls there is means for sealing the gas outlets, and there is a cut-off knife for transversely severing the packages at the cross seals.

3,735,552

**ARTICLE HANDLING MACHINE**

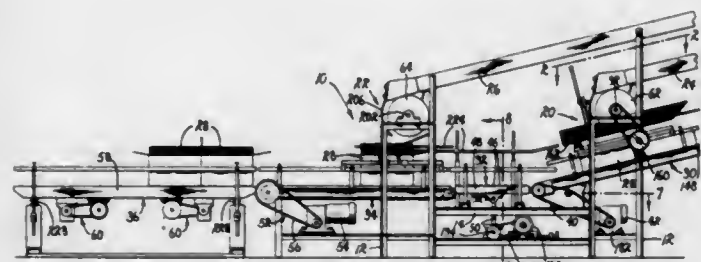
Edward J. Derderian, 4514 N. Wilson Avenue, Fresno, Calif.

Filed Nov. 19, 1970, Ser. No. 91,112

Int. Cl. B65b 57/06

U.S. Cl. 53—63

15 Claims



An article handling machine particularly suited for use in packing articles such as melons and the like in layers within a series of containers, characterized by multiple packing stations, each station being adapted to deliver to a common container a layer of articles. A particular feature of the invention resides in the use of a drum operatively supported at each packing station and having included in its peripheral surface an array of pockets for receiving and then discharging articles being packed in patterns dictated by the pattern of the array of the pockets.

3,735,553

**MULTIPLE GLAZED UNITS**

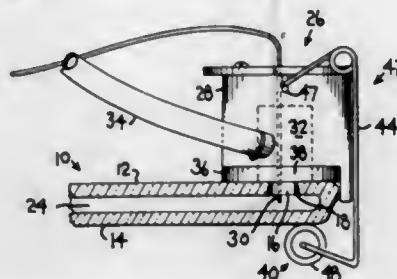
Lloyd Houser, Lincoln, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 12, 1970, Ser. No. 79,766

Int. Cl. B65b 31/02

U.S. Cl. 53—86

3 Claims



This disclosure relates to multiple glazed units containing fluorocarbon gas and to the method and apparatus for producing such units.

3,735,554

**FESTOONING MACHINE**

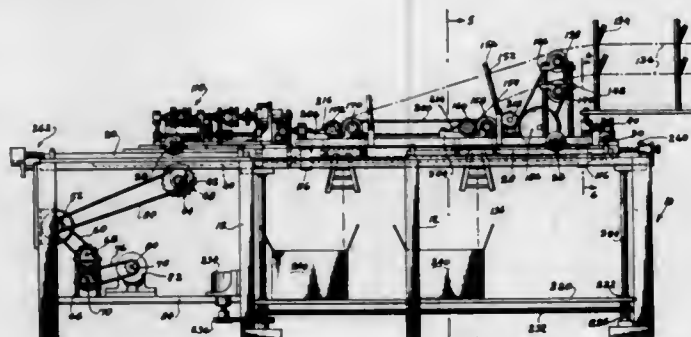
Joseph P. Maggio, Farmingdale, N.Y., assignor to Elastic Systems Corporation, Farmingdale, N.Y.

Filed Feb. 22, 1971, Ser. No. 117,485

Int. Cl. B65b 63/04

U.S. Cl. 53—116

9 Claims



A festooning machine having:

- independently adjustable, variable-speed material feeding means;
- independently adjustable, variable-speed, variable-distance reciprocating drive means which causes the material feeding means to reciprocate longitudinally; and
- independently adjustable, variable-speed, variable-distance reciprocating drive means which causes the material feeding means to reciprocate transversely concurrently with its longitudinal movement.

**ERRATUM**

For Class 53—177 see:  
Patent No. 3,735,564

3,735,555

**APPARATUS FOR STRAPPING LOADS**

James A. Pask, Aberdeen, Wash., assignor to Ovalstrapping, Inc., Hoquiam, Wash.

Filed Dec. 7, 1970, Ser. No. 95,502

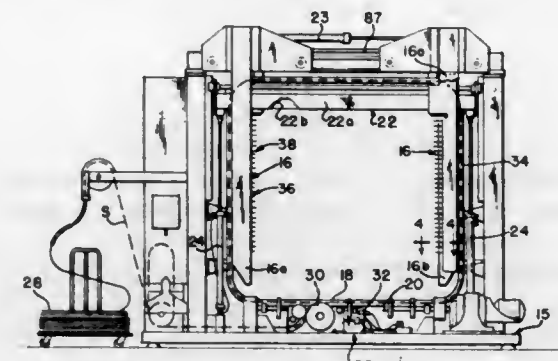
Int. Cl. B65b 13/06, 27/12

U.S. Cl. 53—124 D

23 Claims

A plurality of objects are stacked and compressed both horizontally and vertically. Corner clips from a clip dispensing

mechanism are placed on opposite upper corners of the compressed stack and a strap is drawn tightly around the stack over the corner clips. The strap is applied on the corner clips



in laterally spaced wraps. The clips may be placed on the upper corners of the stack even when the top object in the stack is offset inwardly or downwardly from the generally rectangular periphery line of the stack.

3,735,556

**APPARATUS FOR INSERTION OF SWEET PARTS, IN PARTICULAR OF PRALINES, IN WRAPPING CASES**

Alfred Dille, Garbsen/Hann., and Udo Thamm, Hannover, both of Germany, assignors to Firma Otto Hansel GmbH, Hannover, Germany

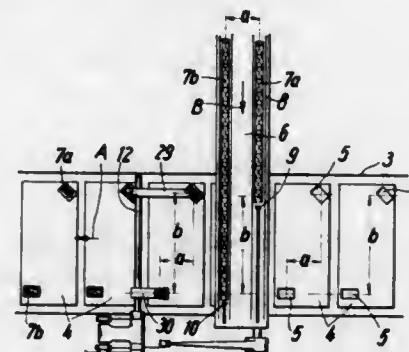
Filed Nov. 3, 1970, Ser. No. 86,567

Claims priority, application Germany, Nov. 8, 1970, P 19 56 246.0

Int. Cl. B65b 5/08, 35/56

U.S. Cl. 53—240

11 Claims



An apparatus for insertion of sweet parts, in particular of pralines in packing cases having a plurality of recesses corresponding to the shape of the parts, comprising feeding paths aligning the parts in one row and equipped with adjustable end abutments, and a transportation device for the open packing cases disposed crosswise at the end of the feeding path, and a transfer device provided at the end of the feeding paths, and comprising means for gripping the individual parts and inserting same into the packing cases and formed as lifting rams sitting on the swinging arms. For insertion of pralines, the feeding paths for the pralines are variable as to their relative distance and the end abutments of the individual paths are adjustable independently from each other to the praline distance. The lifting stamps are adjustable to the praline distances and are connected with a rotary drive transforming the pralines from the delivering position into the packing position.

**ERRATUM**

For Class 53—245 see:  
Patent No. 3,735,561

3,735,557

**MACHINE FOR WRAPPING PALLETIZED LOADS IN HEAT SHRINKABLE PLASTIC FILM**

Odell H. Hoffarth, Brooklyn Center, and Thomas L. Schuette, Osseo, both of Minn., assignors to Possis Machine Corporation, Minneapolis, Minn.

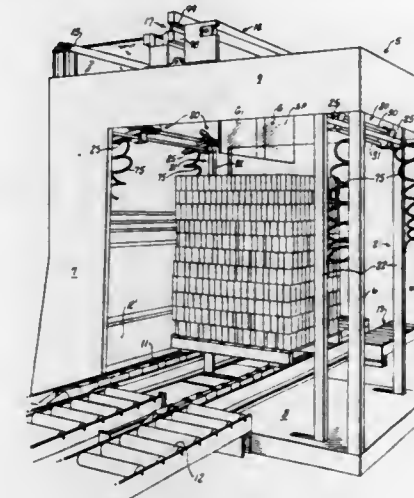
Filed Aug. 16, 1971, Ser. No. 172,163

Claims priority, application Great Britain, Aug. 24, 1970, 40,587/70

Int. Cl. B65b 43/30

U.S. Cl. 53—183

17 Claims



A machine for forming bags of gusseted flat heat sealable web stock, opening the formed bags and drawing them down over palletized loads preparatory to conveying the same into an oven where the bags shrink into intimate contact with the load. The bags are opened by suction cup and claw assemblies mounted on the ends of arms that project from hinged carrier frames between which the palletized load is placed to be wrapped. The frames swing towards and from one another, and in their innermost positions bring the suction cups into contact with the side panels of the pendently hanging web. This causes the suction cups to attach themselves to the side panels, and that attachment brings about initial retraction of the suction cups. With the side panels held by the suction cups, the claws are actuated to cause them to penetrate and grab the side panels. Outward swinging motion of the carrier frames and downward travel of the arms that carry the suction cup and claw assemblies opens the bag and draws it down over the load.

3,735,558

**PROCESS FOR SEPARATING FLUIDS AND APPARATUS**

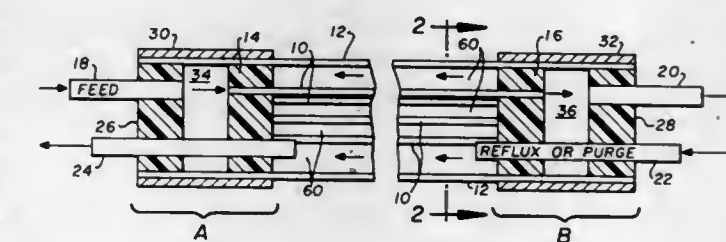
Charles W. Skarstrom, Montvale, and Jack Kertzman, Oceanport, both of N.J., assignors to Perma Pure Process, Inc., Oceanport, N.J.

Filed June 29, 1971, Ser. No. 157,860

Int. Cl. B01d 53/22

U.S. Cl. 55—16

21 Claims



A continuous process is provided for separating key components from mixed fluids, for example, separating water vapor from air, wherein a mixed fluid feed including a key component, at a preselected initial relatively high pressure is passed through a single or a series of hollow tube(s), the walls



of which are selectively permeable to the key components of the mixed feed. At the produce end of the tubes, a portion of the product and/or an external purge fluid is expanded or flashed to a lower pressure than the mixed feed and caused to flow as reflux counter-current along the outside of the tubes toward the feed end. In this manner, a pressure gradient is created across the walls of the permeable tubes to induce permeation. The counter-current reflux flow induces a longitudinal concentration gradient along the walls of the permeable tubes which enhances permeation of key components through the walls of the tubes thereby separating them from the mixed fluid feed.

Apparatus is also provided for carrying out the above-described fluid separation process.

3,735,559

### SULFONATED POLYXYLYLENE OXIDE AS A PERMSELECTIVE MEMBRANE FOR WATER VAPOR TRANSPORT

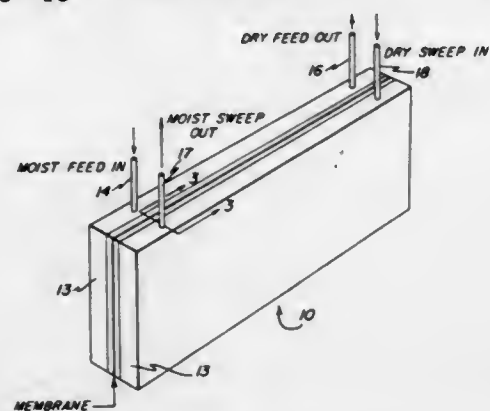
Robert M. Salemme, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 2, 1972, Ser. No. 222,754

Int. Cl. B01d 53/22

U.S. Cl. 55-16

8 Claims



Sulfonated polyxylylene oxide membranes are very effective for the separation of water vapor from other gases. Such a gas separation is very selective and may be readily accomplished at atmospheric pressure. Membrane devices for humidifying or drying an air stream are described.

3,735,560

### ELECTROSTATIC AIR CLEANING APPARATUS

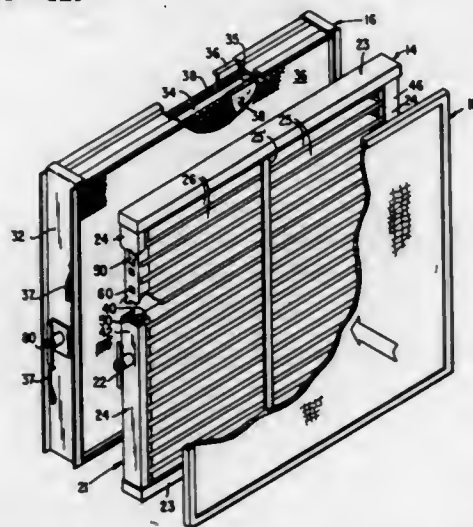
Donald C. Wellman, Marcellus, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 5, 1968, Ser. No. 750,189

Int. Cl. B03c 3/36

U.S. Cl. 55-129

3 Claims



An electrostatic air cleaner including an ionizer and a charged particle collector utilizing a mat or pad of fibrous

media disposed in an electrostatic field wherein the ionizer is constructed of alternately spaced wires and structural members of a width so as to block air flow, the construction permitting the physical size of the collector and ionizer to be substantially the same over an extended range of air flow variation.

3,735,561

### CARTON PACKING DEVICE

Lloyd Murray Wood, Sarnia, Ontario, Canada, assignor to Polymer Corporation Limited, Sarnia, Ontario, Canada

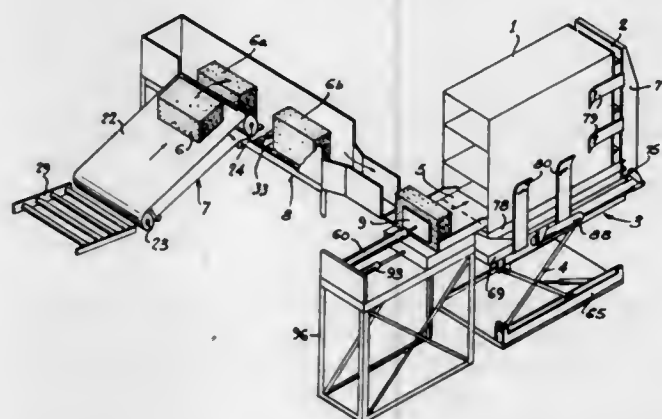
Filed Nov. 30, 1970, Ser. No. 93,666

Claims priority, application Canada, Jan. 27, 1970, 73209

Int. Cl. B65b 5/10, 35/40, 39/12

U.S. Cl. 53-245

2 Claims



A device for inserting rectangular prismatic bales of soft yieldable material, e.g. rubber, into a carton. The device comprises a tiltable carton support means for holding a carton in filling position with a bale-receiving opening on its side and tilting a filled carton through 90° to upright position, conveyor means for positioning bales resting on a narrow rectangular face longitudinally in front of the bale-receiving opening of the carton and pusher means for pushing the bales from the conveyor into the carton.

3,735,562

### MEMBRANE GAS EXTRACTOR

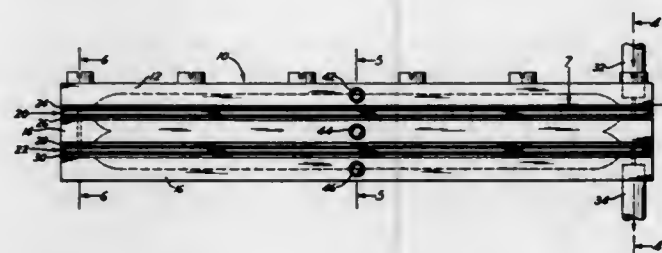
Richard J. Mousseau, Jr., and Homer Patnode, both of Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed June 9, 1971, Ser. No. 151,212

Int. Cl. B01d 59/12

U.S. Cl. 55-158

8 Claims



An improved gas/liquid separator cell utilizing membranes formed of coherent films of unsintered polytetrafluorethylene.

3,735,563

### REGENERATING DESICCATOR

Carlton D. Adams, 5 Carroll Avenue, Boylston, Mass.

Filed Nov. 4, 1971, Ser. No. 195,670

Int. Cl. B01d 53/04

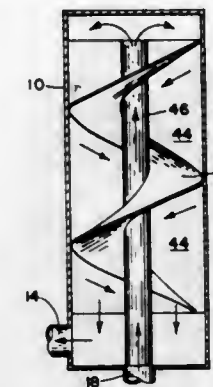
U.S. Cl. 55-179

7 Claims

Desiccator for plastic molding material comprising a pair of alternately operative drying towers, drying air in one tower

and regenerating the desiccant in the other, in an auto-matic timed sequence, the towers each having means forcing the

gas continues to flow. When the component has been collected, the formerly cooled zone is heated to revaporize the



moist air through the desiccant in a tortuous, e.g., helical path, and the dried air to a plenum chamber hopper for the molding material.

3,735,564

### APPARATUS FOR MAKING A FILLED FLEXIBLE TUBING IN A CONTINUOUS OPERATION

Othmar Ruthner, Vienna; Peter Puxkandl, and Guido Fastnacht, both of Linz, all of Austria, assignors to Vereinigte Österreichische Eisen- und Stahlwerke Aktiengesellschaft, Linz, Austria

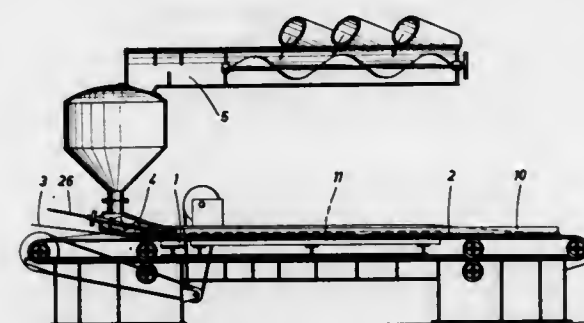
Filed Aug. 2, 1971, Ser. No. 168,149

Claims priority, application Austria, June 1, 1971, 4693/71

Int. Cl. B65b 9/06

U.S. Cl. 53-177

22 Claims



A tubular shaping device is provided and serves to receive a sheeting web having opposite edge portions and to shape said web to form a flexible tubing and to cause said edge portions to contact each other as said web is moved through said shaping device. A conveyor belt extends through said shaping device and is adapted to contact said web on that side which forms the outside of said flexible tubing in said shaping device and to move said web through said shaping device. A filling device has a discharge opening adjacent to said shaping device at a point at which said flexible tubing has been formed and which is disposed inside said flexible tubing. Joining means are provided to join said contacting edge portions at least in parts of their length.

3,735,565

### ENRICHMENT OF CHROMATOGRAPH OUTPUT

Anthony C. Gilby, Darien, and John P. Gaglione, Stratford, both of Conn., assignors to Wilks Scientific Corporation, Norwalk, Conn.

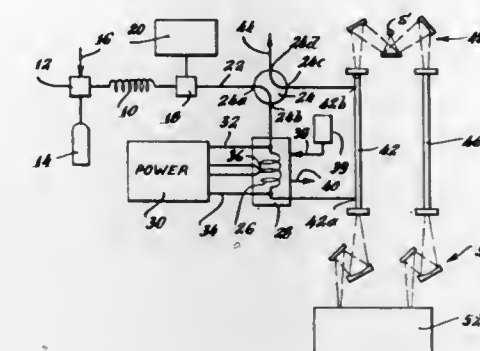
Filed May 6, 1971, Ser. No. 140,758

Int. Cl. B01d 15/08

U.S. Cl. 55-197

8 Claims

There is disclosed method and apparatus for enriching the concentration of one component eluting from a gas chromatograph by the substantial elimination of carrier gas therefrom. This is accomplished by passing the desired component through a cooled zone where it is condensed while the carrier



component, permitting it to be flushed into a subsequent sample chamber, such as that of a spectrophotometer.

3,735,566

### CONTROL SYSTEM FOR A FILTERING APPARATUS

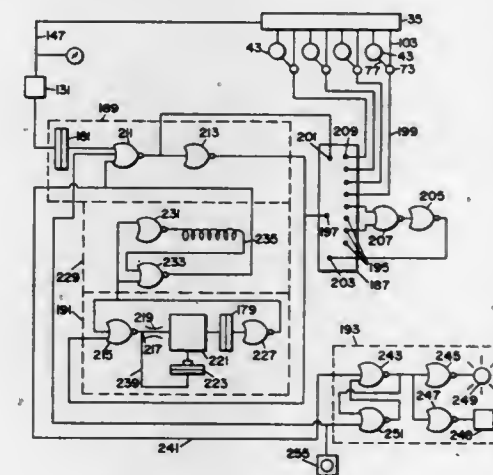
Jitendra R. Lallwala, Hagerstown, Md., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Jan. 4, 1971, Ser. No. 103,404

Int. Cl. B01d 46/04

U.S. Cl. 55-273

8 Claims



A fluidic control system for a filtering device employing a plurality of filters and means for causing a reverse flow through the filters to remove the impurities attached thereto. The control system acts to cause a plurality of rapid release valves to sequentially discharge a reservoir containing fluid under pressure into the filters as a predetermined pressure is attained in the reservoir. A time override control automatically advances the control system to a succeeding release valve if the previous release valve should fail to operate. The control system comprises pure fluidic components which operates without electrical or mechanical connections.

3,735,567

### ENGINE EXHAUST FILTER-MUFFLER

Charles S. Viers, 352 Sexsmith Road, Richmond, British Columbia, Canada

Filed July 12, 1971, Ser. No. 161,855

Int. Cl. B01d 50/00

U.S. Cl. 55-233

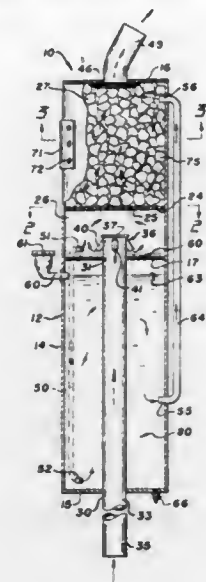
2 Claims

A muffler having a filter housed in a compartment adjacent a tank containing gas cleaning water. Exhaust gas pressure is utilized to vapourize and circulate a gas-water mixture



through the tank and over the filtering material in such a way as to improve the gas washing and filtering action and to

a spinner arranged in its lower portion, and holes through the walls thereof above the spinner. A housing surrounds, and ex-



prevent the unit from becoming clogged with the extracted contaminants.

3,735,568

## AUTOMATIC LIQUID BUBBLER

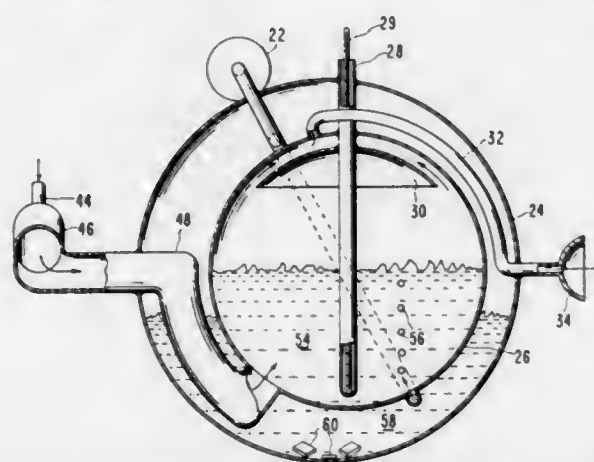
Clark H. Beck, Los Altos, Calif., assignor to Nortec Electronics Corporation, Santa Clara, Calif.

Filed Apr. 29, 1971, Ser. No. 138,703

Int. Cl. B01d 45/08

U.S. Cl. 55-256

11 Claims



An automatic liquid bubbler for providing measured quantities of a gas with a known moisture content. A gas in metered quantities is applied to the bottom of a sphere partially filled with a liquid. A further sphere encloses the first sphere and is partially filled with a liquid that is heated to boil continuously to maintain the inner sphere liquid at a constant temperature: the boiling point of the liquid in the outer sphere. The liquid levels of both spheres are continually replenished to maintain substantially constant levels. Gas bubbled up through the inner sphere liquid is collected and passed out of the spheres to provide a gas having a known moisture quantity.

3,735,569

## WATER-STEAM SEPARATOR

Rudolph J. Micbeller, East Granby, Conn., and Robert C. Patterson, Longmeadow, Mass., assignors to Combustion Engineering, Inc., Windsor, Conn.

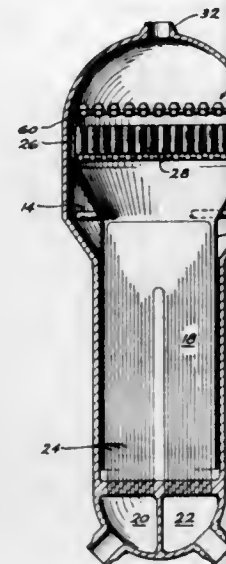
Filed Sept. 7, 1971, Ser. No. 178,105

Int. Cl. B01d 45/12

U.S. Cl. 55-348

3 Claims

A water-steam separator made up of a number of "cell" structures, each cell having a vertical cylindrical member with



3,735,570

## CHROMATOGRAPHIC COLUMN

Stephen Archbold Bergen, and Hannei Elldad Dubsky, both of Cambridge, England, assignors to Pye Limited, Cambridge, England

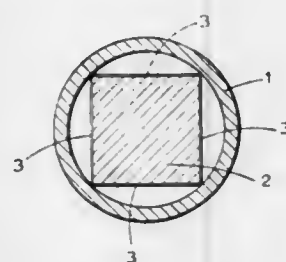
Filed Jan. 23, 1970, Ser. No. 5,261

Claims priority, application Great Britain, Jan. 23, 1969, 3,936/69

Int. Cl. B01d 15/08

U.S. Cl. 55-386

6 Claims



A chromatographic column is manufactured in the form of a tube having a core of uniform cross-section which contacts the tube wall at two or more points forming separate longitudinal passages in the column. The cross-section of the core can be polygonal or star-shaped and the core can be drawn into the tube by means of a draw-wire. The core surface constitutes, or is coated with, a partitioning agent and the surface can be roughened. The core and tube can be made of stainless steel or thermoplastics.

3,735,571

## RESPIRATORS

Klaus Helmut Georg Pampuch, Wiltfinger Str. 1-4, 1 Berlin 28, and Werner Herbert Mascher, Bismarckstrasse 6, 1 Berlin 41, both of Germany

Filed May 25, 1971, Ser. No. 146,650

Claims priority, application Germany, June 9, 1970, P 20 29 414.8

Int. Cl. B01d 31/00

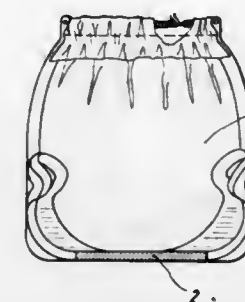
U.S. Cl. 55-372

1 Claim

This invention relates to respirators, of the kind in which a positioning member is located between a filter element and a casing or receptacle. The positioning member is of cruciform

shape and its ends form double arms so that the two arms at each said end can embrace a corner of the filter. Preferably,

extends during one portion of the circular path in which it moves, substantially tangential to this path and in this portion



the two arms of each end are connected together by their ends and may form a quadrilateral figure, such as a square.

3,735,572

## TRACTOR-CARRIED MOWER AND HINGE ARRANGEMENT THEREFOR

Ludwig Kasberger, 7702 Gottmadingen, Germany, assignor to Maschinenfabrik Fahr AG, Gottmadingen, Germany

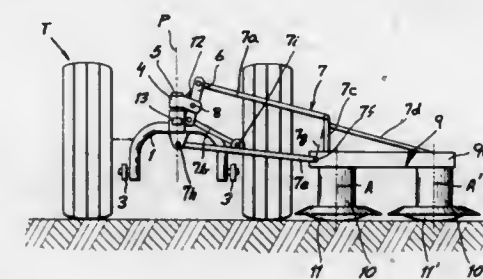
Filed Jan. 20, 1972, Ser. No. 219,276

Claims priority, application Germany, Jan. 22, 1971, P 21 02 911.8

Int. Cl. A01d 35/26

U.S. Cl. 56-16.2

10 Claims



A mower, preferably having a plurality of mower drums rotatable about respective vertical axes and spaced transversely apart upon a support beam, is connected to the elevatable three-point hitch structure of a tractor by a linkage allowing vertical displacement of the mower in one angular position of the beam with respect to the hinge assembly so that the mower drums may follow the contours of the ground. The junction between the frame and the hinge assembly is provided with abutment or stop selectively positionable to retain the attachment device, in an elevated position without supporting the frame on the ground to facilitate reattachment of the mower to the tractor.

3,735,573

## AGRICULTURAL MACHINE

Peter Dziuba, Im Oschle, and Josef Gebele, Saulgau, both of Germany, assignors to Josef Bautz GmbH, Saulgau/Württ., Germany

Filed May 12, 1971, Ser. No. 142,561

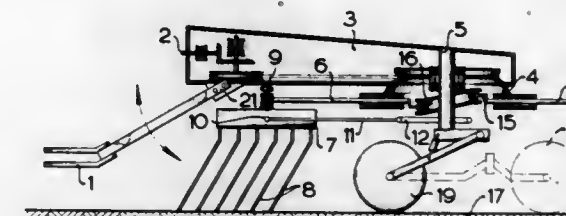
Claims priority, application Germany, May 13, 1970, P 20 23 248.8

Int. Cl. A01d 79/00

U.S. Cl. 56-370

8 Claims

A hub is carried by a support turnable about an upright axis and in turn provides a plurality of arms which radiate from it and carry at their respective outer end portions sets of parallel tines which project downwardly toward the ground. The tines are so mounted that each set turns about a vertical and a horizontal axis and when the arms turn with their hub, each set



has a vertical component of movement relative to the path about the respective horizontal axis.

3,735,574

## GARDENING TOOL

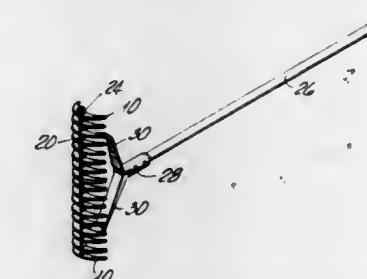
William C. R. Heckner, Carrizozo, N. Mex., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Aug. 18, 1972, Ser. No. 281,828

Int. Cl. A01d 7/00

U.S. Cl. 56-400.16

1 Claim



A gardening tool comprising: a plurality of sickle-shaped blades having aligned outer and inner edges; a bar extending at right angles to said blades and disposed therebetween to form a rigid structure with said blades; an elongated handle extending at right angles to said bar; and a fork extending between one end of the handle and the inner edges of the blades, the fork being secured to the handle end and to the first means.

3,735,575

## SPINNING APPARATUS FOR CONTINUOUS OPERATION

Soichiro Hattori, 444-4, Shimoshibutani, Ikeda, Japan

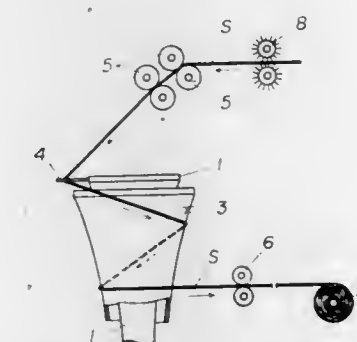
Filed Dec. 17, 1971, Ser. No. 209,156

Claims priority, application Japan, Dec. 23, 1970, 45/117151; Dec. 30, 1970, 45/129657

Int. Cl. D01h 5/28

U.S. Cl. 57-51.3

5 Claims



A spinning apparatus for continuous operation comprises a spindle and a tubular rotary body disposed around the spindle concentrically therewith and driven at a lower speed than the spindle. An untwisted roving supplied from draft rollers is twisted by the rotation of the spindle, then wound on the outer periphery of the rotary body one or several turns and thereafter passed toward discharge rollers continuously.



3,735,576

## SPINNING SYSTEM

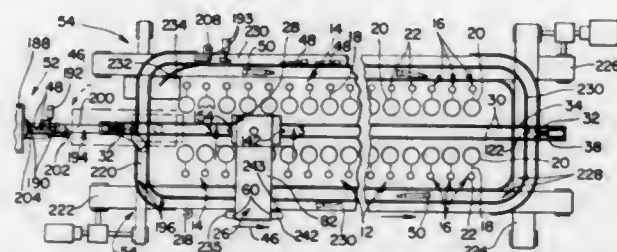
John Nelson, North Kingstown, R.I., assignor to Leeson Corporation, Warwick, R.I.

Filed Apr. 30, 1971, Ser. No. 138,899

Int. Cl. D01h 9/10

U.S. Cl. 57—53

7 Claims



An automatic spinning system has at least one spinning frame with opposite banks of spinning stations. A tractor carries a tender capable of randomly servicing the spinning stations. The tractor is mounted for back and forth movement between opposite ends of a track above the banks of spinning stations. The tender is mounted on the tractor for swinging movement about the ends of the spinning frame from one of the banks of spinning stations to the other bank when the tractor is at either of the opposite ends of its track. Thus, the tender patrols the stations as it travels in one direction along a continuous path about the banks of spinning stations, and is capable of randomly servicing the spinning stations. Either a broken strand of yarn or a full bobbin at a station requiring servicing is sensed by operating mechanism for stopping the tender in servicing orientation with the station requiring servicing, whereupon the tender doffs the bobbin from the station spindle and donns an empty bobbin and starts the strand winding onto the empty bobbin. Empty bobbins are conveyed to the tender and filled bobbins are conveyed from the tender as they are doffed. If desired, the tender may be equipped with a system for ridding the spinning frame of lint.

3,735,577

## TEXTILE APPARATUS WITH BRAKING ARRANGEMENT

Denys William Brough, and Douglas Gibbons, both of Macclesfield, England, assignors to Ernest Scragg &amp; Sons Limited, Macclesfield, England

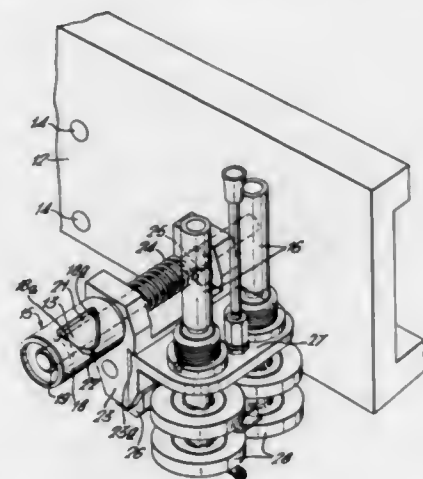
Filed Apr. 21, 1971, Ser. No. 135,949

Claims priority, application Great Britain, Apr. 22, 1970, 19,237/70

Int. Cl. D01h 7/22

U.S. Cl. 57—89

3 Claims



In a yarn processing machine having multiple yarn twisting apparatuses, each apparatus is carried on a bearing plate releasably and adjustably secured to a slide block. Each slide block is mounted on slides projecting laterally from a beam of

the machine frame, and a cam mechanism on the slide provides for moving the block to bring a wharve of the yarn twisting apparatus into or out of contact with a driving belt.

3,735,578

## SPINNING RING

Andrew J. Wayson, Needham, and John T. O'Connell, Medfield, both of Mass., assignors to Merriman, Inc., Hingham, Mass.

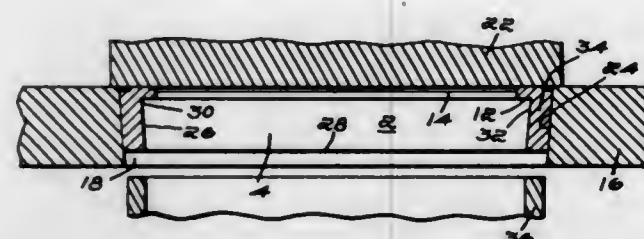
Division of Ser. No. 88,262, Nov. 10, 1970, Pat. No. 3,676,917.

This application May 8, 1972, Ser. No. 250,880

Int. Cl. D01h 7/52

U.S. Cl. 57—119

4 Claims



A powdered metal spinning ring in which the ring, after being initially formed in a press and sintered is then compressed circumferentially to taper the ring body so that the inner wall is in the form of an inverted truncated cone. The exterior of the ring is then machined in conventional manner after which the ring is heat treated and polished to be ready for use in a spinning frame.

3,735,579

## TWINE

Peter V. Catlos, Huron Park, Ontario, Canada, assignor to Ferplas Industries Limited, Huron Park, Ontario, Canada

Filed Nov. 5, 1970, Ser. No. 87,295

Int. Cl. D02g 3/02, 3/04, 3/08

U.S. Cl. 57—155

10 Claims



A twine having a maximum knot strength of 10 percent higher than the knot strength of earlier twines comprising a core of extensible, synthetic, plastic filaments with an extensible cover wound about said core is achievable by twisting together a resilient synthetic (particularly, polypropylene and also polyolefin, an acrylic resin, nylon, polymers of halogenated hydrocarbons, polyesters or similar resinous materials having high tensile strength and resiliency in the direction of orientation with breaking tenacity of 3.5-7 gpd.) film oriented in the longitudinal direction and an extensible paper such as Kraft or tissue type having a stretch in the machine direction of 4 percent or more. The paper and film components of the twine disclosed may be reinforced with synthetic filament yarn.

3,735,580

## CLOCK

Riccardo Giuseppe Nava; Giorgio Augusto Romani; Duccio Soffientini; Aldo Rodolfo Subert; Alessandro Giuseppe Ubertazzi, and Peter Roman Vetter, all of Milan, Italy, assignors to Cohel-Compagnie d'Horlogerie et Electronique SA, Roveredo, Switzerland

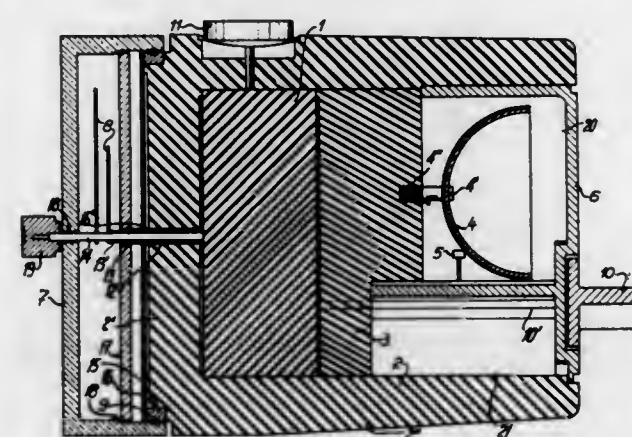
Filed May 31, 1972, Ser. No. 258,414

Claims priority, application Switzerland, July 5, 1971, 9875/71

Int. Cl. G04b 37/00

U.S. Cl. 58—53

4 Claims



A clock has a clockwork movement enclosed in a soundproof case of expanded plastic material having a substantially non-porous smooth outer surface and a sponge-like inner cellular structure. The dial and hands and, possibly, a sonorous alarm are located outside the case.

3,735,581

## DAY-DATE CORRECTING DEVICE

Josef Fluck, and Roland Zaugg, both of Grenchen, Switzerland, assignors to A. Schild S.A., Grenchen, Switzerland

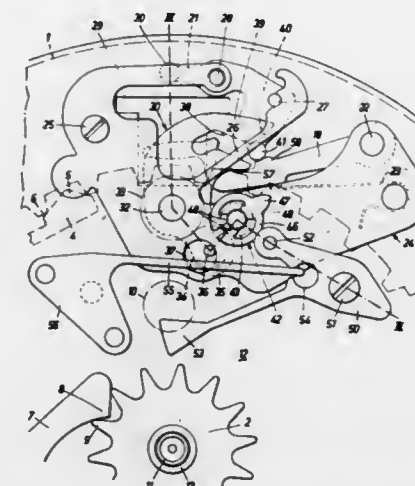
Filed Aug. 17, 1971, Ser. No. 172,464

Claims priority, application Switzerland, Aug. 19, 1970, 12400/70

Int. Cl. G04b 19/24

U.S. Cl. 58—58

1 Claim



The movement comprises a calendar correcting device independent of the mechanism automatically driving the calendar indicators. This device is controlled by the winding and hand setting stem having a third axial position for the calendar correction and it comprises a pinion driven by the stem when the latter is rotated in correcting position. The pinion carries a correcting member driving the calendar indicators. A frictional coupling provided between the pinion and the correcting member however permits the latter to stay at rest when the mechanism automatically driving the calendar indicators just engages the same.

3,735,582

## CALENDAR WATCH DAY-DATE DRIVING AND CORRECTING MEANS

Jean-Claude Schneider, La Chaux-de-Fonds, Switzerland, assignor to Fabrique d'Horlogerie Chs. Tissot et Fils S.A., Le Locle (Canton of Neuchatel), Switzerland

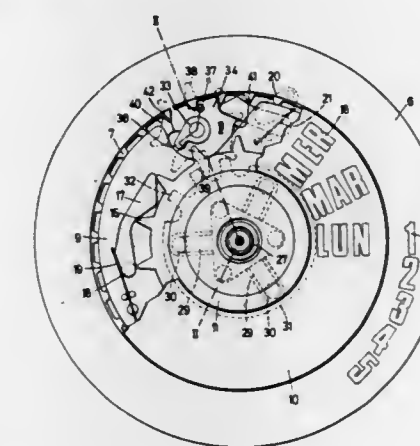
Filed Mar. 31, 1972, Ser. No. 240,118

Claims priority, application Switzerland, Apr. 16, 1971, 5566/71

Int. Cl. G04b 19/24

U.S. Cl. 58—58

9 Claims



Independent date and day setting of a calendar watch is effected by setting the watch hands to a predetermined time followed by to-and-fro rotational movements of a crown in its time setting position to set the date and by setting the watch to a different predetermined time followed by to-and-fro movement of the crown also in its time setting position to set the day.

3,735,583

## MECHANISM FOR HAND-SETTING AND WINDING

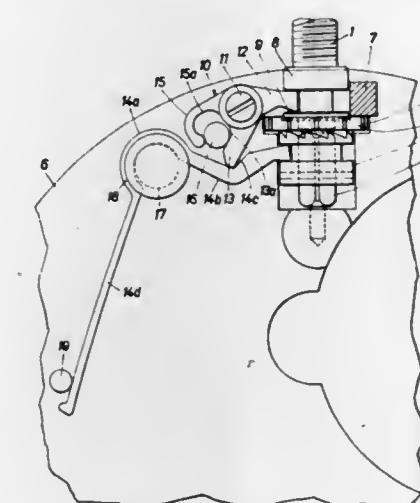
Peter Bachmann, Bettlach, Switzerland, assignor to Ebauches Bettlach S.A., Bettlach, Switzerland

Filed Dec. 21, 1971, Ser. No. 210,390

Int. Cl. G04b 27/04

U.S. Cl. 58—65

3 Claims



A device for setting the hands and for rewinding a watch. A setting lever is associated with an elastic arm in such a way that it is resiliently held in its two extreme positions. The resilient arm is blank in one piece with a lever spring and comprises an arcuate section engaging around a pin held by the watch frame. A flexible arm acting as a lever spring extends from one side of this arcuate member and the lever extends from the other side of the arm.



3,735,584

**SHOCK-RESISTANT WATCHCASE FOR A PORTABLE WATCH**

Ikuo Tokunaga, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

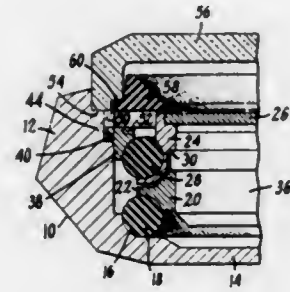
Filed Mar. 22, 1972, Ser. No. 237,037

Claims priority, application Japan, Mar. 26, 1971, 46/17290; Apr. 14, 1971, 46/23156

Int. Cl. G04b 37/00

U.S. Cl. 58—88 C

19 Claims



A shock-resistant structure for a portable watch includes a watch casing in which a watch movement is mounted by means of a pair of opposed support elements which engage the watch movement and a pair of shock-absorbing rings made of a resilient material which are disposed between each of the support elements and the watch casing. The various elements are secured in place in the watch casing by a retaining member which is removably attached to the watch casing.

3,735,585

**WATER-PROOF WRIST WATCH CASE HAVING NON-CIRCULAR GLASS PROFILE**

Tooru Takagi, Kokubunji, Japan, assignor to Orient Watch Co., Ltd., Tokyo, Japan

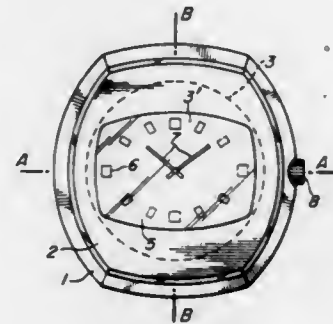
Filed June 23, 1971, Ser. No. 156,011

Claims priority, application Japan, Nov. 13, 1970, 45/112696

Int. Cl. G04b 37/08

U.S. Cl. 58—90 R

5 Claims



A watch glass having a non-circular glass element laminated on an ordinary round glass element. The watch glass is placed on a main body of the watch case with an O-ring interposed therebetween and a rim member having an inner profile complementary to the profile of said non-circular glass element is force-fitted over the main body of the case to surround said non-circular glass element, whereby the non-circular glass element only of the watch glass is exposed to the surface of the watch case.

3,735,586

**HAIRSPRING ASSEMBLY FOR OSCILLATOR**

Jean-Claude Berney, Lausanne, Switzerland, assignor to Bernard Golay S.A., Lausanne, Switzerland

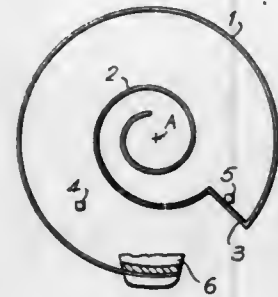
Filed Sept. 25, 1972, Ser. No. 292,170

Claims priority, application Switzerland, Sept. 27, 1971, 13976/71

Int. Cl. G04b 17/06

U.S. Cl. 58—114

6 Claims



An assembly comprising a generally spiral hairspring intended for attachment to an oscillating element which is subject to the action of an electromagnetic arrangement synchronizing its frequency with that of a pilot frequency. The turns of the hairspring are divided into two groups or sections, one external group or section of at least one turn and one internal group or section. The groups or sections are connected to each other by a section of hairspring substantially radially disposed with respect to the axis of the hairspring. Two banking stops are provided and so arranged that the radial section, on moving between the stops, encounters them as soon as the angle of oscillation exceeds the limit fixed by the stops.

3,735,587

**ENGINE EXHAUST TURBINE INLET SCREEN**

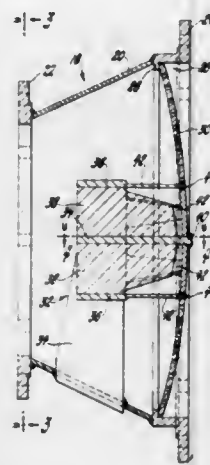
Albert N. Addie, La Grange Park, and Glenn W. Freitag, Woodridge, both of Ill., assignors to General Motors Corporation, Detroit, Mich.

Filed May 6, 1971, Ser. No. 140,801

Int. Cl. F02b 37/04

U.S. Cl. 60—13 R

3 Claims



An engine exhaust turbine inlet screen exposed in normal operation to substantial variations in exhaust gas temperatures is supported in the exhaust gas flow path by a bracket connected with the central portion of the screen by a combination of stiff and flexible portions of minimum mass. The arrangement provides free expansion of the screen, minimizing of internal stresses due to heat transfer between the screen and bracket and isolation of residual stresses due to heat transfer to the small central portion of the screen.

3,735,588

**HEAT EXCHANGER LEAKAGE BAFFLE AND POSITIONING MEANS**

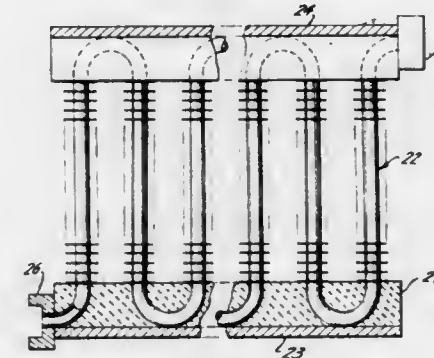
Seymour Moskowitz, Fort Lee, and Joseph A. Horvath, Lodi, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed July 21, 1971, Ser. No. 164,776

Int. Cl. F02c 7/10; F28f 1/00

U.S. Cl. 60—39.51 R

6 Claims



A heat exchanger comprising serpentine finned tubes disposed in an annular configuration, with means for positioning and supporting the unfinned return bends of the tubing with a porous refractory composition in such a manner as to prevent the external heat transfer fluid from bypassing the finned portions and to prevent leakage of hazardous internal fluid from the tubes, while allowing movement of the tubing in thermal expansion.

3,735,589

**WALLS OF COMBUSTION CHAMBERS**

Jacques E. J. Caruel, Dammarie-les-Lys; Jean-Pierre J. E. Castellat, Chartrettes; Simone Coutor, Melun, and Armand Jean-Baptiste Lacroix, Itteville, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

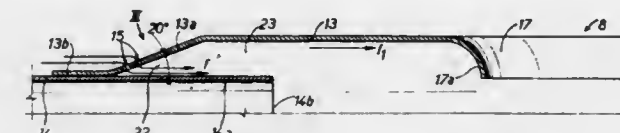
Filed June 1, 1971, Ser. No. 148,715

Claims priority, application France, June 2, 1970, 7020243

Int. Cl. F02g 1/00

U.S. Cl. 60—39.65

5 Claims



A combustion chamber mounted in a flow of air at high pressure and the wall of which is provided with dilution holes located in the path of a cooling air film derived from the said flow through holes provided at a substantially truncated junction connecting an upstream wall element with a downstream wall element offset relative to the upstream element towards the outside of the chamber, wherein the upstream wall element is extended rearwardly of this junction by means of a tongue substantially parallel to the rear element, and wherein this junction has an inclination between 15° and 25°, preferably about 20°, the holes are arranged in zig-zag very near the upstream element so as to provide in the downstream direction a divergent portion of unperforated wall of substantial length, and the dilution holes are surrounded by flanges projecting into the combustion chamber.

3,735,590

**HYDROSTATIC REVERSIBLE DRIVE**

Gerhard Bobst, Oensingen, Switzerland, assignor to Von Roll AG, Gerlafingen, Switzerland

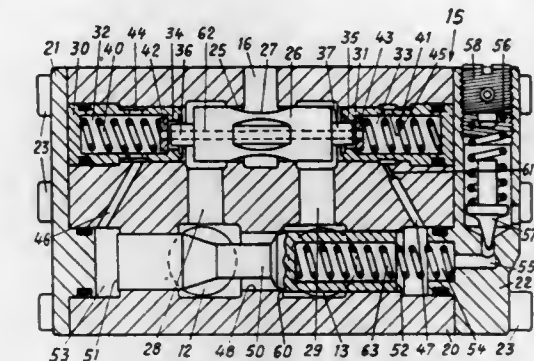
Filed June 10, 1971, Ser. No. 151,721

Claims priority, application Switzerland, June 26, 1970, 9735/70

Int. Cl. F15b 15/18

U.S. Cl. 60—468

12 Claims



A source of hydrostatic pressure is connected to a reversible hydraulic motor over a pair of pressure lines, selectively carrying high or low pressure; a controllable pressure limiting valve is connected to the lines, and having an output connected to a drain. The controllable pressure limiting valve includes a main piston operating in a piston chamber, a settable pilot valve unit, an interconnecting line connecting fluid under line pressure to the settable pilot valve unit and a drain valve unit having a movable drain control piston connecting the interconnecting line with the side of the main piston to which the higher pressure is applied, the arrangement permitting direct drain connection of either of the pressure lines to the drain with a minimum of parts or external interconnections.

3,735,591

**MAGNETO-PLASMA-DYNAMIC ARC THRUSTER**

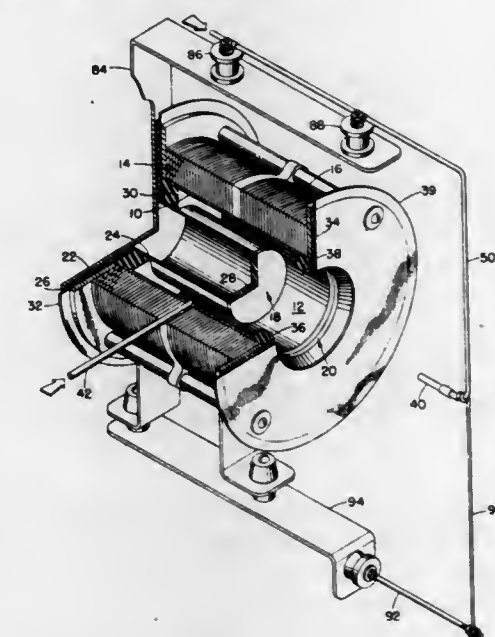
James A. Burkhardt, Olmsted Falls, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 30, 1971, Ser. No. 175,852

Int. Cl. F03h 5/00

U.S. Cl. 60—202

10 Claims



Improving the performance of a magneto-plasma-dynamic arc thruster in the 600 to 2,100 seconds specific impulse range by locating its cathode in the exhaust beam downstream of the anode and main propellant injection point.



3,735,592

**APPARATUS FOR PROTECTION OF A GAS JET GENERATOR**

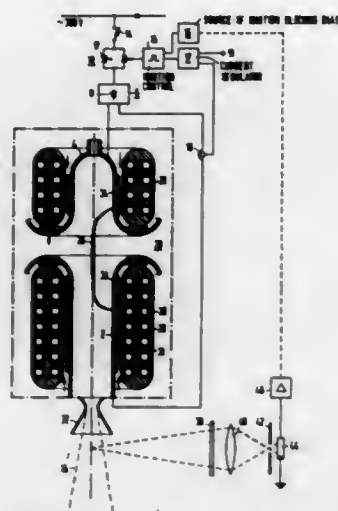
Gerd Schafer, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin/Munich, Germany  
Filed Oct. 29, 1970, Ser. No. 85,118

Claims priority, application Germany, Nov. 3, 1969, P 19 55 147.4

Int. Cl. H05b 7/06

U.S. Cl. 60-203

13 Claims



A gas jet generating apparatus has a container with an electric arc chamber from which the gas jet is to issue, two arc electrodes are provided in the chamber, and at least one of the electrodes has a metallic portion defining a foot-point locality for the arc. The combination of a protective device has near at least one of the electrodes, a vaporizable means of material different from that of said electrode portion so as to effect, when burning off, a change in spectral distribution of the gas jet. Also provided is a signal generating arrangement that is responsive to the spectral distribution for deriving a signal from the change.

3,735,593

**DUCTED FANS AS USED IN GAS TURBINE ENGINES OF THE TYPE KNOWN AS FAN-JETS**

Alan Raymond Howell, Cove, Farnborough, England, assignor to Minister of Aviation Supply in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

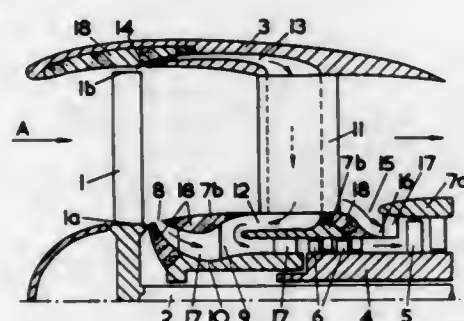
Filed Feb. 11, 1971, Ser. No. 114,469

Claims priority, application Great Britain, Feb. 11, 1970, 6498/70

Int. Cl. F02k 3/04

U.S. Cl. 60-226

14 Claims



A ducted fan having more than one blade row has bleed means adjacent the tips of the blades in at least one upstream blade row. The bleed means are preferably connected by passages to a compressor, the compressor being separate from but driven by a gas generator with which the ducted fan is combined to provide a fan jet engine. Alternative forms of the invention also have bleed means adjacent the roots of the blades in at least one upstream blade-row, and there may also be bleed means adjacent the trailing edges of the blades in such rows.

3,735,594

**SCAVENGER SYSTEM FOR INDUSTRIAL ENGINES**

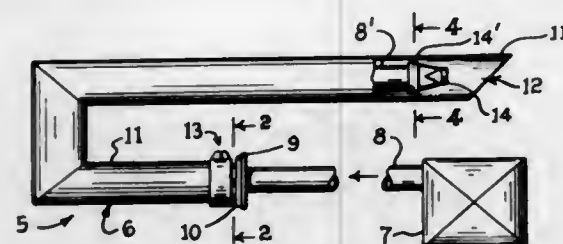
James D. Johnson, and Lauren C. Edwards, Sr., both of Box 898, Pecos, Tex.

Filed May 17, 1971, Ser. No. 143,806

Int. Cl. F01n 5/04

U.S. Cl. 60-319

7 Claims



An exhaust scavenger system associated with industrial internal combustion engines for scavenging the atmosphere in vicinity of the engine and transporting any combustibles to a remote location. The system includes an elongated tubular housing having a concentrically arranged exhaust pipe affixed therein, with means for regulating the mass flow of gases ingested through the annulus formed between the exhaust pipe and its housing.

A gas deflector means is affixed to the terminal end of the exhaust pipe and located within the housing so as to increase the efficiency of the scavenging action of the apparatus.

3,735,595

**REINFORCED SOIL BRIDGE**

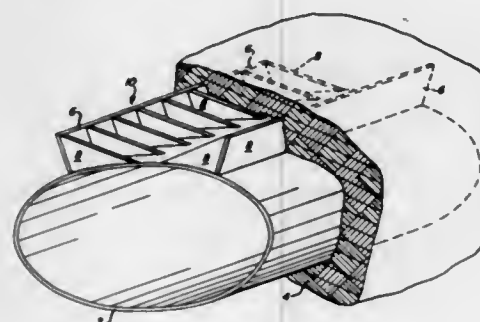
Reynold K. Watkins, Logan, Utah, assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 29, 1971, Ser. No. 193,727

Int. Cl. F16l 9/04

U.S. Cl. 61-16

7 Claims



The structure of the invention is particularly useful in building reinforced soil arch bridges having relatively long transverse axial spans in the range of 30 feet or more. Structure includes a substantially cylindrical liner of relatively thin wall corrugated metal sheet. The structure is characterized by the provision of one or more open-top bins disposed along the upper surface of the liner. Earth-fill is compacted in layers in the bins and around the liner. The bins serve to confine and thus reinforce and strengthen the compacted earth-fill so that a reinforced soil bridge is formed. The bins also serve as stiffeners for the liner.

3,735,596

**VALLEY CLOSURE FOR A ROOF CONSTRUCTION**

Fred J. Stephenson, Lawrence, Kans., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed July 26, 1971, Ser. No. 164,803

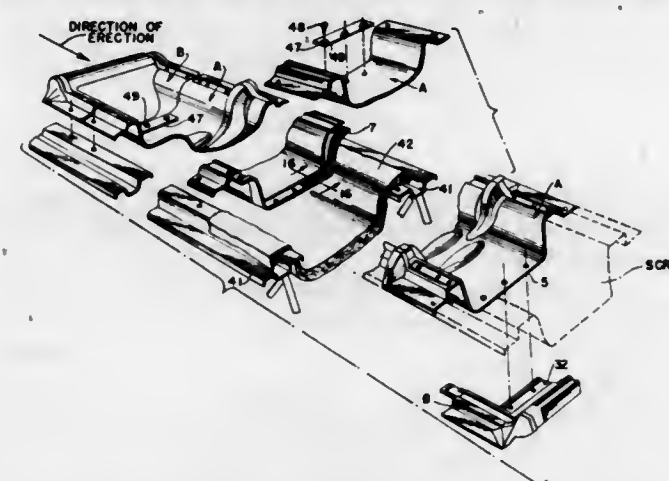
Int. Cl. E04d 13/06

U.S. Cl. 61-14

14 Claims

A valley closure for a roof construction for covering the valley formed where two adjacent sloped roof buildings drain toward one another, including interconnected valley covering

panel members and opposite valley closing end members, the panel members are elongated and have upstanding protuberances arranged in sets at regularly longitudinally spaced locations along the panel members with such protuberances having such extent transversely of and longitudinally of the panel members as to enhance the structural strength thereof and to



constitute a series of effective expansion joints at such locations to relieve internal stresses in the material of the panels caused by thermal expansion and contraction of the panel material. Each set of protuberances includes portions spaced apart sufficiently to provide an adequate drain passage along the valley closure. The panel and end closure members can be of molded plastic materials.

3,735,597

**HINGE SYSTEM FOR OFFSHORE STRUCTURE**

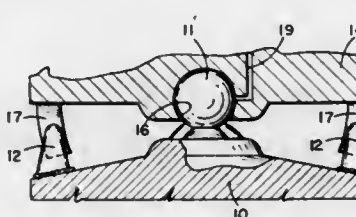
Arthur L. Guy, Houston, Tex., assignor to Esso Production Research Company, Houston, Tex.

Continuation of Ser. No. 53,049, July 8, 1970. This application Feb. 24, 1972, Ser. No. 229,155

Int. Cl. E02b 17/00; E02d 27/04; F16c 11/06

U.S. Cl. 61-46.5

9 Claims



A hinge for use in a buoyant articulated off-shore platform. The hinge connects two members in a manner which permits rotation of one member relative to the other member through vertical planes while preventing horizontal rotation of the members relative to each other. The hinge is made up essentially of two parts: (1) a ball and socket joint and (2) torque elements arranged about the ball and socket joint.

3,735,598

**DIVER'S BELT AND METHOD OF MANUFACTURE**

Ernest N. Oeland, Jr., San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 9, 1971, Ser. No. 206,249

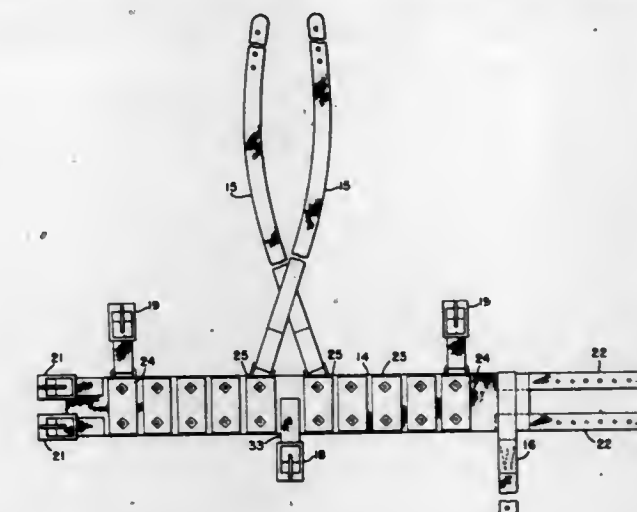
Int. Cl. B63c 11/02

U.S. Cl. 61-70

3 Claims

A method of manufacturing articles from webbing includes the steps of impregnation of selected areas with urethane under hydrostatic pressure and forming fastening apertures in the impregnated areas. The method is particularly useful in the fabrication of a diving weight belt for use with helmet, or

hard hat, diving equipment. The belt made according to the method is a new and useful article having improved salt water



deterioration resistant properties and added strength especially around the fastening apertures.

3,735,599

**PROCESS FOR AUTOMATIC CONTROL OF AIR SEPARATION APPARATUS**

Tetsuo Izumichi, Takarazuka; Sadayuki Nakanishi, and Matsuzi Miyazaki, both of Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe-shi, Hyogo-ken, Japan

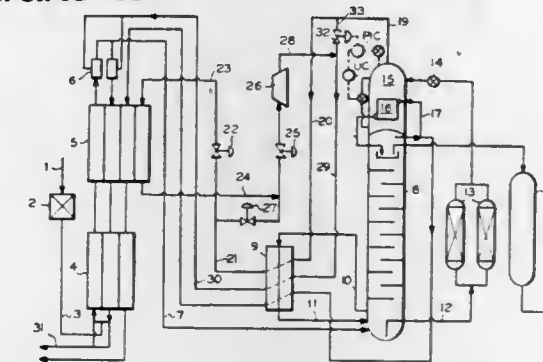
Filed Jan. 8, 1971, Ser. No. 104,986

Claims priority, application Japan, Jan. 9, 1970, 45/2800

Int. Cl. F25j 3/00, 3/02, 3/04

U.S. Cl. 62-21

3 Claims



In an air separation apparatus which comprises a reversing heat exchanger, an air liquefier, a single column rectifier provided with a condenser-evaporator and a cold generation device and wherein air is cooled in the reversing heat exchanger and liquefied in the air liquefier, the liquefied air is rectified in the single column rectifier to separate into liquid air abundantly containing oxygen and highly pure nitrogen gas, the liquid air being subjected to heat exchange in the condenser-evaporator, the resulting gasified air being subjected to heat exchange in the air liquefier and sent through the reversing heat exchanger to the cold generation device and the resultant liquefied air being sent through the air liquefier and the reversing heat exchanger to release, a process for controlling the generation of cold which is characterized in that a by-pass channel is provided for communicating a position on a passage between the condenser-evaporator and the air liquefier and a position on a passage between the cold generation device and the air liquefier, a control valve is provided on the by-pass channel and the opening degree of the control valve is automatically controlled so as to regulate appropriately the flow volume of the gaseous air passing through the by-pass channel whereby the level of the liquid air in the condenser-evaporator is kept constant and the rectification of the liquefied air in the single column rectifier is carried out under stable conditions.



3,735,600

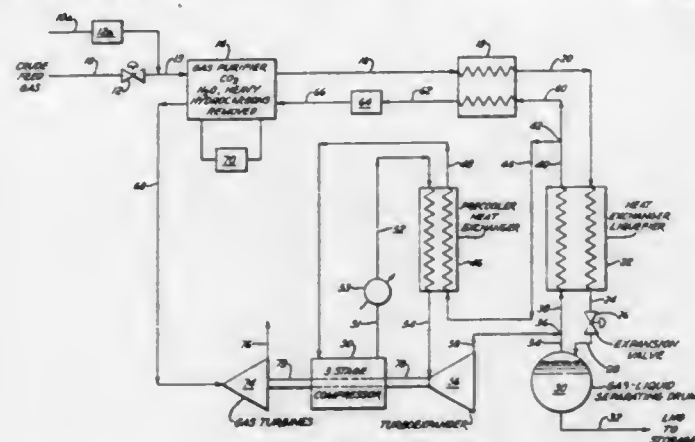
## APPARATUS AND PROCESS FOR LIQUEFACTION OF NATURAL GASES

Stewart Harold Dowdell, Oakmont, Pa., and Robert W. Pachaly, Greenwich, Conn., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed May 11, 1970, Ser. No. 36,277  
Int. Cl. F25j 1/00, 1/02, 3/06

U.S. Cl. 62-39

13 Claims



A process and apparatus for liquefaction of natural gas wherein the gas is cooled and liquified under pressure in a heat exchanger-liquifier. The pressurized cold liquid from the heat exchanger-liquifier is isenthalpically expanded to reduce the pressure and further cool the liquid while at the same time flashing a minor gas fraction. Refrigeration for the liquefaction of the natural gas is supplied by a circulating refrigerant stream which is compressed and work-expanded to obtain the necessary cooling. The minor flash gas portion of the liquefaction step is comingled with the circulating refrigerant stream so that the analysis of the refrigerant stream is always rich in the lighter portions of the liquefaction stream. This analysis difference aids in maintaining refrigeration temperature differentials to drive the liquefaction step. The work-expanded refrigerant portion undergoes a compression cycle and is work-expanded in an expansion turbine. The expansion turbine furnishes at least part of the power necessary to drive the compressor system in the refrigerant gas cycle.

3,735,601

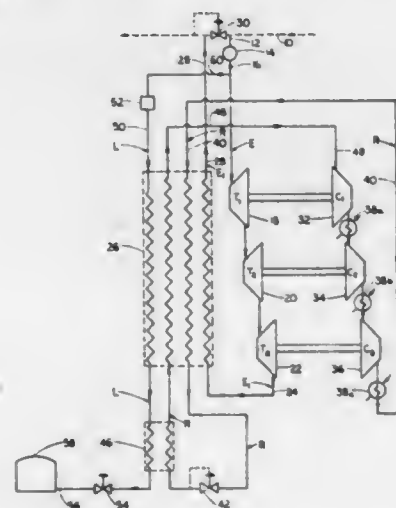
## LOW TEMPERATURE REFRIGERATION SYSTEM

James H. Stannard, Jr., 583 Tarragon Drive, San Rafael, Calif.

Filed July 16, 1971, Ser. No. 160,024  
Int. Cl. F25b 9/00

U.S. Cl. 62-87

7 Claims



A refrigeration system in which a pressurized gas provides the energy. The gas is expanded through an expansion engine

and then passed through a heat exchanger, wherein the refrigeration effect resulting from its expansion is recovered. The expansion engine operates a conventional closed loop refrigeration system which is, in turn, cascaded through the low temperature gas discharging from the expansion engine. Prior to being cooled by the low temperature gas, the refrigeration cycle may also reject heat at a higher temperature to any suitable cooling medium. The invention is particularly suited for the liquefaction of natural gas or for low temperature separation of gas constituents.

3,735,602

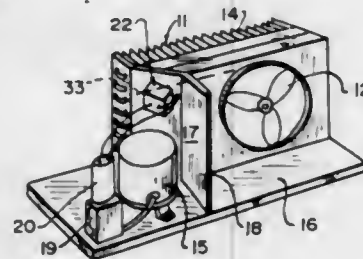
## AIR CONDITIONER CONDENSING SYSTEM CONTROL

Robert W. Ramsey, Nashville, Tenn., assignor to Heil-Quaker, Lewisburg, Tenn.

Filed Apr. 12, 1971, Ser. No. 133,276  
Int. Cl. F25b 39/04

U.S. Cl. 62-184

14 Claims



An air conditioner condensing system control having a motor driven means for flowing cooling air in heat transfer association with a condenser thereof. The operation of the motor is controlled by a resistance means in series therewith and disposed in heat transfer association with the air flowed by the air flowing means. The control means further includes means for providing an adjustable additional voltage to the motor for modulating the speed thereof. The additional voltage supply means may comprise an inexpensive gated control element adapted to control only a portion of the total maximum power supply voltage to the motor. Means are provided for sensing the temperature of the condenser at a liquid-gas interface therein for controlling the gated control element.

3,735,603

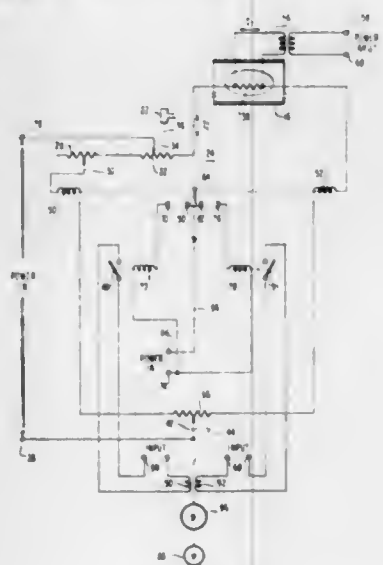
## LIQUID REFRIGERANT FEED CONTROL

Clark B. Hamilton, Hartford, Conn., assignor to Dunham-Bush, Inc., Hartford, Conn.

Filed Aug. 12, 1971, Ser. No. 171,081  
Int. Cl. F25b 41/00

U.S. Cl. 62-210

2 Claims



The quality of the suction gas at the input of a variable capacity compressor in a refrigeration system is controlled by

3,735,604

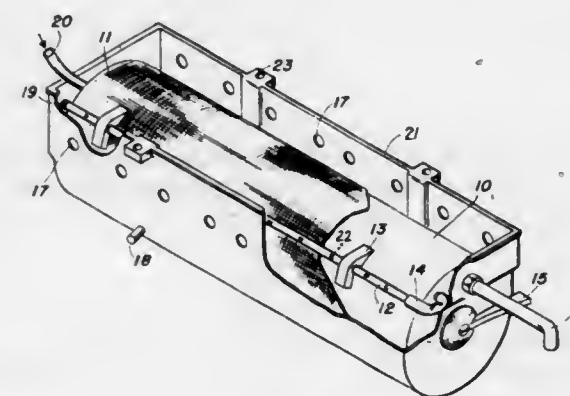
## EVAPORATIVE WATER COOLER

Jaromir Astl, 626 Circle Drive East, Solana Beach, Calif.

Filed July 2, 1971, Ser. No. 159,354  
Int. Cl. F28d 5/00

U.S. Cl. 62-316

4 Claims



A device using the principles of evaporative cooling is used to cool water purified by a water purifier based on reverse osmosis technology. The outside surfaces of the existing water purifier is covered by a sleeve of porous material. This assembly is installed in a container having numerous holes in its walls to provide for air circulation. The waste water produced by the purifier is continuously discharged so as to wet the porous sleeve. Excess waste water accumulates in the bottom of the container and upon reaching a predetermined level is discharged to the drain. Water evaporating out of the sleeve removes heat and therefore cools down the sleeve-purifier assembly and the purified water contained within.

3,735,605

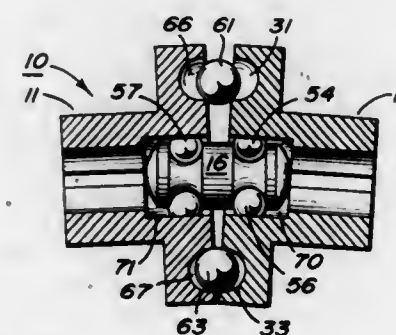
## COUPLING

John T. Hoffman, 1604 E. Greenleaf Street, Allentown, Pa.  
Filed Nov. 29, 1971, Ser. No. 202,819

Int. Cl. F16d 3/16

U.S. Cl. 64-6

7 Claims



A novel coupling permits a driving shaft to drive a driven shaft though the two shafts are not exactly coaligned. Each of

a pair of housings has a keyed passageway for receiving its respected shaft. A double circumferentially grooved member rests within the passageways of the housings, one groove of the member being reposed within one of the housings, respectively. Each of three ball bearings is urged against one of the grooves of the member by a corresponding spring held by a corresponding set screw within one of the housings. Similarly, three ball bearings are urged against the other groove of the member by separate springs and set screws in the other housing. The outer diameter of the member is less than the inner diameter of the housings so that the member can rotate; however, the spring biased ball bearings assure that the housings cannot move axially with respect to each other.

Each housing has a plurality of pockets (e.g., four) for receiving corresponding ball bearings therewithin. The pockets are located at the central face of the housing. The ball bearings engage the pockets of the two housings. The ball bearings are larger than the pockets so that the driving housing drives the driven housing via the ball bearings. In essence, the member with its associated ball bearings restricts axial movement of the housings, while the ball bearings at the face of the housings enable the driving housing to drive the driven housing though the housings are not exactly coaligned.

3,735,606

## METHOD AND APPARATUS FOR THE PRODUCTION OF TEXTILE FABRICS AND THE FABRIC PRODUCED THEREBY

Derek Pollard, Blackburn, England, assignor to Singer Company, (U.K.) Limited, London, England

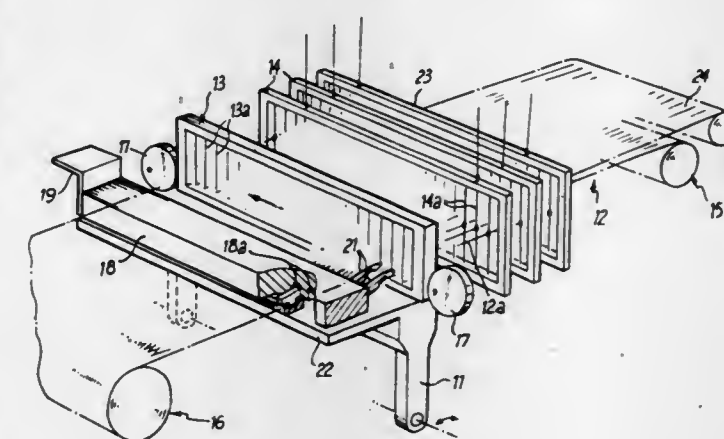
Filed Feb. 1, 1971, Ser. No. 111,270

Claims priority, application Great Britain, Feb. 3, 1970, 5,154/70

Int. Cl. D04b 35/00

U.S. Cl. 66-1

17 Claims



A textile fabric is produced by employing both weaving and knitting techniques simultaneously. The weftwise extending yarns of the fabric are formed by knitting together, within a shed, adjacent loop forming yarns present in such shed and extending in the direction of the warp yarns by needles which are caused cyclically to move into and out of the shed through the sheet of warp yarns, the loop forming yarns being shifted laterally relative to the needles for engagement with respective such needles and the needles being co-operable with different loop forming yarns on successive insertions through the sheet of warp yarns for stitch formation. The co-operation of the needles with different loop forming yarns on successive insertions is achieved by a relative transverse movement of such yarns and the needles.



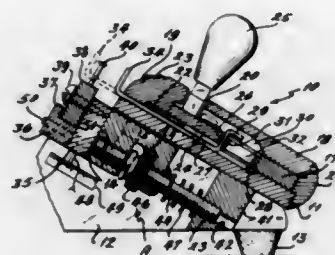
3,735,607

## KNITTING APPARATUS

George K. Jeney, 7024 Southlane, Apt. B, St. Louis, Mo.  
Filed July 21, 1971, Ser. No. 164,611  
Int. Cl. D04b 7/00

U.S. Cl. 66-60

5 Claims



A knitting apparatus for use by individuals and especially such apparatus for hand operation. The present apparatus incorporates means making it easily adjustable to accommodate different thickness of yarns and patterns for the work pieces.

## ERRATUM

For Class 66-104 see:  
Patent No. 3,735,812

3,735,608

## YARN TENSIONING DEVICE FOR CIRCULAR KNITTING MACHINES AND THE LIKE

Giorgio Billi, Firenze, Italy, assignor to G. Billi & C. S.p.A., Firenze, Italy

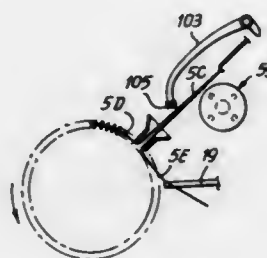
Filed Feb. 4, 1971, Ser. No. 112,694

Claims priority, application Italy, Feb. 10, 1970, 9359 A/70

Int. Cl. D04b 15/44

U.S. Cl. 66-125 R

9 Claims



Apparatus used with a circular knitting machine having a rotary needle cylinder to yieldingly tension the starting end of a yarn knit upon the needles of the machine, the apparatus comprising, a first radially movable hook to engage the yarn extending between a few needles temporarily anchoring the yarn and yarn guide feeding the yarn at a first knitting station, means to withdraw the first hook and the yarn through a tube disposed adjacent the needle circle, a second hook to engage the withdrawn yarn and to present it to a winding reel to be clamped therein and to be wound thereon as the yarn is released from the anchoring needles, then, as the yarn is knit by the needles, the winding reel, which is driven through a slip clutch coupling, exerts yielding tension upon the starting end of the yarn by slippage of the clutch and which also winds up and unwinds the starting end of the yarn as knitting proceeds around the revolving circle of needles. Upon completion of a stage of the knitting, the starting end of the yarn is anchored in the fabric by knitting the same upon a few needles at a second knitting station of the machine after which the yarn is severed.

3,735,609

## YARN BULKING APPARATUS

Larry N. Pearce, Oak Park, Ill., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

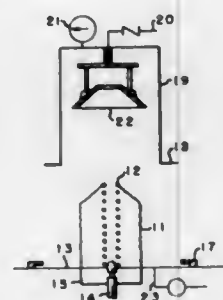
Division of Ser. No. 48,034, June 22, 1970, Pat. No. 3,702,492.

This application June 1, 1971, Ser. No. 150,944

Int. Cl. D06c 1/04

U.S. Cl. 68-5 C

2 Claims



Apparatus to bulk yarn in package form using a pressure chamber into which a nozzle is moved therein to steam and bulk the yarn package.

3,735,610

## DOOR LOCK FOR LAUNDRY APPARATUS

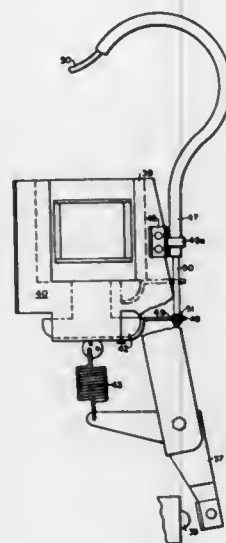
Clayton L. Haller, Mansfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 27, 1972, Ser. No. 221,183

Int. Cl. D06f 33/02, 39/14

U.S. Cl. 68-12 R

6 Claims



Door lock structure for washing machines having a multiple speed belt and pulley transmission to provide at least two rotative speeds for the clothes containing tub and means, such as a solenoid, for changing from one speed to the other. The lock is actuated during the relatively high speed rotation and is controlled by the same solenoid controlling the transmission. The lock structure is characterized by a rod-in-tube assembly, with one end of the rod attached to the armature of the solenoid and the other end attached to a blocking member which, when moved by energization of the solenoid, assumes a blocking position interfering with a latching mechanism to prevent manually moving the latching mechanism to an unlatching position, thereby insuring that the door remains locked during the high speed operation of the machine.

3,735,611

## TREATMENT BARREL

Claude Pillard, Lyon, France, assignor to Centre Technique Du Cuir, Lyon, France

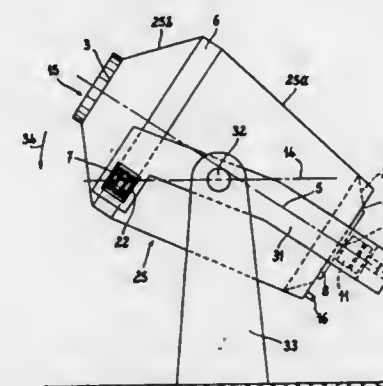
Filed Dec. 30, 1970, Ser. No. 102,601

Claims priority, application France, Apr. 1, 1970, 7011825; Dec. 4, 1970, 7044241

Int. Cl. C14c 1/00

U.S. Cl. 69-30

18 Claims



Rotary barrel for treating materials, notably hides and skins, adapted to be rotated about an axis tilted to provide an upper bottom and a lower bottom shell, the barrel being rotatably supported by a pair of rollers and driven by one of these rollers, which are disposed adjacent the upper bottom for engagement with a race-forming annular ring rigid with the barrel, the lower end of the barrel being provided with a swivel bearing coaxial thereto. The barrel may have a cylindrical, biconical or cylindro-conical configuration, and be provided with internal pins, studs or bars of straight or helical profile for carrying along the materials to be treated, a drain cock being provided near the outer edge of the lower bottom, possibly with a discharge aperture formed in the wall of revolution adjacent to said drain cock, and a loading aperture formed in the free upper bottom shell, perforated plate means near the bottom inner corner for protecting the drain cock from clogging, and possibly an arrangement of helical ribs whereby rotating the barrel in one direction will perform the treatment while rotating same in the opposite direction will cause the treated materials to be discharged therefrom.

3,735,612

## DOUBLE SPRING BOLT RE-KEYABLE PADLOCK

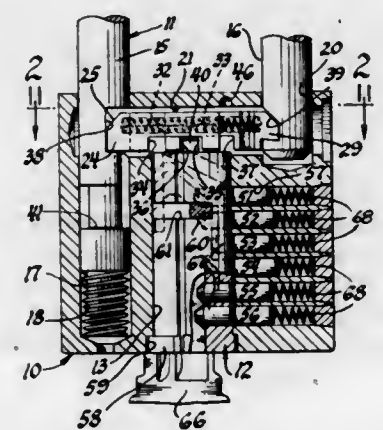
Arcadia Popovici, 211 Currier, Almont, Mich.

Filed June 28, 1971, Ser. No. 157,304

Int. Cl. E05b 67/22

U.S. Cl. 70-38 A

2 Claims



A padlock having a body and a pair of latch members in the body which are spring biased into a locked position to hold a padlock shackle in the locked position and which are moved to the unlocked position by a cam member on a key plug. Passage means are provided in the lock construction, and including the latch members, for the reception of a retainer member capable of retaining the outer tumbler pins in the

body and for retaining the latch members in the unlocked position to permit the key plug to be removed and the lock re-keyed.

3,735,613

## RETRACTABLE DOOR HANDLE AND LOCK

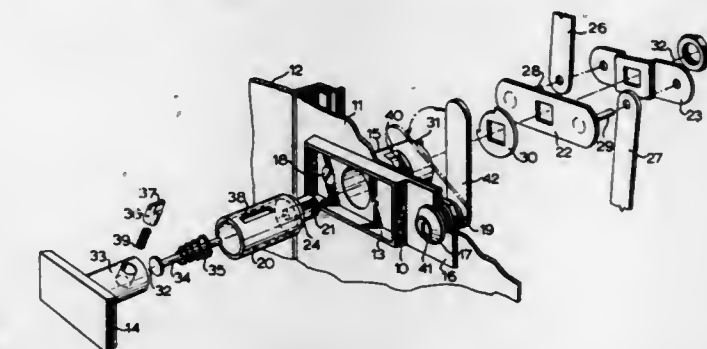
Howard Diebel, Jordan Station, Ontario, and Albert De Man, Vineland, Ontario, both of Canada, assignors to Moyer Diebel Limited, Jordan Station, Ontario, Canada

Filed Mar. 22, 1971, Ser. No. 126,763

Int. Cl. E05b 5/04

U.S. Cl. 70-208

6 Claims



A retractable door handle, especially suited for vending machines to prevent forcing of the door while locked, is mounted for movement between a retracted position and an extended operative position. A spring urged latch retains the handle in the retracted position when it is moved into that position. A key operated lock is mounted displaced from the handle and includes a latch-releasing member which can be moved upon insertion of the key to unlatch the handle latch, whereupon the handle is moved by a spring to the extended position to be grasped by an operator.

3,735,614

## CYLINDER LOCK

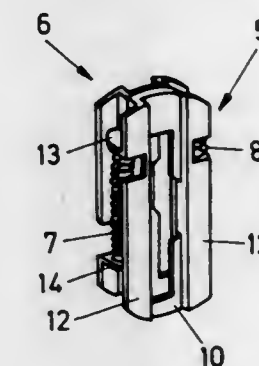
Ernst Keller-Volper, 6 Querstrasse, 8805 Richterswil, Switzerland

Filed Dec. 14, 1971, Ser. No. 207,834

Int. Cl. E05b 15/14

U.S. Cl. 70-377

9 Claims



A cylinder lock for an insertable profile key having a cylinder core with tumbler assemblies each composed of displaceable plate members mounted back to back for slidable movement in a direction perpendicular to the longitudinal axis of the cylinder core, each tumbler assembly being inserted into a respective slot in the cylinder core, the plate members being urged into recesses in an external cylinder housing by helical compression springs. Each plate tumbler is provided with a central portion which is U-shaped in cross-section, and outwardly protruding flanges are attached to the arms of the U-shaped portion, the outer surfaces of each flange of each tumbler assembly slidably abutting against the walls of the slot in the cylinder core. The outer surfaces of the central bridges of the U-shaped portions of the tumbler plates of each as-



sembly slidably abut against each other and at least one helical compression spring for each tumbler assembly is arranged in a channel defined by opposed flanges of the tumbler plates of each assembly, the spring engaging a tongue bent from each flange.

3,735,615

# METHOD OF MAKING GROOVES ON SURFACE OF ARTICLES AND DEVICE FOR ITS REALIZATION

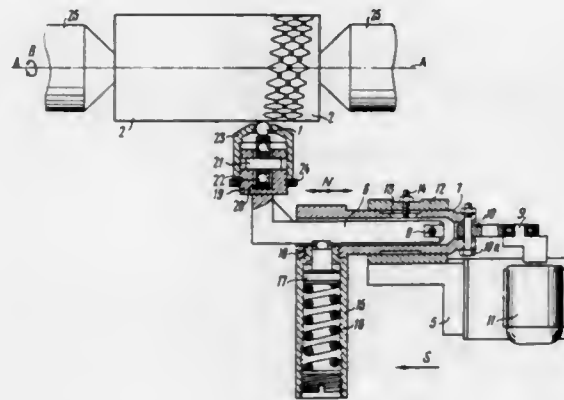
Jury Gdallevich Shneider, prospekt Stachek, 134, kv. 19, Leningrad, U.S.S.R.

Filed May 19, 1970, Ser. No. 38,739

Int. Cl. B44b 5/00

U.S. Cl. 72-75

11 Claims



The machining of the surfaces of articles for making grooves intended to retain liquid or gaseous media used for lubrication or as an interlayer to the devices for the realization of these methods, and to the articles machined by these methods.

Most successfully the invention can be used in machining the surfaces of cylinder liners, pistons and the walls of the holes in the pistons for the piston pins in internal combustion engines and in machining sliding and rolling contact bearings, spinning machine rings, and gauge blocks.

No less successfully this invention can be used for machining the reflectors of heating appliances, fountain pen caps, various vessels and articles of jewelry, because the network of grooves forms an attractive ornamental pattern.

The method consists in forcing at least one spring-loaded spherical deforming member into the surface layer of the article. The machined surface of the article and the deforming member move at an angle to each other and the motion of at least one of them is either reciprocating or rotary.

In the various forms of the device, the deforming member is mounted in a holder which reciprocates and moves progressively with relation to the rotating article holder or rotates with relation to the progressively moving article holder.

3,735,616

# METHOD OF AND APPARATUS FOR CORRUGATING TUBING

James Arthur Francis Donelan, Alresford, England, assignor to Pirelli General Cable Works Limited, London, England

Filed Oct. 19, 1970, Ser. No. 82,048

Claims priority, application Great Britain, Nov. 27, 1969, 58,100/69

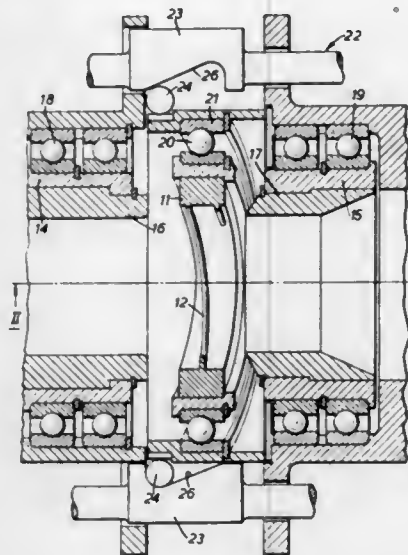
Int. Cl. B21d 13/00

U.S. Cl. 72-77

5 Claims

In an apparatus for corrugating metal tubing, such as an electric cable sheath, the working ridge which bears against the tubing to corrugate the tubing is of a material having a modulus of elasticity lower than that of the tubing-metal. Both

the material of the working ridge and the material of bushes positioned either side of the corrugating ridge to support and



locate the tubing as it is moved axially through the apparatus are of low friction.

3,735,617

# ROLLING MILL

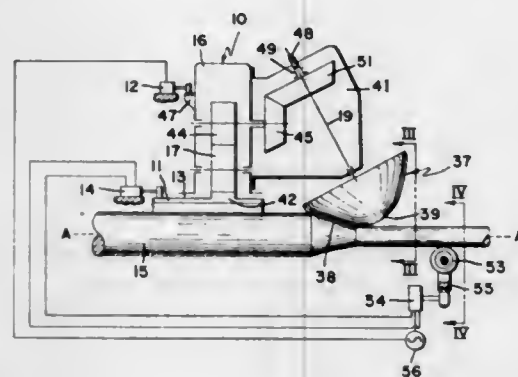
Erich Bretschneider, Buderich, Germany, assignor to Slemag Slegener Maschinenbau Gesellschaft mit beschränkter Haftung, Dahlbruch, Germany

Continuation-in-part of Ser. No. 749,178, July 31, 1968, abandoned. This application Oct. 19, 1970, Ser. No. 81,934

Int. Cl. B21b 13/20

U.S. Cl. 72-78

12 Claims



A rolling mill for attenuating elongated metal stock by the rolling method, wherein the rolls are rotated about axes substantially inclined to the direction of stock motion and are also rotated as a group about an axis through the center of the stock.

3,735,618

# METHOD AND APPARATUS FOR INTERNAL GEAR ROLLING

Elmer S. Zook, Princeton, Mass., assignor to Reed Rolled Thread Die Company, Holden, Mass.

Filed June 10, 1971, Ser. No. 151,743

Int. Cl. B21h 5/02

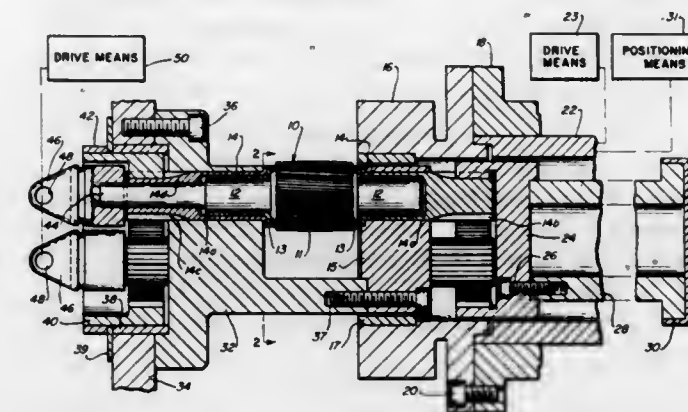
U.S. Cl. 72-91

11 Claims

Apparatus including generally cylindrical dies carried on parallel axes and positioned within a bore of a workpiece. Rotation of the dies and the workpiece concurrently with axial relative movement between the circumferential surface of the dies and the bore rapidly rolls internal gear teeth in the bore without waste of workpiece material. The dies preferably are radially displaced inwardly with respect to the axis of the bore prior to being withdrawn from the bore. The method of rolling

internal gear teeth includes positioning a plurality of cylindrical dies in generally parallel axial relationship within a bore of a workpiece, relatively angularly moving the exterior surface

roller having axially arrayed portions of mutually opposite conicity, or two separate rollers which are conical in mutually opposite direction. The single roll or the two rollers engage the cylindrical surface of the blank intermediate the



of the dies and the interior of the cylindrical opening, and relatively moving the workpiece and the dies into nesting relationship whereby the dies are disposed within the cylindrical opening in interlocking engagement.

3,735,619

# GEAR ROLL CHAMFERING

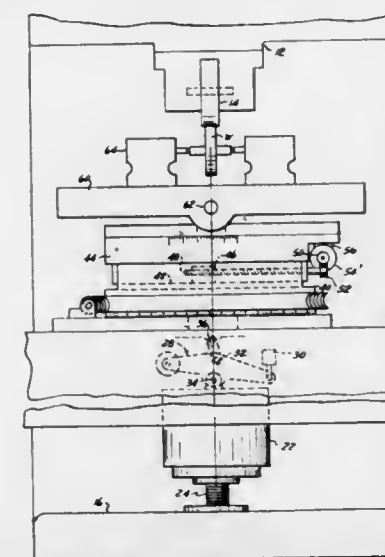
Richard W. Tersch, Grosse Pointe Woods, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Jan. 27, 1972, Ser. No. 221,357

Int. Cl. B21h 5/00

U.S. Cl. 72-98

9 Claims



Helical gears are rolled to improve tooth surfaces and in the same operation have the acute end corners of the teeth chamfered. The chamfering precedes finish rolling so as to avoid displacement of metal above the tooth profile.

3,735,620

# CRANKSHAFT ROLLING APPARATUS

Hans-Joachim Naumann, Wassenberg, Germany, assignor to Wilhelm Hegenscheldt Kommanditgesellschaft, Erkelenz, Germany

Filed Feb. 7, 1972, Ser. No. 223,892

Claims priority, application Germany, Sept. 21, 1971, P 21 46 994.3

Int. Cl. B21h 7/00

U.S. Cl. 72-107

10 Claims

A crankshaft blank, having a cylindrical surface to be rolled and at opposite axial ends of which there are crankshaft fillets, is held between two lever arms under pressure. The lever arms are associated with a pair of master cranks in such a manner that, when the master cranks are rotated, the lever arms move correspondingly and in unison therewith. A tool unit is provided on one of the arms and includes a tool

crankshaft fillets having at their respective axial end faces radii of curvature merging into their circumferential surfaces; these radii of curvature are smaller by between substantially 20-30 percent than the radius of the crankshaft fillets on the blank and thus also of the crankshaft fillets on the master crankshaft which are identical with the crankshaft fillets on the blank.

3,735,621

# HAND OPERATED TUBE BENDER

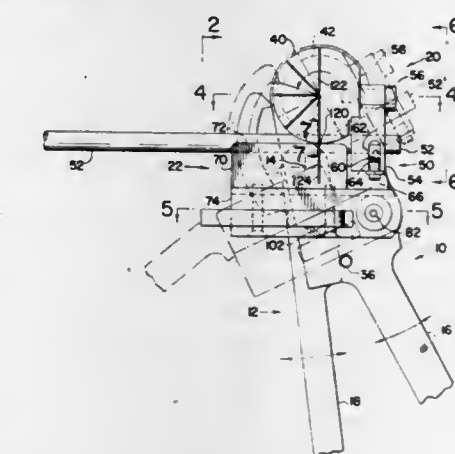
Harry G. Dodge, Palmsville, Ohio, assignor to Crawford Fitting Company, Solon, Ohio

Filed Oct. 12, 1971, Ser. No. 188,489

Int. Cl. B21d 7/04

U.S. Cl. 72-156

7 Claims



The specification and drawings disclose a hand operated tube bender. The disclosed bender includes a pair of rigid frame members which are pivotally interconnected for oscillation about an intermediate axis. Portions of the frames on one side of the axis comprise operating handles to allow manual oscillation. Carried on one of the frames on the side of the axis opposite the handles is a forming roller with a peripheral, semi-circular groove sized to closely receive the outer circumference of a tube to be bent. Releasable lock means are carried on the roller for clamping a tube in the groove. Associated with the forming roller and carried on the same frame is a forming shoe having a generally semi-circular groove along one side and mounted to oscillate between a first lock position where it cooperates with the forming roller to closely engage the tube at the point of bend, and a second position where it is spaced from the forming roller to allow the tube to be inserted or removed. The forming roller is driven by a ratchet drive including a ratchet wheel drivingly connected to



the forming roller and a pawl which is pivotally connected to the second frame and ocated so that when the frames are oscillated toward one another, a drive force is imparted to the forming roller.

3,735,622

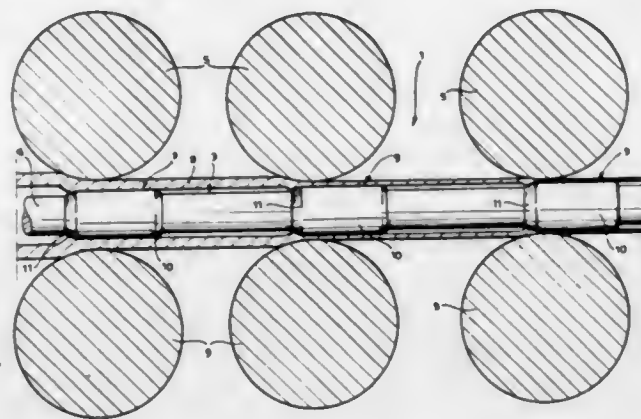
## TUBE ROLLING MILLS

Carlo Montagna, Via S. Martino 11, Milan, Italy  
Filed June 3, 1971, Ser. No. 149,421

Claims priority, application Italy, June 25, 1970, 69197 A/70

Int. Cl. B21b 17/10  
U.S. Cl. 72-209

1 Claim



A rolling mill for seamless tubes, of the type having a central mandrel extending between the rolls of all the roll stands and which is surrounded, in use, by a tubular workpiece. The mandrel is held in a fixed position with respect to the roll stands and has an enlarged portion where it passes between the rolls of each roll stand. Successive enlarged portions are smaller in diameter so that a gradual reduction of the diameter of a workpiece is achieved as the workpiece passes through the rolling mill. The front end of each enlarged portion is curved so that in axial section the curve is substantially the same as the curve of the cooperating roll and the mandrel is so arranged that the two curves are substantially symmetrical about a line parallel to the axis of the mandrel and passing through the mid-point of the space between the mandrel and the roll so that both surfaces of the workpiece are substantially evenly drawn as the workpiece passes through each roll stand.

3,735,623

## INDIRECT EXTRUSION DIE ASSEMBLY AND METHOD OF EXTRUDING

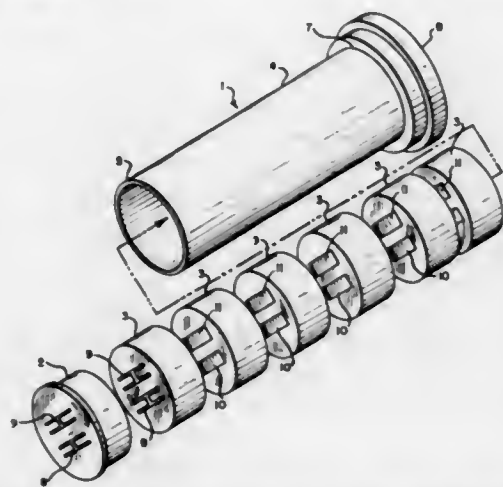
Alfred W. Mann, Rockwall, Tex., assignor to Texas Aluminum Company, Inc., Rockwall, Tex.

Filed Nov. 16, 1970, Ser. No. 89,841

Int. Cl. B21c 23/20

U.S. Cl. 72-261

13 Claims



A die assembly as used in an indirect extrusion press, the assembly comprising a die member having an opening therethrough, a plurality of separate support members positioned on one side of the die with openings extending

therethrough and aligned with, but larger than, the opening in the die, and a guide tube for containing the support members therein and the die at one end. In extruding material through the die assembly, a billet of material is held in a container and the container with the billet is moved toward the die assembly to force the billet material through the opening in the die and then through the aligned openings in the support members.

3,735,624

## STRIP GUIDING APPARATUS

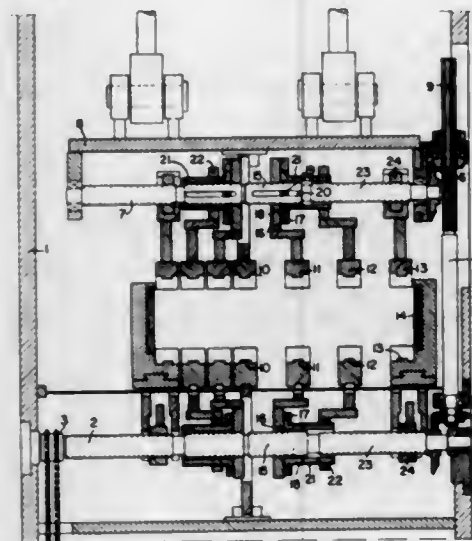
Karl-Helm Volker, and Dieter Brockow, both of Hiltchenbach-Dahlbruch, Germany, assignors to Slemag Slegener Maschinenbau, G.m.b.H., Düsseldorf, Germany  
Filed Mar. 14, 1972, Ser. No. 234,556

Claims priority, application Germany, Mar. 17, 1971, P 21 12 753.7

Int. Cl. B21b 39/20

U.S. Cl. 72-250

5 Claims



The disclosure of this invention relates to a strip entry guide for a rolling mill comprising two spindles associated with a top and bottom strip guiding assembly. Each spindle is adapted to support a number of guide bars to which are secured wooden elements that engage the opposite sides of a strip. This support is accomplished by separate nuts to which the bars are secured, each of which has a selected pitch thread that corresponds to a like thread formed on the spindles or an intermediate shaft for advancing the guide bars prescribed distances with respect to coordinated guide bars on the other side of the guide.

3,735,625

## APPARATUS FOR PRODUCING HELICAL WIRES, RODS, BARS AND THE LIKE

Masatugu Murao, Osaka, Japan, assignor to Naniwa Seitei Company, Ltd., Osaka, Japan

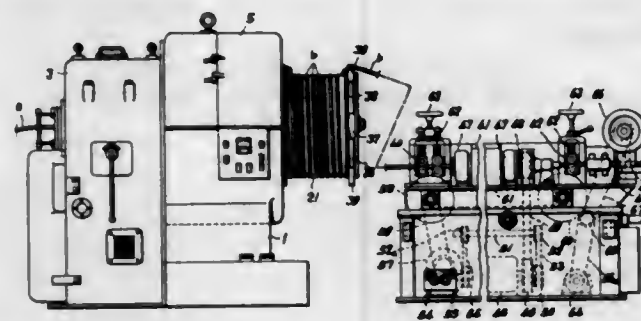
Filed July 15, 1971, Ser. No. 162,920

Claims priority, application Japan, July 28, 1970, 45/175536

Int. Cl. B21c 1/00; B21b 15/02

U.S. Cl. 72-275

3 Claims



An apparatus comprising in combination a machine for producing an elongated helical wire by drawing a wire materi-

al of circular cross-section into a noncircular cross-section such as a square shape by cold working and twisting the wire material in one direction at the same time and an automatic straight wire cutting-off machine disposed in series with the first machine for removing strain from the helical wire material by subjecting the material to an external force beyond the yield point to effect plastic deformation and then cutting-off the straightened wire in a predetermined dimension.

3,735,626

## UPSETTING DIES

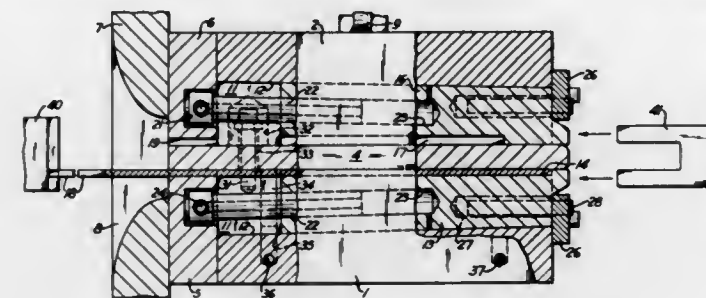
Roland E. Cale, Pittsburgh, Pa., assignor to Schaefer Equipment Company, Pittsburgh, Pa.

Filed June 14, 1972, Ser. No. 262,646

Int. Cl. B21d 19/10

U.S. Cl. 72-318

6 Claims



A pair of die holders normally engage the opposite sides of a plate between them and are provided with recesses facing the plate and extending lengthwise of it, with the wall of each recess opposite the plate sloping outwardly away from the plate from front to back. Slidably mounted in each recess for movement lengthwise of it is a die that has a sliding face engaging the sloping wall of the recess and has an opposite face provided with a channel open at its rear end for receiving the heated end portion of wide thin stock. One of the channels has less depth than the other and extends farther forward. Means are provided for pushing the die with the shallower channel rearwardly to upset the stock in it, after which the upset stock is transferred to the channel in the other die which is then pushed rearwardly to further upset the stock to make it still thicker.

3,735,627

## PUNCH, BEND AND TRIM DEVICE

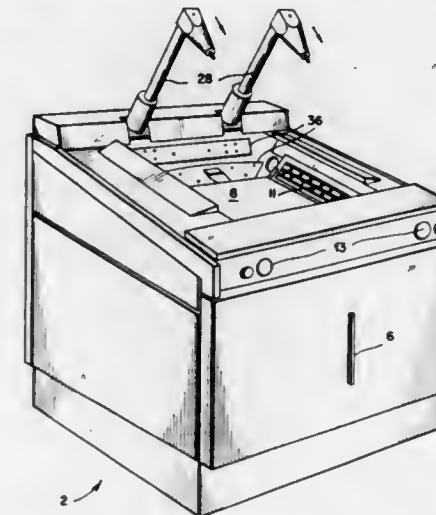
William H. Eburn, Jr., Westport, Conn., assignor to W. R. Grace & Co., New York, N.Y.

Filed Feb. 29, 1972, Ser. No. 230,248

Int. Cl. B21d 43/28

U.S. Cl. 72-324

2 Claims



The invention disclosed is a device having means to punch, bend and trim a metal backed printing plate to effect accurate

registration onto a press. Registration areas are first provided in proper alignment relative the printing areas of the plate being processed. Next, means are provided for positioning the registration areas in fixed location prior to shearing of the plate along the width and length edges thereof. Shearing of the length, along opposite ends of the plate is accompanied by punching saddle engaging slots, and bending. The plate so processed is ready for accurate introduction into a printing press where the ends are conveniently secured in place about a saddle.

3,735,628

## METALLIC CAN BODY STRIPPERS AND THE LIKE

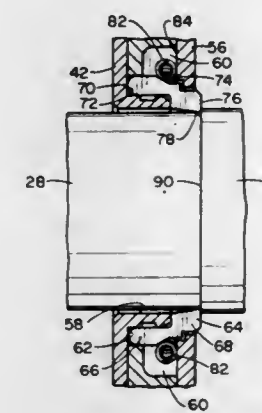
Patrick F. Hutchison, Hawthorne, Calif., assignor to Standun, Inc., Compton, Calif.

Filed May 11, 1972, Ser. No. 252,246

Int. Cl. B21d 45/00

U.S. Cl. 72-344

7 Claims



A series of stripper members are mounted by a retainer ring so as to be moved outwardly by a cup-shaped article during movement of the cup-shaped article and a ram end rearwardly therethrough, the stripper members then moving inwardly to engage the article during ram return movement and strip the article from the ram end. Such stripper member movement is controlled by an encircling resilient ring bearing inwardly against an angular surface on each of the stripper members so that the resilient ring simultaneously exerts axial forces to retain the stripper members properly positioned and properly pivotal, as well as radial forces to ensure such proper pivoting and article engagement.

3,735,629

## APPARATUS FOR FORMING ONE PIECE METALLIC CAN BODIES

Elpidio Paramonoff, Los Angeles, Calif., assignor to Standun, Inc., Compton, Calif.

Filed June 11, 1970, Ser. No. 45,430

Int. Cl. B21d 22/28

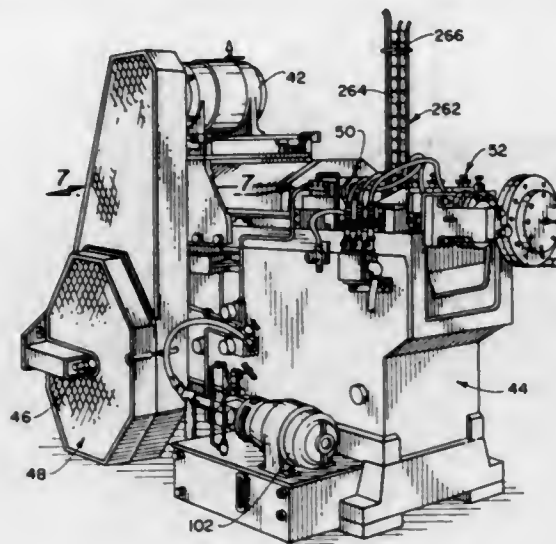
U.S. Cl. 72-349

20 Claims

A horizontally movable ram is mounted on a main frame longitudinally reciprocal in a forward working stroke and a rearward return stroke through a rotating crankshaft drivingly connected to the ram by a plurality of pivot arms, the pivot arms being specifically arranged for longitudinally moving the ram at a reduced comparative speed directly approaching and following the ram stroke rearward reversal than directly approaching and following the ram stroke forward reversal permitting an increased period of time for feeding of metal parts to be engaged and worked by the ram. The ram is mounted on the main frame through hydrostatic-type pressurized oil film bearing assemblies with the ram being supported at a rearward location by combined horizontally extending and vertically extending constantly pressurized and flowing oil films with a more forward portion of the ram being additionally



peripherally supported by a cylindrical constantly pressurized and flowing oil film. The apparatus die pack may include an initial redraw die and a series of ironing dies, each of said dies including a die ring resiliently retained for limited radial movement and also adjustment alignment, as well as arranged in the particular die for selective removal out of its particular die assembly by pivoting of a cover plate without complete



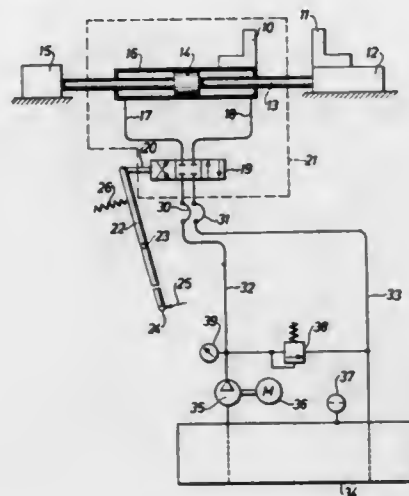
removal of the die assembly from the die pack. Additionally, the ironing die assemblies each include a fluid distribution ring longitudinally adjacent the die ring thereof and preferably removable therewith as an assembly arranged to tangentially distribute a circumferentially moving ring of liquid across the distribution ring ram opening providing lubrication and cooling for the dies and metal parts being formed.

### 3,735,630 MACHINE FOR BENDING

Harald Sondergaard, Bagsvaerd, Denmark, assignor to Sandvikens Jernverks Aktiebolag, Sandviken, Sweden  
Filed May 4, 1971, Ser. No. 140,157  
Int. Cl. B21d 5/01

U.S. Cl. 72-389

3 Claims



A machine for bending metal strip includes a power-driven reciprocating tool the movement of which is controlled by a governing means that is adapted to be moved to arbitrary positions continuously followed by the reciprocating tool.

### 3,735,631 HYDRAULICALLY POWERED COUNTER-BLOW HAMMER

Heinz Schmoll, Huckeswagen, and Dieter Jenke, Griten, both of Germany, assignors to Schloemann Aktiengesellschaft, Dusseldorf, Germany

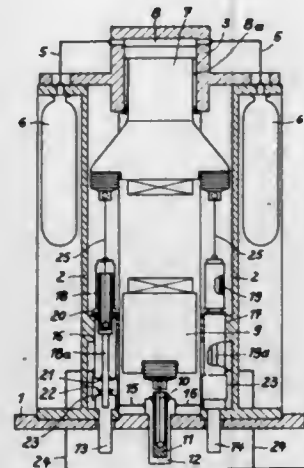
Filed Nov. 23, 1971, Ser. No. 201,439

Claims priority, application Germany, Nov. 25, 1970, P 20 57 958.2

U.S. Cl. 72-407

Int. Cl. B21J 9/10

1 Claim



A hydraulic counter-blow hammer having a hydraulic coupling system for making the tups move in opposite directions and a hydraulic retraction system for retracting the tups prior to a stroke. The hydraulic retraction system is combined with the hydraulic retraction system without there being hydraulic intercommunication between the two systems. Differential pistons are connected to the upper tup and the differential pistons have two working faces moving in two different but co-axial cylinders. One cylinder is in the hydraulic coupling system for coupling the lower tup to the upper tup and the other cylinder is in the hydraulic retraction system for retracting the upper tup.

### 3,735,632 FLUID-PRESSURE ACTUATED PRESS-TOOL EQUIPMENT

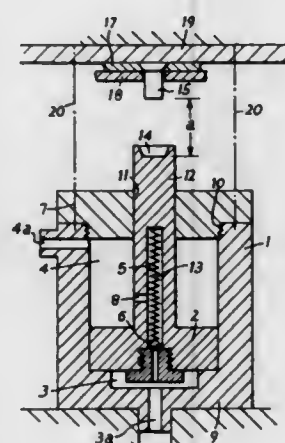
John Leslie Hilton, Ringwood, Hampshire, England, assignor to Plessey Handel Und Investments A.G., Zug, Switzerland  
Filed Nov. 5, 1971, Ser. No. 196,052

Claims priority, application Great Britain, Nov. 10, 1970, 53,314/70

U.S. Cl. 72-453

Int. Cl. B21J 9/12

4 Claims



To avoid damage to press-tool equipment, to the workpiece and/or to a body obstructing the path of the tool during its ap-

proach to the beginning of the working stroke, a hydraulic actuating piston is bypassed by a passage including a port which is blanked-off by the piston entering a blanking cover due to the piston movement when the tool commences its working stroke proper.

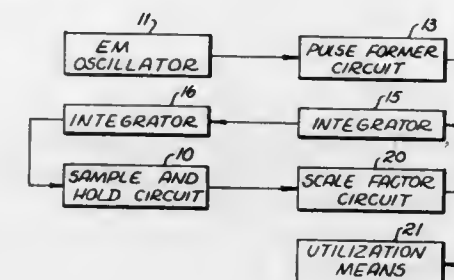
### 3,735,633

FUNCTION GENERATOR AND COMPONENTS THEREOF  
Gerald Lance Schlatter, Boulder, Colo., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 15, 1971, Ser. No. 124,070

Int. Cl. G01n 9/00

U.S. Cl. 73-32



A vibration densitometer that computes and transmits the difference between actual density and a known, constant reference density. A pulse former circuit produces a pulse train useful in producing a linear density difference analog. Two integrators and one sample and hold circuit are employed in the computation. A single one shot actuates both integrators and the sample and hold circuit. A scale factor circuit is employed for calibration and to convert the difference analog to an analog of absolute density. The difference density analog makes possible the computation and transmission of density data with an extraordinarily high degree of accuracy. However, the difference density analog is produced with a very small, unique system.

### 3,735,634

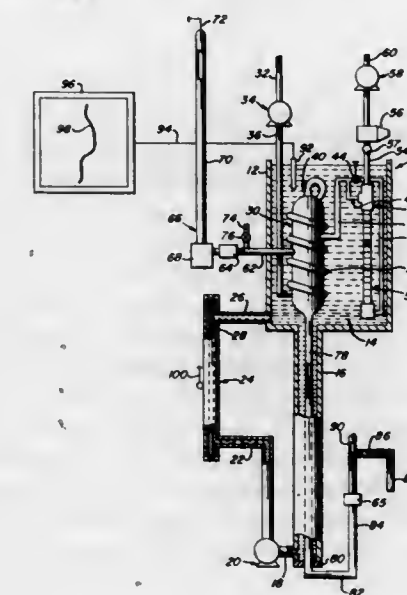
VAPOR-OVER-LIQUID TEMPERATURE ANALYZER  
Russell M. Clinton, Gibsonia; James A. Condon, Freeport, and Richard T. Mator, Pittsburgh, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed June 4, 1971, Ser. No. 150,132

Int. Cl. G01n 33/22

U.S. Cl. 73-64.2

23 Claims



An on-stream vapor-over-liquid ratio temperature (V/L) analyzer comprising a system wherein a constant volume of

gasoline per unit time is supplied to a bomb, and pressure, temperature, and volume of vapors removed are held constant at some particular value simulating some particular V/L ratio and corresponding V/L ratio temperature. In the event of a change in the V/L ratio of the gasoline, only pressure will vary in response thereto, and this change in pressure is made to cause an inverse change in the temperature to bring the system back to the initial operating pressure. In general, the temperature required to maintain a fixed V/L ratio is measured.

### 3,735,635

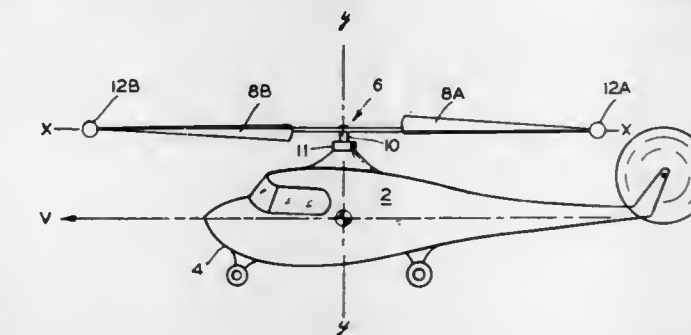
TRUE AIRSPEED MEASURING APPARATUS  
Edward J. Hazen, Woodcliff Lake, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Dec. 21, 1970, Ser. No. 100,241

Int. Cl. G01c 21/10

U.S. Cl. 73-181

7 Claims



Apparatus relying on the adiabatic temperature rise due to stopping a moving stream of air for determining the velocity of that air. Temperature sensors are mounted at opposite ends of a rotating arm for eliminating the need to measure static temperature and for providing a linear relationship between velocity and temperature measurements.

### 3,735,636 LEVEL FEELER

Alun Burke, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland

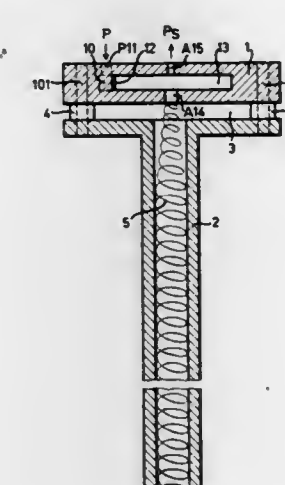
Filed July 16, 1971, Ser. No. 163,267

Claims priority, application Switzerland, Aug. 7, 1970, 11910/70

U.S. Cl. 73-290 R

Int. Cl. G01b 13/12

4 Claims



A level feeler, especially a liquid level feeler of the type containing fluidic circuit components and a feeler tube, wherein the feeler tube is arranged and constructed such that within the effective proximity zone of the fluidic-vortex-proximity



feeler there are provided openings communicating with the surrounding atmosphere and the helically-shaped advancing or propagating feeler vortex of the fluidic-vortex-proximity feeler can penetrate without hindrance into the feeler tube and can be guided by such feeler tube.

3,735,637

## FLOW-METER AND VISCOMETER

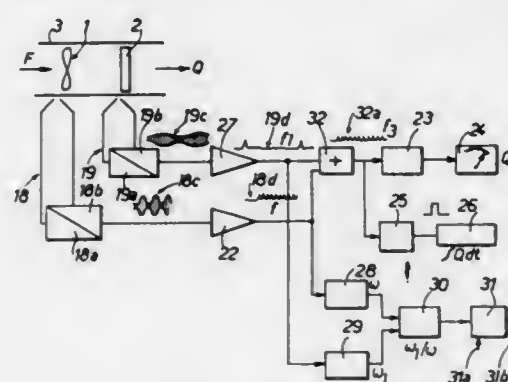
Pierre Marie Marcel Penet, 4, Rue de Bourgogne, Creteil, France

Filed Apr. 15, 1971, Ser. No. 134,306

Int. Cl. G01f 1/00; G01m 1/10

U.S. Cl. 73—231 R

16 Claims



Measuring apparatus of the impeller-type flowmeter kind, designed to be mounted inside a conduit for ducting a fluid flow and comprising an impeller supported for unrestrained rotation about a shaft arranged longitudinally inside the conduit. In accordance with the invention, a rotor is supported for unrestrained rotation coaxially with and downstream of the impeller and carries blades which lie substantially in planes passing through the rotor axis, whereby a comparison between the impeller and rotor rotation speeds  $\omega$  and  $\omega_1$ , respectively, enables the accuracy of the flow rate measurement to be monitored and can provide an indication of the viscosity of the fluid.

3,735,638

## LIQUID LEVEL MEASUREMENT DEVICE

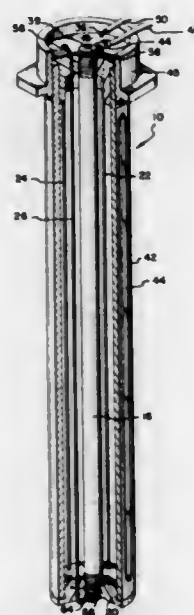
Bernard J. Miller, Andorra Road, Lafayette Hill, Pa.

Filed Feb. 1, 1971, Ser. No. 111,311

Int. Cl. G01f 23/24

U.S. Cl. 73—304 R

3 Claims



A liquid level measurement device relying upon the principle of a resistance bridge wherein the height sensing means is

one resistor of the bridge. The height sensing resistor is comprised of a fine wire extending from the bridge circuit to a grounding rod. The fine wire extends generally parallel to, but spaced from, the grounding rod in order to constitute the height sensor. In use, the height sensor is inserted in the liquid whose height is to be measured in such a way that the grounding rod and the fine wire extend generally perpendicular to the liquid level line. Thus, the aqueous ionic media whose height is being measured will short out that portion of the fine wire below the liquid level to decrease the effective resistance of the height sensor. This has the effect of unbalancing the bridge circuit to give a reading on a meter that is an indication of the height of the liquid.

3,735,639

## GAUGE PRESSURE TRANSMITTER WITH INTERCHANGEABLE RANGE ELEMENTS AND RUPTURE PROTECTION

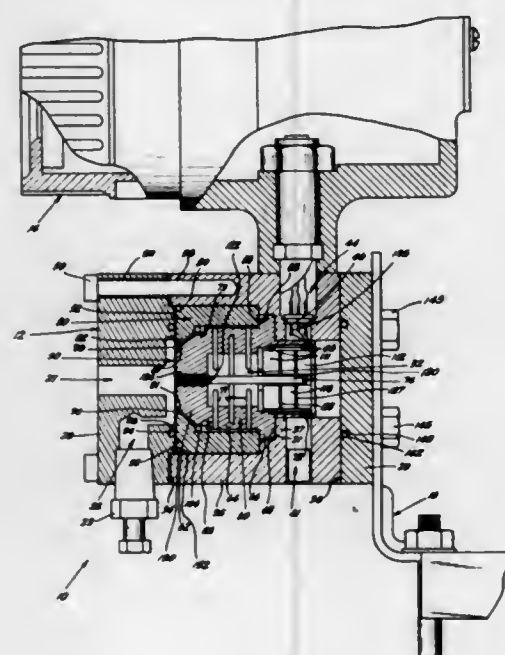
Lloyd T. Akeley, Fullerton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 17, 1972, Ser. No. 244,547

Int. Cl. G01f 9/10

U.S. Cl. 73—398 R

6 Claims



A gauge pressure transmitter for producing an electrical output signal proportional to an inlet fluid pressure. The transmitter includes a sensor assembly having a central chamber therein communicating with an inlet fluid manifold. A diaphragm is secured across the inlet fluid manifold at the head of a central chamber and a sleeve and spring are positioned within the chamber, acting against the diaphragm, to oppose movement of the diaphragm responsive to inlet fluid pressure. The cores and windings of a position responsive transducer are mounted within the central chamber and the armature of the transducer is supported upon a shaft that extends centrally of the chamber and is attached at one end to the spring. An O-ring is provided in a gap between the sleeve and spring, upstream of a shoulder on the spring, so that fluid discharged into the gap, such as might occur upon rupture of the diaphragm, drives the O-ring against the shoulder and seals off further flow of the pressure fluid. The spring, sleeve and diaphragm are confined by a removable pressure body to enable major change of the transmitter pressure range by use of springs having different resiliences.

3,735,640

## APPARATUS FOR INJECTING A SAMPLE INTO A GAS CHROMATOGRAPH

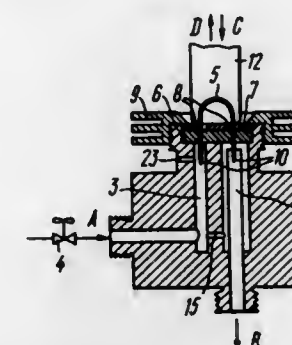
Leonid Vladimirovich Chizhov, Leninsky prospekt, 82/2, kv. 362; Dmitry Emelyanovich Lengauer, Bolshaya Ugreshskaya ulitsa, 12, kv. 42, and Sergel Alexandrovich Danilina, 1 Ambulatory proezd, 2/6, kv. 73, all of Moscow, U.S.S.R.

Filed Mar. 10, 1972, Ser. No. 233,525

Int. Cl. B01f 3/02; G01n 1/10

U.S. Cl. 73—422 GC

6 Claims



An apparatus for introducing a liquid sample into a gas chromatograph, including a heated housing having located therein a liquid sample evaporation chamber and a gauge pressure chamber and further incorporating means for establishing a pressure differential between the gauge pressure chamber and the evaporation chamber. The liquid sample evaporation chamber is hermetically sealed from the ambient atmosphere and communicates with the source of supply of a carrier gas of the associated gas chromatograph and with the separation column of the same chromatograph. The gauge pressure chamber communicates with the said carrier gas supply source. Each one of the two chambers has an opening tightly closed with a gasket made of an elastic material and intended for introduction therein of a needle having two pointed ends and bent so that these two pointed ends extend parallel to each other in the same direction. The needle has an internal longitudinal capillary passage open at both ends, adapted to be filled with a liquid sample that can be transferred into the sample evaporation chamber, after the respective two ends of the needle have pierced the gaskets of the two chambers, the sample being transferred under the action of the pressure differential between the gauge pressure chamber and the evaporation chamber.

3,735,641

## DIVERTING AND SAMPLING GATE

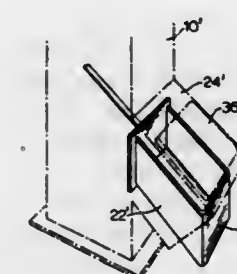
Werner R. Bink, Fort Saskatchewan, Alberta, and George Dempster, Edmonton, Alberta, both of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Ontario, Canada

Filed Oct. 5, 1970, Ser. No. 77,985

Int. Cl. G01n 1/20

U.S. Cl. 73—423 R

5 Claims



A gate for diverting and/or sampling the entire flow of particulate material in an upright chute. The gate includes a gate means positioned to extend slidably from an inoperative posi-

tion in which the gate means spans substantially none of the cross-sectional area of the upright chute means through an opening in a wall of the upright chute to an operative position in which the gate means spans the entire cross-sectional area of the upright chute. Not only is the chute easily constructed and operated, it permits taking a sample with greater confidence in the qualitative and quantitative analysis of the sample.

3,735,642

## CURVE DRIVE FOR OSCILLATING MOTIONS ON WINDING RODS OF STATOR WINDING MACHINES

Lothar Hoppe, Zurich, Switzerland, assignor to Microfil A.G., Zurich, Switzerland

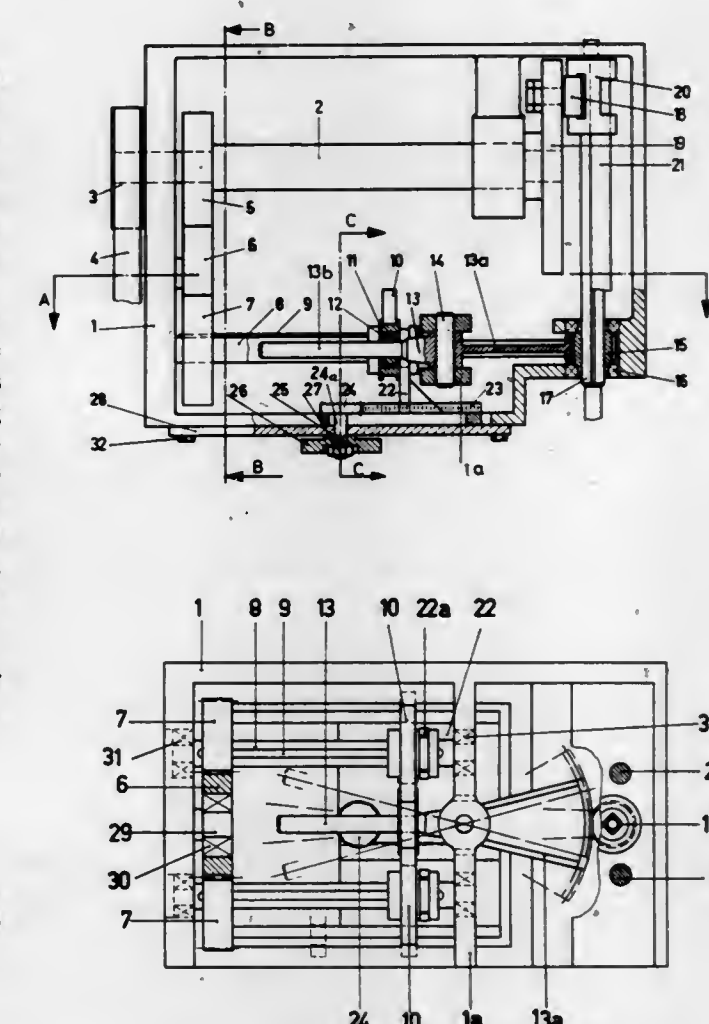
Filed June 30, 1971, Ser. No. 158,207

Claims priority, application Germany, July 6, 1970, P 20 33 417.2

Int. Cl. F16h 21/00

U.S. Cl. 74—23

5 Claims



A drive mechanism for imparting a combined synchronized reciprocating and oscillatory movement to a winding rod or bar of a stator winding machine for laying in the conductors includes a main drive shaft coupled to one mechanism which converts rotary motion of the drive shaft into reciprocating motion of the winding bar which is guided in a longitudinal direction through a bore in a rotatably mounted oscillatory bush. The bush bore and bar have non-circular surfaces, e.g., polygonal so as to effect oscillation of the winding bar as the bush is oscillated and at the same time as the winding bar is reciprocated. Another mechanism provided for oscillating the bush includes an oscillatory articulated arm having a gear segment located to one side of the axis of articulation and which is meshed with an externally formed gear on the bush, and a shaft portion located to the other side of the articulation axis which is received in the bore of a rocker bearing. The rocker



bearing mounts a circular cam follower located between two cam discs which as they rotate impart a reciprocating movement to the cam follower along a path transverse to the axis of the articulated arm which thereby produces the desired oscillation of the latter. The cam discs are slidably mounted on auxiliary drive shafts which are coupled to the main drive shaft by means of a gear transmission, and the cam discs together with the cam follower and rocker bearing constitute a sub-assembly which can be adjusted longitudinally of the articulated arm with respect to the oscillatory axis so as to effect a corresponding change in the angle through which the gear segment is oscillated and hence a corresponding change in the angle through which the bush and winding bar oscillates.

3,735,643

## SPECIFIC VARIABLE RATIO ACTUATOR

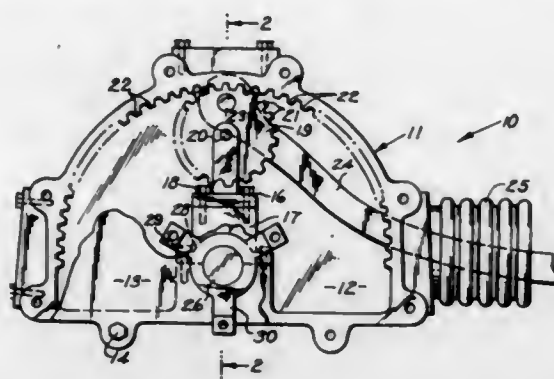
Willie M. Smith, 3716 S.W. 14th Street, Fort Lauderdale, Fla.

Filed Sept. 13, 1971, Ser. No. 179,977

Int. Cl. F16h 27/02

U.S. Cl. 74—89.16

2 Claims



A variable ratio device for producing specific non-linear motion. This device includes primarily, an internally toothed housing in which is rotatable, by shaft means, a pair of gears supported upon pillow blocks, the pillow blocks having a gear with an offset pin, the offset pin carrying a rod which extends from out of the housing.

3,735,644

## REVERSIBLE POWER TRANSMISSION

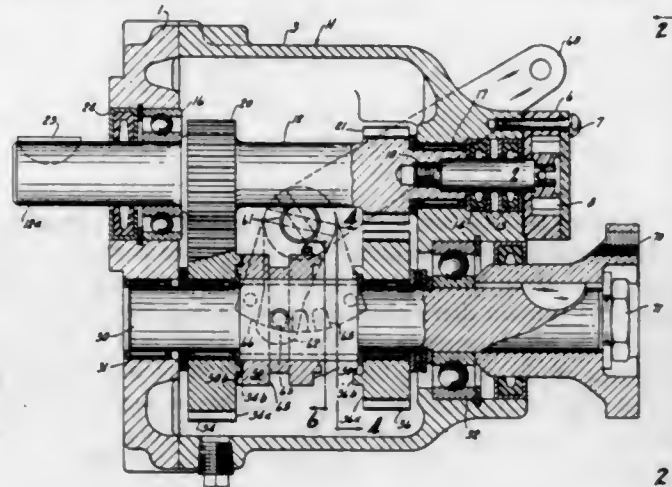
Carl I. Benson, Jr., Westwood, Mass., assignor to Paragon Gears Incorporated, Tauton, Mass.

Filed Dec. 17, 1971, Ser. No. 209,246

Int. Cl. F16h 3/14; F16d 11/06, 21/04

U.S. Cl. 74—355

6 Claims



A transmission for transmitting power from a power source to a power output shaft, for example for transmitting power from an engine to a propeller shaft of a water craft. The transmission is particularly compact and the direction of rotation of the driven shaft can be selectively changed.

3,735,645

## TRANSMISSION AND HOUSING

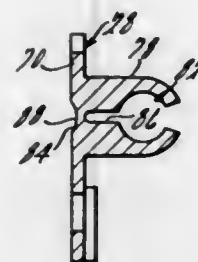
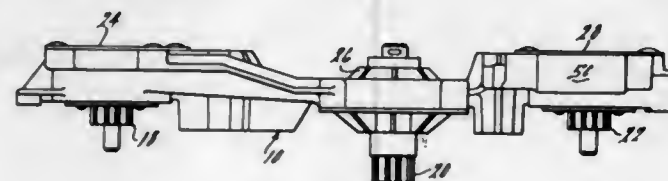
Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.

Filed June 9, 1971, Ser. No. 151,179

Int. Cl. F16h 57/02

U.S. Cl. 74—606

10 Claims



Transmission for connecting a plurality of drive mechanisms to a corresponding plurality of input worms. The gearing is contained in a housing having a plastic cover provided with flexible recessed arms adapted to engage the shafts of the worms to constitute bearings, the arms being received in recesses in the housing to retain them in assembled relation.

3,735,646

## HYDROSTATIC TRANSMISSION MECHANISM

Richard E. Roberts, Lombard, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

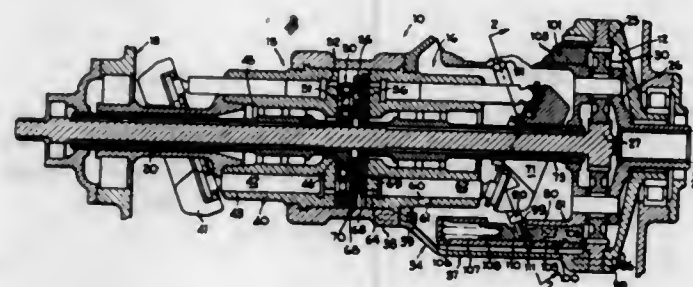
Division of Ser. No. 837,594, June 30, 1969, Pat. No.

3,620,130. This application May 28, 1971, Ser. No. 147,946

Int. Cl. F16h 47/04

U.S. Cl. 74—687

10 Claims



A combined mechanical and hydrostatic transmission having the sun gear of the planetary gear set driven by the input shaft the carrier of the planetary gear set driving the output shaft and a pair of hydraulic units, one of which has relatively rotating elements connected to two of the planetary gear set elements, namely, the planetary carrier and the ring gear, the other hydraulic unit being in fluid communication with the first hydraulic unit and being connected between the fixed element of the case and the ring gear. Both hydraulic units have variable displacement whereby with one of said hydraulic units being at a given displacement, and the other hydraulic unit at zero displacement the ring gear of the planetary gear set will be locked against rotation whereby the full reduction ratio of the planetary gear set is utilized and, in the situation where the said one hydraulic unit is at zero displacement, and

the first hydraulic unit has a given displacement, the first hydraulic unit will lock up the planetary carrier and the ring gear to provide a 1:1 direct drive. In addition, infinitely variable speed ratios are available by having the pair of hydraulic units in various displacement positions relative to the above limits whereby a full range of speed ratios is available between the full reduction ratio of the planetary gear set and a 1:1 direct drive.

3,735,647

## SYNCHRONAL GEARING

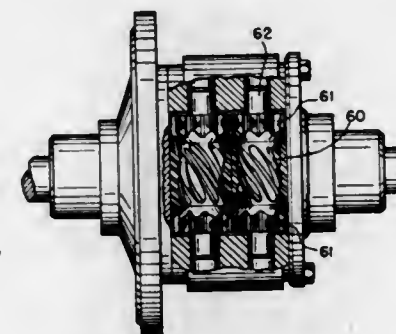
Vernon E. Glaseman, 3808 Kirkwood Road, Cleveland Heights, Ohio

Filed July 1, 1971, Ser. No. 158,672

Int. Cl. F16h 1/42, 1/18, 57/00

U.S. Cl. 74—715

5 Claims



A gear arrangement, wherein a first pair of spur gears, concentric and rigidly connected for simultaneous rotation are in driving relation with a second pair of intermeshing gears similarly arranged, is rendered more effective in the smooth transfer of power by indexing the teeth of one of the concentric gears in at least one pair relative to the other of the concentric gears in the same pair by an amount between one-half of the circular pitch and full registration.

3,735,648

## METHOD OF MAKING FLUID-CONDUCTING HOT-FORGING DIE

John Haller, Furstentum, Liechtenstein, assignor to Federal-Mogul Corporation, Southfield, Mich.

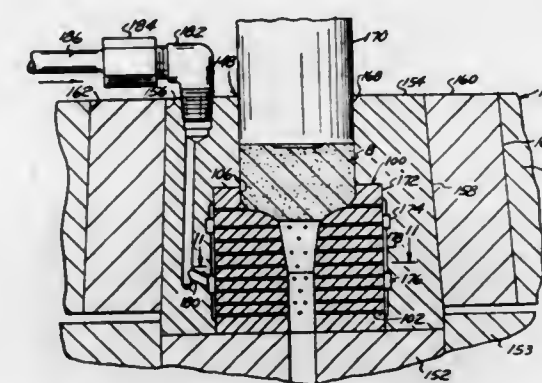
Division of Ser. No. 875,975, Nov. 12, 1969. This application

June 16, 1971, Ser. No. 153,594

Int. Cl. B21k 5/20

U.S. Cl. 76—107 A

4 Claims



A foraminous ordinary-duty-hot-forging die is provided with minute fluid passageways therethrough for the conduction of a coolant, a lubricant or a protective atmosphere under high pressure. A porous hot-forging die is made by forming a briquette of coarse powdered tool metal or carbide, sintering the briquette, machining a die cavity or die bore therein, and heat-treating the thus-formed die for the required hardness and wear resistance.

A modified heavy-duty-fluid-conducting hot-forging die is formed from powdered material by loading the die cavity of a briquetting press with a charge consisting of alternate layers of powdered tool metal or carbide and fusible wire inserts extending thereacross and compressing this charge into a briquette. This briquette is then sintered at a temperature below the melting point of the insert material, hot-forged to densify it so as to produce a substantially solid die forging of approximately 100 percent density, annealed, and bored to form a central pilot hole therethrough. The die forging is then vacuum-sintered at a temperature higher than the melting point of the insert material with a sufficiently low vacuum to vaporize the insert material and withdraw it from the body, leaving perforations therethrough. The sintered perforated die forging is then machined to provide the desired shape of die cavity or die bore and finally heat-treated to obtain the necessary hardness and wear resistance. Either form of die is mounted in a bore in a die-holding block having a chamber therearound. During hot-forging operations, this chamber is supplied with a coolant, a lubricant or a protective atmosphere agent under a sufficiently high pressure to force it through the pores of the porous die or through the perforations in the solid die while the die is being used to hot-forg, extrude or otherwise form workpieces.

3,735,649

## PARTING BLADE WIRE STRIPPER

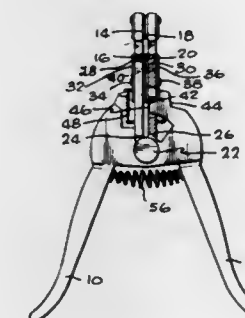
Jesse D. Staggs, R.R. 2, Box 143, Fallbrook, Calif.

Filed May 27, 1970, Ser. No. 41,021

Int. Cl. H02g 1/12

U.S. Cl. 81—9.5 A

2 Claims



A wire stripper for stripping insulation off one end of a wire without necessitating hard gripping of adjacent insulation, thereby preventing damage to the adjacent insulation. The stripper includes two sets of blades for closing against the insulated wire, and then separating while closed on the wire, each set of blades constructed to cut into the insulation. One set of blades which moves along the insulated central conductor when the sets of blades separate has a slightly larger opening than the other set of blades, to reduce the possibility of scratching the conductor.

3,735,650

## EXTRACTOR TOOL

Francis H. Weng, Jr., 4023 Redden Road, Drexel Hill, Pa.

Filed Feb. 17, 1971, Ser. No. 116,070

Int. Cl. B25b 13/50

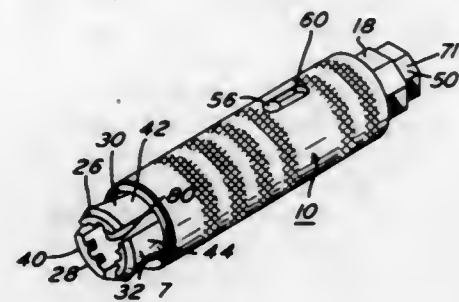
U.S. Cl. 81—53.2

3 Claims

An extractor tool comprising a collet and means for tightening the collet about a member (such as a studhead or the like) in which the collet has an annular array of pointed teeth which form the leading edge of the collet, which extend beyond the remainder of the collet, and which are the first portions of the



collet to contact the studhead or the like. The pointed teeth are pyramid-like in shape and with a stop wall to the rear of



the teeth define a notch which receives material of the studhead or the like which is displaced by the teeth as the collet is tightened about the studhead.

3,735,651

## SHELL MACHINING APPARATUS

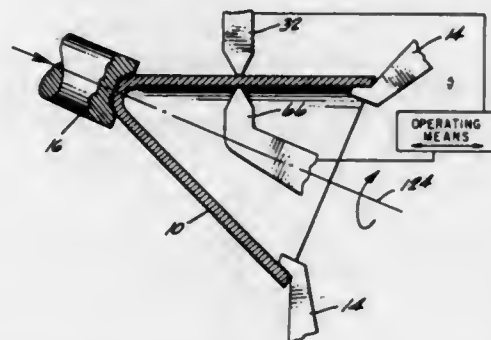
Lloyd Hartford, Northridge, Calif., assignor to The Marguardt Corporation, Van Nuys, Calif.

Filed Oct. 21, 1968, Ser. No. 769,197

Int. Cl. B23b 5/36

U.S. Cl. 82-15

3 Claims



A method and apparatus for producing a shell body of revolution with a substantially constant wall thickness comprising cutting both the inside and outside surface of the shell simultaneously with the cutters at a predetermined fixed spacing.

3,735,652

## HEADSTOCK FOR TURNING MACHINES EQUIPPED WITH INDEXABLE CHUCKS

Hans Scharfen, Buderich, Germany, assignor to Paul Kommanditgesellschaft, Dusseldorf, Germany

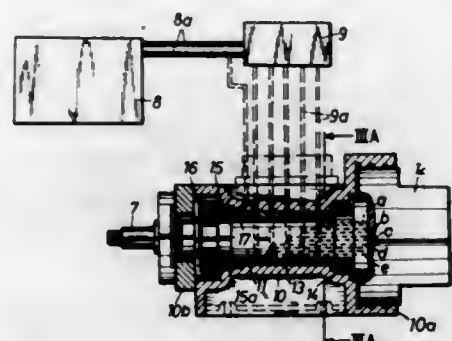
Filed July 30, 1970, Ser. No. 59,647

Claims priority, application Germany, Feb. 4, 1970, P 20 04 940.5

Int. Cl. B23b 19/02

U.S. Cl. 82-30

5 Claims



A headstock for turning machines having pressure fluid operable rotatable and indexable chuck means and stationary

pressure fluid conveying means for conveying control fluid to said chuck means, in which in the housing of said headstock there are provided at least two spindles respectively connected to a chuck, said spindles being adapted to be driven by a common drive in a synchronous manner while for each spindle the pressure fluid conveying housing means for the respective chuck is arranged on the pertaining spindle between two roller bearings supporting the respective spindle.

3,735,653

## METHOD FOR MAKING KNOCK-OUTS IN ELECTRICAL BOXES FORMED OF PLASTIC MATERIAL

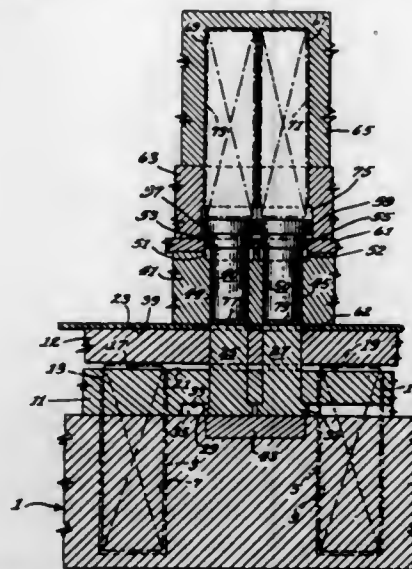
James C. Powell, Elkhart, Ind., assignor to All-Steel Equipment Inc., Aurora, Ill.

Division of Ser. No. 783,584, Dec. 13, 1968, Pat. No. 3,580,122. This application Dec. 7, 1970, Ser. No. 95,922

Int. Cl. B26d 7/18

U.S. Cl. 83-1

3 Claims



Knock-outs are formed in electrical fixtures, such as connector boxes made of plastic sheet material by punching the knock-outs from plastic sheet or blanks prior to shaping into the fixture or by shaping the fixture and then punching out the knock-outs. By resiliently supporting the material surrounding the knock-out area on the punch side and resiliently biasing a knock-out stripper against the surface of the knock-out opposite that contacted by the punch, knock-outs can be punched out and replaced in the material in a single operation if the opposite biasing forces of the support and knock-out stripper are properly correlated.

3,735,654

## BLANKING MACHINE VACUUM SYSTEM

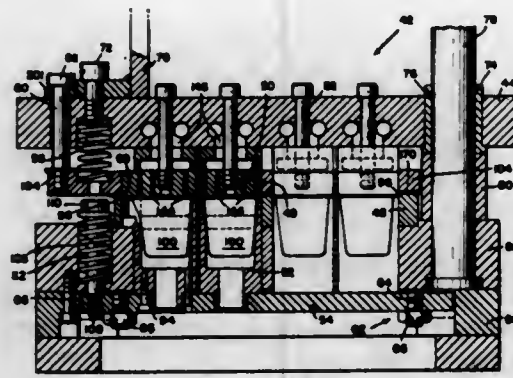
Walter R. Jurasek, Gustine, Calif., assignor to Avocet Food Corporation, Oakland, Calif.

Filed Jan. 24, 1972, Ser. No. 220,311

Int. Cl. B26d 7/20, 7/06

U.S. Cl. 83-100

2 Claims



A fixed upper die member of a blanking press has manifold means and means to exhaust air from said manifold means.

Passages extend from the manifold means through the lower face of the upper die member to urge a web which passes below the upper die member into contact therewith. The press is associated with a generally conventional blanking machine having means to step feed a continuous web to the press below the upper die member and above a reciprocable lower die member, a conveyor adjacent the upper die member and means to remove the waste portion of the web. Upper punches conforming to the tops of the cup are fixed with the lower die being moved upwardly beyond them to cut the tops of the cups clear of the web, the said tops being held to the punches by a cup stripper.

3,735,655

## CARD COVER SHEET APERTURING APPARATUS

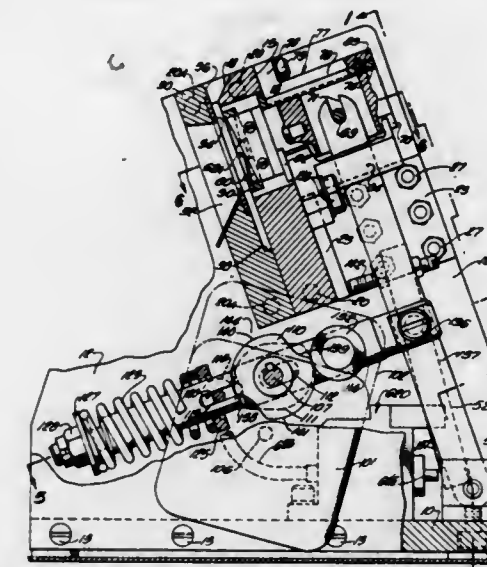
Francis A. Dedona, Sherman Oaks, and James W. Lucas, Los Angeles, both of Calif., assignors to Scionics Business Products, Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 274,025, April 18, 1963, Pat. No. 3,248,986. This application Aug. 26, 1965, Ser. No. 482,881. The portion of the term of this patent subsequent to May 29, 1986, has been disclaimed.

Int. Cl. B26f 1/44

U.S. Cl. 83-140

3 Claims



1. In apparatus of the character described, a cutter assembly having a support; four cutting knives mounted on said support in a rectangular pattern and with respect to a common plane on said support with each knife having a cutting edge inclined with respect to said plane and with adjacent ends of adjacent knives extending unequal distances from said plane; an apertured plate slidably mounted on said support to a position extending forwardly of and surrounding said knives; and spring means acting between said plate and said support normally urging said plate to said position.

3,735,656

## ARRANGEMENT IN AND RELATING TO HIGH SPEED IMPACT COLD PLANAR FLOW SHEARING APPARATUS

Per-Olof Strandell, Taby, and Carl-Erik Ridderstrale, Lulea, both of Sweden, assignors to HJO Mekaniska Verkstad K & V., Smedberg, Hjo, Sweden

Filed May 12, 1971, Ser. No. 142,611

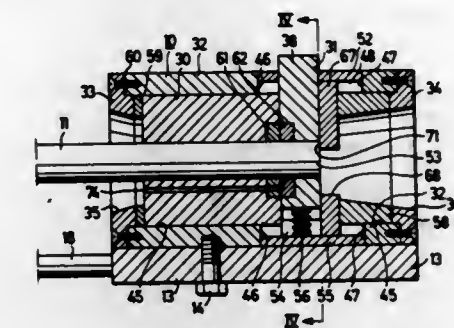
Int. Cl. B26d 3/16

U.S. Cl. 83-198

3 Claims

An improvement in high speed impact, cold planar flow shearing apparatus having a stationary shearing die and a movable shearing member and with which the shearing member is subjected to an impact force of such magnitude that the member is given at least sufficient energy to stress the stock to the point of fracture. The improvement consists of an

axial support member located adjacent the movable die member and extending into the path of the stock so as to support the stock axially during the initial portion of the shearing sequence but so as to be out of engagement therewith before



fracture of the stock is completed. The improvement also includes means which positively stop downward movement of the shearing member substantially immediately the slug has been sheared from the stock.

3,735,657

## APPARATUS FOR CUTTING STRIPS OF MATERIAL

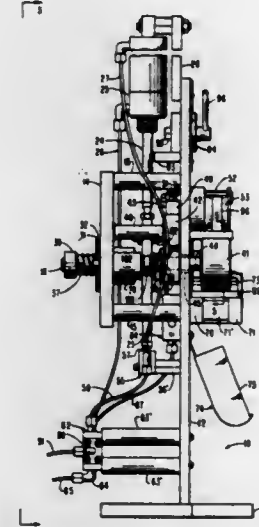
Volker Schmidt, Todds Road, R.R. No. 7, Lexington, Ky., and Erich A. Schmidt, 2415 Liberty Road, Lexington, Ky.

Filed Mar. 9, 1971, Ser. No. 122,384

Int. Cl. B26d 5/20

U.S. Cl. 83-209

15 Claims



Material is fed between a pair of rollers by a pneumatically driven rack rotating a gear, which is connected to one of the rollers through a one direction clutch. When the rack moves downwardly to rotate the roller, a valve is activated just prior to downward movement of the rack stopping to cause a pneumatically powered knife to cut the fed material. Upon completion of cutting of the material, another valve is activated to return the knife to its inactive position and move the rack upwardly to its start position, which is determined by the position of an adjustable stop that limits the upward movement of the rack. This stop determines the amount of downward movement of the rack so as to select the length of the fed strip of material that is cut. In another embodiment, the non-driven roller is moved away from the driven roller when the thickness of the strip of fed material exceeds a predetermined thickness. When the thickness of the strip ceases to exceed the predetermined thickness after having exceeded the predetermined thickness, the non-driven roller is returned toward the rotated roller to cause activation of a valve to stop the downward movement of the rack and activate the knife irrespective of the position of the rack. This results in the thickened portion, which is not usable, being cut as close to the end of the thickened portion as possible so as to reduce material waste.



3,735,658

## PLASTIC CUTTING APPARATUS

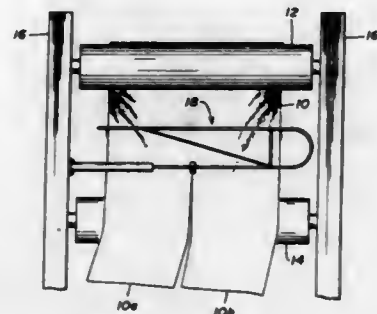
Jimmie R. Swann, Coahoma, Tex., assignor to Cosden Oil & Chemical Company, Big Springs, Tex.

Filed June 14, 1971, Ser. No. 152,881

Int. Cl. B26d 3/08

U.S. Cl. 83-433

3 Claims



Elongated plastic sheet material is cut longitudinally into strips of uniform, predetermined width by passing the plastic sheet material through a cutting device in the direction of its longitudinal axis wherein at least one blade member extends through the sheet material, thereby severing it longitudinally. The blade or blades are maintained in a fixed position relative to the sheet notwithstanding lateral movement of the sheet by a guide mechanism which engages the longitudinal edges of the sheet and instantaneously moves each blade member to correspond with lateral movement of the sheet.

3,735,659

## PERFORATING APPARATUS

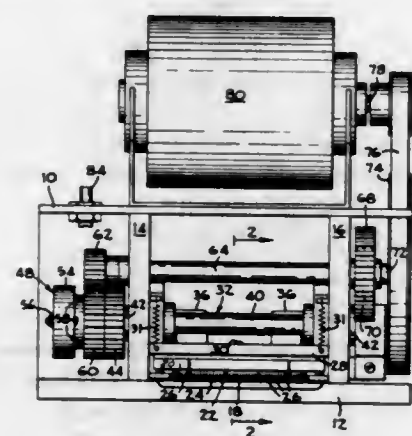
Hollis E. Button, 1025 W. Parr Avenue, Campbell, Calif.

Filed June 17, 1971, Ser. No. 154,119

Int. Cl. B26d 3/08, 5/16

U.S. Cl. 83-524

5 Claims



A perforating apparatus for photographic prints or other sheet material including a platen over which the material can be moved and against which a cam-actuated perforating die can be pressed through cyclical actuation to perform the perforating function.

3,735,660

## DEVICE FOR CUTTING SHEET MATERIAL

David R. Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, East Hartford, Conn.

Filed July 31, 1970, Ser. No. 59,899

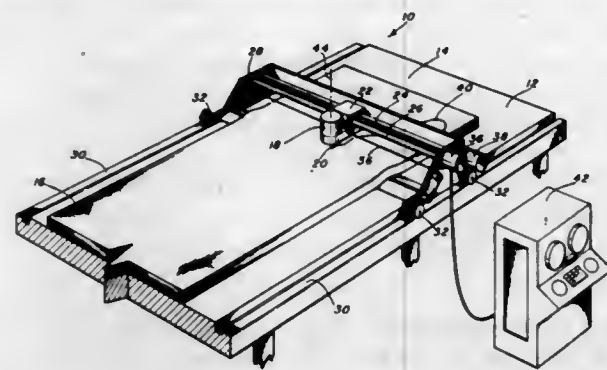
Int. Cl. B23d 27/00; B26d 7/20

U.S. Cl. 83-560

13 Claims

A device for cutting sheet material, such as a layup of fabric sheets spread on a cutting table, includes a cutter head movable over the table and having a vertically reciprocating knife or other similar cutting tool. The cutter head is moved by nu-

meric control relative to the table to cause its tool to follow a desired line of cut, and associated therewith is a bottom plate which moves longitudinally of the table in unison therewith



between the supporting surface of the table and the bottom layer of the material to receive the lower or distal end of the cutting tool.

3,735,661

## APPARATUS FOR CUTTING OF FIBER STRANDS

Norbert Eichler, and Kurt Urban, both of Waldhofen A.D. Ybbs, Austria, assignors to Gebr. Bohler & Co. Aktiengesellschaft, Dusseldorf, Germany

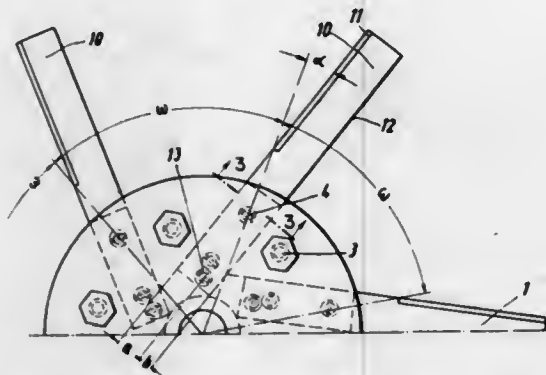
Filed Mar. 10, 1970, Ser. No. 18,274

Claims priority, application Austria, Mar. 10, 1969, A 2329/69; July 9, 1969, A 6564/69

Int. Cl. B26d 1/28

U.S. Cl. 83-675

1 Claim



An apparatus for chopping strands of fibers in which there is provided a rotatable clamping head defined by two disc-shaped members, means for forcing the members against each other and chopping knives clamped between the disc members and protruding therefrom, each knife being defined by a straight metal body of substantially triangular cross-section having a first portion clamped between the disc-shaped members and a second portion protruding beyond the disc-shaped members, with the protruding portion having a knife edge.

3,735,662

## SAW CHAIN

Roy H. Anderson, 1701 90th Street, Bellevue, Wash.

Filed Aug. 11, 1970, Ser. No. 62,848

Int. Cl. B27b 33/14

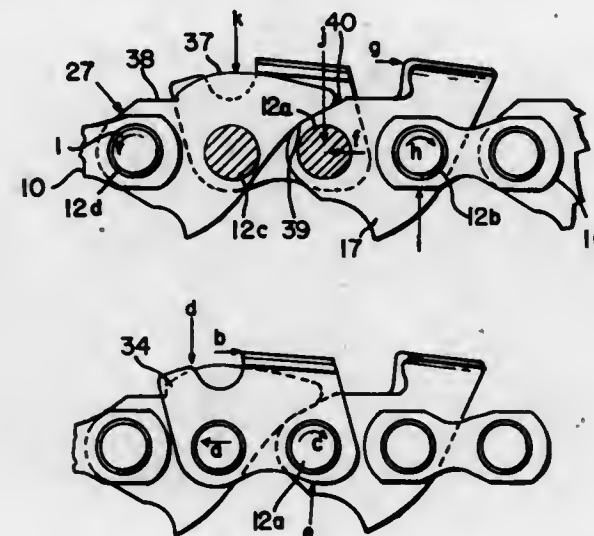
U.S. Cl. 83-830

8 Claims

A saw chain made up of a series of link sequences with each sequence including cutter link means, a raker tooth link, a depth gauge link, at least one spacer drive link and side connector links. The raker tooth link, the depth gauge link and spacer drive link are center links, i.e., located on the longitudinal centerline of the chain while the cutter link means is

made up of two oppositely facing side cutters located in the general planes of the side connector links, and mounted on common pivotal axes which connect them to both the depth

circumferential periphery of the remainder of the washer. Preferably, the tabs are equiangularly spaced about the periphery of the washer and the tabs and washer are formed from a single piece of metal. When positioned on the shank of



gauge link and raker tooth link. At least one of each pair of side mounted cutter links includes a depth gauge element integral therewith.

3,735,663

## MUSICIAN'S PICK

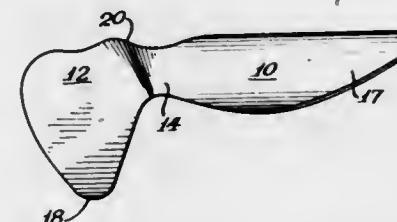
Harold E. Cowell, Sr., 3044 Central St., Evanston, Ill.

Filed Sept. 14, 1972, Ser. No. 288,908

Int. Cl. G10d 3/00

U.S. Cl. 84-322

11 Claims



A musician's pick which includes a plectrum having a strumming tip supported on one end of a handle which is grasped within the fisted palm of the musician. The longitudinal axis of the handle is disposed at an angle to the normal plane of movement of the tip during strumming. By this arrangement the musician may relax the normal grip on the plectrum between the thumb and forefinger but the plectrum continues to be supported by the grasp on the handle thereby positioning the pick for immediate reuse when desired by the musician. The pick is formed from a resilient or flexible sheet material and the plectrum may be integrally formed with or detachably supported on the handle.

3,735,664

## METAL WASHER FOR AN ANCHORING MEMBER

Werner Hermle, Schaanwald, Liechtenstein, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed June 10, 1971, Ser. No. 151,821

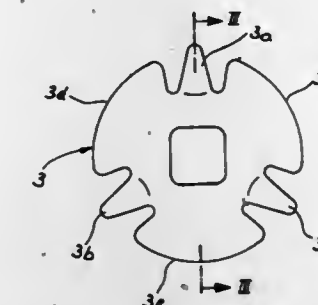
Claims priority, application Germany, June 11, 1970, P 20 28 876.0

Int. Cl. A43b 23/20; F16b 19/14, 43/00

U.S. Cl. 85-10E

5 Claims

A metal washer with resilient tabs extending from its circumferential periphery is used to support an anchoring member, such as a stud, bolt and the like within the barrel of a stud setting apparatus. The tabs have a thickness less than the washer and the roots of the tabs are located inwardly from the



an anchoring member and inserted into the barrel of a stud setting apparatus, the tabs are bent out of the plane of the washer and provide a resilient support in contact with the surface of the barrel.

3,735,665

## EXPANDABLE SCREW ANCHORING DEVICE AND A SPACING MEMBER THEREFOR

Louis Aackersberg Mortensen, Petersholm Hillevej 1, 3480 Fredensborg, Denmark

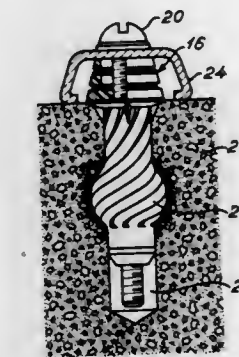
Filed Mar. 15, 1971, Ser. No. 124,097

Claims priority, application Denmark, Mar. 16, 1970, 1298

Int. Cl. F16b 13/06

U.S. Cl. 85-71

4 Claims



An expandable screw anchoring device for fastening recessed or concavely shaped members, such as sectional iron members, to a wall or plate. The anchoring device comprises a spacing member to be positioned between the wall surface and the concavely shaped side of the member to be fastened, in order to prevent the anchoring device be partly drawn out of the bored hole in the wall when the screw cooperating with the anchoring device is tightened. According to the invention the spacing member is shaped in such a manner and/or made from such a material that it is axially deformable so that the length of the spacing member will automatically be adjusted to the "rise of arch" of the concavely shaped member when the screw is tightened. Thus, anchoring devices with spacing members having one and the same length may be used for fastening members having different "rise of arch."

3,735,666

## HAND LOADING PRESS FOR FIELD USE OR THE LIKE

Harold D. Decker, 1160 Manley Drive, San Gabriel, Calif.

Filed May 17, 1971, Ser. No. 144,092

Int. Cl. F42b 35/02

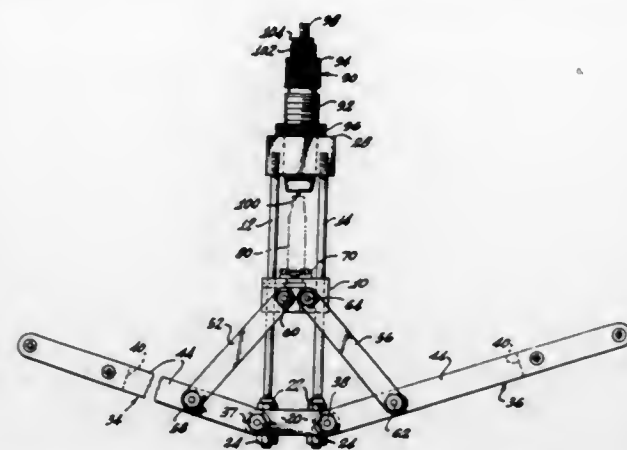
U.S. Cl. 86-24

4 Claims

A ram element is slidable on parallel rods, which at one end are secured to a die holder into which standard rifle and pistol dies are threaded along an axis parallel to and midway between the rods. At their other end, the rods are secured to a



base to which hand operated levers are pivotally mounted. Sliding movement of the ram is effected through links connected between it and the levers. The links are arranged so that of the force components applied to the ram from the levers, all but those directed parallel to the axis of the die



holder are balanced out. The ram is adapted to releasably hold seats for cartridge cases of different sizes, and has a central opening through which a primer cap passes upon being ejected from a spent case by a die decapping pin as the ram forces it into the die held in the die holder.

3,735,667

#### CARTRIDGE FEEDER DEVICE FOR AUTOMATIC FIREARMS WITH A DRIVE MECHANISM INDEPENDENT OF THE BREECHBLOCK

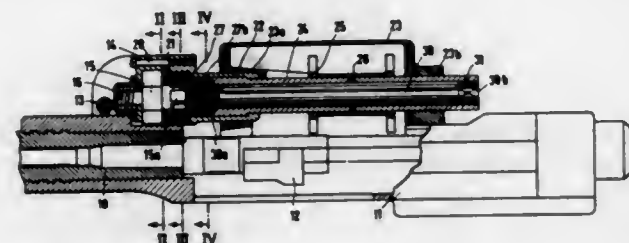
Gerhard Hupp, and Ludwig Vorgrimler, both of Oberndorf/Neckar, Germany, assignors to Messrs. Mauser-Werke Aktiengesellschaft, Oberndorf/Neckar, Germany

Filed May 6, 1970, Ser. No. 35,042

Int. Cl. F41d 9/02

U.S. Cl. 89—33 CA

8 Claims



A cartridge feeding device including a torsion spring mechanism which is interposed between a drive member and a cartridge feeding member and which functions as an energy accumulator.

3,735,668

#### MISSILE LAUNCH CONTROL SYSTEM

Leo O. Langlois; Ralph T. Tadaki, both of Los Angeles; John R. Ellis, Jr., Thousand Oaks, all of Calif.; Roy W. Stevens, Jr., and Robert H. Leech, both of Tucson, Ariz., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 10, 1970, Ser. No. 97,452

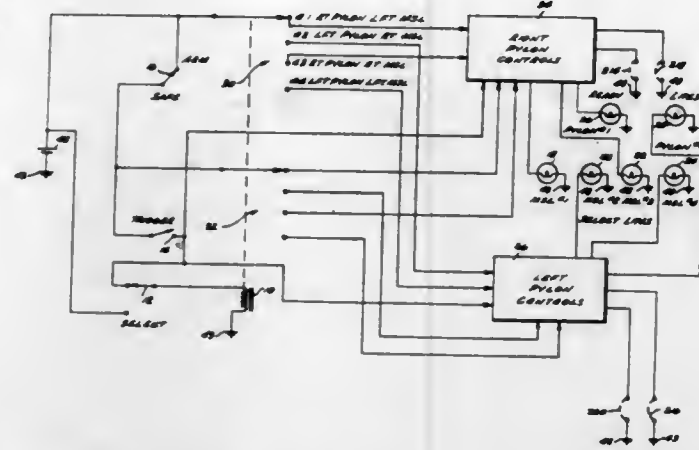
Int. Cl. F41f 3/04

U.S. Cl. 89—1.814

4 Claims

A control system for launching missiles from aircraft wherein said missiles are automatically prepared and fired in either an individual or ripple fire sequence, particularly em-

bodying logical mechanisms for arming and firing said missiles in predetermined sequence, including the arming and firing of



said missiles in an alternate sequence when individual missiles are missing from their firing positions.

3,735,669

#### ELEVATING DEVICE IN PARTICULAR FOR PAINT SPRAYING PLANTS

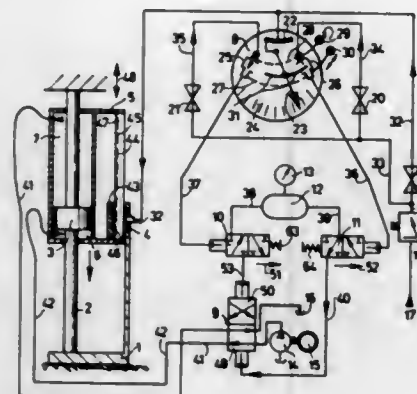
Erich G. Henke, Immenhoferstr. 19, Stuttgart; Helmut F. Braun, Kirchstr. 7; Karl L. Scholl, Argenstr. 76, both of Kressbronn, and Rudolf Schubert, Oberreithnerstr. 24, Lindau, all of Germany

Filed June 3, 1970, Ser. No. 43,016

Claims priority, application Germany, June 6, 1969, P 19 28 855.2

Int. Cl. F01b 31/12; F15b 13/042  
U.S. Cl. 91—1

10 Claims



An elevating device for paint spraying comprising a base supporting a guide bar having a piston thereon, a hydraulically movable elevating section slidably mounted on said guide bar, a pneumatic stroke control means including a grooved control member having a control groove therein and an pneumatic a pneumatic chamber through which said control member slidably moves, and a pneumatic-hydraulic transducer means for controlling the hydraulically movable elevating section by the pneumatic stroke control means.

3,735,670

#### FLUID-ACTUATED CHUCK-OPERATING MECHANISM WITH A FLUID LOCK

Gordon W. Smithson, Westerly, R.I., assignor to Cushman Industries, Incorporated, Hartford, Conn.

Division of Ser. No. 30,636, April 22, 1970, abandoned. This application Nov. 22, 1971, Ser. No. 200,992

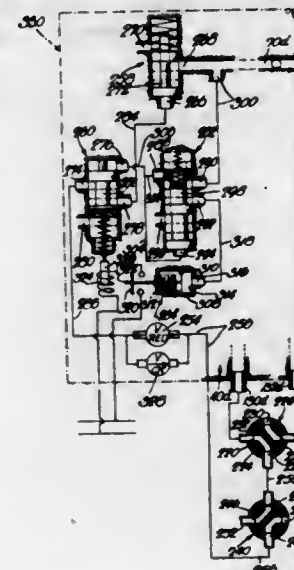
Int. Cl. F15b 12/042; F23b 31/30

U.S. Cl. 91—32

3 Claims

Fluid-actuated chuck-operating mechanism having an operationally turning cylinder with a piston therein, a swivel coupling with companion parts of which one part turns with

the cylinder and the other part is operationally non-turning, with operating fluid under a given high-level pressure being supplied to the non-turning coupling part for its transmission through the latter part and its turning companion part to either cylinder end, and a unit having operating parts embodied in the non-turning coupling part and operative to lock the operating fluid in at least the chuck-closing cylinder end in case the pressure of the supply fluid to the latter should during a chuck operation drop from any cause below the pressure of the operating fluid in this chuck-closing cylinder end, and featuring a device for decreasing the pressure of the fluid in



the chuck-closing cylinder end from the given high-level pressure to a given low-level pressure, which includes a manual control and a fluid passage by-passing the operating parts of the fluid-lock unit and leading directly to a fluid passage in the non-turning coupling part which, through a passage in the turning coupling part, is in permanent communication with the chuck-closing cylinder end, with this device being, on manipulation of the control, operative to vent the chuck-closing cylinder end until the pressure of the fluid therein reaches a given minimum level below the given low-level pressure, then discontinuing venting of this cylinder end and apply to the latter fluid under the given low-level pressure.

3,735,671

#### HYDRAULIC POWER MODULE

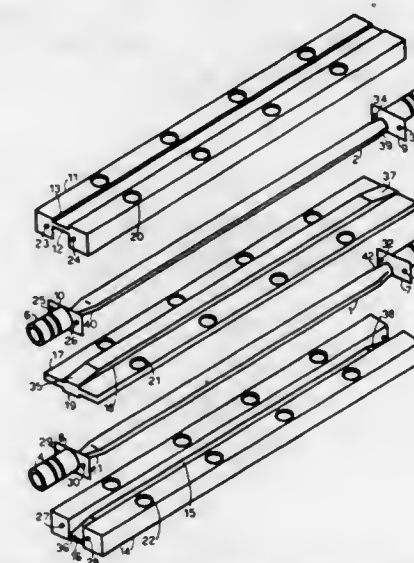
Frank P. Pennucci, 4165 La Ladera Road, Santa Barbara, Calif.

Filed July 12, 1971, Ser. No. 161,686

Int. Cl. F01b 19/00; F16j 3/00

U.S. Cl. 92—90

6 Claims



Two or more high pressure hoses are stacked and constrained to provide a substantially unidirectional force by

means of a floating spacer. The hoses are totally enclosed and operated between two predetermined contours by means of high pressure hydraulic fluid.

3,735,672

#### CIGARETTE FILTERS

Desmond Walter Molins, Deptford, London, S.E. 8, England; Francis Auguste Maurice Labbe, 92 Neuilly-sur-Seine, France, and Clive Perkins, Deptford, London, S.E. 8, England, assignors to Molins Limited, London, England

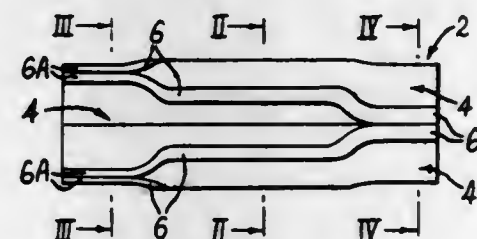
Filed Nov. 3, 1971, Ser. No. 195,177

Claims priority, application Great Britain, Nov. 9, 1970, 53,274/70

Int. Cl. B31c 13/00

U.S. Cl. 93—1 C

7 Claims



Cross-flow filter elements for cigarettes are made by forming a continuous rod of filter material including a number of substantially axial grooves separated by rib portions; closing alternate grooves at regular intervals by pinching together the ribs; and cutting the rod at regular intervals to form a succession of cross-flow filter elements. The rod is preferably formed by folding inwards circumferentially spaced regions of a continuous tube which itself is formed by bringing together the edges of a continuous web of filter material.

3,735,673

#### BAG MANUFACTURING MACHINE

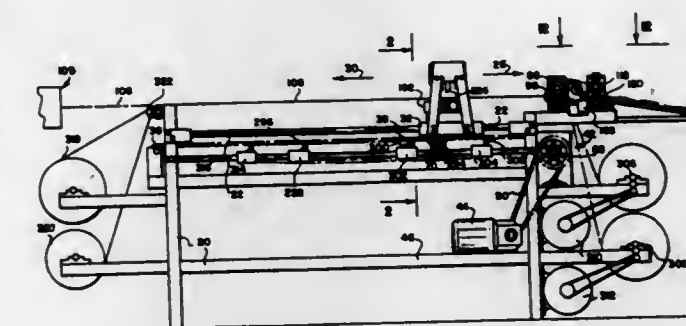
Richard S. Sheehan, 1672 S. Elizabeth, Denver, Colo., and Twyman Guard, 795 S. Alton Way, Denver, Colo.

Filed Apr. 4, 1972, Ser. No. 241,037

Int. Cl. B31b 1/64, 49/04

U.S. Cl. 93—35 R

14 Claims



A plastic bag producing machine and method adapted for continuous production of plastic bags from extruded tubing such as conventional polyethylene plastic or the like; said machine being adapted for high rate operation in line with an extruder and for receiving plastic tubing in flat condition directly downstream from the extruder and for heat sealing and perforating the plastic tubing at evenly spaced positions therealong, during which time the plastic tubing is constantly moving; said machine having a movable carriage adapted to move backward toward the extruder and to move forward at a rate of movement of the plastic tubing from the extruder, and to heat seal, as well as cool the heat sealed area, while the plastic tubing is clamped between a pair of clamp means to avoid tension separation of the heat sealed portion thereof;



said machine also having separator means adapted automatically to separate each perforated portion of flat tubing for delivering separate bags in timed relation to the heat sealing and perforating functions, or the machine of the invention may be selectively operated to roll the heat sealed and perforated tubing into a roll, if desired.

3,735,674

# FORMATION OF CREASES IN BOARD IN OR FOR THE MANUFACTURE OF CARTON BLANKS

George Haddock, Leeds, England, assignor to Alf Cooke Limited, Crown Point, Leeds, Yorkshire, England, a part interest

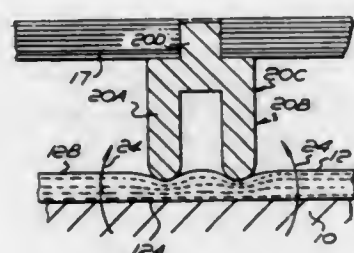
Filed June 25, 1971, Ser. No. 156,891

Claims priority, application Great Britain, Dec. 9, 1970, 58,350/70

Int. Cl. B31b 1/74

U.S. Cl. 93—58 R

7 Claims



The formation of creases in carton blank board wherein each crease is defined by a pair of closely spaced parallel crease lines. The said pair of lines is formed by the edges of a pair of spaced creasing rules which press the board against a creasing machine platen.

3,735,675

# METHOD OF MAKING WINDOW ENVELOPES

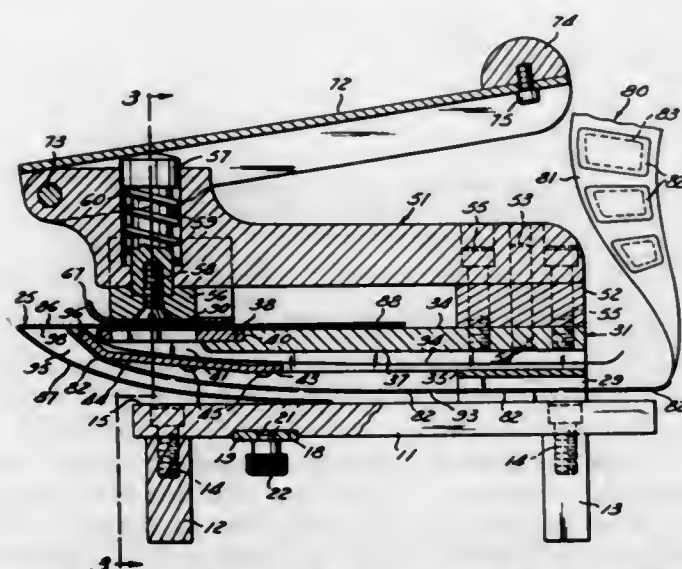
Feiten Michael O'Neill, 1276 Ramona Avenue, Lakewood, Ohio

Division of Ser. No. 864,675, Oct. 8, 1969. This application Jan. 6, 1972, Ser. No. 215,789

Int. Cl. B31b 1/24

U.S. Cl. 93—61 A

7 Claims



A method is disclosed for producing window envelopes from preformed windowless envelopes. Front and rear wall portions of a preformed envelope are separated, and a window opening is punched in one of the wall portions. A transparent window pane is located in the interior of the preformed envelope between the separated wall portions by a flexible carrier web and is removed from the carrier web within the interior of the envelope by passing the carrier web over a guide plate which abruptly changes the direction of travel of the carrier web. The window pane is removed from the carrier web and

affixed to the interior surface of the one wall portion as the envelope is removed from the punching dies. The window panes are adhesively secured to the carrier web in longitudinally spaced apart relation, and the carrier web is fed into and out of the envelopes in a direction substantially parallel to the wall of the envelope to which the window pane is to be affixed.

3,735,676

# EXPOSURE CONTROL MECHANISM FOR PHOTOGRAPHIC CAMERAS

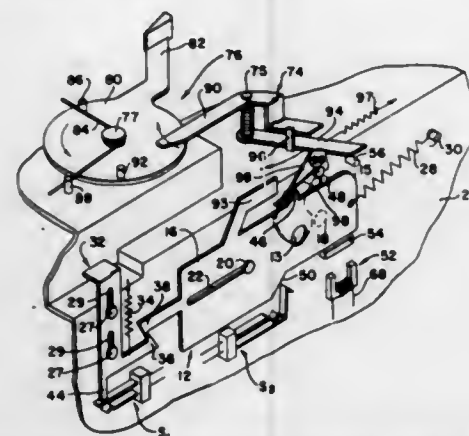
Donald M. Harvey, Webster, and David L. Babcock, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 7, 1971, Ser. No. 178,146

Int. Cl. G03b 7/08, 9/62

U.S. Cl. 95—10 CT

9 Claims



A shutter mechanism wherein a shutter blade is mounted for movement from a first exposure aperture blocking position to an exposure aperture unblocking position in which the shutter blade is retained until a transducer controlled by a light-integrating timing circuit is actuated to release the shutter blade for movement to a second exposure aperture blocking position. According to one embodiment, a shutter blade having an aperture is retained in a first exposure aperture blocking position and adapted to be released for movement under a spring bias into engagement with a stop that positions the blade aperture in alignment with the exposure aperture, and when the transducer is actuated the blade is moved to a second exposure aperture blocking position.

3,735,677

# ANNULAR EXPOSURE SOURCE

Michael B. Jones, North Syracuse, and Wilfred D. Rublack, Liverpool, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

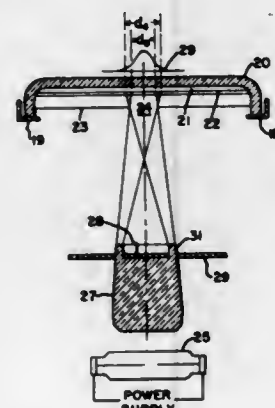
Continuation of Ser. No. 159,591, July 6, 1971, abandoned.

This application Sept. 8, 1972, Ser. No. 287,439

Int. Cl. G03; H01J 29/18

U.S. Cl. 95—1 R

6 Claims



Means for exposing selected portions of a photosensitive surface having an apertured mask disposed in spaced relation-

ship thereto. A source of actinic energy having a substantially annular configuration is disposed at a suitable distance from the side of the mask opposite the photosensitive surface. A major portion of the actinic energy falls upon an area of the photosensitive surface which is smaller than the area of the aperture in the mask, facilitating the photochemical processing of well-defined patterns whose dimensions are less than those of the apertures used to form them.

3,735,678

# TEXTURIZED PHOTOGRAPHIC PRINT, METHOD AND APPARATUS

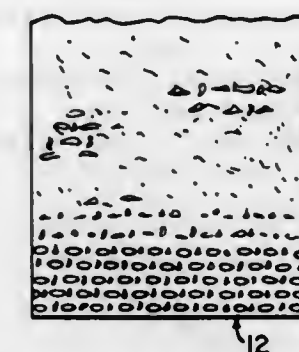
James McC. Smith, 6 B St., Adams, Mass.

Filed Dec. 29, 1969, Ser. No. 888,363

Int. Cl. G03d 15/06

U.S. Cl. 95—1

10 Claims



The texturized print includes an image matrix having spaced, molded surface indentations therein. In the method, the softened multi-layer emulsion surface of a photographic color print is pressed into contact with a texturized non-stick surface and hardened so as to mold indentations therein in conformance with the textured surface. In the apparatus, a press means has a textured Teflon surface adapted to be brought into contact with a softened, multi-layer emulsion of a photographic print, so as to mold the emulsion into conformance with the texture of the Teflon surface during the hardening of said emulsion.

3,735,679

# CAMERA WITH IMPELLER-ACTUATED SOURCE OF ARTIFICIAL LIGHT

Alfred Winkler, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

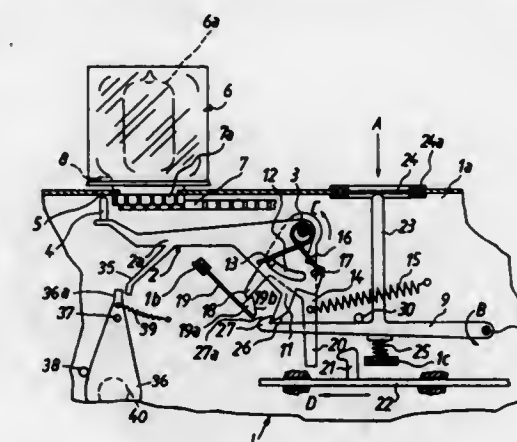
Filed May 24, 1971, Ser. No. 146,291

Claims priority, application Germany, May 23, 1970, P 20 25 180.5

Int. Cl. G03b 15/04

U.S. Cl. 95—11.5 R

15 Claims



A still camera wherein the housing supports an indexable flashcube having cartridges which must be struck in order to fire the respective lamps. The housing contains a pivotable impeller which is released to the action of a torsion spring to

strike against the cartridge for that lamp which faces the subject or scene when the user moves a pivotable release lever from its starting position. A resetting lever is provided to automatically return the impeller to its cocked position as soon as the impeller strikes against the adjacent cartridge. The resetting lever is then moved back to its normal position of engagement with an elastic pawl by a tensioning member which is actuated by the film transporting mechanism. The tensioning member thereby stresses the torsion spring for the impeller as well as a second spring which serves to pivot the resetting lever in a direction to return the impeller to its cocked position.

3,735,680

# CONTAINER FOR FILM UNITS AND FLASH ILLUMINATION DEVICES

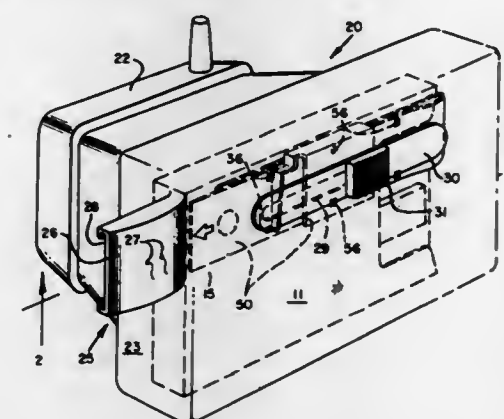
Sheldon A. Buckler, Lincoln; David P. Kennedy, Cambridge, and Kenneth S. Norland, Belmont, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 10, 1972, Ser. No. 216,542

Int. Cl. G03b 15/02, 19/10

U.S. Cl. 95—11 L

8 Claims



A photographic film assemblage including a container having a wall with an aperture therein through which film units contained within the container may be exposed; a plurality of film units are stacked within the container with the photosensitive areas in alignment with the aperture. Additionally, a plurality of flash illumination devices are also contained within the container.

3,735,681

# FILM ADVANCE AND METERING MECHANISM

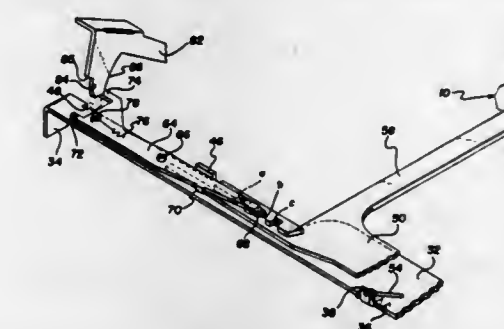
Floyd M. Galbraith, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 4, 1971, Ser. No. 186,119

Int. Cl. G03b 19/04

U.S. Cl. 95—31 FM

10 Claims



A camera for receiving roll film having a leader portion with closer than normally spaced perforations and an exposure portion. A pawl is adapted to sense the perforation spacing. Should that perforation spacing be that of the leader, the camera's shutter release mechanism cannot be activated and the film advance mechanism may be operated to advance more film into the take-up chamber. However, should the pawl sense normally spaced perforations, the film advancing



mechanism is disabled and the shutter release mechanism may be activated to take a picture. After the last exposure frame, the film is perforated at the shorter distance to permit running off of the trailer and is finally perforated at a position to prevent further film movement.

3,735,682

# STRIP METERING MECHANISMS FOR ADVANCING FILM IN A FILM PACK

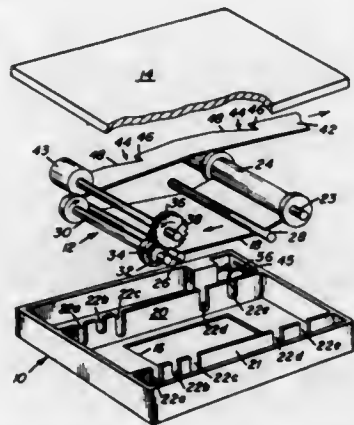
Leonard F. Kamp, Rochester, and William P. Ewald, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 24, 1971, Ser. No. 156,253

Int. Cl. G03b 17/18

U.S. Cl. 95—31 FM

10 Claims



Strip metering mechanisms for successively advancing predetermined increments of film from a roll of film in a film pack adapted for use in a camera of the instant processing type. Such cameras use conventional film packs and do not have a film roll advancing facility. The metering mechanisms comprise a metering strip coupled to a roll of film and adapted when pulled out of the camera a predetermined increment to actuate an audio signal generating device or to lock the film and/or strip to prevent further film advance. The audible signal or strip and/or film lock-up is achieved by notches and ramps in the strip and/or film which actuate the audio signal generating mechanism or the strip and film locking mechanism. The signal is generated, or the strip and/or film locked at the instant that the film has been advanced sufficiently to locate a predetermined increment of film in a correct exposure position.

3,735,683

# MOTOR DRIVEN PHOTOGRAPHIC CAMERA

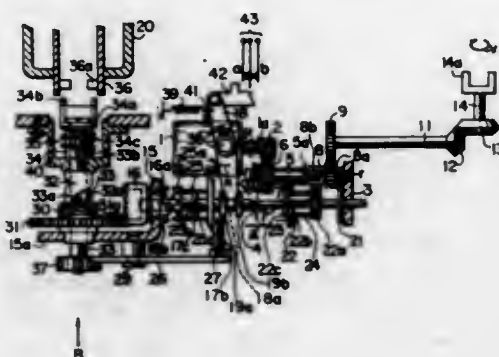
Kaoru Umeda, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Minami-ku, Osaka-shi, Osaka-fu, Japan

Filed Sept. 8, 1972, Ser. No. 288,122

Int. Cl. G03b 1/12, 19/04

U.S. Cl. 95—31 EL

6 Claims



A motor driven photographic camera having a motor for driving a film winding/shutter charging mechanism, wherein

there is provided a manually operative shaft for selectively disconnecting the motor from the film winding/shutter charging mechanism for transmitting the rotational movement of the motor to a film rewinding gear. There is also provided a film rewinding shaft which is connected to the film rewinding gear through a stop lever and which is rotatable in coaxial relationship with the film rewinding gear. The film rewinding shaft has a clutch for transmitting the rotational movement thereof to a shaft to film magazine. The rotation of the film rewinding shaft is stopped temporarily for displacing the shaft axially with respect to the film rewinding gear for connecting the clutch of the film rewinding shaft to the film rewinding spool of the magazine. After and while maintaining the engagement between the clutch and the film rewinding spool shaft, the film rewinding shaft is released from its locked position and allowed to rotate for rewinding the film.

3,735,684

# REFLEX CAMERA WITH MEANS TO REDUCE MIRROR REBOUND

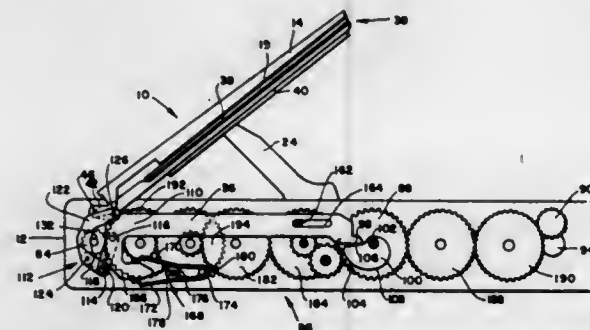
Edward H. Coughlan, Canton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 26, 1971, Ser. No. 146,881

Int. Cl. G03b 19/12

U.S. Cl. 95—42

17 Claims



A single-lens reflex camera having a drive system including a variable acceleration erecting arrangement for moving a reflecting member within an optical path from a viewing position to an erected exposure position. The variable acceleration erecting arrangement is operative to selectively impart both positive and negative accelerating forces to the reflecting member during selected portions of its movement. The forces are operative to drive the reflecting member to its exposure position quickly and reduce the elastic rebound which is generated by impact at a contact surface positioned at its erected exposure position.

3,735,685

# REFLECTIVE IMAGING APPARATUS

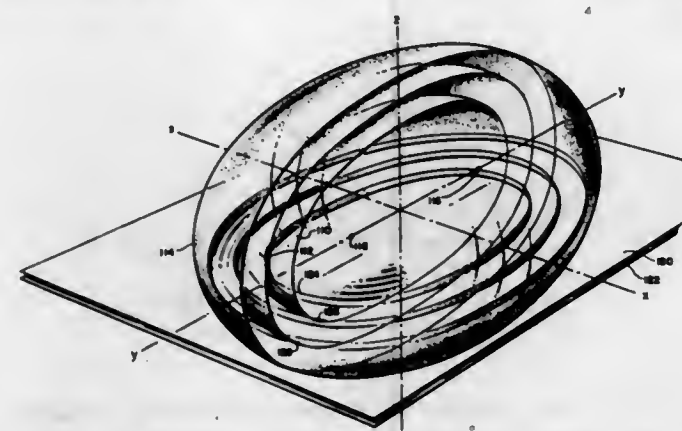
William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 7, 1971, Ser. No. 141,253

Int. Cl. G03b 19/12; G02b 3/08

U.S. Cl. 95—42

23 Claims



A reflex camera having an aberration reducing image reflection surface for use in viewing an image, transmitted

through an entrance pupil to the image reflection surface, at an exit pupil remote from both the reflection surface and the entrance pupil.

The reflective surface is generally planar and so formed as to provide a plurality of ellipsoidal segments extending thereover. The ellipsoidal segments are provided with common foci, whereby any light passing through the entrance pupil and impinging on any of the ellipsoidal segments will be reflected to the exit pupil.

3,735,686

# CAMERA SYSTEMS

Thomas Howard Brewer, and Roger William Blundell, both of Chelmsford, England, assignors to Sidney R. Littlejohn & Co., Ltd., London, England

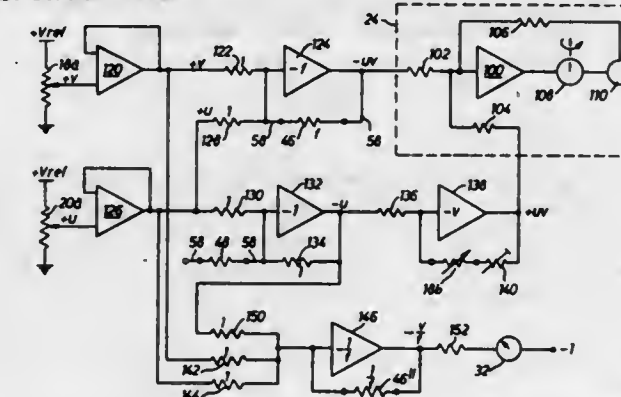
Filed Nov. 22, 1971, Ser. No. 200,751

Claims priority, application Great Britain, Dec. 18, 1970, 60,283/70

Int. Cl. G03b 3/00

U.S. Cl. 95—44 R

8 Claims



A constant focus drive apparatus for controlling the positioning of an object and a lens arrangement in a camera system relative to a desired plane so as to keep an image of the object focused in such plane, comprising means e.g. potentiometers for measuring the object and image distances and for producing distance signals representative thereof, drive means e.g. one or more servo systems and/or a manually controlled motor connected to the camera system for varying both the object and image distances, and a computer which may be analogue or digital and may use electricity, pneumatic or hydraulic power, or other powering medium and which is programmed with the lens formula of the camera system to compute, in accordance with the measured values of the object and image distances, a control signal for application to the drive means to alter one or both of said distances as necessary so that the image is kept focused in said plane.

3,735,687

# ROTARY SHUTTER

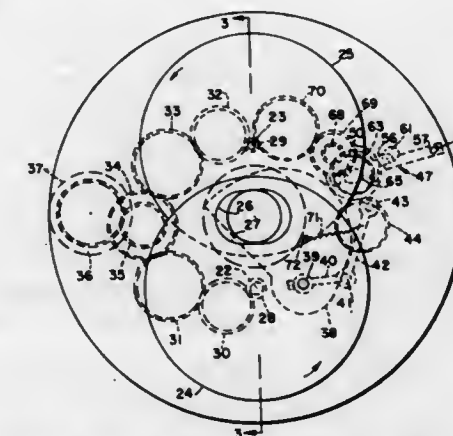
Wallace Sidney Park, P.O. Box 21379, Louisville, Ky.

Filed Nov. 25, 1970, Ser. No. 92,714

Int. Cl. G03b 9/14, 9/16

U.S. Cl. 95—61

12 Claims



A high speed camera is especially adapted for aerial photography and it includes conventional rotary discs and a capping

shutter. The rotary discs contain openings for alignment with the aperture of the camera. These discs, instead of being rotated synchronously, are rotated at different speeds, e.g. 4 to 3, respectively, whereby the disc openings become aligned with the camera aperture on multiple revolutions of the discs rather than on only one revolution. This permits operation of the capping shutter at a much slower speed, thus avoiding the impact forces of conventional cameras when operating the capping shutter.

3,735,688

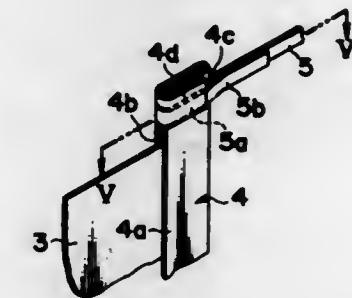
CURTAIN SHUTTER FOR PHOTOGRAPHIC CAMERAS  
Mitsuo Noritake, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka-shi, Osaka-fu, Japan

Filed Aug. 11, 1972, Ser. No. 279,814

Int. Cl. G03b 9/32

U.S. Cl. 95—57

2 Claims



A curtain shutter for photographic cameras including an edge member having a U-shaped groove for holding one end of an opaque curtain, the other end of which is secured to and wound around one of the curtain drums of the shutter, the edge member having at both the upper and lower ends thereof a projecting portion extending beyond the upper and lower longitudinal edges of the opaque curtain, respectively, and being provided with a slot at the bottom of the U-shaped groove in each of the upper and lower projecting portions and also with an extension strip integrally connected to one side wall of the edge member. An exposure slit is formed by the opaque curtain in cooperation with the edge member. The other end of each ribbon is inserted into the U-shaped groove through one of the said slots and turned in U-shape around the side wall of the edge member opposite the side wall on which the extension strip is provided. The turned end portions of the ribbons are adhesively secured to the outer surface of the edge member and also to the respective ribbon portions disposed outwardly of the slots. The extension strip is turned onto the turned end portion of the ribbon to cover at least a portion thereof.

3,735,689

# ROLLER TRAY PHOTOGRAPHIC PROCESSING APPARATUS

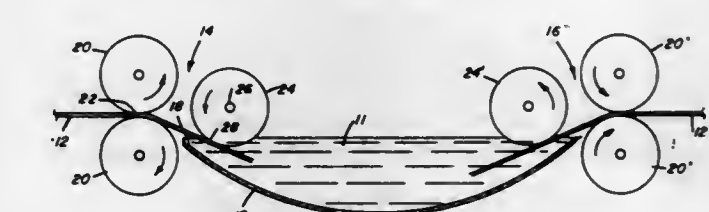
Frank M. Smola, and Richard S. Pomeroy, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 27, 1971, Ser. No. 212,013

Int. Cl. G03d 3/12

U.S. Cl. 95—94 R

6 Claims



A straight-through processing apparatus in which film in sheet or web form is fed through a processing solution in a



shallow tray by a set of three rollers at the inlet of the tray and a set of three rollers at the outlet of the tray. The inlet set of rollers comprises a pair of opposed, interengaging drive or transport rollers positioned outside of the tray, and a driven guide roller positioned within the tray at the entrance end thereof, and partially immersed in the processing solution. The outlet set of rollers also comprises a pair of opposed, interengaging transport rollers positioned outside of the tray and a driven guide roller positioned within the tray at the exit end thereof, and partially immersed in the processing solution. The film transport distance between the nips or line of contact of the inlet and outlet transport rollers is preferably less than the length of a film being processed, and the nips are positioned above the periphery of the tray at each of its ends. The nip of the inlet transport rollers is arranged below the axis of the guide rollers.

3,735,690

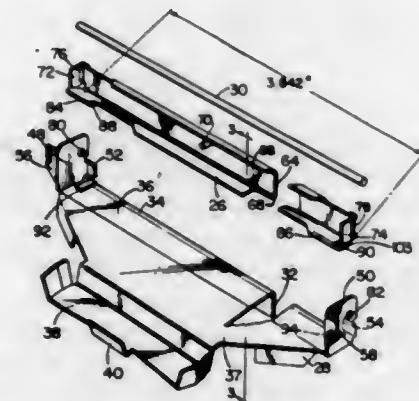
**PHOTOGRAPHIC FLUID SPREADING APPARATUS WITH WRAP-AROUND EDGE CONTROL MEMBERS**  
Earl R. Thoenen, Newburyport, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 14, 1971, Ser. No. 133,905

Int. Cl. G03d 5/02

U.S. Cl. 95-89 R

26 Claims



Apparatus for use in a camera of the self-developing type to effect the spreading of a processing fluid in a layer between a pair of superposed sheet materials as they progressively pass through the apparatus. A first spreader element is formed of sheet metal and includes a flat sheet-contacting facing surface and a canted platform extending in advance thereof. A second spreader element is formed of sheet metal and includes an arcuate sheet-contacting facing surface and a pair of wrap-around collars comprising extensions of that sheet metal structure curled back thereupon in the direction of its arcuate facing surface. Each facing surface is substantially uniform in cross-sectional configuration and extends entirely across the sheet metal structure in which it is formed. In manufacturing the latter mentioned spreader element, the wrap-around collars are formed subsequent to the development of its arcuate sheet-contacting facing surface. When the two spreader elements are disposed in their operative positions and as the superposed sheet materials are advanced therethrough, the collars engage respective longitudinal edges of the sheet materials against the aforementioned platform to preclude fluid escaping from between the edges of the sheet materials.

3,735,691

**LOUVER ASSEMBLY**

Ross H. Gotton, Highland; John K. Koh, Ann Arbor; Edmund A. Newton, Belleville, and David R. Saunders, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 7, 1972, Ser. No. 216,067

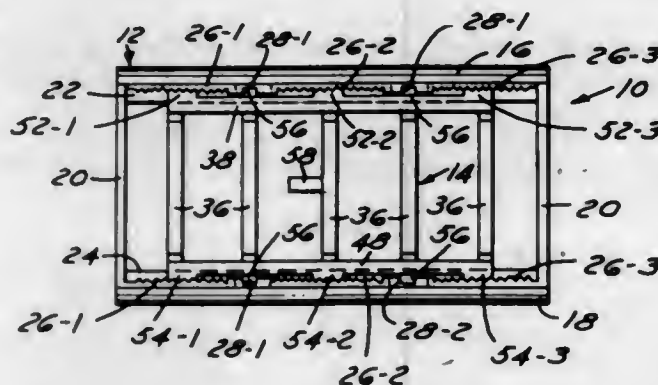
Int. Cl. F24f 7/00, 13/06, 13/08

U.S. Cl. 98-121

10 Claims

A louver assembly includes a housing having an opening therethrough which defines at least one interior surface. A

plurality of louver vanes are interconnected to a pair of gang bars by living hinges. The connection between the vanes and one of the gang bars is at a corner on a first edge of each of the vanes. The other gang bar is interconnected with the plurality of vanes at a second edge of the vanes. Mounting structure is provided which is in part associated with the housing and in part associated with the interconnected vanes. The mounting structure mounts the vanes in the opening of the housing for pivotable movement with respect to the housing. At least one



of the gang bars is in juxtaposition with the housing's interior surface. Ratchet teeth are formed on at least a portion of the one gang bar and these teeth are in facing relationship with the housing's interior surface. Grooves are provided on the housing's interior surface in juxtaposition with the ratchet teeth. The plurality of vanes are held in a fixed position within the housing's opening by engagement of the ratchet teeth and the grooves. The plurality of vanes may be adjusted to any selected position by moving the ratchet teeth over the grooves.

3,735,692

**AUTOMATIC PIZZA MAKING MACHINE**

Albano Marchignoni, Mura D'Azeglio 4, Bologna, Italy

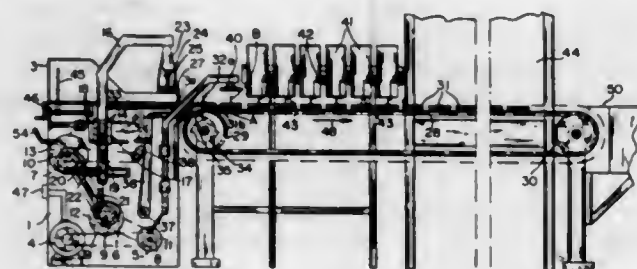
Filed May 4, 1971, Ser. No. 140,056

Claims priority, application Italy, May 5, 1970, 3438 A/70

Int. Cl. A23p 1/00

U.S. Cl. 99-353

10 Claims



An automatic pizza making machine continuously intermittently dispensing a pizza dough mixture and pressing it into a disc onto a conveyor belt, with means to deposit different ingredients, spices and condiments at several stations along the path of the conveyor belt onto the pizza dough, and means to pass the conveyor through a baking oven.

3,735,693

**HOT OIL RECIRCULATING COOKING SYSTEM**

Arthur F. Pelster; Eugene C. Johns, and Norman C. Sullivan, all of Nashville, Tenn., assignors to Kentucky Fried Chicken Corporation, Louisville, Ky.

Filed Feb. 23, 1972, Ser. No. 228,598

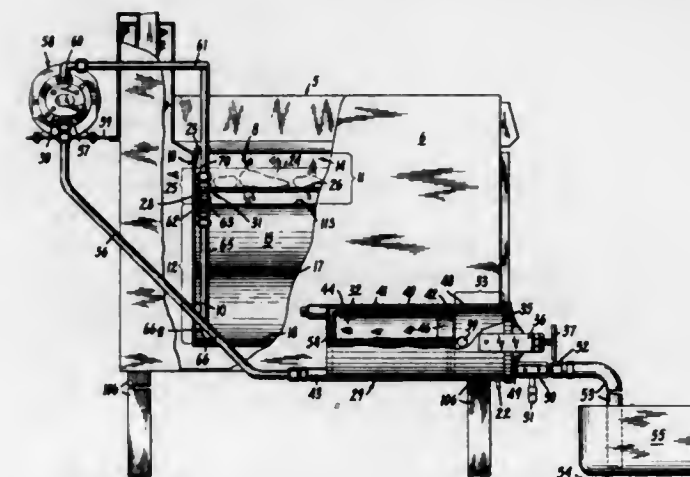
Int. Cl. A47j 37/12

U.S. Cl. 99-408

10 Claims

Hot oil recirculating cooking system for deep fat frying of food, such as chicken parts, including a cooking pot chamber

having a bottom outlet and a top inlet. Through flow conduit means connect the bottom outlet to the top inlet where the returned oil is delivered into the pot chamber by spray nozzles. This conduit means includes a pump and a horizontally oriented, closed, openable cylindrical filter tank containing removable filtering equipment. The cooking pot is transversely rectangular with a pair of its opposed, widely spaced sidewalls shaped inwardly toward each other at the bottom of a frying zone of its chamber to provide a pair of upwardly facing, crowned shoulder ledges. Depending from these shoulder ledges these opposed shaped sidewalls define therebetween a downwardly converging, relatively narrow cold zone deep well closed off by a horizontal bottom section, with the other opposed pair of pot sidewalls being arranged in transversely spaced, vertical planes to define convergently shaped, narrow end walls of this well. The merge portions of these shaped sidewalls which define these shoulder ledges and the deep well sidewalls are smoothly convex inwardly and the well bottom section is smoothly convex outwardly in bulbous fashion. The pot chamber outlet opening is provided in one well end wall at the bottom of this bulbous section for effective clean-out of particulate solids into the conduit line. The outlet opening is connected through a shut-off valve to an inlet end section of the horizontally oriented filter tank with this inlet section being closed off by a removable lid which carries a valved rain and suction tube. The cylindrical filter chamber has nested therein downstream of its inlet section a removable, rigid,



foraminous, cup-shaped basket which supports therein an open-mouth filter bag, and the transverse downstream end of the filter tank has an outlet opening flow connected by a conduit section to the inlet of the pump. The pump outlet is flow connected by a supply conduit section which extends over the rim of the open top of the cooking pot down to its chamber for flow connection therein of a nozzle assembly. The nozzle assembly is located at the end wall of the well opposite that which has the outlet opening, and it includes a pair of lateral nozzles each located at one of the merge shoulder ledges with jet openings thereof directed laterally toward the opposite outlet opening-equipped end wall for washing particulate solids off of this shoulder ledge down into the well. Another nozzle of this assembly depends down into the well to direct a jet therefrom along the bulbous bottom section of the latter for sweeping into the outlet opening particulate solids which tend to collect in this section. A lateral, foraminous, food-supporting rack is supported on the pair of shoulder ledges immediately above the pair of lateral nozzles so that pieces of food thereon will be in the hot frying zone of the hot oil pooled in the pot chamber. A small aspirating and bleed aperture is provided in this supply conduit section in the vicinity of the intended surface of the pooled hot oil. Burners are provided externally of the pot chamber on opposite sides of the cold zone deep well for heating the well walls in their shoulder merge portions and therebelow, and the oil pooled thereabove in the frying zone.

3,735,694

**ROLLING MACHINE FOR STUFFED MEAT "BIRDS" AND OTHER ROLLED ARTICLES**

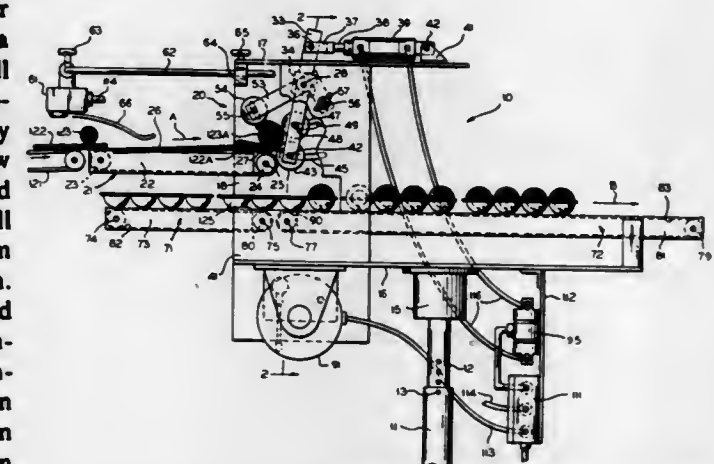
Louis R. Richards, Mokena, and Henry N. Lekan, Chicago, both of Ill., assignors to Formax, Inc., Mokena, Ill.

Filed Sept. 4, 1970, Ser. No. 69,562

Int. Cl. A22c 7/00

U.S. Cl. 99-450.1

6 Claims



A machine for rolling stuffed meat "birds" and other articles comprising an in-feed conveyor for feeding fat, pliable articles of low memory factor, such as meat patties, into a rolling station. A first power-driven roller blocks the path of the articles at the rolling station, deflecting the leading edge of the article upwardly; other power-driven rollers guide the article backwardly and downwardly so that the article is rolled upon itself. Gate means are provided to displace the first roller away from the end of the in-feed conveyor, when the article has been rolled, discharging the completed rolled article down onto a discharge conveyor.

3,735,695

**STACK FORMING AND HANDLING MACHINE**

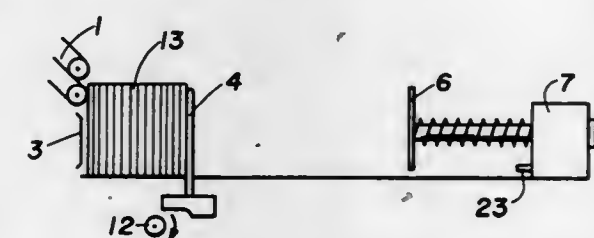
Rolf Bottcher, Markleeberg-ost, Germany, assignor to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen, Leipzig, Germany

Filed Feb. 8, 1971, Ser. No. 113,467

Int. Cl. B65b 13/00

U.S. Cl. 100-7

10 Claims



In combination, a stacker for fold sheets and a bundling press, the bundling press being arranged alongside the stacker, and means for pushing a stack formed by the stacker into the bundling press.

3,735,696

**FRONT-BACK PRINTER**

Jonas E. Dayger, Binghamton; John E. Drejza, Endwell, and Otto F. Moneagle, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,736

Int. Cl. B41j 9/10

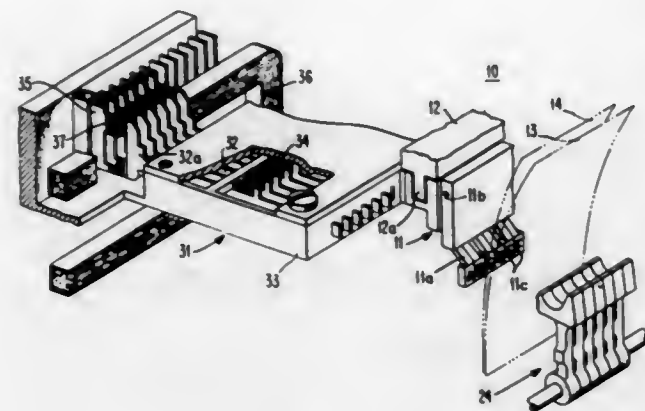
U.S. Cl. 101-93 C

10 Claims

A printer has continuously moving type character bearing elements moving along a print line on one side of a document.



Type hammers located on the opposite side of the document are operable to impact the document and a type ribbon or the



like with selected ones of the type characters which are themselves selectively advanced towards the hammers by an associated actuating means.

3,735,697

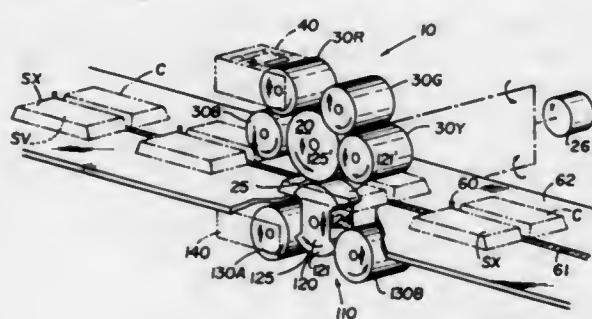
#### APPARATUS FOR PRINTING ON BOTH SIDES OF THE LIDS OF EGG CARTONS

Alexander R. Provan, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 3, 1970, Ser. No. 94,658  
Int. Cl. B41f 17/00, 17/26

U.S. Cl. 101-37

5 Claims



A rotary cylinder, for example having an offset blanket attached is arranged for engagement with a surface panel raised above a border rim to be printed; a segmental cylindrical element having cylindrical surface portions and, for example, an offset blanket attached to the surface portion is located for engagement with the surface of the obverse side of the panel to be printed. The leading and trailing faces of the segments extend from the obverse surface in a general transverse direction with respect to the center of the cylindrical element, at angles with the faces (with respect to a tangent at the point of junction of the faces and the cylindrical surface) which are so selected that the segmental element may enter into the hollow or cavity formed by the obverse surface and the rim. Ink transfer means, such as ink trains, printing cylinders, and the like are located to be engaged by the segmental cylindrical surfaces. Both the cylindrical element as well as the segmental cylindrical surfaces are driven in synchronism, preferably at a slightly faster speed than the supply and removal speed of the objects to be printed so that any possible drag on the objects by the supply, and removal apparatus, during printing, is avoided.

3,735,698  
**PRINT HAMMER FOR A PRINTING MACHINE**  
Wilhelmus Leonard Louis Lenders; Hendrik Alle Post; Tjwan Khing Ste, all of Emmasingel, Eindhoven; Johannes Mattheus Vlascher, and Marius Quirijnen, both of Rijswijk, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

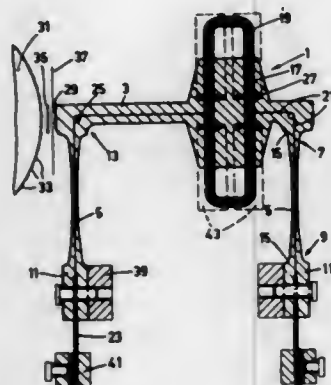
Filed Aug. 13, 1970, Ser. No. 63,469

Claims priority, application Netherlands, Aug. 29, 1969, 6913289

Int. Cl. B41j 9/00

U.S. Cl. 101-93 C

7 Claims



A print hammer for a printing machine, particularly for a high-speed printing machine having a rotating or translating type support, comprising an impact beam, two supporting members for supporting the impact beam and at least one clamping means, the impact beam being movable in a direction parallel to its center line and relative to the clamping means, the supporting members during the displacement of the impact beam being subjected to bending. The impact beam, the supporting members and the clamping means are manufactured from the same material, preferably a synthetic resin, and constitute a hammer body which consists of a single part. The print hammer is particularly suitable for an electrodynamic drive and comprises for that purpose an embedded magnet coil and embedded current conductors.

3,735,699

#### MULTICOLOR OFFSET SCREEN PRINTING APPARATUS

Albert Koelschbach, Cologne-Lindenthal, Germany, assignor to Werner Kammann, Westfalen, Germany

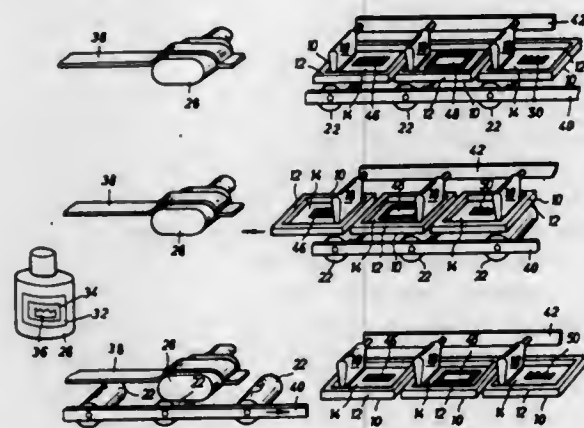
Filed Mar. 31, 1970, Ser. No. 24,251

Claims priority, application Germany, Apr. 5, 1969, P 19 17 520.3

Int. Cl. B41f 15/10

U.S. Cl. 101-124

1 Claim



An apparatus for producing a multi-color image on an object by means of the known silk screen process, wherein there are a number of silk screens each with its own pattern, the number of screens being equal to the number of colors to be employed. Colored printing media is applied with its own doc-

tor blade to an associated silk screen. An intermediate color carrier such as a belt or a plurality of rollers receives a colored image from each screen and applies the colored image in sequence to an article by rolling contact between the article and the intermediate belt or rollers.

3,735,700

#### TIRE RING DRIVE FOR LABEL PRINTERS

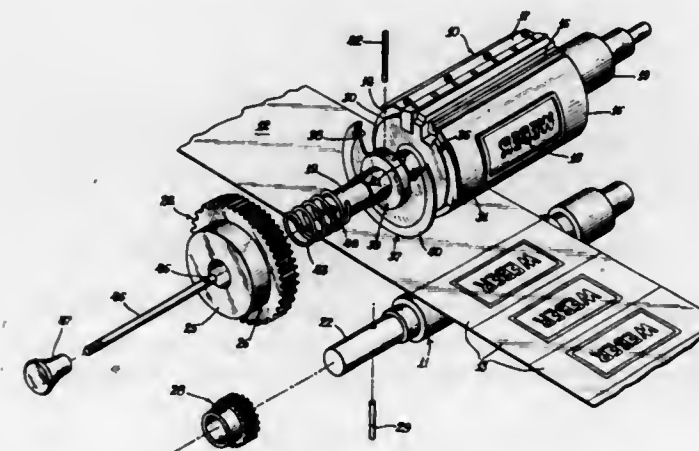
Gerhard K. Roser, Mount Prospect, Ill., assignor to Weber Marking Systems, Inc., Abington Heights, Ill.

Filed Feb. 28, 1972, Ser. No. 229,671

Int. Cl. B41f 13/10

U.S. Cl. 101-228

4 Claims



A removably positioned tire ring on a printing roller in a label printer or the like having a slightly spaced apart cooperative platen roller. The tire ring imparts movement to a label stock fed between the cooperating printing and platen rollers to cause a feed out of the label stock a distance equal to the arcuate length of the tire ring which is made commensurate with the length of the indicia on the label being printed.

3,735,701

#### TRAVELLING CYLINDER PRINTER WITH MEANS FOR LOCKING THE PLATEN AND ASSOCIATED HANDLE IN RETRACTED POSITION

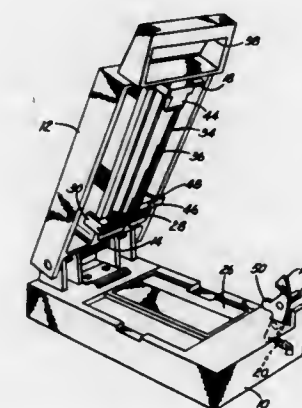
Francis R. Ackerman, Willoughby Hills, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Aug. 24, 1971, Ser. No. 174,387

Int. Cl. B41f 3/20

U.S. Cl. 101-269

1 Claim



A compact portable data recorder wherein a single handle functions both for operating the platen for recording and for carrying the device. A detent releasably locks the handle in position for carrying the device.

3,735,702

#### APPARATUS AND METHOD FOR CLEANING ROTATING CYLINDRICAL SURFACES

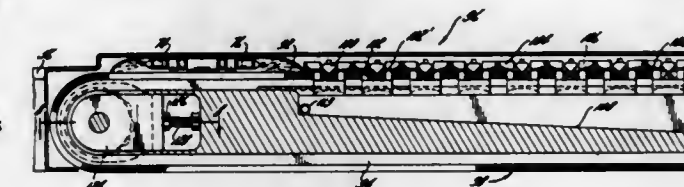
Joseph J. Kossak, Roselle, N.J., assignor to Oxy-Dry Sprayer Corporation, Chicago, Ill.

Filed May 12, 1971, Ser. No. 142,585

Int. Cl. B41f 35/00; B41f 41/00

U.S. Cl. 101-425

28 Claims



A means, and a corresponding method therefore, for removing undesired foreign matter from rotating cylindrical surfaces, such as, for example, the blanket of a blanket cylinder on an offset press, comprises a scrub means including an endless belt having upstanding bristles thereon which presents a scrubbing course for tangentially contacting the transverse dimension of the surface to be cleaned and a preparation course in which excess solvent and foreign matter is removed from the bristles and solvent applied thereto and a means for drying the scrubbed surface which includes an absorbent wiper roller. In the preparation course, a plurality of flicker bars are interposed to intercept the bristles as they proceed through the preparation course to cause the bristles to flex and to remove the solvent and foreign matter therefrom. Transfer means are provided to receive the solvent and foreign matter and move the same away from the bristles.

3,735,703

#### FIRING DEVICE FOR LIMPET MINE

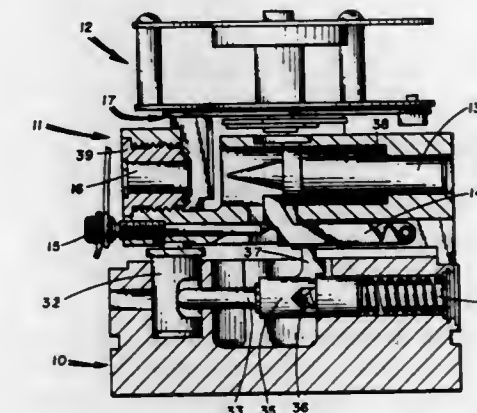
Theodore H. Bayer, Dover Plains; David W. Beaman, and Dell K. Tower, both of Poughkeepsie, all of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 15, 1964, Ser. No. 376,300

Int. Cl. F42c 15/10

U.S. Cl. 102-16

5 Claims



1. An anti-removal device for an underwater demolition weapon comprising, a spring-biased plunger in said weapon adapted for contacting the surface of the target when the weapon is attached thereto, a detonator for detonating the main charge of the weapon, a spring actuated firing pin for striking said detonator, safety means releasably engaging said firing pin for normally holding said pin in a retracted position, a timing mechanism, and means actuated by said timing mechanism after a predetermined period of time has elapsed for physically connecting said safety means and said plunger,



whereby the subsequent movement of said plunger in either direction caused by any attempt to remove or tamper with the weapon will cause the plunger to release said safety means and thereby detonate the main charge.

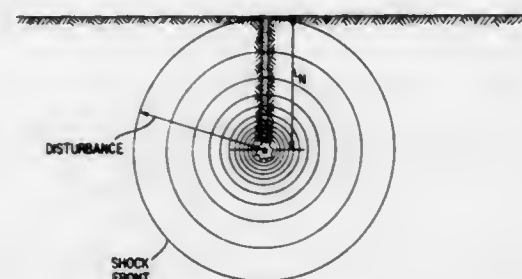
### 3,735,704 CONTROL BLASTING

Clifton W. Livingston, 624 Panorama Drive, Grand Junction, Colo.

Filed Feb. 25, 1970, Ser. No. 14,166  
Int. Cl. F42d 1/00

U.S. Cl. 102-23

33 Claims



Disclosed herein is a new concept in blasting which is based on a unique theory that permits total utilization of the energy of a blasting charge. The method of this invention enables one, through a set procedure, to control the direction and distance of placement of huge volumes of earth and/or the degree of breakage of a volume of material adjacent the area effected by the blast. The method requires systematic test blasts to determine parameters for use in established formula so that the desired end of control blasting of huge volumes of earth can be attained. The scope of this invention is unlimited in its application to mining, hydropower development, construction projects, etc.

### 3,735,705

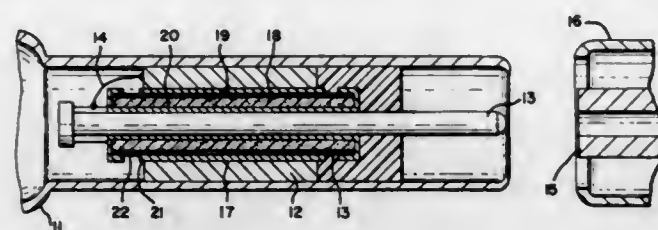
#### FILTERED ELECTRO-EXPLOSIVE DEVICE

William Jeffrey Hudson, Jr., Hummelstown, and William Baird Fritz, Hershey, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed July 15, 1971, Ser. No. 162,863  
Int. Cl. F42b 19/12

U.S. Cl. 102-28 R

2 Claims



A pyrotechnic device includes a high pass, lossy, ceramic filter on the connector pin of the device. The pyrotechnic device includes a bridging wire between the connector pin and an outer metallic shield. Electrical current passing through the bridging wire detonates an explosive charge. The lossy filter shunts high frequency electrical noise away from the bridging wire thereby preventing accidental detonation of the charge.

### 3,735,706

#### PYROTECHNIC DEVICES

William Rupert Brooke Elstow, Laverstock, and Anthony Ronald Witt, Amesbury, both of England, assignors to Pains-Wessex Limited, Salisbury, Wiltshire, England

Filed Apr. 22, 1970, Ser. No. 30,784  
Int. Cl. C06d 1/04

U.S. Cl. 102-34.1

10 Claims

A signal device comprising a rocket housed in a discharge tube having a closure at its upper end and a closure displacing

device including an actuating member in the region of the



lower end of the discharge tube, the actuating member being operable to ignite the rocket after displacement of the closure.

### 3,735,707

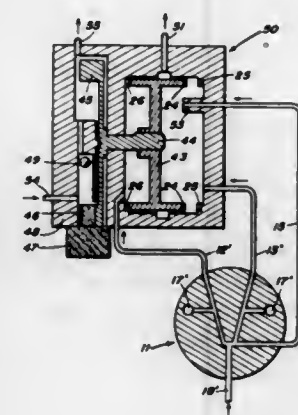
#### FLUIDICALLY CONTROLLED PNEUMATIC TO MECHANICAL CONVERTERS

Happy H. Unfried, Los Angeles, and John F. Cogger, Northridge, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1971, Ser. No. 138,413  
Int. Cl. F42c 5/00

U.S. Cl. 102-81

2 Claims



A device for converting the output of a fluid amplifier into rotational mechanical energy. Teeth are arranged upon both ends of a short piston as well as both ends of its cylinder. An oscillatory motion is imparted to the piston by rapidly switching the output of a fluid amplifier from one end of the piston to the other. Upon oscillation, for engagement of the piston and cylinder teeth will cause the piston to rotate.

### 3,735,708

#### DRIVE FOR VIBRATING A TRACK MAINTENANCE MACHINE TOOL

Franz Plasser, and Josef Theurer, both of Johannesgasse 3, Vienna, Austria

Filed Apr. 7, 1971, Ser. No. 132,048

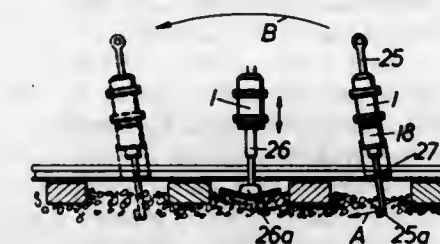
Claims priority, application Austria, Apr. 17, 1970, 3537  
Int. Cl. E01b 27/16, 37/00

U.S. Cl. 104-12

21 Claims

A drive for vibrating a track maintenance tool, such as a ballast tamper or a track lining unit, comprises a pneumatic or

hydraulic motor with two pistons which are linearly reciprocated under the pressure of a unidirectionally flowing



pressure fluid whose alternating pressure direction is controlled by a valve in the motor.

### 3,735,709

#### BRANCHING AND JOINING APPARATUS IN AUTOMATIC CARRYING SYSTEM

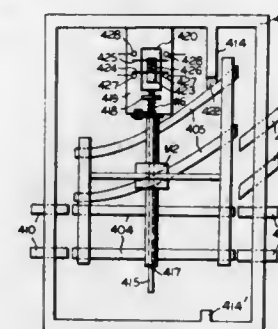
Mikio Matsumoto, Ashiya; Kenji Terada, Suita, and Mitsuru Matsunaga, Neyagawa, all of Japan, assignors to Tsubakimoto Chain Company, Joto-ku, Osaka, Japan

Division of Ser. No. 769,320, Oct. 21, 1968, Pat. No. 3,646,613. This application Nov. 23, 1971, Ser. No. 201,449  
Claims priority, application Japan, Oct. 31, 1967, 42/69578; Oct. 31, 1967, 42/17299

Int. Cl. E01b 26/00

U.S. Cl. 104-130

2 Claims



A branching and joining apparatus for use in an automatic carrying system including an electromotive carrier adapted to move along a main rail and at least one sub-rail, said apparatus comprising movable rails located at a location where a branching or joining operation takes place, said movable rails being positively locked at one of a "straight-forward" and a "branching and joining" positions with a spring substantially compressed, or at the other of said positions with the spring substantially stretched. Said main rail and sub-rail are associated with means for detecting the position of the movable rails.

### 3,735,710

#### TRANSPORTATION SYSTEM

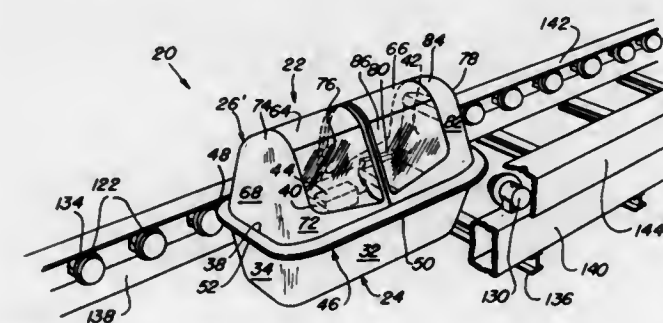
Jack Hickman, 5766 Fair Oaks Boulevard, Carmichael, Calif.

Filed Mar. 1, 1971, Ser. No. 119,738

Int. Cl. B61b 13/12, 13/10, 13/04

U.S. Cl. 104-168

15 Claims



A transportation system, providing a vehicle having two opposite side walls, each side wall being formed with an out-

wardly-projecting drive rail, a plurality of electrically-operated rotatable drive wheels being arranged to frictionally engage the undersides of both of the drive rails, for advancement of the vehicle.

### 3,735,711

#### ELASTOMERIC RAILWAY CAR SIDE BEARING

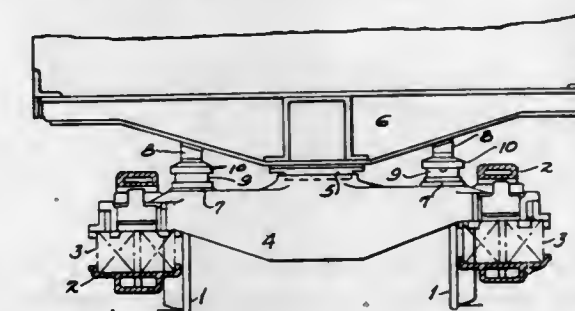
Robert L. Hassenauer, Wilmette, Ill., assignor to Evans Products Company, Plymouth, Mich.

Filed July 16, 1971, Ser. No. 163,346

Int. Cl. B61f 5/14; F16c 17/04; F16f 1/36

U.S. Cl. 105-199 CB

8 Claims



A railway car side bearing combining in a unitary structure a bottom member and a top member with an elastomeric pad compressed between them, and means definitely limiting the movements of the bottom and top members toward and away from each other irrespective of their association with the car truck and body. The unit is adapted to be mounted on a car truck bolster and to engage a car body bolster but is not to be attached to the body bolster.

### 3,735,712

#### BULKHEAD LOCKING ARRANGEMENT

Raymond M. Krokos, and John J. Kostrewa, both of Detroit, Mich., assignors to Evans Products Company, Plymouth, Mich.

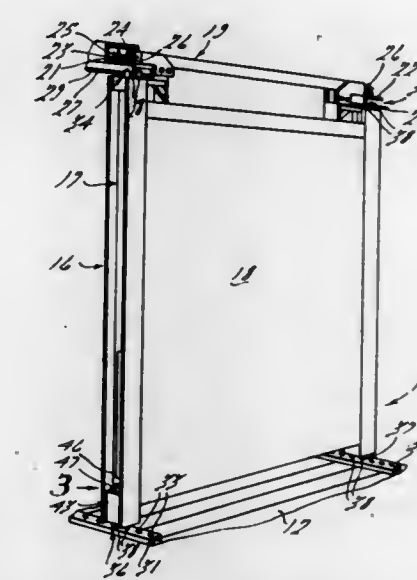
Continuation of Ser. No. 865,277, Oct. 10, 1969, abandoned.

This application Jan. 3, 1972, Ser. No. 215,199

Int. Cl. B60p 7/14

U.S. Cl. 105-376

2 Claims



A freight bracing bulkhead assembly embodying an improved locking arrangement that facilitates its release when a load is bearing against the bulkhead. The locking arrangement includes locking pins and supporting sockets that have cooperating tapered surfaces that are in full engagement when the locking pins are in their engaged position and which are spaced apart as the pins move toward their released positions.



3,735,713

**CARGO TRANSPORTING DEVICE**

John J. Glosmeyer, Covington, Ky., assignor to Pullman Incorporated, Chicago, Ill.

Filed Mar. 23, 1972, Ser. No. 237,317

Int. Cl. B65d 19/38

U.S. Cl. 100—53

12 Claims



A cargo transporting device which comprises a platform and frame assembly having at longitudinally opposite ends bulkheads, which in an upright position relative to the base, permit the handling and transporting of cargo secured to the platform. In another adaptation the bulkheads are movable in a hinged relation outwardly from the opposite ends of the platform and then are slidable horizontally underneath the frame to provide a different configuration providing for the handling of another type of cargo.

3,735,714

**ENTRY-RESISTANT SECURITY FILE CONSTRUCTION**

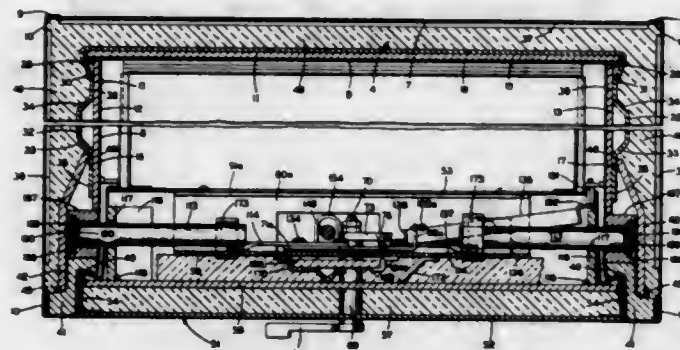
James D. Shoop, Canton, Ohio, assignor to Diebold, Incorporated, Canton, Ohio

Filed July 15, 1971, Ser. No. 162,926

Int. Cl. E05b 65/46

U.S. Cl. 109—59

18 Claims



A security file having a cabinet open at the front with mullion means dividing the open front into a series of drawer receiving pigeonhole compartments. Spaced outer and inner shells form the cabinet, the inner shell including a duplex walled entry-resistant shell comprising an outer sheet of aluminum and an inner sheet of abrasive steel. Insulation material fills the space between the outer and inner shells where an insulated security file is desired. Drawers are slidably located in the pigeonholes and a gang-lock bolt mechanism which extends through the drawer fronts and mullion means is operated by a handle of the main locking mechanism. The gang-lock mechanism includes dual upper and lower bolts located at the corners of each drawer and tied together by tie straps. A bolt strap is rigidly connected at one end to each tie strap and pivotally connected at its other end to a rotatable cam plate. A plunger operated bolt is fixed to the lower tie strap in the upper or main locking drawer and operates a plunger in the next-adjacent mullion means. Each such

plunger contacts the upper end of a gang-lock control rod, the lower end of which contacts the plunger in the next-lower mullion means. Horizontally disposed side bolts are pivotally connected by actuating arms to diametrically opposite points on a cam disc in each drawer front. Detents are provided which prevent locking of any drawer unless the same is fully closed, and release means is provided for releasing said detent means when the drawer is fully closed. An anti-wedge plate is provided in each drawer front and protective angles are welded thereto in positions to permit locking of the bolts in each drawer to pass therethrough. A protective cover is provided for a locking bar bolt which connects the lower tie strap in the main locking drawer with the cam plate. Protective devices are provided to impede drilling of the ends of lock bolts and the lower ends of the lowermost control rod of the gang-lock. Protective devices and anti-wedge means are provided in various areas of the mechanism to impede access to or actuation of the mechanism if attacked by externally applied force.

3,735,715

**APPARATUS FOR TUFTING UNIFORM CUT PILE**

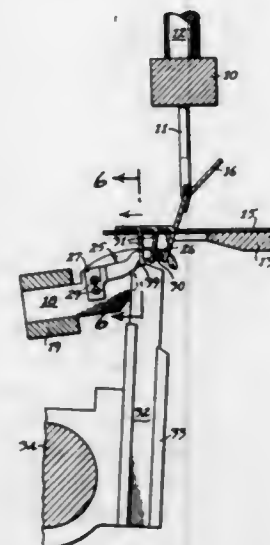
William Erby Parsons, and William Rubin Reese, both of c/o Broad Street Machine Company Inc., P. O. Box 6568, Chattanooga, Tenn.

Filed Jan. 24, 1972, Ser. No. 220,048

Int. Cl. D05c 15/24

U.S. Cl. 112—79 R

5 Claims



A cut pile looper device including a looper element or hook and a spreader element fixed proximate to the bill of the hook for receiving a tufted loop thereover in a spread position for cutting by a knife member reciprocating between the spreader element and the hook so that the loop is cut in substantially the center to form cut pile yarn ends of equal height.

The looper device is characterized by a small recess formed in one side surface of the bill adjacent its free end, to freely receive the free end of the spreader element projecting laterally toward the bill and into the recess.

3,735,716

**BUTTONHOLE OPENER**

Wendell Wilkie, Jasper, Ga.

Filed May 25, 1972, Ser. No. 257,032

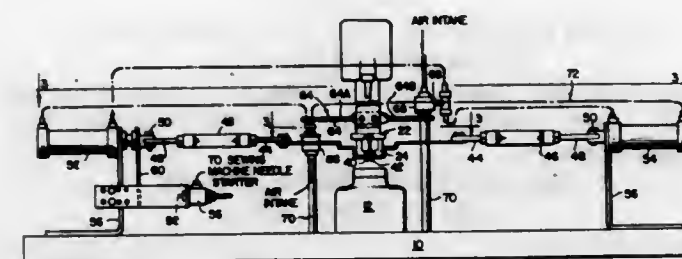
Int. Cl. D05b 3/14

U.S. Cl. 112—110

7 Claims

A buttonhole opener for button sewing machines, using air operation to automatically open a buttonhole in a garment to which a button is to be attached and thereby eliminate the necessity of pulling back of a garment pocket and the like

prior to tacking on of the button. A series of valves and air cylinders in operation automatically actuate the opener to



open the buttonhole when the button sewing machine is operated through a series of air switches.

3,735,717

**ELECTROMAGNETIC DRIVE SYSTEM**

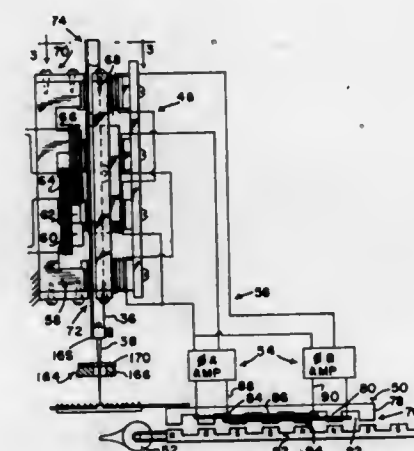
Joe W. VonBrimer, deceased, late of Las Vegas, Nev.; C. M. Brimer, co-executor, 4345 N. Camino Cardenal, Tucson, Ariz.; Dr. Gehra, co-executor, 5353 Balboa Blvd., Encino, Calif., and Angelo Rizzo, co-executor, 6052 Red Ave., Woodland, Calif.

Filed Feb. 10, 1971, Ser. No. 114,233

Int. Cl. D05b 69/10

U.S. Cl. 112—220

8 Claims



A drive system for controlling and synchronizing the movement of two or more relatively movable members, one of which is to be driven with any desired amplitude and at any desired rate, and one or more others of which have the movement thereof determined by the movement of the first member. One relatively movable member typically comprises a non-magnetic, electrically conductive armature, such as a reciprocating metal slide operating axially in the air gap between an electromagnetic stator containing plural distributed multiphase windings and a return piece for the flux paths thus generated. Another relatively movable element typically comprises a permanent magnet armature driven by an associated linear actuator also having multiphase windings distributed therein and adapted to create a field of the character indicated by a control signal emanating from a unit detecting the movement of the first movable member. In a described embodiment, the first element includes a carrier for a magnetic sender moving in relation to the coils in a magnetic detector, while the driven or second member includes an amplifier for the signal supplied to it by the detector. As embodied in a sewing machine, for example, the first member or driving element is in the form of a vertically movable slide carrying the needle, and the second or driven member is a horizontally movable armature serving as the bobbin carrier. The needle holder carries the magnet, pickup coils are located adjacent the movement path of the magnet, and the amplifier furnishes amplified pulses of a characteristic type to the windings distributed in the bobbin carrier so as to cause synchronized or

slaved movement of the bobbin carrier. Means are typically provided for changing the voltage, current and polarity of the signal applied to the first element stator so as to permit varied movement characteristics to be imparted thereto.

3,735,718

**PRESSER FOOT FOR SLIDE FASTENERS**

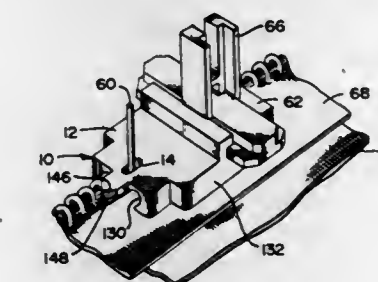
Eugenia J. Vizgirda, New Hyde Park, N.Y., and William F. Van Amburg, Meadville, Pa., assignors to Textron Inc., Providence, R.I.

Filed June 23, 1971, Ser. No. 155,968

Int. Cl. D05b 29/00

U.S. Cl. 112—235

10 Claims



A slide fastener presser foot is conventionally attached to a sewing machine presser bar assembly for sewing a slide fastener to a material, such as a garment fabric. A pair of guide channels recessed in the presser foot receives a stringer of the slide fastener and a projection on the front of the presser foot guides the stringer into one of the guide channels.

3,735,719

**WHEEL LUG**

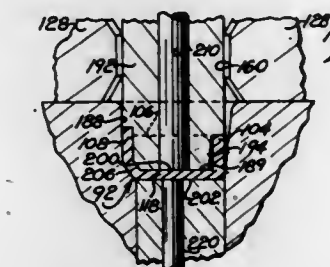
Otto V. Pazik, Willoughby, Ohio, assignor to Willow Hill Industries, Inc., Willoughby, Ohio

Filed May 13, 1971, Ser. No. 142,947

Int. Cl. B21d 53/20

U.S. Cl. 113—116 H

15 Claims



A method of making an improved wheel lug for use in securing a removable or demountable tire carrying rim to the hub of a wheel assembly includes the cold working of a circular flat metal blank to form a cup-shaped blank which is then cold worked to the configuration of the wheel lug. The flat metal blank or disc is first formed into a cup-shaped blank having a generally hemispherical configuration. A side portion of this hemispherical cup-shaped blank is cold worked to form four rectangular side panels. These side panels are integrally formed with each other to define an uninterrupted and joint free rectangular rim and side wall of the cup-shaped blank. The arcuate bottom of the cup-shaped blank is then cold worked to form a generally flat rectangular main or bottom panel. Finally, the rectangular side and bottom panels of the cup-shaped blank are cold worked to the configuration of the wheel lug. During this final cold working of the cup-shaped blank, one side panel is bowed outwardly at the same radius of



curvature as a clamp surface on the rim of the wheel assembly. In addition, the opposite side panel is bowed inwardly at the same radius of curvature as a clamp surface on the hub of the wheel assembly. The side panels of the finished wheel lug are integrally formed with each other without an interruption or joint between them to provide the wheel lug with sufficient strength to withstand relatively severe operating conditions.

3,735,720

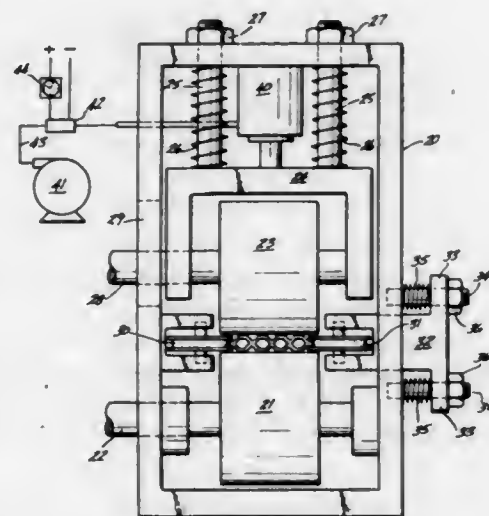
# METHOD AND APPARATUS FOR DEFORMING A FLAT ON PARTS OF METAL STRIP-TYPE TUBING WHILE LEAVING OTHER PARTS UNDEFORMED

Lester J. Tranel, St. Louis, Mo., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 119,600, March 1, 1971. This application May 4, 1972, Ser. No. 250,250  
Int. Cl. B21d 53/02

U.S. Cl. 113-118 D

5 Claims



A method and apparatus for forming metal strip-type tubing suitable for use in heat exchangers. Deforming flats are formed on parts of a first surface and an opposing surface of the tubular passageways in the strip-type tubing while other parts of the tubing are left undeformed. The deformed flats are adapted to be bonded to flat type fin stock for heat exchange applications. The undeformed areas of the tubing are adapted to be bent without a significant pressure drop occurring in the bend area. The apparatus includes means for deforming the flat on the tubular passageways while restraining the edges of the strip-type tubing and further includes means for sequentially engaging and disengaging the deforming means from contact with the tubing.

3,735,721

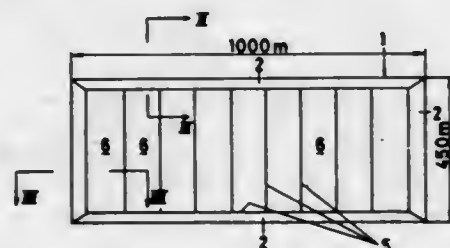
# IMPERVIOUS MEMBRANE OIL STORAGE SYSTEM

Jacob Leguljt, Dordrecht, Netherlands, assignor to Maan-nesmann (Nederland) N.V., Dintelmond (Gem. Figmaart), Netherlands

Filed Mar. 25, 1971, Ser. No. 128,033  
Int. Cl. B63b 35/00

U.S. Cl. 114-0.5 T

10 Claims



Storage system for oil in impervious membrane envelopes comprising a water basin with communicating compartments

each for one container, the system being such that optimal fire protection is achieved with minimal dimensions.

3,735,722

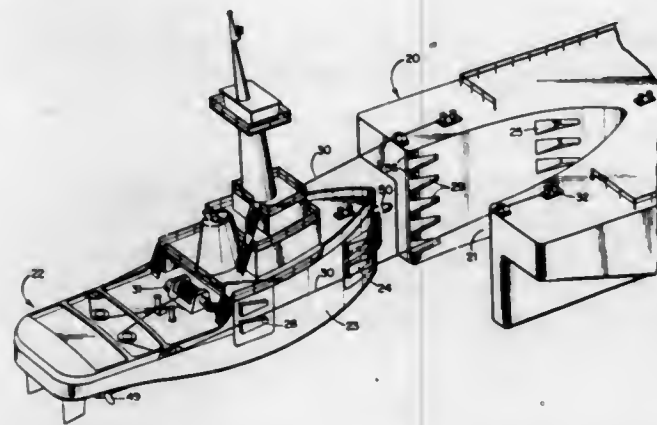
# RIGID DISCONNECTABLE COUPLING FOR WATERBORNE VESSELS

Adrian S. Hooper, Devon, Pa., and Ernst G. Frankel, Chestnut Hill, Mass., assignors to Interstate Oil Transport Co., Philadelphia, Pa.

Filed Dec. 9, 1971, Ser. No. 206,434  
Int. Cl. B63b 21/00

U.S. Cl. 114-235 R

28 Claims



A combination of a pushed watercraft with a pushing watercraft, which is powered accordingly. A deep, through-going stern notch on the pushed watercraft, mating with and extending to about amidships of the pushing watercraft. Multiple, short, quick engaging-disengaging coupling apparatus on the pushed watercraft stern notch and pushing watercraft bow end, arranged for multiple point engagement between the watercraft. Short fore and aft dimensioning of the coupling apparatus for coupling and uncoupling of the watercraft with a minimum of relative longitudinal motion. Vertically ordered pluralities of the coupling apparatus enabling different relative draft engagements of the watercraft.

3,735,723

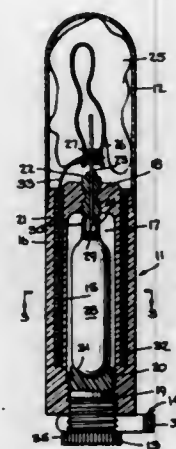
# INFLATABLE EMERGENCY DEVICE

Pierre Lutz, P.O. Box 84, Redding, Conn.

Filed Sept. 18, 1972, Ser. No. 289,790  
Int. Cl. G09f 9/00

U.S. Cl. 116-124 B

10 Claims



The helium cartridge is mounted within a recess of the casing while the spool of line is mounted within an annular recess about the cartridge chamber. The balloon is disposed within a removable cap mounted on the casing. A needle valve passes through a self-sealing nipple into the balloon as well as into the cartridge chamber. A threaded screw forces the cartridge

against the end of the needle valve to rupture the sealing disc therein and permit helium to enter into the balloon after the cap has been removed. The balloon is anchored by a line extending from the casing.

3,735,724

# WATER SKIER SAFETY ALARM

Nathan W. Miller, Chino, Calif., assignor to Flag-Matic Inc., Chino, Calif.

Filed Oct. 2, 1972, Ser. No. 294,374  
Int. Cl. G08c 5/00

U.S. Cl. 116-132

7 Claims



A safety alarm flag is mounted to a ski towboat so that, when a skier towed by a boat has fallen, the flag is automatically raised to be visible by operators of other boats in the vicinity and also by the operator of the boat that had been towing the downed skier. A flag-carrying arm is pivotally mounted to the ski towboard and spring-urged to upright alarm position. A tension line is connected to the flag arm above its pivot and guided downwardly and rearwardly along the boat rail for connection to the skier towline. Fluid damping is provided for control of the raising motion of the flag-carrying arm.

3,735,725

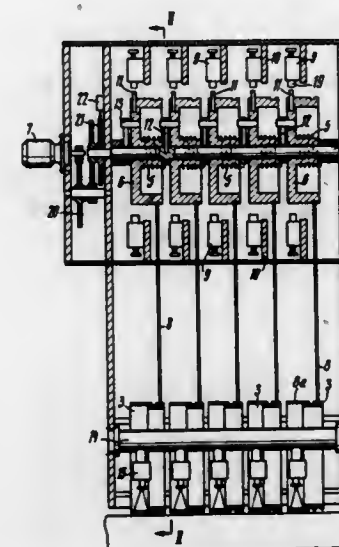
# MARKING DEVICE

Efim Lvovich Petrikovsky, prospekt Imeni Lenina, 45, kv. 34, Chelyabinsk, U.S.S.R.

Filed Dec. 23, 1971, Ser. No. 211,258  
Int. Cl. B05c 11/00; B05b 7/06

U.S. Cl. 118-7

2 Claims

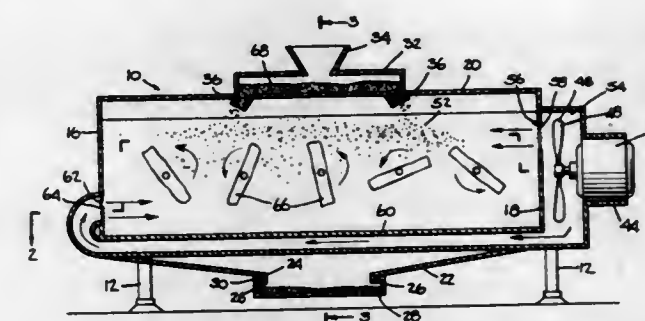


The specific feature of the device lies in that its driving discs linked kinematically with the marking drums are installed on a reversibly-rotatable shaft with the aid of springs and each disc is provided with a system of retainers whose number and position correspond to the number and position of the marking signs, each disc carrying a stop which can interact with the retainer; this ensures rapid and simultaneous remote changing of the position of the marking drums; besides, the device incorporates a system of drive links installed on the shaft, and stops located on the discs; these drive links and stops allow the marking drums to be returned rapidly and remotely to the initial position.

3,735,726  
AUTOMATIC BREADING MACHINE  
William Butler, 954 Hoe Avenue, New York, N.Y.  
Filed Aug. 18, 1971, Ser. No. 172,636  
Int. Cl. A23g 3/20

U.S. Cl. 118-24

4 Claims



A machine for breading or coating food articles with comminuted material prior to baking or frying, which comprises a transparent, substantially rounded housing divided into a main chamber and blower chamber. The main chamber has a plurality of pairs of spaced opposing spits, rotatably attached medially to the chamber walls, on which the articles are affixed, and a hopper for the breading material disposed above the chamber to discharge the material into the chamber in several directions. A fan blower is disposed at one end of the chamber to create air currents therethrough at one level and a connecting duct opening into the other end of the chamber at a different level to create air currents in the chamber from the opposite direction, causing the discharging breading material to impinge against and adhere to the surfaces of the food articles as they are caused to rotate. A crumb tray at the bottom of the chamber receives the excess breading material. As a modification fan blowers are provided at each end of the chamber.

3,735,727

# DEVICE FOR THE PRECIPITATION OF LAYERS OF SEMICONDUCTOR MATERIAL

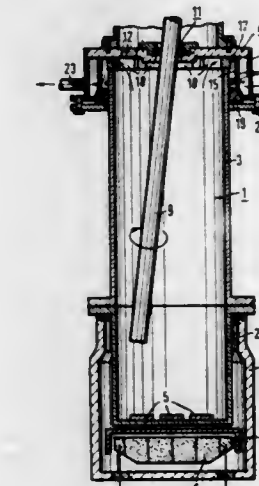
Erhard Sussmann, Pöing, Germany, assignor to Siemens Aktiengesellschaft Munich, Berlin, Erlangen, Germany  
Filed Oct. 29, 1971, Ser. No. 193,743

Claims priority, application Germany, Nov. 5, 1970, P 20 54 538.4

Int. Cl. C23c 13/08

U.S. Cl. 118-48

18 Claims



Epitaxial device in which semiconductor wafers to be coated are disposed at the bottom of a vertical cylindrical reaction vessel and are heated to the high temperature required for precipitation by a heat source arranged underneath the bottom. Fresh reaction gas is fed to the heated semiconductor wafers from above and the spent gas is



removed again upwards through holes arranged along an annular zone in the wall of the reaction vessel. The spent gas then passes to two exhaust chambers connected in series. The flow resistance of the gas discharge being essentially determined by the flow resistance between the two exhaust chambers.

3,735,728

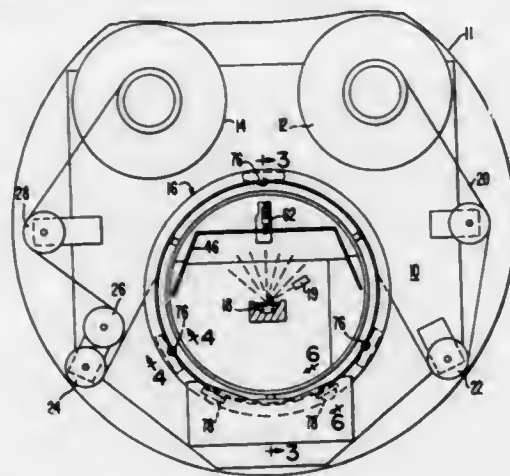
**APPARATUS FOR CONTINUOUS VACUUM DEPOSITION**  
John Frederick Krumme, Woodside, and Donald Thomas Ford, Menlo Park, both of Calif., assignors to Andvari, Incorporated, Redwood City, Calif.

Filed Dec. 1, 1971, Ser. No. 203,813

Int. Cl. C23c 13/10

U.S. Cl. 118-49

11 Claims



A vapor deposition apparatus is provided wherein a workpiece strip is passed over a rotatable masking wheel within a vacuum environment. The evaporation source and material to be evaporated and deposited upon the strip is located within the perimeter of the masking wheel. It is deposited upon the strip as it passes along the masking wheel. The masking wheel consists of two or more parallel, and independently mounted rings which are axially aligned and axially adjustable for altering the gap between the rings, and hence the width(s) of the material deposited on the workpiece strip.

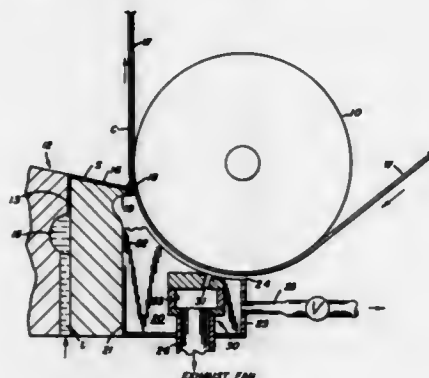
3,735,729

**APPARATUS FOR COATING A CONTINUOUS WEB**  
Martin George Bird, Northwood, England, assignor to Eastman Kodak Company, Rochester, N.Y.  
Division of Ser. No. 749,109, July 31, 1968, abandoned. This application Sept. 24, 1970, Ser. No. 75,245

Int. Cl. B05c 5/02

U.S. Cl. 118-50

8 Claims



An apparatus for applying fluid materials to a moving strip of material to be coated wherein a stream of coating liquid is maintained in bridging relation between a hopper and a surface of the strip moved in spaced relation relative to the hopper and a differential pressure is maintained on opposite

sides of the stream of coating liquid. The apparatus includes the improvement of separate means for vacuuming the surface of the strip just ahead of the stream to remove the laminar layer of air carried along by the strip.

3,735,730

**APPARATUS FOR APPLYING A FLOWABLE MEDIUM TO A CARRIER**

Matthias Mitter, Senne, Germany, assignor to Mitter & Co., Schloss Holte, Germany

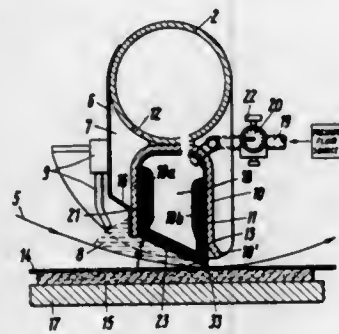
Filed Dec. 21, 1970, Ser. No. 99,771

Claims priority, application Germany, Dec. 22, 1969, P 19 64 182.8

Int. Cl. B05c 1/00; B41j 13/00; B41f 15/42

U.S. Cl. 118-205

20 Claims



A flowable medium is to be supplied to an exposed surface of a carrier, for instance a web which is to be printed. A supply arrangement supplies the flowable medium to the vicinity of the exposed surface and an applicator arrangement is provided for applying it to the exposed surface. The applicator includes a hollow spreading element of elastically distensible material which engages either the exposed surface directly, or engages a portion of the applicator arrangement which is operatively associated with the exposed surface, and admitting means is provided for admitting requisite quantities of pressurized fluid to the interior of the hollow spreading element whereby to distend the latter to various extents and thus vary its engaging pressure.

3,735,731

**LABEL GUMMING AND DISPENSING DEVICE**

Georges Tavernier, Lyon, France, assignor to Societe Nouvelle Bacle-Gangloff, Villeurbanne, France

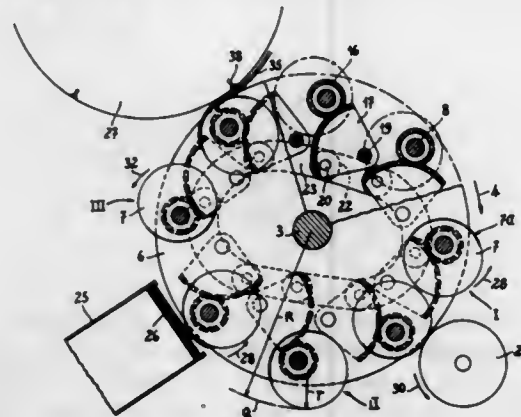
Filed Oct. 27, 1971, Ser. No. 192,967

Claims priority, application France, Oct. 30, 1970, 7039895

Int. Cl. B05c 1/02

U.S. Cl. 118-220

2 Claims



This device for gumming and dispensing labels comprises a rotary support carrying label-pick-up members, and adapted to cause said pick-up members to register in succession with a gumming cylinder, a fixed magazine containing the labels to be gummed, and a drum adapted to transfer these labels to the articles to be labelled, wherein said label pick-up members consist of cylinders or cylinder portions having a radius con-

siderably smaller than that of the path described by their outermost generatrix during the rotation of said support, the axis of rotation of said cylinders or cylinder portions being off-set in relation to their longitudinal axis by a value determined to permit the rolling of said pick-up member on the gumming cylinder and on the first label of said magazine without slipping, said pick-up members being connected to means adapted to impart thereto a pivotal movement in either direction in relation to their rotary support, as they move past the different peripheral stations for gumming, picking-up and transferring said labels. (FIG. 1).

3,735,732

**COATING APPARATUS**

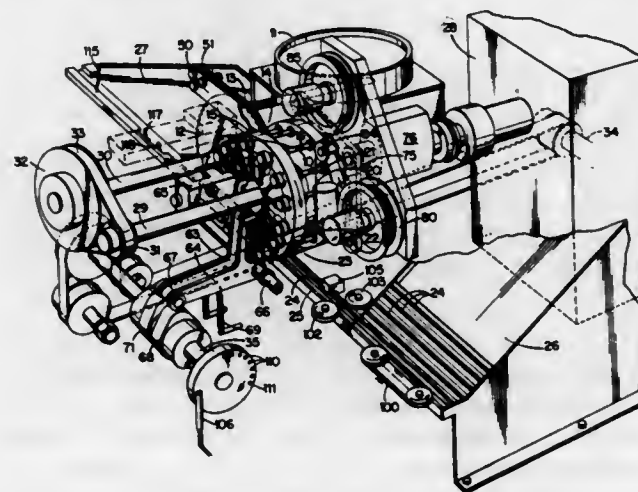
Theodore H. Van Der Schoot, Deering, N.H., assignor to GTE Sylvania Incorporated, New York, N.Y.

Filed Feb. 23, 1971, Ser. No. 117,959

Int. Cl. B05c 1/02

U.S. Cl. 118-230

18 Claims



Apparatus for applying liquid material to the edges of a die of semiconductor material mounted between two conductive plugs. The plugs and intervening die constitute a semiconductor element which is fed from a vibratory feeder to a transfer wheel and then gripped between a pair of opposed spindles of a conveyor wheel. The conveyor wheel carries the semiconductor element with the spindles rotating into a work station. At the work station the edges of the rotating semiconductor die come into contact with continuously moving filamentary material which passes through a vessel containing liquid coating material before contacting the semiconductor element at the work station. The filamentary material picks up liquid material from the vessel and transfers it to the edges of the die of the semiconductor element at the work station.

3,735,733

**APPLICATOR FOR PAPER HANDLING APPARATUS**

Edward V. Henc, Promisedale Farm, Boot Road, R.D. 2, Malvern, Pa.

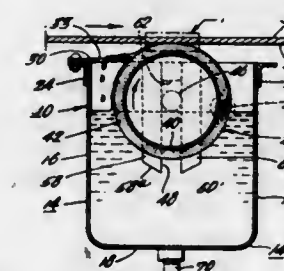
Continuation of Ser. No. 3,283, Jan. 16, 1970, abandoned.

This application Aug. 9, 1971, Ser. No. 170,068

Int. Cl. B05c 1/08, 1/16

U.S. Cl. 118-261

10 Claims



An applicator assembly for applying a liquid substance to at least one face of sheet material moving along a predetermined

path comprising a housing defining a reservoir for the liquid substance, means for maintaining a predetermined level of the liquid substance in the reservoir, a roll member having at least one circumferentially extending pad mounted on its outer surface, means for rotatably mounting the roll member in said housing comprising vertical trackways in opposed end walls of said housing which in the operative position limit lateral movement of said roll assembly, and a doctor blade made of resilient material mounted along one edge of the housing having a plurality of longitudinally spaced openings therein adapted to engage and wipe said pads whereby a uniform predetermined quantity of liquid substance is applied to the sheet material irrespective of rotational speed of the roll member.

3,735,734

**ODOR SUPPRESSING LITTER MATERIAL**

Albert R. Pierce, III, Franklin Lakes, and David Rodriguez, Fort Lee, both of N.J., assignors to Thomas J. Lipton Inc., Englewood Cliffs, N.J.

Filed Dec. 15, 1970, Ser. No. 98,474

Int. Cl. A01k 29/00, 1/00

U.S. Cl. 119-1

4 Claims

An odor suppressing litter material for domestic animals is an admixture of an absorbent soil and an odor inhibiting additive. The soil is clay or diatomaceous earth and may be a form of clay known as Fuller's earth. The deodorizing additive is chlorophyll, sodium dihydrogen phosphate, potassium dihydrogen phosphate, potassium acid phthalate, or a combination of these. The deodorizing additive content is between 0.01 and 10.0 percent by weight of the admixture.

3,735,735

**PORTABLE COMMODE FOR PETS EMPLOYING REMOVEABLE MAINTENANCE**

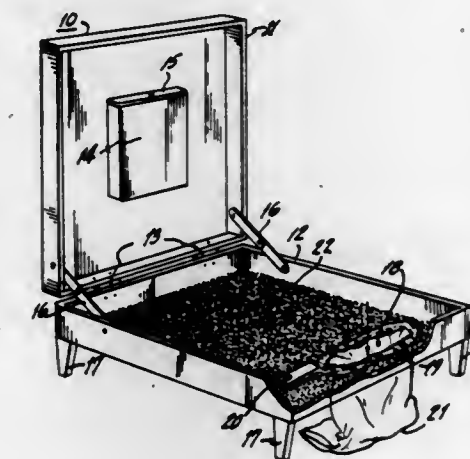
George Norolan, Brooklyn, N.Y., assignor to Michael Ethkin, Howard Beach, Queens, N.Y., a part interest

Filed Apr. 14, 1971, Ser. No. 133,986

Int. Cl. A01k 67/00

U.S. Cl. 119-1

9 Claims



There is disclosed a commode for animals particularly adapted for dogs. The commode comprises first and second rectangular box-like sections hinged together at one end. In an open position, the sections are positioned relatively perpendicular with respect to one another. The second section has legs on a bottom surface to permit the commode to rest above a floor. The top surface of the second section has an aperture thereon. In cooperation with the aperture is a bag holding apparatus which is positioned about the aperture, permitting a plastic or other type bag coacting therewith to rest between the space formed by the bottom surface of the second section and the floor. Animal droppings and so can easily be swept or raked into the aperture and hence confined within the plastic bag. The bag holding apparatus can then be easily removed, the bag and contents discarded and a new bag inserted.



3,735,736

**METHOD FOR GROWING EDIBLE AQUATIC ANIMALS ON A LARGE SCALE**

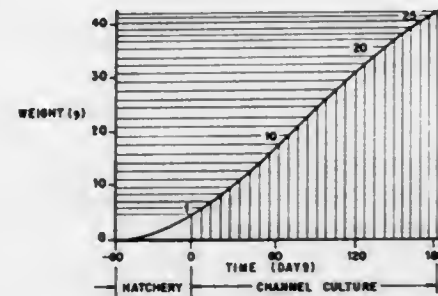
William C. Yee, Oak Ridge, Tenn., and Perry R. Stout, Davis, Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Feb. 8, 1971, Ser. No. 113,534

Int. Cl. A01k 61/00

U.S. Cl. 119-2

8 Claims



A continuous and large-scale method for growing batches of shrimp or other aquatic animal from an initial average unit weight to a desired average unit weight. As exemplified by the growing of shrimp, each batch of shrimp is grown to increasingly larger unit weights by sequential transfer through a series of continuous-flow, above-ambient-temperature ponds of increasingly larger batch dwell volume. The ponds are fed by a stream of water which is at above-ambient temperature by virtue of being derived at least in part from effluent water coolant from an industrial facility. A batch of shrimp to be grown is transferred into each of the ponds for approximately equal growth periods. In a preferred form of the method, the dwell volumes of the ponds are sized so that approximately the same animal weight density prevails in each pond at the end of the growth period associated with that pond.

3,735,737

**METHOD AND PACKAGE FOR STORING AND SHIPPING OYSTER LARVAE**

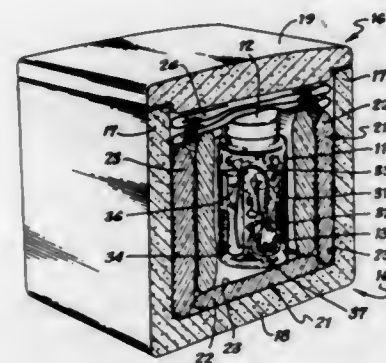
William W. Budge, Hillsborough, Calif., assignor to Pacific Mariculture, Inc., Pescadero, Calif.

Filed Sept. 14, 1970, Ser. No. 71,944

Int. Cl. A01k 61/00

U.S. Cl. 119-4

9 Claims



Method and package for storing marine larvae, such as oyster larvae, by taking marine larvae at or near the state of metamorphosis and reducing the marine larvae to a temperature substantially below the larval growing temperature to avert metamorphosis for a period of time, and thereafter raising the temperature of the marine larvae to cause metamorphosis to commence.

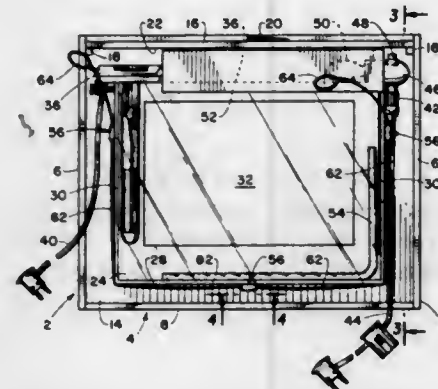
3,735,738

**WALL MOUNTABLE AQUARIUM**

John K. Lake, 15353 Weddington St., Van Nuys, Calif.  
Continuation-in-part of Ser. No. 88,002, Nov. 9, 1970,  
abandoned. This application Aug. 4, 1971, Ser. No. 168,860  
Int. Cl. A01k 64/00

U.S. Cl. 119-5

16 Claims



A picture frame-like, novelty aquarium adapted to contain the usual aquarium life-support systems and still be capable of easy mounting on a wall or the like surface in a manner that insures proper securement thereof. An easily fabricated, economical, aquarium of unique, aesthetic quality capable of flush, picture-like mounting on a wall or other surface and in an exemplary embodiment of molded plastic.

3,735,739

**IGNITION DEVICE FOR MONOROTOR ROTARY PISTON INTERNAL COMBUSTION ENGINES**

Jean Panhard, Paris, France, assignor to Societe de Constructions Mecaniques Panhard & Lavasson, Paris, France

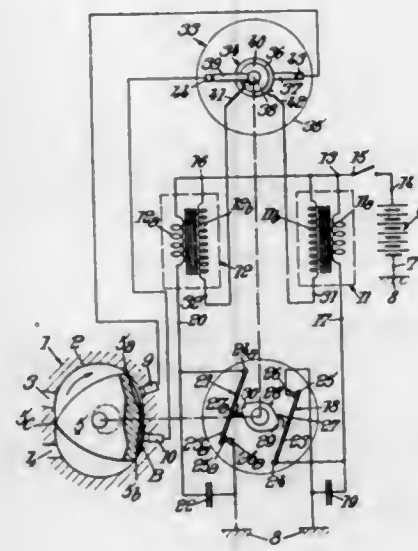
Filed Mar. 18, 1970, Ser. No. 20,661

Claims priority, application France, Mar. 18, 1969, 6907680

Int. Cl. F02p 3/02

U.S. Cl. 123-8.09

10 Claims



The ignition device includes a rotary switch for preventing the voltage peak which is produced on the closing or opening of the breaker from appearing at the electrodes of the spark plug when the latter is in a combustion chamber of the engine at the beginning of compression. The device may include a cam driven by the engine and having an outline of sudden slope. The device has a disrupting effect sensitive to the direction of flow of the current in the secondary of the ignition coil.

3,735,740

**AIR INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES**

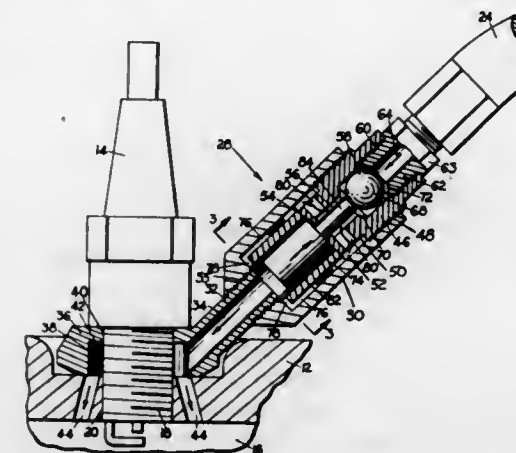
John H. Hunt, 8030 S.E. Barbara Welch, Portland, Oreg.

Filed Apr. 20, 1971, Ser. No. 135,709

Int. Cl. F02b 41/00

U.S. Cl. 123-26

2 Claims



An air injection system arranged to admit air under pressure into the combustion chamber of an internal combustion engine for reducing waste products of combustion and also increasing the efficiency of the engine. A valve assembly is mounted on the engine for communication at one of its ends to the combustion chamber and for communication at its other end to a pressure supply line for admitting cold air to the valve. The valve assembly includes a ball valve and plunger which automatically control the flow of air from the pressure supply line into the combustion chamber. The valve mechanism is arranged such that air is admitted to the combustion chamber precisely as the piston approaches the end of the compression stroke. In a preferred arrangement, the valve housing has a base by means of which such housing is clamped in place by the existing spark plug, with ports being bored adjacent to the spark plug for directing the air into the combustion chamber.

3,735,741

**PISTON ENGINE**

Ernst Hatz, Alte, Germany, assignor to Motorenfabrik Hatz KG., Ruhstorf, Germany

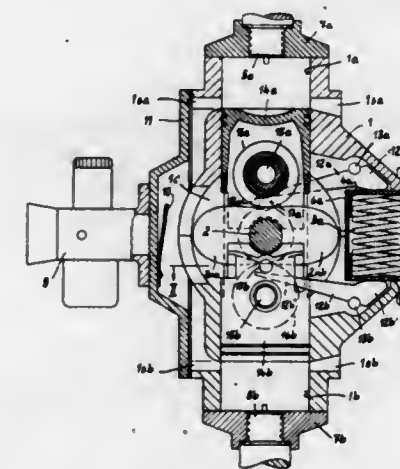
Filed Aug. 16, 1971, Ser. No. 172,056

Claims priority, application Germany, Aug. 27, 1970, P 20 42 632.8

Int. Cl. F02b 75/24

U.S. Cl. 123-56 C

7 Claims



A piston engine of the type in which opposed pistons drivingly engage a shaft between the pistons by engagement

with cam parts fixed on the shaft. A return spring compressible in a direction parallel to the axis of the pistons is spaced laterally from this axis. Pivotal mounted levers engage the spring ends and the pistons to urge the latter against the cam parts. Cups may cover the spring ends, the outside of these cups facing a common scavenging chamber such that inward and outward movement of the cups under the action of the springs and the levers pump air into and out of this scavenging chamber.

3,735,742

**ENGINE OVERRUN PREVENTING DEVICE FOR INTERNAL COMBUSTION ENGINE**

Shigeo Aono, and Shunyu Nambu, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

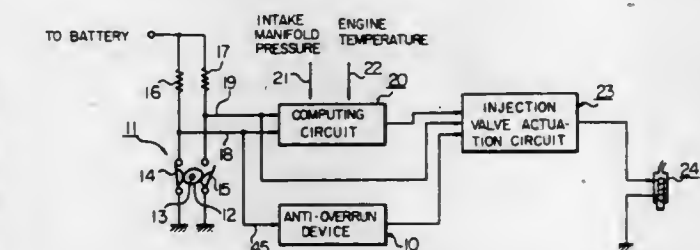
Filed Oct. 22, 1970, Ser. No. 82,947

Claims priority, application Japan, Oct. 22, 1969, 44/84431

Int. Cl. F02d 11/10

U.S. Cl. 123-102

3 Claims



An engine overrun preventing device adapted to shut off or reduce the fuel supply to the engine cylinders so as to cause engine speed to decrease when "the maximum permissible engine speed" over which the engine tends to overrun has been reached. When applied to a fuel injection system, the overrun preventing device receives a signal indicating engine speed from an engine driven triggering device to generate a fuel shut-off signal when the maximum permissible engine speed has been reached. The fuel shut-off signal is supplied to an injection valve actuation circuit so as to render it ineffective thus preventing the engine from overrunning. When engine speed decreases to a predetermined value lower than the maximum permissible engine speed, the overrun preventing device generates a fuel supply restarting signal which causes the fuel supply system to restart the normal fuel supply to the cylinders.

3,735,743

**APPARATUS FOR ADJUSTING THE IGNITION TIMING FOR USE IN INTERNAL COMBUSTION ENGINES**

Takeo Shimizu, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

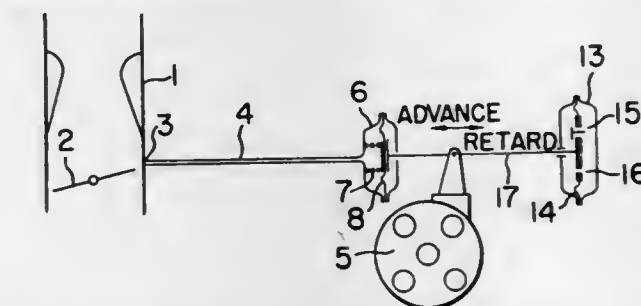
Filed Dec. 21, 1970, Ser. No. 99,740

Claims priority, application Japan, Dec. 24, 1969, 44/103421

Int. Cl. F02p 5/04

U.S. Cl. 123-117 A

1 Claim



An apparatus for adjusting the ignition timing for use in internal combustion engines having a conventional vacuum igni-

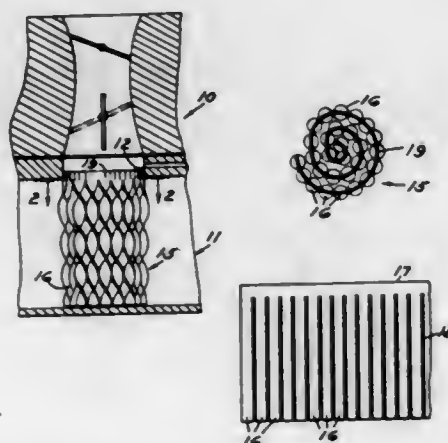


tion advancer, the apparatus retarding or slowing down the action of said vacuum ignition advancer upon the occurrence of the negative pressure at the throttle valve of the carburetor, thereby giving hysteresis loop characteristics in the negative pressure-ignition timing relation.

3,735,744

## INTAKE MANIFOLD FUEL SYSTEM

Peter E. Brody, 224 California Avenue, and Otto H. Brody, 559 Askin Boulevard, both of Windsor, Ontario, Canada  
Continuation of Ser. No. 858,730, Sept. 17, 1969. This application July 18, 1971, Ser. No. 163,499  
Int. Cl. F02m 29/04, 29/14  
U.S. Cl. 123—141 9 Claims

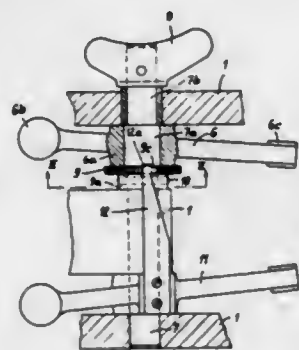


A fuel system for internal combustion engines comprising a manifold having an inlet passage for a fuel mixture and a plurality of outlet passages to the cylinders of the engine. A fuel mixture distributing device is provided adjacent the inlet passage and comprises a plurality of closely packed sinuous members defining a plurality of generally axially extending twisted passages which are laterally intercommunicating.

3,735,745

## DECOMPRESSION DEVICE FOR INTERNAL COMBUSTION ENGINES

Ernst Hatz, Ruhstorf, Germany, assignor to Motorenfabrik Hatz KG., Germany  
Filed Mar. 29, 1971, Ser. No. 128,942  
Claims priority, application Germany, Apr. 23, 1970, P 20 19 755.1  
Int. Cl. F01I 13/08  
U.S. Cl. 123—182 5 Claims

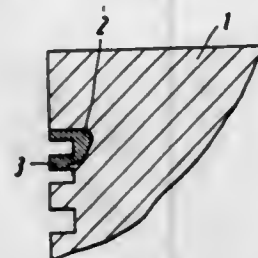


A decompression device for an internal combustion engine in which the control parts which open and close the exhaust valves of the combustion chambers include a rocking lever acting on the valve. The decompression device includes an eccentric bearing on which the rocking lever is freely mounted, rotation of the eccentric bearing thus moving the axis of the rocking lever to prevent full closing of the exhaust valve, that is, provide decompression of the chamber. The eccentric bearing may be turned to reference position at which it permits full closing of the exhaust valve by either manual or automatic means.

3,735,746

## RING CARRIER FOR LIGHT ALLOY PISTONS

Gerhard Schieber, Bad Wimpfen, Germany, assignor to Karl Schmidt GmbH, Neckarsulm, Germany  
Filed Jan. 14, 1971, Ser. No. 106,467  
Claims priority, application Germany, Feb. 7, 1970, P 20 05 662.6  
Int. Cl. F02I 5/00; F16J 9/22  
U.S. Cl. 123—193 P 1 Claim

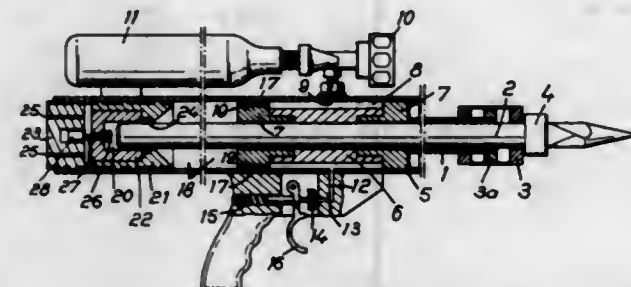


Ferrous ring carriers for internal combustion engine pistons are provided and include an annular land formed by a flange of the ring carrier which is adjacent to the skirt end of the piston. The preferred location for the ring carrier is nearest the head of the piston.

3,735,747

## UNDERWATER COMPRESSED-GAS GUN

Jean Barjavel, 70 Avenue Gernuschi, Nice, France  
Filed July 22, 1970, Ser. No. 57,184  
Claims priority, application France, July 25, 1969, 6925375  
Int. Cl. F41b 11/08  
U.S. Cl. 124—11 A 6 Claims

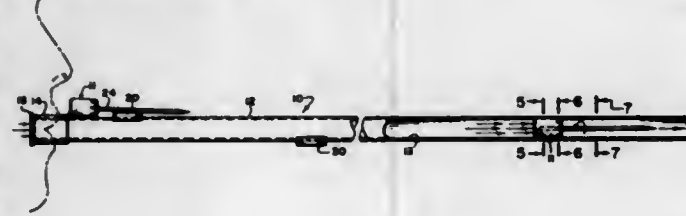


Compressed-gas gun for projecting a spear under water, consisting of a compressed-air tank and a gun body formed of two tubes assembled end to end, one located at the front which constitutes the barrel and the other which contains an elastic sleeve serving as impervious joint between a compressed-gas reserve chamber and the barrel. The elastic sleeve and body define a further chamber which is cooperative with a trigger to selectively release the spear. Pressure on the spear by the elastic sleeve holds the spear tight before firing, but deformation of the sleeve away from the spear during firing permits the spear to be released.

3,735,748

## COMBINED BLOW GUN AND DARTS

Paul E. Gaylord, 2504 N.W. 22nd Court, Miami, Fla.  
Filed June 19, 1972, Ser. No. 264,245  
Int. Cl. F41b 1/00, 1/02  
U.S. Cl. 124—12 4 Claims



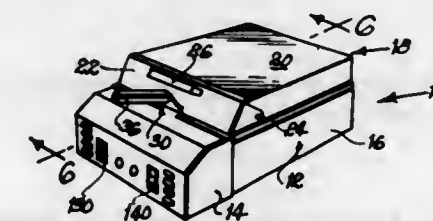
A combined blow gun and darts wherein the blow gun includes a substantially elongated tubular member, a

mouthpiece mounted on the end of the tubular member, a plurality of magnets secured to the tubular member in proximity of the mouthpiece and a plurality of darts held in position on the gun by the magnets, and wherein each of the darts consists of a cylindrical body section whose diameter is substantially slightly smaller than the inner diameter of the tubular member for free sliding movement of the dart through the tubular member, a pointed metallic rod mounted at the axis of the cylindrical body section and extending forwardly thereof, and the forward peripheral edge portion of the cylindrical body section being slotted to stabilize the dart while in flight.

3,735,749

## BUN STEAMER INJECTOR

Chester Blinks, La Grange, and Ronald M. Herbert, Hanover Park, both of Ill., assignors to Restaurant Technology, Inc., Oak Brook, Ill.  
Filed Nov. 4, 1970, Ser. No. 86,721  
Int. Cl. A21b 1/36  
U.S. Cl. 126—20 8 Claims

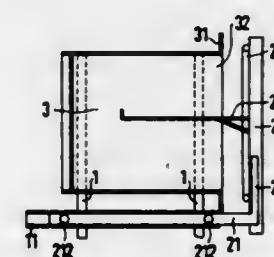


A method and apparatus for injecting steam into buns. The steam injector includes a readily removable platen assembly which defines a plurality of equally spaced steam injection orifices arranged in rows and columns. The platen assembly is specially configured to produce high quality steam. The buns are positioned on a perforated tray, the perforations of which coincide with the steam injection orifices. The steam is injected directly into the buns themselves through the perforations in the tray.

3,735,750

## BAKING AND ROASTING OVEN

Heinrich Dettlerbeck, Josef Ackermann, and Bruno Schmalzgruber, all of Traunreut, Germany, assignors to Siemens-Elektrogerate GmbH, Berlin, Germany  
Filed Feb. 16, 1971, Ser. No. 115,195  
Claims priority, application Germany, Feb. 13, 1970, P 20 06 621.1  
Int. Cl. F24c 15/02  
U.S. Cl. 126—197 22 Claims



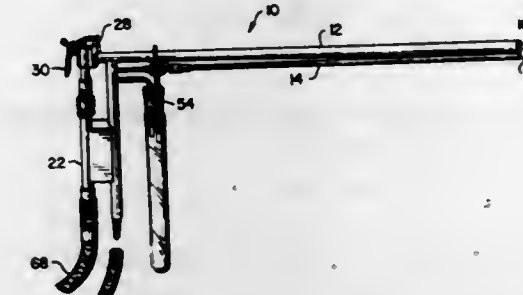
A baking and roasting oven for cooking food has a muffle structure having a front face which defines a charging opening for receiving the food to be cooked. Guide members are fixedly mounted with respect to the muffle structure and a door assembly having a door extending substantially parallel to the front face is also provided. The door assembly includes carriage members which are connected with the door. The carriage members are arranged beneath the muffle structure in spaced relation to the door. The carriage members movably engage the guide members and so facilitate the movement of the door between open and closed positions. A locking mechanism is disposed with respect to the guide and carriage

members for locking the door when the door is in the closed position.

3,735,751

## LAVAGE AND CYTOLOGY INSTRUMENT

Seymour Katz, 444 East 68th Street, New York, N.Y.  
Filed June 8, 1971, Ser. No. 151,058  
Int. Cl. A61b 10/00  
U.S. Cl. 128—2 F 4 Claims



A device for use in proctosigmoidoscopic examinations for directing a pressure liquid, such as water, a saline solution and/or diagnostic dyes to a predetermined proctosigmoid zone and for withdrawing the injected fluid, feculent and mucoid debris associated therewith including first and second hollow parallel nonconcentric tubular members, means connecting one of the tubular members to a source of liquid under pressure and further conduit means selectively connecting the other of the hollow tubular members to a source of reduced pressure and/or a collector maintained at a reduced pressure. The withdrawing function and/or spraying may be continuous or intermittent.

3,735,752

## SPIROMETER

Jerome A. Rodder, 774 Sunshine Drive, Los Altos, Calif.  
Continuation-in-part of Ser. No. 809,847, March 24, 1969, abandoned. This application Apr. 7, 1971, Ser. No. 131,920  
Int. Cl. A61b 5/08  
U.S. Cl. 128—2.08 23 Claims



A spirometer for measuring the flow rate of breath inhaled and exhaled through a disposable venturi tube includes a lateral conduit which communicates with the venturi tube. The flow of breath through the tube aspirates fresh air from the atmosphere through the conduit over a thermistor in the conduit which is connected to a bridge circuit to measure the flow rate of breath in the tube.

3,735,753

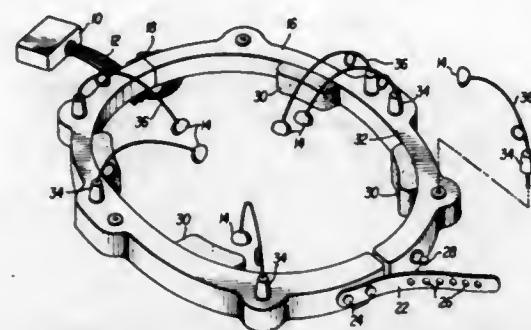
## HEAD HARNESS FOR EEG ELECTRODES

Lech Pisarski, Los Angeles, Calif., assignor to Humetrics Corporation, Los Angeles, Calif.  
Filed Nov. 9, 1971, Ser. No. 196,924  
Int. Cl. A61b 5/04  
U.S. Cl. 128—2.1 E 7 Claims

An EEG head harness for rapidly and automatically locating a plurality of EEG electrodes on the head of a patient in which



the electrodes are removable and are spring biased toward the



head of the patient and in which the electrode supporting frame is longitudinally separable.

3,735,754

### THERAPEUTIC EXERCISING APPARATUS

John M. Reed, 12 Magnolia Street, Centralia, Ill.

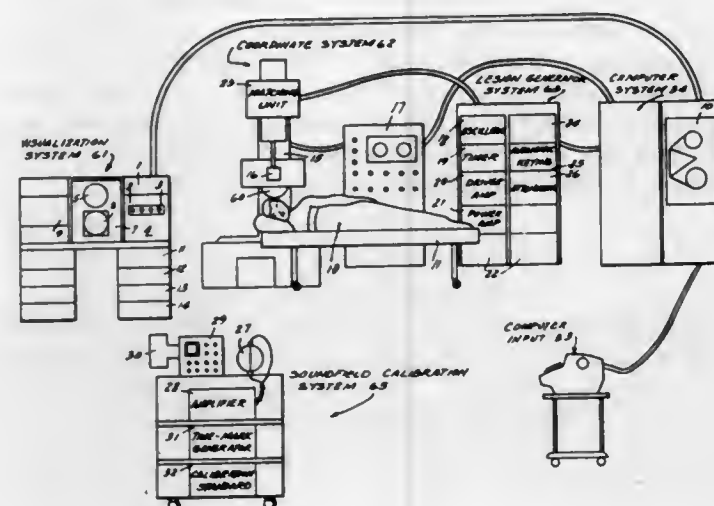
Filed June 11, 1971, Ser. No. 152,045

Int. Cl. A61h 1/02

U.S. Cl. 128-25 R

9 Claims

formed and monitored by the visualizing apparatus. The visualizing and the tissue destructing means are under the con-



3,735,756

### DUPLEX ULTRASOUND GENERATOR AND COMBINED ELECTRICAL MUSCLE STIMULATOR

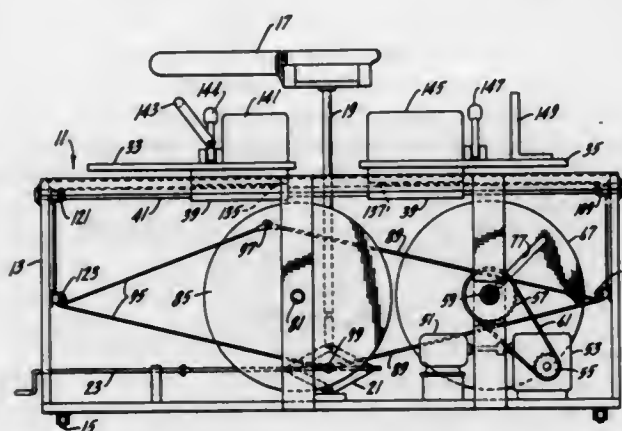
Joseph M. Richards, and Mark E. DeGroff, both of Tulsa, Okla., assignors to Medco Products Co., Inc., Tulsa, Okla.

Filed June 23, 1971, Ser. No. 155,823

Int. Cl. A61m 1/26

U.S. Cl. 128-24 A

13 Claims



An exercising apparatus for therapeutic use which moves the limbs of a patient in a cross-pattern crawling motion. The apparatus is power driven and a clutch is provided to protect the patient from the application of excessive forces. The apparatus is adjustable to vary the length of movement of the limbs of the patient and to support patients of varying sizes ranging from infants to adults.

3,735,755

### NONINVASIVE SURGERY METHOD AND APPARATUS

Reginald C. Eggleton, and Francis J. Fry, both of Champaign, Ill., assignors to Interscience Research Institute, Champaign, Ill.

Filed June 28, 1971, Ser. No. 157,160

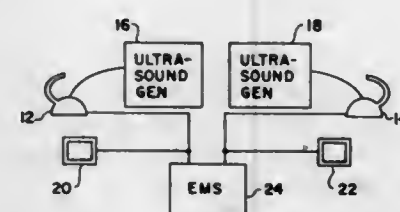
Int. Cl. A61h 29/00

U.S. Cl. 128-24 A

8 Claims

A method and apparatus for performing human and animal surgery in which the tissue field including all soft tissue fluid space interfaces can be visualized along with other soft tissue features by appropriate ultrasonic visualization means such as transmitting a scanning ultrasonic beam and receiving echoes from the desired areas and presenting a picture of said areas on a suitable display monitor such as a cathode ray tube for two-dimensional presentation where the presentation may be compared with standard atlases of normal tissue. Means and apparatus for transmitting ultrasonic energy at substantially higher level than that used for visualizing the area are provided so as to selectively destroy tissue without requiring a surgical incision. The extent of the surgery may be observed with the visualizing apparatus and the surgery may be per-

A duplex electro-ultrasonic medical therapy apparatus comprising a pair of ultrasound generators connected to a common power source and keyed by a duplex keyer circuit, the output of which is connected to a transducer which converts the electrical oscillations into mechanical vibrations for application to the patient's body to administer the ultrasonic medical therapy treatment. The apparatus also comprises an integrated electrical pulse generator having outputs connected to a pair of conductive pads to supply electrical muscle stimulation to the patient's body simultaneously with the ultrasound treatment. The electrical pulse generator further serves as a driving function for the ultrasound duplex keyer circuit.



3,735,757

### HAND HELD VIBRATOR WITH FLEXIBLE DRIVE SHAFT

Charles H. MacFarland, Cleveland, Ohio, assignor to The Scott & Fetzer Company, Cleveland, Ohio

Filed June 19, 1970, Ser. No. 47,662

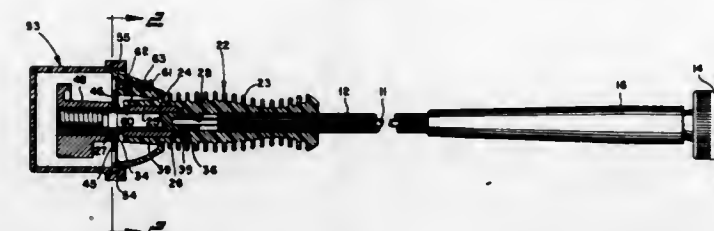
Int. Cl. A61h 1/00

U.S. Cl. 128-36

8 Claims

A vibrator is disclosed which includes a flexible drive shaft and a connector at one end of the drive shaft for manually connecting and disconnecting the one end to a vacuum cleaner power source for rotating the drive shaft. An eccentric

weight is releasably attached to the other end of the drive shaft for vibrating a handle. A first stop member is secured to the other end of the drive shaft, and a second stop member is secured to the handle for engaging the first stop member and preventing rotational movement of the drive shaft to permit



manual removal of the eccentric weight. A cover is releasably secured to the handle to cover the eccentric weight by an annular groove on the cover extending through 360° and an annular lip on the handle extending through slightly more than 180°. The handle encapsulates the other end of the drive shaft to prevent abrupt bending thereof.

3,735,758

### FOOT AND ANKLE CAST ENCLOSURE

Marguerite E. Novotny, 1626 W. Oregon, Lapeer, Mich.

Filed June 7, 1971, Ser. No. 150,418

Int. Cl. A61f 13/00

U.S. Cl. 128-82

2 Claims

3,735,760

### NEEDLE APPARATUS

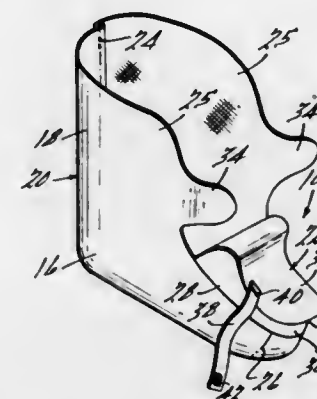
Walling D. Vreeland, Jr., 3910 Country Club Road, Winston-Salem, N.C.

Filed Jan. 20, 1971, Ser. No. 108,116

Int. Cl. A61m 5/00

U.S. Cl. 128-216

5 Claims



A removable protective enclosure for an ankle cast or the like, the enclosure comprising a boot-like portion adapted to removably receive a person's foot and being sufficiently large to accommodate and permit effortless insertion and removal of the foot when the same has been fitted with a foot or ankle cast, the boot-like portion being adapted to substantially enclose the foot and cast fitted thereon and including an upwardly extending ankle enclosing portion cooperable with the boot-like portion to protect the person's foot and ankle cast thereon from foreign material, moisture, inclement weather conditions and the like.

A finger controlled needle apparatus containing a housing which supports a fluid reservoir and connecting ejecting means which can be actuated by movement of the user's finger. A flexible cover retains the various components on the finger of the user and permits the injection of fluids into the wall of a cavity or organ located within the human body.

3,735,761

### HYPODERMIC DEVICES

Alfred A. Hirschman, Streetsboro, and Thomas P. Schiller, Pepper Pike, both of Ohio, assignors to Ampoules Inc., Macedonia, Ohio

Filed Feb. 11, 1971, Ser. No. 114,493

Int. Cl. A61m 5/00; A61j 1/00

U.S. Cl. 128-218 M

5 Claims

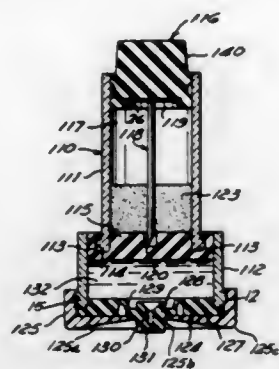
A flexible waterproof plastic cover comprises an open-topped sleeve intended to be used over a plaster cast on a person's foot and ankle. The sleeve is formed from two edge-interconnected plies of flexible waterproof material. The plies are interconnected along rear and bottom edges as well as along a front edge which is formed in two sections. The first section of the front edge of the sleeve extends generally perpendicularly upwardly from the bottom edge for a distance equal to at least about half the length of the bottom edge and

the second section extends obliquely upwardly and rearwardly toward the rearward edge so that the size of the largest foot cast which can be inserted into the sleeve is primarily determined by the minimum separation between its rear edge and

Hypodermic ampoules of the contained-needle type, a method of assembling and filing such ampoules, and combinations of such ampoules with so-called "applicators" for actuating the ampoules to make injections are disclosed. Each of several ampoule forms has a plurality of cylindrical, medication-containing chambers and a plunger closing one end of one of the chambers. A hollow needle is fixed to the plunger and is initially contained within such a chamber. The other end of the ampoule is sealed by a diaphragm which is pressed against a beaded end portion of a cylinder and is sealed thereto by a cup-shaped clip which snaps over the beaded end portion to thereby compress the diaphragm against the end



portion. The clip has a peripheral rim about a recessed bottom end which stretches the patient's skin to facilitate the injection. According to the invention, the ampoule includes multi-



ple chambers for premixing a medicament with at least one other medicament and dispensing the mixture by, for example, injecting it either subcutaneously or intramuscularly.

3,735,762

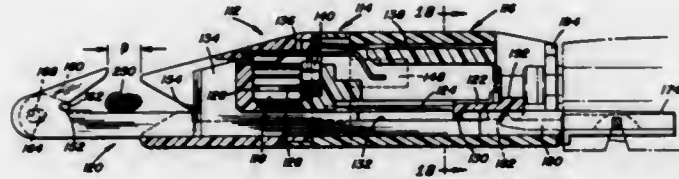
#### INSTRUMENT FOR LIGATING SUTURING AND DIVIDING ORGANIC TUBULAR STRUCTURES

Graham W. Bryan, Ridgefield, and David T. Green, Norwalk, both of Conn., assignors to United States Surgical Corporation, Baltimore, Md.

Division of Ser. No. 32,247, April 27, 1970, Pat. No. 3,675,688. This application Dec. 29, 1971, Ser. No. 213,574  
Int. Cl. A61b 17/12, 17/32; B21f 15/00

U.S. Cl. 128—305

7 Claims



A medical instrument and associated cartridge for ligating an organic tubular structure, for suturing this structure in two places with a pair of sterilized staples and for dividing the tubular structure intermediate the suturing staples. The instrument is provided with a variable cam so that the ligating, suturing and dividing stages are all performed with uniform effort from the operating surgeon. The instrument is also provided with a counter for indicating the number of staples remaining in the cartridge. The novel cartridge ensures that the stapled and severed tubular structures are ejected from the instrument after the operation, operates smoothly without binding, and includes a lock which holds the elements of the cartridge in fixed positions during all stages of transit.

3,735,763

#### HEMOSTAT

Snel Grant Shannon, and Norwood Claude Graeff, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 773,593, Nov. 5, 1968, abandoned, which is a continuation-in-part of Ser. No. 608,419, Jan. 10, 1967, Pat. No. 3,533,410. This application Mar. 25, 1970, Ser. No. 22,462

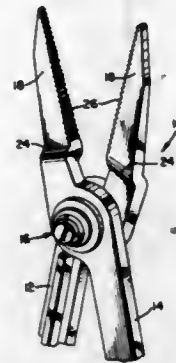
Int. Cl. A61b 17/28

U.S. Cl. 128—322

3 Claims

A hemostat or similar device for clamping blood vessels, tubes, or the like and comprising a pair of pivotally mounted

handle members joined by a hub integrally formed on one



handle member and secured to the opposite handle member by a retaining clip.

3,735,764

#### INSTRUMENT FOR CRUSHING STONES IN URINARY BLADDER

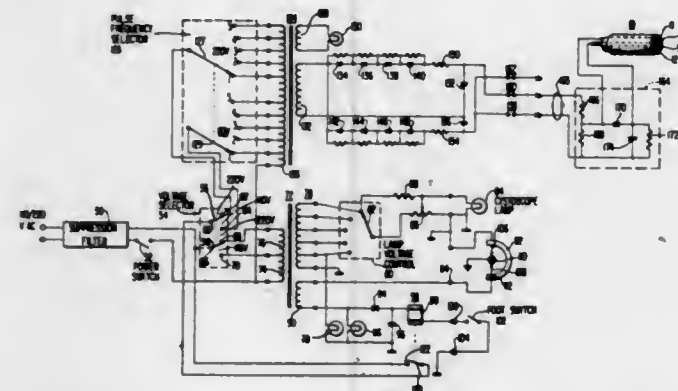
Oleg Gavrilovich Balev, Prospect 40-letia Oktyabrya 100, kv. 174; Jury Grigorovich Ediny, Rovenskaya ulitsa 7, kv. 58, and Nikolai Akimovich Korol, Prospect 40-letia Oktyabrya 108/128/17, kv. 3, all of Kiev, U.S.S.R.

Continuation-in-part of Ser. No. 871,849, Oct. 28, 1969, abandoned, which is a continuation-in-part of Ser. No. 444,681, April 1, 1965, abandoned. This application Nov. 23, 1970, Ser. No. 92,056

Int. Cl. A61b 21/00, 29/00; A61b 17/00

U.S. Cl. 128—328

21 Claims



A method and apparatus for non-surgical removal of concretions in the urinary tract. A lithotrite including a central and outer electrode is connected to electric pulser means including spark discharge members for generation of electrical pulses which result in hydraulic shock waves being emitted from the lithotrite. In operation, the lithotrite is placed adjacent the concretion to be crushed which is surrounded by a dielectric fluid. The frequency and/or intensity of the hydraulic shock wave can be varied until the desired crushing of the concretion is achieved.

3,735,765

#### METHOD OF CLOSING LACERATIONS AND CLAMP THEREFOR

David L. Ichelson, 155 Birch St., Redwood City, Calif.  
Filed Mar. 18, 1971, Ser. No. 125,505

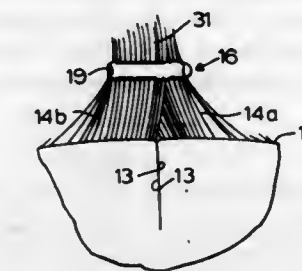
Int. Cl. A61b 17/04

U.S. Cl. 128—335

4 Claims

Lacerations of the scalp are closed by pulling the hair on opposite sides of the laceration perpendicular to the skin and then together directly above the laceration, thus pulling the skin together so that the edges are in close proximity. A clamp is applied to the hair, holding the skin in place with the edges close enough to heal together. Thus, use of sutures and necessity of shaving hair adjacent the wound is avoided. The clamp

has two pivoted jaws lined with a friction material which resists slippage and securely grips the hair when the jaws are



closed and latch means for holding the jaws closed. The clamp is preferably of materials which may be sterilized.

3,735,766

#### OPTIONAL UNIPOLAR-BIPOLAR BODY ORGAN STIMULATOR

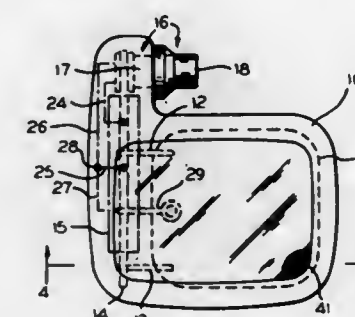
David L. Bowers, Wauwatosa, and John E. Mohalski, Milwaukee, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 19, 1971, Ser. No. 135,069

Int. Cl. A61m 1/36

U.S. Cl. 128—419 P

14 Claims



A body organ stimulator such as an electronic cardiac stimulator has the customary connector for attaching intracardiac catheter leads or myocardial leads to operate the stimulator in a bipolar mode. Set in the resin encapsulation of the stimulator or in an adapter is an indifferent electrode plate which connects internally of the device with one of the connector terminals. The plate in the stimulator or the adapter is dipped in medical grade silicone sealant. An insulating label or strip is then superposed over the sealant coated plate and it is dipped and cured again. At the time of implantation, the physician has the option of stripping the label to expose the plate so the stimulator may be operated in the unipolar mode or leave the strip in place for operation in the bipolar mode.

3,735,767

#### METHOD AND MACHINE FOR THE MAKING OF CIGARETTE PACKS OR THE LIKE

Friedel Kruse, Hamburg; Gunter Wahle, Reinbeck; Otto Erdmann, Hamburg, and Willy Rudzinski, Dasselndorf, all of Germany, assignors to Hauni-Werke Korber & Co. KG, Hamburg, Germany

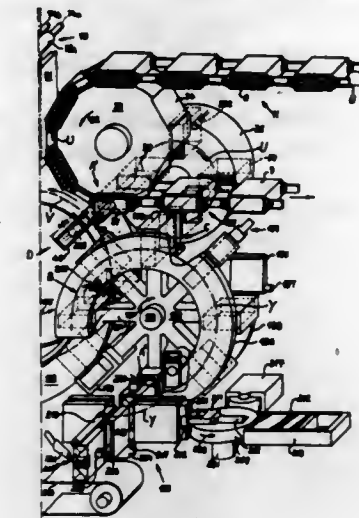
Filed Oct. 20, 1970, Ser. No. 82,468

Int. Cl. A24c 5/35; B65b 19/22

U.S. Cl. 131—25

68 Claims

A cigarette packing machine wherein empty packs are produced independently of the rate of formation and transport of blocks of cigarettes. The blocks of cigarettes are introduced into a compacting turret which rotates past a detector serving to effect transfer of an empty pack to a pack filling station whenever it detects a satisfactory blocks so that a particular empty pack is assigned to each scanned block. Unfilled packs



stepwise along an endless path defined by one or more turrets or one or more turrets and one or more belt conveyors.

3,735,768

#### METHOD AND MEANS FOR TREATING FILAMENTS OF HAIR, OR THE LIKE

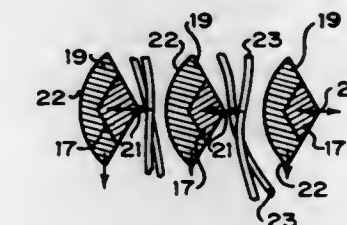
Charles F. Burney, Tulsa, Okla., assignor to John Kenecally, Monte Sereno, Calif., a part interest

Filed Sept. 30, 1971, Ser. No. 185,329

Int. Cl. A45d 2/00

U.S. Cl. 132—9

9 Claims



An improved method and means for curling hair uses relatively slidable combs to apply lateral forces to the hair as the teeth are drawn through the hair.

3,735,769

#### METHOD FOR PUMPING OIL THROUGH TERRAIN CONTAINING PERMAFROST

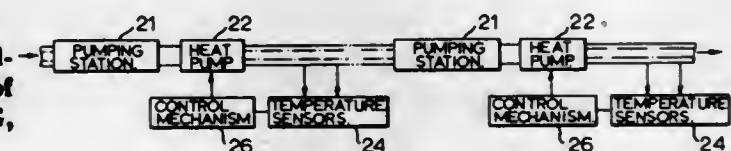
Jack Miller, 618 Athol St., Whitby, Ontario, Canada

Filed Apr. 8, 1971, Ser. No. 132,384

Int. Cl. F17d 1/14; F16k 49/00

U.S. Cl. 137—13

6 Claims



A method of pumping oil in the Arctic in which an oil pipeline is located inside a natural gas pipeline. The cold natural gas pipeline insulates the warm oil pipeline and prevents the latter from melting the permafrost. Alternatively, alternate slugs of oil and gas can be pumped through one pipeline or through two pipelines located side-by-side, the temperatures and volumes of the gas slugs being controlled so that the tem-



perature at the exterior of the pipeline installation remains below 32° F.

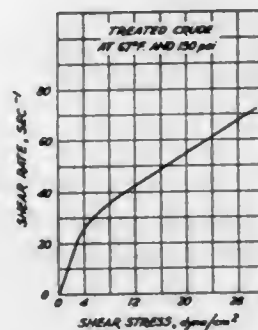
### 3,735,770 METHOD FOR INCREASING THE MOBILITY OF WAXY CRUDE OILS

John J. Day, Tulsa, Okla., and Jaroslav Zajac, Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Feb. 9, 1972, Ser. No. 224,745  
Int. Cl. F17d 1/16

U.S. Cl. 137-13

11 Claims



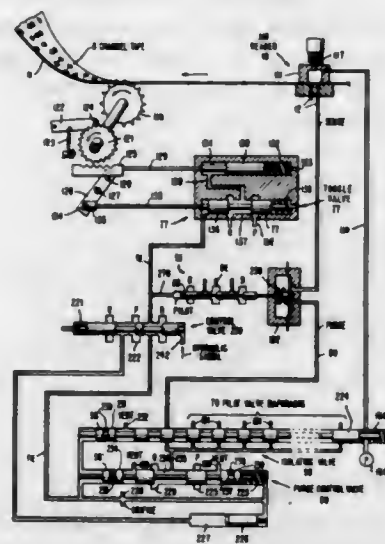
The mobility of waxy crude oils is increased by cooling a mixture of the crude oil and an amphipathic additive from a temperature higher than the nucleation temperature of the crude oil at a rate less than 10° F. per hour to a temperature at which nucleation of wax particles causing high pour point is virtually complete. Preferred amphipathic additives are alkylated phenols and copolymers of ethylene with polar organic compounds such as acetate or acrylate esters. The increased mobility is characterized by reduced pressures required to start flow through a pipeline and reduced pressure drop in a pipeline after flow has commenced.

### 3,735,771 PNEUMATIC READER FOR PERFORATED MEDIA

Hugo A. Panissidi, Peekskill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.  
Continuation-in-part of Ser. No. 824,424, May 14, 1969. This application Dec. 31, 1970, Ser. No. 103,223  
Int. Cl. G06k 7/02

U.S. Cl. 137-15

9 Claims



A pneumatic, perforated tape, intermittent motion reader is connected to a pneumatic-to-hydraulic interface in a hydra-

lic control system. A hydraulically controlled pneumatic purge system is provided for ejecting or purging foreign matter from the pneumatic reading lines between successive cycles of reading by the reader, by blowing air under high pressure through the lines in the reverse direction to the direction air travels when the reader is reading. Reading is blocked during the purging cycle by locking diaphragms in the interface.

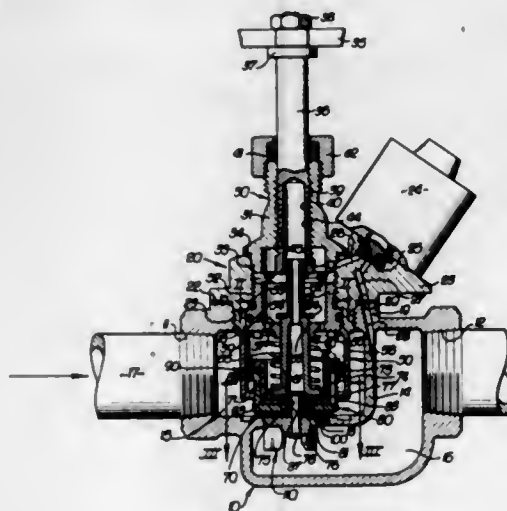
### 3,735,772 WATER VALVE APPARATUS

Edwin J. Hunter, and Joseph Walto, both of Riverside, Calif., assignors to Toro Manufacturing Corporation, Riverside, Calif.

Filed May 20, 1971, Ser. No. 145,284  
Int. Cl. F16k 31/40

U.S. Cl. 137-15

10 Claims



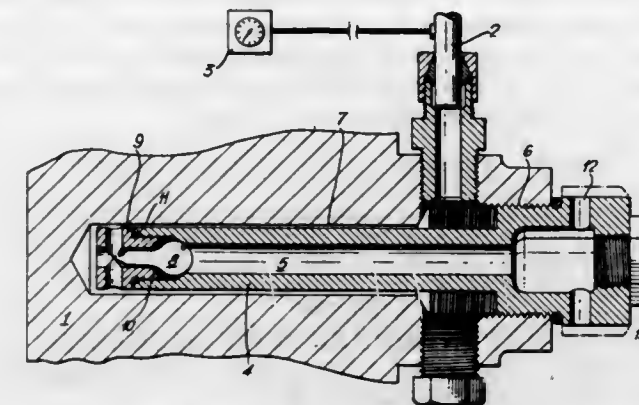
The water valve apparatus has a subassembly of molded plastic valve actuator parts provided within a brass valve housing including a body having inlet and outlet chamber divided by a ported partition, a threaded cap including electrically or hydraulically operated internal pressure controlling means and a flow control stem assembly mounted on the cap. The apparatus subassembly of internal parts includes a one-piece molded cylindrical insert means having an upper threaded neck portion for removable connection into the cap and a depending cylindrical skirt positioned within the valve body inlet chamber upon assembly of the cap to the valve body. Piston means, including nested inner and outer cup-like members clamping a ring seal means between flanges thereof, are provided within the cylinder with a valve closure member fastened to the underside of the piston means and a control rod slidably mounted within a web of the cylinder insert means seated within the inner cup-like member of the piston means and biasing it via associated spring means into a valve closure position. In the first exemplary embodiment, port means are provided through the piston means to allow inlet water pressure to operate the piston means within the associated insert cylinder means to a valve closed position subject to selective venting thereof via an electrically operated valve in the valve housing. In an alternative embodiment, a hydraulic line is associated with the valve housing for selectively applying pressure within the cylinder insert means to force the piston means into a valve closed position or allow it to move to an open valve position under the urging of inlet water pressure.

### 3,735,773 PNEUMATIC TEMPERATURE RELEASER

Henrik Pande Røise, Snaroya, Norway, assignor to Thune-Eureka A/S Drammensveien, Oslo, Norway  
Filed Mar. 23, 1971, Ser. No. 127,222  
Claims priority, application Norway, Apr. 3, 1970, 1240/70  
Int. Cl. F16k 17/38

U.S. Cl. 137-74

4 Claims



A gasfilled glass bulb which bursts when a predetermined temperature is reached is used as the valve body for closing a valve in a pipeline under pressure in which a pressure drop due to bursting of the bulb indicates a particular condition.

### 3,735,774 DIFFERENTIAL GAS LIFT VALVE APPARATUS

David V. Chenoweth, Houston, Tex., assignor to Baker Oil Tools, Inc., City of Commerce, Calif.  
Division of Ser. No. 778,721, Nov. 25, 1968, Pat. No. 3,592,561. This application Nov. 25, 1970, Ser. No. 92,640  
Int. Cl. F04f 1/20

U.S. Cl. 137-155

15 Claims



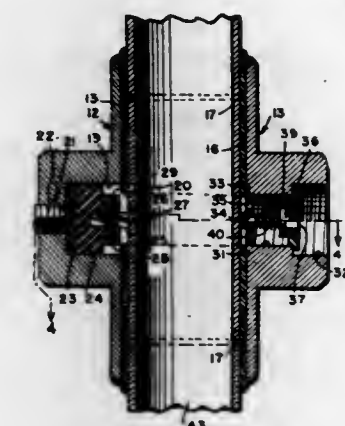
A well bore gas lift valve apparatus for controlling elevation of well bore liquids through a tubing string to the surface of the well bore. A main pressure differential valve controls the feed of gas from the tubing-casing annulus into the tubing string, the main valve containing a pilot pressure differential valve that also controls the gas feed from the tubing-casing annulus into the tubing string. The pilot or normal high differential pressure valve opens to admit gas to the tubing string on reduction of the casing-to-tubing differential pressure. This action further reduces the casing-to-tubing differential pressure, causing opening of the main valve, both valves then being open. The pilot valve first opens, assisting opening of the main valve. The main valve first closes, assisting closing of the pilot valve.

### 3,735,775 PIPE FITTING

Edward F. Tickett, El Paso, Tex., assignor to Alex B. Reynolds, St. Louis, Mo., a part interest  
Filed Feb. 22, 1971, Ser. No. 117,761  
Int. Cl. B23b 41/08; F16c 41/04

U.S. Cl. 137-318

9 Claims



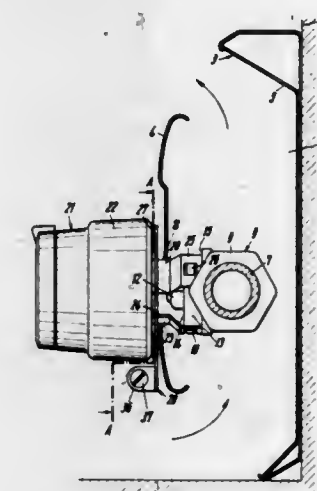
A pipe fitting which is capable of being attached to an existing pipe line for diverting a part of the flow of the pipe line through a branch line connected to the fitting, without interrupting the flow through the pipe line. A cutter carried by the fitting permits cutting of the pipe as the fitting is applied thereto to enable a part of the flow through the pipe line to be diverted to the branch line; and a valve carried by the fitting shuts off the flow from the fitting until the branch line is applied to the fitting, and enables the flow to the branch line to be shut off for any servicing operations subsequently required in connection with the branch line.

### 3,735,776 VALVE FOR A HEATING ELEMENT

Niels P. G. Graversen, 6440 Augustenborg, Denmark, and Carl Sorensen, deceased, late of Nordborg, Denmark (by Inger Vorre Sorensen, administratrix), assignors to Danfoss A/S, Nordborg, Denmark  
Filed June 28, 1971, Ser. No. 157,303  
Claims priority, application Germany, June 12, 1970, P 20 29 008.8  
Int. Cl. F24f 11/00

U.S. Cl. 137-359

4 Claims



The invention relates to a heating valve assembly in which a valve casing is positioned behind a convactor housing and a thermostatic member is positioned in front of the convactor



housing. The thermostatic member carries a rotatable setting knob and has a short radially resilient base which can be snapped onto the neck of the valve casing which casing surrounds a valve spindle which is controllable by the setting knob.

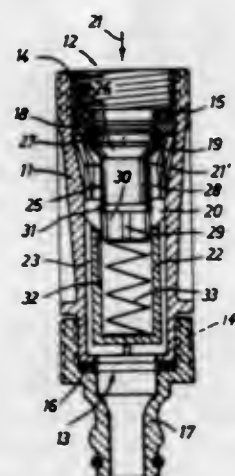
### 3,735,777 AUTOMATIC VALVE

Johannes Katzer, and Franz Lopic, both of Neu-Ulm, Germany, assignors to Kupex AG, Gerns, Switzerland  
Filed Jan. 24, 1972, Ser. No. 220,220  
Claims priority, application Germany, Jan. 28, 1971, P 21 03 948.5

Int. Cl. F16k 17/04

U.S. Cl. 137—514.5

19 Claims



An automatic valve in which a valve body is located in a central chamber of a housing and fluid flow is directed through passages of progressively decreasing flow area formed between the valve body and the inside wall of the housing, thereby causing throttling of the flow in the chamber. A spring acting on the valve body balances the resulting pressure differential between the upstream and downstream sides of the valve body to hold the valve body in an open position during normal fluid flow. Should the flow exceed a predetermined amount, the pressure differential exceeds the force of the spring and the valve body moves to a closed position, shutting off flow through the system. To prevent an abrupt shutoff of the fluid flow, a damping device is provided for limiting the closing speed of the valve body.

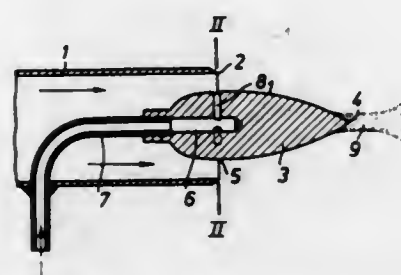
### 3,735,778 DRIVING OF FLUIDS

Michel Garnier, 28, Avenue Montaigne, Paris, France  
Continuation-in-part of Ser. No. 846,423, July 3, 1969, Pat. No. 3,589,383. This application June 25, 1971, Ser. No. 156,870

Claims priority, application France, July 17, 1970, 7026477  
Int. Cl. B05b 7/08

U.S. Cl. 137—604

12 Claims



A device for the fine, homogeneous pulverization of one fluid by another. The device comprises an intake pipe carrying the driving fluid, a tube carrying the fluid to be driven which is introduced into the driving fluid, and an olive-shaped mass arranged at the outlet of the intake pipe and coaxial therewith.

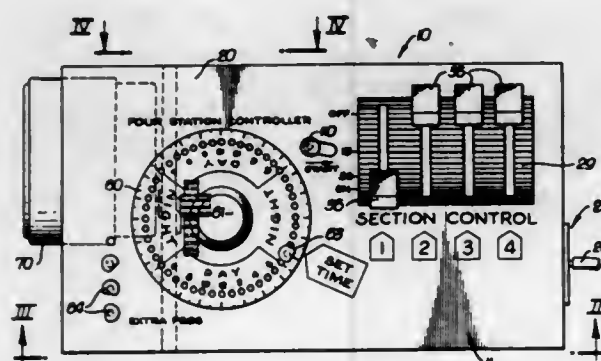
The forward end of the olive-shaped mass extends beyond the plane of the outlet orifice of the intake pipe. The plane including the largest cross-section of the mass substantially coincides with the plane of the outlet orifice of the intake pipe. An annular passage is formed between the olive-shaped mass and the interior wall of the intake pipe. The pressure of the fluid is relatively low so that at least the portion in the vicinity of the olive-shaped mass flows parallel to the axis of the pipe. The tube is connected by a slit or radial channels to discharge the fluid to be driven at one or more points on the outer surface of the olive-shaped mass. A ring of blades inclined at 15° to the common axis and parallel to one another may be provided in the intake pipe. A further conduit may be provided about the intake pipe which defines the annular passage.

### 3,735,779 AUTOMATIC CONTROLLER DRIVE MECHANISM

Edwin J. Hunter, Riverside, Calif., assignor to Toro Manufacturing Corporation, Riverside, Calif.  
Filed Oct. 19, 1971, Ser. No. 190,530  
Int. Cl. A01g 27/00

U.S. Cl. 137—624.2

6 Claims



An automatic control apparatus having a caming means for operating a series of cam followers, a constant speed electric motor, and clutch and transmission means for selectively connecting the caming means to the constant speed motor to be driven thereby past the cam followers, such followers offering resistance to the movement of the caming means thereby when engaged by the caming means, is provided with rapid advance means associated between the clutch-transmission means and the caming means for storing energy received from the motor during operation thereof and for releasing the same to advance the caming means between engagements with the cam followers more rapidly than the advancement normally caused thereby by the motor. The transmission means has a drive shaft connected to the motor and the rapid advance means has a tubular member connected to the caming means and having an inside bore portion with a predetermined internal diameter, a wound wire spring secured at one end to the transmission means drive shaft and having an enlarged diameter portion adjacent the other end in a press fit in the tubular member to store energy during relative rotation between the drive shaft and tubular member prior to an operating cycle and for releasing such energy to rapidly advance the tubular member and associated caming means relative to the transmission means drive shaft during an operating cycle. The spring means is mounted in coaxial bores in a drive shaft and cam shaft, the latter having mating convex and concave bearing surfaces facilitating relative rotation therebetween during twisting and untwisting of the associated spring means.

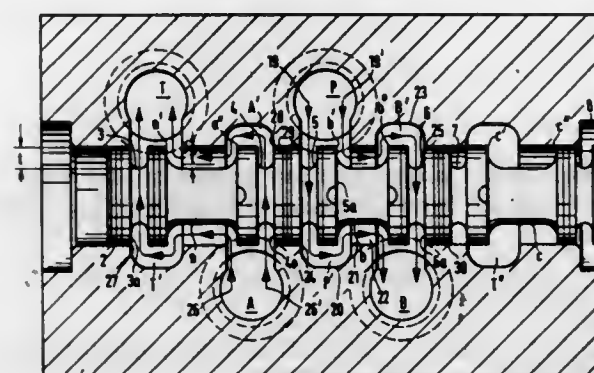
### 3,735,780 VALVE

Walter Held, 8770 Lohr/Main, Germany, assignor to Rexroth GmbH, Lohr/Main, Germany  
Filed July 23, 1971, Ser. No. 165,649  
Claims priority, application Germany, July 31, 1970, P 20 38 115.1

Int. Cl. F16k 4/00

U.S. Cl. 137—625.69

5 Claims



A housing of a valve has an internal elongated chamber provided with a plurality of longitudinally arrayed discrete annular spaces including two longitudinally spaced terminal ones each of which communicate with a port. An elongated valve member is received in and longitudinally slidable in this chamber and provided with a plurality of spaced annular recesses in its outer circumferential surface. Each of these recesses is bounded by longitudinally spaced flow control edges. At least one annular groove is also provided axially adjacent at least one of the annular edges of each pair in the valve member.

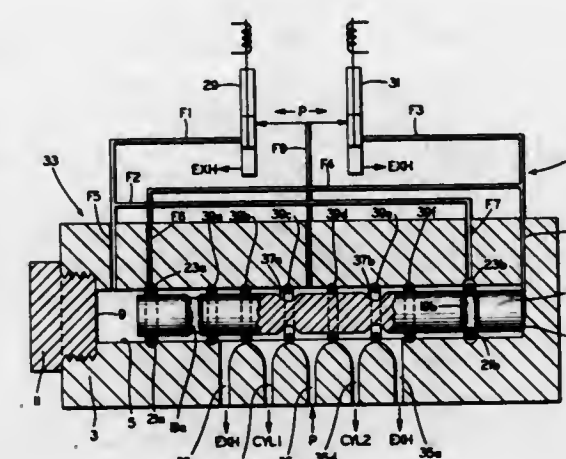
### 3,735,781 VALVE UNIT

Richard R. Kesti, Akron, Ohio, assignor to International Basic Economy Corporation, New York, N.Y.  
Filed Nov. 9, 1971, Ser. No. 196,979

Int. Cl. F16k 11/00

U.S. Cl. 137—625.48

6 Claims



A valve unit or rectilinear positioning device having a plurality of operating positions and arranged such as to hold the operating position last encountered upon inactivation of the valve or positioning device moving and control means comprising a body including a bore, a slide positioner or slide valve reciprocable in the bore between the two operating positions, at least two elastic ring seals spaced along the bore, and partially recessed into the periphery thereof, said seals having an

unexpanded ring diameter substantially equal to or slightly less than the ring diameter of complementary detents or recesses on the slide positioner into which the seals are selectively seated, means for applying fluid pressure to the ring seals and to the ends of the slide positioner or slide valve, and means for locking and unlocking the elastic ring seals to the slide positioner simultaneously with moving it to the next operating position and holding it in that position upon inactivation of the moving means.

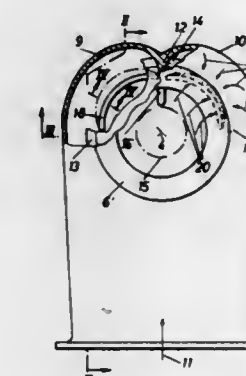
### 3,735,782 SUCTION BEND FOR CENTRIFUGAL PUMPS

Michael Stracheletzky, 799 Friedrichshafen, Germany, assignor to J. M. Voith GmbH, Heidenheim, Germany  
Continuation of Ser. No. 797,491, Feb. 7, 1969. This application June 24, 1971, Ser. No. 156,499  
Claims priority, application Germany, Feb. 15, 1968, P 16 53 786.3

Int. Cl. F15d 1/06

U.S. Cl. 138—39

16 Claims



A suction bend, especially for centrifugal pumps, in which within the range or area where the substantially oppositely directed secondary flows impact upon each other, there is provided at least one rib which forms a boundary layer fence and extends primarily transverse to the flow lines of said flows.

### 3,735,783 DRIVE MEANS FOR WEFT INSERTING APPARATUS FOR A LOOM

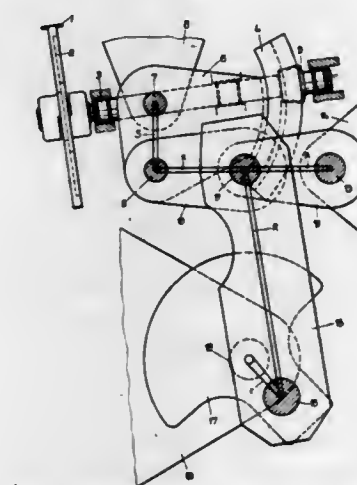
Gabler Fritz, Rheinstrasse 161, 7505 Ettlingen, and Hans Mihatsch, Grottenau 3a, 8871 Bubesheim/Gunzburg, both of Germany

Filed Oct. 26, 1970, Ser. No. 83,756

Int. Cl. D03d 47/00

U.S. Cl. 139—123

13 Claims



For regulating the operation of a weft inserting apparatus during each cycle of loom operation, a sector lever is positive.



ly connected by a gear segment or similar element to the west inserting apparatus and a linkage assembly is connected to the sector lever for reciprocating a west inserting member during two-thirds of each cycle of loom operation and, during the remaining one-third of each cycle, retaining the west inserting member in a position spaced outwardly from the shed of the loom. One end of the sector lever is secured to a fixed support and its other end is free so that during each cycle of operation the lever pivots through an angle in the range of 50° to 70°. The linkage assembly includes a coupling lever attached to the free end of the sector lever and during operation the coupling lever, relative to the sector lever, is disposed in a range of 90° to between 105° and 125°. In addition, the linkage assembly includes a driving lever pivotally connected at one end to the coupling lever and at its other end to a fixed support, a connecting rod connected to the point of pivotal attachment of the driving lever to the coupling lever, and a crank connected to the end of the connecting rod spaced from the coupling lever and the driving lever. The crank is arranged to be driven in synchronization with the main shaft of the loom.

3,735,784

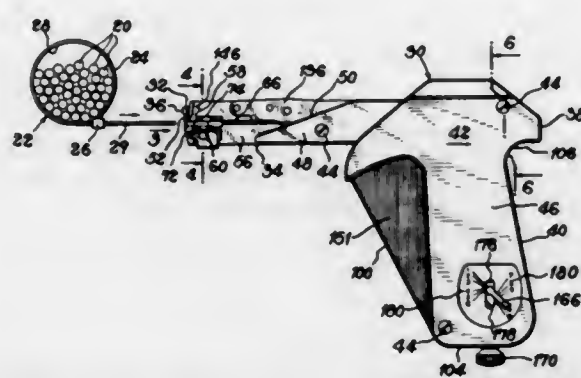
# HAND TOOL FOR TENSIONING AND CUTTING WIRE TIE STRAPS

Edward A. Obuch, Linden, and William T. Waddington, Fairwood, both of N.J., assignors to Buchanan Electrical Products Corporation, Union, N.J.

Filed July 6, 1971, Ser. No. 159,621  
Int. Cl. B21F 9/02

U.S. Cl. 140-93.2

21 Claims



A hand tool for tensioning and cutting the strap of a wire tie, the tool having a draw bar for drawing the strap to a predetermined tension and a toggle-like linkage system for actuating a strap cutting means when the strap is drawn to a predetermined tension. Means are provided for selectively adjusting the predetermined tension in finite fixed increments and for providing a vernier or fine adjustment of the predetermined tension with reference to each finite fixed increment. An operating lever adapted to actuate the toggle-like linkage system is pivotally attached to the tool's handgrip near the remote bottom portion thereof so that the pivot point of the actuating lever is generally located below the operator's hand when the tool is in operation.

3,735,785

# PRESSURIZED DISPENSING PACKAGE

Louis V. Nigro, Saugus, Mass., assignor to The Gillette Company, Boston, Mass.

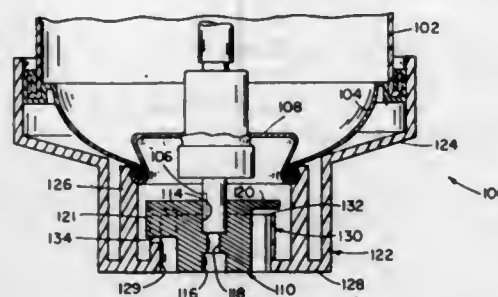
Filed Mar. 3, 1971, Ser. No. 120,467  
Int. Cl. B65b 1/04, 3/04

U.S. Cl. 141-20

23 Claims

A pressurized dispensing package system includes two dispensing packages, each package including a projecting discharge passage structure. Transfer structure defines a closed passage that provides communication between the two discharge passage structures and interconnecting structure includes indexing means that permits the passage structures to be brought into communication only when the contents of the

two packages are such that mixing of the contents is desirable, and latching structure for maintaining the transfer structure



and the packages in proper position relative to each other for transfer of material from one package to another in a refilling operation.

3,735,786

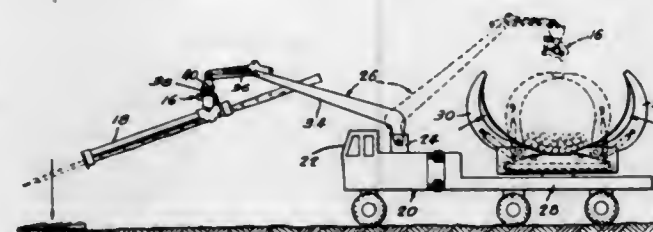
# APPARATUS FOR DELIMBING AND LOADING FULL-LENGTH TREES

Rudy Vit, 108 Leacock Road, Pointe Claire, Quebec, Canada  
Filed June 15, 1971, Ser. No. 153,389

Int. Cl. A01g 23/08

U.S. Cl. 144-2 Z

7 Claims



A debrancher and forwarder is described wherein a sliding boom debranching apparatus with clamping devices at the end of the boom are provided at the end of a loading crane.

A vehicle can also be provided with a buncer in which a sling is subtended between picoting closing arms and the sling passes over an expanding and retracting piston and cylinder arrangement for tightening or slackening the sling.

3,735,787

# STUD AND DADO CUTTER

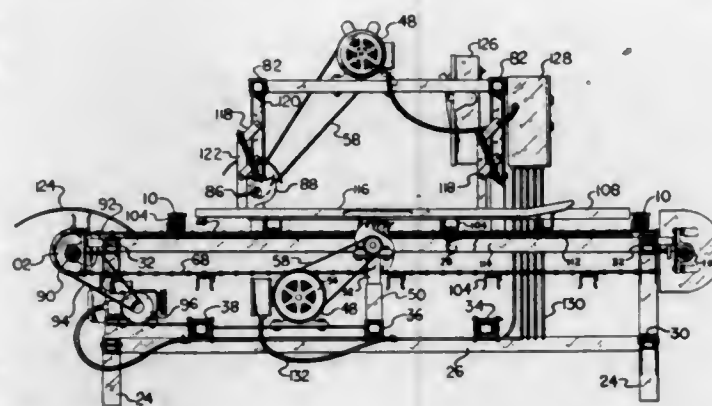
Harry A. Slei, Lubbock, Tex., assignor to Everett A. Platt, Jr., Idalou, Tex.

Filed Oct. 28, 1970, Ser. No. 84,741

Int. Cl. B27c 5/04

U.S. Cl. 144-133 R

7 Claims



A series of wooden studs are clamped into a chain-feed means which moves them transversely of their length past a plurality of stations. At one station they are cut to length and at other stations dados are cut in them; thus producing a plurality of identical studs with dados therein.

3,735,788

# TREE HARVESTING APPARATUS

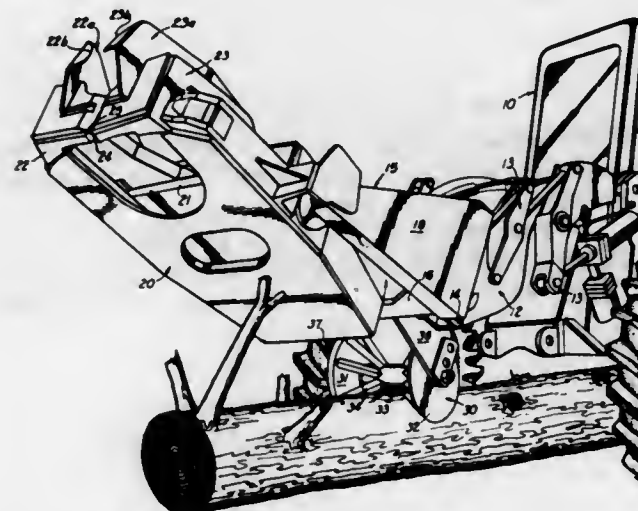
Samuel J. Coughran, Jr., Cedartown, Ga., assignor to Rome Industries, Incorporated, Cedartown, Ga.

Continuation-in-part of Ser. No. 782,626, Dec. 10, 1968, Pat. No. 3,572,411. This application Mar. 22, 1971, Ser. No. 126,838

Int. Cl. A01g 23/08

U.S. Cl. 144-309 AC

20 Claims



A tree harvesting apparatus including means for severing a standing tree adjacent the base allowing the severed tree to fall to the ground, means for grasping the severed tree and removing the tree, by skidding, to a remote location and means for traversing the felled tree trunk to remove limbs therefrom. The tree severing means includes an operable shear blade supported for movement between a retracted inoperable position to a forward tree shearing position. The tree grasping means includes a pair of arms movable from an open position to a position in engagement with the surface of the tree trunk. One operable delimbing means on the tree harvesting apparatus includes a rotatable wheel means mounted thereon for contacting upper surface portions of the felled tree trunk. A second delimbing means includes severing means operatively associated with tree grasping means, with the severing means of the tree grasping means operable for contacting sides and lower portions of a felled tree trunk. The two delimbing means are operable for removing limbs from a tree trunk in response to a traversing movement of the delimbing means over the surface of the tree trunk. The tree harvesting apparatus includes means for effecting attachment thereof to a transport vehicle capable of providing the operative power to the tree shear means, for operating the tree grasping means, for providing the tree skidding movement and to provide the traversing movement of the delimbing means.

3,735,789

# REMOVABLE ANTI-SKID ARRANGEMENT FOR VEHICLE TIRES

Melmar Landauer, Naus Nr. 12, 8972 Tiefenbach, and Anton Kuisle, 8971 Burgberg 172, both of Germany

Filed Dec. 16, 1970, Ser. No. 98,761

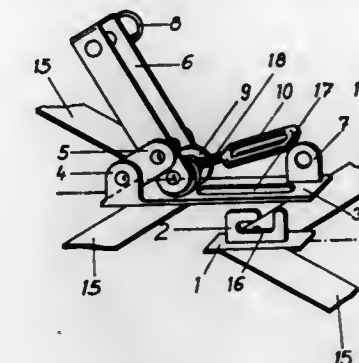
Int. Cl. B60c 27/10

U.S. Cl. 152-217

7 Claims

The invention relates to a removable anti-skid arrangement for vehicle tires comprising, on opposite faces of the tire, a

pair of releasably secured plates, each plate having a pair of arms, the free ends of said arms interconnected by a chain,



and the chains interconnected by cross chains disposable over the treads of the tire.

3,735,790

# PNEUMATIC TIRE

Marcel J. Bertrand, Grivenee-Liege, Belgium, assignor to Unroyal Eaglebert Deutschland AG, Aachen, Germany

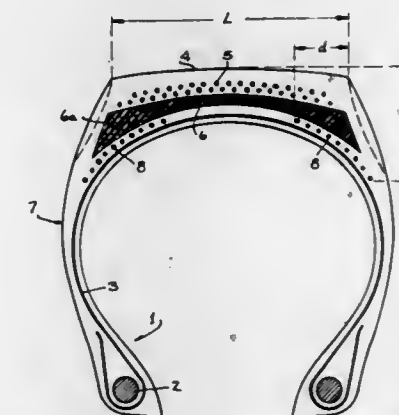
Filed Oct. 26, 1970, Ser. No. 83,976

Claims priority, application Germany, Nov. 5, 1969, P 19 55 669.5; Dec. 4, 1969, P 19 60 943.9

Int. Cl. B60c 9/18

U.S. Cl. 152-3C1

9 Claims



A radial ply tire in which grooves due to wear at the edge regions of the tread are minimized. One embodiment of the tire includes a radial ply carcass, a layer of fiber-reinforced rubber material, a pair of circumferentially extending strips of fabric at the shoulder regions having cords obliquely disposed with respect to the circumference of the tire, a circumferential belt, and tread and sidewall portions.

3,735,791

# PNEUMATIC TIRE

Lance R. McKissick, Akron, and Michael A. Kolowski, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 849,475, Aug. 12, 1969, abandoned.

This application June 7, 1971, Ser. No. 150,713

Int. Cl. B60c 3/00

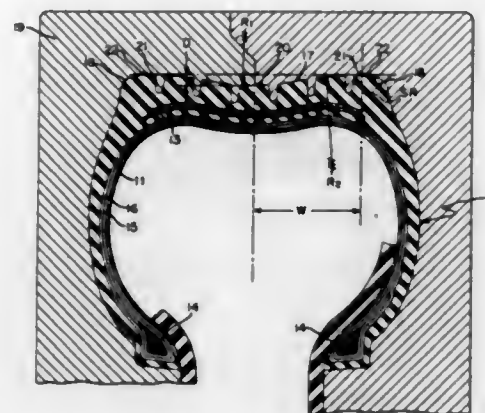
U.S. Cl. 152-352

12 Claims

A method of increasing the tread life of a radial belted pneumatic tire in which the tire is cured in a mold with the central portion of the tread in a reversely curved configuration. The depth of the reversely curved portion, during curing in the mold, is maintained within predetermined limits, and this reverse curvature in the tread is removable from the completely manufactured tire by inflation of the tire to design pressure.



The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the full



nature and extent of the technical disclosure of this application, reference must be made to the accompanying drawing and the following detailed description.

3,735,792

#### SPRAY DRYING METHOD AND APPARATUS FOR PRODUCING GRANULAR PARTICLES FROM STOCK LIQUIDS OF SOLIDS

Naohito Asizawa, Sugihama-ku, Tokyo, and Motomi Kono, Edogawa-ku, Tokyo, both of Japan, assignors to Asizawa Tekko Kabushiki Kaisha, Tokyo, Japan

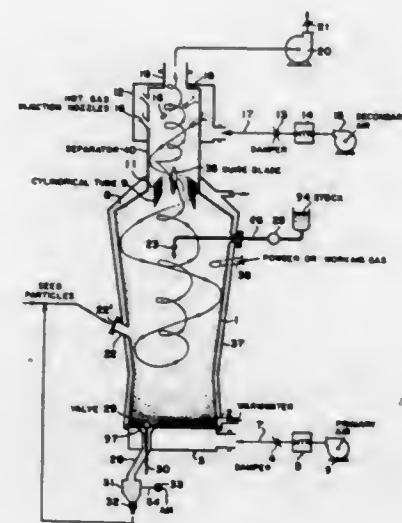
Filed Mar. 4, 1971, Ser. No. 120,922

Claims priority, application Japan, June 1, 1970, 45/47026

Int. Cl. B01d 1/16; F26b 3/12

U.S. Cl. 159-4 CC

8 Claims



A spray drying method comprising forming a layer of solid particles at the bottom of a drying chamber defined by a vertical cylinder, blowing gas into said layer from the underside to agitate the whole of said layer and thereby to form a fluidized bed of solid particles with part of said particles being blown up from the upper surface of said fluidized bed and suspended within said drying chamber, blowing gas into said drying chamber in a direction to form a swirling downward gas flow along the side wall and a swirling upward flow along the center of said drying chamber, whereby said suspending particles are caused to make a circulatory motion while being entrained in said swirling gas flows in such a manner that the fine particles spirally move upward in the center of the drying chamber and at least the major part thereof approach the side wall of the drying chamber under the effect of centrifugal force before

they reach the top of said drying chamber and finally spirally move downward along the side wall of said chamber, said particles being partially returned to said fluidized bed and partially being carried upward again in the center of the drying chamber by being entrained in said swirling upward gas flow, spraying stock solution into said drying chamber, the droplets of said sprayed stock solution colliding against and adhered to said circulating particles to form larger sized particles, said larger sized particles being dried by the surrounding gas and partially circulated within said drying chamber and partially falling into said fluidized bed, and discharging said larger sized particles from said fluidized bed while maintaining the depth of said fluidized bed substantially constant.

3,735,793

#### PLATE EVAPORATORS

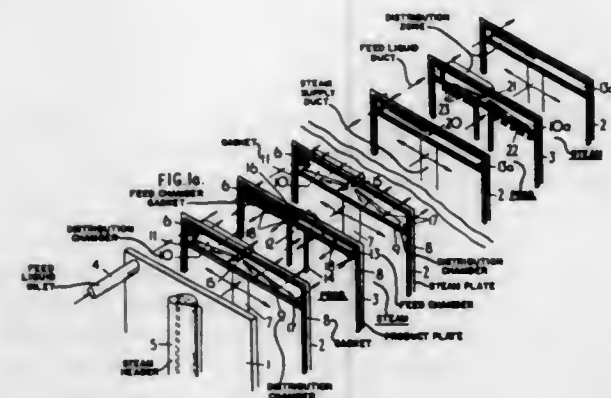
Robin Keith Burberry, Copthorne, and Robert Anthony White, Banstead, both of England, assignors to The A.P.V. Company Limited, Crawley, Sussex, England

Filed May 4, 1971, Ser. No. 140,058

Int. Cl. B01d 1/00, 3/02; F26b 3/08; B01d 3/28, 1/22, 1/28

U.S. Cl. 159-28 P

8 Claims



A plate type evaporator of the falling film type, comprising a pack of plates arranged in spaced face-to-face relationship and gasketed to define flow spaces for heating medium and feed liquid between the plates, characterized in that distribution means is provided to distribute the feed liquid across the flow spaces, the said distribution means comprising at least one restriction leading to a transversely extending distribution zone in communication with one or more flow spaces, the restriction being adapted to cause some flashing of vapor from the feed liquid whereby a mixture of liquid and vapor is present in the distribution zone, the or each distribution zone communicating with the respective flow spaces through a series of laterally spaced further restrictions which are adapted to produce further flashing as the liquid and vapor mixture passes through them.

3,735,794

#### SPACE DIVIDER SYSTEM

Samuel Lebowitz, Brooklyn, N.Y., assignor to Tleco Products, Inc., Royal Oak, Mich.

Filed July 2, 1971, Ser. No. 159,143

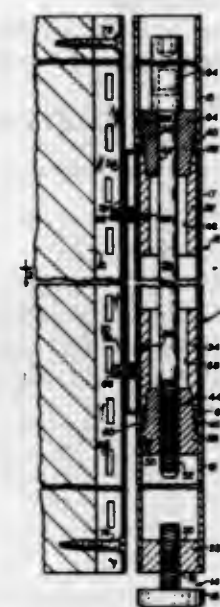
Int. Cl. A47g 5/00

U.S. Cl. 160-135

5 Claims

A corner post assembly for connecting panels or dividers to form a space divider system. The panels terminate in a bracket

which is attached to the post and is slidably rotatable and phenolic resin. The insulator is baked by residual heat in



therewith permitting the panels to form any desired angle with adjacent panels.

3,735,795

#### SUPPORT FOR SUSPENDING A CURTAIN

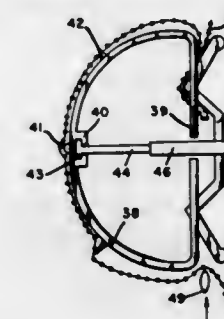
Johannes Bernardus Brock, Aarle-Rixtel, Netherlands, assignor to Plastofold A.G., Herisau, Switzerland

Filed Nov. 12, 1970, Ser. No. 88,772

Int. Cl. A47h 13/14

U.S. Cl. 160-348

7 Claims



A support for suspending a curtain including the supporting member has a curved portion in front and two cloth fixing means at the rear thereof. Each of said means is adapted to hold a double thickness of curtain cloth formed by making a fold in the curtain adjacent the means. The cloth between said fixing means extends over said portion, thereby obviating visibility of said curved portion.

3,735,796

#### PERMANENT MOLD RISER

Andrew Gerald Germann, Medinah, Ill., and Donald Ray Wiles, Muncie, Kans., assignors to Amsted Industries Incorporated, Chicago, Ill.

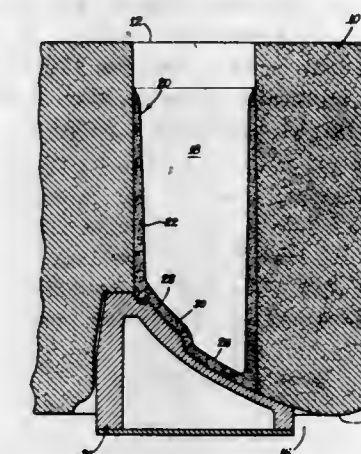
Filed Dec. 22, 1971, Ser. No. 210,638

Int. Cl. B22c 9/12

U.S. Cl. 164-23

3 Claims

A graphite mold has riser openings lined with an insulator extending around the periphery and substantially across the bottom of the openings. The bottom portion of the insulator is formed of facing sand and phenolic resin while the peripheral portion of the insulator is formed of a coarser backing sand



the mold and decreases in thickness from the bottom toward the top of the riser opening.

3,735,797

#### PROCESS AND APPARATUS FOR DIE-CASTING OF FERROUS METALS

Jean Louis Jeanneret, Brecksville, Ohio, assignor to Foseco International Limited, Birmingham, England

Continuation of Ser. No. 811,212, March 27, 1969,

abandoned. This application Sept. 3, 1971, Ser. No. 177,844 Claims priority, application Great Britain, Mar. 27, 1968, 14,717/68

Int. Cl. B22c 3/00

8 Claims

In a process for the production of die-cast ferrous metals, using refractory metal dies and moulds, the molten ferrous metal passes through a shot sleeve en route to the mould. The invention provides a continuous coating of an adherent, heat-insulating, refractory composition. Said composition comprises a finely divided refractory material, suspending and binding agents therefore, and a liquid media that will evaporate or be otherwise removed from the composition at high temperatures.

3,735,798

#### METHODS FOR CASTING HOLLOW INGOTS

Friedrich Kocks, and Hans J. Lippert, both of Dusseldorf, Germany, assignors to Friedrich Kocks, Dusseldorf, Germany

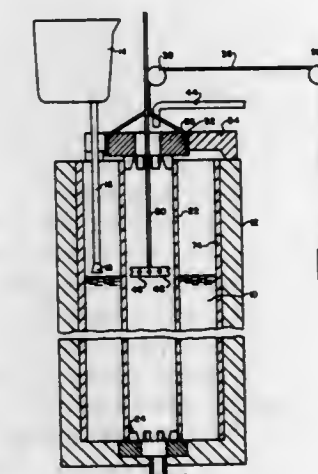
Filed July 15, 1970, Ser. No. 55,177

Claims priority, application Germany, Aug. 30, 1969, P 19 44 149.7

Int. Cl. B22d 23/00

U.S. Cl. 164-94

15 Claims



An apparatus and method are provided for producing hollow castings wherein an axial tube of metal inserted in a mold and molten metal is poured in the area between the tube and mold to form a metallurgical bond with the tube.



3,735,799

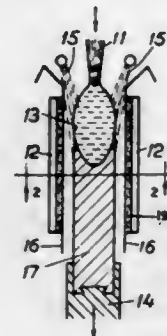
## DEVICE FOR CONTINUOUS CASTING OF METAL

Karl Gosta Karlson, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden  
Filed Mar. 1, 1971, Ser. No. 119,776

Claims priority, application Sweden, Mar. 3, 1970, 2740/70  
Int. Cl. B22d 11/00, 27/02

U.S. Cl. 164-147

2 Claims



An electromagnetic field is produced in a flow of molten metal by a coil surrounding the flow in order to establish forces in the flow. A coolant is applied to the solidifying and solidified surface of the ingot produced from the flow. A thin non-magnetic screen is positioned between the coil and the flow and insulating material is positioned between the screen and the coil. Coolant is also applied to the screen.

3,735,800

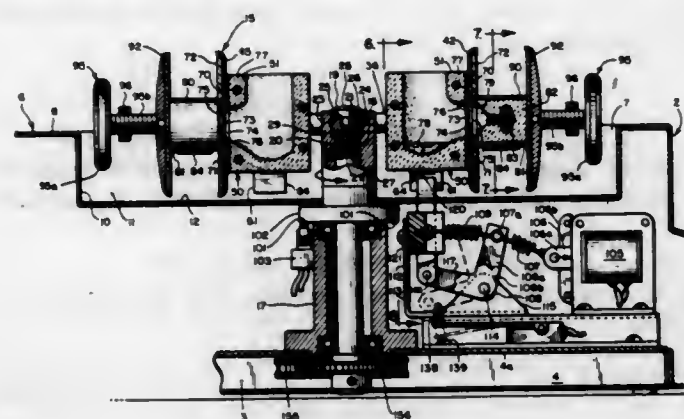
## CENTRIFUGAL CASTING MACHINE

Karl H. Huppert, S. Holland, and Stephen J. Schipitsh, Hickory Hills, both of Ill., assignors to K. H. Huppert Co., Inc., South Holland, Ill.

Filed Feb. 26, 1971, Ser. No. 119,235  
Int. Cl. B22d 13/06

U.S. Cl. 164-250

10 Claims



A casting machine having a casting arm rotatable about a vertical axis and mounting a pair of opposed graphite crucibles and held casting rings thereon with one crucible casting ring in opposition to the other crucible ring wherein electrode contact fingers are positioned below crucible contact blocks on the casting arm for movement into electrical contact with one of the crucibles during the melting cycle and wherein the contact fingers are retracted during the spin cycle at which time the melt is thrown horizontally and radially outwardly in centrifugal action through a gate in the side of the appropriate crucible into the investment cavity of the associated casting ring abutted against the outer side of the respective crucible. The interlocking of the electrical contact fingers and blocks prevents rotation of the casting arm. Interlocking electrical components in an electrical circuit are employed to prevent rotation of the casting arm when the electrode contact fingers are engaged with the crucible contact blocks and the components permit the rotation when the electrodes are withdrawn.

3,735,801

## CONTINUOUS CASTING MOLD

Max Burkhardt, 8049 Zurich, Switzerland, assignor to Coacast AG, Zurich, Switzerland

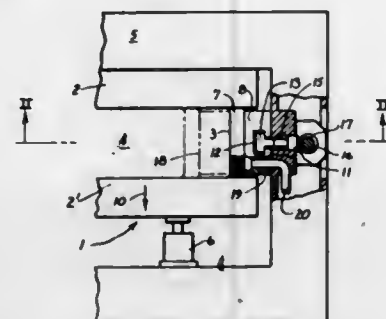
Filed Mar. 9, 1971, Ser. No. 122,345

Claims priority, application Switzerland, Mar. 10, 1970, 3481/70

U.S. Cl. 164-273

Int. Cl. B22d 11/06

7 Claims



A built-up plate mold for continuous casting of slabs comprises a supporting frame and longitudinal and transverse mold walls. The transverse walls are normally clamped between the longitudinal walls but can be released for removal and replacement by movement of at least one longitudinal wall. The transverse walls are also clamped to the supporting frame by releasable means operable from the top of the mold so that they may be removed and replaced without removal of the entire mold.

3,735,802

## CASTING MACHINE WITH LOW PROFILE CONVEYOR

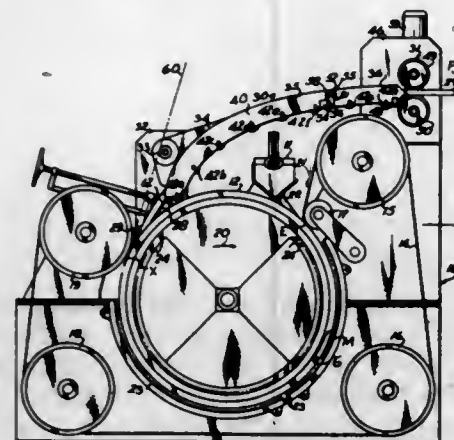
Enrique C. Chia, 42 Tower Apts.; George C. Ward, 128 Bennett Cir., and George E. Lennaus, 301 Sunset Blvd., all of Carrollton, Ga.

Division of Ser. No. 737,719, June 17, 1968, abandoned. This application Jan. 26, 1971, Ser. No. 109,864

Int. Cl. B22d 11/12

U.S. Cl. 164-278

6 Claims



Disclosed herein is a continuous casting machine having a casting wheel with a groove closed by a band to form a casting mold and including a conveying means for conveying cast metal between the casting mold and a substantially horizontal path in a manner that reduces voids in the cast metal, that reduces the concentrations of dissolved gases in the cast metal, that increases the production rate of the casting machine, and that facilitates the initial removal of the cast metal from the casting mold while at the same time providing for convenient and efficient pouring of molten metal into the casting mold. Specifically, the conveying means in the casting machine disclosed is a low-profile conveyor positioned and shaped to place the cast metal leaving the casting mold in a predetermined arcuate path which provides for relatively little vertical displacement of the cast metal above the casting

wheel, which extends the length of the portion of the circumference of the casting wheel which may be used as the casting mold, which is a path into which cast metal leaving the casting mold will initially pass with a minimum of manual guidance, and which provides for the passage of the cast metal over pouring apparatus used for pouring molten metal into the casting mold. Also disclosed herein are a method of casting molten metal and a method of manufacturing a casting machine which embody the same invention as the casting machine.

3,735,803

## METHOD OF AND APPARATUS FOR CONTINUOUSLY CASTING A HOLLOW BILLET

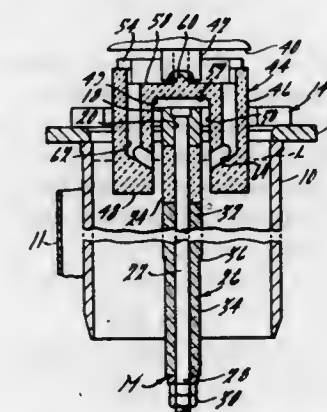
Thomas B. Arrington, and Leonard A. Moody, both of Decatur, Ala., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 19, 1971, Ser. No. 134,953

Int. Cl. B22d 11/10

U.S. Cl. 164-281

30 Claims



Melted metal, typically copper, is applied through floating valve means to a water-cooled mold containing a mandrel of special form and materials so as to result in continuous downward movement of the solidified billet through the bottom lower end of the mold and over the lower end of the mandrel.

3,735,804

## ADJUSTABLE CONDUCTING ROLL APPARATUS

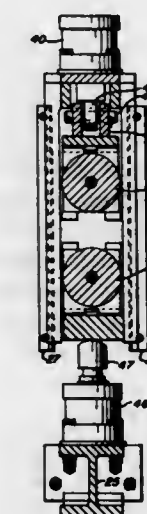
George J. Wagner, Jr., McDonald, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 25, 1971, Ser. No. 118,799

Int. Cl. B22d 11/06

U.S. Cl. 164-282

11 Claims



Apparatus for conducting a continuously formed casting through a portion of a continuous-casting machine which offers high resistance to movement of the casting therethrough. The apparatus has rolls carried by an inner frame movable in a fixed housing. One roll moves with the inner frame and the

3,735,805

## METHOD AND APPARATUS FOR THE TEMPERATURE CONTROL OF MOLDING MACHINES

Bruno J. Stillhard, St. Gallen, Switzerland, assignor to Gebrüder Buller AG, Uznivil, St. Gall, Switzerland

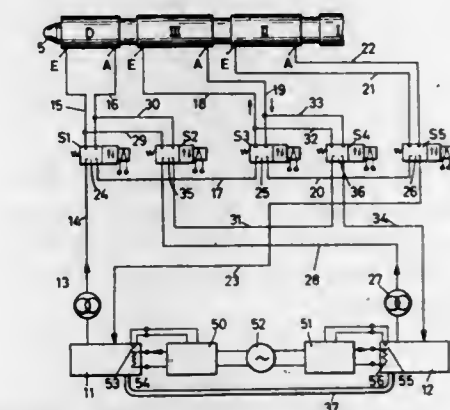
Continuation of Ser. No. 759,334, Sept. 12, 1968, abandoned. This application Jan. 18, 1971, Ser. No. 107,475

Claims priority, application Switzerland, Sept. 15, 1967, 12979/67

Int. Cl. F25b 29/00

U.S. Cl. 165-12

7 Claims



A compression or injection molding machine is connected to a source of hot temperature controlling fluid and to a source of a cooler temperature controlling fluid. Each component of the apparatus is provided with a common passage for flow of both fluids therethrough. Pulses are provided as a function of variation of the temperature of a component with respect to a selected temperature, and these pulses are used to selectively supply or interrupt flow of one or the other of the fluids through the associated common flow passage in accordance with the direction of the temperature variation.

3,735,806

## UNIDIRECTIONAL THERMAL TRANSFER MEANS

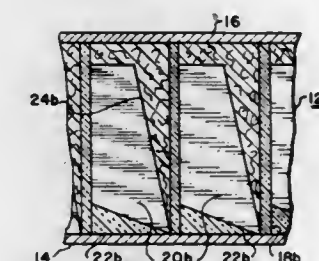
Milton E. Kirkpatrick, Palos Verdes Peninsula, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Dec. 7, 1970, Ser. No. 95,488

Int. Cl. F28d 15/00

U.S. Cl. 165-32

7 Claims



A unidirectional thermal transfer panel of cellular construction wherein each cell has an upper end wall that bears an internal capillary structure and an opposing lower end wall that has an inclined surface devoid of capillary structure. Thermal transfer in the same direction as the force of gravity occurs through vaporization of working fluid liquid from the upper capillary structure and condensation of the working fluid vapor on the inclined surface below. A conduit connected between the lowermost point on the inclined surface and the capillary structure above has high liquid capillary flow properties to transfer the working fluid liquid condensate to the capillary structure above in opposition to the force of gravity



and high thermal impedance to prevent thermal conduction in that direction.

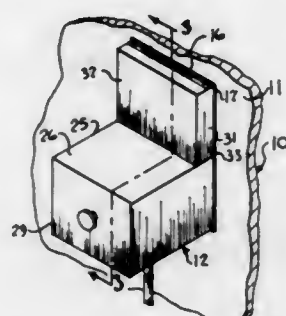
3,735,807

# HEATER FOR FLUID CONTAINED IN A VESSEL

Benner E. Hunt, Box 94, Stockton, N.J.  
Filed June 18, 1971, Ser. No. 154,367  
Int. Cl. F27h 3/10

U.S. Cl. 165-47

4 Claims



For heating fluid in a vessel, a conductive heat exchange structure is provided with one side engaging fluid in the vessel, and a passage is provided on the other side of the heat exchange structure for passing a heating fluid to transmit heat to the fluid to be heated.

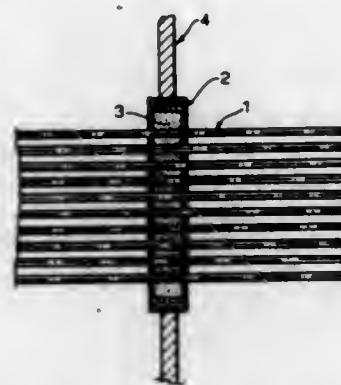
3,735,808

# HEAT-EXCHANGER FOR DESALTING SEA WATER

Diego Barba; Giuseppe Luzzo; Giovanni Tagliaferri, and Antonio Germana, all of Rome, Italy, assignors to Societa Italiana Resine S.p.A., Milan, Italy  
Filed July 1, 1971, Ser. No. 158,826  
Claims priority, application Italy, July 1, 1970, 26846A/70  
Int. Cl. F28f 7/00

U.S. Cl. 165-69

2 Claims



The heat-exchanger tubes of instantaneous evaporators for providing fresh water from saline formed into a unitary nest by transverse supports corresponding in position with the walls dividing off successive chambers of the evaporator and in shape with holes provided in those walls.

3,735,809

# FLUID DISTRIBUTION DEVICE

Katsuki Matsushima, Aichi-ken, Toyota City, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota City, Aichi-ken, Japan  
Filed Sept. 7, 1971, Ser. No. 178,215  
Claims priority, application Japan, Sept. 9, 1970, 45/79007  
Int. Cl. F28f 27/02

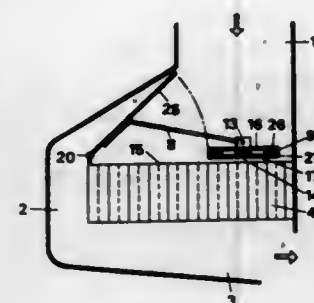
U.S. Cl. 165-103

9 Claims

A heat exchanger for an air flow, comprising; a duct with a hump; a heat transfer matrix mounted on the duct within the hump in a spaced manner to make a free air flow passageway, a damper plate pivotally mounted on the matrix, a first plate having a plurality of first apertures and mounted on the duct, a

second plate with a plurality of second apertures, a device for linking the second plate with the damper plate, and apparatus connected to the damper plate for holding the damper plate in a first or second position and moving the damper plate therebetween.

The damper plate closes the free air flow passageway when



the damper plate is in a first position, thereby forcing air to flow through the matrix, said damper plate covers a portion of the matrix when the damper plate is in a second position, thereby allowing air flow through the free air flow passageway, and an uppermost periphery of the first plate is contiguous to a lower periphery of the damper plate when the damper plate is in the second position.

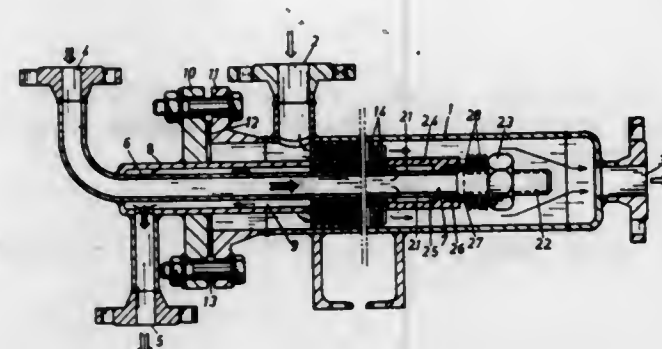
3,735,810

# PLATE HEAT EXCHANGER

Karl Robert Ambjorn Ostbo, Storgatan 2, S-510 Tranemo, Sweden  
Filed Feb. 18, 1971, Ser. No. 116,423  
Claims priority, application Sweden, Aug. 21, 1970, 1146/70  
Int. Cl. F26d 7/12

U.S. Cl. 165-142

3 Claims



A plate heat exchanger of the type comprising a shell housing circular discs arranged in succession separated by sealing rings. The discs are provided with two sets of openings for passage therethrough of a first medium and a second medium, respectively. The first set of openings for the first medium is positioned close to the outer periphery of the discs, i.e., radially outside of the separating rings, while the second set of openings for the second medium is positioned radially inside the separating rings. According to one embodiment of the invention the second set of openings are notches formed at the edge portion of a central hole passing through the discs and through which hole flows one of said media. According to another embodiment of the invention the discs are mounted on an axial tube the inner end of which extends inside the shell and is formed with slots but is otherwise closed, this tube end being also provided with a sleeve serving to guide medium flowing through the tube and passing through the slots, in through the notches at the central hole of the discs.

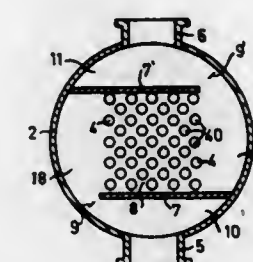
3,735,811

# HEAT EXCHANGER

Paul Moser, Winterthur, and Tadeusz Zaba, Wetztingen, both of Switzerland, assignors to Brown Boveri-Sulzer Turbomaschinen Aktiengesellschaft, Zurich, Switzerland  
Filed July 12, 1971, Ser. No. 161,467  
Claims priority, application Switzerland, July 17, 1970, 10915/70  
Int. Cl. F28d 7/00; F28f 9/22

U.S. Cl. 165-160

7 Claims



Heat exchanger with a cylindrical housing and heat exchanger elements arranged axially and centrally of the housing; two connections in the cylindrical wall of the housing; two partitions facing the connections, and lying against the heat exchanger elements, and forming a flow space containing the heat exchanger elements and being in contact with the connections only by throttling gaps between partition and tubular wall. The medium flowing through the flow space being widened out over the entire length of the heat exchanger elements.

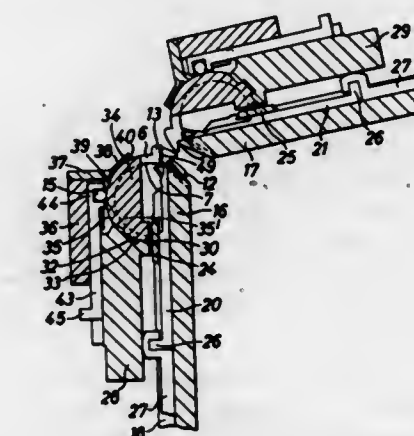
3,735,812

# KNITTING MACHINES

John Flavell; Max William Betts, both of Coventry, and Frank Robinson, Borrowash, all of England, assignors to Courtaulds Limited, London, England  
Filed Dec. 10, 1970, Ser. No. 96,728  
Int. Cl. D04b 15/06

U.S. Cl. 66-104

16 Claims



A sinker for a knitting machine with independently operable needles, has a curved edge for sliding engagement with a supporting structure in a knitting machine, a hook for engaging and pushing down knitted loops, a nose extending forward of the open mouth of the hook and presenting an edge to support knitted loops for engagement by the hook, and a raised edge extending rearwardly from the point of the hook. A knitting machine comprising such a sinker and a method of operating the machine are also described.

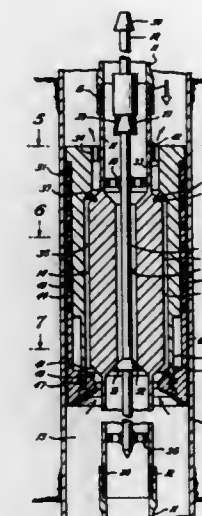
3,735,813

# STORM CHOKE

William T. Mack, P.O. Box 3112, and Thomas Quinn, 122 West Amherst, both of Tyler, Tex.  
Filed Mar. 12, 1971, Ser. No. 123,742  
Int. Cl. E21b 33/00

U.S. Cl. 166-183

13 Claims



There is disclosed a storm choke adapted to close a well tubing and the annulus between the tubing and the well casing into which the tubing is run in response to predetermined changes in the velocity of well fluid flowing upwardly through the tubing and casing, respectively.

3,735,814

# RESILIENT SLIP SUSPENSION MEANS FOR HYDRAULIC PACKER

Andrew J. Tucker, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.  
Filed May 24, 1971, Ser. No. 146,056  
Int. Cl. E21b 23/00

U.S. Cl. 166-217

7 Claims



A resilient mounting for the upper slip in a Hydraulic packer which holds the upper slip carrier and the slip carried thereby in retracted position out of contact with the upper packer head while running in the hole so that if the packer is stopped suddenly or the slip encounters an obstruction which tends to cause the slip to move downwardly in contact with the upper packer head, a spring in the suspension head will cause the carrier and the slip mounted thereon to move back into relaxed running position out of contact with the casing.



3,735,815

**METHOD AND APPARATUS FOR PRODUCING  
MULTIPLE ZONE OIL AND GAS WELLS**  
Nijah F. Myers, Oklahoma City, Okla., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed July 19, 1971, Ser. No. 163,855

Int. Cl. E21b 43/00

U.S. Cl. 166—313

12 Claims



Two or more oil and gas zones are produced by allowing production from at least one zone to drain down to a common chamber where production from the zones is comingled and lifted to the earth's surface. A separate gas bent is provided for each zone to the earth's surface.

3,735,816

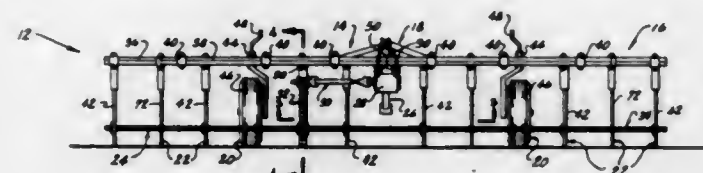
**ROD WEEDER DRIVE ASSEMBLY**

Dale G. Koehn, Rural Route 1, Montezuma, Kans.  
Filed Feb. 1, 1971, Ser. No. 111,431

Int. Cl. A01b 39/19

U.S. Cl. 172—44

1 Claim



A drive assembly used with an implement having a rod weeder that is attachable to a tractor vehicle. The drive assembly is adapted to rotate the weeder rod of the rod weeder implement, and has a gearbox connectable with the power takeoff of the tractor by a main shaft, a second shaft connects the gearbox and a chain drive connected to the weeder rod contained in a strut mountable on a plow of the rod weeder.

3,735,817

**HELICAL PLOW**

Harlan H. Tatge, 118 N. Broadway, Herington, Kans.  
Filed Dec. 28, 1970, Ser. No. 101,940

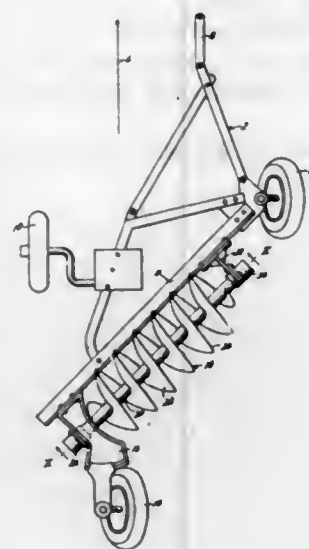
Int. Cl. A01b 5/00

U.S. Cl. 172—532

1 Claim

A plow consisting of a wheeled frame and a helical plow share resembling an auger carried rotatably by said frame on a horizontal axis which is horizontally angled relative to the

direction of travel of said frame, the convolutions of said plow



share being radially concave at the sides thereof facing the forward end of said plow share.

3,735,818

**MOTOR-GRADER IMPLEMENTS**

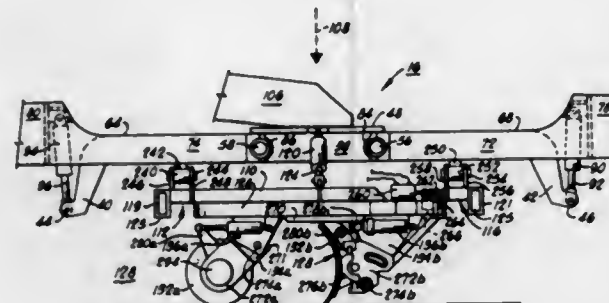
George W. Swisher, Jr.; Don W. Smith, and Gordon L. Spivey, all of Oklahoma City, Okla., assignors to CMI Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 793,274, Jan. 23, 1969, Pat. No. 3,568,778. This application Oct. 19, 1970, Ser. No. 81,744

Int. Cl. E02f 3/12

U.S. Cl. 172—785

11 Claims



Apparatus for earth-working which consists of motor-grader mobile apparatus of the type which carries a subframe element in adjustable planar relationship with respect to the earth, said subframe providing adjustable support for a cutting and trimming implement which includes a first earth-cutting and moving implement in coactive combination with a mold-board for adjustable positioning and contact in a pre-set plane of said earth's surface.

3,735,819

**DEVICE FOR DRIVING STAKES**

William W. Ramsey, c/o Anchorage Mobile Homes, 1925 N. Federal Hwy., Lot 32, Delray Beach, Fla.

Filed Apr. 28, 1971, Ser. No. 138,122

Int. Cl. B25d 1/00

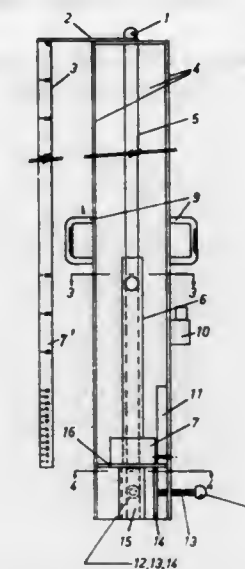
U.S. Cl. 173—21

5 Claims

A device for driving stakes and the like into the ground for establishing the elevation of the stake down from the outside line of the building down to the bottom of the footer.

The invention contemplates a novel structure wherein a vertical frame of suitable height and configuration is provided to guide the stake into the ground in combination with the means

to impart blows to the top of the stake and measure the penetration of the stake into the ground.



Suitable scales are provided for assuring that the stake is driven the desired distance.

3,735,820

**BORE HOLE AIR HAMMER**

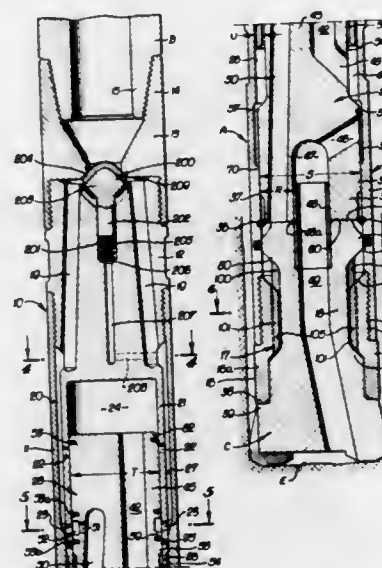
Alfred R. Curington, Houston, Tex., assignor to Baker Oil Tools, Inc., Los Angeles, Calif.

Filed May 5, 1971, Ser. No. 140,515

Int. Cl. E21b 1/06

U.S. Cl. 173—78

18 Claims



An air hammer embodying an outer housing structure connectible to a rotatable drill pipe string through which compressed air is conducted. An upper cylinder sleeve in the housing structure defines an annular air inlet passage therewith, a hammer piston reciprocating in the housing structure with an upper smaller diameter portion slidable in this sleeve and a larger diameter portion in the housing structure below this sleeve, such that high pressure acts over the full cross-sectional area of the larger diameter piston portion in driving the piston downwardly against a companion anvil affixed to a drill bit rotatable by the drill pipe string and housing structure, compressed air acting over a smaller diameter piston area and returning the piston upwardly in the housing structure, all of the air being caused to exhaust through the anvil and bit to clean the bit and the bottom of the bore hole of cuttings.

3,735,821

**TRANSMISSION MEANS FOR USE IN TORQUE AND  
IMPULSE TRANSMITTING MACHINES**

Reinhard Hahner, Stuttgart, and Wolfgang Schmid, Plattenhardt, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

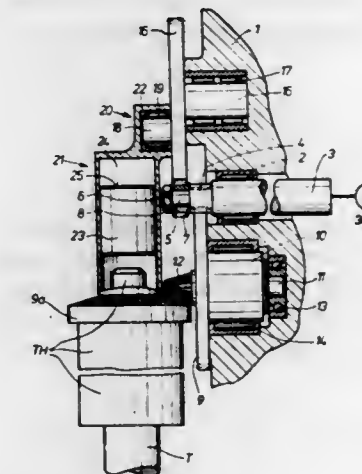
Filed June 25, 1971, Ser. No. 156,735

Claims priority, application Germany, July 3, 1970, P 20 32 941.3

Int. Cl. B25d 11/04

U.S. Cl. 173—104

8 Claims



A portable torque and impulse transmitting machine wherein the output shaft of an electric motor carries two coaxial gears. One of the gears drives a first transmission which rotates the holder for a rotary tool, and the other gear transmits torque to a second transmission serving to oscillate an impeller which transmits impulses to the tool holder to thereby promote the penetration of the rotating tool into a wall or the like. One of the gears is integral with the output shaft and its modulus and the number of its teeth may, but need not differ from the modulus and the number of teeth of the other gear.

3,735,822

**MANUALLY ACTUATED JACK HAMMER**

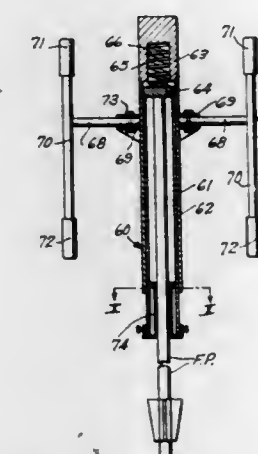
Robert F. Delke, Cheyenne, Wyo., assignor to William H. Chamberlain and Anna B. Chamberlain, Cheyenne, Wyo., part interest to each

Filed Mar. 12, 1971, Ser. No. 123,787

Int. Cl. B25d 1/00

U.S. Cl. 173—118

9 Claims



A manually actuated jack hammer useful as an anchor or post driver, a compactor, a pavement breaker and the like, composed of telescoped ram and barrel members, a recoil spring and a handle which when manually reciprocated will drive the ram and through the recoil action of the spring establish a systematic rhythm causing repeated impact blows with minimum applied manual energy. For low level usage such as for driving anchors into the ground, for compacting



the ground or for breaking concrete, the barrel may have the driver head on the end thereof, the ram may be solid entering the open top of the barrel and impacting against the driver, the handle may be attached to the top of the ram and the recoil spring may be compressed between the top of the barrel and the top of the ram. For high level usage such as driving fence posts into the ground, the barrel may be hollow receiving the post therein, the ram may overlie the barrel with the handle attached thereto at a convenient operating level, and the recoil spring may be interposed between the top of the barrel and the top of the ram. The handle is preferably H-shaped with handle grips at the tops and bottoms of the vertical legs. Attachments may be provided to lock the barrel to the anchor, breaker tool or the like and for guiding a fence post in the hollow barrel.

3,735,823

## IMPACT MOTIVE IMPLEMENT

Hiromu Terada, Ikoma-gun, Nara, Japan, assignor to Nippon Pneumatic Manufacturing Co., Ltd., Osaka-shi, Japan

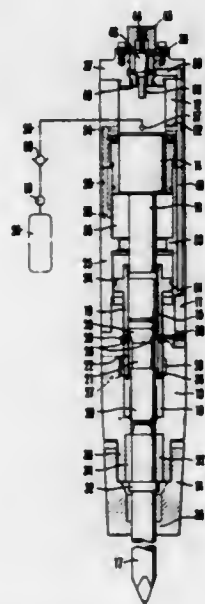
Filed Apr. 19, 1971, Ser. No. 13,522

Claims priority, application Japan, May 1, 1970, 45/38490; May, 1970, 45/38491

Int. Cl. B25d 9/00

U.S. Cl. 173-119

3 Claims



An impact motive implement for a fluid impact tool or the like. The implement has a main body having an upper cylinder and a lower cylinder. An upper piston and a lower piston are fitted into the two cylinders and connected with a piston rod. An impact tool is disposed under the main body against the upper end of which the lower end of the lower piston strikes when the piston are lowered. A main valve opens and closes an oil inlet port and an oil outlet port leading to the oil chamber in the lower portion within the lower cylinder, and a limiting valve is moved by the upper piston as it rises. The operating portion of the main valve and the limiting valve are correlated so that the main valve will shut off the oil chamber and the oil inlet port and connect the oil chamber and the oil outlet port by feeding compressed high pressure gas in the upper chamber within the upper cylinder to the operating portion of the main valve when the limiting valve is moved by the upper piston, and the oil chamber and the oil inlet port are connected and the oil chamber and the oil outlet are shut off when the limiting valve is not moved by the upper piston, and when the oil chamber is connected with the oil inlet port, the lower piston is pressed upward by the pressure oil fed into the oil chamber.

3,735,824  
ARRANGEMENTS IN AND RELATING TO A  
CHISELLING HAMMER OR SIMILAR PERCUSSION  
MACHINE

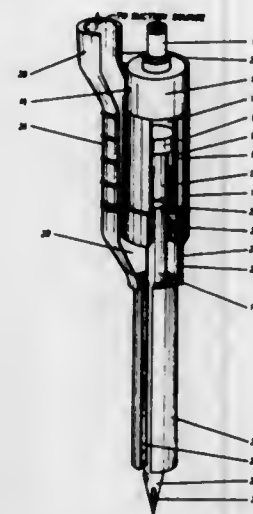
Nils Osten Astrom, Bromma, Sweden, assignor to Devac AB, Vallingby, Sweden

Filed Mar. 3, 1971, Ser. No. 120,624

Int. Cl. E21b 21/00; E21c 7/00

U.S. Cl. 175-213

11 Claims



A chiselling hammer or similar percussion machine, having a pneumatic impact creating and/or vibration generating motor, a motor housing made of a vibration damping material, and a cutting tool provided with a casing structure also made of a vibration damping material and adapted for accommodation in a tool insert opening arranged in connection with the motor housing. Extending from one end of the casing structure to the other is at least one channel which forms a communicating passage between the working zone of the tool and an open through-flow passage within the machine housing proper.

3,735,825

## PRESSURE EQUALIZING SYSTEM FOR ROCK BITS

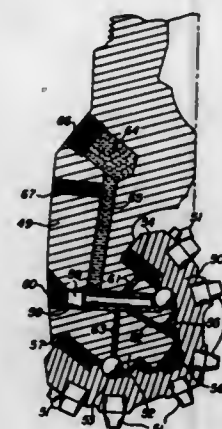
Wilbur Stanley Keller, Arlington, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 7, 1972, Ser. No. 232,378

Int. Cl. E21b 9/10

U.S. Cl. 175-228

8 Claims



A lubricant reservoir is positioned in each arm of a three cone rotary rock bit to provide lubricant to bearings located between the bit's rotary cone cutters and the bearing shafts upon which the cutters rotate. A seal is positioned between the cutters and the bearing shafts to retain lubricant in the bearing area and to prevent borehole fluids and debris from entering the bearing area. A pressure equalizing passage provides communication between the lubricant reservoir and the outside of the bit. A two-way valve is positioned in the pressure equalizing passage to prevent excessive pressure dif-

ferentials from building up between lubricant in the lubricant reservoir and fluid outside of the bit by allowing lubricant from the lubricant reservoir to escape to the outside of the bit and allowing fluid outside of the bit to enter the lubricant reservoir.

3,735,826

SEALED BEARING WITH HYDROSTATIC PRESSURE  
BALANCING FOR CORE BARRELS

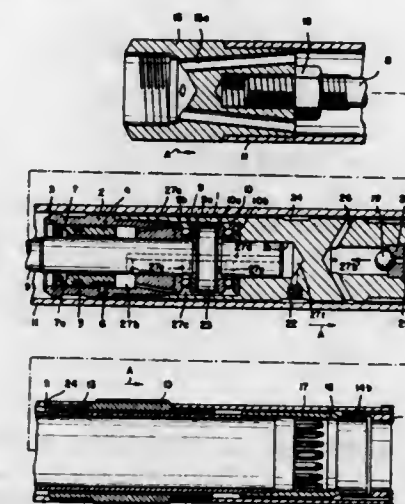
Doria Constantinescu, Sever Cruceanu, Eugen Spataru, and Nicolae Mereanu, all of Bucharest, Romania, assignors to IPCUP Institutul De Proiectari Si Cercetari Pentru Utilaj Petrolifer, Bucharest, Romania

Filed June 17, 1971, Ser. No. 154,145

Int. Cl. E21b 9/20

U.S. Cl. 175-228

8 Claims



A coring device has an elongated tubular drill receiving a tubular core barrel which is mounted on the drill by a bearing and defines with the drill a drilling-fluid passage. The bearing is enclosed in a fluidtight lubrication compartment that must be protected from the drilling fluid. To this end one axial wall of the compartment is formed as a piston which can be displaced axially by a pressure differential between the lubrication compartment and the drilling-fluid passage to hydrostatically equalize the two pressures and prevent cross leakage.

3,735,827

## DOWN-HOLE ADJUSTABLE HYDRAULIC FISHING JAR

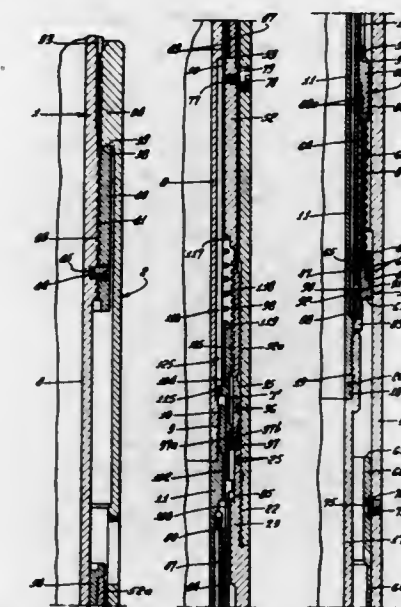
William O. Berryman, Houston, Tex., assignor to Baker Oil Tools, Inc., Los Angeles, Calif.

Filed Mar. 15, 1972, Ser. No. 234,737

Int. Cl. E21b 1/06, 1/10

U.S. Cl. 175-296

40 Claims



A down-hole adjustable hydraulic fishing jar for removing stuck objects from a well bore in which hydraulic fluid within a compression chamber by-passes a compression piston

through an unrestricted flow passage normally closed by a valve. The valve is instantaneously opened by a trigger mechanism adjustable down-hole to vary the tension on the running-in string required to trigger the valve to the open position. The jar is operative repetitively in any selected adjusted condition.

3,735,828

## ACCELERATOR FOR FISHING JARS

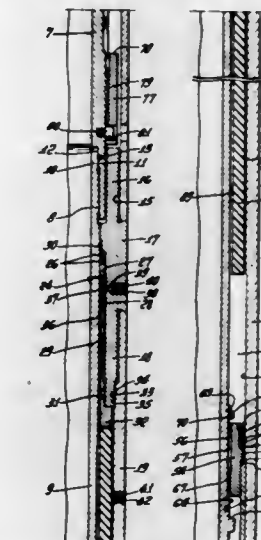
William O. Berryman, Houston, Tex., assignor to Baker Oil Tools, Inc., Los Angeles, Calif.

Filed Mar. 15, 1972, Ser. No. 234,736

Int. Cl. E21b 1/06, 1/10, 23/00

U.S. Cl. 175-299

17 Claims



An accelerator for fishing jars for removing stuck objects from a well bore located above a drill collar string, the jar being located between a fishing tool and the drill collar string. A resiliently compressible body of rubber-like material is disposed in a pressure chamber in the accelerator containing a lubricating oil pressure transfer medium to apply pressure to all surfaces of the compressible body and reduce its volume when the fishing string is tensioned, the compressible body acting as a spring on expansion to accelerate the drill collar mass when the jar is released to produce the jarring action. The resilient material has a high impedance to the transmission of sound to improve jarring efficiency.

3,735,829

## EXCAVATOR STEERING MECHANISM

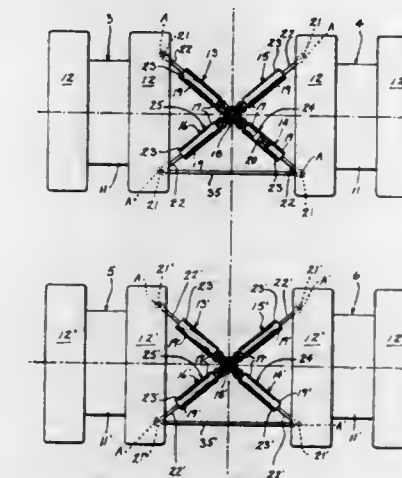
Robert E. Talley, Racine, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.

Filed Aug. 6, 1971, Ser. No. 169,748

Int. Cl. B62d 7/14

U.S. Cl. 180-9.44

3 Claims



A steering mechanism steers in pairs the four dual crawler trucks of a strip mining shovel by diagonally mounting steering



members between the two dual crawler trucks of each pair. In the first embodiment two powered double acting cylinders are diagonally end mounted in tandem to form each of the steering members. The second embodiment employs a pair of diagonally end mounted hydraulic rams. In a third embodiment each of the steering members is a pair of racks driven by a common pinion. In a fourth embodiment, a pair of cylinders mounting worm gears and having screws telescoped within them are diagonally mounted between a pair of dual crawler trucks.

3,735,830

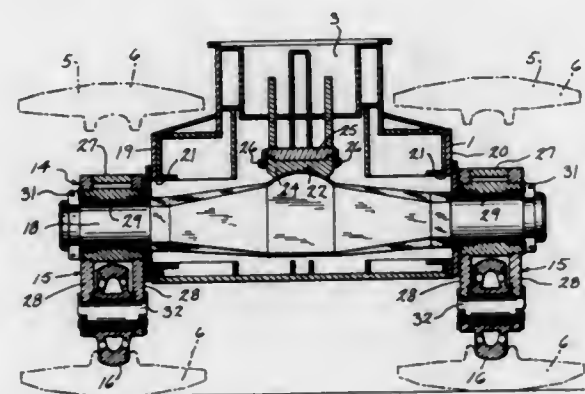
## EXCAVATOR CRAWLER MECHANISM

Robert E. Talley, Racine, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.

Filed Aug. 9, 1971, Ser. No. 169,963  
Int. Cl. B62d 5/14

U.S. Cl. 180-9.5

1 Claim



An endless track crawler mechanism has a plurality of bogie yokes that each contain a pair of rotatable bogie rollers and are pivotally mounted on two opposite sides of a chassis of said mechanism to support said chassis. At least two of said bogie yokes are affixed to said chassis by a bogie shaft 56 that provides shaft limited vertical translation of said two bogie yokes.

3,735,831

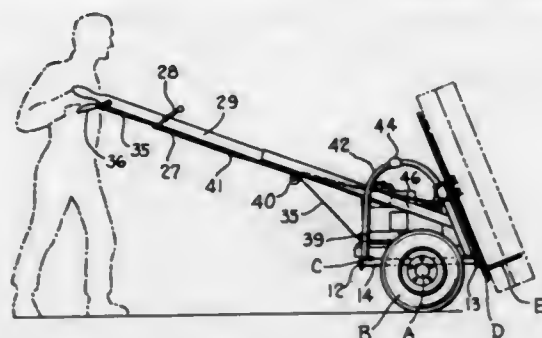
## ARTICLE TRANSPORTING DEVICE

Gary W. Gray, Route 2, Liberty, S.C.

Filed Aug. 3, 1971, Ser. No. 168,707  
Int. Cl. B62d 51/04

U.S. Cl. 180-19 R

6 Claims



Apparatus for transporting articles, such as bundles of bricks, including a supporting frame journaled on axles carried between a pair of wheels. A substantially vertical member is pivotally carried by the supporting frame and has a fork member carried thereby for engaging the articles to be transported. The vertical member has holes therein, through which bolts secure the fork member thereto, in a manner so that the fork member can be rotated slightly for properly positioning the fork so the articles being transported. The vertical member can also be pivoted to properly locate the articles

relative to the for. The apparatus is powered by a gasoline operated motor.

3,735,832

## POWER STEERING APPARATUS FOR A VEHICLE

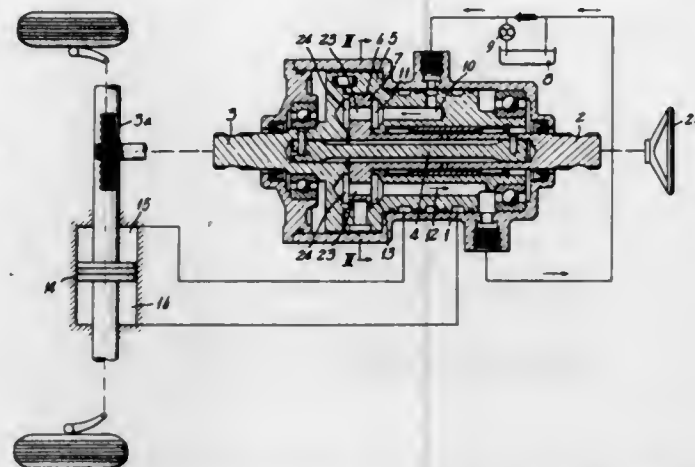
Akira Akima, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Mar. 2, 1971, Ser. No. 120,164

Claims priority, application Japan, Mar. 3, 1970, 45/17632  
Int. Cl. B62d 5/08

U.S. Cl. 180-79.2 R

1 Claim



A power steering apparatus in which an oil pump is selectively connected to opposite chambers of a power steering cylinder by an operation valve driven by a steering handle. The operation valve comprises a rotary disk enclosed in a valve chamber having supply and return lines in one side surface thereof, the disk having fluid conducting openings in the form of through bores to connect the supply and return lines together in a neutral steering position, and to connect them respectively to the opposite chambers in the power steering cylinder in right and left steering positions. The opposite side surface of the valve chamber is formed with areas on which the oil acts which are symmetrical with the supply and return openings at the other side of the valve chamber and these areas are in communication with the supply and return openings via through bores in the rotary disk.

3,735,833

## THEFT PREVENTION DEVICE FOR MOTOR VEHICLES

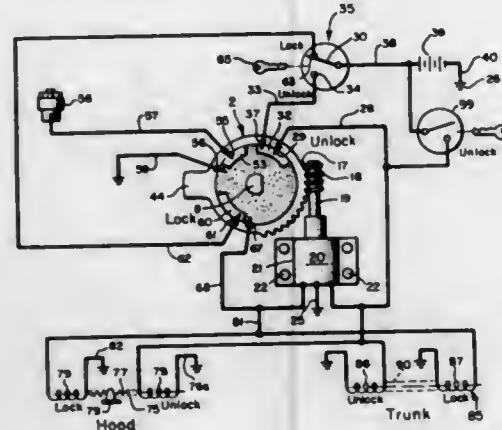
Joseph Sutkowski, 15600 Woodbrook Avenue, Maple Height, Ohio

Filed Oct. 12, 1971, Ser. No. 188,363

Int. Cl. B60r 25/04

U.S. Cl. 180-112

10 Claims



A theft prevention device which is controlled through a door lock wherein the operating components are connected in operating position when the door lock is open and in inoperative position when the door lock is locked.

3,735,834

## VEHICLE ANTI-THEFT SYSTEM COMBINATION

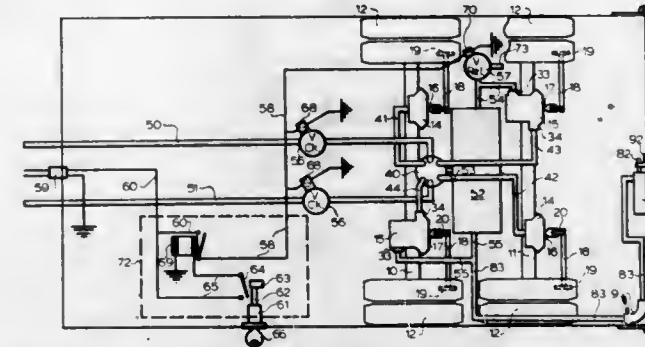
Daniel A. St. Onge, Detroit, Mich., assignor to Charles Dale Brothers, Warren, Mich.

Filed Dec. 27, 1971, Ser. No. 212,366

Int. Cl. B60r 25/08

U.S. Cl. 180-112

3 Claims



An anti-theft system combination for vehicles, especially trucks and semi-trailers, which includes at least one double brake cylinder having a first compartment for applying the brakes with air-pressure for driving and a second compartment for automatically applying the brakes with spring force in the absence of air pressure when parked; the presence of air-pressure overcoming the spring force to give the first compartment control of brake application; at least one normally closed check valve in the air lines leading from air pressure supply, at least one normally open relief valve in the brake system down stream from said check valves; the check valve and the relief valve being solenoid actuated to their non-normal conditions; wires leading to the solenoid controlling the valves; a self-locking normally open relay in said wires; and a key operated mechanism for closing the relay; the anti-theft system having a driving condition upon connection of air pressure to the air lines and EMF to the wires established by the driver using the key to close the relay whereupon the check valves are open allowing introduction of air pressure into the brake system and the relief valve is closed holding air pressure in the brake system; the anti-theft system having a non-driving condition upon the disconnection of EMF to the relay whereupon it opens and stays open allowing the relief valve to open to vent air pressure in the brake system whereupon the spring force of the air cylinder sets the brakes under spring force preventing movement of the vehicle and the check valve closes preventing the introduction of air pressure to overcome the spring force to release the brakes.

3,735,835

## LOCKING MEANS

Lucien Antoine Yves Joseph Thomas, c/o Faylands Hotel, corner Clarendon Place & Claim Sts., Hillbrow, Transvaal, Republic of South Africa

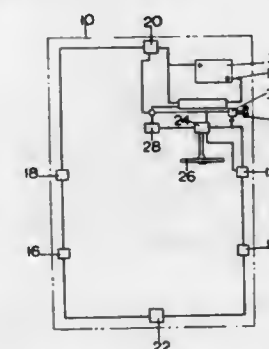
Filed Mar. 3, 1971, Ser. No. 120,625

Claims priority, application South Africa, Mar. 4, 1970, 1453

Int. Cl. B60r 25/00

U.S. Cl. 180-114

10 Claims



This invention relates to a system whereby all the locks of an automobile are electromagnetic locks and all are con-

3,735,836

## OBSTETRIC STETHOSCOPE

David Littmann, Needham Township, Norfolk County, Mass., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 30,897, April 22, 1970, abandoned. This application July 21, 1971, Ser. No. 164,623  
Int. Cl. A61b 7/02

U.S. Cl. 181-24

5 Claims



A light-weight obstetric stethoscope comprises, a binaural construction having a pair of legs and an interconnecting bight section, said legs being resiliently urged toward a normal untensioned position against deforming forces at least in part by the characteristics of the material of fabrication, the free ends of said legs forming ear tubes; ear plugs engaging said ear tubes; a tubular stem extending from said bight; and audio pickup means attached to said stem, whereby when said ear plugs are in the user's ears, said bight section is adapted to rest on the user's chin, said stem projecting outwardly therefrom.

3,735,837

## ANECHOIC CHAMBER SYSTEM

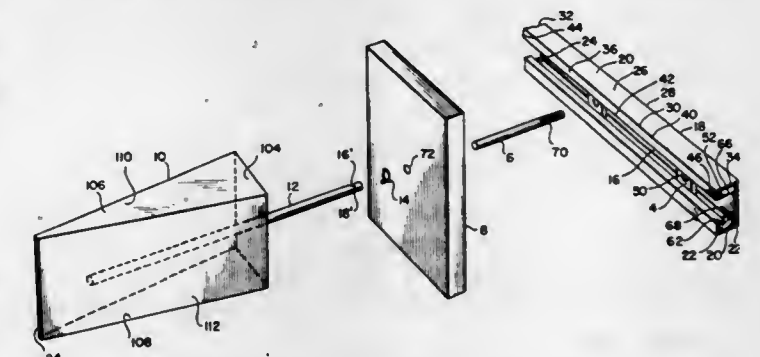
John Duda, Dumont, N.J.; Stan Gelfman, Riverdale, and Arne Kaufman, Plainview, both of N.Y., assignors to Industrial Acoustics Company, Bronx, N.Y.

Filed Apr. 17, 1972, Ser. No. 244,896

Int. Cl. E04b 1/82

U.S. Cl. 181-33 GE

11 Claims



A system for attaching anechoic wedge elements to the walls of an anechoic chamber. One or more struts are affixed to the chamber wall to hold nuts. Support rods are screwed into the nuts and partially covered with a mat of batting. Wedge elements are affixed to support tubes with spring-



receiving slots therein. The tubes slide over the rods and are held by the springs, allowing easy installation of the wedge elements.

**3,735,838**  
**WHEELED LADDER WITH A WEIGHT ACTUATED SELF-LOCKING WHEEL THEREON**

Jack W. Greenleaf, Snohomish, Wash., assignor to Everett Sound Machine Works, Inc., Everett, Wash.

Filed May 22, 1972, Ser. No. 255,623

Int. Cl. E06c 1/397, 7/48

U.S. Cl. 182-15

11 Claims



The ladder is elevated above its supporting surface and has an arm pivotally mounted on the lower end portion thereof, which is yieldably biased in one angular direction thereof, into a stopped position on the ladder. The arm in turn has a surface engaging wheel thereon, which is rotatably mounted about an axis that is spaced apart from the pivotal axis of the arm, at a point on the arm at which the wheel supports the ladder above the surface in response to the bias on the arm. When the user's weight is added to the ladder, the wheel is restrained against rotation by an element which is disposed on the ladder so as to engage the wheel when the arm and the ladder are pivoted in relation to one another in the direction opposed to the bias on the arm. However, there are means on the ladder whereby the restrainer element can be disengaged from the wheel under the condition in which the element and the arm are displaced in relation to one another in the direction opposed to the bias on the arm. Therefore, the wheel can be released for rotation even while the user remains on the ladder.

**3,735,839**  
**GRAVITY MOTOR**  
Roger Francois Moisson, 4875 S.W. 28th Avenue, Fort Lauderdale, Fla.

Filed Apr. 28, 1971, Ser. No. 81,446

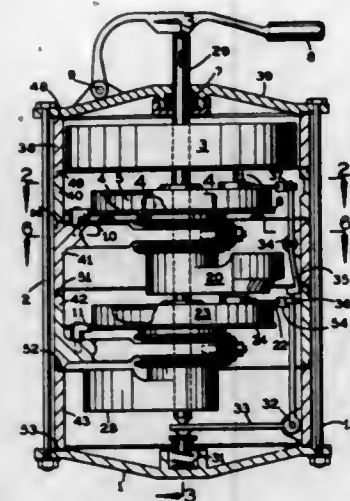
Int. Cl. F03g 3/00

U.S. Cl. 185-29

5 Claims

A gravity motor having a vacuum body has a plurality of units each comprising an unbalanced weight and mechanical gear box, either direction of rotation of a reversible shaft being used to tighten mechanical energy accumulating means

coupled to the shaft of said motor for subsequent release to



rotate said shaft as an output shaft upon operation of manual actuating means, a flywheel being used as a rotation regulator.

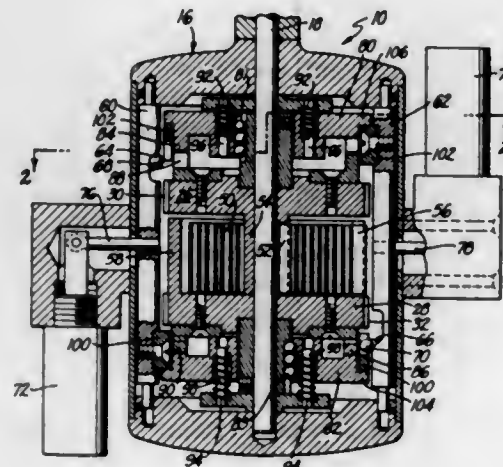
**3,735,840**  
**SPRING OPERATED ACTUATOR FOR OPENING AND CLOSING DOORS, OR THE LIKE**  
Willard W. Shepherd, Whittier, Calif., assignor to Shepherd Machinery Co., Los Angeles, Calif.

Filed Feb. 7, 1972, Ser. No. 223,882

Int. Cl. E05f 1/14; F03g 1/08

U.S. Cl. 185-39

7 Claims



A remotely controlled, spring operated actuator for opening and closing a door, or the like. The actuator spring is wound by manual opening and closing of the door. Remote controls selectively activate the actuator in directions to open and close the door.

**3,735,841**  
**BRAKE LOCKING AND RELEASE SYSTEM**  
Nicholas A. Auricemma, Miami, Fla., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Mar. 10, 1972, Ser. No. 233,607

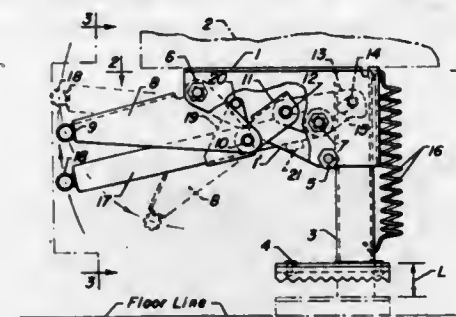
Int. Cl. B60t 1/14

U.S. Cl. 188-5

4 Claims

A pivoted lever arm, through connecting linkage means to a pivoted rocker member, provides for the locking movement of a brake member. A second, alongside, lever arm provides for lifting the first said lever arm back to a brake released position. One embodiment uses extended rod members such that

there can be a foot operation for each pivoted lever arm and



the entire assembly is particularly adapted for use on a serving cart or other rollable unit.

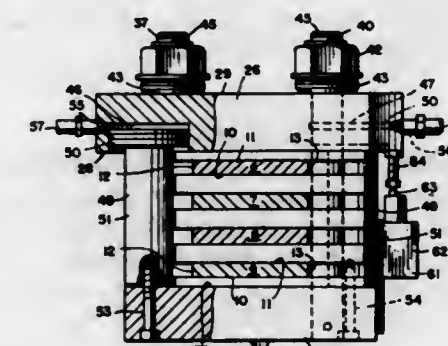
**3,735,842**  
**SPRING APPLIED, FLUID PRESSURE RELEASED LOCKING DEVICE**  
Edwin A. Spanke, Oak Forest, and Vincent J. Balunas, Jr., Chicago, both of Ill., assignors to U. S. Industries, Inc., New York, N.Y.

Filed Apr. 8, 1971, Ser. No. 132,445

Int. Cl. B65h 59/10

U.S. Cl. 188-67

6 Claims



A locking device for preventing accidental movement of a member and embodying elongated supporting members, with a unit comprised of a plurality of plates mounted on the supporting members and movable to be disposed in clamped and released relation thereto.

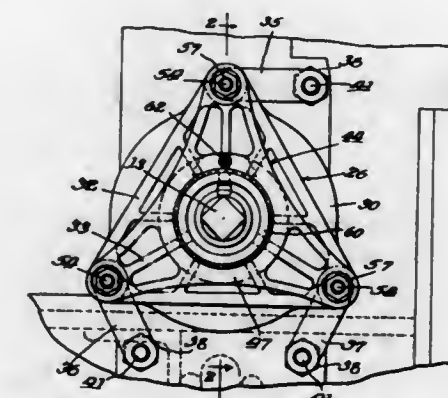
**3,735,843**  
**DISC BRAKE STRUCTURE**  
Chester M. Wilg, Lincolnwood, Ill., assignor to F. J. Littell Machine Company, Chicago, Ill.

Filed Sept. 10, 1971, Ser. No. 179,318

Int. Cl. F16d 65/20

U.S. Cl. 188-72.1

5 Claims



The present brake device, primarily designed for intermittently rotating shafts, includes a pair of stationary pressure

brake plates located on respective sides of a hub member fixed to the shaft. The pressure brake plates are anchored by link elements one of which is disposed at right angles to the remaining link elements to secure a non-rotatable but stable mounting of the brake plates. The hub member carries a plurality of replaceable friction brake inserts and the pressure brake plates are resiliently clamped into friction contact with the hub member which is located therebetween by a plurality of bolt and coil spring combinations carried in turn by one of the brake plates and by a face plate adapted to have contact with the other brake plate. By means of an adjusting nut the clamping pressure of the bolt and coil spring combinations can be adjusted.

**3,735,844**  
**VEHICLE BRAKING SYSTEMS**  
Hamilton Nigel Barnes, Sevenoaks, England, assignor to Minister of Technology in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

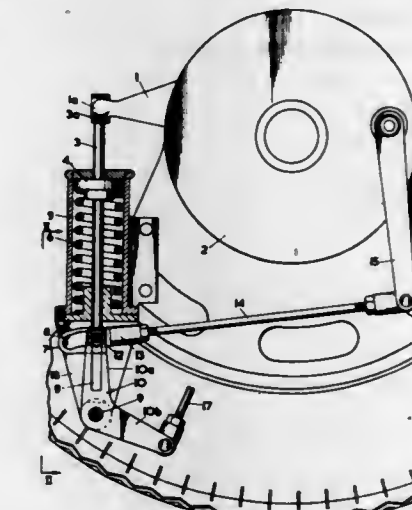
Filed Sept. 11, 1970, Ser. No. 71,295

Claims priority, application Great Britain, Sept. 12, 1969, 45141/69

Int. Cl. B60t 8/00

U.S. Cl. 188-181 T

7 Claims



A vehicle braking system incorporates a shoe carrier or back plate mounted for limited rotation relative to the vehicle chassis and to which a torque is applied, during braking, in opposition to that applied by the braking force in conjunction with the adhesion between the associated road wheel and the ground, which opposing torque rotates the back plate when the road adhesion is reduced by the incidence of slip. The back plate acts as a sensor for a mechanism, which may be hydraulic, pneumatic or mechanical, for reducing the braking force to restore adhesion, which mechanism is preloaded during braking and is allowed to operate on rotation of the back plate by the opposing torque.

**3,735,845**  
**CONDUCTOR RAIL SUPPORT ELEMENT**  
Johan L. Harmsen, 68 Hawkridge Avenue, Markham, Ontario, Canada

Filed Aug. 11, 1971, Ser. No. 170,823

Claims priority, application Great Britain, Aug. 24, 1970, 91,381/70

Int. Cl. B60m 1/30

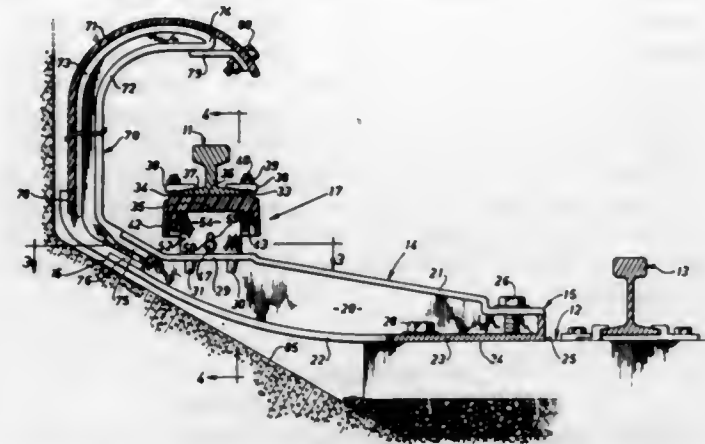
U.S. Cl. 191-32

6 Claims

A support structure for supporting a conductor rail and especially useful in subway systems in which stringent space restrictions exist includes an electrically insulated conductor rail-supporting seat and an electrically conductive seat-supporting arm. The latter is secured to one end of a rail tie to extend laterally outwardly and obliquely upwardly therefrom



while the rail-supporting seat is mounted on that arm for ad-



justment of its position in both the vertical and lateral directions.

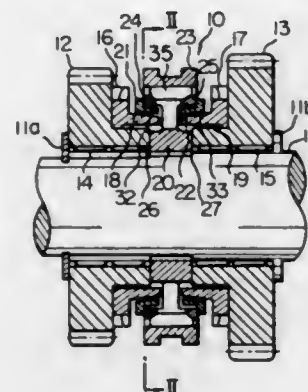
### 3,735,846 SYNCHRONIZING MECHANISM OF POWER TRANSMISSION

Kazuyoshi Hiraiwa, Tachikawa, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan  
Filed Dec. 7, 1971, Ser. No. 205,674

Claims priority, application Japan, Feb. 23, 1971, 46/8372  
Int. Cl. F16d 23/04

U.S. Cl. 192-53 A

1 Claim



An improved synchronizing mechanism for a synchro-mesh power transmission is disclosed, having a cee spring having spaced end portions between which a land of the synchronizing ring and one of axial extensions of a sleeve bearing are loosely received. When a sleeve is axially moved by a gear shifting unit of the power transmission, the cee spring is forced to expand by a rotational force imparted to the synchronizing ring so that the synchronizing ring is driven in synchronism with the gear of the rotary shaft of the transmission.

### 3,735,847 ELECTROMAGNETIC SPRING-WOUND CLUTCH

Byron L. Brucken, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

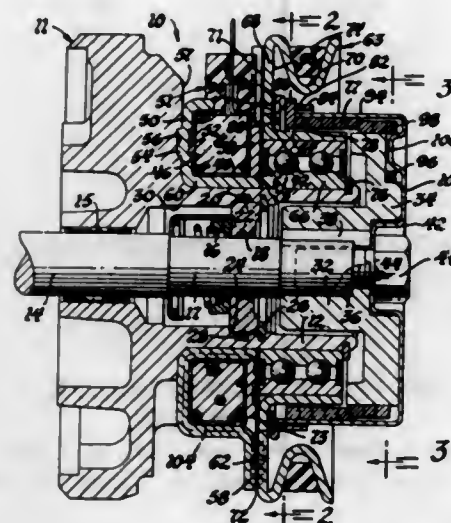
Filed Mar. 20, 1972, Ser. No. 236,022  
Int. Cl. F16d 27/10, 41/20, 3/12

U.S. Cl. 192-35

8 Claims

The drawings illustrate an electromagnetic spring-wound clutch wherein an input pulley hub member is axially aligned with an output shaft hub member, and both are surrounded by a coil-wound spring having one end thereof secured to the output shaft hub member. A flanged clutch armature ring is mounted around and adjacent the other end of the spring, with a bent-end tab of the spring extending through a slot formed in the armature ring. When the armature ring is drawn into frictional contact with a radial wall formed on the input pulley hub member by an adjacent energized electromagnetic coil,

the bent tab is caused to rotate with the armature ring, in turn, causing the spring to wrap around and grippingly engage the pulley hub member to thus drive the output shaft hub member, the flux path being from the coil housing across a



### 3,735,848

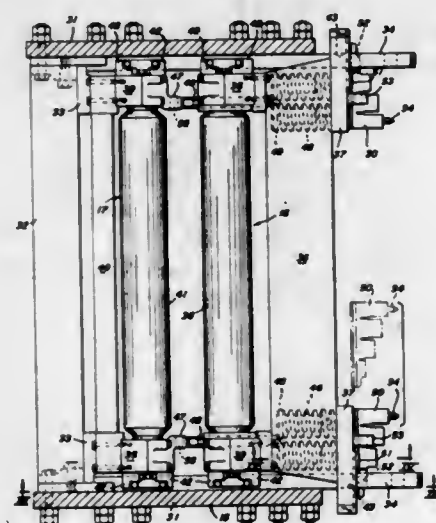
#### IDLER ROLL MOUNTING CONSTRUCTION

Charles H. Bode, Jr., Upper St. Clair Township, Allegheny County, and Wilmer C. Wrhen, Oil City, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 22, 1972, Ser. No. 236,937  
Int. Cl. B65g 13/00

U.S. Cl. 193-35 R

9 Claims



A construction for mounting idler rolls in a roll-rack of a continuous-casting machine. The rolls are arranged in sets of top and bottom clusters, which can be withdrawn from the supporting structure or inserted at one side of the roll rack, the concave side if the rack is curved. Each bottom cluster rests on respective seat fixed within the supporting structure. Each top cluster is held in the supporting structure with keys which are received in openings in straps. Both top and bottom clusters have legs engageable by an extractor for withdrawing or inserting them.

### 3,735,849

#### COUPLING ELEMENT FOR A CONE COUPLING

Manfred Lutz, Schweinfurt, Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Germany

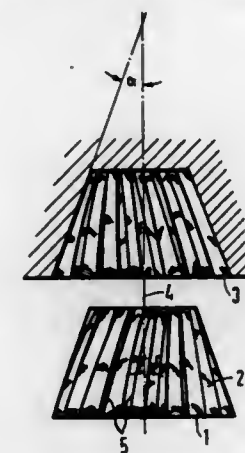
Filed May 17, 1971, Ser. No. 143,931

Claims priority, application Germany, May 23, 1970, P 20 25 197.2

Int. Cl. F16d 13/60

U.S. Cl. 192-108

2 Claims



A male, conical coupling element for a cone coupling having spiraling external ribs can be produced by forging or cold pressing without turning the forming die during shaping or during the withdrawal of the shaped element if the element and the conforming female die satisfy certain geometrical requirements.

### 3,735,850

#### REPEAT SPACING MECHANISM FOR TYPEWRITERS

Tomoyoshi Watanabe, Hekikai-gun, Aichi-ken, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya-shi, Japan

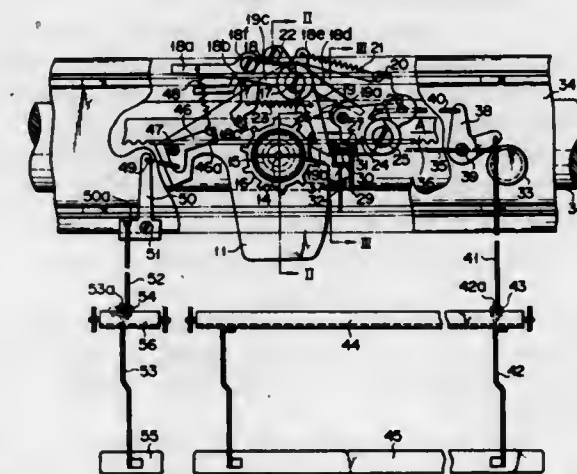
Filed Aug. 4, 1970, Ser. No. 60,911

Claims priority, application Japan, Aug. 4, 1969, 44/61916

Int. Cl. B41j 19/00

U.S. Cl. 197-82

1 Claim



A repeat spacing mechanism for a manual typewriter includes feed and keep pawls that are rotatable in a horizontal plane in conjunction with a horizontal escapement wheel operatively connected to a carriage. A spring is interposed between the feed pawl and a repeat spacing key, wherein the keep and feed pawls are alternately engaged with the escapement wheel and disengaged therefrom so as to cause the carriage to make a repeat spacing movement under control of the bias of the spring while the repeat spacing key is depressed. The spring may be provided with a holding member that is adjustably connected to a lever which is connected to and actuated by said repeat spacing key. In addition, an inertia increasing member may be secured to an end of one of said pawls.

### 3,735,851

#### PLATE FOR CONVEYORS EMPLOYING SLIDING PLATES

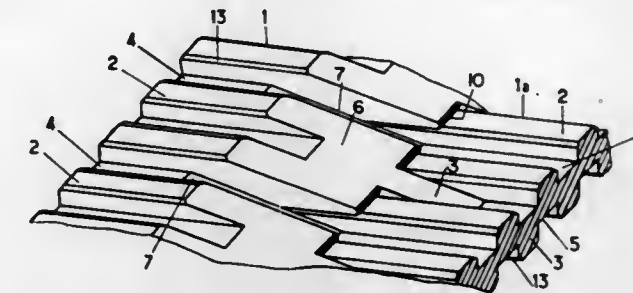
Pierre Patin, 58 rue de Sevres, 92 Boulogne-sur-Seine, France

Filed July 8, 1971, Ser. No. 160,759

Int. Cl. A63g 1/00; B66b 9/12

U.S. Cl. 198-16 R

3 Claims



A plate for conveyors employing sliding plates has longitudinal ribs and grooves on its upper face and on at least one terminal portion of its lower face for sliding in the grooves and on the ribs of the upper face of the adjacent lower plate. The grooves of the lower face are directly beneath the ribs of the upper face. The upper part of the plate above the lower terminal portion has a top chamfer so that the top chamfer above the lower plate forms a continuous surface for each of two successive upper ribs and a lower rib which they straddle. Each upper groove is situated between two successive continuous surfaces and the corresponding lower rib terminates in a common lower chamfer situated below the continuous surfaces so that the plates are engaged in each other while forming a horizontal surface adjacent ingress and/or egress stationary rakes of the conveyor. The construction provides in every two grooves a passage for the teeth of the rakes through these plates above their lower chamfers.

### 3,735,852

#### TRANSFER MECHANISM

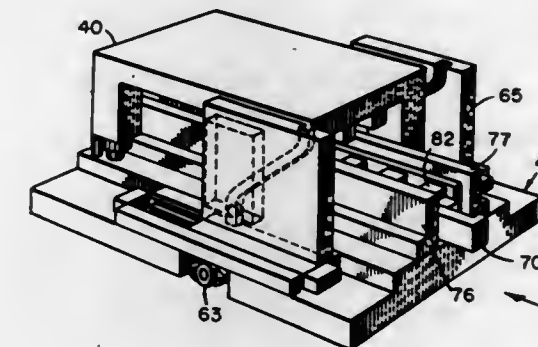
Thomas A. O'Keefe, Wyoming, Mich., assignor to Northwest Tool & Die, Inc., Grand Rapids, Mich.

Filed Apr. 11, 1972, Ser. No. 243,026

Int. Cl. B23q 5/22; B65g 25/04

U.S. Cl. 198-19

7 Claims



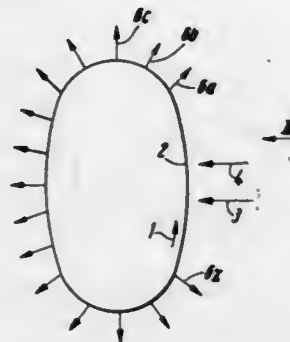
A transfer mechanism is adapted for inclusion in conventional die assemblies operated by reciprocating presses. A cam-actuated drive mechanism induces transferring movement of an assembly having a lost-motion interconnection between certain components, and this lost-motion is utilized to induce a cam-controlled lifting-retracting action at the opposite extremes of a normally horizontal transferring movement. The lifting and carrying component is embraced by a member establishing a vertical guideway, and these two members move together horizontally. A second set of these members, connected in sequence, provides movement of the mechanism in three successive dimensions.



**3,735,853**  
**SYSTEM FOR DISTRIBUTING PIECES OF LOAD SUCH AS BAGGAGE, PARCELS ETC.**  
 Gerhard Lingg, Norbert Gottstein, and Joachim Rostock, all of 6906 Leimen, Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Germany  
 Filed Mar. 1, 1972, Ser. No. 230,612  
 Int. Cl. B65g 47/04

U.S. Cl. 198—20

7 Claims

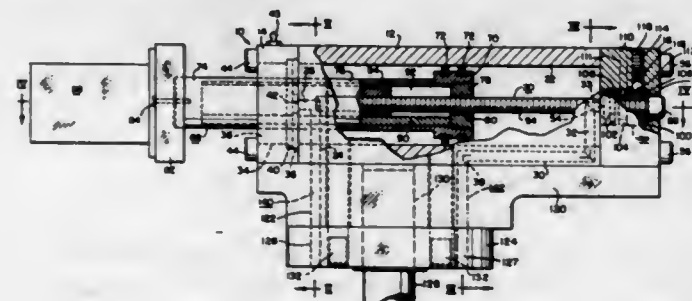


In a system for distributing pieces of load such as baggage, parcels etc., for example, among different destination points in an airport baggage handling system, using a closed loop conveyor system and loading and unloading stations, arranged along the loop. The conveyor system includes a plurality of individual carriages wherein some of the carriages have fixed level, load carrying platform, each followed directly by at least one carriage having liftable load carrying platform, forming therewith a group, whereby the number of carriages per group is equal to the number of loading stations; a first loading station is constructed for loading the fixed level carriages from a relatively low level, and the remaining loading stations are constructed for loading the liftable carriages when lifted to a higher level, selected for permitted passage of unlifted load carrying carriages. Each loading station includes a selectively operable loading belt, extending parallel to the direction of carriage movement at the respective loading station and being speed-synchronized with the carriages and at least one carriage per group is not loaded by any individual loading station.

**3,735,854**  
**FLUID PRESSURE MOTOR WITH EXTENSIBLE AND RETRACTABLE PART**  
 Richard Hirsch, Plymouth Meeting, and Joseph F. Tomczako, Philadelphia, both of Pa., assignors to Paramount Precision Products, Inc., Philadelphia, Pa.  
 Filed June 15, 1971, Ser. No. 153,214  
 Int. Cl. B65g 47/24

U.S. Cl. 198—24

4 Claims



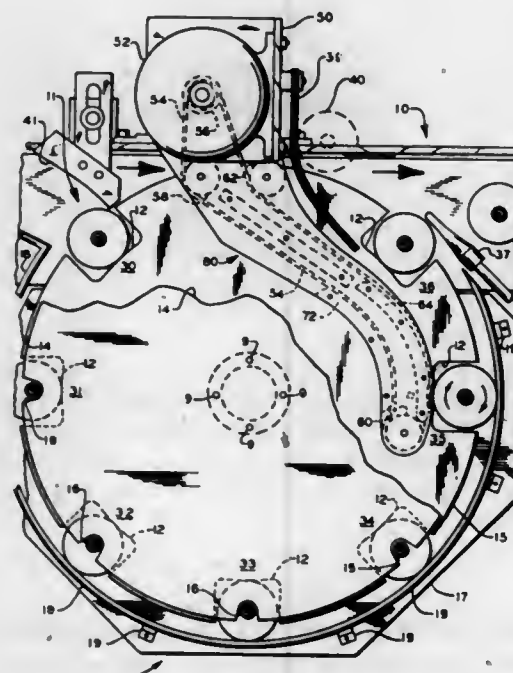
A fluid pressure motor is mounted at the head of a vertically extending shaft for being oscillated or turned forth and back thereby about the axis of the shaft. The motor is provided with a part extensible and retractable laterally of the shaft. The axis of the shaft is coincident with the line of intersection of a plane extending longitudinally of the fluid pressure motor and a plane extending transversely thereof. The weight of the fluid pressure motor on one side of either of said planes substan-

tially balances the weight of the fluid pressure motor on the other side of the plane.

**3,735,855**  
**CONTAINER ROTATING APPARATUS**  
 John R. Johnson, and Benjamin Mercer, Jr., both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio  
 Filed Dec. 28, 1970, Ser. No. 102,006  
 Int. Cl. B65g 47/24

U.S. Cl. 198—33 AB

7 Claims



Apparatus for selectively rotating a container restrained between spaced nesting elements at an inspection station is disclosed. The preferred embodiment includes a cantilever member having one end adapted for insertion between spaced container nesting members to a position adjacent an inspection station, and another end adapted to extend from between the nesting members for attachment to a cantilever support. Means for frictionally engaging a side wall of a container at the inspection station, such as an endless belt, is carried by the cantilever member. The endless belt may be selectively driven by motor and pulley means to impart rotation of the container about its vertical axis.

**3,735,856**  
**CROP DRIERS AND METHOD OF DRYING CROP**  
 Ary van der Lely, 10, Weverskade, Maassland, and Cornelis Johannes Gerardus Bom, 36, Esdoornlaan, Rozenburg, both of Netherlands  
 Filed Jan. 11, 1971, Ser. No. 105,213  
 Claims priority, application Netherlands, Jan. 12, 1970, 7000329

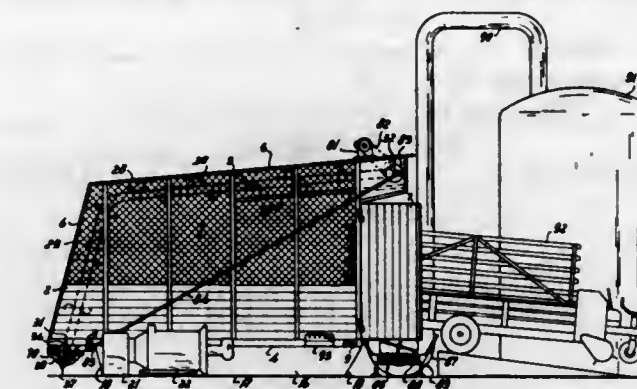
U.S. Cl. 198—58

Int. Cl. B65g 17/20

46 Claims

A crop drier in a defined space having an endless conveyor with a series of hooks which is disposed near the rear of the space in an inclined portion and along the top of the space in a horizontal portion. The relative disposition of the hooks is controlled so that near the transition from the inclined portion to the horizontal portion they are maintained in the same operative position relative to the defined space and they are caused to disengage crop at two or more selectable locations in the horizontal transit. The floor of the space is movable and heated air moves upwardly through the floor from a space under the floor. In operation, the crop in the space is circulated by the conveyor and moving floor and the thickness of

the crop is maintained between 50 and 120 cms with the crop

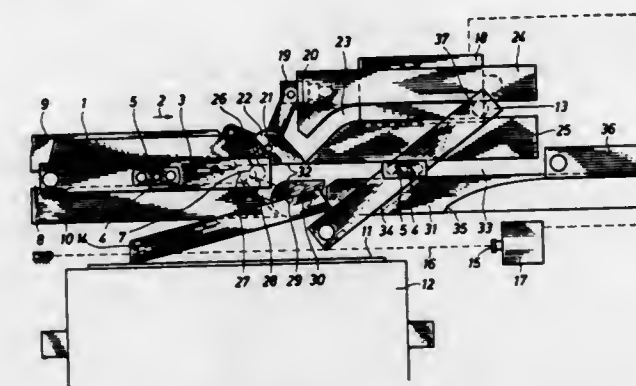


thickness divided by the product of the length of the crop and heated air pressure being maintained at a constant value.

**3,735,857**  
**MECHANISM FOR DELIVERING GOODS FROM CONTINUOUSLY OPERATING CHOCOLATE MOULDING PLANTS**  
 Kai Christian Sophus Aasted, Skovgårdsvej 41, Charlottenlund, Denmark  
 Filed Jan. 26, 1971, Ser. No. 109,912  
 Claims priority, application Denmark, Jan. 30, 1970, 453/70  
 Int. Cl. B65g 17/00

U.S. Cl. 198—155

2 Claims



Moulded chocolate slabs are transported on conveyor plates mounted in pivots on to parallel conveyor chains having equal and even speed. At the known mechanisms each plate has at its rear end a guide pin which follows a horizontal fixed track in order to keep the plate horizontal during the transport. At the station of delivery the track slopes downwards to tilt the plate. By attaching the guide pin at the leading end of the plate and let the track slope upwards a quicker tilting movement and a better safety against locking of the pin in the track — even at a considerable sloping angle — can be obtained. The front end of the sloping track portion consists of two simultaneously tilted track sections.

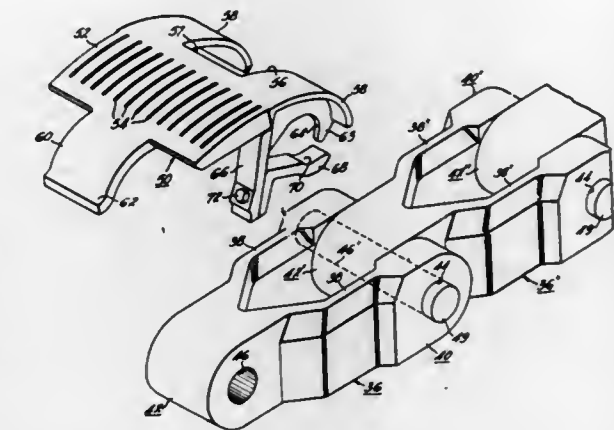
**3,735,858**  
**CHAIN FOR GRATE CONVEYOR OR THE LIKE**  
 Walter J. Hartwig, Oconomowoc, Wis., assignor to Allis Chalmers Corporation, Milwaukee, Wis.  
 Filed Sept. 1, 1971, Ser. No. 176,850  
 Int. Cl. B65g 15/30

U.S. Cl. 198—195

8 Claims

A two-piece chain link assembly and a chain for a grate conveyor or the like formed by a plurality of such two-piece chain link assemblies connected together. Each two-piece chain link assembly comprises a "chain link proper" which includes a yoke at one end and a neck at the opposite end, the neck of one "chain link proper" being received by and pivotally connected to the yoke of a contiguous chain link proper. A nonin-

tegral separate cover member having gas passage slots or apertures therein is provided in overlying relation to each chain link proper, each cover member including at one end thereof projecting lips which are pivotally connected to a pivotal support moving with the conveyor such as a pipe spacer lying on

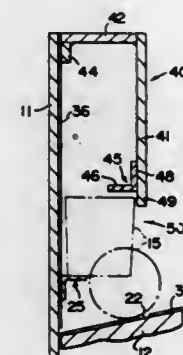


the same transverse axis of the grate conveyor as the pivotal axis of the connection between the corresponding chain link proper and a contiguous chain link proper. The other end of each cover member includes a tail portion having a part thereof which underlies an end of the cover member of a contiguous chain link assembly.

**3,735,859**  
**CENTRIFUGAL PARTS FEEDER AND METHOD**  
 Paul Marcus Miller, Largo, Fla., assignor to Tange Drives, Inc., Clearwater, Fla.  
 Filed May 21, 1971, Ser. No. 145,632  
 Int. Cl. B65g 27/00

U.S. Cl. 198—220 BC

12 Claims



A centrifugal parts feeder having a conical central driven rotor surrounded by a circular bowl wall. Tooling is provided for the feeding of cylindrical parts particularly where the length exceeds the diameter. A bowl plow spaced from the bowl wall at a distance slightly greater than the diameter of the parts accomplishes the first alignment and then delivers the parts to an elevating plow and thereafter to a corner trap which diagonally engages the vertically oriented cylindrical parts and delivers the same to a reject discharge where the horizontal parts are dropped and recirculated. A turning chute is optionally provided where the parts are to be delivered with the axis horizontally oriented. A trip finger is provided at a point downstream from the bowl plow to orient parts which are tipped. The method contemplates the steps of confining the cylindrical parts for single file movement, positively confining the parts to be delivered, elevating the same, and then rejecting those parts which are not elevated and confined.



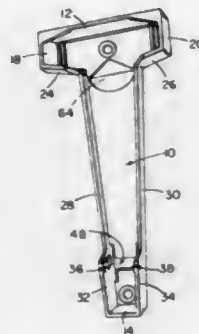
3,735,860

## ARTICLE HOLDER

Warren I. Nissen, Topsfield, and Richard J. Petrillo, Norwell, both of Mass., assignors to The Gillette Company, Boston, Mass.

Filed May 17, 1971, Ser. No. 143,959  
Int. Cl. B65d 85/54

U.S. Cl. 206—16 A



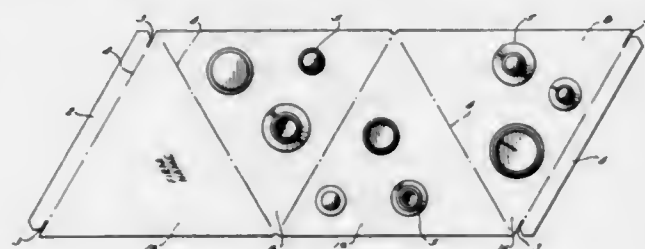
A one piece molded plastic holder for a safety razor has a base including support surface portions for the head and handle of the razor, a first stop structure at one end of the base for limiting longitudinal movement of the razor in one direction, a second stop structure at the opposite end of the base for limiting longitudinal movement of the razor in the opposite direction, resilient means connecting one of the stop structures to the base, first securing means for securing the razor head in the holder, and second securing means for securing the razor handle in the holder.

3,735,861

## CONVERTIBLE SHIPPING AND DISPLAY PACKING DEVICE

Harvey Wallach, 29 Gun Lane, Levittown, N.Y.  
Filed Mar. 23, 1971, Ser. No. 127,236  
Int. Cl. B65d 5/44, 5/00

U.S. Cl. 206—45.11



A substantially rigid sheet-material body is elongated and subdivided by transversely extending fold lines so as to form connected plate portions of triangular shape which can be folded along the fold lines. The bases of alternate ones of the plate portions are located at one lateral margin of the elongated strip-shaped sheet material body, and the bases of the remaining plate portions are located at the other lateral margin. The two terminal plate portions have at their free edges foldable flaps. The body can be folded in one direction about the respective fold lines so that it forms a pyramidal package and surrounds objects which are secured on that major surface or side of the body which is folded inwardly. The body can, also be folded to the opposite direction so that the first mentioned side carrying these objects will be exposed at the exterior and objects mounted thereon will be exposed for viewing. A rubber band or similar means engages the foldable flaps and retains them releasably in overlying relationship so that the body can be releasably retained in one or the other pyramidal configuration.

3,735,862

## RIBBON PACKAGE AND PROCESS FOR PRODUCTION THEREOF

Philip E. Nimmo, Jr., Wayne, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Filed July 16, 1971, Ser. No. 163,364  
Int. Cl. B65d 85/67

14 Claims U.S. Cl. 206—46 Z



A ribbon package is formed of a plurality of spaced reels of ribbon wound on a cardboard tube. The inner end of each ribbon reel is secured to the tube by an adhesive strip or a line of adhesive applied in a hot melt state. The end of the last convolution of each ribbon reel is secured to its next inner convolution by a similar adhesive strip. The cardboard tube ends then receive plastic end caps and a label is placed on the ribbon reel surface. A transparent heat shrink plastic tube then receives this assemblage and overlaps the tube ends, and heat is applied to shrink the film tightly over the ribbon reels and around the outer sides of the caps to hold in position the outer caps and label, and to form a protective covering for the ribbon reels.

3,735,863

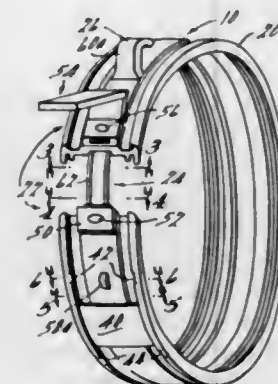
## SEALING RING WITH INTEGRAL LABEL HOLDER

Boris M. Osojnak, 512 Roanoke Drive, Birmingham, Mich.  
Filed Oct. 21, 1970, Ser. No. 82,726

Int. Cl. B65d 85/67

U.S. Cl. 206—53

8 Claims



A sealing ring for use with a reel of the type including a central spool and spaced flanges and wherein the sealing ring comprises a strip of flexible material adapted to be formed into a loop to encircle the reel and coacting latch means on the respective free ends of the loop operative to draw the free ends together to form a closed loop sealingly encircling the reel. The strip is formed as a continuous polyethylene extrusion of constant cross section and includes a main body portion of generally rectangular cross section, integral circumferentially extending ribs on the radially inner face of the main body portion adapted to fit within the spaced reel flanges, and a pair of spaced, integral circumferentially extending lip portions on the opposite side edges of the radially outer face of the main body portion. Each lip portion, in cross section, extends radially outwardly away from the radially outer face of the main body portion and then bends over toward the other lip portion to define a continuous inwardly opening groove extending around the strip and coacting with the confronting groove defined by the other lip portion to define a continuous, integral label holder on the radially outer face of the main

body portion for selective receipt of a label at any circumferential location along the strip.

3,735,864

## TEMPERATURE PROBE COT PACKAGE

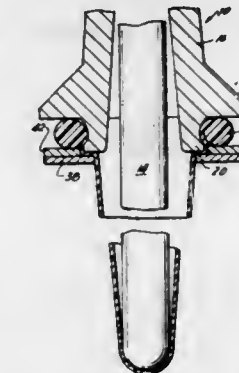
Edgar O. Eckhart, Livingston, N.J., assignor to Becton, Dickinson & Company, East Rutherford, N.J.

Filed Sept. 27, 1971, Ser. No. 184,129

Int. Cl. B65d 73/00

U.S. Cl. 206—56 AC

4 Claims



An improved package for holding a plurality of electronic thermometer cots or the like in position for simplified removal is provided. The package includes a flat, two-ply sheet formed of relatively rigid cardboard stock. A plurality of holes extend through the sheet with the openings through the top ply being slightly larger than the corresponding openings through the bottom ply.

3,735,865

## ROLL OF PLASTIC FILM APRONS

Buford Bryan Smith, P.O. Box 567, Paxton, Ill.

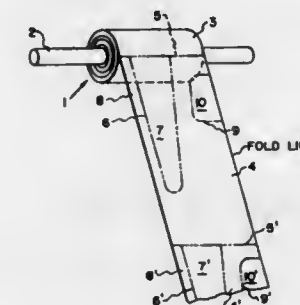
Filed May 17, 1971, Ser. No. 144,154

Int. Cl. B65d 85/66, 85/67

U.S. Cl. 206—58

4 Claims

U.S. Cl. 209—74 R



Disposable plastic film aprons are prepared from strip material folded longitudinally and the folded film strip packaged in roll form and perforated to provide a plurality of readily separable aprons. The plastic film strip has a plurality of perforations extending transversely thereof to separate one apron from the next on said strip and perforations defining straps positioned on opposite sides of each apron extending longitudinally thereof to provide tie straps operable to be tied around of the neck of the user and perforations extending from said longitudinal fold to define a neck opening.

3,735,866

## COMPUTER CORE HANDLER

Richard Bower, Northridge, Calif., assignor to E. H. Research Laboratories, Inc., Oakland, Calif.

Filed Apr. 29, 1971, Ser. No. 138,718

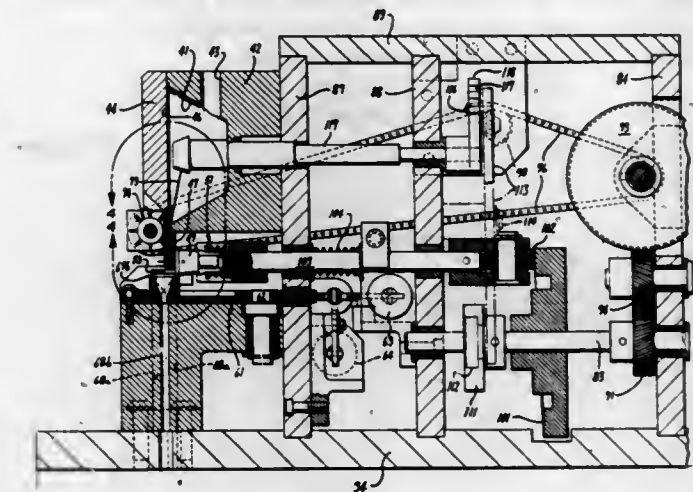
Int. Cl. B07c 1/04

U.S. Cl. 209—73

10 Claims

A computer core handler having a bowl for receiving and holding untested cores and a vertical chute for receiving cores

from the bowl and guiding them to a test station where the cores are speared by a test probe. The cores are allowed to drop into a selector which guides the core into a selected one



3,735,867

## ARTICLE CONVEYOR WITH LATERAL SWITCHING MECHANISM

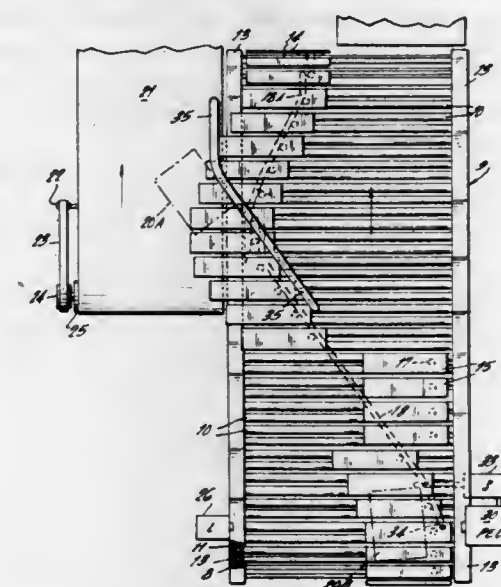
Frank B. Vanderhoof, Lake Forest, and Robert Dederer, Boonton Township, Morris County, both of N.J., assignors to Metramatic Corp., Landing, N.J.

Filed July 21, 1972, Ser. No. 273,938

Int. Cl. B07c ; B41j 7/30

U.S. Cl. 209—74 R

7 Claims



A conveyor having a plurality of plate-like article carriers for supporting a series of articles or article containers. A scanning means detects specific containers and diverts them to one side of the conveyor where they may be picked up by a second conveyor and removed to a storage position. A lateral extension of each plate-like carrier permits the movement of the articles across the conveyor and onto a second conveyor.



3,735,868

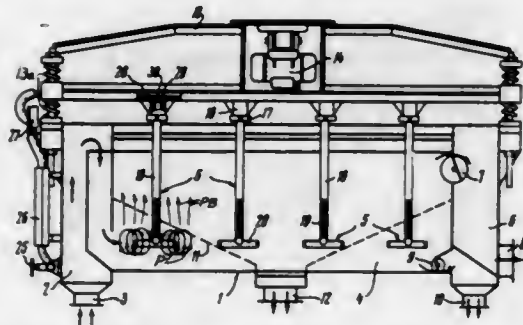
# FLOTATION MACHINE WITH VERTICALLY RECIPROCATING AERATORS

Alexandr Mikhailovich Fedotov, Bolshoi prospekt, 58/17, kv. 34; Evgeny Stepanovich Alexeev, Belgradskaya ulitsa, 44, kv. 97; Genrikh Alexandrovich Denisov, ulitsa Mayakovskogo, 4, kv. 9; Konstantin Alexandrovich Rundkvist, ulitsa Mayakovskogo, 4, kv. 9, and Artur Avgustovich Skrunde, 14 Linia, 45, kv. 4, all of Leningrad, U.S.S.R.

Filed Nov. 17, 1970, Ser. No. 90,261  
Int. Cl. B03d 1/22

U.S. Cl. 209-169

7 Claims



A flotation machine incorporating a chamber for pulp and means for removing therefrom separated products, as well as vibration aerators disposed therein and having ducts for the supply of air to their piston-like portions having openings for the outlet of said air and openings for the passage of pulp during the upward stroke of the aerators.

The piston-like portion of each aerator is provided with flaps of elastic material adapted to close the openings for the passage of pulp in the course of the aerator downward stroke and open them in the course of the aerator upward stroke.

As a result of such an arrangement, the operation of the machine is accompanied with an intensive stirring and aeration of pulp at low values of the vibrational speed of the aerator, owing to which takes place a considerable reduction of the electric energy consumption and aerator wear.

3,735,869

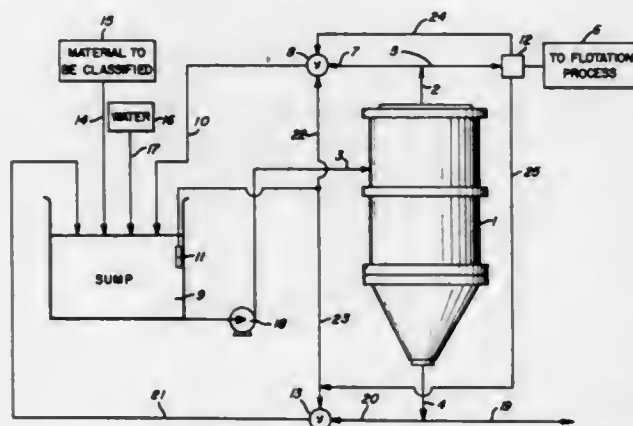
# CYCLONE PARTICLE SEPARATOR

Robert D. Carpenter, Bishop, Calif., and Ronald J. Roman, Socorro, N. Mex., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 29, 1970, Ser. No. 85,108  
Int. Cl. B04c 5/30

U.S. Cl. 209-211

7 Claims



A process and cyclone apparatus for the separation of particles within a liquified medium into fine and coarse particle solutions whereby the density of the fine particle solution is varied by means of recycling a portion of the fine and/or coarse particle slurry back into the input liquified medium.

3,735,870

# ACTIVATED SLUDGE PLANT

Rupert H. Uden, Prosser, Nebr.

Filed Aug. 12, 1971, Ser. No. 171,060  
Int. Cl. B01d 21/10

U.S. Cl. 210-138

11 Claims



A sewage treatment apparatus adapted to handle sewage loading, the apparatus designed for aerobic decomposition of fresh sewage and comprising in series: a digester tank, a plurality of aeration tanks, a settling tank, and a final aeration tank, wherein a raw sewage influent passes through an activated sludge process and is discharged as a purified water effluent.

3,735,871

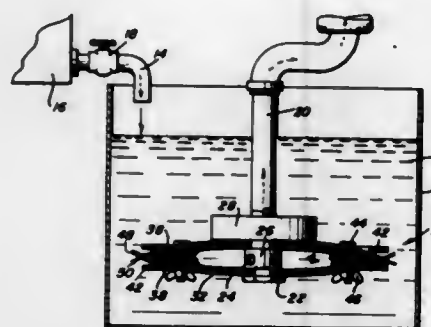
# FILTER JACKET FOR COOKING OIL

Joseph P. Blisko, Pacifica, Calif., assignor to John Christopher, Bradley and Edward A. McIntire, Kankakee, Ill., part interest to each

Filed Sept. 23, 1970, Ser. No. 74,717  
Int. Cl. B01d 25/04

U.S. Cl. 210-167

2 Claims



A jacket of cloth for a paper and wire mesh filtering assembly presently employed for cleaning fried food cooking oil which enables cleaning of the filter assembly by scraping the surface of the filter jacket thus prolonging the effective life of the filtering assembly and reducing the time required to clean and replace the filter components.

3,735,872

# FILTER SYSTEM

Marvin H. Anderson, 3382 S. Florence Court, Denver, Colo. Division of Ser. No. 826,812, May 22, 1969, abandoned. This application July 12, 1971, Ser. No. 161,852

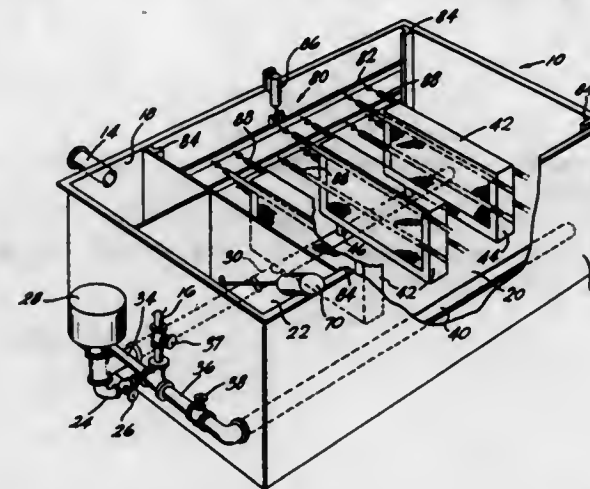
Int. Cl. B01d 23/26, 37/02, 35/00

U.S. Cl. 210-167

4 Claims

A filter system for fluids consisting of a tank in which a plurality of filter units are mounted relative to a recirculation header such that recoating of the filter units with diatomaceous earth is facilitated. The header is operable to provide a high velocity fluid vortex in the tank which is con-

trollable to provide for a coating of each filter unit with size therethrough, and this filter has an upstream surface toward which the fluid flows and a downstream surface away from which the fluid flows after passing through the filter. In com-



classified particles so that the coating becomes progressively coarser as it continues.

3,735,873

# APPARATUS FOR SCREENING AQUEOUS SUSPENSIONS, PREFERABLY FIBER STOCK AND/OR FIBER-PULP SUSPENSIONS

Karl Erik Bergstedt, 86100 Timra, Sweden, assignor to Sunds Aktiebolag, Sundsvall, Sweden

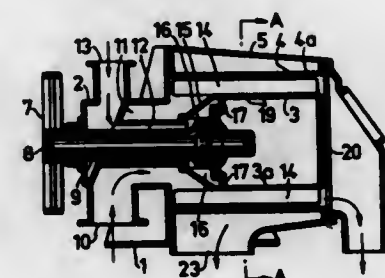
Filed June 2, 1970, Ser. No. 42,675

Claims priority, application Sweden, June 10, 1969, 8264/69

Int. Cl. B01d 29/42

U.S. Cl. 210-415

7 Claims



An improvement in apparatus for screening aqueous suspensions and being of the type having a perforated, diluting-liquid cylinder adapted to rotate inside a co-axial, perforated, non-rotatable screening drum, and with which means are provided for supplying diluting liquid and suspension mixtures to the cylinder and drum respectively, the improvement being that the means which causes the diluting cylinder to rotate is at least partially enclosed by the means supplying said liquid to the cylinder and that means are provided for imparting to the liquid, prior to its entry into said cylinder, a determined speed of rotation, thereby preventing uneven distribution in the apparatus of the suspended material.

3,735,874

# VALVE AND FILTER ASSEMBLY

Bernard Steinman, New York, N.Y., assignor to Mueller Steam Specialty Division of SOS Consolidated Inc., Brooklyn, N.Y.

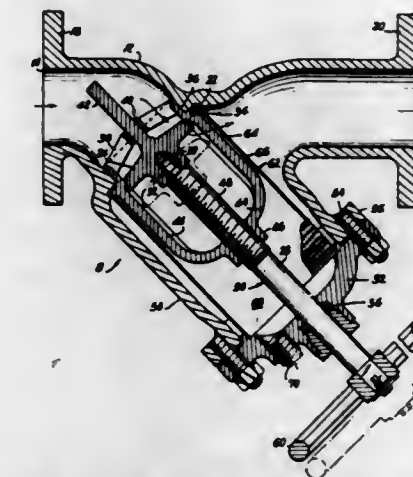
Filed Aug. 11, 1971, Ser. No. 170,802

Int. Cl. B01d 35/02

U.S. Cl. 210-430

9 Claims

A valve and filter assembly. The assembly has an elongated tubular structure defining a path of fluid flow and this tubular structure carries between its ends a valve seat surrounding the path of fluid flow. A valve member coacts with the valve seat and is moved to and from a closed position engaging the valve seat for controlling the fluid flow. A filter extends across the interior of the tubular structure for filtering the fluid flowing



3,735,875

# SECURITY DEVICE FOR CLOTHES RACKS

Vincent Parillo, Highland Park, N.J., assignor to Bond Stores, Incorporated, New York, N.Y.

Filed Mar. 17, 1971, Ser. No. 125,268

Int. Cl. E05b 73/00

U.S. Cl. 211-7

1 Claim



This application for patent discloses a security device for clothes racks commonly employed in retail stores for the display of men's suits and the like arranged on hangers in a show case. The device is composed of three principal parts, a pair of hanger rail clamps permanently attached to the hanger rail, a channel support bar which is pivotally connected to the clamps and a tray member slidably supported on the bar and adapted to engage the clamps so as to hold the bar in locked position against clothes hangers which are supported by the rail.

3,735,876

# CRANE CONTROLS

Roy D. Brownell, Aurora, and Richard E. Rogers, Oswego, both of Ill., assignors to Clark Equipment Company, Buchanan, Mich.

Continuation-in-part of Ser. No. 794,042, Jan. 27, 1969. This application Mar. 1, 1971, Ser. No. 119,663

Int. Cl. B66c 13/48

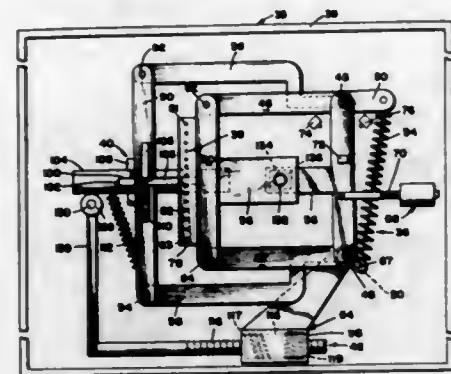
U.S. Cl. 212-39 R

10 Claims

A control for a crane boom mounted on a self-propelled vehicle for pivotable movement about vertical and horizontal axes, the control including first control means for controlling boom movement about a horizontal axis and second control means for controlling boom extension. Connecting means cooperating with said first and second control means are provided for actuating one of said first and second control means upon actuation of the other to maintain the free end of the boom in a predetermined vertical or horizontal plane. Vehicle



orientation compensating means also may be included, as well



3,735,877

## RAILWAY COUPLER HEAD

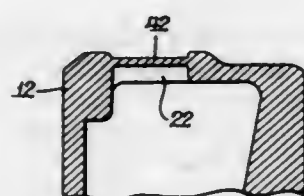
Raymond J. Bossong, Alliance, Ohio, assignor to AMSTED Industries Incorporated, Chicago, Ill.

Division of Ser. No. 4,937, Jan. 22, 1970, abandoned. This application Nov. 16, 1971, Ser. No. 199,288

Int. Cl. B61g 3/04, 3/08

U.S. Cl. 213-75 R

5 Claims



An improved railway coupler head having an integral horizontal metal wall section cast within the upper locklifter hole to completely close the upper hole thereby preventing foreign matter from entering into the coupler. The wall is relatively thin and is formed by the improved method of removing a portion of the coupler cope core, depending upon the desired location of the wall, prior to casting to thereby permit forming the easily removable horizontal wall section.

3,735,878

## CHAIN AND STRUT COUPLER UNCOUPLING DEVICE

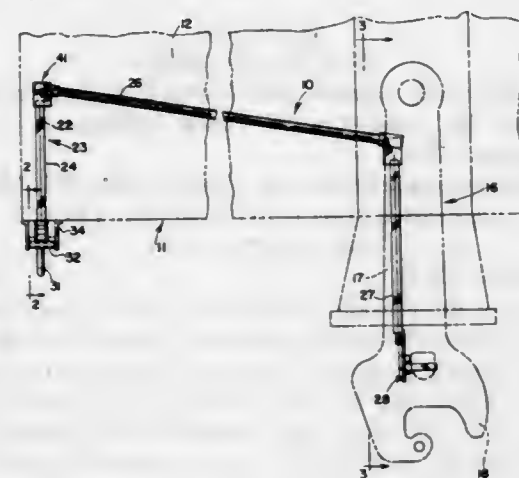
John W. Allen, Flossmoor, Ill., assignor to Stanray Corporation, Chicago, Ill.

Filed July 6, 1971, Ser. No. 159,668

Int. Cl. B61g 3/08

U.S. Cl. 213-162

6 Claims



A coupler uncoupling arrangement including a chain operating member. The chain operating member is guided in

rigid guide struts pivotally connected to each other. At least one of the guide struts is suspended from the coupler while another of the guide struts is pivotally connected to the underframe.

3,735,879

## DOCK CRANE

Daniel Grandin, Fontenay-aux-Roses, France, assignor to Fives Lille-Cail, Paris, France

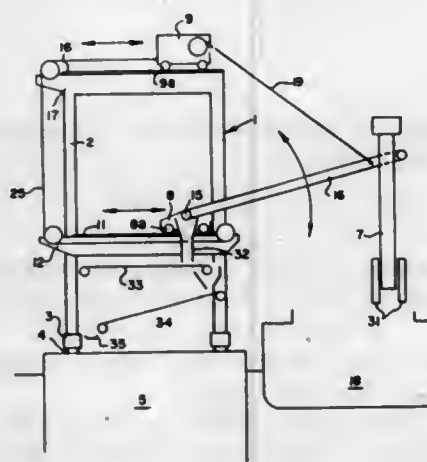
Filed Feb. 4, 1972, Ser. No. 223,660

Claims priority, application France, Feb. 8, 1971, 7104063; June 11, 1971, 7121237

Int. Cl. B65g 63/00

U.S. Cl. 214-14

14 Claims



The boom of a dock crane is pivoted to a trolley which is displaceably mounted on a mobile frame on the wharf. A support member, such as another trolley or a strut, supports the tackle for the boom intermediate the tackle and the frame. A cable connects the support member to the boom supporting trolley and guide pulleys for the cable are so mounted that the support member is displaced simultaneously in the same direction and at the same speed as the boom supporting trolley and to transmit to the frame the tilting force due to the weight of the boom and any load thereon.

3,735,880

## TRANSFER APPARATUS

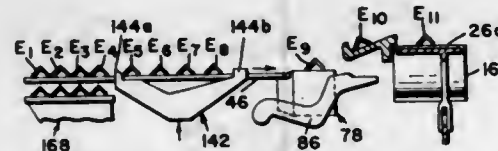
William J. Hill, Holden; Harold E. Woodrow, and Kenneth L. Klusmier, both of Worcester, all of Mass., assignors to Morgan Construction Company, Worcester, Mass.

Filed July 21, 1971, Ser. No. 164,601

Int. Cl. B65g 57/24

U.S. Cl. 214-6 DK

7 Claims



An apparatus for transferring elongated elements from a receiving station onto an adjacent carrier. The elements are first arranged in a layer or tier on a plurality of laterally extending support members spaced along the length of the receiving station at a level slightly above that of the carrier. The loaded support members are next extended over the carrier, after which stop members are raised to operative positions protruding between the support members at the receiving station. Thereafter, the support members are retracted, causing the elements to be stripped therefrom onto the carrier.

3,735,881

## METHOD OF PROCESSING TOBACCO IN A BLEND-BULK SILO

Edwin L. Wilding, Louisville, Ky., assignor to Griffin & Company, Louisville, Ky.

Filed July 6, 1971, Ser. No. 159,823

Int. Cl. B65g 65/32

U.S. Cl. 214-152

20 Claims



A method for processing tobacco which varies between a single type and a plurality of types, includes a plurality of bulk storing and blending steps. A shuttle car and conveyor carried thereon traverses a longitudinal storage bin or silo as the conveyor is controlled to deposit tobacco placed thereon into the silo beneath the conveyor. To store tobacco, the shuttle is moved incrementally while the conveyor is operated in the direction of that portion of the silo to be charged. To blend tobacco, the shuttle is reciprocated while the conveyor is operated in a direction toward that portion of the silo to be charged so as to deposit a plurality of layers into the silo. The shuttle and conveyor are operable to manually or automatically charge selected portions of the silo. The speed of the conveyor is varied in several of the blending steps to insure layers of even thicknesses. Tobacco is deposited on the conveyor by an additional shuttle and associated conveyor, the speed of the latter also being varied to insure deposited layers of even thickness on the first conveyor.

3,735,882

## SUPPORTING AND POSITIONING DOLLY FOR DUAL WHEELS

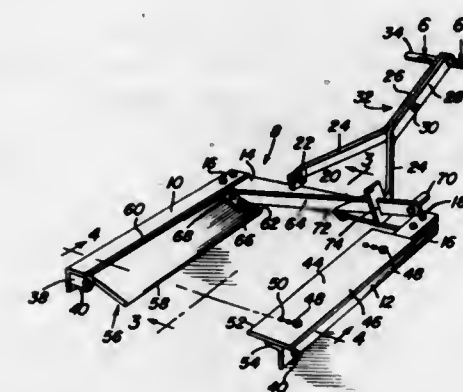
Frank Reznicek, 1412 7th Street, Columbus, Nebr.

Filed July 14, 1971, Ser. No. 145,453

Int. Cl. B60b 29/00

U.S. Cl. 214-332

7 Claims



A dual wheel assembly handling dolly for use by a single workman, constructed to supportively cradle, transport and position the assembly whether removing or applying the same. It comprises a knockdown roller supported U-frame, a pivoted manually maneuverable detachable sectional handle and wheel contacting adapter plates. A first adapter plate is seated and adjustably bolted atop one leg of the frame. The second adapter plate is spaced from and parallel with the first plate, is hingedly mounted on the other leg, sloped inwardly and downwardly and is provided at a rearward transverse end with a right angled lever. This lever has a hand-grip and is provided with a slidably mounted cleat which provides a lever propping chock and is adjustably engageable with the bight portion of the frame.

3,735,883

## SPARE TIRE AND WHEEL CARRIER FOR PICK-UP TRUCKS

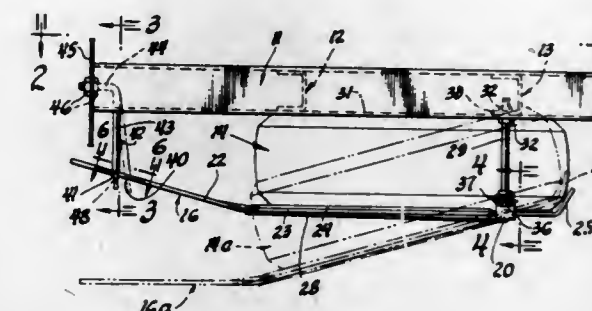
John Hrivnyak, 2055 Harvard, Berkley, Mich.

Filed Aug. 13, 1971, Ser. No. 171,465

Int. Cl. B62d 43/00

U.S. Cl. 214-454

5 Claims



A spare tire and wheel carrier for a pick-up truck which includes a cross member pivotally mounted at its upper ends to the vehicle frame. A longitudinal center member having an inner end fixed to the cross member and an outer end releasably locked to the vehicle frame.

3,735,884

## SYSTEM FOR LOADING TRUCKS AND WAREHOUSES

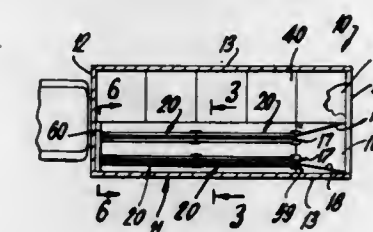
Robert H. Klett, 112 Gramatan Drive, Yonkers, N.Y.

Filed May 6, 1971, Ser. No. 140,737

Int. Cl. B60p 9/00

U.S. Cl. 214-515

15 Claims



The system comprises tracks laid on the floors of trucks, trailers or warehouses, having funneled entry guides, and pallets having wheels received on the tracks for easier and speedier loading. Means is provided to quickly attach different sections of the track. A front plate carrying the entry funnel receives a pallet thereon by a fork lift truck, and from which plate, the pallet may be pushed onto the tracks.

3,735,885

## SIDELOADER LIFT TRUCK WITH POWERED DECK AND CARRIAGE ROLLERS

Samuel T. Comfort, Homewood, Ill., assignor to Allis Chalmers Corporation, Milwaukee, Wis.

Filed July 28, 1971, Ser. No. 166,910

Int. Cl. B60p 1/00

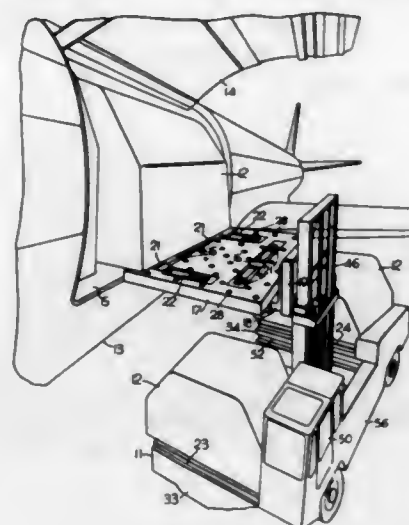
U.S. Cl. 214-520

10 Claims

Reversible powered rollers are provided on the fore and aft



decks of a sideloader lift truck to move cargo containers longitudinally and a carriage platform is provided with reversible



powered rollers to selectively move cargo containers longitudinally or laterally.

3,735,886

## FEED DEVICE FOR CLOTH FOLDING MACHINES

Gunter Stumpf, Kreis Münstingen, 7421 Mehrstetten, Germany

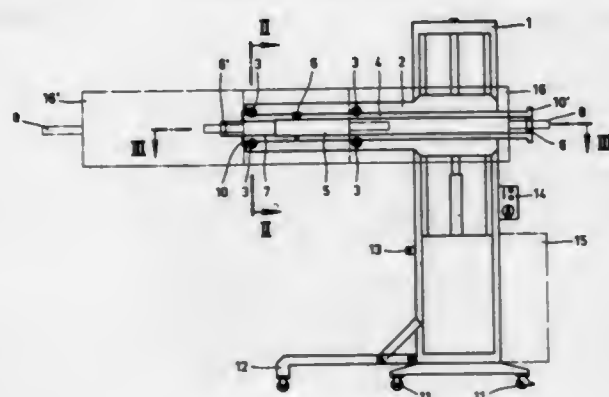
Filed July 8, 1971, Ser. No. 160,819

Claims priority, application Germany, Aug. 21, 1970, G 70 31 432.8

Int. Cl. B66F 9/14

U.S. Cl. 214-730

8 Claims



A feed device for material folding machines comprises a holding plate secured to a vertically movable member of a displaceable lifting apparatus, the plate extending horizontally towards one side of the lifting apparatus. The holding plate serves as a carrier for a carriage which is horizontally displaceable on the plate, and attached to each of the two ends of the carriage is a forwardly overhanging arm for carrying a roll of material. The carriage is constituted of two telescoping parts for adjusting the spacing between the arms.

3,735,887

## SAFETY CAP FOR MEDICINE CONTAINERS AND THE LIKE

Glenn H. Morris, 4203 Highwood Drive, Chattanooga, Tenn.

Filed Mar. 14, 1972, Ser. No. 234,507

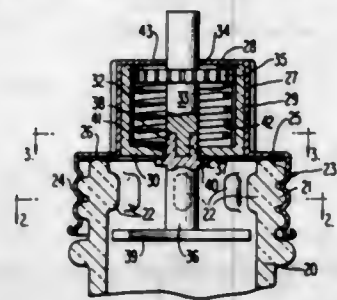
Int. Cl. B65d 55/02

U.S. Cl. 215-9

15 Claims

A safety cap for protecting children from contact with the contents of medicine bottles or containers of poison features a

screw-threaded cap on the neck of a bottle or container which cannot be completely removed until an associated plunger is



depressed to cause releasing of a locking means in the neck of the bottle or other container.

3,735,888

## BABY BOTTLE

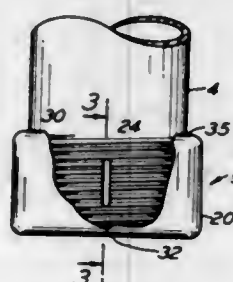
John M. Jacko, 1247 Hayden Avenue, East Cleveland, Ohio

Filed Dec. 23, 1970, Ser. No. 100,899

Int. Cl. A61J 9/00

U.S. Cl. 215-11 B

6 Claims



The specification and drawing disclose a baby bottle comprised of a cylindrical open ended tube which is threaded on each of its two ends. An air passageway which communicates between the interior and the exterior of the tube is formed through the threads at one end of the tube. The tube is fitted with two adjustably positionable caps on both of its ends. One cap is adapted to releasably secure a nipple and the cap and the other end is adapted to adjustably overlay the air passageway through the threads so that the air flow into the bottle can be adjusted.

3,735,889

## NON-RECLOSABLE CLOSURE

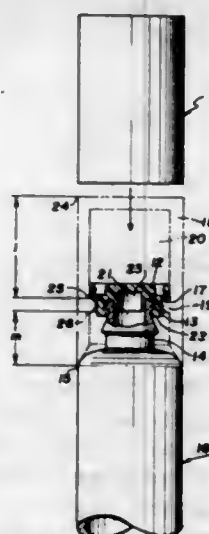
Frank Vincent Stagnitto, 6 Freeman Avenue, Denville, N.J.

Filed July 8, 1971, Ser. No. 160,856

Int. Cl. B65d 41/18

U.S. Cl. 215-41

2 Claims



A two piece closure consisting of an inner snap-on cap and an outer shell adapted to prevent re-use of the closure after initial opening is disclosed.

3,735,890

## LID SUPPORT

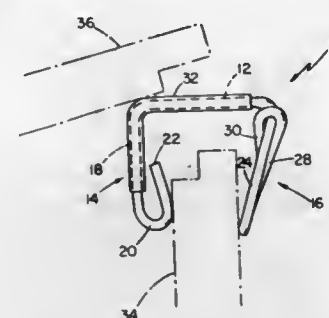
Robert S. Archibald, Gilson Road, Wellesley Hills, Mass.

Filed Apr. 12, 1971, Ser. No. 133,183

Int. Cl. G65d 43/24

U.S. Cl. 217-61

2 Claims



A lid supporting device for engagement with the upper portion of a container wall comprising a single piece of heavy gauge wire formed to have a wall-spanning back portion, a first leg, a second leg, and a sleeve of resilient non-abrasive material surrounding a major portion of the back portion. The first leg comprises a generally linear length of wire and a smoothly curved tail of wire at its lower end.

3,735,891

## FLEXIBLE SEAL FOR A VAPOR CAVITY

Martin A. Nishkian, Long Beach, and Wayne E. Nuttall, San Gabriel, both of Calif., assignors to United States Steel Corporation, Pittsburgh, Pa.

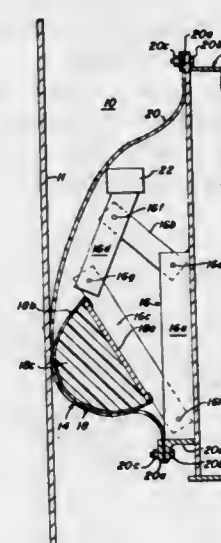
Division of Ser. No. 879,022, Nov. 24, 1969, Pat. No.

3,618,813. This application Apr. 19, 1971, Ser. No. 134,934

Int. Cl. B65d 87/18

U.S. Cl. 220-26 S

7 Claims



A flexible seal is disclosed having a support member secured at one end to the floating roof, and a tubular sealing member having a wear cover member provided with flanges at each end and a flexible core member. The sealing member has one flange secured to the free end of the support member and the other flange secured to the other end of the floating roof. The sealing member is operable to seal the vapor cavity.

3,735,892

## FULL OPEN END HAVING CHORDAL START TEAR SCORE SECTIONS

Christian Frederick Kinkel, Arlington Heights, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Oct. 26, 1970, Ser. No. 84,072

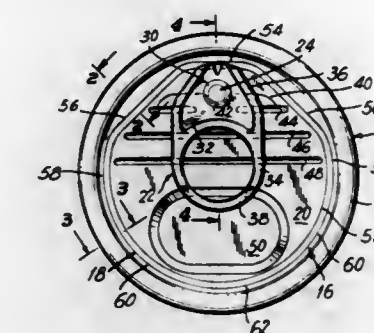
Int. Cl. B65d 17/24

U.S. Cl. 220-54

3 Claims

A score in a "full-open" end closure for a can, which defines a removable section in the end panel, has sections in

the form of chords to the generally circular configuration of the score located equally distant from, and adjacent to, an opening tab secured to the removable section of the end panel. By providing these chordal score sections at the tear starting section of the score at either end of the pop or initial



rupture section of the score, the load or force required to be exerted by the user to initiate the starting tear of the removable section from the end panel is substantially reduced and, thereby, openability of the "full-open" end closure is substantially improved and enhanced.

3,735,893

## SHIELDED CONTAINER WALL OPENING

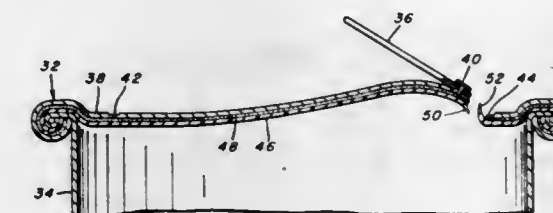
Herbert Gayner, Monroeville, and David A. Smith, Penn Hills, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 19, 1971, Ser. No. 190,479

Int. Cl. B65d 17/20

U.S. Cl. 220-54

2 Claims



A method of establishing a shielded container wall opening including providing a metal container wall panel having an adhesively bonded protective layer selected from the group consisting of polyolefin, copolymers of polyolefin-ethylene and ionomers of polyolefin. Providing a score line defined removable sector within the metal panel and an operating pull tab secured thereto. Thermally treating the container wall having the integral opening device at about 275° to 375°F for about 0.2 second to 4 minutes and preferably about 300° to 350°F for about 0.5 to 3 minutes. Operating the pull tab to initiate fracture of the score line and establish an opening in the container wall. Simultaneously elongating portions of the protective layer disposed in a generally underlying position with respect to the score line and severing the same to provide a shielding edge which is disposed protectively against the opening defining wall of the metal container wall panel. Feathering preferably including an average projection of about 0.002 to 0.010 inch beyond the metal opening defining wall.

3,735,894

## SELF-OPENING END CLOSURE HAVING A REPAIR COATED RUPTURABLE INTERIOR SCORE

Christian Frederick Kinkel, Prospect Heights, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Apr. 17, 1972, Ser. No. 244,667

Int. Cl. B65d 17/24

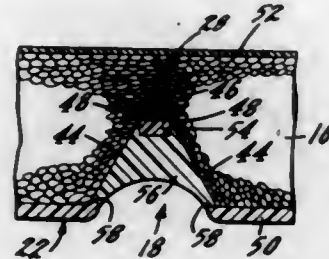
U.S. Cl. 220-54

8 Claims

A self-opening sheet metal end closure wherein a rupturable score is formed in the interior or product-facing surface of the



end closure resulting in a highly cold worked residual of sheet metal located between the score and the exterior surface of the end closure, the end closure having a non-metallic repair coat with a concave cross-sectional structure provided on the rupturable score substantially within and only partially filling the void defined by the score. The repair coat structure sub-



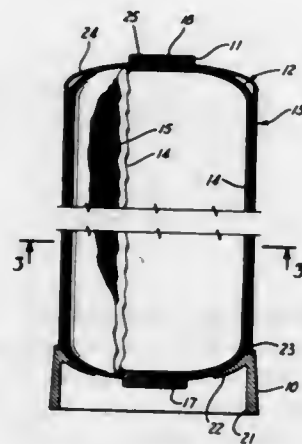
stantially prolongs the resistance of the highly cold worked sheet metal residual to chemical attack by corrosive products contained in the container closed by the end closure, while the amount of force required to rupture the score during opening of the end closure is substantially unaffected by the presence of the repair coat.

3,735,895

## COMPOSITE NON-SWEAT WATER TANK

Jarold D. Roper, 17125 Bixby, Bellflower, Calif.  
Filed May 24, 1971, Ser. No. 146,050  
Int. Cl. B65d 25/14, 25/34  
U.S. Cl. 220-63 R

1 Claim



A water tank in which an inner cylindrical vessel, of molded plastic wound with reinforcing strands has a base affixed to its lower end and is enclosed in an outer, cylindrical shell which seats in an upper edge of the base. The shell is reflective externally and air space is provided interiorly, so that the tank does not sweat.

3,735,896

## JAW-OPERATED CUP DISPENSING MECHANISM AND METHOD

Robert J. Mistrz, Northbrook, and Albert B. Mojonner, Sr., Chicago, both of Ill., assignors to Koehring Company, Milwaukee, Wis.

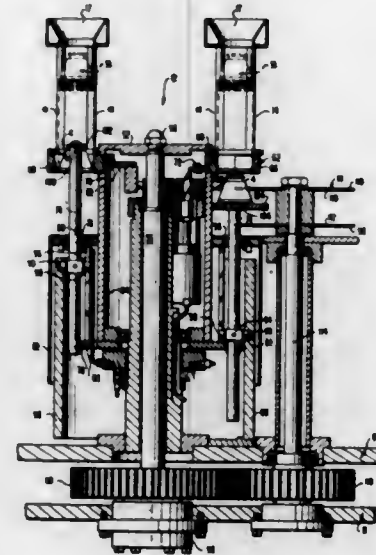
Filed June 17, 1971, Ser. No. 154,079  
Int. Cl. B65g 25/00

U.S. Cl. 221-210

17 Claims

A dispenser for cup-like articles rotates a plurality of stacks of the articles through a circular path. Each stack is normally supported by a jaw mechanism which engages the lowermost article of the stack. At one angular portion about the axis of rotation of the dispenser, the jaw mechanism associated with each stack is actuated to release the articles, and at this por-

tion of the path a vertically reciprocable receiver moves into contact with the lowermost article in the stack. An extra increment of upward motion is imparted to the receiver for readjusting the stack. Then the receiver moves downwardly carrying the lowermost article of the stack with it. The jaw mechanism closes again to engage the next article in the stack,



while the receiver recedes to separate the lowermost article entirely from the stack. At another angular location, the separated article is transferred from the dispenser by a star wheel mechanism. The jaw mechanisms are cam operated, and means are provided for temporarily inactivating the cam mechanism when it is desired to continue rotation of the dispenser without delivering articles therefrom.

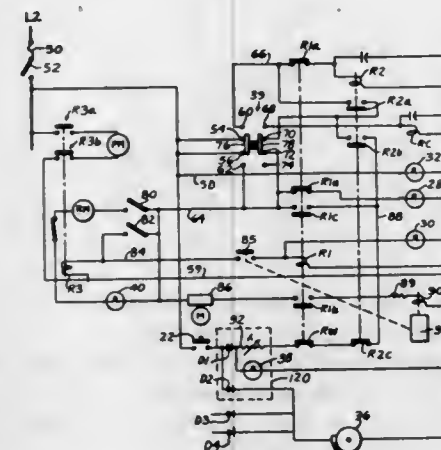
3,735,897

## SELF SERVICE DISPENSING REMOTE CONTROL SYSTEM

Larry A. May, Jonesboro, and Glenn A. Jones, Mosheim, both of Tenn., assignors to Keene Corporation, New York, N.Y.  
Filed Mar. 4, 1971, Ser. No. 120,815  
Int. Cl. B67d 5/30

U.S. Cl. 222-16

11 Claims



The specification discloses a remote control system, especially for self-service fuel, chemical, or other liquid dispensing pumps in which each dispensing pump is provided with a call switch which actuates a signal in a remote location whereupon the operator in a remote location can enable the respective dispensing pump to dispense fuel. The remote location is operable for monitoring the quantity of fuel dispensed and can include counter means for totalizing or limiting the quantity dispensed from each of a plurality of remote controlled dispensing pumps.

The signal which is actuated in the remote station consists of visual signal, such as a lamp, and an audible signal, such as a bell or buzzer, with the audible signal sounding only so long as the customer has the button of the call switch depressed at the respective dispensing pump, while the visual signal remains illuminated after the button on the dispensing pump is released. When the operator in the remote location takes the action necessary to enable the dispensing pump, the visual signal in the remote station is extinguished.

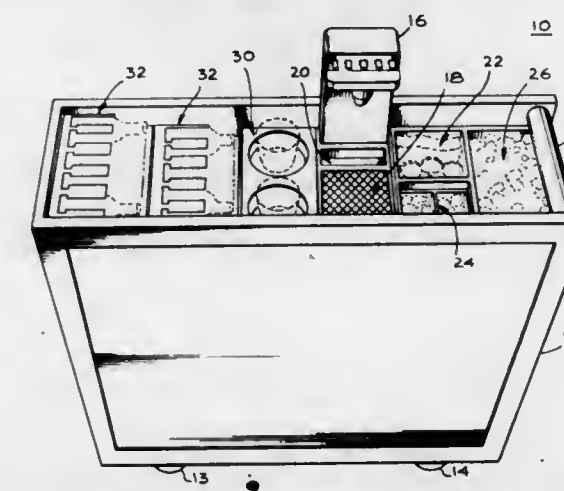
3,735,898

## PORTABLE BEVERAGE DISPENSING APPARATUS

Robert L. Smith, Los Angeles, Calif., assignor to Northrop Corporation, Los Angeles, Calif.  
Filed Dec. 28, 1970, Ser. No. 101,780  
Int. Cl. B67d 5/56

U.S. Cl. 222-129.4

5 Claims



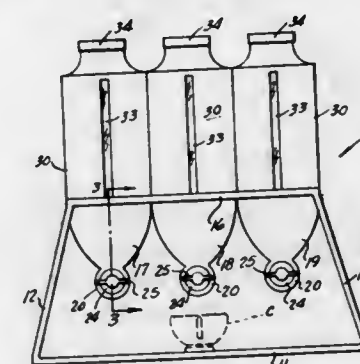
A portable, totally self-contained, liquor and soft drink beverage dispensing cart suitable for use in the narrow confines of commercial aircraft aisles. Various items to be dispensed are stored in separate collapsible compartments within a pressurized tank. The tank is filled with soda water before being pressurized. Tubes for the separate fluids lead through couplings in the wall of the tank to a dispensing head having a plurality of mechanically actuated valve mechanisms, each affording positive operation for both opening and closing. A cooling device is included which makes use of the ice cubes to be served in the individual beverages. The unit includes an individual liquor bottle dispensing and storage device which utilizes a spring mechanism to maintain a constant pressure urging the bottles toward their point of removal.

3,735,899

## DISPENSING HOPPER

Kenneth Rollinson, P. O. Box 242, Tallulah, La.  
Filed July 23, 1971, Ser. No. 165,560  
Int. Cl. B67d 5/52; B65b 37/00  
U.S. Cl. 222-135

1 Claim



A dispensing hopper for powdered or granulated material having a rotary dispensing valve positioned in its lower end

and arranged with a single pocket in one side of the valve which can rotate from a filling position to a dumping position to dump a predetermined measured quantity of material from the hopper. A plurality of hoppers are illustrated as a unit for dispensing varied products.

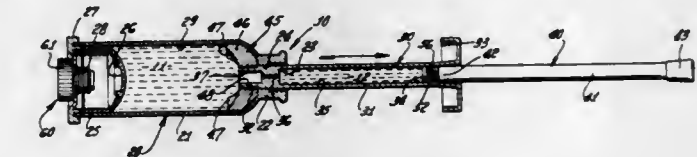
3,735,900

## DUAL INGREDIENT STORAGE, INTERMIXING AND DISPENSING STORAGE

Kenneth W. Gores, Bellevue, Wash., assignor to Products Research & Chemical Corporation, Burbank, Calif.  
Filed May 13, 1971, Ser. No. 142,926  
Int. Cl. B67d 5/60

U.S. Cl. 222-145

1 Claim



The cartridge, according to this invention, has a main container storing a first ingredient; an auxiliary container storing a second ingredient, and extending into the main container; a movable piston in the auxiliary container with a plunger secured thereto for extruding the second ingredient into the main container upon forward movement of the piston and plunger; a dasher threaded onto the inner end of the auxiliary container for intermixing the two ingredients upon manual movement of the auxiliary container relative to the main container after which rearward movement of the plunger pulls the piston rearwardly to return a portion of the mixture to the auxiliary container, with the auxiliary container then being removable from the main container; and has a nozzle securable to the auxiliary container for dispensing the mixture therefrom upon subsequent forward movement of the plunger and piston therein.

3,735,901

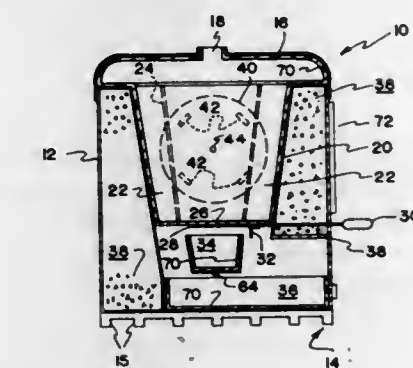
## STORAGE CONTAINER FOR GRANULAR MATERIALS

Robert A. Taylor, 6511 Merrill Road, Columbia, S.C.  
Continuation-in-part of Ser. No. 818,951, April 24, 1969, Abandoned.

Filed Mar. 29, 1971, Ser. No. 128,678  
Int. Cl. B67d 3/00

U.S. Cl. 222-196

4 Claims



A portable storage device having a container housed within an outer substantially moisture-free container with a mechanism for insuring release of the cement or mortar in the inner container through coinciding perforations in the bottom and slide into a bucket dumped by a mechanism into the mixing box which can be removed and emptied into the mixing box.



3,735,902

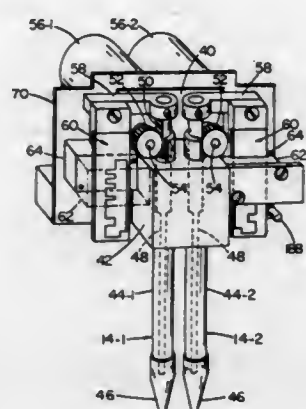
## DISPENSER APPARATUS

Jerrold Zindler, Cambridge, Mass., assignor to Instrumentation Laboratory, Inc., Lexington, Mass.

Filed July 22, 1971, Ser. No. 164,995

Int. Cl. A61b 10/00

U.S. Cl. 222-363



A dispenser apparatus comprises a housing that includes a chamber for holding a sample. A member in the housing is moved relative to the chamber from a first position to a second position to aspirate material into the chamber and is moved from the second position to the first position to dispense material from the chamber. Pressure in the chamber is increased at the end of the dispensing movement to discharge all of the material from the chamber.

3,735,903

## VALVE DEVICES FOR PRESSURIZED CONTAINERS

Roger Remane, Sainte-Colombe-les-Vienne, France, assignor to Application Des Gaz, Paris, France

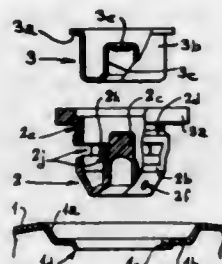
Filed Dec. 18, 1969, Ser. No. 886,242

Claims priority, application France, Dec. 18, 1968, 6850768

Int. Cl. B65d 83/14

U.S. Cl. 222-402.16

2 Claims



A valve device mounted in an opening provided in the wall of a pressurized container comprises an outer cup-shaped member made of a resilient plastic and an inner cup-shaped member made of a rigid material and mounted as a force fit in the outer cup-shaped member. The outer cup-shaped member has a perforated bottom which carries an upwardly extending axial portion adapted to form the closure member of the device. Under the action of the resiliency of the outer cup-shaped member this closure member is engaged in gas-tight contact into a tubular seat portion carried by the bottom of the inner cup-shaped member. This seat portion has a perforatable upper wall adapted to be perforated by the needle of a gas-intake head. The needle depresses the closure member and thus opens the valve device. If the gas-intake head is accidentally removed, the closure member returns to the closed position and prevents any gas exhaust from the container.

3,735,904

## DEVICE FOR SPREADING, SOWING OR DELIVERING POWDERED OR GRANULAR MATERIAL

Herbert Visser, Nieuw-Vennep, Netherlands, assignor to H. Visser N. V., Nieuw-Vennep, Netherlands

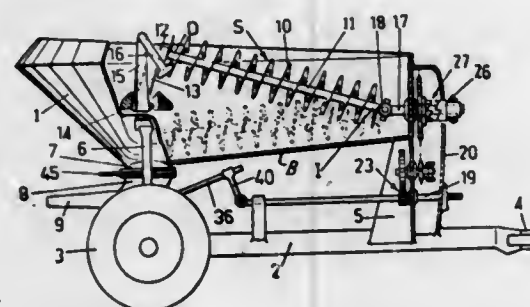
Continuation-in-part of Ser. No. 807,365, March 14, 1969, abandoned. This application Apr. 13, 1971, Ser. No. 133,678

Claims priority, application Netherlands, March 21, 1968, 6804010; Jan. 29, 1969, 6901402

Int. Cl. G01F 11/00

U.S. Cl. 222-412

21 Claims



The bed of powdered, granular or particulate material contained within the hopper-like body is assured of ultimate gravity discharge through a relatively small discharge opening in the body by providing a conveyor screw which displaces the material of the bed towards such opening so that the material tends to form a pile over such opening. Compaction of the material by the conveyor screw is minimized by so mounting the conveyor screw that its discharge end in particular tends to follow the level of the pile of material and therefore discharges material to the top of the pile. This is accomplished by mounting the conveyor screw so as to swing in a vertical plane about a pivot point remote from the opening and thereby leaving the discharge end of the conveyor screw free to assume a position in which it remains essentially uncovered by the material.

3,735,905

## PRECISION NECK CONSTRUCTION FOR CENTER LOCK CAPTIVE CLOSURE

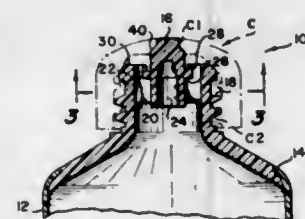
Charles Arthur Badavas, Allendale, N.J.; Raymond William Landry, Hudson, Mass., and John William Piltzecker, Shelbyville, Tenn., assignors to American Can Company, New York, N.Y.

Division of Ser. No. 576,420, Aug. 31, 1966, abandoned. This application Jan. 25, 1971, Ser. No. 109,482

Int. Cl. B67d 3/00

U.S. Cl. 222-521

3 Claims



A neck element for collapsible tubes or the like wherein the neck is formed as by injection molding to maintain precise dimensional tolerances thereof in a configuration to receive a centerlock captive closure wherein the neck central plug is suspended by circumferentially spaced radial webs within a hollow neck body thereby to define a plurality of precisely formed dispensing apertures between the tubular member and the plug and terminating in orifices bounded by a sheared planar upper terminal surface.

3,735,906

## REPLACEABLE MOLTEN METAL NOZZLE STRUCTURE

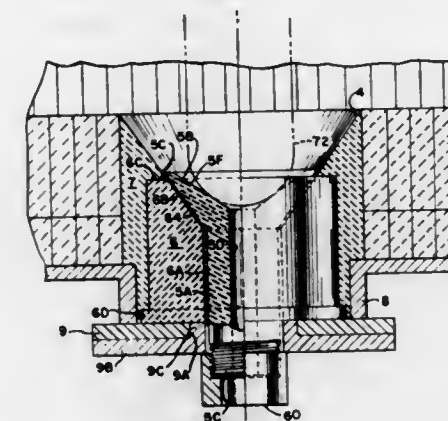
James E. Zettlemoyer, and Charles F. McGee, both of Bethlehem, Pa., assignors to Millford A. Juten, Washington, D.C., a part interest

Continuation-in-part of Ser. No. 802,138, Feb. 25, 1969, abandoned. This application Mar. 15, 1971, Ser. No. 124,186

Int. Cl. B22d 37/00

U.S. Cl. 222-567

15 Claims



A readily replaceable ceramic nozzle and well ring for use in ladles carrying molten metal to cooperate with a vertically moveable valve stop rod to control the flow of molten metal, the nozzle being of funnel-shape with the conical mouth providing a well ring and with the well ring and the tubular stem supported in a nozzle receiving block means of preformed ceramic material with the stem portion of the funnel extending through the block means to outside of the metal casing of the ladle, the stem having retaining means such as screw threads on its outer end cooperating with screw threads on a tubular nozzle extension with the tubular nozzle extension serving the dual function of retaining the nozzle in position and also preventing splattering of the molten metal. The nozzle receiving block means has a nozzle receiving opening conically enlarged at its upper end so that a minimum of fire clay mud seal is required to seal the funnel shaped nozzle in the nozzle receiving block means, the space between the rim of the block means and the fire brick lining of the ladle being filled with mortar-like material such as HELSPOT so that a minimum of moisture is used in the plastic sealing materials when replacing the nozzle whereby the nozzle can be used immediately instead of requiring the long waiting period for setting up and hardening of the plastic materials.

3,735,907

## MACHINE FOR INTERMITTENTLY FEEDING ELONGATED ARTICLES

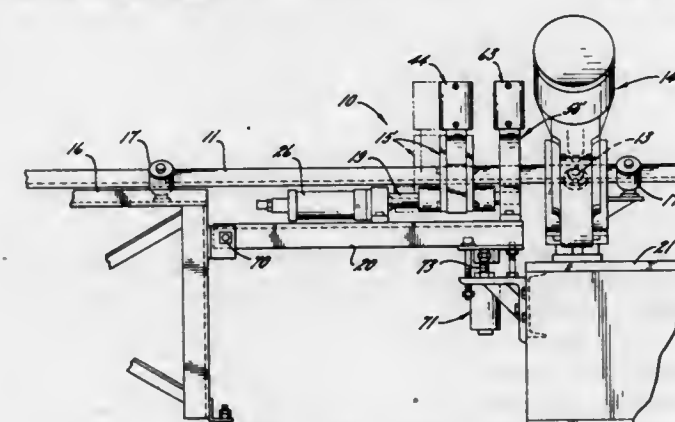
William E. Kuchar, Cherry Valley, and Robert W. Mauk, Rockford, both of Ill., assignors to W. A. Whitney Corp., Rockford, Ill.

Filed Jan. 20, 1972, Ser. No. 219,315

Int. Cl. B65h 17/44

U.S. Cl. 226-150

8 Claims



An elongated angle iron is fed lengthwise through successive intermittent strokes to a punch press by a movable carriage which supports a pair of upper and lower jaws operable to clamp the angle for movement with the carriage. The jaws are mounted to float vertically relative to one another so that each may grip the angle securely and then release the angle cleanly even if the angle is bowed intermediate its ends. During the feed stroke, the carriage is raised to lift the angle away from the die of the press and thereby avoid damage to the die.

3,735,908

## MACHINE FOR INSERTING FASTENERS

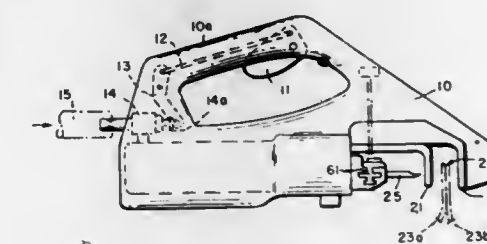
John E. Kinney, Upton, and Arnold R. Bone, Needham, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed May 27, 1971, Ser. No. 147,528

Int. Cl. B65c 7/00

U.S. Cl. 227-67

34 Claims



A machine for having a plurality of jaws for clamping layers of material therebetween and relatively moving the material and a needle in order to insert the needle through the material. Thereafter a fastener attachment member is forced through the needle to insert it through the material.

3,735,909

## AUTOMATIC NAILING APPARATUS

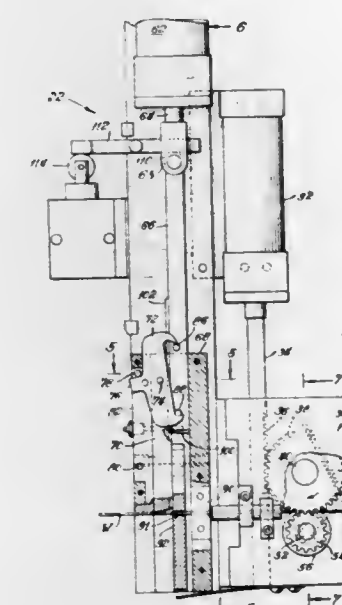
Ernst G. Breckenfelder, Elmhurst, Ill., assignor to UPG Engineered Products Corporation, Elk Grove Village, Ill.

Filed July 30, 1971, Ser. No. 167,727

Int. Cl. B27I 7/02

U.S. Cl. 227-86

15 Claims



An improved automatic nailing apparatus having means for feeding a length of wire, bending the wire to form an L-shaped nail, severing the nail thus formed from the remaining length of wire, and driving the nail into an object to be nailed, such object being for example a bundle of roofing shingles to be bound together.



3,735,910

## FRICTION WELDING

Geoffrey Walter Watson, and Brian Edward Jenkinson, both of Inverness, Scotland, assignors to A. I. Welders Limited, Inverness, Scotland

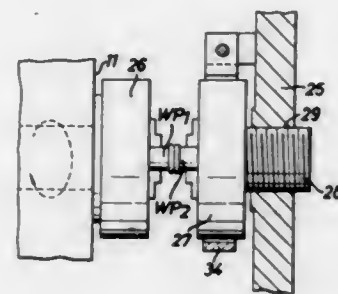
Filed Apr. 15, 1971, Ser. No. 134,290

Claims priority, application Great Britain, Apr. 14, 1970, 18543/70

Int. Cl. B23k 27/00

U.S. Cl. 228-2

14 Claims



A friction welding machine for performing a welding operation including a heating phase and a forging phase, the machine being operative during the forging phase to convert kinetic energy produced by rotation of one of the workholding devices during the heating phase into axial thrust urging the workholding devices towards one another during the forging phase. The conversion of kinetic energy into an axial thrust may be made by two interengaged screw-threaded components, by a cam mechanism or by a mechanical lever system.

3,735,911

## INTEGRATED CIRCUIT CHIP REPAIR TOOL

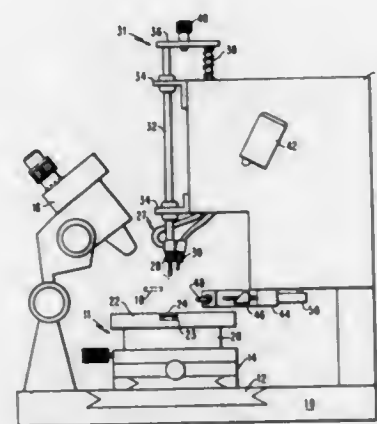
William C. Ward, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1971, Ser. No. 139,063

Int. Cl. B23k 1/00

U.S. Cl. 228-19

10 Claims



An integrated circuit chip repair tool for bonding or removing reflow soldered chips on multi-chip substrates having chip pickup means to move chips toward or away from a substrate, flame heating means to apply a concentrated source of heat to a single chip without overheating adjacent chips, infrared temperature sensing means to measure the temperature of a heated chip and control means responsive to the temperature of the heated chip to automatically discontinue heating by extinguishing the flame and to automatically activate the chip pickup means.

3,735,912

## APPARATUS FOR WELDING NONROTATABLE PIPE JOINTS

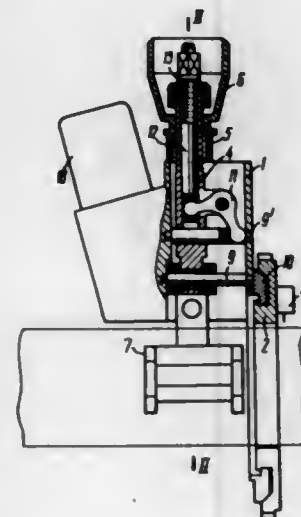
Vasily Il'ich Nikolaev, ulitsa Amudzena, 5, korpus 4-9; Alexander Jur'evich Eliseev, Lomonosovsky prospekt, 19, kv. 45; Vladimir Petrovich Bogachev, ulitsa Fonvizina, 14, kv. 40; Artem Petrovich Prosvirin, Iazhenennaya ulitsa, 8, kv. 51; Vladimir Ionovich Konstantinopolsky, ulitsa Kibalgicha, 4/6, kv. 38, and Anatoly Nikolaevich Belousov, proezd Cherskogo, 11, kv. 124, all of Moscow, U.S.S.R.

Filed July 27, 1970, Ser. No. 58,612

Int. Cl. B23k 5/00

U.S. Cl. 228-28

6 Claims



An apparatus for welding nonrotatable pipe joints, whose frame is by means of a fixing mechanism connected to one of the pipes to be welded together, while the torch moves along the joint by means of a rotating faceplate, said frame provided with a drive for its movement across the joint being movably mounted on said fixing mechanism, and carrying at least one circular guide for the rotational movement of the faceplate, whereon the torch is located.

3,735,913

## VENTED POULTRY CONTAINER

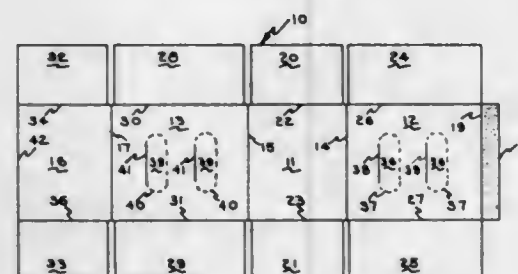
Robert Q. Lueben, Detroit Lakes, Minn., assignor to Swift & Company, Chicago, Ill.

Filed Apr. 26, 1971, Ser. No. 137,539

Int. Cl. B65d 25/00

U.S. Cl. 229-6 R

6 Claims



An improved container, adapted for packaging food items to be subsequently subjected to a blast freezing operation, is provided with spaced venting means in at least two side wall members. The venting means of each side wall member are arranged in a manner so as to direct and enhance the movement of a current of chilled air, flowing towards either end of the container, inwardly one side and outwardly the opposite side of the container in a single direction to provide increased air flow for rapid chilling of the packaged food item therein.

3,735,914

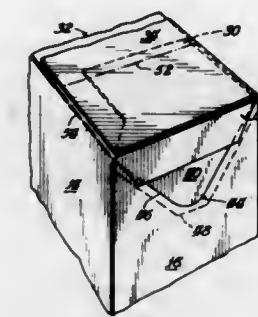
## SIFT-PROOF DISPENSING CARTON

Peter C. Collura, Stamford, Conn., and John D. Desmond, Philadelphia, Pa., assignors to Container Corporation of America, Chicago, Ill.

Filed Jan. 3, 1972, Ser. No. 214,691

Int. Cl. B65d 5/72

U.S. Cl. 229-17 R



A seal-end, sift-proof, paperboard dispensing carton having a top closure arrangement including overlapping top closure flaps, extending from the upper edges of the side walls, and a removable portion in an upper area of one of the side walls which is separable from the side wall and connected to certain of the top closure flaps for removal therewith to open the carton.

3,735,915

## DISPENSING HOPPER

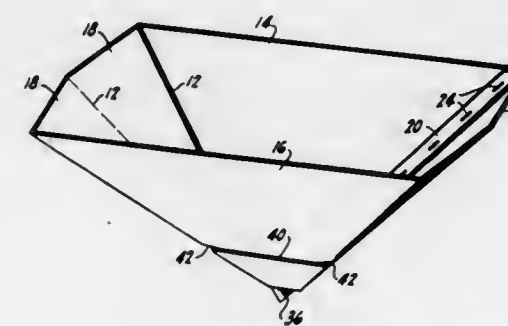
Gunter G. Fuss, Daly City, Calif., assignor to Free-Flowing Packaging Corporation, Redwood City, Calif.

Filed July 22, 1971, Ser. No. 165,034

Int. Cl. B65d 5/72

U.S. Cl. 229-17 B

5 Claims



A foldable, easily assembled dispensing hopper construction fabricated from cardboard. The hopper is assembled from a foldable blank provided with fold lines defining generally triangular panels, which form an inverted pyramidal hopper configuration. One hopper panel is cut and folded to form a lower dispensing opening which functions in cooperation with movable flap means to dispense free flowing materials from the hopper. Suitable biasing means (e.g., rubber band) hold the flap means in a normally closed position. In one principal embodiment, the flap means is an integral part of the panel forming the dispensing opening. In another embodiment the flap means comprises a separate member.

3,735,916

## ICE CREAM CARTON HAVING READILY REMOVABLE DIVIDER AND SUPPORT MEANS

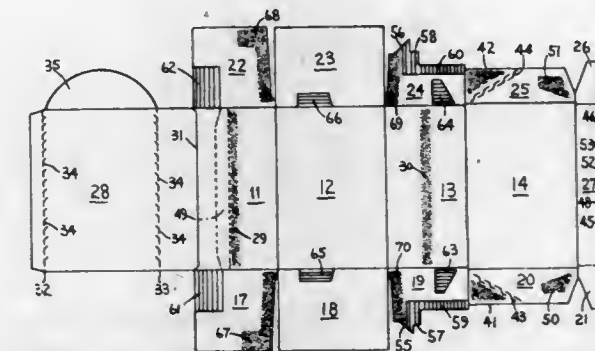
Kenneth T. Buttery, Kalamazoo, Mich., assignor to Brown Company, Kalamazoo, Mich.

Filed May 3, 1971, Ser. No. 139,357

Int. Cl. B65d 5/48

1 Claim U.S. Cl. 229-27 R

4 Claims



A paperboard carton including top, bottom, front, rear and end wall panels which together define an enclosure having at least two of the panels situated opposite each other and a divider panel detachably secured to the opposing panels, separating the enclosure into a plurality of compartments.

3,735,917

## EGG CARTON CONSTRUCTION

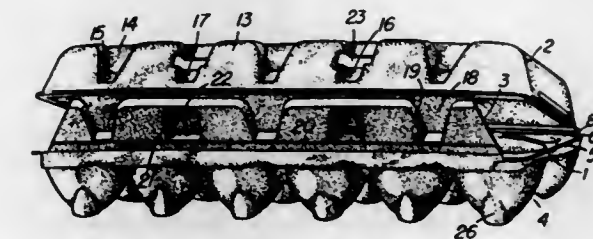
Richard T. Warburton, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 137,915, April 27, 1971. This application June 18, 1971, Ser. No. 154,373

Int. Cl. B65d 85/32

U.S. Cl. 229-44 R

13 Claims



A disposable carton formed of low cost material and adapted for the packaging of eggs and the like is formed with coacting elements of a cover and latching flap which, in combination, afford rigidity to those elements, guide the coacting elements on closure and provide for a secure latching susceptible of easy opening. Recesses are provided in cover and latching flap for guidance and rigidity. Latching is accomplished by a recess extending inwardly from the cover front wall to engage the underside of a latching bar of the flap, which is positioned above a substantially rectangular shaped recess in the latching flap.



3,735,918

## COHESIVE CLOSURE PATTERN

Werner Otto Tundermann, Colonia, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 31, 1971, Ser. No. 176,632

Int. Cl. B65d 33/16

U.S. Cl. 229-62

5 Claims



A container having a fillable body provided with a flap. A series of bands of cohesive material are coated on said body and said flap so that independent of the location at which said flap is folded, said cohesive bands will intersect and seal the container.

3,735,919

## MAILBOX

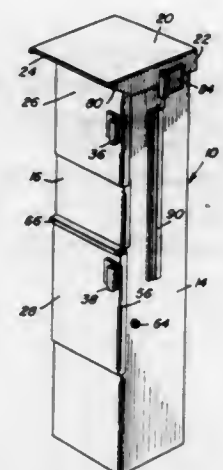
Walter C. Morgan, P.O. Box 4088, Monroe, La.

Filed July 1, 1971, Ser. No. 158,939

Int. Cl. A47g 29/12

U.S. Cl. 232-17

8 Claims



A mailbox in the form of an upright tubular member in the form of a hollow post or structural member having upper and lower compartments separated by a trap door which defines a bottom for the upper compartment when in closed condition. The lower compartment is provided with a manually operated lock device so that only authorized persons have access thereto with the lower compartment having sufficient capacity to receive a substantial number of mail items. The upper compartment is provided with a pivotally mounted access door, pivoted about a vertical axis, actuating a mechanism for automatically closing the trap door when the access door to the upper compartment is opened and permitting gravitational opening of the trap door when the access door to the upper compartment is closed. A signal flag is mounted on the mailbox for vertical reciprocatory movement between a retracted and extended position with the signal flag associated with the operating mechanism for the trap door to retain the trap door in closed position while the signal flag is in an extended signaling position to enable outgoing mail to be placed in the upper compartment for pickup by a mailman.

3,735,920

## CENTRIFUGE AND DISCHARGE MEANS THEREFOR

Ernst Hausmann, Horgen, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

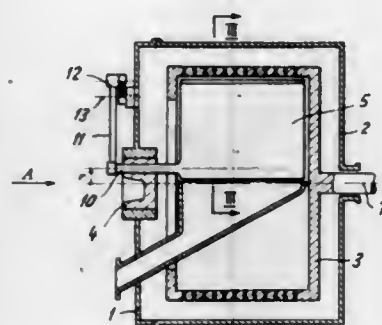
Filed Dec. 6, 1971, Ser. No. 205,021

Claims priority, application Switzerland, Dec. 16, 1970, 18550/70

Int. Cl. B04b 1/00

U.S. Cl. 233-46

8 Claims



In a centrifuge comprising a housing, a drum and a clearing knife; the knife carrier having a pivot shaft pivotally mounted in a holding part; the improvement that said holding part is pivotally mounted in said housing; the axis of said shaft and the axis of said holding part are parallel to, and apart from each other; guide means connected to said housing and serving to guide said knife carrier — during turning of said holding part — so as to keep the cutting angle between said knife and the layer to be cleared out at least approximately constant.

3,735,921

## PRINTING DEVICE FOR CALCULATING MACHINES

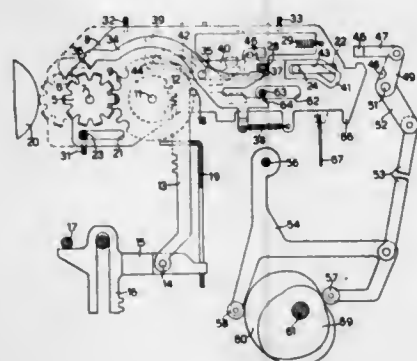
Bruno Azzalin, 10015 Ivrea, Turin, and Domenico Bertina, 10010 Parella, Turin, both of Italy, assignors to Ing. C. Olivetti & C., Ivrea (Turin), Italy

Filed Apr. 18, 1972, Ser. No. 245,073

Int. Cl. G06c 11/04

U.S. Cl. 235-58 P

5 Claims



A printing device for a calculating machine comprises a set of toothed type wheels mutually distanced less than a set of reciprocable actuators connected thereto and apt to be rotated differentially. Also the pitch of the type wheels is less than the pitch of the reciprocable actuators.

Each type wheel is rotated by the relevant actuator through a rack pivoted on the actuator and motion reducing gear meshing with the type wheel.

3,735,922

## COMBINATION AIR VENT-VACUUM BREAKER

Katsuji Fujiwara, 191 Nishitani, Hiraoka-cho, Kakogawa-shi, Hyogo, Japan

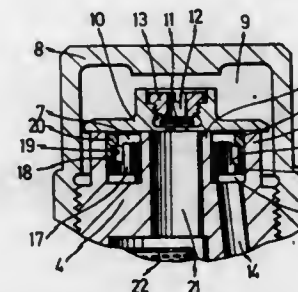
Filed Feb. 7, 1972, Ser. No. 224,183

Claims priority, application Japan, Feb. 10, 1971, 46/5708; March 31, 1971, 46/19506

Int. Cl. F16f 1/44

U.S. Cl. 236-66

8 Claims



A combination air vent-vacuum breaker such as is employed in a system using steam, is formed of a main body member and a cover member attached to and combining with the body member to form a pressure chamber. The main body member contains an inlet port and an outlet port which communicate with the pressure chamber and has a surface facing the pressure chamber which provides an inner annular valve seat and an outer annular valve seat. A disc valve, positioned within the pressure chamber, is movably displaceable relative to the valve seats to regulate flow between the inlet and outlet ports. Further, a bi-metal ring and a support member with a slanted surface are associated with the main body member and cooperate in opening and closing flow between the inlet and outlet ports as the bi-metal ring expands and contracts. Further, the construction of the air vent-vacuum breaker assures that any vacuum developed in the system during its operation can be broken immediately, any condensate in the system in the system at shut-down can be discharged and any dirt clogging operation of the valve disc can be blown clear.

3,735,923

## LOOPED TRAFFIC ACCESSORY

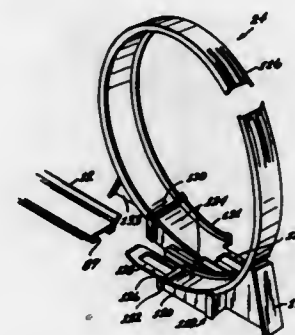
Emerson W. Brigham, Hermosa Beach; Harvey W. La Branche, Palos Verdes Peninsula; Alan W. B. Nash, Torrance; Howard F. Newman, Los Angeles; Thomas E. See, Huntington Beach; Marjorie Ann M. Smith, Gardena, and Arthur S. Woodward, Sylmar, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Division of Ser. No. 785,135, Dec. 19, 1968, abandoned. This application Aug. 13, 1970, Ser. No. 63,589

Int. Cl. A63h 19/36

U.S. Cl. 238-10 E

2 Claims



A flexible track for toy vehicles has one end connected to a bracket on a C clamp, the clamp being engaged with an elevated support so the track droops to the floor below. Accessory means in the form of starting gates, loops, ski jumps, banked curves, finish gates, and track mergers may be connected to the track to interact with toy vehicles.

3,735,924

## ELECTROSTATIC SPRAYING APPARATUS FOR PULVERULENT MATERIAL

Hermann Wirth, 8883 Gundelfingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

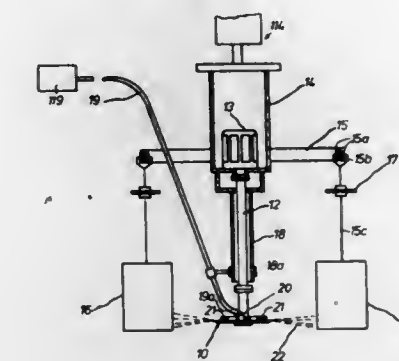
Filed Aug. 6, 1971, Ser. No. 169,645

Claims priority, application Germany, Feb. 2, 1971, P 21 04 658.2

Int. Cl. B05b 5/00; F23d 11/28

U.S. Cl. 239-15

10 Claims



An electrostatic spraying apparatus for applying powder to housings of refrigerators or the like has a disk-shaped sprayer which is rotated about a vertical axis and the upper surface of which receives a stream of powder through the slot-shaped orifice of a rigid or flexible conduit at an angle of 5°-35°. The upper surface of the sprayer carries radial agitating blades for air to thus reduce the speed of powder which creeps radially outwardly and is dispersed at the circular spraying edge of the sprayer. The orifice discharges the stream in the general direction of the spraying edge and is closely adjacent to the blades and to the periphery of the drive shaft for the sprayer.

3,735,925

## METHOD AND DEVICE FOR ELECTROSTATIC SPRAYING OF MATERIAL

Gyorgy Benedek, Ringhó u. 35; Andras Buday, Korvin Otto u. 44, and Andras Besz, Torokvesz u. 7/c, all of Budapest, Hungary

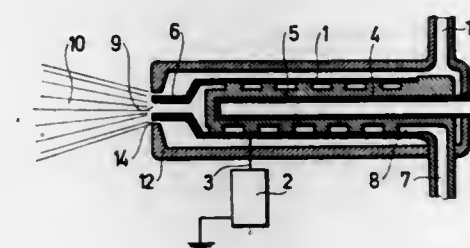
Filed July 23, 1971, Ser. No. 165,606

Claims priority, application Hungary, July 31, 1970, HA-893

Int. Cl. B05b 5/02

U.S. Cl. 239-15

6 Claims



A method and apparatus for electrostatically charging material to be sprayed onto a surface, by pressing the material to be sprayed between two electrodes of a condenser positioned in a spaced-apart relationship and insulated from each other by a dielectric. One of the electrodes is connected to a high-voltage, low-amperage power supply and the other electrode is grounded to create a uniform electrical field through which the material to be sprayed is passed for achieving a strong, uniform electrostatic charging of all the material to be sprayed while requiring less voltage and current for operation than the prior art devices and methods.



3,735,926

**LIQUID SPRAY DEVICE WITH FIXED AND ROTATABLE DIFFUSERS**

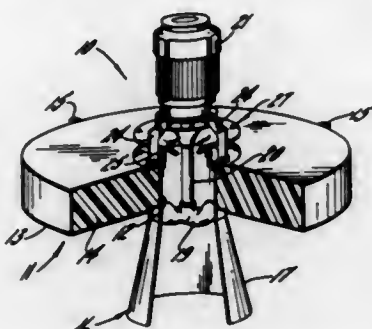
Richard B. Ravitts, Rockford, Ill., assignor to Richards of Rockford, Inc., Rockford, Ill.

Filed May 27, 1971, Ser. No. 147,472

Int. Cl. B01f 5/12, 7/22

U.S. Cl. 239-16

8 Claims



A floating aerator includes an axial flow impeller rotated by an electric motor and disposed within a tubular throat to pump a column of water from a pond upwardly through the throat and against a stationary or fixed diffuser positioned above the upper outlet of the throat. The fixed diffuser divides the column of water into a central core which passes through a neck portion of the diffuser and an outer sleeve which is deflected outwardly of the throat by an annular baffle encircling the upper end of the neck. The baffle extends outwardly from the neck in a generally horizontal direction to guide the deflected water in a relatively flat trajectory to cause the water to strike the surface of the pond with considerable force. A rotatable diffuser positioned above the fixed diffuser coacts therewith to sling the central core of water outwardly relative to the throat in a path above and converging downwardly into the water deflected by the baffle.

3,735,927

**ELECTRO MAGNETIC INJECTOR**

Louis A. Monpetit, L'Etang La Ville; Herve Gueret, Versailles; J. V. Schneider, Mante La Ville, and J. W. Ufnalewski, Marly Le Roi, all of France, assignors to Societe Des Procèdes Modernes D'Injection Sopromi, Les Mureaux, France

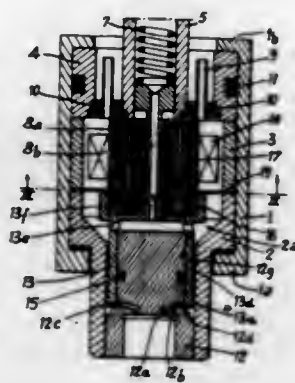
Filed Apr. 21, 1971, Ser. No. 135,962

Claims priority, application France, Apr. 22, 1970, 7014582

Int. Cl. B05b 1/30

U.S. Cl. 239-585

5 Claims



An electromagnetic fuel injector for internal combustion engines wherein the fuel is fed onto the periphery of an annular piston controlled by the armature of the injector electromagnet, so as to enter when the piston is raised an annular chamber communicating with the injection ports in the injector nozzle; said chamber is bounded by the nozzle and the free end of the piston one of the ridges of which cooperates with a seat formed by a frustoconical area on the nozzle, so as to close said chamber when the piston is urged onto its seat by a spring or by a hydraulic reaction.

3,735,928

**SPRINKLER MOUNTING AND PIPE CONNECTOR**

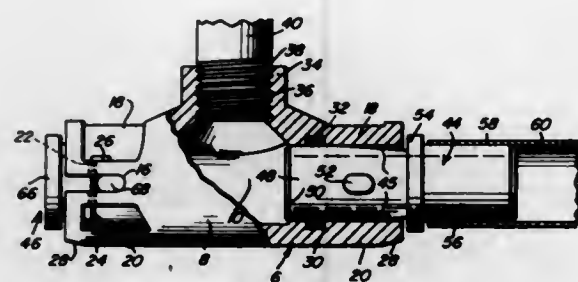
Thomas E. Watts, P.O. Box 534, and Clifford L. Ballard, P.O. Box 48, both of Shelley, Idaho

Filed Dec. 2, 1971, Ser. No. 203,965

Int. Cl. A01g 25/00; F16i 41/00

U.S. Cl. 239-267

4 Claims



A T-coupling for anchoring and supporting a vertical upstanding spray pipe having its upper end provided with an appropriate sprinkler head. The T-coupling comprises an elongated hollow body having a pair of horizontally aligned branches and a complemental upstanding vertical branch. The vertical branch supports the spray pipe. The respective horizontal branches are basically alike in that the outer end of each branch has diametrically opposite notches. These notches open outwardly and provide keyways. They also define upper and lower half portions which in turn are provided with paired keeper holes for L-shaped keeper pins. The notched horizontal branches serve to accommodate attachable and detachable fittings. One fitting comprises a sleeve and has diametrically opposite positioning and retaining lugs which are removably lodged in the keyways and held in place by the keeper pins. One fitting serves as a connector for the coacting end portion of a pipeline which delivers and feeds water to the coupling. The other fitting is provided with a flanged closing head and constitutes a closing plug for that end of the coupling with which it is cooperable.

3,735,929

**DEVICE FOR APPLYING A SELECTED MOISTURE CONTENT TO A WEB MADE OF A FIBROUS MATERIAL**

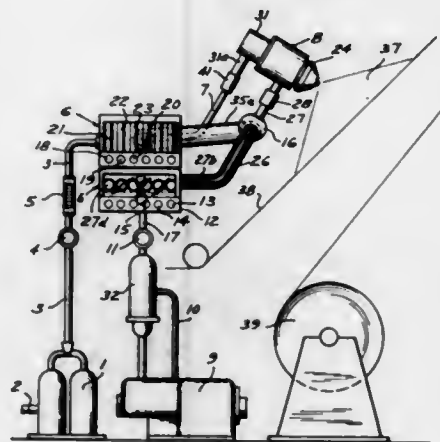
Hanns Dieter Pleines, Benzstrasse 47-49, Spremlingen-Hessen, Germany

Filed Sept. 24, 1970, Ser. No. 75,143

Int. Cl. B05b 7/32

U.S. Cl. 239-341

6 Claims



A dampening device applies a selected moisture content to a fibrous web such as a paper or textile web by spraying liquid in nebulized form upon the web. Solid, liquid or gaseous additives may be included in the stream of nebulized liquid at selected proportions. The liquid and the additives, if any, are

nebulized by feeding flows of liquid plus additives, if used, and air to spray nozzles which nebulize the liquid by the action of the air flows and direct cones of nebulized liquid upon the web in uniform distribution and at a minimum impact pressure thereby effectively avoiding spotting, discoloration and excessive moistening of the web material.

3,735,930

**FUEL INJECTION NOZZLE**

Yoshitaka Mori, Tarumi-ku, Kobe, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

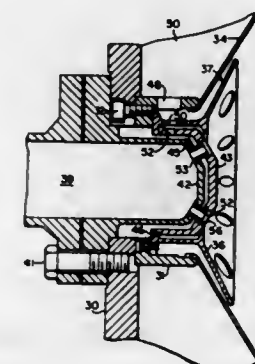
Filed Sept. 29, 1971, Ser. No. 184,676

Claims priority, application Japan, Nov. 30, 1970, 45/118098

Int. Cl. F23d 13/40

U.S. Cl. 239-419.5

5 Claims



A fuel nozzle structure for a combustion chamber, the downstream portion of the nozzle structure having a plurality of hollow nozzle inserts disposed therethrough, and a nozzle cover in spaced relation with the downstream nozzle portion and defining a cooling air passageway therebetween. The nozzle inserts project into apertures in the nozzle cover so that fuel can be projected through the cover and into the combustion chamber and the inserts being in spaced relation with the cover so as to allow cooling air flowing through the passageway to flow into the combustion chamber. This fuel nozzle structure prevents residues from collecting on the downstream nozzle portion.

3,735,931

**FLOTATION OF COPPER ORES**

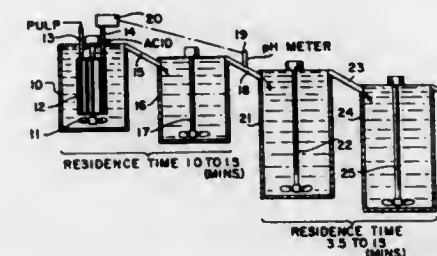
David Weston, Toronto, Ontario, Canada

Continuation of Ser. No. 37,679, May 15, 1970, abandoned, which is a continuation-in-part of Ser. No. 874,026, Nov. 3, 1969. This application July 19, 1972, Ser. No. 270,961

Int. Cl. B03b 1/04; B03d 1/02

U.S. Cl. 241-24

36 Claims



A process for the flotation of copper minerals employing sulfhydryl anionic collectors wherein the copper minerals are conditioned in at least one stage at a pH below 5.5 for a predetermined period followed by at least one further stage of conditioning for a predetermined period at a pH beginning above 9.0 in the presence of the collector, and the resulting pulp is subsequently subjected to froth flotation.

3,735,932

**SYSTEM FOR OVERCOMING TRANSPORT-PARTICLE-FLOW DEFICIENCIES INHERENT IN FEED GRINDING AND MIXING MACHINES USING DUST COLLECTORS FOR THE GRINDER**

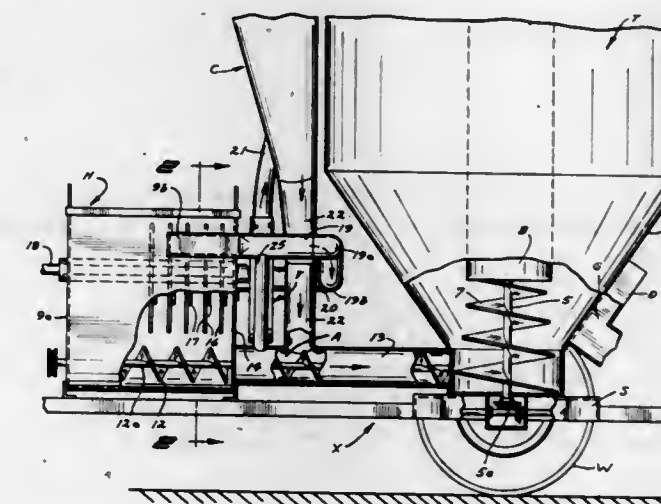
Richard S. Bradley, Fairmont, Minn., assignor to Art's-Way Manufacturing Company Incorporated, Armstrong, Iowa

Filed Dec. 8, 1971, Ser. No. 205,877

Int. Cl. B02c 13/288

U.S. Cl. 241-60

4 Claims



A new system for overcoming particle-flow deficiencies is readily applicable to most conventional feed grinding and mixing machines now in use by addition and connection of a minimal number of components. Said grinder mixers employ, in addition to the feed mixing mechanism and tank, a grinder, such as a hammermill, having its bottom discharge transport-connected to the lower portion of the feed mixing tank, usually by means of an enclosed screw conveyor. Said combination machines also employ an upstanding dust collector interspersed between the grinder and the screw conveyor and equipped with a power fan to remove the finer comminuted particles and dust from the interior of the grinder and to collect and communicate the same to an intermediate portion of the screw conveyor and into the stream of the larger ground particles. The screw conveyor builds up pressure throughout its length with the result that upward air pressure is applied at the communication point with the depending discharge of the dust collector, producing upward blowout and often clogging. Also, in present machines back pressure is created at the extreme discharge of the screw conveyor into the tank. The new system applies a predetermined degree of suction to the pressure build up area near or at the discharge tube of the dust collector, thereby relieving the accumulated pressure in said conveyor at the point of connection with the dust collector and also at the ultimate discharge of the conveyor into the bottom portion of the mixing tank.

3,735,933

**DISPOSAL MACHINE FOR CUTTINGS OR THE LIKE**  
James Samuel Campbell, 74 Sleepy Hollow Lane, Orinda, Calif.

Filed Apr. 1, 1971, Ser. No. 130,093

Int. Cl. B02c 13/06

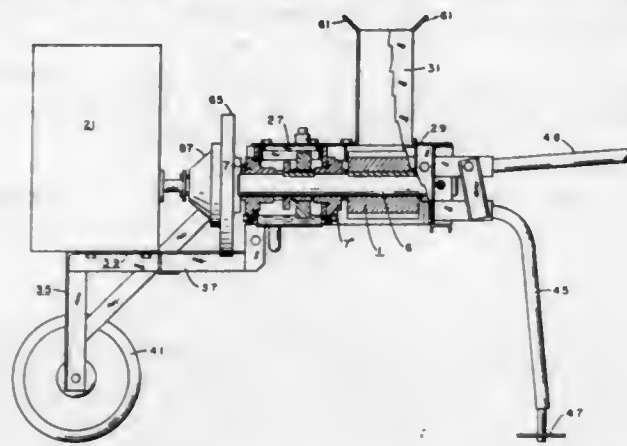
U.S. Cl. 241-236

4 Claims

Apparatus for the disposal of cuttings or the like adapted to cut, tear and compress such cuttings to prepare the same for composting, involving a pair of adjacent parallel disposed contra rotating rotors, each of the rotors having circumferentially



spaced blades at a rake angle in the direction of rotation, with the blades of one overlapping those of the other rotor during



rotation, and means for guiding material to said rotors at the location where the blades of each rotor approach the blades of the other.

3,735,934

## GOLF BALL RETRIEVING APPARATUS

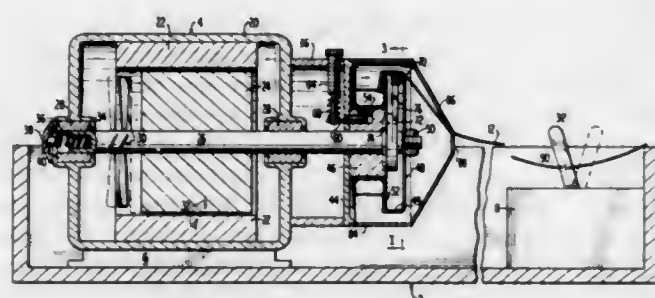
George W. Black, 902 East Pershing, Riverton, Wyo.

Filed July 30, 1970, Ser. No. 59,412

Int. Cl. A63b 69/36

U.S. Cl. 242—54 R

7 Claims



Apparatus for retrieving a golf ball, wherein a line is attached to the ball and a reel automatically rewinds the line to return the ball after the ball has been driven. The motor is connected with the reel through a clutch that allows the line to be unwound from the reel with a selected tension and to be rewound by the motor.

## ERRATUM

For Class 242—71 see:  
Patent No. 3,736,015

3,735,935

## REEL HUB ASSEMBLY

Robert A. Nordmeyer, Los Angeles, Calif., assignor to Pertec, Chatsworth, Calif.

Filed Dec. 27, 1971, Ser. No. 212,318

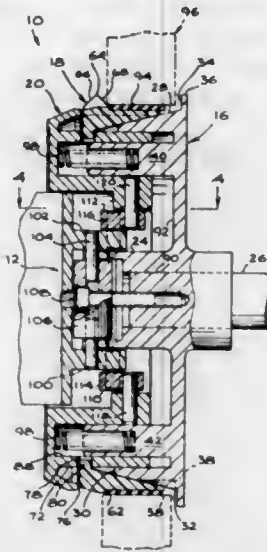
Int. Cl. B65h 19/02, 75/34

U.S. Cl. 242—68.3

9 Claims

A hub assembly actuable to selectively lock and unlock a reel thereon. The hub assembly is particularly useful with magnetic tape reels for enabling a reel to be locked onto the hub for rotation therewith. With the hub assembly unlocked, the reel can be easily placed on or removed from the hub assembly. The hub assembly includes a cylindrical drive plate secured to a drive shaft. The circumferential surface of the

drive plate is formed by an inclined plane terminating in a flange defining a radially extending reference surface. A pressure plate is mounted substantially parallel to the drive plate for limited axial movement with respect thereto in response to the movement of an actuator handle coupled to the pressure plate. As the actuator handle is moved from an unlocked to a locked position, the pressure plate moves toward the drive plate exhibiting a travel stroke on the order of 0.120 inches.



The pressure plate bears against an expansion ring which expands as it moves axially up the drive plate inclined plane to press outwardly against the inner surface of a tape reel. The expansion ring is provided with several protrusions beveled to define inclined planes for forcing the tape reel axially against the flange reference surface as the ring expands. The linkage coupling the actuator handle to the pressure plate is designed to assure stable retention of the actuator handle in either the locked or unlocked position.

3,735,936

## WEB SEPARATING DEVICE

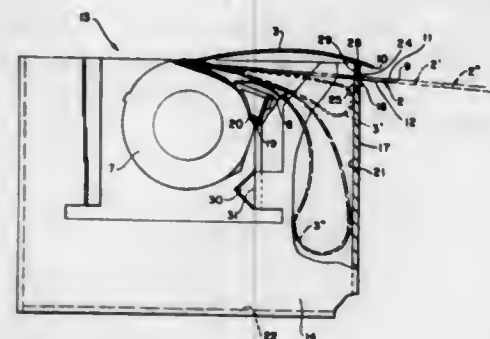
Anthony C. D. Ercole, and David N. Schwardt, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 29, 1971, Ser. No. 167,195

Int. Cl. G03b 23/04

U.S. Cl. 242—71.1

7 Claims



An enclosure is adapted to receive a cartridge in which first and second webs are wound in substantially contiguous relation on a common core, the cartridge being provided with an opening through which such webs can be advanced. The enclosure includes a wall member in which a web egress slot is disposed and a projecting member which is engageable with a corresponding member of the cartridge. When so engaged, the cartridge will be oriented within the enclosure in a manner such that if the first and second webs are advanced from the cartridge opening, the first web will be positioned for movement through the web egress slot, and the second web will be

positioned to abut against the wall member of the enclosure and thus separate from the first web upon movement of the first web through the web egress slot. The periphery of the web egress slot is shaped to support the opposed edges of the first web while maintaining a spaced relation with at least one of the web faces. To facilitate insertion of a free leading end of the first web into the web egress slot, the wall member includes an open-ended guideway which communicates with the slot so that such web end can be readily directed into the slot.

3,735,937

## CONTINUOUS SHEET SLITTING MILLS

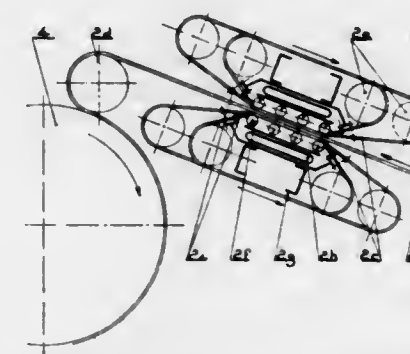
Bernard Plantard, 14, rue du Clos-des Moines 95, Argenteuil, France

Filed Feb. 8, 1971, Ser. No. 113,304

Int. Cl. B65h 23/10, 23/30

U.S. Cl. 242—75.2

21 Claims



In a mill for slitting wide sheets a tensioning device is provided for simultaneously braking, without any friction effect, a plurality of strips to be subsequently reeled on a same coiling drum, wherein the necessary braking effort is transmitted to endless belts, the braking means are adapted to impart different speeds to said endless belts which are equal to the speeds of the cut strips to be braked, respectively.

3,735,938

## APPARATUS AND METHOD FOR WINDING WIRE ON COILS

Frans Coopman, B 8730 Harelbeke, Belgium, assignor to N.V. Bekaert S.A., Zvevegam, Belgium

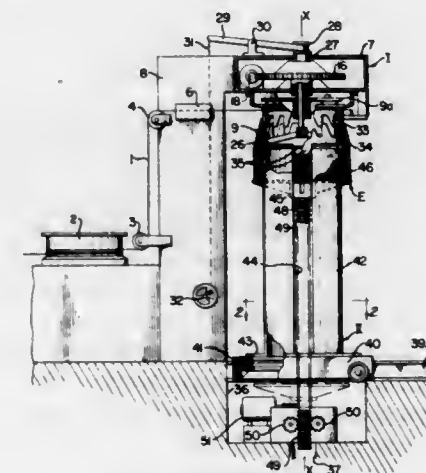
Filed July 12, 1971, Ser. No. 161,822

Claims priority, application France, July 20, 1970, 7026615

Int. Cl. B21c 47/02

U.S. Cl. 242—83

10 Claims



An apparatus and method for winding wire on coils is disclosed in which the apparatus includes a wire winding device and a coil reception device. Means are provided for maintaining an axial force on the end of the coil disposed on the wire winding device and a support means for maintaining an axial

force on the other end of the coil disposed on the coil reception device. Operating means are provided for moving the support means to release the axial force on the other end of the coil thereby causing movement of the coil on the coil reception device and actuating means are provided to activate the operating means in response to an increase in the axial forces on the coil.

3,735,939

## TAPE CASSETTE

Katsu Inaga, Satagaya-ku, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

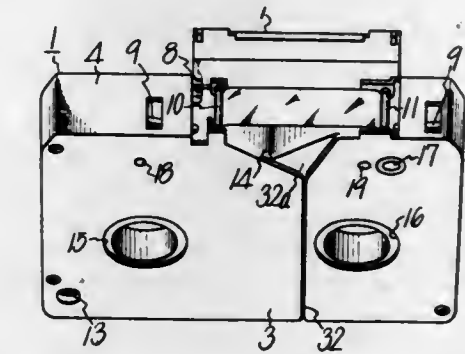
Filed Aug. 9, 1971, Ser. No. 170,214

Claims priority, application Japan, Aug. 10, 1970, 45/79548

Int. Cl. G03b 1/04; G11b 15/32, 23/04

U.S. Cl. 242—198

7 Claims



A tape cassette for magnetic tape apparatus for recording or reproducing or both and which has a housing formed by walls and in which one of the walls has formed therein a cutout and a slot contiguous thereto for engagement with one part of the apparatus to guide the tape cassette to a proper position of the apparatus.

3,735,940

## IDLER ASSEMBLY FOR TAPE CASSETTE

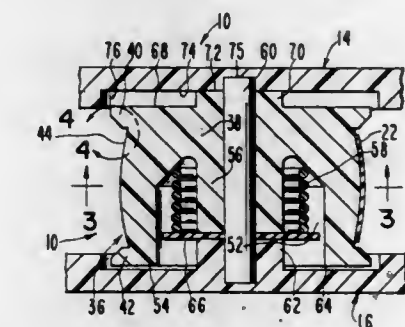
Vern R. Schwartz, Cupertino, Calif., assignor to Information Terminals Corp., Mountain View, Calif.

Filed Feb. 5, 1971, Ser. No. 112,984

Int. Cl. G11b 23/10; B65h 27/00

U.S. Cl. 242—199

8 Claims



An improved idler assembly for use as a tape guide in a tape cassette, especially a Phillips type tape cassette, wherein the assembly includes an idler rotatably mounted between the spaced, opposed walls of the cassette and having an outer, tape-engaging surface which is convex to present a crown to keep the tape centered on the idler as the tape moves partially about the idler and as the idler rotates in the cassette. The idler has a bore extending into one end face thereof and a coil spring in the bore biases the idler toward one wall of the cassette. The idler has a pair of end flanges with each flange having a barrier surface preventing any substantial axial movement of the tape relative to the crown.



3,735,941

## REEL FOR WEB MATERIAL

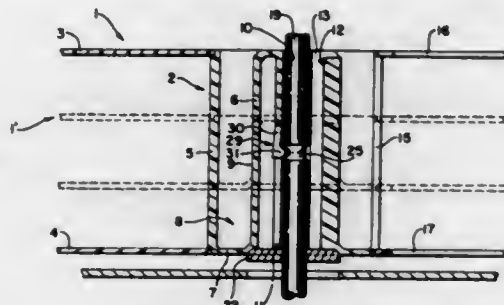
Gordon P. Brown, 36 Solman Dr., Rochester, and Andrew V. McClure, 47 Wincanton, Fairport, both of N.Y.

Filed July 26, 1971, Ser. No. 166,050

Int. Cl. B65h 19/02

U.S. Cl. 242—68.3

3 Claims



A reel for web material, including two spaced opposed flange members, is provided with a hub member which has an outer tubular portion supporting the flange members and an inner core portion disposed within the first-mentioned portion in radially spaced relation. An opening in the core is adapted to receive a drive spindle for rotation of the reel. A flexibly movable finger member of the reel hub is supported, in a cantilevered manner, within a core slot which communicates with the core opening. This finger member has a cam detent which is adapted to impart flexing movement to the finger member and to engage an engageable portion of the drive spindle for securing the reel on such spindle. Since the cam detent is disposed at a location which is substantially midway between the reel flanges, reels of the foregoing kind having different flange member spacing for supporting various width webs can be respectively located on the drive spindle in a manner whereby the longitudinal center line of each supported web will be disposed in the same position with respect to such spindle.

3,735,942

## SPACE STATION WITH SOLAR GENERATORS

Wolfgang Palz, Paris, France, assignor to Centre National D'Etudes Spatiales, Paris, France

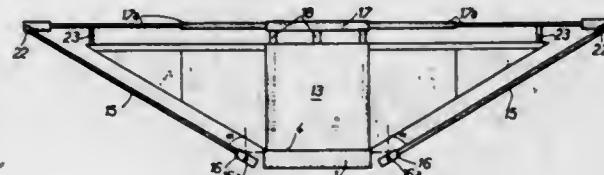
Filed Mar. 4, 1971, Ser. No. 120,976

Claims priority, application France, Mar. 5, 1970, 7007954

Int. Cl. H011 15/02

U.S. Cl. 244—1 SS

6 Claims



A solar generator has flexible panels adapted to be deployed by means of extensible frame means. The flexible active material of each panel is so arranged and the extensible frames so operated that the development of the panel takes place not only in the longitudinal direction away from the base, but also in the transverse direction. The panels are adapted for use on satellites or other space vehicles.

3,735,943

## SPACE STATION WITH SOLAR GENERATORS

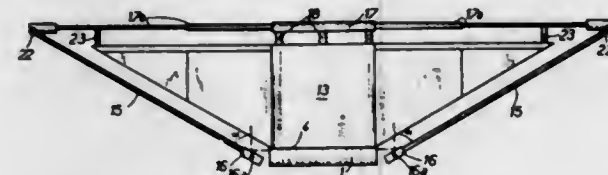
Philippe Fayet, Avon, France, assignor to Centre Nationale D'Etudes Spatiales, Paris, France

Filed Mar. 5, 1971, Ser. No. 121,500

Claims priority, application France, June 19, 1970, 7022716

Int. Cl. H011 15/02  
U.S. Cl. 244—1 SS

4 Claims



A solar generator has flexible panels adapted to be deployed by means of extensible frame means. The flexible active material of each panel is so arranged and the extensible frames so operated that the deployment of the panel takes place not only in the longitudinal direction away from the base, but also in the transverse direction. The panels are adapted for use on satellites or other space vehicles.

3,735,944

## DUAL MODE GUIDANCE AND CONTROL SYSTEM FOR A HOMING MISSILE

Roger J. Bennett, Willow Grove, and Roland S. Hal, Jr., Ivyland, both of Pa., assignors to the United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 25, 1971, Ser. No. 156,672

Int. Cl. F41g 7/00, 7/10

U.S. Cl. 244—3.15

8 Claims



A missile guidance system having two control modes alternatively controlling the thrust vector of the missile. The first control mode provides turning commands for substantially aligning the missile towards an airborne target, and the second control mode controls the missile on a homing path in pursuit of the target once the missile is aligned. A threshold detector operates switches for selectively enabling the control modes, where the first mode is enabled at an angular rate of the target line-of-sight above a predetermined threshold and the second mode is enabled at a light-of-sight rate below the threshold. The first mode provides thrust vector control signals corresponding to a signal sum of the component angle signals of the line-of-sight emitted by a narrow field of view infrared sensor mounted on the missile and continuously locked on to the target, angular rate signals of the line-of-sight, and acceleration signals emitted by an accelerometer having orthogonal sensing axes normal to the line-of-sight. The second mode provides thrust vector control signals corresponding to the difference between the signal sum of the first mode and accelerometer signals emitted by an accelerometer mounted on the missile having orthogonal sensing axes normal to the missile.

3,735,945

## YAW CONTROL SYSTEM FOR AN AIR VEHICLE

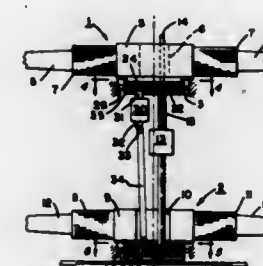
Marius E. Huvers, Ste Therese, Quebec, Canada, assignor to Canadian Limited, St. Laurent, District of Montreal, Quebec, Canada

Filed Mar. 29, 1971, Ser. No. 128,712

Claims priority, application Canada, Apr. 24, 1970, 081046

Int. Cl. B64c 27/12  
U.S. Cl. 244—17.19

15 Claims



An air vehicle having a pair of contrarotating rotors is provided with a yaw control system including a variable clutch operatively associated with a differential gearbox in such a manner that the energization of the clutch will produce a variation in the relative speeds of rotation and torques of two rotating elements driven by the differential gearbox and drivingly connected to a respective one of each of the two contrarotating rotors.

3,735,946

## AIRCRAFT ENGINE MOUNTINGS

John Albert Mullins, Chellaston, Derby, England, assignor to Rolls Royce Limited, Derby, England

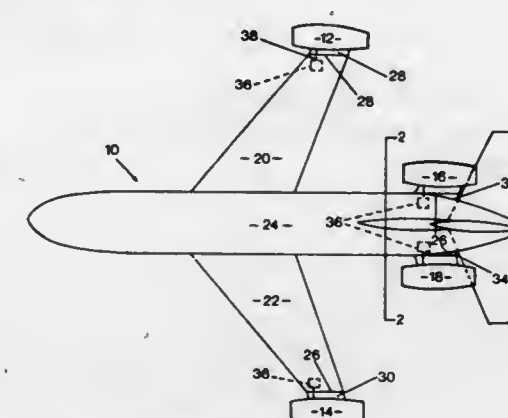
Filed July 7, 1971, Ser. No. 160,318

Claims priority, application Great Britain, July 9, 1970, 33,316/70

Int. Cl. B64d 27/18, 27/20

U.S. Cl. 244—54

3 Claims



A multi engined aircraft is provided with standardized engine mounting points which enables an engine to be removed from one side of the aircraft and fitted to the opposite side thereof, so as to broaden the range of engine interchangeability.

3,735,947

## CUSHIONED, BARREL-CURVED, WRECK-RESISTANT VEHICLE

Alvin Edward Moore, 916 Beach Boulevard, Waveland, Miss.

Filed Dec. 29, 1970, Ser. No. 102,321

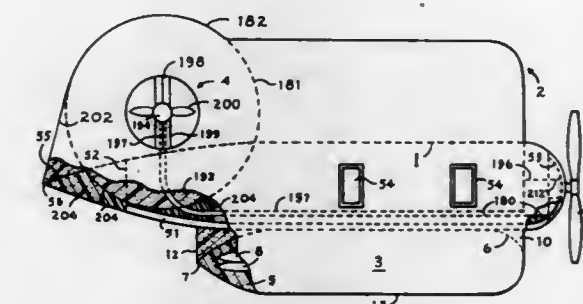
Int. Cl. B64c 1/06

U.S. Cl. 244—119

28 Claims

A strong, light-weight, shock-absorbing vehicle having: a barrel-curved cabin, with surfaces curved inward toward the cabin's axis and hollow elements in the sidewalls; cushioning means, mostly below the cabin, comprising a long pad (FIG. 1) or a tandem pair of spaced pads (FIGS. 2 and 3) (optionally

floating, landing or wheel-supporting means — preferably hydrofoils; stiffly resilient means, comprising inflated tubes and resilient plastic, connecting the pad or pads with the cabin; balloon means connected to the top of the cabin, stabilizing it against rolling and pitching; and a powered, reversible steering propeller for holding the high craft on course against strong winds. The preferred balloon is much larger than the cabin, and the preferred shock-absorbing means is



shown in FIG. 3. The cushioning means of FIG. 2 or 3 comprises flattened corners at 29 of the main, elongated, plastic-sheathed, pad-supporting tubes (14, 16, 18), and as in FIG. 3 preferably comprises diagonal, inflated, bracing members (49, 50). The cabin comprises barrel-curved, stave-like members, bonded together at their sides, and clamped together with barrel-hoop-like rings or other looped means. These members may be arranged in the circular-in-cross section cabin form of FIGS. 2 and 3 or the oblong-in-cross-section form of FIG. 13.

3,735,948

## ROCKET CATAPULT

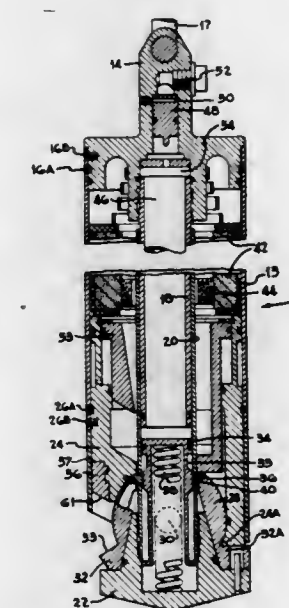
Hugh D. MacDonald, Cinnaminson; Norman J. Waecker, Masonville, and Charles S. Sterrett, Meadowville, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 1, 1971, Ser. No. 148,562

Int. Cl. B64d 7/00, 11/06

U.S. Cl. 244—122 A

12 Claims



A rocket catapult ejection arrangement for a seat-occupant mass of a disabled aircraft in which the longitudinal axis through the nozzle throat of the rocket motor is always operatively directed toward the center of gravity of the seat-occupant mass regardless of individual seat elevational adjustments affected for any of various flight condition improvements.



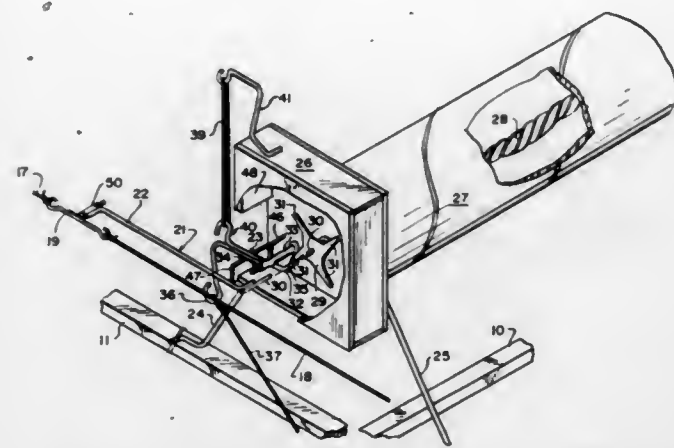
3,735,949

## KITE

James V. Theis, Jr., 3324-B Western Avenue, Park Forest, Ill.  
Filed Mar. 12, 1971, Ser. No. 123,671  
Int. Cl. B64c 31/06

U.S. Cl. 244—155 A

8 Claims



A kite that is maneuverable from the ground and that has as part of its bridle device a laterally extending cord mounted on the kite frame for lateral movement and a movable member also mounted on the frame and attached to the bridle device for moving it in increments upon manipulating a kite controlling cord. This lateral movement of the bridle device changes the relative point of attachment of the cord to the kite, as desired, so that the flying characteristics of the kite are similarly altered.

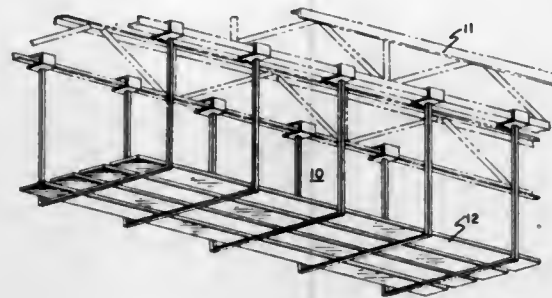
3,735,951

## SUSPENDED MOVABLE SCAFFOLD

Philip E. Reed, 4818 Grover Street, Boise, Idaho  
Filed July 28, 1971, Ser. No. 166,895  
Int. Cl. E04g 3/14

U.S. Cl. 248—340

1 Claim



The present invention comprises a substantially U-shaped truss member including a flat base and a pair of opposing perpendicular legs carried upstanding to support and carry deck planking forming a work platform of the scaffold; and a substantially C-shaped rafter engaging bracket suitably fastened to the terminal ends of the upstanding legs of the truss portion operable to slidably engage ceiling rafters commonly employed in building construction, each bracket being provided with a bracket closure bolt pivotally mounted to the lower portion of each of the C-shaped brackets and engageable with the top plate thereof.

3,735,952

## ENERGY ABSORBING SHOCK ISOLATION STABILIZING ARRANGEMENT

David L. Platus; David A. Lee, and Gernot Harold Klein, all of Los Angeles, Calif., assignors to Mechanics Research Inc., Los Angeles, Calif.

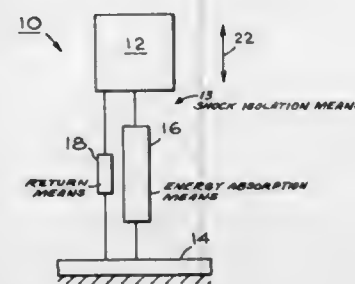
Filed Feb. 13, 1970, Ser. No. 11,284

Int. Cl. F16d 63/00; F16f 13/00, 15/04

U.S. Cl. 248—358 R

33 Claims

U.S. Cl. 248—358 R



An energy absorbing shock isolation stabilizing arrangement for providing shock and vibration isolation of an object within a supporting enclosure. The arrangement provided is passive and has energy absorption means for absorbing energy during relative motion of the object within the enclosure from a base position to displaced positions at a comparatively high energy absorption rate that preferably is constant and substantially independent of the magnitude of the relative velocity. Restoring means comprising return means also are included for returning the object from the displaced position to the base position and a comparatively low level of energy is absorbed during this return. Such shock isolation can be provided for each degree of freedom of the object within the enclosure.

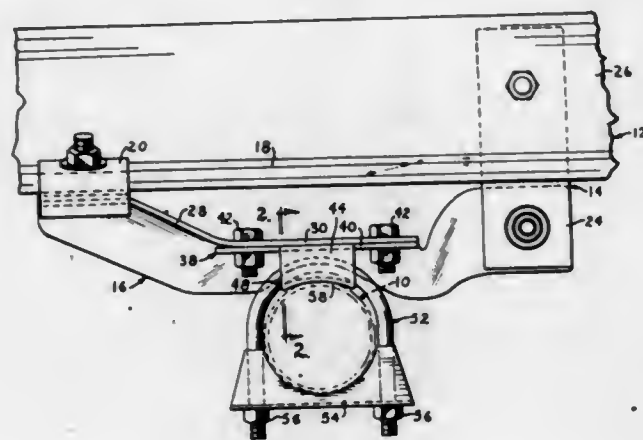
3,735,950

## HANGER ASSEMBLY FOR AUTOMOBILE EXHAUST SYSTEMS

John D. Paintin, 8125 Dearborn, Prairie Village, Kans.  
Filed June 28, 1971, Ser. No. 157,337  
Int. Cl. F16l 3/02

U.S. Cl. 248—62

3 Claims



An attachment for installation of automobile exhaust system replacement components comprising a baseplate configured to be bolted to the frame mounted hanger bracket. The base plate has a hook depending from one edge with an arcuate upper surface adapted to receive the bight of a U-clamp with the legs thereof extending downwardly from the hook. The replacement components are installed between the clamp legs from below and the clamp is closed below the components to secure the latter to the vehicle frame.

3,735,953

## CONCRETE BEAM FORMS

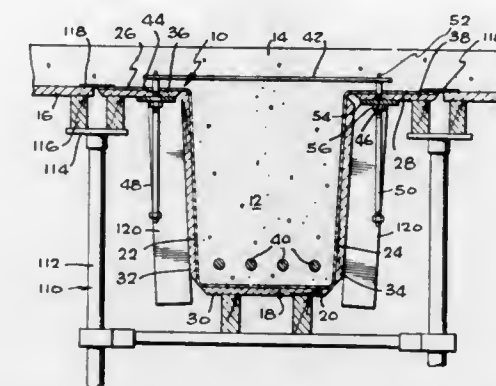
Stephen S. Dashew, Los Angeles, and Arnold Wills, Lakeview Terrace, both of Calif., assignors to La Mesa Industries, Los Angeles, Calif.

Filed Apr. 22, 1970, Ser. No. 30,872

Int. Cl. E04g 11/42

U.S. Cl. 249—28

6 Claims



Apparatus for forming concrete beams integrally with concrete floors comprising an elongated beam form with bottom and side walls and with flanges extending outwardly from the top of the side walls. A pair of rods projected upwardly through holes in opposite flanges, are tied by a steel strap to prevent spreading of the side walls when concrete is poured into the form. After the concrete sets, the rods are pulled out, the form stripped, and the strap left in place. The elongated beam forms have end portions, where the lower walls are stepped down and the side walls stepped outwardly, and a pair of aligned beam forms is joined by an adjustment form section which lies within the stepped end portions of the beam forms.

3,735,954

## GAGING DEVICE AND METHOD

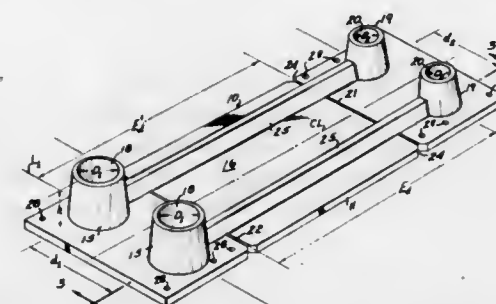
Richard W. Mullin, Columbus, Ga., and David L. Robb, Sanford, Fla., assignors to Insulation Corporation of America, Columbus, Ga.

Filed Feb. 17, 1971, Ser. No. 116,139

Int. Cl. B28d 7/04

U.S. Cl. 249—91

5 Claims



A gaging and location device and method of using same for use in locating anchor fasteners in concrete poured within a form wherein the device includes a base plate constructed and arranged to be selectively attached to the form before the concrete is poured, the base plate defining a plurality of apertures therethrough having a location corresponding to the desired spacing of the fasteners, indicator means on the base plate having a predetermined location with respect to the plurality of apertures for alignment with the inside edge of the form to selectively locate the apertures with respect to the form, and bushing means carried by the base plate about the apertures and defining a central passage therein aligned with the apertures for receiving the fasteners therein and supporting the fasteners at a predetermined location with respect to the form while the concrete is poured.

The method of using the device includes the steps of placing the concrete forms, inserting the threaded end of the fasteners through the apertures and passages in the device, threading a nut onto the end of the fastener protruding above the bushing means until the end of the fastener is flush with the outermost side of the nut, and attaching the device to the form so that the indicator means is aligned with the inside edge of the form.

3,735,955

## COMBINATION TILT OR AXIALLY RECIPROCAL ACTION VALVE

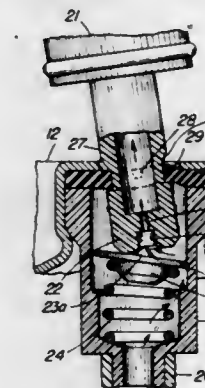
David Kerr, Des Plaines, Ill., and Willard S. Curtis, Brooklyn, N.Y., assignors to Precision Valve Corporation, Yonkers, N.Y.

Filed Oct. 22, 1970, Ser. No. 82,928

Int. Cl. F16k 11/00

U.S. Cl. 251—303

2 Claims



A pressurized container valve is capable of being actuated by either axial or tilting motion. Separate product passages leading to separate valve orifices are independently opened by distinct movements of the valve body to afford alternate independent paths to the discharge nozzle. These plural paths thereby prevent disabling of the container through clogging of a single orifice.

3,735,956

## BALL VALVE AND IMPROVED SEAT ARRANGEMENT

Stephen Matousek, Moraga, Calif., assignor to Whitley Research Tool Co., Emeryville, Calif.

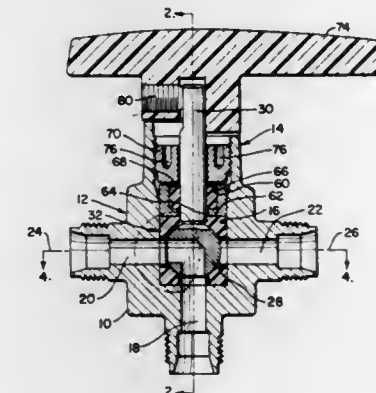
Continuation of Ser. No. 41,503, May 28, 1970, abandoned.

This application Apr. 10, 1972, Ser. No. 242,861

Int. Cl. F16k 5/06

U.S. Cl. 251—315

4 Claims



The specification and drawings show a ball valve including a housing defining a valve chamber which is of cylindrical configuration. Inlet and outlet flow passages extend into the housing and connect with the chamber. A ball member is positioned in the chamber with its center located generally at the



intersection of the axes of the flow passage and the axis of the chamber. A resilient, resinous packing completely encloses the ball and fills substantially all voids between the ball and the inner walls of the chamber. Circular ports are formed through the packing at locations aligned with the inlet and outlet passages and the center of the ball. The outer ends of the ports terminate at the inner of the chamber and about the associated passageway, whereas, the inner ends of the ports terminate adjacent the surface of the ball. A circumferential, cylindrical recess is formed inwardly from the outer end of each port and terminates closely adjacent the inner end of the port to leave a continuous circumferential lip of packing material extending radially inwardly of the port adjacent the ball. Positioned in each recess is a relatively rigid ring member having an axial opening of a diameter substantially equal to the diameter of the associated passage, and an outer diameter which engages the wall of the recess. The axial length of the ring is substantially equal to the length of the recess. Preferably, the inner end of the ring closely engages the lip, whereas the outer end is shaped to engage the inner wall of the chamber about the associated port.

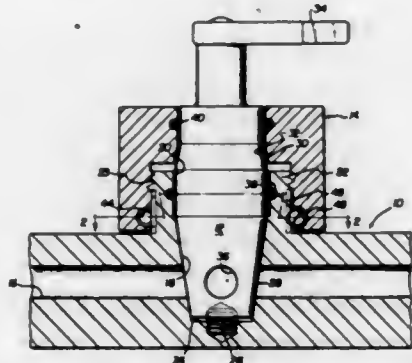
### 3,735,957 VALVE

Anderson Duggar, Jr., 4350 Delmere, Royal Oak, Mich.  
Filed Oct. 14, 1971, Ser. No. 189,460

Int. Cl. F16k 25/00

U.S. Cl. 251-330

1 Claim



A valve suitable for high pressure applications comprises a plug with a transverse bore which is rotatable through ninety degrees to bring the bore either into or out of registry with the conduit bore for the respective on and off positions. The plug has conically tapering portions which converge toward each end to cooperate with complimentary tapered bores in the valve housing to provide seals in the respective open and closed positions as the plug moves axially slightly during its rotation between such positions. Tightening of the valve cap on the valve housing threads is achieved by a screw which passes through the cap tangentially to and in engagement with spline-like teeth on the housing, rotation of the seated screw causing rotation of the cap on the housing.

### 3,735,958

#### HIGH RISE TRANSMISSION JACK

Elmont E. Hollingsworth, St. Joseph, Mo., assignor to Gray Manufacturing Company, Inc., St. Joseph, Mo.  
Filed Nov. 15, 1971, Ser. No. 198,922

Int. Cl. B60p 1/00; B66f 3/24

U.S. Cl. 254-2 R

18 Claims

A high rise lifting jack, for use in handling transmissions or the like, having a pair of vertically extensible members telescopically received within a housing, one of the members being pneumatically actuated and the other being hydraulically actuated. Means secured to the housing at ground level control pneumatic raising during a first stage of operation, and means disposed adjacent and traveling with a load-carrying

station at the upper end of the jack control hydraulic raising of the load station during a second, subsequent operating stage.



Locking means secure the pneumatic member to the housing to positively support the load station during hydraulic raising.

### 3,735,959

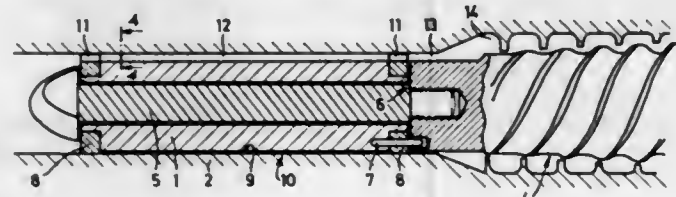
APPARATUS FOR DISAGGLOMERATING MATERIAL  
Hans Keinath, Frankfurt (Main); Klaus Kroger, Offenbach (Main), and Robert Lauerbach-Lehmeier, Frankfurt (Main), all of Germany, assignors to Zimmer Aktiengesellschaft, Frankfurt (Main), Germany

Filed Oct. 13, 1970, Ser. No. 80,264

Int. Cl. B01f 7/00; B02c 23/02

U.S. Cl. 259-7

4 Claims



Apparatus for disagglomerating pigment in fiber-forming resinous material having a body member containing a cylindrical bore and an inlet and outlet passage for passing said material axially through the apparatus; a rotor mounted within said bore having a polygonal cross section. The ridges of the polygonal rotor are rounded and slightly spaced from the bore. The material is subjected to shearing forces to effect disagglomeration as it moves circumferentially between the ridges and the surface of the bore.

### 3,735,960

#### CONTINUOUS MIXER

Hans Albert Bosch, Streamwood, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 28, 1972, Ser. No. 229,690

Int. Cl. B01f 7/16

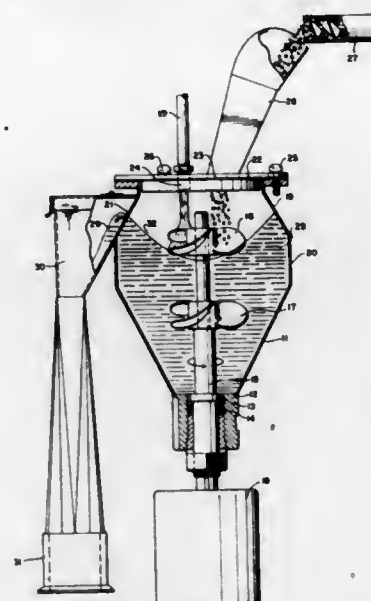
U.S. Cl. 259-8

4 Claims

A continuous mixer for mixing pancake and waffle batter and the like is disclosed having a mixing vessel having a conical shaped lower section and a cylindrical shaped upper section, two downward pushing propellers in the center of the

mixer, a material removing port near the top of the mixer, means for rotating the propellers to create a vortex extending

crank to a jar receiving structure free to move within the housing within limits defined by a restraining spring. The structure



into the material removing port, and means for supplying material above the top propeller.

### 3,735,961

#### OSCILLATORY DEVICE FOR PHOTOGRAPHIC PROCESSING

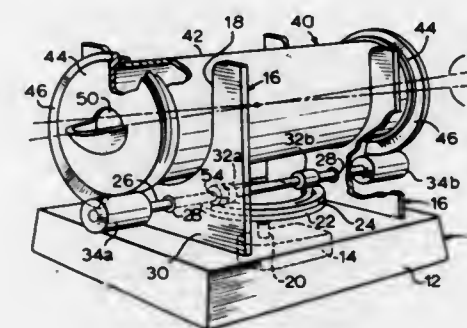
Gordon George Taylor, Toronto 3, Ontario, Canada, assignor to Moarick Holdings Limited, Downsview, Ontario, Canada  
Filed Feb. 22, 1972, Ser. No. 227,973

Claims priority, application Canada, Dec. 8, 1971, 129612

Int. Cl. B01f 9/00

U.S. Cl. 259-72

6 Claims



A device for oscillating a horizontally disposed carrier about a fulcrum centrally located on its longitudinal axis, the carrier having spaced circumferential cams. A frame locates the carrier on a horizontal rod which is rotated reciprocally by a semicircular cam on a flat disc which sequentially engages a pair of cam rollers on the rod as the disc is rotated unidirectionally.

### 3,735,962

#### AUTOMATIC JAR SHAKER

Henry A. Pagano, Syracuse, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

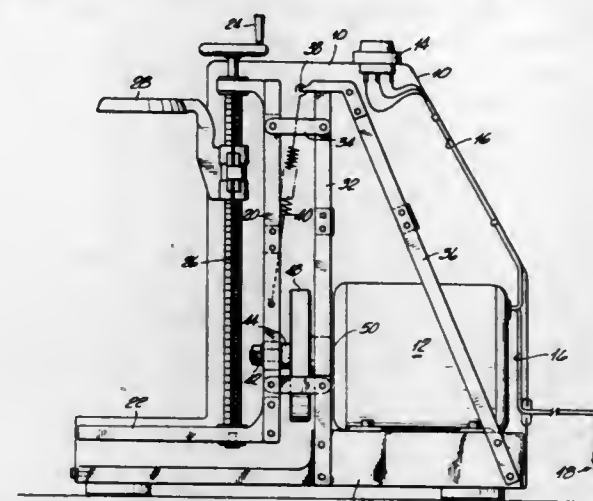
Filed Nov. 23, 1971, Ser. No. 201,326

Int. Cl. B01f 1/00

U.S. Cl. 259-72

1 Claim

An electric motor drives a flywheel connected by an offset



is adjustable to receive and hold different sizes of jars. A timer controls duration of motion action.

### 3,735,963

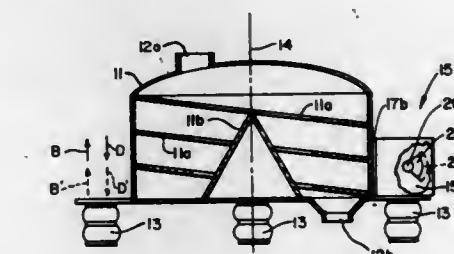
APPARATUS FOR AGITATING FLOWABLE MATERIAL  
George D. Dumbaugh, Louisville, Ky., assignor to Vibranetics, Inc., Louisville, Ky.

Filed Nov. 11, 1971, Ser. No. 197,794

Int. Cl. B01f 1/00

U.S. Cl. 259-72

23 Claims



This invention provides novel apparatus for agitating flowable material. Basically, the apparatus provided by the present invention comprises generally vertically arranged container means, in combination with mounting means for supporting the container means for limited movement relative to its generally vertical axis and drive means for independently first twisting the container means about its generally vertical axis and then moving the container means along that axis such that the material is induced to move within the container means.

### 3,735,964

#### POWERED MECHANICAL SHAKER DEVICE

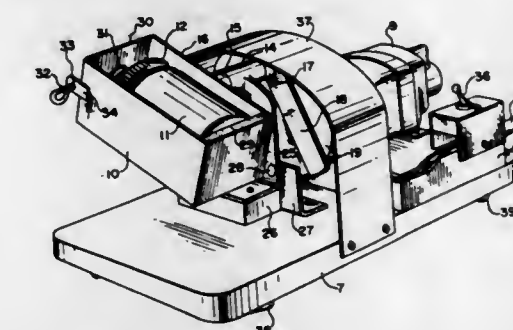
Robert K. Lorenzen, Box 14, Shirland, Ill.

Filed Feb. 7, 1972, Ser. No. 223,948

Int. Cl. B01f 1/00

U.S. Cl. 259-75

10 Claims



An open top, open end cradle for the jar containing the material to be mixed by shaking has a resilient pad in one end



cooperating with a coiled compression spring on a hinged closure at the other end that is suitably secured in closed position, as by a cross-in, is subjected to vigorous oscillation with minimum vibration of the support on which the electric drive motor furnishing the power is mounted, suitable cushioning friction pads and feet secured to the bottom of the base, reducing likelihood of creeping relative to a table top or the like on which the shaker may be set. A supporting boss centrally located on one side of the cradle assures good balance as the axis of oscillation extends substantially through the center of the load being oscillated, which accounts for the small vibration involved in the operation of the device, and the horizontal drive shaft extending from the boss is carried in a bearing fixed to and extending upwardly from the base, so that a radius arm attached to the driven end of the shaft can be operated directly by a roller carried on a driven disk mounted on the end of the armature shaft of the aforesaid motor, the roller operating lengthwise of a groove provided in one side of the aforesaid radius arm to give simple harmonic motion with quiet and smooth operation and substantially a minimum number of parts required and the maximum compactness. A generally U-shaped inverted guard carried on the base encloses the aforesaid disk and radius arm for safety in operation.

3,735,965

## FURNACE CARRIER AND HANDLING SYSTEM

James A. Way, Mountain View, Calif., assignor to H.L. Schoger & Associates, Inc., Santa Clara, Calif.

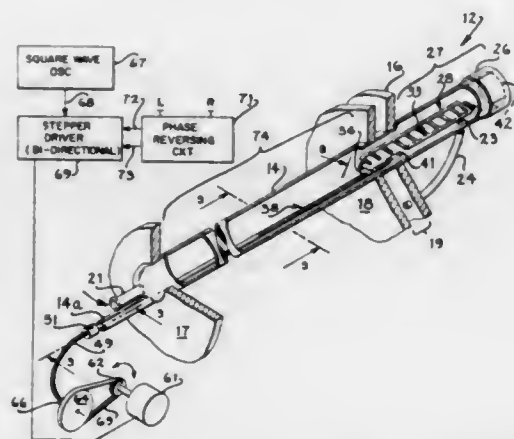
Continuation of Ser. No. 101,036, Dec. 23, 1970, abandoned.

This application Feb. 29, 1972, Ser. No. 230,500

Int. Cl. F27b 9/14

U.S. Cl. 34-227

7 Claims

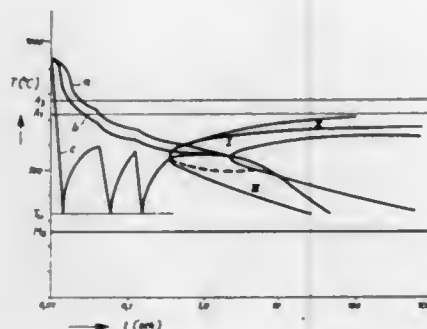


In an impurity treatment chamber, such as a gas diffusion furnace or the like, of a type having means for passing gases into and out of a chamber for treating semiconductor elements disposed therein, a carrier is movable longitudinally thereof and adapted to support semiconductor elements within the chamber. An elongated screw mounted for rotation within the chamber adjacent to the bottom thereof cooperates with a follower portion formed on the carrier for engaging the threads of the screw for positive movement of the carrier in response to rotation of the screw. Motive means rotate the screw so as to positively drive the carrier between advanced and retracted positions within the chamber and to oscillate the carrier within the chamber over a short distance so as to preclude adhesion or sticking of the parts of the system which would otherwise make difficult the withdrawal of the carrier from the chamber.

3,735,966  
METHOD FOR HEAT TREATING STEEL WIRE ROD  
Bernd Hoffmann, Dusseldorf, Germany, assignor to Schloemann Aktiengesellschaft, Dusseldorf, Germany  
Continuation of Ser. No. 743,101, July 8, 1968, abandoned.  
This application June 7, 1971, Ser. No. 150,806  
Int. Cl. C21d 9/52

U.S. Cl. 266-3 R

3 Claims



Patenting hot-rolled rod with alternate quenching and heat compensation stages before transformation; the quenching stations decrease logarithmically and the compensation stages increase logarithmically; the surface of the rod reaches is cooled down to below about 400°C, and the rod begins to transform in the pearlite zone before full temperature equalization, the rod being reeled when a substantial peripheral zone of the rod has been predominantly transformed to pearlite.

3,735,967

## WATER QUENCH METHOD AND APPARATUS

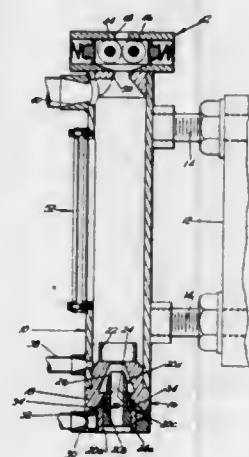
Ronald D. Brown, and Marvin L. Stark, both of Middletown, Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Filed Sept. 15, 1971, Ser. No. 180,803

Int. Cl. C21d 1/62

U.S. Cl. 266-3 R

11 Claims



Method for liquid quench cooling a heated strand moving in a vertical path of travel by providing a variable height water column through which the strand passes. The column is completely supported by air under pressure so that there is no mechanical apparatus in contact with the heated strand until after it emerges from the water in the column.

The apparatus includes a chamber provided with aligned openings in its top and bottom through which the strand passes with substantial clearance in a vertical path of travel. A cooling fluid is introduced into the chamber and is supported by air under pressure admitted to the chamber adjacent the bottom thereof and surrounding the bottom opening.

3,735,968  
FURNACE

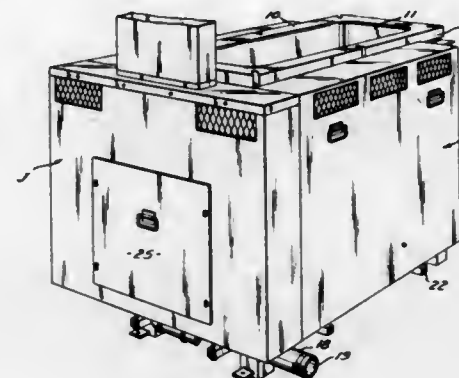
Max W. Pearch, Novelty, Ohio, assignor to Rex Products, Inc., Chesterland, Ohio

Filed July 12, 1971, Ser. No. 161,595

Int. Cl. F27b 14/00

U.S. Cl. 266-24

6 Claims



A furnace for melting material and for holding molten or liquid material at elevated temperatures and consisting of a pot heated directly by banks or arrays of gas-fired infrared burners normally closely spaced from and directed at the outer surface of the pot. The banks of burners are movable toward and away from the pot for easy inspection, maintenance, and adjustment, even during operation.

3,735,969

## METHOD OF THERMAL AND CHEMICAL TREATMENT OF FINELY-DIVIDED MATERIALS

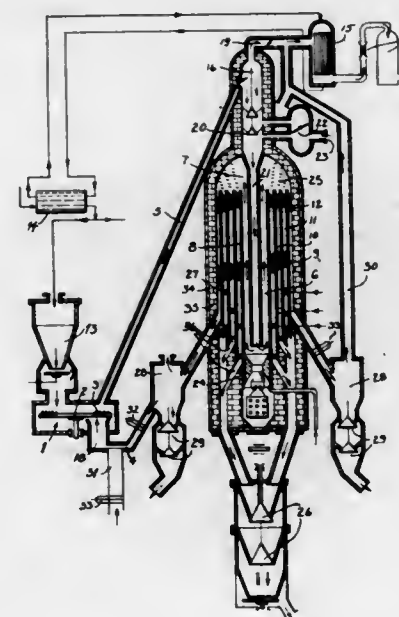
Lev Petrovich Brusov, bulvar Shakhstroiitelei, 22, kv. 32, Donetsk; Dmitry Pavlovich Vasilevsky, ulitsa Pravdy, 5, kv. 9, Kharkov; Vasily Ivanovich Dorokhov, ulitsa Dzerzhinskogo, 34, kv. 6, Kharkov, and Vasily Petrovich Onoprienko, ulitsa Sumskaya, 118, kv. 16, Kharkov, all of U.S.S.R.

Division of Ser. No. 52,196, July 6, 1970. This application Aug. 13, 1971, Ser. No. 171,766

Int. Cl. F27b 1/04

U.S. Cl. 266-24

4 Claims



The invention relates to the branches of industry in which finely-divided materials are subjected to thermal and chemical treatment in a flow of gas.

The method of thermal and chemical treatment of finely-divided materials according to the invention is characterized in that it includes the preparations of gas-suspended matter from

the material and gas, conveyance of the material in the gas-suspended state accompanied by concurrent partial treatment with gas, gas-dynamic classification of the material, then its complete treatment during which the working gas and material move in contrary directions.

The installation for the realization of this method in accordance with the invention comprises a device for the preparation of gas-suspended matter, a device for partial treatment and conveyance of the material in the gas-suspended state, and a multistage reaction plant for the complete treatment of the material in the gas-suspended state, made in the form of several concentric chambers forming a common working space hermetically-sealed from the atmosphere and intercommunicating with one another via the chamber for gas-dynamic classification of the material being treated.

3,735,970

## METHOD AND APPARATUS FOR EQUALIZING THE GAS PRESSURES OF SLUICE CHAMBERS AND FURNACE ZONES OF SHAFT FURNACES, PARTICULARLY BLAST FURNACES

Ulrich Genge, Monclova Coah, Mexico, assignor to Demag AG, Duisburg, Germany

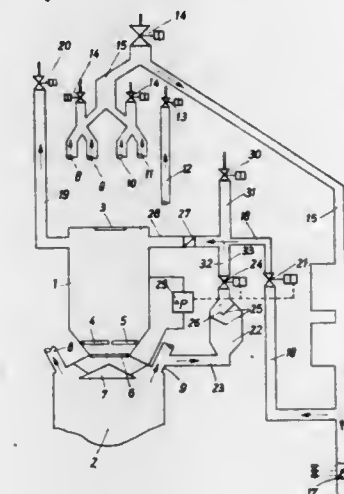
Filed Apr. 14, 1971, Ser. No. 133,895

Claims priority, application Germany, Apr. 4, 1970, P 20 16 205.4

Int. Cl. F27b 11/12

U.S. Cl. 266-27

9 Claims



In such a pressure equalizing method in which raw top gas from the furnace zone is first purified and then fed into the sluice chamber, in a first pressure equalizing stage, the sluice chamber is filled with purified top gas directly from the purification zone, as from a purifier which the raw top gas is fed. In a second pressure stage, there is added, to the sluice chamber, a relatively small volume of top gas at furnace pressure to complete pressure equalization between the sluice chamber and the furnace zone. This latter top gas is drawn from a storage space communicating with the furnace zone and provided with labyrinth means effecting removal of dust from the top gas. A conduit, provided with a check valve, communicates with the sluice chamber, and a first line, connected to the purifier and provided with a control valve, and a second line, connected to the storage space and likewise provided with a control valve, are connected in parallel to the conduit communicating with the sluice chamber. A control device controls the sequential operation of the two control valves in the first and second lines.



3,735,971

**STRAINABLE MEMBERS EXPOSED TO TEMPERATURE VARIATIONS AND MATERIALS THEREFOR**

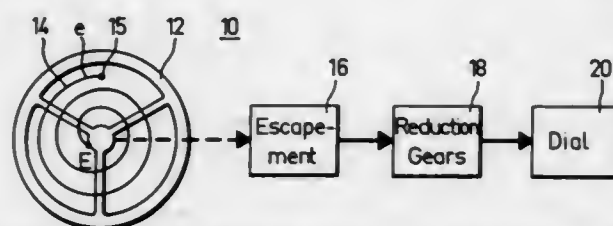
Samuel Steinemann, 4410 Liestal, Switzerland, assignor to Institut Dr. Ing. Reinhard Straumann A.G., Waldenburg, Switzerland

Continuation-in-part of Ser. No. 728,422, May 13, 1968, abandoned. This application Dec. 14, 1970, Ser. No. 97,923 Claims priority, application Switzerland, May 13, 1967, 6802/67

Int. Cl. F16f 1/04

U.S. Cl. 267—182

23 Claims



A temperature-stable strainable member is formed of an antiferromagnetic alloy having a low temperature-coefficient of the modulus of elasticity. The member may be embodied in a mechanical oscillator as a vibratory element with a modulus of elasticity whose temperature coefficient is between  $-10 \cdot 10^{-4}$  and  $+10 \cdot 10^{-4}$  centigrade and which is composed of 20–29 percent manganese, 2–9 percent chromium, 0.03–1 percent carbon, the remainder iron with ordinary impurities less than 1 percent.

3,735,972

**PUSH/PULL PLUNGER CLAMP WITH TAKE UP FOR WEAR**

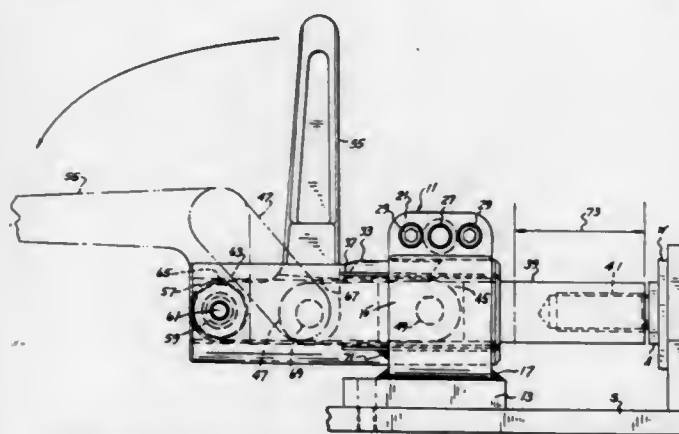
Leland F. Blatt, 24121 Mound Road, Warren, Mich.

Filed Oct. 6, 1971, Ser. No. 186,954

Int. Cl. B25b 1/14, 5/12

U.S. Cl. 269—228

4 Claims



In a toggle action plunger clamp having a base assembly and a sleeve in which to mount an elongated body, a reciprocable work piece engaging plunger in the body and a cantilever handle operated link to reciprocate said plunger, the improvement providing a split contractable sleeve. The plunger body has a series of longitudinal slits and is also contractable on contraction of said sleeve for maintaining a uniform non-wobbling sliding fit between the plunger and body.

3,735,973

**PIPE SUPPORT**

William E. Petrie, c/o Economy Design Inc. 5003 West 159th St., Tinley Park, Ill.

Continuation-in-part of Ser. No. 834,669, June 19, 1969, abandoned. This application Oct. 15, 1971, Ser. No. 189,638

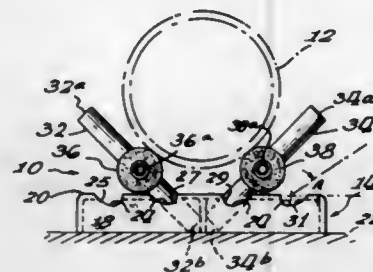
Int. Cl. B23q 3/00; F16i 3/00

U.S. Cl. 269—296

9 Claims

A pipe support assembly for holding pipe to be worked upon including a generally inverted V-shaped base with the

top of the base defined by the apex thereof. Plural openings are formed in the top on an axis inclined relative to the intended horizontal positioning of the base. A pair of tubes are



provided, being of a size and shape to be received in the openings at an angular orientation to the horizontal during intended use, each tube having roller elements for rotatably supporting the pipe to be worked upon.

3,735,974

**APPARATUS FOR FOLDING FABRIC MATERIAL IN LAYERS**

Gunter Otto Stumpf, Kreis Muningen, 7421 Mehrstetten, Germany

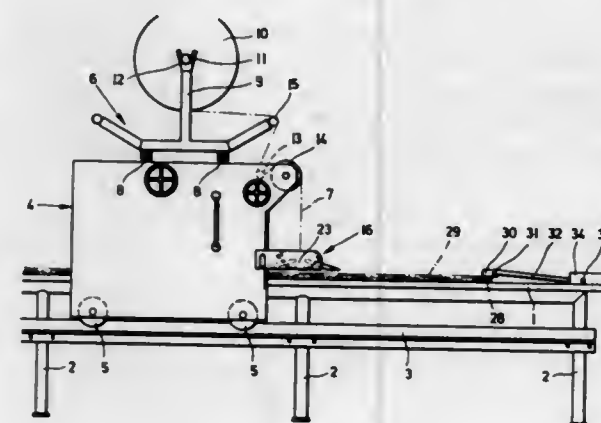
Filed Dec. 21, 1970, Ser. No. 100,094

Claims priority, application Germany, Oct. 12, 1970, P 70 37 650.0

Int. Cl. B65h 29/46

U.S. Cl. 270—31

6 Claims



A reciprocating carriage is advanced along a folding table and is provided with a support for a bale of fabric to be unwound. A folding head is carried by the carriage for folding the fabric on the table at each end of stroke of the carriage. The folding head includes two opposed folding shovels supported by opposite lateral walls and each tiltable about a horizontal axis. The free lower edges of the shovels are aligned with each other and define a longitudinal gap for passage of the fabric from the bale. Two inclined arms are mounted on the inner surfaces of each of the lateral walls for engaging guiding rollers at both sides of a pivotable fabric clamping beam which serves the purpose of holding the ends of the folded stack of fabric layers. The beam extends across the folding table and lifts the front folding shovel at the same time that the beam is being lifted. A gap is provided between the upper ends of the arms at each lateral wall permitting the guiding rollers to drop therebetween, and secured to the walls below the gap is a stop bar for catching the fabric clamping beam at such an elevation that a slot is provided between the lower side of the clamping beam and the upper side of the unlifted folding shovel permitting a loose support of the fabric in the slot.

3,735,975

**APPARATUS FOR FAN FOLD STACKING CONTINUOUS STRIPS OF MATERIAL**

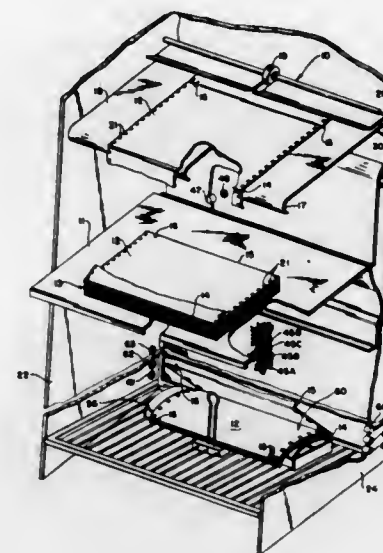
Gerald J. Sukel, and Jacob C. Rubin, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 2, 1971, Ser. No. 130,674

Int. Cl. B65h 45/00

U.S. Cl. 270—61 F

7 Claims



Apparatus is described for stacking strip material that has been folded in opposite directions, e.g. computer output, by directing sequentially a plurality of fluid jets to position the outfalls of the strip material as it falls into an output receptacle. In particular, the apparatus for stacking includes a plurality of fluid valves located at spaced intervals along a fall plate. A first detector senses the leading edge of the continuous strip material and activates a first timing circuit which controls the energization of a selected fluid valve. A second timing circuit controls the duration of the energization of the fluid valve and a second detector determines the stack height of the strip material in the output receptacle and thereby controls which fluid valve will be energized.

3,735,976

**DOCUMENT PICKER**

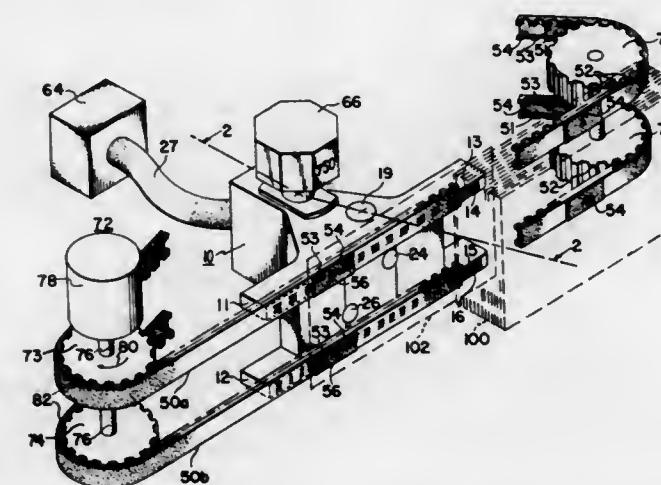
James Power Watson, Palm Beach Gardens, Fla., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1971, Ser. No. 198,108

Int. Cl. B65h 3/12

U.S. Cl. 271—26 ES

4 Claims



Vacuum-operated document picking and transporting apparatus includes a moving belt formed with two rows of apertures therein extending in the length direction of the belt either row of which may be coupled to a vacuum source.

Apertures in one row may be located at different positions than those in the other and the apertures in one row may be spaced apart different distances than those in the other. Then as a portion of the belt containing an aperture passes between a stack of documents and the vacuum source, a document may be separated from the stack and transported by the belt. The phasing of the pickup and/or the number of documents picked up in a given interval of time may be changed without changing the belt speed by switching the vacuum to the other row of apertures.

3,735,977

**METHOD AND APPARATUS FOR TURNING FLAT STRUCTURES, ESPECIALLY NEWSPAPERS**

Walter Reist, Zurich, Switzerland, assignor to Ferag, Fehr & Reist AG, Hinwil, Switzerland

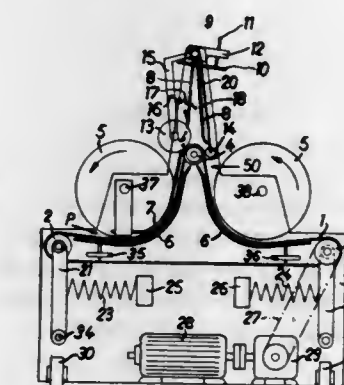
Filed July 12, 1971, Ser. No. 161,704

Claims priority, application Switzerland, July 16, 1970, 10855/70

Int. Cl. B65h 29/16

U.S. Cl. 271—75

10 Claims



A method of, and apparatus for, turning flat structures, especially newspapers, which are conveyed by a conveying mechanism, wherein each flat structure is erected in a plane which is disposed substantially transverse to the main direction of conveying of the flat structures, and then further conveying such flat structures with the lower portion thereof bearing against the conveying mechanism leading.

3,735,978

**METHOD AND APPARATUS FOR STACKING COPY SHEETS**

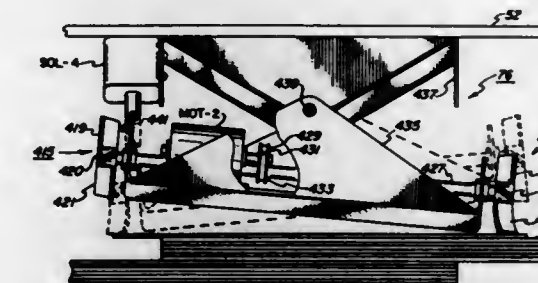
Lyman H. Turner, Pittsford, and Rhinehart A. Manzek, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 9, 1970, Ser. No. 70,736

Int. Cl. B65h 29/22

U.S. Cl. 271—88

6 Claims



A system for producing finished sets of collated copies from precollated documents fed and copied in repeated cycles including a side stacking assembly for grouping sheets into separately identifiable stacks by the action of pivotable paddle wheels. A control logic enables side stacking the sheets into separately identifiable bundles.



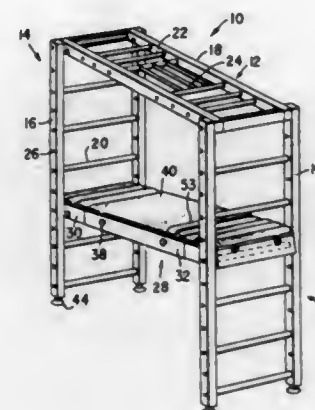
3,735,979

**EXERCISE DEVICE ADAPTABLE TO PERMIT THE PERFORMANCE OF A PLURALITY OF DIFFERENT EXERCISES**

Kay W. Levenberg, 2844 28th St. N. W., Washington, D.C.  
Filed Apr. 28, 1970, Ser. No. 32,620  
Int. Cl. A63b 21/00

U.S. Cl. 272-58

4 Claims



There is disclosed an exercise device which is adaptable to permit the user to perform a number of different and varying exercises which includes two ladder assemblies provided with a number of horizontal cross bars, a bed-shelf assembly, and a grip-bar assembly positioned above the bed-shelf assembly, the bed-shelf assembly and the grip-bar assembly being supported between and by the ladder assemblies and positioned at any desired inclination with respect thereto and with each other.

3,735,980

**STILT BALL GAME APPARATUS**

Robert E. Weiss, 809 W. Genesee Avenue, Saginaw, Mich.  
Filed July 23, 1970, Ser. No. 57,561  
Int. Cl. A63b 25/00

U.S. Cl. 272-70.1

3 Claims



Game apparatus including a multi-sided projectile and a set of stilts for propelling the projectile toward a goal. At least one of the stilts has a vertically movable horizontally extending kicking member adjacent the lower portion thereof for engaging the projectile at selected distances above the ground. The kicking member is ellipsoidal and has a ground engageable rocker portion which, in the lowermost position, serves as a training aid for assisting one learning to walk with the stilts by providing lateral support for the stilt when it is tilted from a vertical position.

3,735,981

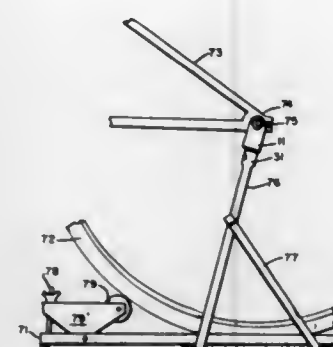
**EXERCISER ADAPTOR STAND FOR DETACHABLY RECEIVING THE REAR PORTION OF A BICYCLE**

Sidney Maillin, 236 Kingston Row, Winnipeg, Manitoba, Canada

Filed Dec. 23, 1971, Ser. No. 211,410  
Int. Cl. A63b 69/16

U.S. Cl. 272-73

4 Claims



Two identical mounting brackets are connected to the back axle of a bicycle, one on each side of the bicycle frame. Two complementary mounting bracket sockets are located at the top of the stand of an exerciser adaptor stand for a bicycle. The bicycle is connected to the stand by pivoting the mounting bracket sockets onto the mounting brackets, and disconnected from the stand by pivoting the mounting bracket sockets off of the mounting brackets.

This mating arrangement of the mounting brackets and the sockets of the adaptor stand eliminates the need for a tool each time the stand is secured to the bicycle and disconnected from the bicycle.

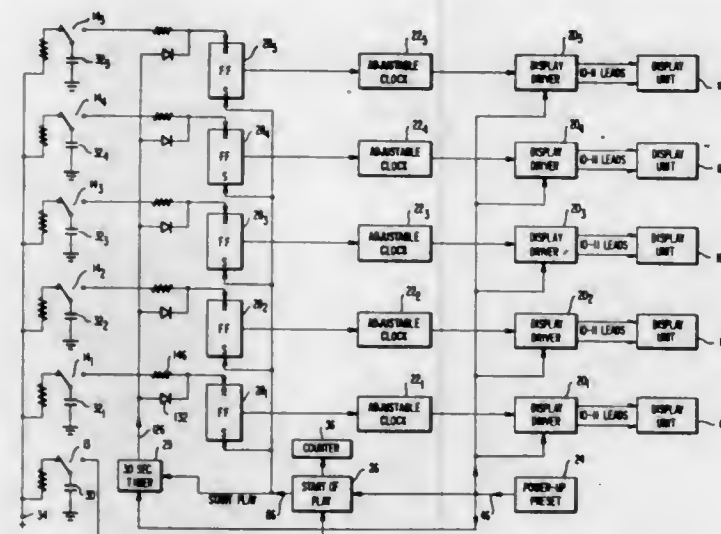
3,735,982

**ELECTRONIC CARD GAME MACHINE**

Jay N. Gerfin, 636 Jefferson Avenue, Cherry Hill, N.J.  
Filed Mar. 29, 1972, Ser. No. 239,057  
Int. Cl. A63f 9/00, 1/00

U.S. Cl. 273-1 E

19 Claims



A card playing machine for "poker" or the like including electronic circuitry for controlling a display of card transparencies. Initially a flashing card display is provided, the flashing time of which is selectively controlled so that either random selection or skilled selection of a card hand can be made by a player. A hand is normally obtained by the sequential operation of a plurality of manually depressed push-buttons. The control circuitry, moreover, will terminate operation and display a randomly selected hand if the player does not make his selection within a predetermined playing time.

Additionally, electronic control means are also included for allowing the player to reject or "discard" one or more of the cards in the hand initially displayed and reselect or "draw" new cards in another predetermined time period in an effort to improve the card hand. Another embodiment of the invention discloses control circuitry which provides the player an option to play a game other than poker which may be, for example, "black-jack" or "twenty-one."

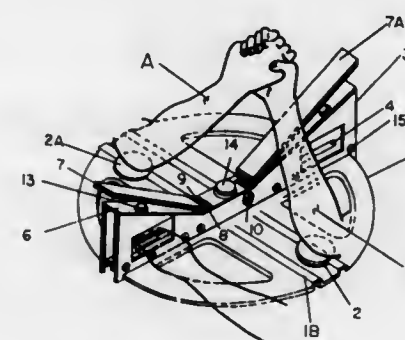
3,735,983

**ARM WRESTLING MACHINE**

James J. Ortiz, 705 Montgomery Avenue, Cumberland, Md.  
Filed Jan. 11, 1971, Ser. No. 105,296  
Int. Cl. A63f 9/00; A63b 67/00

U.S. Cl. 273-1 E

1 Claim



An electrical amusement device including a circular base having two guides or tracks for adjustable support elbow pads which provide support for contestants' elbows with the adjustment on the rails compensating for the length of a person's forearm. Pressure pads are provided on the right and left of the opponents on a slight angle above the base plate. A hand grip in the form of a round bar is provided under the pressure pad thus eliminating any leverage advantages contestants may use on one another. The opponents pit their strength against one another until one opponent puts the others back of the hand down on the pressure pad, at which time a contact button under the pressure pad will actuate a signal device to designate a win.

3,735,984

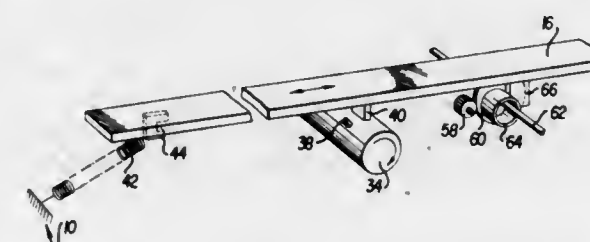
**RACETRACK AMUSEMENT DEVICE**

Kiyozl Asano, Sumida-ku, Tokyo, Japan, assignor to Shinsei Kogyo Co. Ltd., Tokyo, Japan

Filed Mar. 24, 1972, Ser. No. 237,731  
Int. Cl. A63f 9/14

U.S. Cl. 273-86 E

4 Claims



An amusement device simulating a racetrack wherein the top of the frame is provided with a plurality of strips mounted for reciprocating movement. A motor and gear train rotate a rod positioned transversely below the strips, the rod being provided with spokes which contact flanges depending from the strips sequentially moving the strips which thereafter return to their original position by the action of springs. Simultaneously, the motor and gear train rotate a plurality of gears provided with offset bearing surfaces against which other flanges depending from the strips bear. Since the offset bearing surfaces are staggered, the distance of the return stroke of each strip varies. A racing figurine, for example, a horse, is positioned on

each of the strips. As the stroke of each reciprocating strip continuously varies, the speed of each racing figurine continuously varies. In this manner the results of each race are new providing a source of continuing amusement for the user, adult or child.

3,735,985

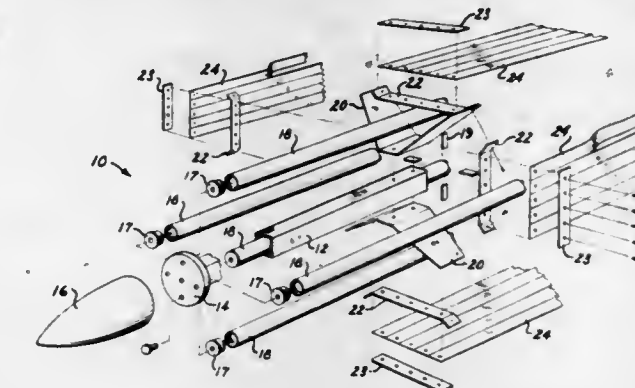
**ROCKET PROPELLED TARGET**

Gerard E. Layer, Newport Beach; John A. Kreuzer, Mission Viejo, and John S. Yates, Placentia, all of Calif., assignors to The Susquehanna Corporation, Fairfax County, Va.

Filed Oct. 15, 1970, Ser. No. 80,874  
Int. Cl. F41j 9/06

U.S. Cl. 273-105.4

16 Claims



A rocket vehicle suitable for use as an airborne training target is disclosed. The vehicle frame is manufactured of aluminum or other lightweight material having high structural strength and includes a longitudinally extending elongated center member to which are attached a nose cone, fin sections and one or more rocket motors. Attached to the rear of the vehicle are a series of lightweight banners. By varying the length of the banners and the number of rocket motors, visual cross-section as well as the performance characteristics of the vehicle may be varied. The rocket vehicle may be adapted for firing of the rocket motors in sequence with the time of firing controlled in order to obtain sustained high velocity flight over an extended range or to vary the performance of the vehicle during flight.

3,735,986

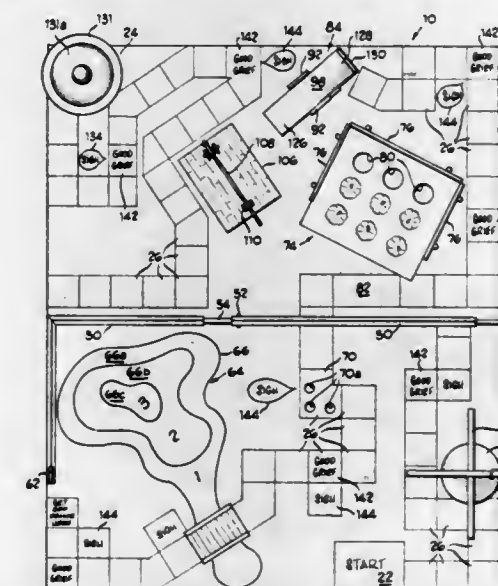
**BOARD GAME APPARATUS**

Marvin I. Glass; Joseph Burck, and Andras Race, all of Chicago, Ill., assignors to Marvin Glass Associates, Chicago, Ill.

Filed May 14, 1971, Ser. No. 143,484  
Int. Cl. A63f 3/00

U.S. Cl. 273-134 G

4 Claims



A game device of the type including playing pieces, a playing board, a chance device for random chance advancement



of the playing pieces along the board, with the playing board having simulated hazards positioned on the game board in the playing piece path of travel which must be successfully traversed or completed by a player during advancement of the playing piece from a starting point to a completion point. Auxiliary playing piece support members are provided for temporary attachment to the playing pieces for assistance in traversing some of the hazards, said hazards including a partition extending across the board along which a playing piece may move.

3,735,987

# AUTOMATIC ROTATION INDEXING AND MASKING OF DRUM CHANGE DEVICE WITH MANUAL RELEASE OF THE MASKING SHUTTERS

Haruo Ohki, Katsushika-ku, Tokyo, Japan, assignor to Yoshie Ito, Tokyo, Japan, a part interest

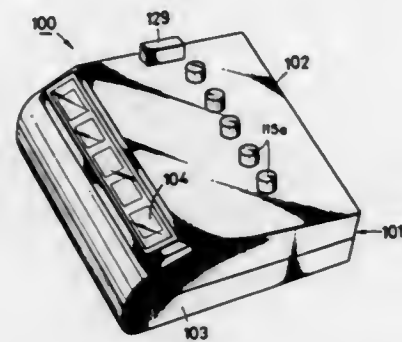
Filed Aug. 16, 1971, Ser. No. 171,969

Claims priority, application Japan, Aug. 13, 1971, 46/16186

Int. Cl. A63F 5/04

U.S. Cl. 273-143 R

5 Claims



A toy game machine is disclosed which includes a plurality of rotatable display drums each bearing suitable combinations of symbols on its peripheral surface and as many display windows as there are such drums for exposing to view therethrough the symbols which have been concealed during rotation of the drums by shutters which automatically mask during rotation and indexing of the drums and which are individually released by manual actuation of the operator.

3,735,988

# PRACTICE PUTTING SURFACE

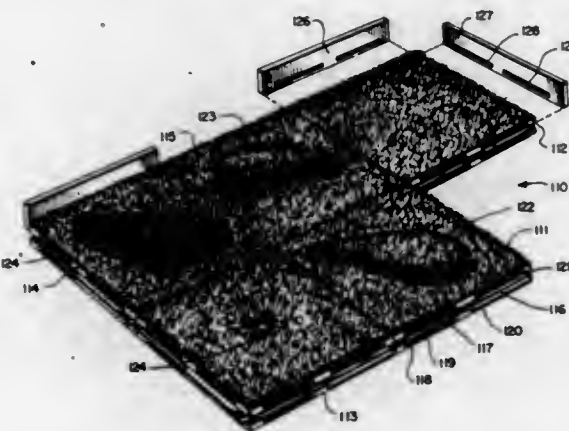
Donald J. Palmer, Mark L. Palmer, and Irwin A. Breinin, all of 3962 Bel Pre Road, No. 6, Silver Spring, Md.

Filed June 17, 1971, Ser. No. 154,008

Int. Cl. A63b 57/00, 67/02

U.S. Cl. 273-178 B

6 Claims



A practice putting surface for indoor and outdoor use by a golfer having a plurality of individual putting sections of

identical rectangular configuration, each section having four sides and a base portion with upper and lower surfaces, some with raised and/or depressed surfaces and detachable border sections. There is a friction pad mounted on the bottom surface of each base portion to prevent sliding. A layer of synthetic artificial turf covers the upper surface of each base board and has synthetic grass of different heights extending upwardly therefrom. There are female and male Velcro fastening means located on each side of each section and interchangeable cups and insert pieces whereby the individual sections may be put together in any given order to fasten any desired putting configuration to simulate the natural putting green on a golf course. An undulating putting surface may be provided by locating a slidable elevated member under the turf. The elevated member may include a handle which extends through a slotted portion in a putting section, whereby the elevated member may be manually moved and rotated from one position to another.

3,735,989

# CARTRIDGE LOCKING MECHANISM WITH ADJUSTABLE TENSION

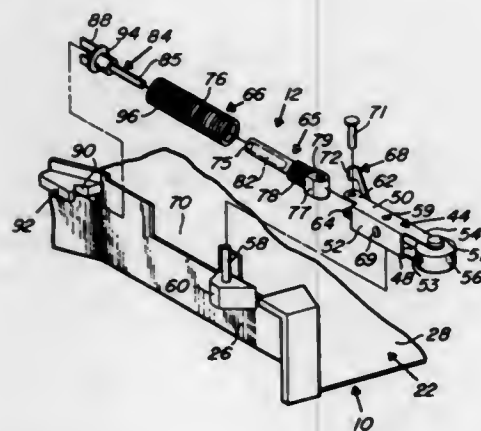
Donald J. Dattilo, Mount Prospect, Ill., assignor to Motorola Inc., Franklin Park, Ill.

Filed May 12, 1972, Ser. No. 252,809

Int. Cl. G11b 5/00

U.S. Cl. 274-4 B

6 Claims



A cartridge locking mechanism for a tape player includes a roller arm mounted for pivotal movement on a first mounting member and a bistable spring arrangement including a coil spring and a threaded pin, the former being screwable onto the latter, coupled between the roller arm and a second mounting member to operate the roller arm between two stable positions. A leaf spring connected to the roller arm extends into a cartridge receiving tunnel of the tape player for deflection by a cartridge inserted therein. Deflection of the leaf spring snaps the bistable spring arrangement from a first to a second stable state causing the roller to engage and be received in a notch in the side wall of the cartridge to removably secure the latter in the tunnel. The force provided by the bistable spring arrangement through the roller, is adjustable by screwing or unscrewing the coil spring member of the bistable spring arrangement with respect to the pin member coupled to the roller arm.

3,735,990

# SEALING STRUCTURE FOR ROTARY MOTION TRANSMITTING DEVICE

Helmut Steegmuller, Affalterbach, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed June 25, 1971, Ser. No. 156,841

Claims priority, application Germany, June 26, 1970, P 20 31 608.9

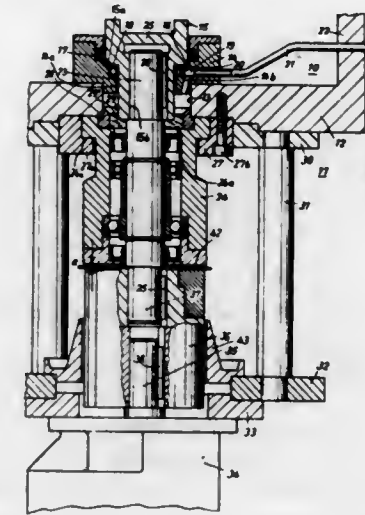
Int. Cl. F16k 41/08; F16j 15/10

U.S. Cl. 277-8

4 Claims

A sealing structure for a system which rotates a driven coupling member in a contaminated compartment has a sleeve

which extends into an opening of a wall of the cell defining the contaminated compartment and has an internal annular shoulder sealingly engaging an external shoulder of the driven coupling member in the compartment. The driven coupling member has an axial bore which is sealed from the contaminated compartment and can receive a torque-transmitting part of a second coupling member which is located without the compartment and is driven by a motor through the intermediary of a clutch. The sleeve is in sealing engagement with



the wall, and the likelihood of leakage between the sleeve and the driven coupling member is further reduced by the provision of one or more packings, U-rings and/or liquid seals. The two shoulders bear against each other to prevent leakage of contaminating matter from the compartment when the second coupling is detached. The opening in the wall is evacuated prior to detachment of the second coupling member and remains evacuated until after attachment of a fresh second coupling member.

3,735,991

# STUFFING BOXES

Hugo Nobs, Basel, Switzerland, assignor to Maschinenfabrik Burckhardt AG, Basel, Switzerland

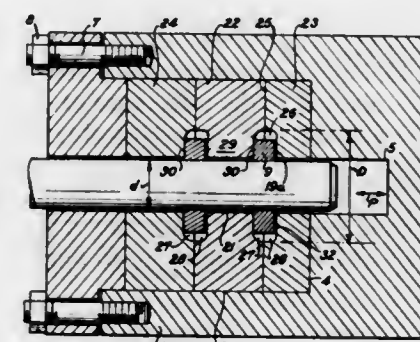
Filed Apr. 7, 1971, Ser. No. 132,161

Claims priority, application Switzerland, Apr. 7, 1970, 5128/70

Int. Cl. F16j 15/16, 15/40

U.S. Cl. 277-27

13 Claims U.S. Cl. 279-1 B



The stuffing box comprises a chamber having gland rings adapted to fit therein. The gland rings are tightly held within the gland chamber by a movable neck that compresses the gland ring within the gland chamber. At least one packing ring chamber is formed between adjacent gland rings. The packing ring chamber accommodates a packing ring means that engages the member which reciprocates within the gland chamber. The packing ring chamber is formed by a first cavity portion located in one of the adjacent rings and a second cavi-

ty portion located in the other of the adjacent gland rings. Sealing surfaces are provided on each of the adjacent gland rings and cooperate with the surface of the packing ring means to effect the desired seal within the packing ring chamber. That is, the packing ring chamber accommodates the packing ring means. The sealing surfaces are not in the same plane with the line of contact formed between the adjacent gland rings.

3,735,992

# PISTON RING

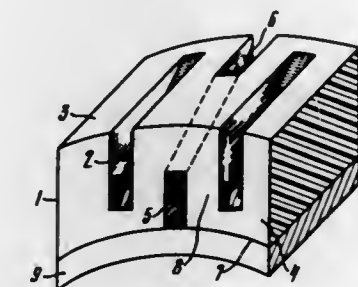
Igor Semenovitch Prostorov, poselok Krivka, ulitsa Festivalnaya, 3, kv. 3, Leningradskaya oblast, and Vladimir Sergeevich Davydov, prospekt Smirnova, 6, kv. 21, Leningrad, both of U.S.S.R.

Filed Mar. 14, 1972, Ser. No. 234,522

Int. Cl. F16j 9/08

U.S. Cl. 277-215

2 Claims



The present invention relates to piston machines and, more particularly, to piston rings.

The piston ring 1 has blind slots 2 and slots 5 which form channels. The blind slots 2 open on the outer surface 3 and on the face surface 4. The slots 5 are made from inside of the ring 1 and form channels which open on the face surfaces 4 and 6 and on the outer surface 3. The spaces between the adjacent slots 2 and 5 form flexible bridges.

3,735,993

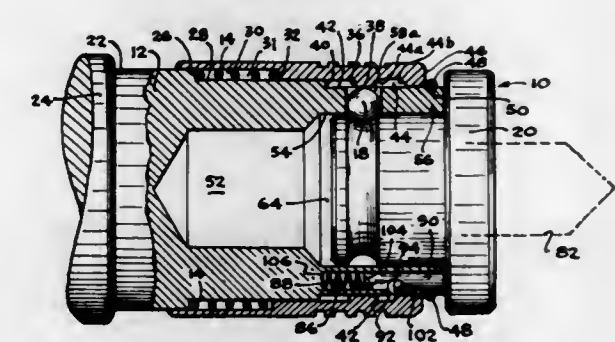
# SELF-RELEASE AND RELOAD TOOLING DEVICE

Warren F. Selbert, c/o Selbert and Sons, Inc., Chenoa, Ill.

Filed Apr. 26, 1971, Ser. No. 137,175

Int. Cl. B23b 31/22

11 Claims



A self-release and reload tooling device having a tool body, an adaptor nut for receiving a tool implement, a spring biased outer sleeve, and a spring biased release, whereby upon insertion of the adaptor nut in the tool body, the spring biased release is actuated freeing the outer sleeve which locks the adaptor nut to the tool body, and where upon manually sliding the outer sleeve back, the spring biased release is reset permitting removal of the adaptor nut, with the tool body then remaining in a position of readiness to receive and lock the next adaptor nut inserted in the tool body.



3,735,994

**WORK HOLDING CHUCK AND ARBOR**

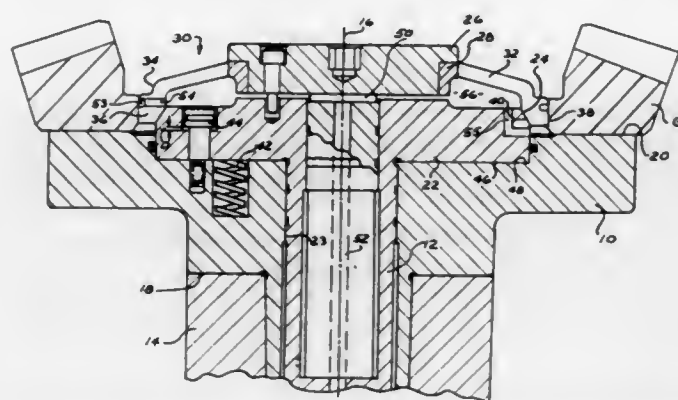
Edwin C. Jaehn, Rochester, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed Dec. 6, 1971, Ser. No. 205,220

Int. Cl. B23b 31/40; B23f 23/06

U.S. Cl. 279-1 G

12 Claims



A chuck is provided employing a dish-shaped arbor with an elongated shoulder portion inclined rearwardly from a collar section to an outer periphery attached to an upstanding flange portion having a work-gripping face. Upon axial flexure of the arbor, the novel combination of the elongated shoulder and a tapered expander portion co-operate to impart parallel radial expansion of the work-gripping face to a workpiece bore thereby causing the bore to be gripped in substantially full-area abutment rather than in "line" contact as in prior art arbors. Also provided are air passages for supplying air under pressure to an annular groove in the surface of the work-gripping face to prevent possible entry of abrasive particles from entering between the work-gripping face and the workpiece bore.

3,735,995

**REAR HOLDING DEVICE FOR SKI BOOTS**

Georges P. J. Salomon, 34, Avenue de Loverchy, Annecy, France

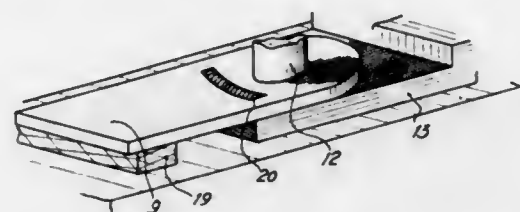
Division of Ser. No. 789,680, Jan. 8, 1969. This application June 21, 1970, Ser. No. 155,107

Claims priority, application France, Jan. 10, 1968, 68135562; Dec. 20, 1968, 68109474

Int. Cl. A63c 9/00

U.S. Cl. 280-11.35 T

5 Claims



A pivotable rear holding device for a ski boot on a ski which includes a pivotable jaw for vertically holding down the heel of the boot, and a horizontally pivotable member for supporting the heel of the boot, said member including means for elastically bringing the member back to its median position of rest after a lateral motion.

3,735,996

**PORTABLE LUGGAGE DOLLY**

Virgil K. Rath, c/o Rath Manufacturing Co., Janesville, Wis.

Filed Feb. 15, 1972, Ser. No. 226,495

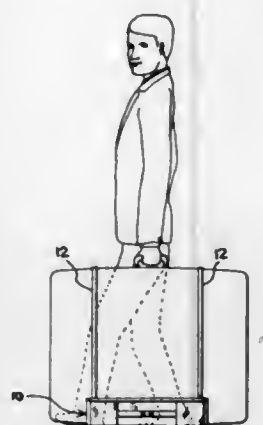
Int. Cl. B62d 21/18

U.S. Cl. 280-35

4 Claims

A portable wheeled vehicle for moving luggage such as suitcases, trunks and the like. The vehicle has a pair of elongate

side support elements connected by a pair of flexible attaching straps which encircle the luggage. The side support elements



each have a pair of wheels which are retractable into a protective wheel assembly housing.

3,735,997

**GOLF CART**

Paul F. Seibold, Huntington Woods, Mich., and Alfred H. Haberstump, Detroit, Mich., assignors to said Seibold, by said Haberstump

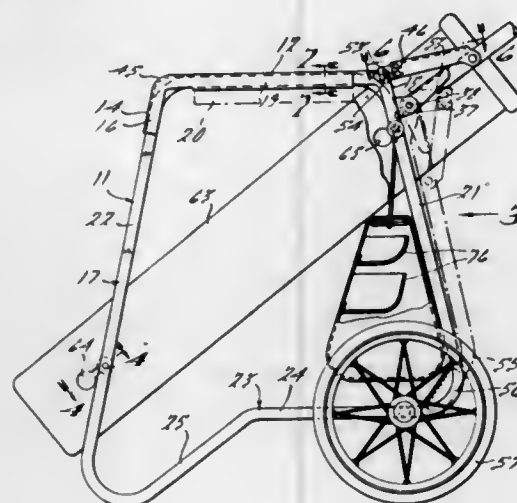
Continuation of Ser. No. 10,488, Feb. 11, 1970, abandoned.

This application Nov. 24, 1971, Ser. No. 198,005

Int. Cl. B62b 1/100

U.S. Cl. 280-36 C

9 Claims



The golf cart embodies a seat having a tubular frame on each side which is pivoted to the side edges of the seat and so formed as to have golf carrying bags releasably secured to opposite sides thereof. The top inner side of the bag is secured to the top outer face of the frames and the bottom outer side of the bags is secured to the bottom inner face of the frames with the bags disposed in parallel planes at an angle of approximately 45°.

3,735,998

**TRAILER FRAME CONSTRUCTION**

Leon K. Green, 568 West 2nd St., South, Salt Lake City, Utah

Filed Mar. 5, 1971, Ser. No. 121,363

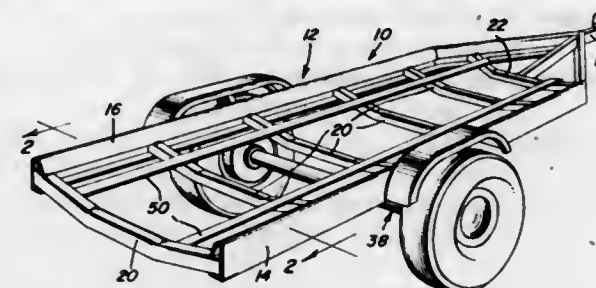
Int. Cl. B62H 21/02

U.S. Cl. 280-106 T

6 Claims

A vehicle frame construction including opposite side longitudinal members interconnected by means of longitudinally spaced and transversely extending cross-beams secured therebetween. The side beams or members each include upstanding or outside flanges having inwardly projecting

generally horizontal lower flange portions and upstanding upper flange portions supported along the upper edge portions from the upper marginal portions of the outside flanges and including lower marginal edges spaced inwardly of the corresponding outside flanges and spaced above the corresponding lower flange portions. The cross-beams extend between and have their ends abutted against the opposing surfaces of the outside flanges and secured thereto by welding. The lower marginal edges of the upper flanges abut and are welded to the



adjacent upper surface portions of the opposite ends of the cross-beams and the inner edge portions of the lower flange portions abut and are secured to the undersurfaces of the opposite ends of the cross-beams with the remote marginal portions of the lower flanges spaced below the adjacent undersurfaces of the cross-beams whereby strength at the junctures of the opposite ends of the cross-beams and longitudinal members is afforded without extreme rigidity thus providing a frame which is strong and yet capable of flexure under extreme and shock loads without failure.

3,735,999

**MOTOR VEHICLE SUSPENSIONS**

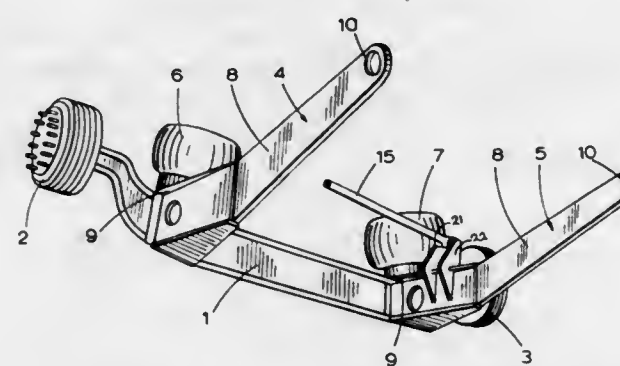
Keith Blackledge, Longton, and Harold Rushton, New Longton, both of England, assignors to British Leyland Truck and Bus Division Limited, Leyland, Lancashire, England

Filed Aug. 13, 1971, Ser. No. 171,712

Int. Cl. B60p 1/16

U.S. Cl. 280-124 F

3 Claims



The front rigid axle of a public service vehicle is located by two leading arms. The leading end of each arm is rigidly attached to the axle and the trailing end is pivotally attached to the vehicle body. Suspension elements, such as air or coil springs, are interposed between the vehicle body and the axle and leading end of each arm.

3,736,000

**AUTOMOBILE SUSPENSION**

Rene Capgras, Paris, France, assignor to Industrial Development Company Establishments, Vaduz, Liechtenstein

Filed Feb. 17, 1971, Ser. No. 116,195

Claims priority, application France, Feb. 24, 1970, 7006442

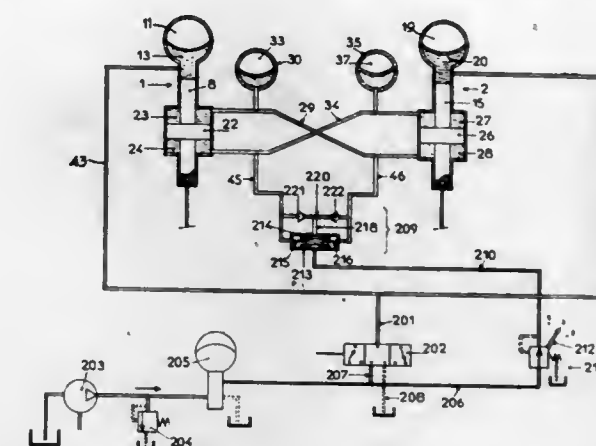
Int. Cl. B60g 17/04

U.S. Cl. 280-124 F

8 Claims

Two parallel road wheels of an automotive vehicle are loaded by the pistons of respective jacks each having a

cylinder with a main chamber connected to a main pressure accumulator, an upper ancillary chamber and a lower ancillary chamber, the ancillary chambers of the two jacks being cross-connected by pipes provided with respective ancillary pressure accumulators. Oil under pressure is supplied to the main chambers under the control of a distributor responsive to



changes in static load and, independently thereof, is delivered to the ancillary chambers by way of a slide valve cutting off the supply upon a tilting of the vehicle giving rise to a substantial pressure differential between the two cross-connecting pipes. The slide valve is in series with a pressure selector manually settable to different oil pressures corresponding to different levels of the vehicular center of gravity.

3,736,001

**AUTOMOBILE SUSPENSION**

Rene Capgras, 51 rue du Rocher, Paris, France

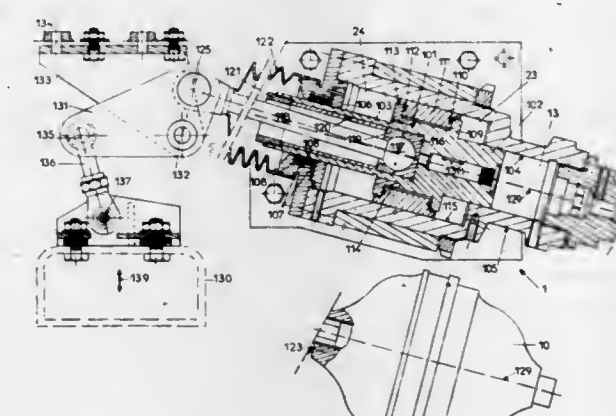
Filed Feb. 17, 1971, Ser. No. 116,196

Claims priority, application France, Feb. 24, 1970, 7006441

Int. Cl. B60g 11/26

U.S. Cl. 280-124 F

10 Claims



A hydraulic jack, forming part of a hydropneumatic suspension for an automotive vehicle, comprises a cylinder with two end portions of relatively small inner diameter and an intermediate portion of relatively large inner diameter, the latter being subdivided into two chambers by a closely fitting piston head formed as a transversely shiftable ring on a piston body. The ring is bracketed between two shoulders on the piston body, one of them being formed by a detachable collar, and has annular grooves in its end faces occupied by annular gaskets which contact the confronting faces of the collars to form a fluidtight joint. The extremities of the piston body are in fluidtight contact with the reduced end portions of the cylinder, one of these end portions forming a further fluid chamber; the opposite piston is hollow and accommodates a piston rod universally jointed within the piston body at the level of its shiftable ring.



3,736,002

## AXLE WITH INDEPENDENT WHEELS

Albert Grosseau, 92 Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

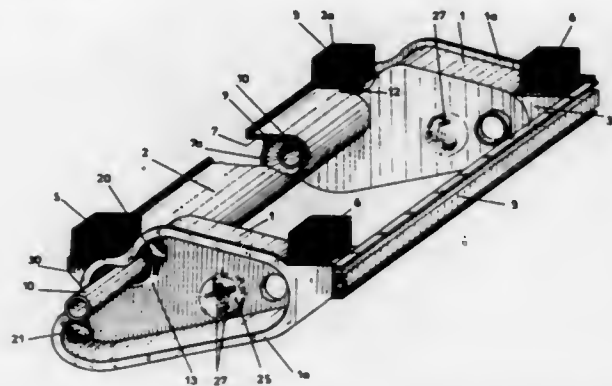
Filed Feb. 16, 1971, Ser. No. 115,403

Claims priority, application France, Feb. 18, 1970, 7005877

Int. Cl. B60g 11/64

U.S. Cl. 280—124 F

9 Claims



An axle wherein the independent wheel carriers each rock around a transverse longitudinal member adapted to rock inside a corresponding dished support; each pair of parallel dished supports being interconnected by a hollow cross-beam and connected to the chassis through elastic means, a hydroelastic shock-absorbing suspension enclosed at each end of the cross-beam and bearing against the latter to control the rocking of the corresponding wheel carrier around the transverse axis through the agency of a lever rocking in unison with the wheel carrier around the same axis between predetermined limits.

3,736,003

## AIR-SUSPENSION SYSTEM FOR MOTOR VEHICLES

Hiroaki Ono, Kariya-shi, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi-ken, Japan

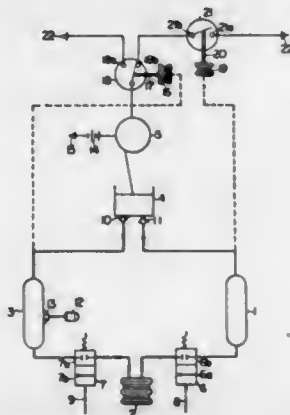
Filed Dec. 8, 1970, Ser. No. 96,167

Claims priority, application Japan, Dec. 9, 1969, 44/98333; Oct. 20, 1970, 45/92568

Int. Cl. B60g 17/04

U.S. Cl. 280—124 F

4 Claims



A motor-vehicle suspension system incorporates a closed air circuit comprising a low-pressure tank, a first changeover valve, a compressor, a second changeover valve, a high-pressure tank, and a pneumatic device (an air spring or the like into which compressed air is supplied from the high-pressure tank). A first pressure-sensitive device is provided for preventing the compressor from pumping any more air away from the low-pressure tank into the high-pressure tank upon reduction in the pressure of the former tank, while a second pressure-sensitive device is provided for restarting the once-stopped pumping operation in the event of the reduction in the pressure of the latter tank which may be caused by air leakage. Simultaneously with this restarting of the compressor opera-

tion, a device for air replenishment becomes operative to cause the first and second changeover valves to cut off the above two tanks from the compressor. Atmospheric air is then permitted to flow into this compressor and thence back into the low-pressure tank, from which the air is pumped into the high-pressure tank by the same compressor.

3,736,004

## VEHICULAR SAFETY DEVICE

Takashi Haruna, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama City, Japan

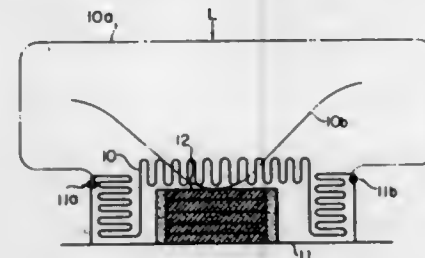
Filed Apr. 29, 1971, Ser. No. 138,528

Claims priority, application Japan, May 14, 1970, 45/38098

Int. Cl. B60r 21/04, 21/08

U.S. Cl. 280—150 AB

3 Claims



An improvement is made on a vehicular safety device using an inflatable confinement which is expanded to a protective condition when a collision is encountered by a motor vehicle. The improvement comprises a shock-absorptive structure which is located within the inflatable confinement and receives a vehicle occupant in the event the vehicle occupant is flung to the inflatable confinement before the confinement is fully expanded to the protective condition. The vehicle occupant is thus protected from being forced against structural parts of a cabin of the motor vehicle even when the confinement which is being expanded and caused to cave in by the force of inertia in the vehicle occupant subjected to the impact.

3,736,005

## SNOW VEHICLE ATTACHMENT

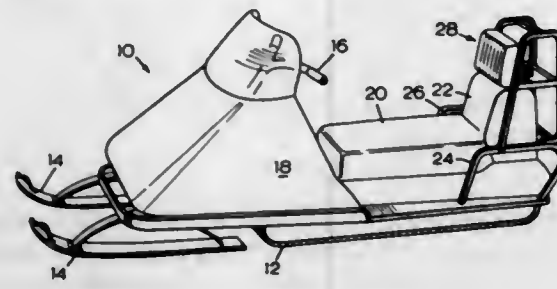
Orval George Wright, Toronto 12, Ontario, Canada, assignor to Wright Aluminum Limited, Weston, Ontario, Canada

Filed May 17, 1971, Ser. No. 144,202

Int. Cl. B62m 27/02

U.S. Cl. 280—150 C

1 Claim



This invention provides a safety attachment for snow vehicles of the type having a body and a seat extending longitudinally rearwardly and terminating at a rear end. The attachment comprises first and second end frames extending upwardly in generally parallel relationship. Each of the end frames includes means at its lower end adapted to attachment the end frame to the side of the vehicle body adjacent the rear end and a plurality of rails extend generally horizontally between the end frames. A back rest is coupled to the end frames and positioned so that when the attachment is coupled to the vehicle the back is positioned relative to the seat such that a passenger sitting on the seat is supported by the back rest.

3,736,006

## ENVELOPE

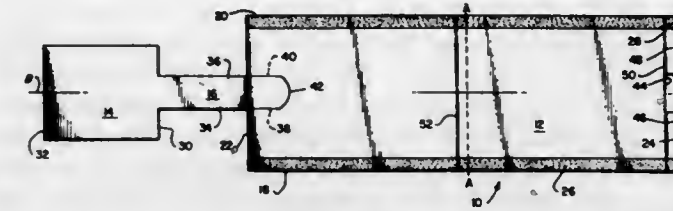
Nathan Polsky, 70 Mount Vernon Street, Boston, Mass.

Filed June 16, 1971, Ser. No. 153,780

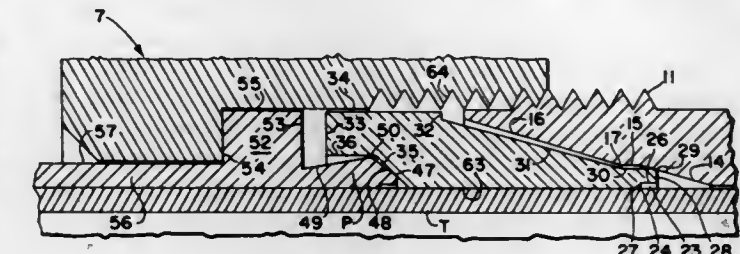
Int. Cl. B42d 15/00; B65d 27/00

U.S. Cl. 283—6

8 Claims



An envelope, and a unitary blank for making the same, having a rectangular panel joined to another panel at one end by a connecting strip and having a slit at the other end is disclosed. The connecting strip is folded where it joins the rectangular panel and the rectangular panel is then folded transversely along a line slightly offset from the transverse axis. A pair of tabs formed by the slot are then folded over to seal the envelope. The connecting strip is extended into the rectangular panel by perforations which can be torn thereby allowing the user to pull the strip and second panel outwardly thereby exposing hidden writing through a window provided in the rectangular panel.



edge which penetrates the tube material in a true radial direction responsive to arcuate flexing of such projection caused by engagement along a portion of the front collet, such flexing and bite occurring with relatively reduced friction between the collets due to the configuration and flexure of the projection.

3,736,009

## TUBE CONNECTING MEANS

Lawrence H. Juhnke, Niles, Ill., assignor to Display Engineers Inc., Skokie, Ill.

Filed May 10, 1971, Ser. No. 141,596

Int. Cl. F16b 7/04

U.S. Cl. 287—54 C

2 Claims

3,736,007

## SWIVEL

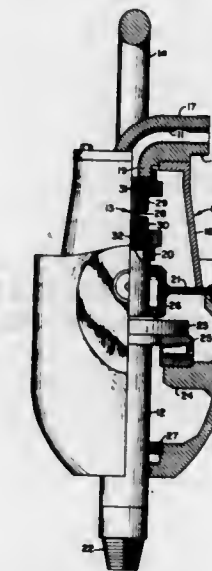
Joe K. Heilhecker, Bellaire; William C. Maurer, and Everett H. Lock, both of Houston, all of Tex., assignors to Esso Production Research Company, Houston, Tex.

Filed Aug. 23, 1971, Ser. No. 173,897

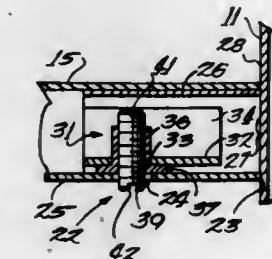
Int. Cl. F16l 27/00

U.S. Cl. 285—31

7 Claims



A washpipe assembly for use in drilling swivels wherein the assembly includes a washpipe, a sleeve for mounting the washpipe to the swivel body, and packing for sealing the space between the sleeve and washpipe. The packing comprises a plastic ring and a metal anti-extrusion ring mounted in a recess formed in the plastic ring.



A display stand for use as shelving having vertical corner members joined by horizontal members adapted to support flat shelves or plates of any suitable material. The corner members and support members are tubular, and are telescopically connected together by a channel or U-shaped stub or projection secured to one of said members and adapted to telescope into the open end of the other member, a clip frictionally held in the projection, an internally threaded bearing member supported in the clip and having a top bearing surface to frictionally engage the interior surface of the telescoping tubular member, and a threaded stud received in the bearing and acting to urge the bearing against the interior surface of the tubular member for detachably but rigidly joining said members.

3,736,010

## PITCH LINK ASSEMBLY AND LOCKING DEVICE THEREWITH

Artemas M. Larkin, Glendale, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Dec. 3, 1970, Ser. No. 94,696

Int. Cl. F16b 7/10

U.S. Cl. 287—62

13 Claims

A connecting rod assembly particularly adaptable as a pitch link or push-pull rod device in a rotary wing aircraft, comprising a telescoping pair of rods splined to each other to prevent relative rotation but providing for relative axial displacement

3,736,008

## TUBE COUPLING

Cullen B. Crawford, 28151 Gekhrst, Euclid, Ohio

Filed Feb. 16, 1971, Ser. No. 115,171

Int. Cl. F16l 19/08

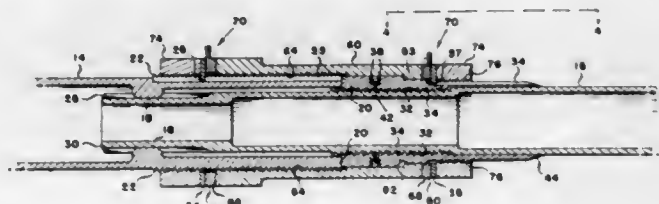
U.S. Cl. 285—342

6 Claims

A tube coupling including a front and rear collet which are driven into biting engagement with a tube wall, the front collet



and thus, adjusting its effective length, a calibrated sleeve mounted on the second of such rods, a union sleeve threaded to the first of such rods for clamping the calibrated sleeve to the first rod, and jam nut, lock ring-and-tang ring combinations mounted on the first rod and calibrated sleeve for tightening against the union sleeve after the length of the assembly has been precisely adjusted by rotation of the calibrated sleeve. Each end of the union sleeve includes notches at staggered intervals for cooperative engagement with projections on the lock ring which also includes serrations for engaging corresponding serrations on the tang ring. One lock ring is keyed to the first rod and one lock ring is keyed to the calibrated sleeve. By trial and error of rotation of lock ring to notches, a maximum fit of lock ring to tang ring is achieved while infinite adjustment in effective length for the assembly by rotation of the calibrated sleeve remains available.



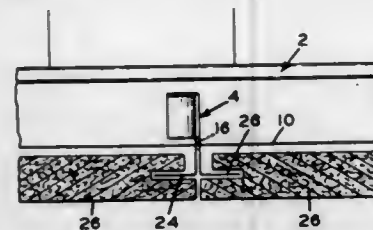
### 3,736,012 CONNECTION JOINT FOR A CONCEALED CEILING SUSPENSION SYSTEM

Joseph W. Boylan, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed June 7, 1971, Ser. No. 150,401  
Int. Cl. F16b 7/04

U.S. Cl. 287—189.36 A

2 Claims



The joint structure for connecting together the grid elements which form the suspension system for a concealed ceiling suspension system. A groove structure is provided in the cross members of the suspension system. This permits the cross members to be suspended from the main runners on the ceiling suspension system. Ceiling panels are then suspended from the cross members. The joint structure is specifically a generally inverted T-shaped groove in the vertical web of the cross member for receiving the generally inverted T-shaped structure of the main runner structure.

3,736,011

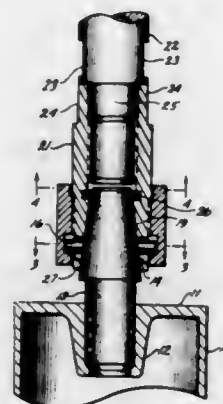
### QUICK DISCONNECT TOOL COUPLING

James E. Ward, Glendora, Calif., assignor to Tool & Equipment Mfg. Co., Inc., Monrovia, Calif.

Filed Mar. 2, 1972, Ser. No. 231,163  
Int. Cl. F16b 7/20

U.S. Cl. 287—103 A

5 Claims



This torque transmitting quick disconnect coupling is particularly useful with concrete coring tools and the like. It includes a female member in the form of a sleeve having a self-releasing tapered socket at one end and a pair of opposed radiating slots in its sides, extending from the wider open

### 3,736,013 RETENTION CLIP FOR CONCRETE SLAB KEY JOINT FORMING STRIPS

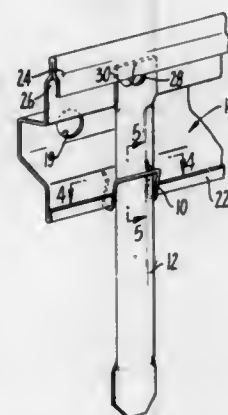
Phillip S. Hunter, Castro Valley, Calif., assignor to Burke Concrete Accessories, Inc., Burlingame, Calif.

Continuation of Ser. No. 851,994, Aug. 21, 1969, abandoned.  
This application July 6, 1971, Ser. No. 160,175

Int. Cl. F16b 7/04, 2/20

U.S. Cl. 287—189.35

2 Claims



A wire-like spring clip and clip installing tool for clamping a retaining stake to a key joint forming strip for concrete slabs.

The clip has a back portion transversely disposed against the retaining stake, and two prong-like arm portions extending under the lower edge of the forming strip and projecting upwardly against the back of the forming strip. The prong-like arm portions are spring biased to direct a compressing force in cooperation with the straight back portion, thereby firmly clamping the retaining stake against the forming strip. The installing tool which operates as a lever to facilitate installation of the clip on the retaining stake and forming strip comprises a flat rigid shank with a notched end for temporarily holding the clip for installation.

3,736,014

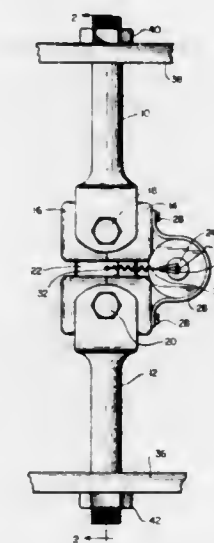
### PRESSURE ACTUATED RELEASE DEVICE

Kenneth T. Cornelius, Potomac, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 18, 1971, Ser. No. 200,101  
Int. Cl. E05c 15/00

U.S. Cl. 292—256.5

6 Claims



The invention is a device to hold shipboard hatches closed against the application of great mechanical force, yet release them when the ambient air pressure reaches a preselected value.

3,736,015

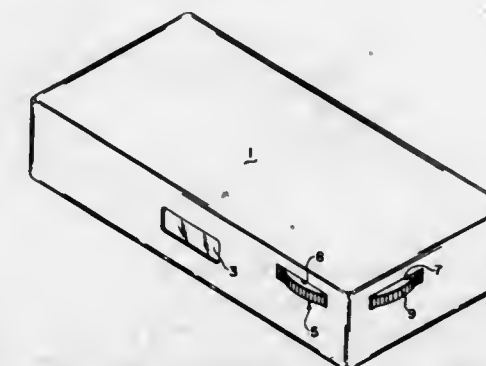
### WINDING MECHANISM FOR A CAMERA

James J. Dierks, and Jeffrey R. Stoneham, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 30, 1971, Ser. No. 139,123  
Int. Cl. G03b 17/26

U.S. Cl. 242—71.2

7 Claims



A mechanism for rotating a film cartridge wind-up core which has a gear attached thereto includes a manually rotatable ring gear having internal teeth engageable with the cartridge gear for effecting the rotation of the cartridge gear. The ring gear can be directly engaged with the cartridge gear, or coupled thereto via a gear train.

3,736,016

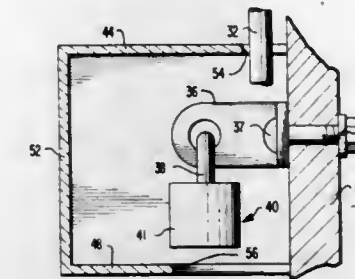
### LOCK GUARD FOR TRAILER DOORS

C. Godfrey Garvey, 2918 Center Drive, Ellicott City, Md., and Harry Paul McCoy, R.R. No. 1, Box 340 A, Owings Mills, Md.

Filed Dec. 6, 1971, Ser. No. 205,206  
Int. Cl. E05b 65/16, 67/38

U.S. Cl. 292—281

8 Claims



The lock guard includes an enclosure secured to one of pivoted double doors on a trailer. The enclosure projects beyond the edge of the one door and encloses a pair of hasps when the doors lie in a closed position. An access opening is provided through the bottom wall of the enclosure to facilitate locking and unlocking a padlock joining the hasps. A second opening is provided through the upper wall of the enclosure in registry with the bottom access opening. The standard locking cam rod for trailer doors extends through these openings.

3,736,017

### SEALING DEVICE

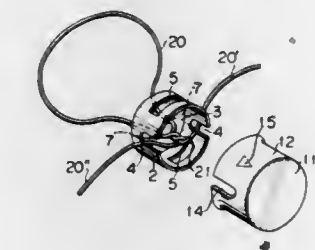
Toshio Kaiho, Tokyo, Japan, assignor to Takara Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1971, Ser. No. 115,601

Claims priority, application Japan, June 26, 1970, 45/55172  
Int. Cl. B65d 55/06

U.S. Cl. 292—317

4 Claims



A sealing device comprises a shackle, a pair of inner and outer cup-like members each having an end wall at one end, and means for locking said cup-like members together in such a manner as preventing their separation after said cup-like members are once nested one in another. The shackle may be or may not be preliminarily connected at its ends to the end walls of the inner and outer members.

3,736,018

### HYDRAULIC CLAW WITH LOCKING MECHANISM

Jack L. Sayre, Jr., Glendora, and Kenneth R. Fishel, Del Mar, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 10, 1971, Ser. No. 179,348

Int. Cl. B66c 3/16

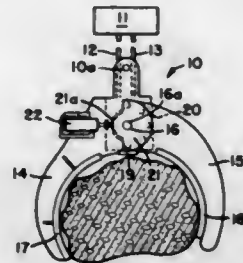
U.S. Cl. 294—88

4 Claims

A claw for grasping and recovering an object is articulated by a hydraulically responsive actuator which additionally has the capability for exerting a substantial gripping force on the object. After the object has been gripped, allowing its recovery, a pawl and ratchet carried on the claw mutually en-



gage to lock the claw in its gripped position. The hydraulic actuator and the pawl-ratchet combination are hydraulically coupled to retain the claw in its locked gripped position in the event of hydraulic failure. With availability of hydraulic pressure, suitable hydraulic connections allow disengagement of



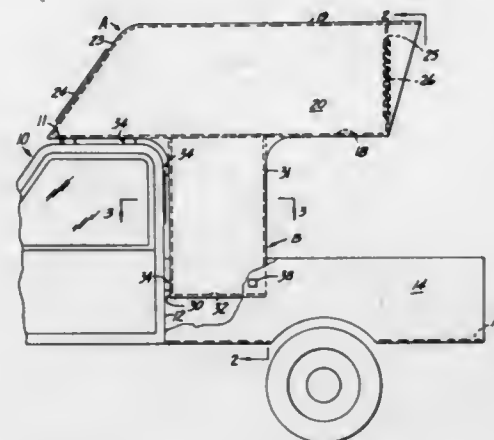
the pawl from the ratchet when hydraulic pressure is fed to the claw actuator for causing release of the claw. In an electrohydraulic system, a solenoid actuated pawl and ratchet mechanism, with appropriate connections also provide for locking the claw in its locked position and for its subsequent release.

### 3,736,019 CAMPER

James E. Kinberger, P.O. Box 372, Stinson Beach, Calif.  
Filed Oct. 19, 1970, Ser. No. 81,704  
Int. Cl. B60p 3/32

U.S. Cl. 296—23 MC

7 Claims



A camper body for use with a truck having a driver's cab and a truck bed rearwardly of said cab. The camper body is designed to provide a relatively large sleeping space and a storage space and at the same time leave the major portion of the truck and truck bed free for use in its ordinary function of hauling articles.

### 3,736,020

#### ENERGY ABSORBING SEAT FOR SNOWMOBILES

Martin Thomas Pilachowski; Larry F. Stikleather, and Donald J. Zach, all of Milwaukee, Wis., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed July 26, 1971, Ser. No. 166,142

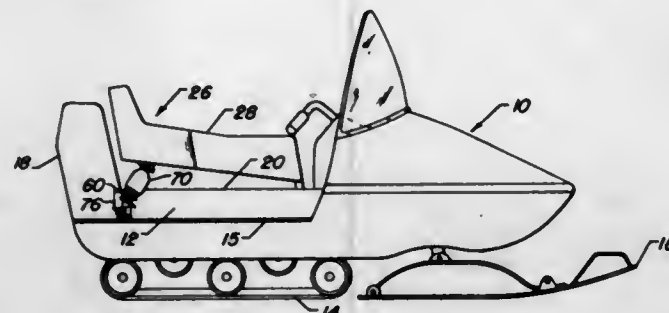
Int. Cl. A47c 7/14

U.S. Cl. 296—63

15 Claims

Snowmobile seat has relatively firm, damped cushion mounted on a base member which is pivoted at its front end to the snowmobile chassis. The rear end of the base member is supported above the chassis by a pair of rearwardly and downwardly extending shock absorbers which are attached at their lower ends to a rigid saddle strap bracket which spreads the load over a large area of the chassis. The shock absorbers

are surrounded by springs which are preloaded so as not to be compressed by the static weight of an average operator. The shock absorber means cooperate with the springs and damped cushion to greatly reduce shock loads transmitted to the operator as a result of hard bounces of the vehicle. By preloading and positioning the linear springs so as to face rear-



wardly at an angle to the vertical, a far greater amount of energy can be absorbed by a given amount of vertical seat deflection and a maximum allowable vertical spring force than if the springs were vertical, since the linear springs are loaded in a non-linear manner which causes them to function somewhat as a constant force spring.

### 3,736,021

#### FOLDING WHEEL CHAIR

Owen Finlay MacLaren, 14 Daventry Road, Barby, Near Rugby, England

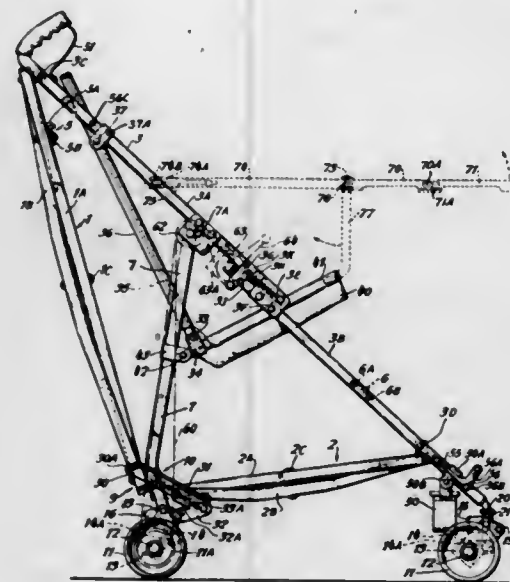
Filed Apr. 16, 1971, Ser. No. 134,589

Claims priority, application Great Britain, Apr. 17, 1970, 18,489/70

Int. Cl. A47c 4/00

U.S. Cl. 297—42

9 Claims



A folding wheeled chair or the like having bottom and back frame portions connected together at one end by a double-axis pivot joint and foldable brace members pivotably attached at the other ends of the frame portions. Each of the bottom and back frame portions are formed by inter-pivoted cross members and means are provided to lock the frames in an extended condition. Wheels are provided at the four corners of the bottom frame portion. The chair may be collapsed by pivoting the frame portions with respect to themselves and to each other while folding the brace members until a cane-like configuration is obtained.

### 3,736,022

#### MOLDED SEAT CUSHION WITH CAST SKIN AND INSERT RECEIVING RECESS

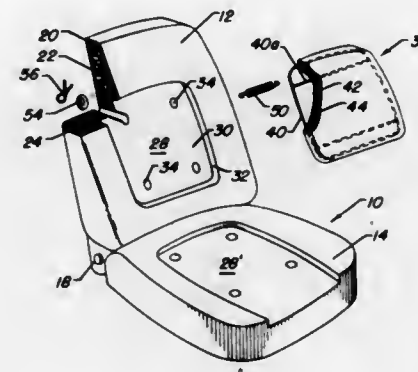
Arthur O. Radke, Milwaukee, Wis., assignor to Oil Products Company, Des Plaines, Ill.

Filed July 26, 1971, Ser. No. 166,182

Int. Cl. A47c 27/08, 7/02

U.S. Cl. 297—453

15 Claims



In order to overcome the non-breathing properties of a molded seat cushion having a cast skin and to permit a single molded seat cushion member to be capable of taking on various aesthetic appearances as well as to provide functions such as ventilation, heating, cooling and manufacturer or owner identification, the seating area of the cushion is provided with large recessed areas which are adapted to receive insert members. The insert members, which may be formed of porous materials, are fastened to the seat parts in a manner such that they appear to be permanently attached to the seat parts but can be readily replaced when desired.

### 3,736,023

#### PORTABLE FOOTSTOOL AND LOUNGE CHAIR COMBINATION

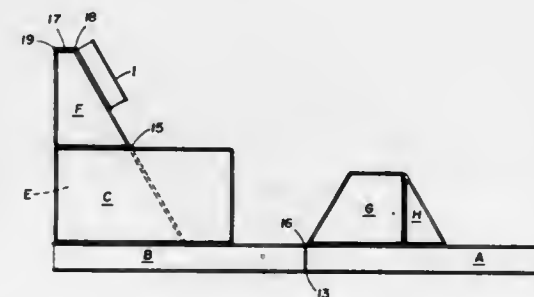
William L. Lyons, 618 Melrose Drive, Cedar Falls, Iowa

Filed Feb. 2, 1972, Ser. No. 222,804

Int. Cl. A47c 13/00

U.S. Cl. 297—118

6 Claims



A portable footstool and lounge chair combination is formed from a plurality of cushions of non-rigid material. Certain of the cushions are hinged to each other so that when folded up, in which state its overall shape is that of a compact, rectangular prism, it provides a footstool or hassock. When unfolded the combination of cushions provides an extensive lounge having a seat, a pair of arm rests, a back rest, a head rest, and an elevated leg rest.

### 3,736,024

#### COMBINATION FIREPLACE COVER AND ARTICLE OF FURNITURE

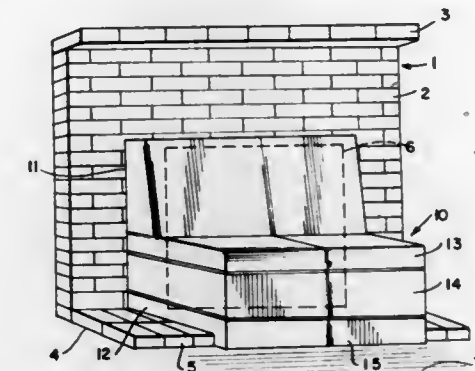
William J. Woolard, 3748 Silina Drive, Virginia Beach, Va.

Filed Sept. 3, 1971, Ser. No. 177,709

Int. Cl. A47c 15/00

U.S. Cl. 297—217

7 Claims



An article of furniture for temporary use in hiding the opening of a fireplace when the fireplace is not in use, the furniture having a vertically disposed back of a size to cover the fireplace opening and a horizontal support surface extending forwardly from the back to overlie the fireplace hearth.

### 3,736,025

#### DEVICE FOR POSITIONING A SEATING ARRANGEMENT ESPECIALLY IN MOTOR VEHICLES WITH FINE ADJUSTMENTS

Horst Ziegler, and Albert Thill, both of 318 Wolfsburg, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

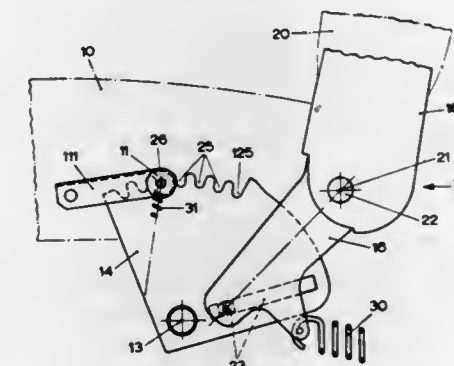
Filed June 14, 1971, Ser. No. 152,749

Claims priority, application Germany, June 25, 1970, P 20 31 383.1

Int. Cl. B60n 1/06

U.S. Cl. 297—369

6 Claims



In a motor vehicle, a seat arrangement having a seat portion and a backrest pivotably mounted on a common axle with the seat portion and tiltable between a first region of inclination corresponding to a sitting position and a second region of inclination corresponding to a rest position, a positioning device comprising an operating handle disposed at one side of the seat arrangement, first latching device coupled to the operating handle and affecting fine adjustments in the sitting position of the backrest, a second operating handle disposed on the other side of the seat arrangement, a second latching device coupled to the second operating handle and limiting the maximum region of fine adjustments within the sitting position by the first operating handle, the first operating handle affecting the fine adjustments independently of the second operating handle, but the first and second operating handles are actuated simultaneously for transferring the backrest into the rest position.



3,736,026

**DEVICE FOR POSITIONING A SEATING ARRANGEMENT ESPECIALLY IN MOTOR VEHICLES**  
 Horst Ziegler, and Albert Thill, both of Wolfsburg, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

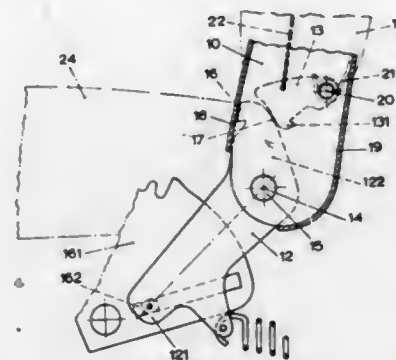
Filed June 14, 1971, Ser. No. 152,750

Claims priority, application Germany, June 25, 1970, P 20 31 382.0

Int. Cl. B60n 1/06

U.S. Cl. 297—379

4 Claims



In a vehicle, especially in a motor vehicle, a seat arrangement having a seat portion and a backrest portion, the latter being tiltable between an upright sitting and a forwardly tilted "getting-in" position, the backrest has a hollow frame lower portion pivotally mounted, a lever having one end secured to the pivot point and protruding into the hollow portion, it has formed at two opposite sides thereof abutting surfaces cooperating with abutting surfaces formed on the hollow portion, a latching member pivotally mounted adjacent the protruding end portion of the lever, a spring forcing an abutting surface of the lever into engagement with one of the abutting surfaces on the end portion lying adjacent thereto and thereby forcing the other of the abutting surfaces of the lever end portion into engagement with the abutting surface on the hollow portion adjacent thereto thereby latching the backrest in an upright position, an operating handle secured to the latching member for releasing the latching member from the latched position in the upright position, a hook portion formed on the end portion of the lever and hook portion formed on the latching member for engaging the hook portion of the lever in the tilted position of the backrest, the handle serving to disengage the latching when operated.

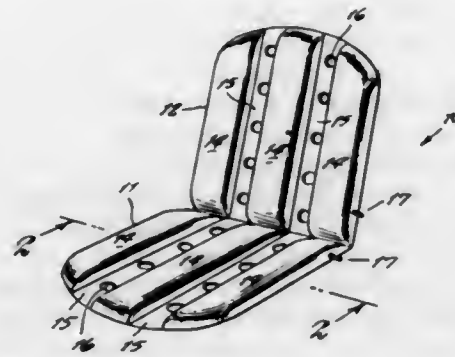
3,736,027  
AIR SEAT

Alfred P. Stafford, P.O. Box 1546, Vegreville, Alberta, Canada  
 Filed Feb. 7, 1972, Ser. No. 216,351

Int. Cl. A47c 7/14

U.S. Cl. 297—453

1 Claim



A special cushion designed for sitting upon and leaning against, the device comprising seat portion and a back rest portion which are attached pivotally together along one edges

thereof, the back rest and the seat each having a series of parallel inflated tubes which are inflatable with air, and a web between the inflated tubes, the webs each having a series of ventilation openings there through.

3,736,028

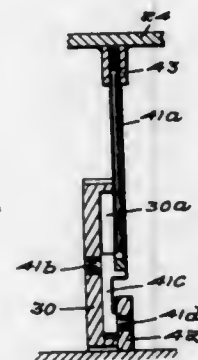
**ICE AND SNOW REMOVAL MACHINE**  
 Richard P. Davis, Sanbornton, N.H.

Filed Feb. 16, 1971, Ser. No. 115,404

Int. Cl. E01h 5/12

U.S. Cl. 299—25

8 Claims



A machine for breaking up and removing compacted snow and ice utilizing a number of narrow disks placed side by side. The disks are mounted in pairs, each pair consisting of a breaker disk and a sweeper or pick up disk, individually spring-pressed downward. The breaker disks are designed to crush the snow or ice remaining on a road after plowing, and force the crushed snow or ice sideward, where it is picked up by the sweeper disks. A shoe immediately behind the disk assembly guides the snow onto a conveyor belt which ejects the snow toward the side of the road. The machine is mounted on, or towed by, a truck or other vehicle.

3,736,029

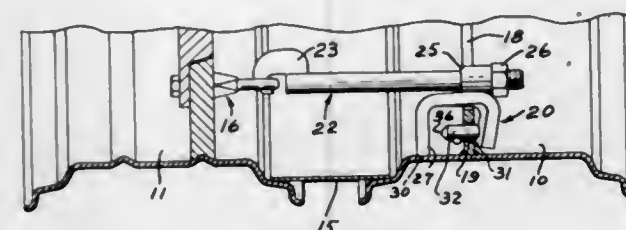
**ATTACHABLE DUAL DRIVE WHEEL**  
 William J. Dietrich, Sr., Goodfield, Ill., assignor to Dietrich Manufacturing, Inc., Goodfield, Ill.

Filed Apr. 13, 1971, Ser. No. 133,674

Int. Cl. B60b 11/06

U.S. Cl. 301—39 R

6 Claims



A dual wheel is secured to a drive wheel of a traction vehicle by means of a plurality of bolt fasteners. The bolt fasteners are secured to the rim of the dual wheel by means of removable anchor lugs. The anchor lugs are attachable at predetermined locations about the dual wheel rim and these locations have a different angular spacing than the pivotal attachment of the bolt fasteners to the drive wheel rim so that some of the bolt fasteners are forwardly inclined and some are rearwardly inclined relative to a line parallel to the drive axis. Thus, some of the bolt fasteners will always be in tension when the drive is reversed, and slip between the two wheels is minimized.

3,736,030

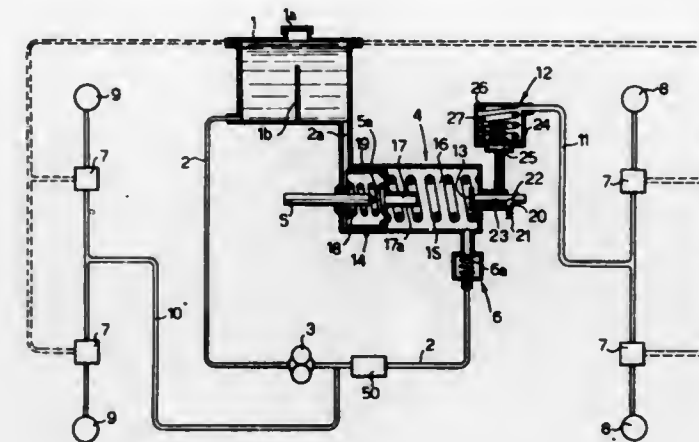
**MOTOR VEHICLE HYDRAULIC BRAKING SYSTEMS**  
 Marco Peruglia, Turin, and Giancarlo Michellone, Cambiano, both of Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed June 2, 1972, Ser. No. 259,312

Int. Cl. B60t 13/18

U.S. Cl. 303—6 C

11 Claims



An hydraulic braking system for motor vehicles comprising a loop circuit around which the hydraulic fluid is pumped when the engine is in operation, to maintain a normal operating pressure in the loop and two branches containing front and rear braking actuators. The brake pedal is linked to a valve in the circuit such that depression of the brake pedal causes a restriction in the loop circuit so as to increase the hydraulic pressure in the system to operate the brakes. The system thus has a normal operating pressure due to circulation of fluid in the loop part of the circuit, and a number of pressure sensitive devices are positioned in various parts of the circuit to detect a fall in the pressure in the part of the circuit with which each is associated and to isolate that part of the circuit from the remainder of the circuit when such a fall in pressure is detected. Thus, in the event of a failure of any part of the circuit at least some of the brakes will still be operable.

3,736,031

**HYDRAULIC BRAKE FLUID PRESSURE PROPORTIONING VALVE**

Kelichiro Yabuta, Asahi-ku, Yokohama, and Kaname Doi, Itame, both of Japan, assignors to Nissan Motor Company Limited, Yokohama and Sumitomo Electric Industries, Limited, Osaka, both of Japan

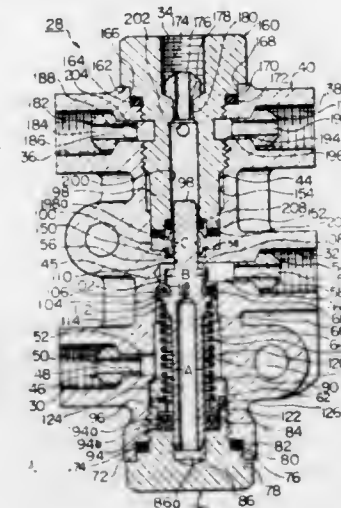
Filed July 6, 1972, Ser. No. 269,455

Claims priority, application Japan, Aug. 30, 1971, 46/66404

Int. Cl. B60t 8/26

U.S. Cl. 303—6 C

9 Claims



A hydraulic brake fluid pressure proportioning valve adapted to be interposed in a dual brake system between a

tandem master cylinder and rear brake cylinders for modulating the fluid pressure to be transmitted to the rear brake cylinders. The brake fluid pressure proportioning valve includes a housing having first and second inlet ports communicating with front and rear brake fluid pressure sections of the tandem master cylinder, respectively, an outlet port communicating with the rear brake cylinders and a first chamber for providing fluid communication between the second inlet port and the outlet port to pass an unmodulated fluid pressure from the second inlet port to the outlet port when a fluid pressure in the second inlet port is lower than a predetermined point of transition. The brake fluid pressure proportioning valve also includes a pressure responsive differential piston which is axially slidably accommodated in the second chamber and which has an upper stem portion extending into the second chamber, a valve head and a lower stem portion. A valve member is operatively disposed in the first chamber and cooperative with the valve head of the differential piston to control the fluid communication between the second inlet port and the outlet port thereby to modulate the fluid pressure to be delivered to the outlet port when the fluid pressure at the second inlet port reaches the predetermined point. A sealing member is disposed in the second chamber for sealing the second chamber from the first chamber so that a failure in the front brake pressure will modify the functioning of the differential piston.

3,736,032

**PNEUMATIC DRIVE SPROCKET FOR TRACKED VEHICLES**

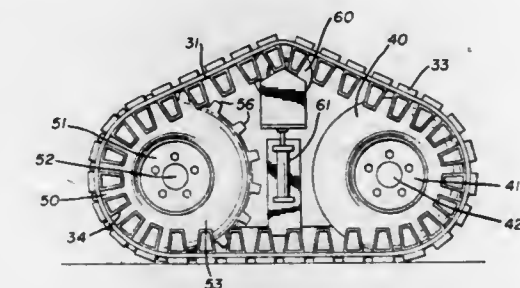
Crockett Mosshart, Detroit; Earl F. Burton, Dearborn Heights, and Walter C. Macklem, Detroit, all of Mich., assignors to Uniroyal, Inc., New York, N.Y.

Filed Jan. 28, 1970, Ser. No. 6,531

Int. Cl. B62d 55/12

U.S. Cl. 305—34

2 Claims



A pneumatic drive sprocket for tracked vehicles which includes a belted radial tire casing having radially projecting lugs or teeth disposed in spaced-apart relationship about the circumference of the tire and which are adapted to engage the track for driving purposes. The utilization of such a drive sprocket enables the vehicle to obtain the shock absorbing and flotation characteristics of pneumatic tires while permitting accurate, consistent and positive driving engagement with the track due to the fact that the pitch length between the teeth is not appreciably changed upon contact with the ground because of the essentially circumferentially inextensible nature of the radial belted tire.

3,736,033

**GYROSCOPIC REFERENCE SYSTEM**  
 Jorge G. Codina, 223 Secor Road, Hartsdale, N.Y.

Filed Mar. 16, 1972, Ser. No. 235,370

Int. Cl. F16c 39/06

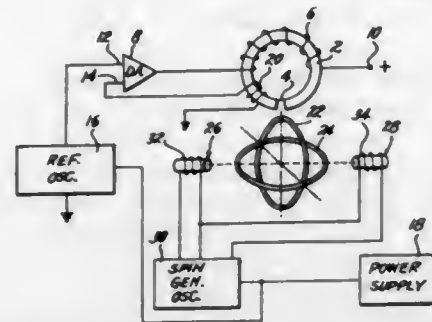
U.S. Cl. 308—10

4 Claims

A single core has an energizing winding and establishes a



levitational magnetic field therebelow. A skeletal sphere is suspended in the field and opposed electromagnets cause the



suspended sphere to rotate as the rotor of an induction motor to thus provide a gyroscopically stable inertial reference.

3,736,034

### MEANS TO IMPROVE RETENTION OF ROLLERS IN CAGE

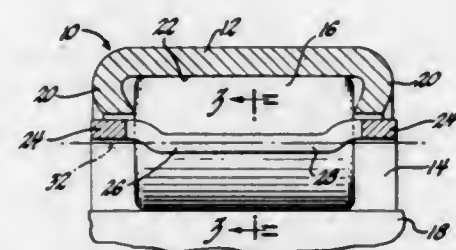
Edward W. Molloy, Port Clinton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 19, 1971, Ser. No. 173,064

Int. Cl. F16c 33/64

U.S. Cl. 308-213

5 Claims



The roller retention in a unit handled "package" roller bearing is improved by bowing the cage cross bars inwardly after snap insertion of the rollers into the cage windows. The bowing moves the cross bar retention edges further inwardly and increases the interference between the cross bars and the rollers.

3,736,035

### MODULAR DISPLAY ASSEMBLY

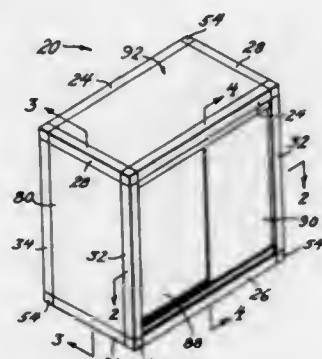
Milton T. Brown, Narberth, and Zdenek Bilek, Whitmarsh Village, both of Pa., assignors to DCA Educational Products, Inc., Philadelphia, Pa.

Filed June 1, 1971, Ser. No. 148,556

Int. Cl. A47b 77/00

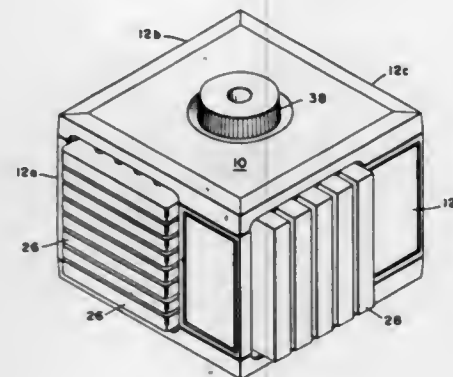
U.S. Cl. 312-107

7 Claims



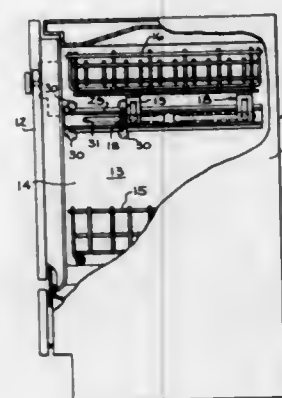
A modular display assembly comprised of a plurality of modular elements which may be joined to define an assembly of desired configuration. The modular elements have means for receiving and supporting side panels, shelves or sliding doors.

3,736,036  
STORAGE SYSTEM FOR TAPE CASSETTES  
Gregory Mathus, Cambridge, Mass., assignor to Data Packaging Corporation, Cambridge, Mass.  
Filed Jan. 19, 1972, Ser. No. 219,086  
Int. Cl. A47b 81/00, 81/06, 53/00  
U.S. Cl. 312-285 4 Claims



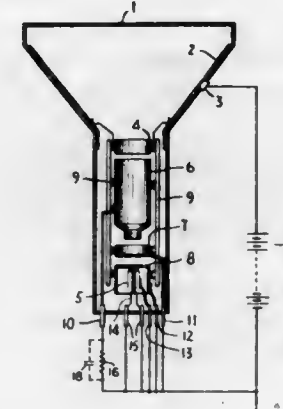
A storage cabinet for cassettes, either boxed or unboxed, comprising a turret with four side members, each of which has a compartment to receive boxed and unboxed cassettes. Each compartment is defined by two opposite pairs of supports, each of which carries dividers that describe pockets in the compartment to support either boxed or unboxed cassettes within the same volume.

3,736,037  
RACK LEVEL ADJUSTMENT APPARATUS IN AN APPLIANCE CABINET  
Donald G. H. Doepke, Greenfield, Wis., assignor to General Electric Company, Louisville, Ky.  
Filed June 1, 1971, Ser. No. 148,839  
Int. Cl. A47b 51/00  
U.S. Cl. 312-351 4 Claims



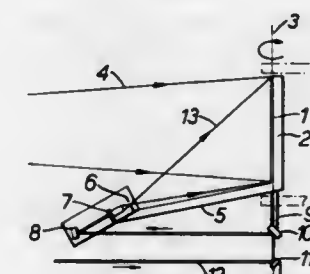
The support means for a rack, such as a dish-supporting rack in a front-opening dishwasher cabinet, includes means for manually adjusting the level of the rack in accordance with the size of the items to be placed on the adjustable rack or on a rack vertically spaced therefrom. Each side of the adjustable rack is preferably adjustable between upper and lower positions, and adjustment of the rack side from an upper position to a lower one is a particularly rapid operation accomplished by manually releasing a locking means whereby the rack side will drop to its lowermost position.

3,736,038  
SPOT-KNOCKING METHOD FOR ELECTRONIC TUBES  
Hisao Nakanishi, and Wataru Imanishi, both of Kyoto, Japan, assignors to Mitsubishi Kenki Kabushiki Kaisha, Tokyo, Japan  
Filed Mar. 26, 1971, Ser. No. 128,294  
Int. Cl. H01j 9/00  
U.S. Cl. 316-26 10 Claims



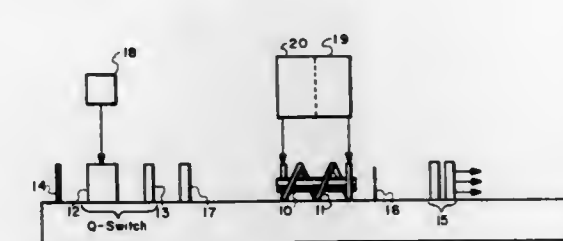
For spot-knocking a cathode ray tube including a first electrode adapted to be externally applied with a high operating voltage, a high voltage in excess of the operating voltage is supplied across the electrode and ground to cause an electric discharge within the tube while a second electrode disposed adjacent the first electrode between it and a cathode is connected to ground through a resistor. This leads to a flow of current through the resistor to cause another electric discharge across the second electrode and a third electrode adjacent it and grounded.

3,736,039  
SYNTHETIC 3-D HOLOGRAM WITH REDUCED DISPERSION UPON RECONSTRUCTION  
Donald John Hay, Basingstoke, England, assignor to United Kingdom Atomic Energy Authority, London, England  
Filed May 17, 1971, Ser. No. 143,944  
Claims priority, application Great Britain, May 21, 1970, 24,773/70  
Int. Cl. G02b 27/22  
U.S. Cl. 350-3.5 7 Claims



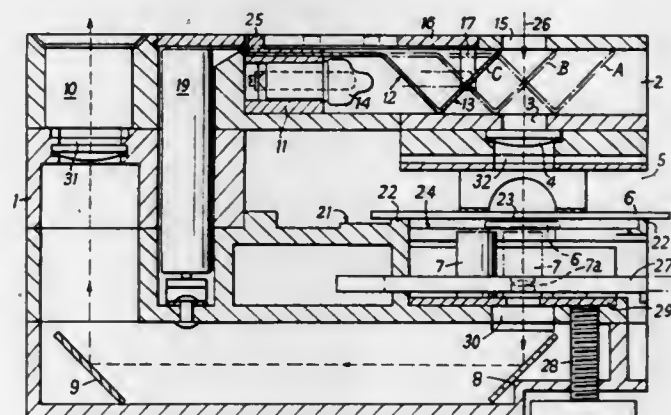
The system of producing 3-D holographic reconstructions from a plurality of photographs of a scene taken from different angles (as described in British Pat. specification No. 1,218,556 and U.S. Pat. No. 3,598,484) is modified by using an oblique reference beam of specified direction when making the successive holograms therefrom on a common photo-sensitive sheet. The reference beam is directed in a plane which is normal to the sheet and which includes its axis of rotation. This direction allows the system to be mechanical simpler and also reduces the optical dispersion when viewing.

3,736,040  
COHERENCE EXTENDER FOR Q-SWITCHED LASERS FOR USE IN HALOGRAPHY  
Samuel M. Zivi, Sherman Oaks, and Gordon H. Humberstone, Encino, both of Calif., assignors to TRW Data Systems, Inc., Torrance, Calif.  
Filed Dec. 28, 1970, Ser. No. 101,898  
Int. Cl. G02b 27/00  
U.S. Cl. 350-3.5 4 Claims



The coherence of Q-switched, solid state lasers, such as ruby lasers, is improved by employing an intracavity optical element, such as an etalon, positioned between the Q-switch and the active laser medium. This permits the laser to be operated reliably at low pumping power levels and enables holograms and interferograms to be obtained consistently.

3,736,041  
MICROSCOPE WITH SELECTIVELY OPERABLE ILLUMINATING AND VIEWING MEANS  
John Norrie McArthur, Skatchbow Cottage, Landbeach, England  
Filed Apr. 19, 1971, Ser. No. 135,056  
Int. Cl. G02b 21/08  
U.S. Cl. 350-87 7 Claims



A microscope comprises a body including an opening and containing a condenser and an objective and an eyepiece constituting an optical system for viewing of a subject positioned between the condenser and the objective.

The body has an aperture on the optical axis of the condenser on the side of the condenser which is remote from the objective.

Reflector means, including two angled reflector elements, are disposed in said body and are movable linearly transversely of the optical axis of the reflector at the side of the condenser remote from the objective. A light source is positioned in the body.

The reflector means has a first position in which it intercepts the optical axis of the condenser so as to direct onto the condenser light rays from the light source, and a second position in which it directs thereonto light rays originating externally of the body, and a third position in which it does not intercept the optical axis of the condenser, thereby to permit viewing, through the aperture, of a subject magnified by the condenser.



3,736,042

## MICROSCOPE SLIDE ASSEMBLY

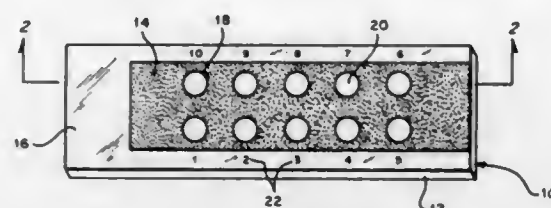
Arthur L. Markovits, Millburn, and Stanley W. Wolfson, West Orange, both of N.J., assignors to Clinical Sciences, Inc., Gladstone, N.J.

Filed May 5, 1971, Ser. No. 140,497

Int. Cl. G02b 21/34

U.S. Cl. 350-95

30 Claims



A microscope slide assembly and a method of preparing such which includes an optically clear glass slide having a controlled thickness fluorocarbon layer coated on one planar surface. The layer is provided with a multiplicity of openings to form wells on the glass slide. An agar solution may be incorporated within the wells to provide an adhesive layer. In addition, a particular antigen may be layered on top of the agar composition to provide a completed assembly wherein only a patient's serum is needed to process a microscopic examination. For use in fluorescent microscopy, a film body grade Teflon containing an adhesive is used to provide the uniform fluorocarbon layer. The microscopic assembly may be enclosed within an environment isolation container to prevent contamination of the assembly from the ambient surroundings when the antigen is combined with the agar solution.

3,736,043

## ELECTROCHEMICAL MOLECULAR DISPLAY AND WRITING

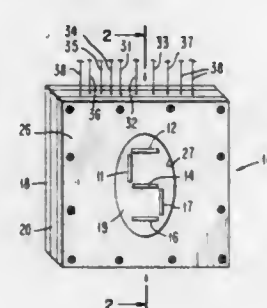
Carlos J. Sambucetti, Mohegan Lake, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 29, 1971, Ser. No. 128,833

Int. Cl. G02f 1/28

U.S. Cl. 350-160 R

22 Claims



An electrochemical, electrically-controlled, reversible, segmented, display method and apparatus presents character patterns which can be erased. The apparatus includes a substrate carrying highly reflective display electrode strips which can be electrically addressed selectively to present characters. Characters are displayed by producing a cloud of iodine molecules obscuring certain electrode segments or strips composed of a noble metal or the like normally visible through a transparent cover in the absence of an iodine cloud. An electrolyte capable of undergoing an electrochemical reduction-oxidation reaction yields a molecular, highly non-reflective film on the display electrode strips to selectively obscure the selected display strips from view to present different characters to the viewer. Satisfactory electrolytes include organic polar iodide compounds including ammonium, arsonium, and phosphonium iodides. Preferably, the electrolyte includes pentavalent nitrogen iodides with a radical selected from the choline group such as acetylcholine, propionylcholine and butyrylcholine iodides. The iodine molecules provided in the

film tend to remain near the electrode for a substantial period of time to provide "short-term" memory. If gelatine or other water soluble substances are added to the electrolyte, which substances are inert, transparent, and which retard migration of ions, then the duration of the memory provided by the system is extended according to the concentration of such substances. Alternatively, iodine lines can be used to form characters where the gold background is present everywhere and dark lines are written upon the display electrodes which normally are not distinguishable from the background optically. In still another alternative, the form of this invention electrolyte carried in a paper can be used to provide electrochemical writing upon the paper.

3,736,044

## DISPERSIVE ACOUSTICAL DEFLECTOR FOR ELECTROMAGNETIC WAVES

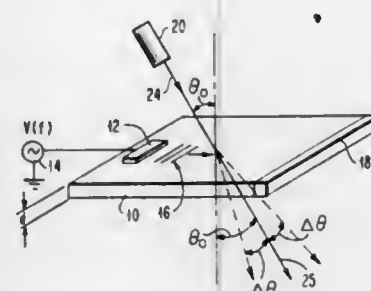
Erk G. Lean, Mahopac, and Carl G. Powell, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1971, Ser. No. 158,231

Int. Cl. G02f 1/32

U.S. Cl. 350-161

23 Claims



An acoustical deflector for electromagnetic waves using a dispersive medium for propagation of the acoustic waves. That is, the thickness of the medium is approximately the wavelength  $\lambda$  of the acoustic wave so that the phase velocity of the acoustic wave is a function of the acoustic wave frequency. Electromagnetic waves which interact with the acoustic wave fronts are deflected through different angles as the phase velocity of the acoustic wave changes due to frequency changes of this wave. Means are provided to excite an adjustable frequency acoustic wave in the dispersive medium.

3,736,045

## FAST OPTICAL GUIDED WAVE MODULATOR AND DIGITAL DEFLECTOR

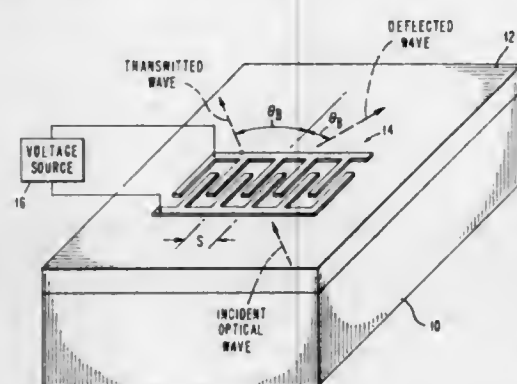
Paul F. Heidrich, Mahopac; Lawrence Kuhn, Ossining, and Keith S. Pennington, Somers, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1971, Ser. No. 212,523

Int. Cl. G02f 1/32; G02b 5/14

U.S. Cl. 350-161

6 Claims



An optical guided wave modulator and digital deflector is described having a piezoelectric substrate with an amorphous

film waveguide thereon. An interdigital periodic electrode structure is connected to the amorphous film and to a source of d.c. voltage. The voltage produces fringing fields which generate a periodic strain in the piezoelectric substrate. The compressional strain in the piezoelectric substrate extends into the amorphous film to produce a periodic variation of index of refraction which functions as a grating at the Bragg angle which deflects an optical wave traveling in the amorphous film.

3,736,046

## OPTICAL SPOT SIZE CHANGER

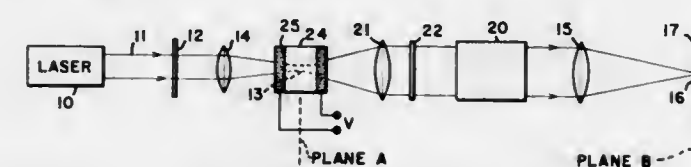
James D. Zook, Burnsville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 15, 1971, Ser. No. 134,245

Int. Cl. G01d 15/12; G02f 1/26

U.S. Cl. 346-74 MT

15 Claims



In a beam-addressed optical memory, the size of the focused light spot is electrically controlled to provide successively larger spot sizes for reading, writing and erasing. A body of material having electric field controllable optical properties which are capable of altering the intensity distribution or the wave front shape of the light beam is positioned between the light source and the focusing means. Electrodes controllably apply a non-uniform electric field to the body such that a non-uniform change in the intensity distribution or the wave front shape of the light beam occurs, thereby causing a change in the size of the focused light spot.

3,736,047

## LIQUID CRYSTAL DISPLAY DEVICE WITH INTERNAL ANTI-REFLECTION CASTING

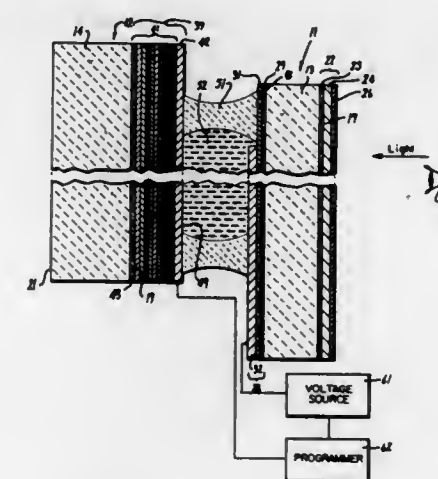
Robert M. Gelber, Healdsburg, and Edward A. Small, Jr., Santa Rosa, both of Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Aug. 13, 1971, Ser. No. 171,572

Int. Cl. G02f 1/16

U.S. Cl. 350-160 LC

13 Claims



Liquid crystal display device having first and second substantially transparent insulative plates having front and rear surfaces with said plates being arranged so that the rear surface of the first plate and the front surface of the second plate face each other. An antireflection coating is disposed on at least one of said front and rear surfaces of said front plate. A

conducting coating is carried on said rear surface of said first plate and said front surface of said second plate. Means secures the first plate to the second plate so that there is a space provided between said conducting layers. A layer of liquid crystal material is disposed in said space.

In the method, an antireflection coating is provided on a surface so that the pattern carried by the display device is invisible when the display device is not activated.

3,736,048

## OPTICAL OBJECTIVES OF VARIABLE EQUIVALENT FOCAL LENGTH

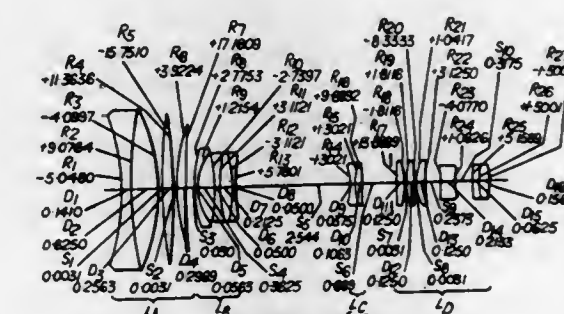
Gordon Henry Cook, Oadby, England, and Peter Arnold Merigold, Prestatyn, Wales, assignors to The Rank Organization Limited, London, England

Continuation-in-part of Ser. No. 309,208, Sept. 16, 1963, abandoned. This application June 11, 1971, Ser. No. 152,254

Int. Cl. G02b 7/10, 15/18

U.S. Cl. 350-186

22 Claims



A zoom lens having an improved zooming range and comprising a convergent first member which for a given object distance remains stationary during the zooming relative movements, an axially movable divergent second member behind the first member having equivalent focal length  $f_1$  lying numerically between 4 and 8 times the minimum value of the ratio of the equivalent focal length of the complete objective to the  $f$ -number of the objective in the range of variation, an axially movable divergent third member behind the second member having equivalent focal length  $f_2$  lying numerically between 5 and 10 times the minimum value of such ratio, a stationary convergent fourth member behind the third member, a zoom control element, and means whereby operation of the zoom control element causes the zooming relative movements to be effected, wherein the total axial movement of the second member in the range of variation lies numerically between  $1.5f_1$  and  $2.5f_1$  and the total axial movement of the third member in the range lies numerically between  $0.25f_2$  and  $0.5f_2$ , the minimum axial separation between the second and third members occurring when the equivalent focal length of the object is greater than half its maximum value in the range of variation, the movable divergent second member consisting of a divergent simple meniscus component with its surfaces convex to the front and a divergent compound component behind such simple component, and the movable divergent third member consisting of a doublet component having its front surface concave to the front with radius of curvature lying numerically between  $0.5f_2$  and  $1.0f_2$ .

3,736,049

## WIDE ANGLE PHOTOGRAPHING LENS

Yoshiyuki Shimizu, Kawasaki-shi, Kanagawa-ken, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Sept. 29, 1971, Ser. No. 184,883

Claims priority, application Japan, Sept. 30, 1970, 45/85417

Int. Cl. G02b 9/64

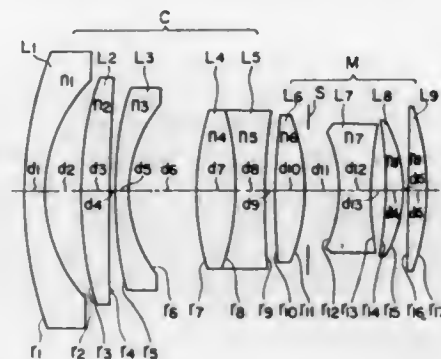
U.S. Cl. 350-214

1 Claim

A wide angle photographing lens which has a brightness of  $F2$ , an angle of field greater than  $74^\circ$  and a long back focus of



1.2 times as great as the focal length, and which comprises a combination of a forward lens group which is an afocal reversed Galilean conversion, and a rearward lens group which is a master lens. The forward lens group comprises a negative meniscus lens convex to the object side, a positive lens, a negative meniscus lens convex to the object side, a



positive lens and a negative lens cemented thereto. The rearward lens group comprises a biconvex lens, a biconcave lens, a positive meniscus lens concave to the object side, and a positive lens. All of these lenses are sequentially arranged in the named order in the direction away from the object so as to satisfy predetermined conditions. The spacing between the forward and rearward lens groups is variable.

3,736,050

#### HIGH CONTRAST FILTER FOR VISUAL DISPLAYS DOWN-CONVERTING OTHERWISE BLOCKED RADIATION

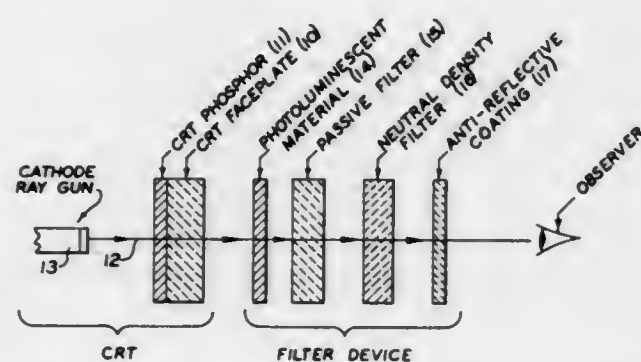
Donald R. Bolum, East Islip, N.Y., assignor to A-T-O Inc., Willoughby, Ohio

Filed July 27, 1970, Ser. No. 58,568

Int. Cl. G02b 5/22

U.S. Cl. 350—316

4 Claims



A radiation filter device is provided for utilization with visual display apparatus, such as the diffusely-emitting cathode ray tube, for contrast enhancement through substantial elimination of ambient radiation effects. This objective is attained through construction of a unique filter device comprising at least two filter elements. The filter device comprises, in cascaded, superposed relationship, a first filter element consisting of a layer or film of luminescent material having a sharp cut-off, band-pass radiation transmission characteristic disposed immediately adjacent the diffusely-emitting surface of the cathode-ray tube faceplate, a second filter element that is effectively a band-pass filter having a transmission band covering the selected band, and a neutral density filter element providing uniform attenuation to radiation of all useful wavelengths within the source emission spectrum. An anti-reflective coating may also be applied to the exit face of the filter device which is the neutral density filter.

#### 3,736,051 PHOTOGRAPHIC APPARATUS FOR MOTION PICTURE PROJECTION

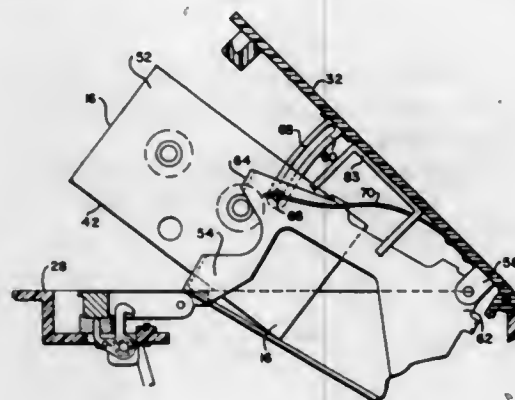
James M. Conner, Mamaroneck, N.Y., and Henry J. Salvador, Hasbrouck Heights, N.J., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 24, 1971, Ser. No. 174,374

Int. Cl. G03b 23/02

U.S. Cl. 352—72

16 Claims



Projector for use with a motion picture film cassette, employing a housing having a front viewing face and a cassette-receiving cavity in communication with the top surface of the housing. A door member mounted at the rear of the opening and configured to block the opening when pivoted into closing position thereacross, carries a cassette-receiving guide which is adapted to receive the cassette from the front of the projector when the door is in its open position and to carry it to an operative location in the cavity when the door is pivoted to its closed position. The door is adapted to displace a drive mechanism of the apparatus into operative relation with the cassette, and the guide is coupled to the door through a lost motion member such that the cassette remains fixed in its operative location during engagement and disengagement of the drive mechanism. Additionally, a handle member is pivotally attached to the apparatus for selective displacement from a first position flush with a surface of the housing to a depressed position where it effects displacement of the door from its closed position and to an upright position where it is accessible for carrying of the unit.

3,736,052

#### REFLEX MOTION PICTURE CAMERA MECHANISM

Jacques Lecoq, Paris, France, assignor to Eclair International, Paris, France

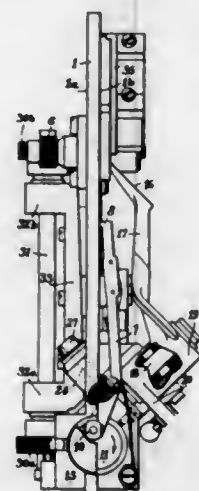
Filed Aug. 2, 1971, Ser. No. 168,012

Claims priority, application France, Jan. 28, 1971, 7102816

Int. Cl. G03b 1/18

U.S. Cl. 352—166

8 Claims



A rotary shutter, a movable mirror and a film moving mechanism are mounted on the same face of a relatively thin

plate in which the film gate and the exposure window are formed. A power shaft is mounted parallel to, and at a relatively short distance from, one face of the plate, with one end flush with a plate edge to permit the direct coupling of the power shaft to the camera motor. Means are provided for coupling the power shaft with the film moving mechanism, the rotary shutter and the movable mirror.

3,736,053

#### ELECTROSTATIC APPARATUS

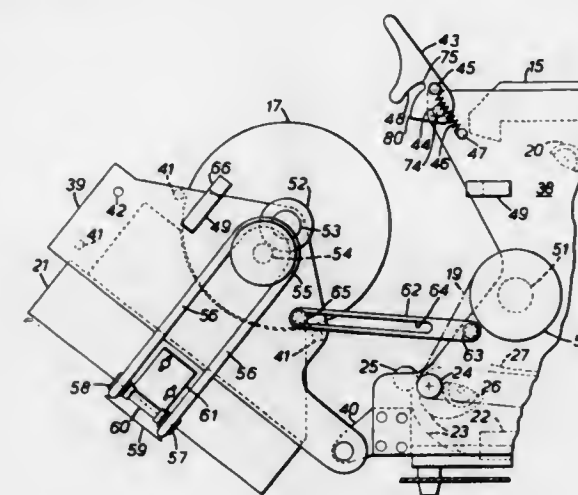
Nicholas Gilbert Shreeve, Weybridge, and Kenneth Sidney Blake, Woking, both of England, assignors to Statkon Copiers Limited, London, England

Filed Oct. 22, 1970, Ser. No. 82,971

Int. Cl. G03g 15/00

U.S. Cl. 355—3

12 Claims



In copying apparatus comprising a drum provided with a photo-conductive surface, copy paper feed means for feeding paper to the drum and drive means for driving the drum surface and the copy paper at the same speed, the drum is carried on first support means the copy paper feed means are carried on second support means, and the two support means are moveable into and out of register, so that main drive means on the said second support means, arranged to drive the copy paper feed means, engage or disengage driven means arranged to drive the said drum without the said main drive means needing to be disengaged.

3,736,054

#### AUTOMATIC LINE TRANSFER CONTROL

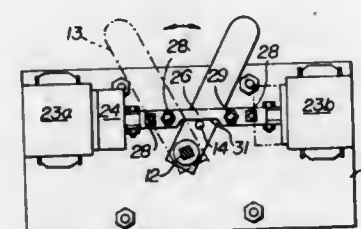
Erich W. Löffler, and Hans Kruger, both of Redwood City, Calif., assignors to Electro-Motion Pacific, Inc., Redwood City, Calif.

Filed Mar. 27, 1972, Ser. No. 238,280

Int. Cl. H01h 3/00

U.S. Cl. 355—13

2 Claims



An oscillatory, multi-pole, mechanically held switch has a shaft provided with a lever at one end. The lever extends into a reciprocating box-like yoke which is connected at each end to the armature of a solenoid. Energization of one or the other

solenoid causes oscillation of the shaft through about 60° and throws the switch to connect load lines to either public utility lines or emergency lines. In proximity to the yoke are two normally closed micro-switches, one wired in series with each solenoid. A pin on the lever is positioned so that when either solenoid has been energized and the switch lever fully moved in proper direction by the solenoid, the pin opens the micro-switch to de-energize the solenoid. The lever may be manually actuated in emergencies when the controls for the solenoids fail.

3,736,055

#### REPRODUCTION APPARATUS INCORPORATING ALTERNATE REDEVELOPMENT AND REIMAGING CYCLES FOR MULTIPLE COPIES

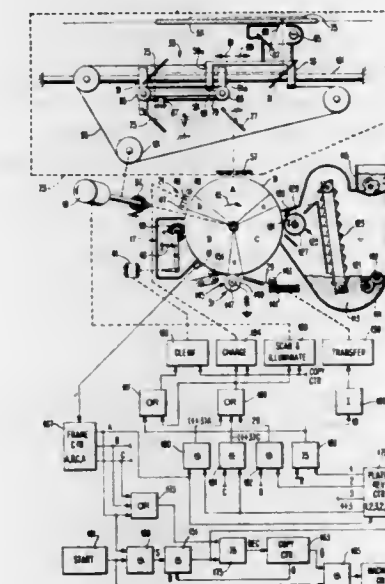
Ronald V. Davidge; George W. Hobgood, Jr.; Carl A. Queener; Jesse W. Spears, and Bernard G. Thompson, all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1971, Ser. No. 209,326

Int. Cl. G03g 15/00

U.S. Cl. 355—14

9 Claims



A continuously operating transfer reproduction apparatus includes a cyclic control unit which automatically effects alternate redevelopment and reimaging cycles when reproducing multiple copies of the same master. An electrophotographic plate travels in a closed loop past a moving optical system which images the plate with a light image of the master creating a latent electrostatic image on the plate. The latent image is developed at a developing station and transferred to a substrate at a transfer station as the plate travels therepast. Increased throughput speed is achieved by effecting a fixed number of redevelopment cycles while the moving optical system is resetting. Thus, the plate continues its travel past the resetting optical system to the developing station where the latent image is redeveloped and thence to the transfer station for transfer of the developed image to a second substrate. The plate is then cleaned and charged prior to being reimaged with the light image of the same master, and the process continues until the requisite number of copies have been reproduced. In one embodiment, multiple imaging areas, preferably an odd number thereof, are located on the plate facilitating rapid alternate imaging and redevelopment cycles.



3,736,056

# **APPARATUS FOR IMPARTING INTERMITTENT ROTATION TO A FIRST MEMBER IN ROTATING REGISTRY WITH A SECOND MEMBER**

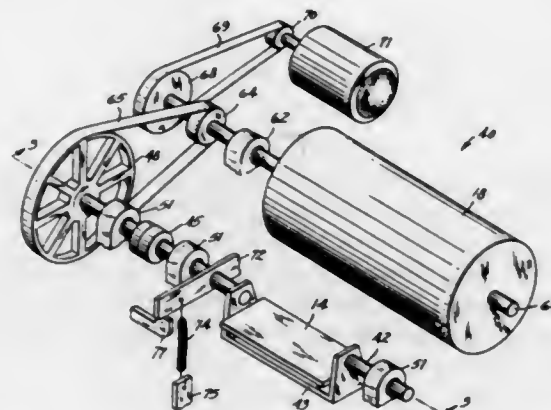
Robert C. Burnet, Hackettstown, and William F. Slack, Andover, both of N.J., assignors to Van Dyk Research Corporation, Whippany, N.J.

Filed Jan. 27, 1972, Ser. No. 221,310

Int. Cl. G03g 15/04

U.S. Cl. 355-8

20 Claims



An office copier in which a rotating photoconductive drum is exposed by an intermittently rotating scan mirror. A slip-free clutch intermittently couples the scan mirror to a shaft which rotates in synchronism with the photoconductive drum. When the clutch is engaged, the scan mirror is caused to rotate in a given direction in precise synchronism with rotation of the photoconductive drum, thus insuring that there is substantially no scan slip in the resulting latent image formed on the drum surface. When the scan mirror has completed its scan, the clutch is disengaged and a spring rapidly returns the scan mirror to an initial rest position in preparation for the next scan. Since the amount of rotation of the scan mirror may be varied by varying the time of engagement of the slip-free clutch, this arrangement is especially suitable for office copiers requiring variable scan length capability.

3,736,057

# **ZONE RANGE FINDER APPARATUS**

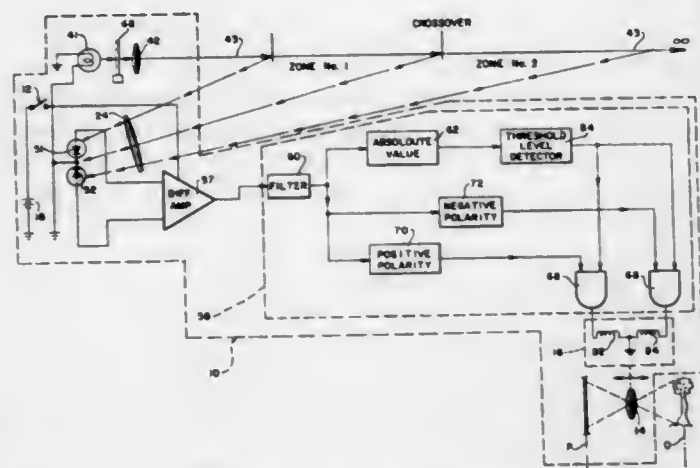
Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 12, 1971, Ser. No. 133,058

Int. Cl. G01c 3/08

U.S. Cl. 356-4

7 Claims



A zone type range finder apparatus is disclosed which includes means for projecting a beam of light toward an object, two spaced photosensitive devices having electrical parameters which respectively vary as a function of the brightness of light incident thereon reflected from the object, and circuitry coupled to the devices for producing a signal having a positive polarity when the object to be photographed is in a first range

of distances measured with respect to a reference plane and a negative polarity when the object to be photographed is in a second range of distances measured with respect to the reference plane. The apparatus further includes means responsive to the signal when it reaches a predetermined magnitude in the positive polarity for indicating that the object is in the first range of distances and responsive to the signal when it declines to a predetermined magnitude in the negative polarity for indicating that the object is in the second range of distances.

3,736,058

# **ROTATING REFLECTOR LEVEL ROD**

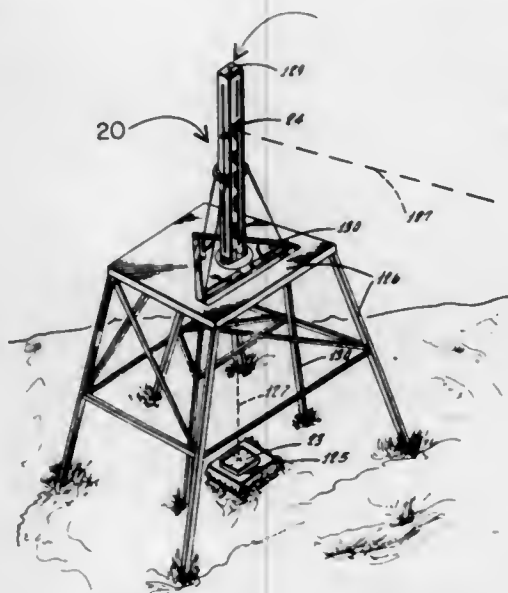
Joseph M. Iadarola, 3422 Oliver St., N.W., Washington, D.C.

Filed Apr. 15, 1971, Ser. No. 134,352

Int. Cl. G01c 3/08; G01b 11/26

U.S. Cl. 356-4

9 Claims



The present invention provides an apparatus and a related method of carrying out leveling survey operations (differential and trigonometric), and is distinguished more particularly by the application of a Rotating Reflector Level Rod which in conjunction with a laser distance measuring instrumentation combines the means of obtaining the required distance measurements to establish the elevations of remote ground points.

3,736,059

# **DEVICE FOR SPECTROCHEMICAL ANALYSIS OF SOLUTIONS**

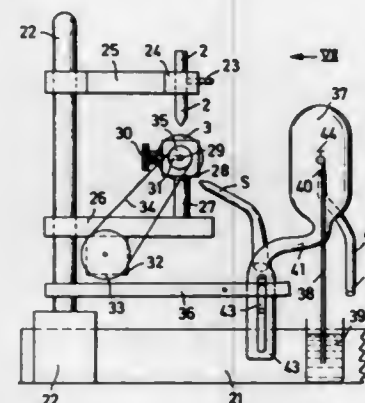
Wolfgang Schölknecht, Enshelmer Strasse 36, St. Ingbert, and Manfred Bollsterling, Karl-Marx-Strasse 22, Kaiserslautern, both of Germany

Filed June 17, 1971, Ser. No. 154,149

Int. Cl. G01j 3/30

U.S. Cl. 356-86

4 Claims



A device for the quantitative spectrochemical analysis of solutions uses two spark discharge electrodes. One of the elec-

trodes is a carbon rod electrode whose one end is shaped as a truncated cone and has a semi-spherical end surface. The other electrode is a circular carbon disc electrode which has a rotary drive and is located beneath the rod electrode. A condensing chamber atomizer is provided for producing a flow of aerosol from the solution to be tested and a jet for the flow of aerosol is directed at the disk outside the spark discharge zone. The device uses optical and electrical equipment comprises among other things a lenticulated condensor, multichannel spectrometer and photomultipliers.

3,736,060

# **OPTICAL CONTOUR SCANNER**

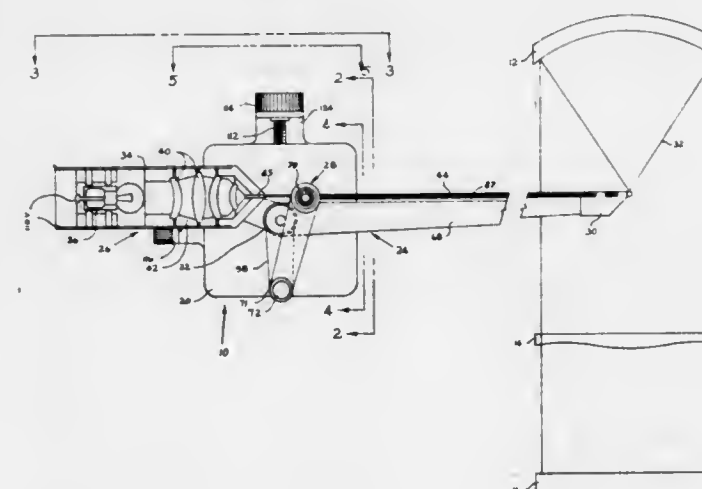
Marvin J. Mayo, Van Nuys, Calif., assignor to Altair Scientifics, Inc., Van Nuys, Calif.

Filed Feb. 11, 1971, Ser. No. 114,419

Int. Cl. G01b 9/00

U.S. Cl. 356-124

7 Claims



A knife-edge type optical testing instrument including a pinhole source and a knife-edge device superimposed into space by means of a beam splitter. A pinhole source is conducted to the beam splitter from a remote source by means of a light conductor tube so that the bulk of the source is not disposed in the beam. The knife-edge shadow pattern is viewed remote from the operational region of the pinhole and knife-edge by means of a fiber bundle image conductor which transmits the pattern from the operational region of the knife-edge to the viewing apparatus. A triple slide mounting means maintains the pinhole source and knife-edge device in fixed relation but permits translation of the source and device accurately in three orthogonal degrees of freedom relative to a fixed reference. A triple slide base may be manually operable by means of micrometer screws having dial readouts for locating the knife-edge position. The viewing apparatus may include a microscope to provide pinhole demagnification to provide sharper shadows.

3,736,061

# **AIRCRAFT PROXIMITY WARNING INDICATOR SYSTEM**

Gary L. Knowlden, Torrance, and David I. Blanchard, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 12, 1970, Ser. No. 10,816

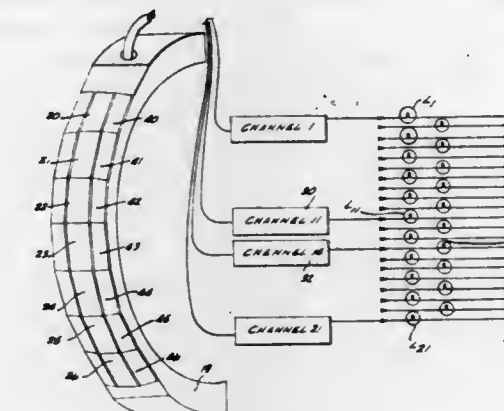
Int. Cl. G01b 11/26

U.S. Cl. 356-141

8 Claims

An aircraft warning system is disclosed for detecting and displaying the relative azimuth and elevation of any aircraft xenon beacon in the vicinity. A total field of view for the system is provided by two or more sensor units which have overlapping subfields. The subfield of a given unit is formed by

the composite view of an array of radiation-sensitive devices, each coupled to a separate lamp in a display instrument by a signal processing channel adapted to identify beacon radiation



pulses and reduce false alarms. Each lamp illuminates a separate segment of the display instrument to indicate relative azimuth and elevation of the detected beacon.

3,736,062

# **CO-AXIAL COORDINATOR AND METHOD OF USE IN ALIGNING ROTATING UNITS IN PROPULSION SYSTEMS**

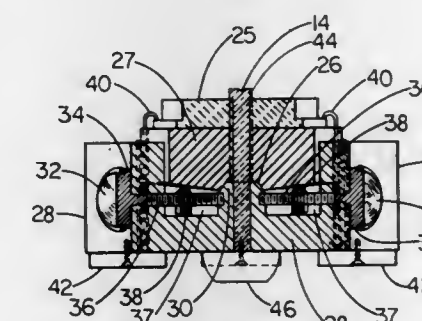
Judson D. Murphy, Rte. 4, Box 4, Natchas Dr., Slidell, La.

Filed Mar. 10, 1972, Ser. No. 233,410

Int. Cl. G01b 11/26; B23q 3/00

U.S. Cl. 356-153

5 Claims



An optical alignment instrument comprises an annular mirror, with an optically flat face, supported in a mirror mount and mounted in an annular base. The mirror and mount are concentrically supported in the base by interfitting spherical surfaces, and radially supported by movable wedging cams mounted therebetween and spaced apart ninety degrees for tilting the mirror independently of said base. A straight target pin, having oppositely disposed ends, is adapted to extend through an annular space defined by the mirror, mount and base, with the oppositely disposed ends respectively projecting from the base and the mirror. The end projecting from the base is adapted to engage in a center recess tapered in the coupling end of every rotating unit in a propulsion system, and to snugly engage said base and loosely engage mirror and mount. Magnetic plates are fixed to the base for removably mounting it, with the snugly engaged target pin, on a coupling end and concentric with the center recess thereof. The optical alignment instrument is used in combination with an alignment telescope, having an illuminated reticle, for aligning the various rotating units of a propulsion system by a new method.



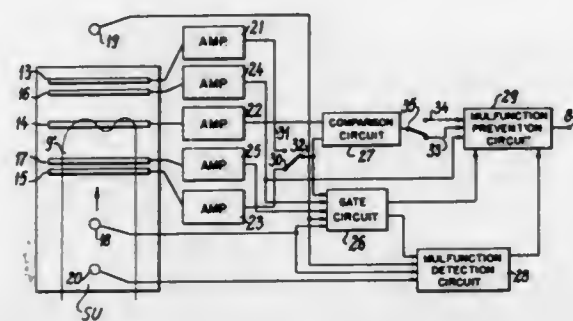
3,736,063

## COMPARISON SYSTEM FOR DETERMINING SHAPE AND INTENSITY OF ILLUMINATION OF LUMINOUS OBJECTS

Eiichi Ohno; Mitsuki Danno, Amagasaki, Hyogo Prefecture; Elzo Yamazaki, Kamakura; Kiyoto Ohkawa, Kamakura, and Osamu Watanabe, Kamakura, all of Japan, assignors to Mitsubishi Denki Kabushiki, Kaisha, Tokyo, Japan  
Filed Aug. 7, 1970, Ser. No. 61,908  
Int. Cl. G01b 11/04

U.S. Cl. 356—160

6 Claims



A red hot steel strip travels below two elongated photocells disposed in parallel and in a direction perpendicular to the longitudinal axes of the latter. A comparator detects a difference between outputs from both photocells indicating the widths of the strip end portion and provides a signal upon that difference reaching a predetermined magnitude. The signals serve to cut the strip end portion off. One strip sensor is disposed adjacent each photocell to disable the signal during any erroneous system operation.

3,736,064

## HAIR COLOR LEVEL INDICATING METHOD

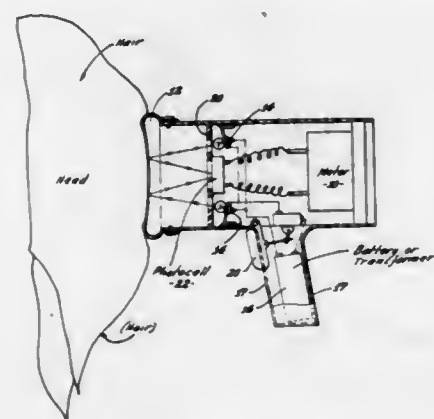
Paula Jane Kent, Malibu, and Arthur R. McCullough, Van Nuys, both of Calif., assignors to Redkin Laboratories, Inc., Van Nuys, Calif.

Filed Sept. 17, 1970, Ser. No. 73,536

Int. Cl. G01j 3/50

U.S. Cl. 356—195

3 Claims



An improved method has been conceived in the art of hair tinting and bleaching, whereby cosmetologist may determine exactly the shade level of a patron's hair for tinting or bleaching purposes. In addition, he can determine exactly the number of shade lifts the hair has undergone during a tinting operation, or the number of stages of bleach the hair has undergone during a bleaching operation. A simple, hand-held instrument is provided which measures the shade level of the patron's hair directly and instantaneously, and which enables the cosmetologist initially to determine the level of color tint to use, and then to determine exactly whether or not the hair has been lifted the desired number of shades. To assist in carrying out the method of the invention, the color tints themselves should be labelled to designate their respective shade levels.

3,736,065

## RADIATION SENSITIVE MEANS FOR DETECTING OPTICAL FLAWS IN GLASS

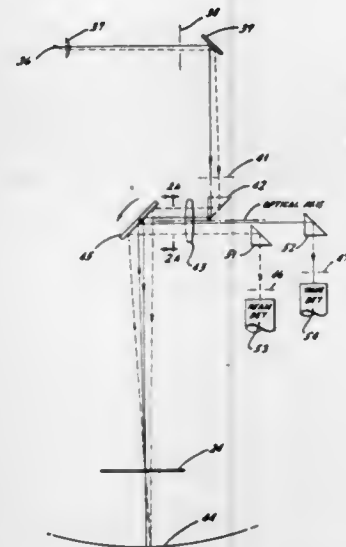
Charles J. Cushing, Churchville; Kurt C. Schwind, and Richard D. Vander Neut, both of Philadelphia, all of Pa., assignors to Philco-Ford Corporation, Philadelphia, Pa.

Filed May 9, 1972, Ser. No. 251,833

Int. Cl. G01n 21/32

U.S. Cl. 356—239

10 Claims



Apparatus for detecting flaws in a continuously moving ribbon of float-formed glass, comprising optical elements constructed and arranged to direct scanning beams of light through the glass ribbon, and which, in combination with associated discriminating means, afford a system which detects discrepancies in the transmission of light in the region of a flaw contained in the glass. In addition to the optical elements, the disclosed apparatus comprises a flaw marking unit and a control unit. Information as to the exact nature and location of marked flaws in the inspected glass may be stored in a computer, in the order of severity of the flaw. The apparatus claimed is particularly adapted to detect ream and wave flaws.

3,736,066

## VIBRATORY EARTH COMPACTING APPARATUS

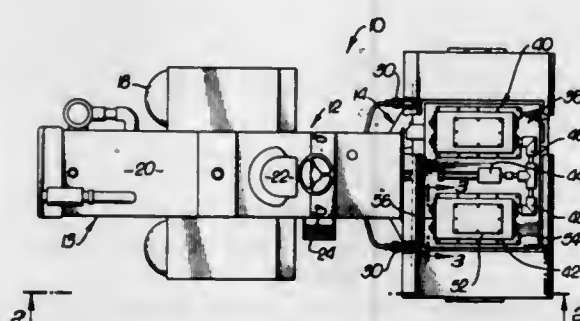
Victor N. Koontz, Los Angeles, Calif., assignor to Pettibone Corporation, Chicago, Ill.

Filed Mar. 15, 1971, Ser. No. 124,023

Int. Cl. E01c 19/28

U.S. Cl. 404—117

4 Claims



A vibratory earth compacting apparatus comprising a vehicle having a main frame and a roller frame mounted on the main frame for vertical movement relative thereto, the roller frame carrying an earth compacting roller rotatable about a transverse axis, and vibrated by two vibration generators which extend longitudinally of the vehicle and are mounted on the roller frame in transversely spaced relation. Each of the vibration generators includes eccentric driving and driven

shafts extending longitudinally of the vehicle and geared together. The gearing between the driving and driven shafts of each generator includes meshed driving and driven gears and the driven gear is axially movable out of mesh with the driving gear so that the driven gear, and its eccentric shaft, may be displaced angularly relative to the driving gear, and its eccentric shaft, thereby adjusting the amplitude of vibration independently of the frequency. The driven gears of the two generators, and their eccentric shafts, are angularly adjusted equally and in opposite directions so as to cancel out horizontal vibration components for a net horizontal vibration output of zero.

3,736,067

## REBORING TOOL FOR BRAKE SPIDERS

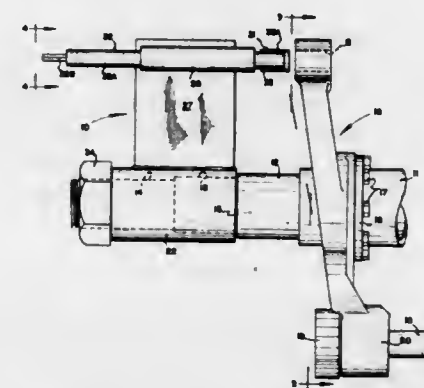
Lee R. Akins, 1384 N. 33rd St., Springfield, Oreg.

Filed Dec. 15, 1971, Ser. No. 208,481

Int. Cl. B23b 45/14

U.S. Cl. 408—79

9 Claims



A boring tool for repairing brake spiders in place on a vehicle axle. The tool having a base rotatably mountable on the axle spindle with adapter means permitting tool use on various spindle configurations. Elongate bearing sleeves radially spaced from the base are adapted for rotation into axial alignment with the anchor pin bores of the brake spider. A retention bar and a boring bar interchangeably journaled in said sleeves respectively position the tool. Rotation of the base subsequent to a first boring operation permits bar extraction and interchange prior to a second boring operation. Additional structure is shown providing feed means for the boring bar. A modified form of the invention permits permanent retention of retention and boring bars within their respective sleeves.

3,736,068

## RECYCLE POWER UNIT

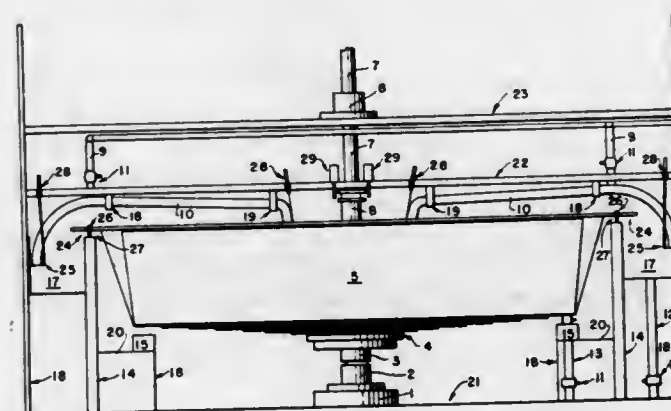
Cecil Lloyd Porter, Route 1, Box 242, Courtland, Ala.

Filed Nov. 3, 1970, Ser. No. 86,436

Int. Cl. F04d 1/14

U.S. Cl. 415—89

1 Claim



This Recycle Power Unit is for the purpose of creating a massive power to operate electric generators or other massive power requirements.

This Recycle Power Unit is a unit that takes water and by recycling it on a massive scale uses it to create power by the Unbalanced Force of the Siphons and the Centrifugal Force acting on the Turbines and the ejection nozzles.

The centrifugal forces are built up by a starter motor till they exceed the resistance of friction and air resistance till these forces become greater than the resistance forces. After exceeding these resistance forces they are at this point an unbalanced force which is constantly resupplied with water for recycle use to keep them unbalanced by the siphons as described in the following drawings and descriptions of Recycle Power Unit you already have.

3,736,069

## TURBINE STATOR COOLING CONTROL

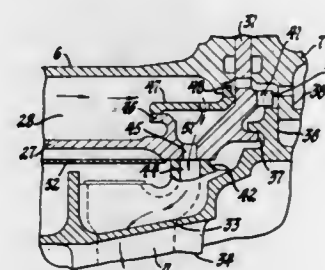
Paul E. Beam, Jr.; Albert L. Hunt, Jr., and Esten W. Spears, Jr., all of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 28, 1968, Ser. No. 770,919

Int. Cl. F01d 5/14

U.S. Cl. 415—115

5 Claims



The stator of a gas turbine includes an arrangement for controlling flow of cooling air to the vanes of the second stage turbine nozzle from the engine compressor. Control is by a valve defined by two rings extending around the exterior of the turbine nozzle which have different coefficients of thermal expansion so that the gap between them varies in accordance primarily with the temperature of the cooling air which tends to increase with the power output of the engine and thus with the need for cooling air.

3,736,070

## VARIABLE STATOR BLADE ASSEMBLY FOR AXIAL FLOW, FLUID EXPANSION ENGINE

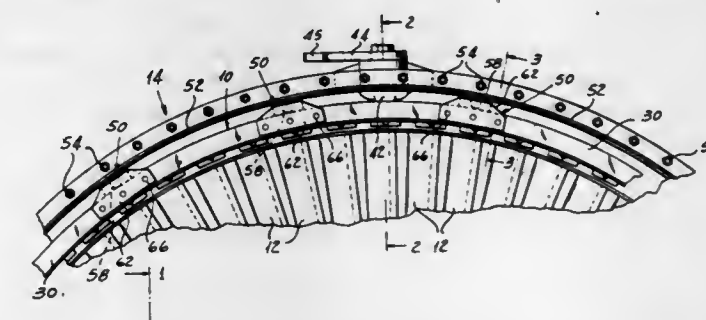
Seymour Moskowitz, Fort Lee, and Anthony Leto, Franklin Lakes, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed June 22, 1971, Ser. No. 155,524

Int. Cl. F01d 17/14

U.S. Cl. 415—147

12 Claims



In an axial flow, fluid expansion engine having stator vanes adjustable, through a rotatable unison ring and linkage assembly, to vary the area of the throat defined between the next adjacent stator vanes, a frame for circumferentially supporting the unison ring to prevent ovalizing of the ring and, hence, provide accurate adjustment of the size of each of the throat areas.



3,736,071

**BUCKET TIP/COLLECTION SLOT COMBINATION FOR OPEN-CIRCUIT LIQUID-COOLED GAS TURBINES**

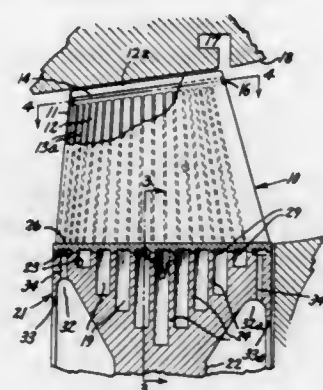
Paul H. Kydd, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 27, 1970, Ser. No. 93,057

Int. Cl. F01d 5/18

U.S. Cl. 416-97

5 Claims



Bucket tip designs are shown for manifolding fluid discharge from open-ended coolant passages in a liquid-cooled gas turbine. The manifolded fluid (e.g., steam and excess water in a water-cooled system) is discharged from the trailing edge of the bucket and liquid content thereof is thrown into a collection slot located in register therewith in the wall of the casing.

3,736,072

**SYSTEMS FOR THE SUPPLY OF LIQUID FUEL TO GAS-TURBINE ENGINES**

Horace George Turner, Chandler's Ford, and Robert Spurgeon Wood, Gosport, both of England, assignors to Plessey Handel Und Investments A.G., Zug, Switzerland

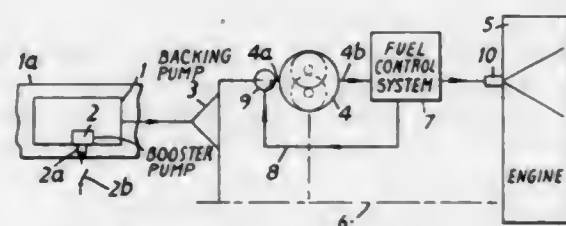
Filed Aug. 24, 1971, Ser. No. 174,366

Claims priority, application Great Britain, Aug. 25, 1970, 40,897/70

Int. Cl. F04b 23/04, 23/14; F02c 9/04

U.S. Cl. 417-79

5 Claims



To permit the booster pumps in aircraft wing tanks to be switched-off immediately after starting of the engine, thus reducing the fire hazards in the event of a crash, without endangering the maintenance, even at high altitude, of adequate pressure at the inlet 4a of an engine-driven fixed-displacement main fuel pump, the energy of the spill flow is utilized in an injector-type pump to boost the pressure of the fuel in the supply line leading from a backing pump to the main fuel pump. A novel form of injection-type pump is also described which makes use of the Coanda wall-attachment effect.

3,736,073

**PUMP CONTROL MECHANISM**

Robert Edwin Walmsley, Marlow, England, assignor to Joseph Lucas Industries, Limited, Birmingham, England

Continuation-in-part of Ser. No. 866,253, Oct. 14, 1969, abandoned. This application Dec. 29, 1971, Ser. No. 213,475

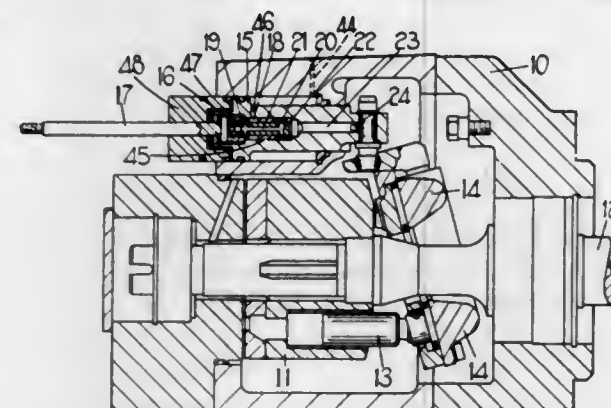
Int. Cl. F04b 49/00

U.S. Cl. 417-222

3 Claims

The invention relates to a control mechanism for a swash plate type pump wherein the cam plate can be moved to op-

posite inclinations relative to the axis of the rotation of the rotor. An axially movable pump stroke controlling member is connected to means for setting the member through a means permitting lost motion against the action of a spring or the like. A piston subjected to the output pressure of the pump is provided with an arm to coact with an abutment controlling



member, when the pump output pressure exceeds a predetermined value with the cam plate of the pump set at one inclination to the axis of rotation. A lever connected to the piston coacts with the abutment in reducing the stroke of the pump when the pump output pressure exceeds a predetermined value with the cam plate of the pump set at the other inclination to the axis of rotation of the rotor.

3,736,074

**INLET, FILTER AND NOISE SUPPRESSOR ENCLOSURE FOR COMPRESSING APPARATUS**

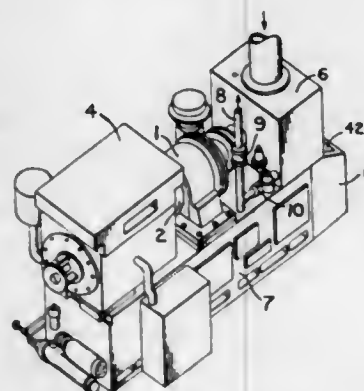
John R. Kilbane, East Aurora, and Peter G. Wendt, Williamsville, both of N.Y., assignors to Worthington-Cel Incorporated, Buffalo, N.Y.

Filed Apr. 20, 1972, Ser. No. 245,718

Int. Cl. F04b 49/02

U.S. Cl. 417-279

7 Claims



A composite inlet, filter and noise suppressor enclosure to be connected to apparatus for compressing air or gas includes at least one compartment lined with sound absorbing material having an inlet passage for the air or gas to be compressed with which a single or multi-stage filter coacts, an outlet passage which communicates with the suction inlet of the compressor in the compressing apparatus, and a by-pass conduit for delivering compressed air or gas from the compressing apparatus for recycling the same through the chamber and the outlet passage back to the compressor. The chamber in addition to said sound absorbing material having means therein for both suppressing or silencing the air or gas flowing from the inlet through the chamber to the compressor or from the by-pass and blow-off system through the chamber to the compressor. The enclosure further provided with simple access means for replacement of the filter elements.

Additionally, the combination of the enclosure above described with an enclosure for housing all compressor control system components, meters, etc.

3,736,075

**PUMP AND FILTER UNIT**

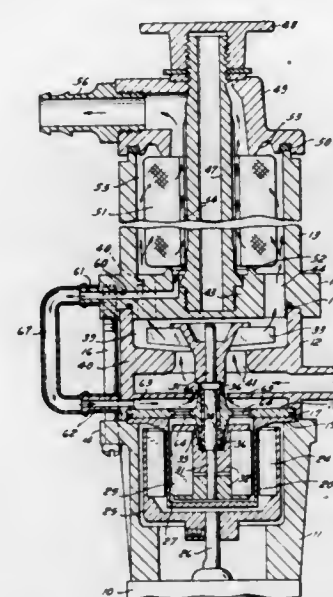
Walter J. Otto, Wantagh, N.Y., assignor to Sethco Manufacturing Corp., Freeport, N.Y.

Filed Feb. 16, 1971, Ser. No. 115,265

Int. Cl. F04b 35/04

U.S. Cl. 417-366

6 Claims



A pump impeller is rotated by a motor through magnetically coupled driving and driven magnets. The driven magnet rotates with the impeller and is located in a chamber defined by a cup-shaped partition interposed between the two magnets. The impeller draws dirty liquid through the pump inlet and delivers it to a filter housing in which the liquid is filtered. Through a passageway located between the driven magnet chamber and the pump inlet, filtered liquid is introduced into the driven magnet chamber; the filtered liquid also flows through the passageway to the pump inlet through a restricted opening surrounding the shaft on which the impeller and driven magnet are mounted. The pump drive motor, pump body, and filter housing are all axially aligned.

3,736,076

**COMPRESSOR LUBRICATION SYSTEM**

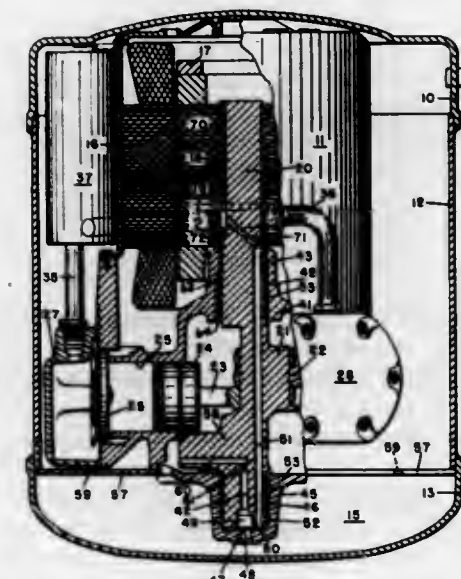
Robert W. Ayling, Bristol, Va., assignor to Cardinal Compressor Corporation, Bristol, Va.

Filed Mar. 1, 1972, Ser. No. 230,652

Int. Cl. F04b 39/02

U.S. Cl. 417-372

14 Claims



A refrigerant compressor has a vertically extending crankshaft with its lower end in an oil sump. An off-center

bore extends vertically within the crankshaft, and is connected through radial bores to the bearings. The bottom of the off-center bore is connected to the outlet of an oil pump formed in the bottom of the crankshaft. The inlet of the oil pump is connected to the oil in the sump. A gas pump is formed in the lower portion of the crankshaft above the oil pump. The gas pump has its inlet connected to the inlet of the oil pump, and has its outlet connected through a radial bore in the crankshaft to the space above the sump. Another gas pump is formed in the upper portion of the crankshaft and has its inlet connected to the top of the off-center bore, and its outlet within the interior of a motor compartment above the off-center bore.

3,736,077

**HOIST PIPING FOR DEEP-SEA MINERAL SLURRY**

Ernest Blaney Dane, Jr., 57 Tyler Road, Belmont, Mass. Division of Ser. No. 754,191, Aug. 21, 1968, abandoned. This application Dec. 28, 1970, Ser. No. 102,034

Int. Cl. F16l 9/12; E21b 7/12

U.S. Cl. 417-424

9 Claims



Pipe sections adapted for constructing into a lengthy fluid circuit for hoisting mineral slurry from a mining plant working a deep ocean bed to a surface ship. Each pipe section possesses termini for facilitating the initial under-water construction of the circuit and strength for supporting the mining plant as it is simultaneously lowered to the bed. A pipe section contains a pump for lifting slurry through its length and a dump-valve for dumping slurry in the event a malfunction occurs in the circuit. A series of buoyancy tanks separated by cushions are disposed along the sides of a pipe section contribute counter-balancing forces that largely neutralize the load that would otherwise accumulate in the circuit. The cushions are adapted to prevent high direct contact pressures between opposing surfaces of adjacent tanks.

3,736,078

**DRIVE CONTROL AND HOLD-IN ARRANGEMENT FOR A ROTARY ACTUATOR**

Ronald G. Read, Birmingham; Norbert L. Sikora, Southfield, and Kenneth W. Verge, Farmington, all of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed July 1, 1971, Ser. No. 158,757

Int. Cl. F01c 1/02; F03c 3/00; F04c 1/02

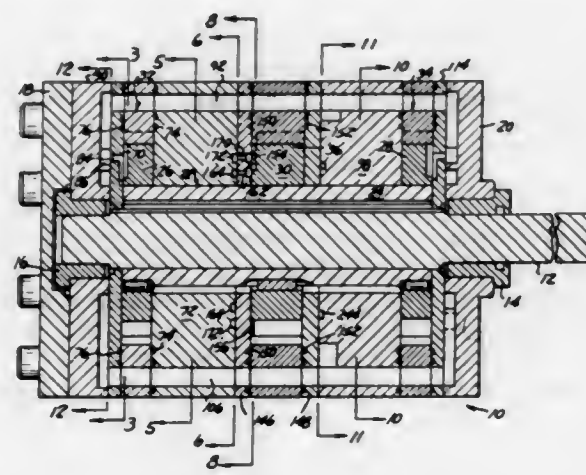
U.S. Cl. 418-60

22 Claims

A rotary actuator of the type in which a ring gear is orbited within a stationary reaction gear and about an output gear, the ring gear driven to so orbit by a torque producing vector which is constantly indexing about the circumference thereof to produce its orbiting motion is disclosed, in which an ar-



rangement is provided for producing a hydraulically generated hold-in vector acting on the ring gear at an angle displaced from the torque producing vector and which also constantly indexes about the circumference thereof in the same manner so that the ring gear is maintained in engagement with the



reaction and output gear during its orbiting motion without the use of rotary bearings or cranks. This arrangement also provides for a disengagement of the ring gear from the reaction and output gear in the event a hold-in vector of a certain magnitude is not produced to thus provide a means to controllably discontinue drive through the unit.

3,736,079

# LUBRICATING OIL FLOW CONTROL FOR A ROTARY COMPRESSOR

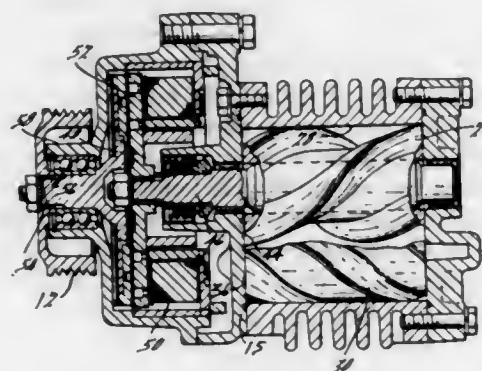
Don B. Kantz, Ferndale, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 29, 1972, Ser. No. 239,064

Int. Cl. F04c 17/00

U.S. Cl. 418-77

4 Claims



A rotary compressor adapted especially for pumping fluids in a closed circuit of an air conditioning system comprising a pair of meshing helical rotors adapted for rotation about parallel axes and a lubrication oil flow path including registering oil ports in one of said rotors and in an adjacent housing wall whereby fluid is admitted to the lubrication oil circuit intermittently at a rate that is dependent upon the speed of the rotors thereby providing a desired higher lubricating oil flow at high compressor speeds and a reduced flow at lower compressor speeds to establish lubrication, sealing and cooling of the relatively movable parts of the compressor.

## 3,736,080 ROTARY-PISTON INTERNAL-COMBUSTION ENGINE Huschang Sabet, Edward-Pfeiffer-Strasse 67, Stuttgart, Germany

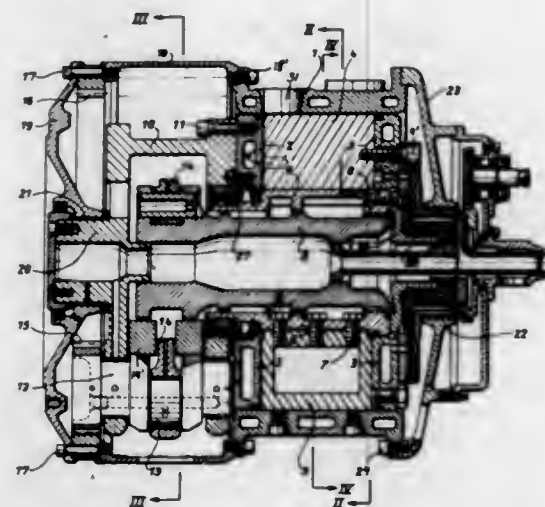
Filed Apr. 27, 1971, Ser. No. 137,870

Claims priority, application Germany, May 2, 1970, P 20 21 640.4

Int. Cl. F01c 1/00; F03c 3/00; F04c 17/00

U.S. Cl. 418-34

10 Claims



In a rotary-piston internal-combustion engine in which two sets of pistons rotate about a common axis while in sealing engagement with a cylindrical casing wall, and the two sets are connected so that the pistons of one set rotate at uniform speed and those of the other set rotate at cyclically varying speed to expand and contract combustion chambers circumferentially bounded by the pistons, the uniformly rotating pistons are fixedly fastened to the radial end walls of the casing, and motion is transmitted between the two sets by crankshafts journaled in a gear carrier fixedly fastened to one of the end walls and oscillating a mounting sleeve for the pistons of the other set. The crankshafts are rotated by respective gears meshing with a ring gear fastened to the normally stationary cylindrical casing wall.

3,736,081

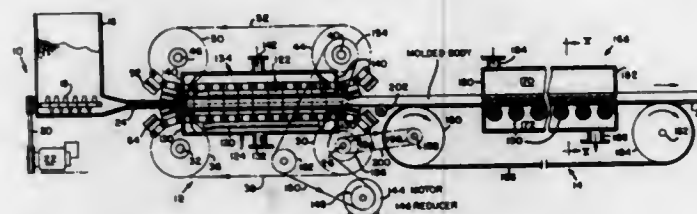
## APPARATUS FOR CONTINUOUSLY PRODUCING BODIES OF SYNTHETIC THERMOPLASTIC MATERIAL Joseph T. Yovanovich, Rosemont, Pa., assignor to Milton Berger, Philadelphia, Pa., a part interest

Filed June 4, 1971, Ser. No. 149,948

Int. Cl. B29d 27/04

U.S. Cl. 425-4 C

5 Claims



A mold channel is formed by attachments carried by two straight runs of a pair of endless articulated link chain belts all moving continuously in the same direction at the same rate of speed through a heating zone. Granules of a synthetic thermoplastic material containing a heat expanding agent are continuously fed into the upstream end of the mold channel, and steam under pressure is introduced into the mold channel through openings in the attachments. Thus the granules of material fed into the mold channel are converted into a coherent foamed agglutinated body. The molded body continuously issuing from the mold channel is received by an endless flat belt conveyor and carried thereby through a coating zone.

3,736,082

## STEAM CHAMBER

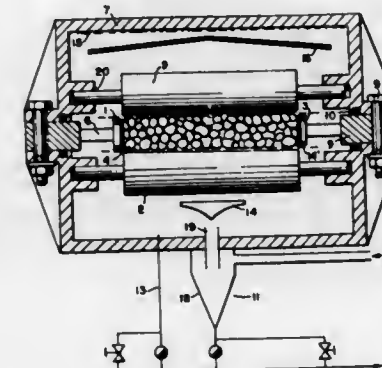
Kurt Wick, Frankenthal, and Norbert Holl, Ludwigshafen, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Nov. 26, 1971, Ser. No. 202,077

Int. Cl. B29d 27/04

U.S. Cl. 425-4 C

5 Claims



The steam chamber in an apparatus for the continuous manufacture of foamed polystyrene strands has perforated conveyor belts which are guided by rolls and which form, together with foam guides, a channel for the accommodation of particulate polystyrene which has been preformed but is capable of further expansion and which are positively and sealingly connected, via spacing strips, to two housing parts which encompass said channel.

3,736,083

## RAM TIP SECURING ARRANGEMENT

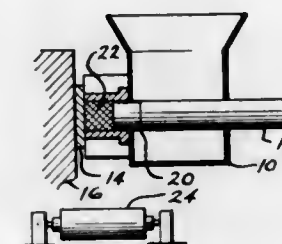
Robert Davis Mitchell, Solon, Ohio, assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 29, 1971, Ser. No. 213,315

Int. Cl. B30b 11/04

U.S. Cl. 425-78

10 Claims



A ram shaft for a briquetting press having a removable shaft tip with the tip being secured to the shaft by a pair of wedge shaped members that extend through aligned passageways formed in the ram shaft and the tip member. When occupying one position, the wedges are effective to retain the removable tip in place. They may be reversed however and used to forcibly break the connection between the tip and the ram shaft.

3,736,084

## BRIQUETTING PRESS WITH BRIQUETTE CONVEYING FACILITY

Robert Davis Mitchell, Solon, Ohio, assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 29, 1971, Ser. No. 214,574

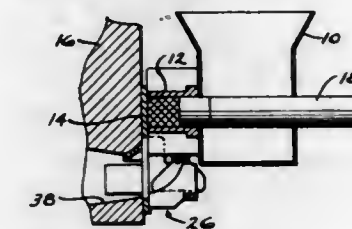
Int. Cl. B30b 11/04

U.S. Cl. 425-78

7 Claims

A briquetting press of the stationary anvil movable die type provided with a passageway through the end frame portion of the press to which the anvil is secured and having a foraminous trough for catching the briquettes as they fall from

the anvil and directing them through the passage in the frame and also having a pusher device that forcibly pushes the



briquettes from the trough through the end frame passage incident to moving the die and its associated mechanism toward the anvil.

3,736,085

## BRIQUETTING PRESS WITH BRIQUETTE REMOVAL MECHANISM

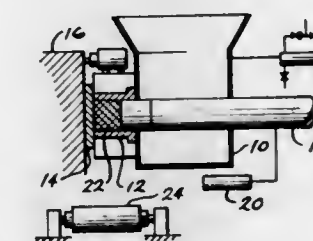
Robert Davis Mitchell, Solon, Ohio, assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 29, 1971, Ser. No. 213,367

Int. Cl. B30b 11/04

U.S. Cl. 425-78

8 Claims



A briquetting press of the stationary anvil movable die type provided with mechanism for engaging a briquette that sticks to the anvil upon retraction of the die to forcibly remove the briquette from the anvil. The mechanism is actuated incident to movement of the die and the associated chip box.

3,736,086

## APPARATUS FOR MAKING FIBER PREFORM

Arthur J. Wiltshire; Henry U. Ranallo, both of Cleveland, and Frank E. Czumber, Chardon, all of Ohio, assignors to Structural Fibers, Inc., Chardon, Ohio

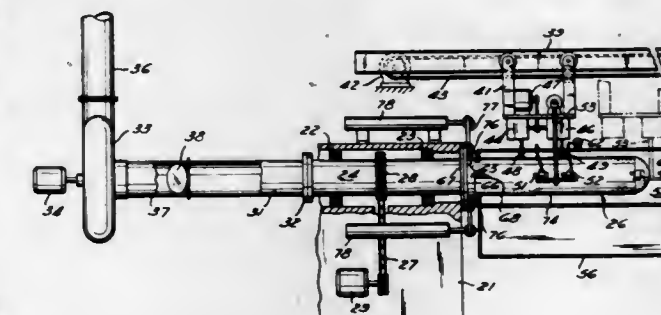
Division of Ser. No. 742,692, July 5, 1968, Pat. No. 3,654,002.

This application July 1, 1971, Ser. No. 158,774

Int. Cl. B29c 13/00, 27/26

U.S. Cl. 425-92

11 Claims

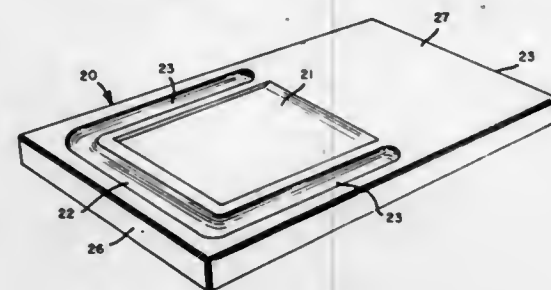


A preform suitable for the bag molding of fiber glass articles such as tanks or the like is disclosed. The preform includes a tubular portion and an integrally formed end wall at one end. The wall of the preform consists of a mat formed by a multitude of short lengths of fibers randomly oriented in the wall and bonded by a settable resin which does not fill the voids



between the fibers. The form is free of overlaps and seams. A machine and a method for forming this preform is also disclosed. The machine includes a perforated form rotated about its longitudinal axis while vacuum is applied internally. Choppers deposit short lengths of fibers on the rotating form and resin is sprayed onto the fibers as they are deposited. An oven is provided to cure the resin while the preform remains on the form. Power means are provided to remove the preform from the machine. Because the form is rotating while the cutters traverse the length to deposit the fibers, the dominant orientation of the fibers is in a spiral direction. According to a further aspect of the invention, the preform is wound with a continuous filament so that the preform will have additional reinforcing strength characteristics and so that the outside diameter of the preform will be dimensioned to fit within a tubular mold with minimum clearance.

trough adjacent and parallel to three sides of said depression. A flat edged spreader blade provides the means to uniformly



distribute material placed on said husk and to sweep the excess thereof into said trough. A further portion of said surface provides a general working area.

3,736,087

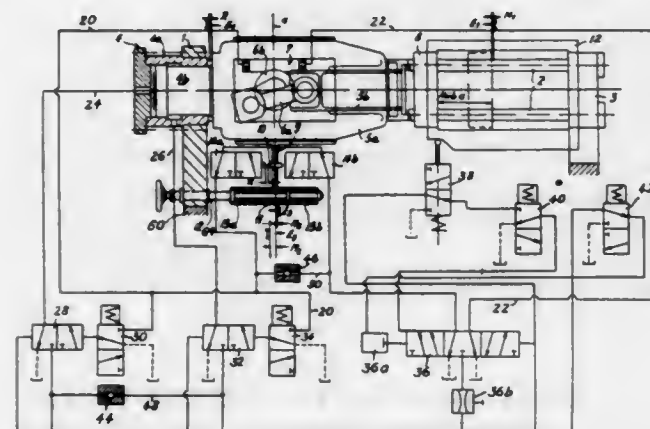
**MOLD CLOSING UNIT WITH SEPARATELY ACTING ROTARY AND FLUID PRESSURE PISTON DRIVES**  
Edwin Ruegg, Netstal, Switzerland, assignor to Maschinenfabrik Glesserei Netstal AG, Netstal, Switzerland

Filed Dec. 17, 1970, Ser. No. 99,051

Int. Cl. B29f 1/00

U.S. Cl. 425-137

6 Claims



A mold plate closing mechanism includes a housing member which is connected to a movable mold plate which is guided for movement toward and away from a fixed mold plate along with the housing member. The housing member is shifted by a rotary drive and also by a fluid pressure-operated piston which is connected to the housing member. The arrangement includes an electrical contact switch for shifting from one drive to the other.

3,736,088

**TOMALE MAKING DEVICE**

Antonio J. Jimenez, 472 North 13th St., San Jose, Calif.

Filed July 26, 1972, Ser. No. 275,228

Int. Cl. A21c 3/00

U.S. Cl. 425-218

4 Claims

A tamale making board has in its top surface a shallow rectangular depression to receive corn husk and a U-shaped

**3,736,089**  
**APPARATUS FOR MOLDING A RIGID PRODUCT FROM SYNTHETIC RESINOUS MATERIALS**

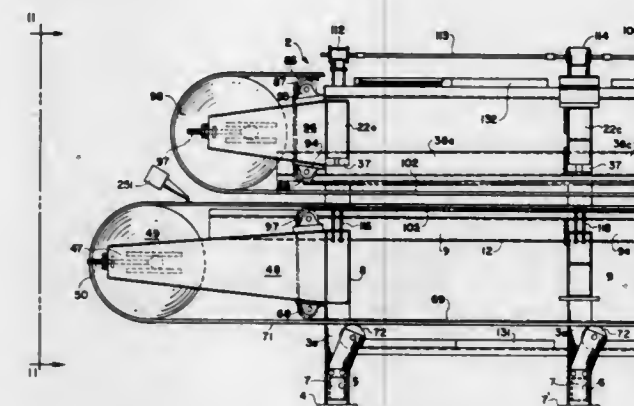
Lee F. Ross, Los Gatos; James E. Wilkinson; Fred A. Craig, both of San Jose, and Allan M. Hudson, Mountain View, all of Calif., assignors to Thiokol Chemical Corporation, Bristol, Pa.

Filed Nov. 8, 1971, Ser. No. 107,174

Int. Cl. B28b 3/12

U.S. Cl. 425-174.4

4 Claims



A machine operable to produce molded synthetic products in finished form in a continuous process, including mixing, pouring, molding, and curing the resultant product.

3,736,090

**APPARATUS FOR CONTINUOUSLY MAKING PEARLESCENT PLASTIC SHEETING**

George R. Adey, Huntingdon Valley, and Wilmer Souder, Jr., Pottstown, both of Pa., assignors to Denton Plastic Products Corp., Southampton, Pa.

Division of Ser. No. 638,482, May 15, 1967, Pat. No. 3,518,333. This application Nov. 26, 1969, Ser. No. 31,451

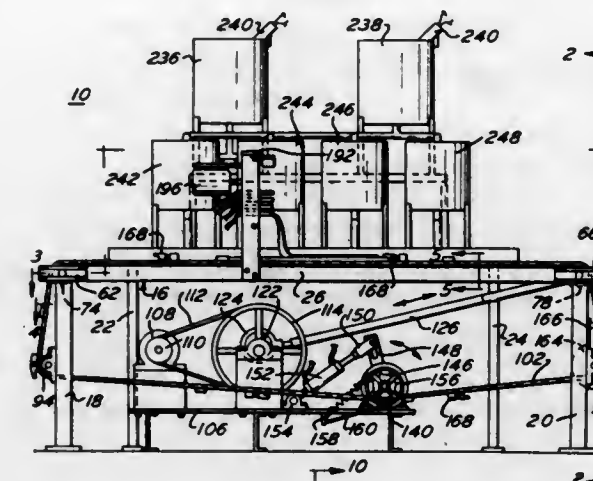
Int. Cl. B28b 1/04

U.S. Cl. 425-224

16 Claims

Apparatus and method for continuously making pearlescent sheeting including a reciprocating surface mounted on an

endless chain driven by an intermittent drive. Pumps deliver resin material from containers to one or more vertically



aligned nozzles being traversed across the surface. Initiation of displacement of the surface is regulated by position of traversing nozzle.

3,736,091

**APPARATUS FOR FINISHING HOLLOW BLOW MOLDED ARTICLES**

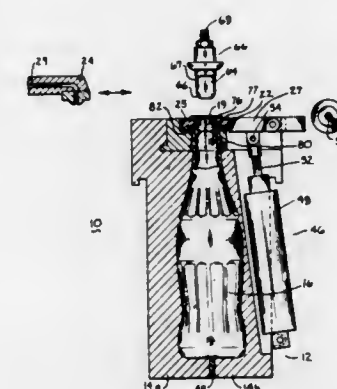
Joseph R. Reilly, Naugatuck, Conn., assignor to Monsanto Company, Saint Louis, Mo.

Filed Mar. 3, 1971, Ser. No. 120,514

Int. Cl. B29d 23/03

U.S. Cl. 425-326

6 Claims



A method and apparatus for finishing a blow molded plastic article having flash attached to a neck portion thereof which includes gripping and relatively moving the flash and the article away from each other to sever the flash at a portion immediately adjacent the end of the neck which is at an elevated temperature with respect to the neck portion, and thereafter advancing a forming mandrel into the neck to roll an irregular edge left in the area of flash severance forwardly toward the body of the article and outwardly against the wall of the neck to form a smooth finish. The apparatus includes an inwardly directed step in the blow mold at the extremity of the neck defining portion of the mold whereat a thickened and therefore elevated temperature portion of the plastic is formed on expanding the parison, this thickened section being the area where severing occurs during finishing.

3,736,092

**APPARATUS FOR TRANSMITTING MOTION TO MOLD SECTIONS IN INJECTION MOLDING MACHINES**

Karl Konig, Munich; Ernst Wurl, Weiboldshausen, and Richard Herbst, Munich, all of Germany, assignors to Krauss-Maffel Aktiengesellschaft, Munich, Germany

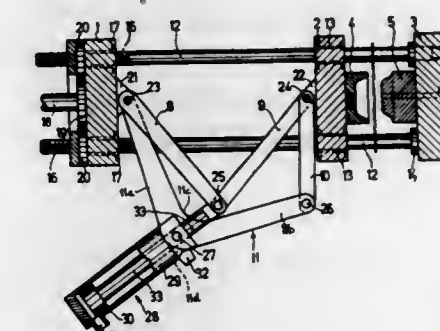
Filed Apr. 8, 1971, Ser. No. 132,466

Claims priority, application Germany, Apr. 11, 1970, P 20 17 476.9

Int. Cl. B29f 1/00

U.S. Cl. 425-450

17 Claims



Clamping apparatus for an injection molding machine wherein a movable platen is reciprocable between a fixed platen and a support for a stationary mold section has at least one pair of toggle links whose outer ends are pivoted to the two platens and whose inner ends are pivoted to each other, at least one pair of levers the outer ends of which are pivoted to the platens and the inner ends of which are pivoted to each other, and a hydraulic motor having a cylinder which is pivotally connected to at least one of the levers and a piston rod pivotally connected to the pin coupling the inner ends of the toggle links. When the movable platen is remote from the support, the toggle links make with each other an angle of less than 90° and the piston rod of the hydraulic motor makes with the tie rods for the movable platen an acute angle which is preferably less than 45°. This insures the generation of a substantial closing force as soon as the movable platen begins to advance toward the support and prevents excessive acceleration or deceleration of the movable platen during movement away from or toward the fixed platen.

3,736,093

**INTEGRAL REGULATED HAND TORCH**

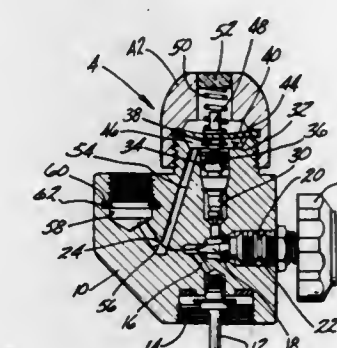
Cadet E. Bowman, and Frank Hayward, both of Sycamore, Ill., assignors to Olin Corporation, New Haven, Conn.

Filed Dec. 14, 1971, Ser. No. 207,931

Int. Cl. F23d 13/04

U.S. Cl. 431-89

2 Claims



A portable gaseous hydrocarbon-burning torch having a pressure regulated outlet valve wherein the torch will produce a flame having predetermined characteristics throughout a wide range of ambient operating temperatures.



**3,736,094**  
**APPARATUS FOR GENERATING HIGH ENERGY**  
**GASEOUS BLAST**

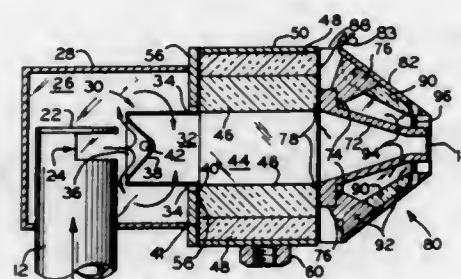
Donald Eugene Shisler, Napoleon, Ohio, assignor to Johns  
 Manville Corporation, New York, N.Y.

Filed June 1, 1971, Ser. No. 148,841

Int. Cl. F23r 1/02

U.S. Cl. 431-158

23 Claims



A gas burner comprising a metallic housing for receiving a premix of fuel and air for introduction into a combustion chamber enclosed thereby. Metallic, gas permeable walls form the combustion chamber wherein the premix of fuel and air is burned producing a high temperature effluent which is directed by a metallic converging slot nozzle to an outlet which shapes the effluent while its velocity is increased by the nozzle to form a high temperature, wide, flat stream of uniform velocity and temperature which is an effective filament attenuator for materials such as glass.

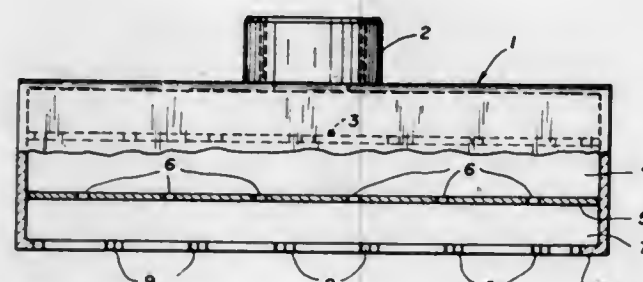
**3,736,095**  
**GAS-FIRED BLAST TYPE BURNER**  
 Vincent C. Leatherby, Glenshaw, Pa., assignor to Fuel Equip-  
 ment Company, Sharpsburgh, Pa.

Filed Mar. 8, 1971, Ser. No. 121,806

Int. Cl. F23d 13/36

U.S. Cl. 431-349

2 Claims



This invention relates to a gas-fired burner of the blast type, comprising a substantially rectangular unit having a burning grid spaced downwardly of the top of the unit. The top has an inwardly projecting lip with spaced notches to prevent blowout from cross drafts and to create a piloting action. Below the grid is spaced a perforated baffle plate for evenly distributing the gas-fired mixture before reaching the burning grid.

## CHEMICAL

**3,736,096**  
**PRINTING BY LEVELLING DYES WITH**  
**GLYCERINE-ETHYLENE OXIDE-FATTY**  
**ACID CONDENSATE**

Douglas Alan Nichols and Brian Neville Parsons, Man-  
 chester, England, assignors to Imperial Chemical In-  
 dustries Limited, London, England

No Drawing. Filed July 12, 1971, Ser. No. 161,999

Claims priority, application Great Britain, July 24, 1970,  
 35,981/70

Int. Cl. D06p

U.S. Cl. 8-62

8 Claims

Printing process for wool, polyamides, acrylic, poly-  
 ester or dyeable polypropylene textile materials in which  
 the print paste used incorporates (a) a reaction product  
 of glycerol with, in either order, an alkylene oxide and  
 a carboxylic acid having four or more carbon atoms and  
 (b) a surface-active agent, the amount of (a) being from  
 0.1% to 0.5% of the total weight of the print paste and  
 the amount of (b) being at least equal to that of (a).

**3,736,097**  
**PROCESS EMPLOYING AQUEOUS MEDIA IN THE**  
**TREATMENT OF FIBROUS MATERIALS**

Paul R. Gior, Piscataway, and Arthur H. Drelich, Plainfield,  
 both of N.J., assignors to Johnson & Johnson, New Brun-  
 swick, N.J.

Continuation-in-part of Ser. No. 4,405, Jan. 20, 1970,  
 abandoned. This application Jan. 5, 1971, Ser. No. 104,148

Int. Cl. D06m 5/02, 5/16, 5/26

U.S. Cl. 8-131

14 Claims

A method of treating fibrous materials to render them more  
 amenable to subsequent textile and papermaking processes  
 employing aqueous media which comprises: treating fibrous  
 materials with a softening and swelling agent whereby the in-  
 dividual fibers become soft, limp and swollen; exposing said  
 fibrous materials to textile or papermaking processes employ-  
 ing aqueous media wherein the individual fibers show less ten-  
 dency toward undesirable fiber agglomeration, exhibit greater  
 tendency toward fiber individualization, and demonstrate  
 enhanced response and receptivity to fiber processing or  
 manipulation because of their soft, limp and swollen nature;  
 and forming a nonwoven fabric of the individual fibers. Also  
 included are methods combining (1) the treating of the  
 fibrous materials with the softening and swelling agent and (2)  
 the textile processes into a single operation.

**3,736,098**  
**METHOD OF INHIBITING THE ACID**  
**CORROSION OF METALS**

Toshiya Kataoka, Chigasaki-shi, and Atunobu Takada,  
 Tokyo, Japan, assignors to Nisshin Oil Mills, Ltd.,  
 Tokyo, Japan

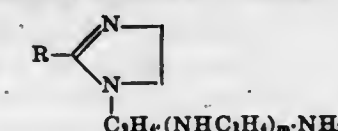
No Drawing. Filed Jan. 18, 1972, Ser. No. 218,825

Int. Cl. C23f 11/14

U.S. Cl. 21-2.7 R

9 Claims

A method of preventing the acid corrosion of metals  
 which consists in inhibiting acid solutions from corroding  
 metals by mixing with said acid solutions an anticorrosive  
 composition prepared by the reaction of benzyl halides  
 and materials mainly consisting of imidazoline derivatives  
 having the following structural formula:



where:

R=an alkyl, alkenyl or hydroxyalkenyl radical having  
 5 to 21 carbon atoms  
 $m=0$  or integer of 1 to 3

**3,736,099**  
**PIPETTING DEVICE**

Geoffrey S. Begg, Heidelberg, Victoria, Australia, and  
 Nils Bertil Jacobson, Solna, Sweden, assignors to Medi-  
 nova AB, Solna, Sweden

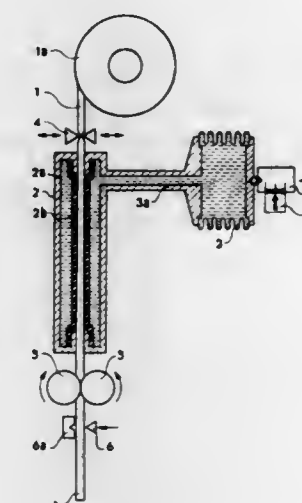
Filed Apr. 21, 1971, Ser. No. 135,989

Claims priority, application Sweden, Apr. 27, 1970,  
 5,756/70

Int. Cl. G01n 1/10, 1/12

U.S. Cl. 23-259

14 Claims



Pipetting device, in which a disposable plastic tube sup-  
 plied from a store roll is used as a pipette. A portion of  
 the plastic tube extends through an elongate, cylindrical  
 chamber having a tube-shaped elastic wall surrounding the  
 plastic tube. This chamber is filled with liquid and com-  
 municates with a compressible bellow also filled with  
 liquid. By compression of the bellow it is possible to  
 compress the portion of the plastic tube surrounded by  
 the liquid-filled chamber and thus to vary the internal  
 volume of said portion of the plastic tube. This variation  
 of the internal volume of the plastic tube is used for suck-  
 ing up a predetermined liquid volume to be pipetted into  
 the plastic tube and subsequently discharging this pipetted  
 liquid volume from the plastic tube into another vessel.  
 After each pipetting operation the used section of the  
 plastic tube can be cut off and a new unused section of  
 plastic tube be supplied from the store roll.

**3,736,100**  
**IMMUNOELECTROPHORESIS GEL TRAY**

Stephen D. Rains, Henrietta, N.Y., assignor to Bausch &  
 Lomb Incorporated, Rochester, N.Y.

Filed May 24, 1971, Ser. No. 146,388

Int. Cl. B01k 5/00; G01n 31/02, 33/16

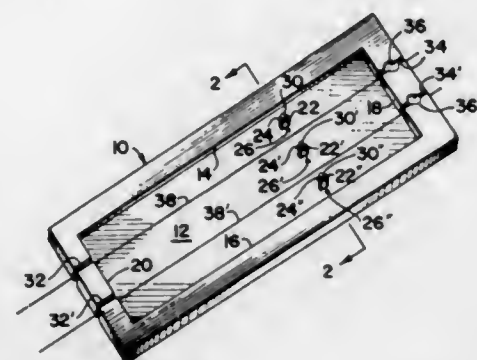
U.S. Cl. 23-253 R

11 Claims

An electrophoresis tray having wire-like elements dis-



posed therein for injecting into a gel carried by the tray, serum and anti-serum to provide for electrophoresis and



subsequent diffusion of the anti-serum to precipitate proteins.

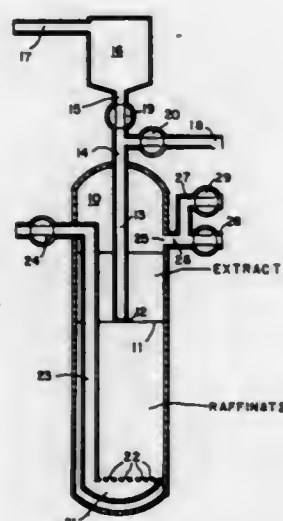
### 3,736,101 LIQUID-LIQUID EXTRACTION APPARATUS AND METHOD

Othel L. Pirtle, Jr., 2718 Stratford,  
Pearland, Tex. 77581

Filed June 13, 1969, Ser. No. 832,954  
Int. Cl. B01d 11/04; G21g 1/00

U.S. Cl. 23-267

2 Claims



A carbon black reactor employing a dished head at its feed inlet, this head being adapted with a suspended arch and an interpositioned layer of insulation.

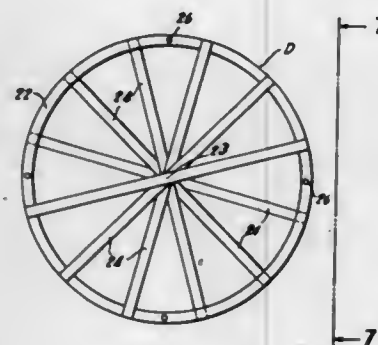
### 3,736,103 INCINERATOR COMBUSTION APPARATUS

Paul H. Stibbe, De Pere, Wis., assignor to TEC  
Systems, Inc., De Pere, Wis.

Filed Sept. 20, 1971, Ser. No. 182,018  
Int. Cl. F23g 7/06

U.S. Cl. 23-277 C

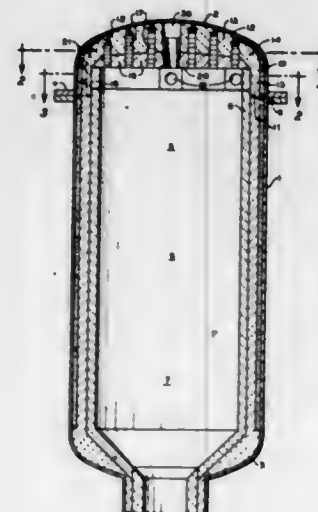
4 Claims



Apparatus for incinerating gaseous waste material, for example, the combustible portions of the effluents from various industrial equipment such as wire enameling ovens, metal coating ovens, paint ovens, web dryers or the like. The apparatus includes a diffusor for the combustible chamber and which acts to create turbulence and flow

3,736,102  
**CARBON BLACK REACTOR**  
Joseph S. Rogers, Jr., and Glenn J. Forseth, Borger, Tex.,  
assignors to Phillips Petroleum Company  
Filed Nov. 19, 1970, Ser. No. 90,935  
Int. Cl. F27d 1/04  
U.S. Cl. 23-259.5

1 Claim



disturbance to the gaseous material as it proceeds through the combustion chamber, thereby promoting effluent mixing for complete combustion.

### 3,736,104 OXYGEN GENERATOR CELL

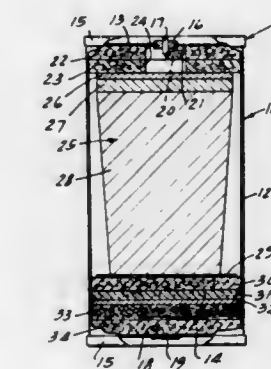
John P. Churchill, Indiatlantic, and Tommy Lewis Thompson,  
Melbourne, both of Fla., assignors to Life Support, Inc., Mel-  
bourne, Fla.

Filed May 17, 1971, Ser. No. 143,853

Int. Cl. B01j 7/00

U.S. Cl. 23-281

14 Claims



Chemical oxygen generators in the form of disposable tin plated steel cans housing a chlorate candle, a starter, and filters where needed to remove contaminants and also serve as shock absorbing means. The cans have oxygen delivery outlets and starter actuators which can be at one end of the can or separated at both ends of the can. The preferred oxygen generating chemical is sodium chlorate, the decomposition of which is catalyzed by sodium peroxide.

### 3,736,105 CATALYTIC MUFFLER

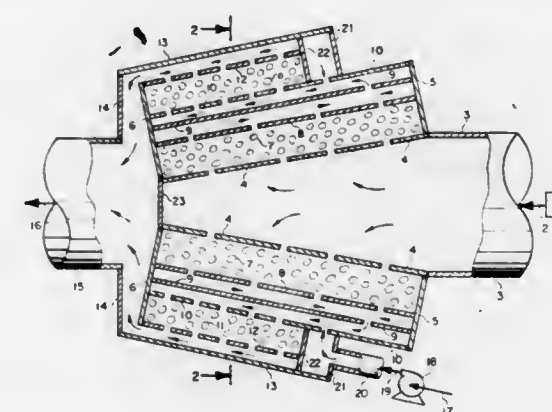
John F. Tourtellotte, 634 Glen Ave., Westfield, N.J.  
07090; John F. Villiers-Fisher, 2 Newman Drive, Ken-  
dall Park, N.J. 08824; and John S. Negra, 295 S.  
Plainfield Ave., Plainfield, N.J. 07080

Filed Oct. 6, 1971, Ser. No. 186,859

Int. Cl. B01j 9/04; F01n 3/14

U.S. Cl. 23-288 F

4 Claims



An apparatus for catalytically treating the exhaust gas from an engine, so as to eliminate noxious components and prevent air pollution. The apparatus features a tapered exhaust gas inlet pipe, which provides uniform distribution of exhaust gas to a cylindrical catalyst bed.

### 3,736,106 PROCESS FOR FLUX CRYSTALLIZING FERRITES, SPINELS AND GARNETS FROM 1% MELT MIXTURE

André Hamelin, Bellevue, Max Paulus, Paris, and Charles  
Guillaud, Bellevue, France, assignors to Agence Na-  
tionale de Valorisation de la Recherche (Anvar)

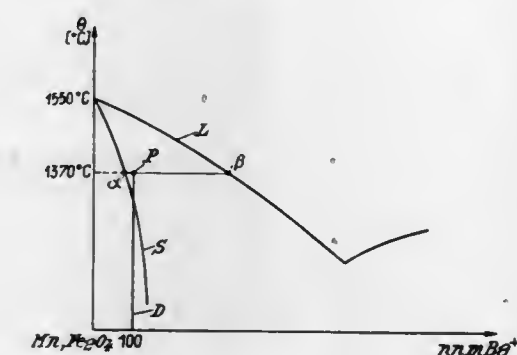
Filed Apr. 3, 1969, Ser. No. 813,017

Claims priority, application France, Apr. 4, 1968,  
147,034

Int. Cl. B01j 17/02

U.S. Cl. 23-300

9 Claims



To an initial material (mixture of 50% mol.  $\text{Fe}_2\text{O}_3$  and 50% mol.  $\text{MnO}$ ) a flux (for example  $\text{BaCO}_3$ ) is added in sufficiently small proportion (85 p.p.m.) so that the liquid phase which appears, when the sample thus constituted is maintained at appropriate temperatures, is constituted by fine liquid films whose presence causes a discontinuous growth of the crystals (diameter of the crystals equal to  $10^3$ - $10^4 \mu$ ) and the formation of mono-crystals, the sample remaining in the solid state.

### 3,736,107 COATED CEMENTED CARBIDE PRODUCT

Thomas E. Hale, Warren, Mich., assignor to  
General Electric Company

No Drawing. Filed May 26, 1971, Ser. No. 147,240

Int. Cl. B22f 7/00

U.S. Cl. 29-182.7

9 Claims

A high-strength, coated cemented carbide product comprising a cemented carbide substrate and a fully dense alpha aluminum oxide coating on the substrate. The coating has a thickness of from 1-20 microns and is firmly and adherently bonded to the cemented carbide substrate through a thin intermediate nonmetallic layer of an iron group metal aluminate. The coated product combines a wear resistance substantially as high as aluminum oxide cutting materials and a transverse rupture strength of at least 150,000 p.s.i. The coated product is prepared by passing water vapor, hydrogen gas and an aluminum halide over the substrate at a temperature of from  $900^\circ$ - $1250^\circ$  C., the ratio of water vapor to hydrogen gas being between about 0.025 and 2.0.

### 3,736,108 ARTICLES AND METHOD OF ELECTRODEPOSITING A DECORATIVE NICKEL/CHROMIUM COATING ON A METAL SUBSTRATE

Renzo Vaglio, Turin, Italy, assignor to A.I.C. Approvirgiana-  
menti Industriali Chimici S.p.A., Turin, Italy

Continuation-in-part of Ser. No. 80,725, Oct. 14, 1970,

abandoned. This application Feb. 1, 1972, Ser. No. 222,507

Claims priority, application Italy, Oct. 15, 1969, 874542  
A/69

Int. Cl. C23b 5/50

U.S. Cl. 29-183.5

13 Claims

A method of electrodepositing a decorative nickel/chromium coating on a metal substrate, which comprises, as its essential step, before a final chromium plating step, electroplating on the substrate a nickel layer containing fine particles of a



solid, non-conductive material embedded therein. Improved results are achieved when the nickel layer is electroplated from an aqueous nickel-plating bath containing dispersed therein from 0.1 to 10.0 g/l of microcrystalline particles of a nickel compound, which is insoluble in the bath, selected from the group consisting of the compounds having the formula  $Ni_x[M(CN)_yA_z]$  and compounds having the formula  $Ni_x[M(SCN)_y]$ , wherein M is a transition metal, A is  $NO_2$  or CO, z is 0 or 1, y+z is the coordination number of the transition metal, and x is the number of nickel atoms saturating the valence of the complex portion of the nickel compound.

3,736,109

# METHOD OF COATING REFRACTORY METALS FOR PROTECTION AT HIGH TEMPERATURES AND RESULTING ARTICLES

Alan Sydney Darling and Gordon Leslie Selman, London, England, assignors to Johnson, Matthey & Co., Limited, London, England

No Drawing. Continuation-in-part of application Ser. No. 16,943, Mar. 5, 1970, now Patent No. 3,657,784, which is a continuation-in-part of abandoned application Ser. No. 631,592, Apr. 18, 1967. This application Mar. 17, 1971, Ser. No. 125,430

Claims priority, application Great Britain, Mar. 20, 1970, 13,599/70

The portion of the term of the patent subsequent to Apr. 25, 1989, has been disclaimed

Int. Cl. B32b 15/04; C03b 5/18

U.S. Cl. 29—195

19 Claims

This specification describes an article for use at high temperature, for example in the glass industry, and comprises a refractory core made from niobium, tantalum, chromium, zirconium, vanadium, hafnium, rhenium or alloys thereof, a barrier layer of magnesia and a sheath of a platinum group metal or an alloy based on at least one metal of the platinum group. The oxides of the core metal or alloy are chosen to be less volatile than the oxides of molybdenum at operating temperatures within the range 1100° to 1500° C. A core may also be made from tungsten or molybdenum and in such a case the barrier layer may contain a small quantity of vitreous material, for example borosilicate glass.

3,736,110

# MONO- AND DICRESYL PHOSPHATE AMINE RUST INHIBITORS

Ernest H. Owston, Jr., Corona, and Robert L. Dinsmore, Long Beach, Calif., assignors to Atlantic Richfield Company, Philadelphia, Pa.

No Drawing. Filed June 24, 1969, Ser. No. 836,170

Int. Cl. C10I 1/26

U.S. Cl. 44—56

3 Claims

A rust inhibitor synthesized by reacting cresylic acid with phosphorus pentoxide to form mono- and di-aryl acid phosphates which are then neutralized with an imidazoline, and a process for producing such rust inhibitors is described. The rust inhibitor is useful in gasolines, including gasolines containing t-butyl alcohol.

3,736,111

# PROCESS AND APPARATUS FOR THE COMPLETE RECLAMATION OF VALUABLE PRODUCTS FROM SOLID WASTE

William H. Gardner, Newark, Del., and Donald H. Graham, Fort Ashby, W. Va., assignors to Hercules Incorporated, Wilmington, Del.

Filed May 17, 1971, Ser. No. 144,170

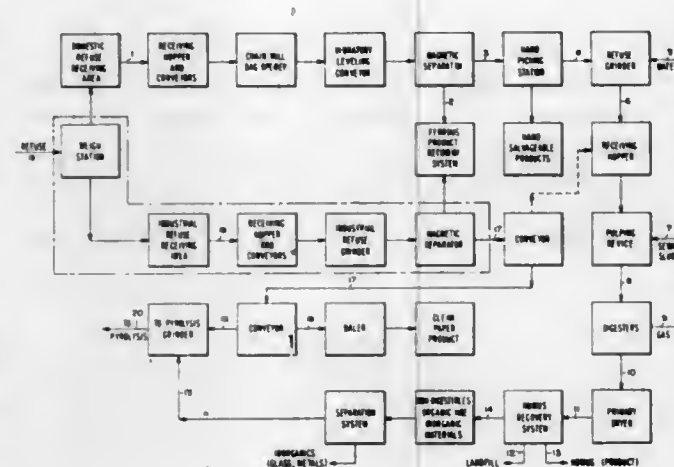
Int. Cl. C05f 9/00; C10b 57/00; C10j 3/00

U.S. Cl. 48—111

6 Claims

A process for recovery of valuable products from domestic refuse is provided. Domestic refuse is subjected to aerobic digestion. A crude humus product containing non-digestible materials is recovered. The crude humus is separated into a humus product and non-digestible materials.

The non-digestible materials are pyrolyzed to produce valuable oils and gases. Industrial refuse can be pyrolyzed



with the non-digestible material derived from domestic refuse.

3,736,112

# HERBICIDAL COMPOSITIONS

Walter W. Abramitis, Downers Grove, Steven C. Ducey, Westmont, and James G. Atherton, Hoffman Estates, Ill., assignors to Akzona Incorporated, Asheville, N.C.

No Drawing. Continuation-in-part of application Ser. No. 645,614, June 13, 1967. This application Mar. 31, 1970, Ser. No. 24,376

Int. Cl. A01n 9/26

U.S. Cl. 71—110

15 Claims

Herbicide concentrate compositions containing carboxylic acid salts of amino ester of herbicidal acids and an organic solvent providing compositions having a high level of active herbicidal ingredient and water-in-oil emulsification properties.

3,736,113

# SPIRAL GRINDING RELIEVING MACHINE WITH TANDEM PLANETARY DIFFERENTIAL DRIVE

Walter Umbdenstock, Chicago, and Charles T. Brettenstein, Elk Grove Village, both of Ill., assignors to Spiral Step Stool Company, Elk Grove Village, Ill.

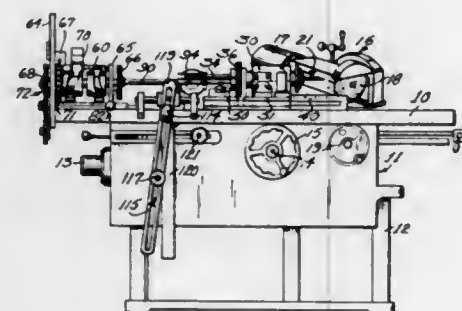
Continuation of Ser. No. 24,509, April 1, 1970, abandoned.

This application Feb. 18, 1972, Ser. No. 227,377

Int. Cl. B24b 3/24

U.S. Cl. 51—225

12 Claims



Spiral and radial relief grinding and backing off apparatus with improved headstock assembly capable of complex motion including simultaneous axial and radial displacements of a work spindle which is continuously rotated independently by a tandem planetary differential sine drive system operative to

increase or reduce its speed as a selectable function of the linear travel of a machine carriage, traverse table, or the like, of which the headstock assembly and drive components are a structural part.

3,736,114

# THREE POINT CONTACT STEADY REST

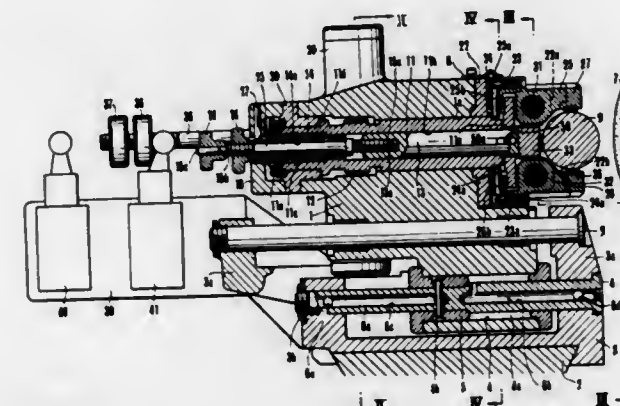
Takahiko Okada, Chiryu, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Dec. 6, 1971, Ser. No. 204,953

Int. Cl. B24b 41/06

U.S. Cl. 51—238 S

7 Claims



In a steady rest for supporting a workpiece of the type comprising upper, lower and side contact shoes adapted to engage the workpiece and means for simultaneously moving the contact shoes toward and away from the workpiece, there are provided a main body of the steady rest having a bore, a sleeve rotatably received in the bore, means provided for the main body for rotating the sleeve, a rest shaft slidably contained in the sleeve, means for mounting the side contact shoe on one end of the rest shaft, means responsive to the rotation of the sleeve for axially moving the rest shaft, an upper contact shoe supporting member pivotally mounted on the main body, a lower contact shoe supporting member pivotally mounted on the main body, and means responsive to the rotation of the sleeve for pivotally rotating the upper and lower contact shoe supporting members in the opposite directions whereby the upper, lower and side contact shoes are moved simultaneously toward and away from the workpiece by the rotation of the sleeve.

3,736,115

# APPARATUS FOR AND METHOD OF EDGE MACHINING FLEXIBLE CONTACT LENSES

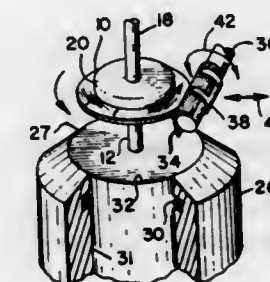
Raymond T. Blum, Pittsford, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed July 6, 1971, Ser. No. 160,016

Int. Cl. B24b 1/00, 7/00, 9/00; B08b 7/00, 3/00

U.S. Cl. 51—284

4 Claims



A machine for centering a hydrophilic lens between rotatable spindles to engage a polishing pad for contouring the edge

of the lens comprises a rotatable spindle having an extensible sleeve concentrically disposed about it for raising to form a chamber for holding a fluid for floating and centering a hydrophilic lens. A clamping spindle is provided for engaging and moving the hydrophilic lens against the rotatable support spindle and to thereafter cooperatively spin the lens to displace fluids therefrom to condition the edge of the lens for contouring by engaging a slurry coated polishing pad. A novel method for preparing the hydrophilic lens for polishing comprises the steps of floating the lens on the fluid filled chamber, centering the lens concentrically with the support spindle axis, concentrically clamping the lens upon the spindle and rotating the spindle to centrifugally displace at least some fluid from the lens and thereby condition the lens for contouring of its edge.

3,736,116

# METHOD AND APPARATUS FOR MANUFACTURING CONTINUOUS FILAMENTS

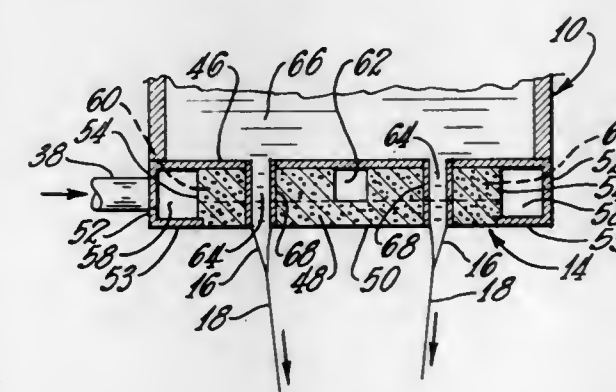
Robert G. Russell, Granville, Ohio, assignor to Owens-Corning Fiberglass Corporation

Continuation of abandoned application Ser. No. 798,286, Feb. 11, 1969. This application July 20, 1971, Ser. No. 164,441

Int. Cl. C03b 37/02

U.S. Cl. 65—2

24 Claims



Apparatus and method for making glass fibers such that molten glass flows to a passageway outlet located at the surface of a porous region and gaseous fluid is supplied under pressure to the porous region, the gaseous fluid being released from the surface of the porous region to promote separation of the molten glass from the surface.

3,736,117

# DRAWING SHEET GLASS FROM A MASS OF MOLTEN GLASS THROUGH A BODY OF PROTECTIVE MATERIAL

Donald W. Dunlap, Perrysburg; William E. McCown, Toledo, and Conrad B. Schafer, Maumee, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Continuation of Ser. No. 838,304, Sept. 4, 1959, abandoned.

This application July 18, 1966, Ser. No. 566,086

Int. Cl. C03b 13/00, 5/32

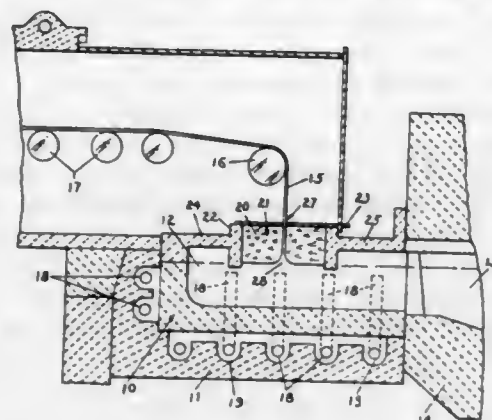
U.S. Cl. 65—32

9 Claims

Drawing sheet glass from a mass of molten glass through a body of protective material. The surface of the mass of molten glass from which the sheet is being formed is covered, and the surfaces of the newly formed sheet are surrounded by, a rela-



tively dense fluid to protect the sheet from adverse temperature and atmospheric conditions in this area. The fluid is inert



and non-injurious to the glass at the forming temperatures, and may be either a heavy gas or a light liquid.

3,736,118

### METHOD AND MEANS FOR FORMING A THERMOMETER BULB

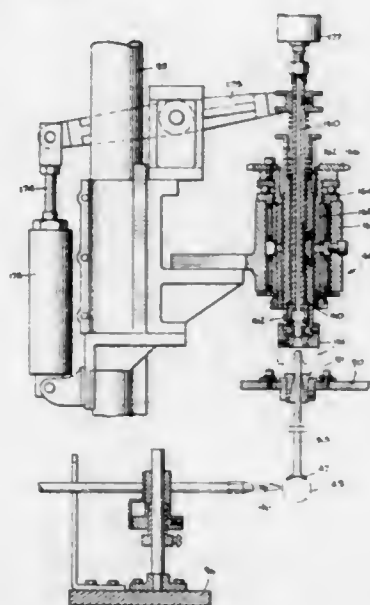
Henry G. Hefflich, Ridgefield, and Charles K. Krumm, Wyckoff, N.J., assignors to Kahle Engineering Co., Union City, N.J.

Filed Nov. 5, 1971, Ser. No. 196,097

Int. Cl. C03b 21/00

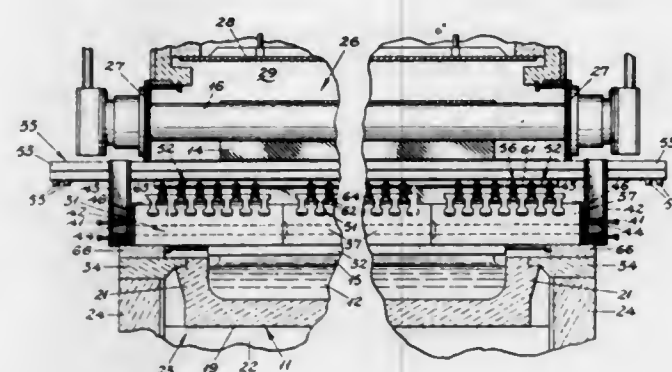
U.S. Cl. 65—110

13 Claims



An improved method of manufacturing a thermometer bulb is disclosed together with an automatic machine for performing the new method. The invention covers the manufacture of a liquid thermometer of the usual type which consists of a hollow bulb for containing mercury or other liquid and an attached extending stem including a connected tunnel. The new method includes the formation of the hollow bulb and its connection to the stem capillary tunnel while insuring that there is no blockage between the bulb and the capillary tunnel during manufacture. The method first blows a hollow bubble in the bottom of the stem. Thereafter, this bubble is broken and reshaped to a flared section which is then welded to the upper portion of a hollow glass tube which is then cut and sealed to form the closed bulb. A rotary multi-positioned machine is provided with a number of stations which automatically and successively perform the above described steps.

3,736,119  
GLASS FURNACE LIP-TILE  
Frank W. Irland, Shreveport, La., assignor to Libbey-Owens-Ford Company, Toledo, Ohio  
Filed May 3, 1971, Ser. No. 139,637  
Int. Cl. C03b 5/20  
U.S. Cl. 65—204 9 Claims



An improved lip-tile and mounting apparatus for use in the drawing chamber of a window glass furnace in which a plurality of axially aligned refractory segments are compressed together between end bearing plates and independently suspended from a continuous, fluid-cooled overhead beam. A recess provided along the bottom of the lip-tile contains an auxiliary radiant heating element. The rearward bottom edge of the lip-tile projects into a sealing member containing a body of loose granular material to thereby create an elongated seal between the pot chamber and the drawing chamber along the rear pot wall.

3,736,120

### METHOD OF DISPOSING AND RECLAIMING SOLID REFUSE

Andre Tempe, P.O. Box 242, Budd Lake, N.J. 07828

Original application Aug. 4, 1970, Ser. No. 60,856.

Divided and this application Mar. 2, 1971, Ser. No. 120,318

Int. Cl. C05f 11/08

U.S. Cl. 71—9

11 Claims

This specification discloses a method of disposing of solid refuse and converting it into usable end products. Two basic groups of method steps are involved. One is the sorting of the refuse to segregate metals, cardboard, cartons and papers; bottles and glass; cloth and rags; and plastics together with attending steps of treating the sorted components to reclaim them for usage. The second group of steps is the processing of the organic materials which remain after the above solids have been removed to convert it into usable organic fertilizer.

3,736,121

### AGENT FOR STUNTING THE GROWTH OF PLANTS

Bernd Zech, Ludwigshafen; Karl-Heinz Koenig, Frankenthal, and Johann Jung, Limburgerhof, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

Filed Mar. 11, 1971, Ser. No. 123,382

Claims priority, application Germany, Apr. 1, 1970, P 20 15 416.9

Int. Cl. A01n 9/22

U.S. Cl. 71—76

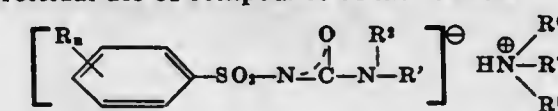
4 Claims

A process for stunting the growth of plants with substituted pyridinium compounds.

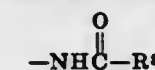
3,736,122  
METHOD OF CONTROLLING PLANT GROWTH  
Ching C. Tung, 1 Stoneleigh Towers, St. Louis, Mo. 63132, and Philip C. Hamm, 51 Wingfield Road, Glendale, Mo. 63132  
No Drawing. Continuation-in-part of application Ser. No. 406,884, Oct. 27, 1964. This application Apr. 10, 1969, Ser. No. 815,208  
Int. Cl. A01m 9/14 16 Claims

U.S. Cl. 71—103

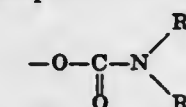
Herbicide use of compounds of the formula



wherein R is selected from the group consisting of chloro, bromo, iodo, cyano, alkyl having a maximum of four carbon atoms, alkoxy having a maximum of four carbon atoms, nitro, amino and the group



wherein R<sup>3</sup> is hydrogen or alkyl having a maximum of four carbon atoms; n is the integer one to three, provided that when n is one, R is substituted in the 4'-position of the phenyl ring; R' and R<sup>2</sup> are each independently selected from the group consisting of hydrogen, alkyl having a maximum of twelve carbon atoms, alkoxy having a maximum of five carbon atoms, alkynyl having at least three and a maximum of five carbon atoms, cycloalkenyl having at least five and a maximum of seven carbon atoms, cycloalkyl having at least five and a maximum of seven carbon atoms, mono substituted cycloalkyl said substituent being alkyl having a maximum of four carbon atoms, phenyl, substituted phenyl having a maximum of three substituents said substituents being selected from the group consisting of alkyl having a maximum of four carbon atoms, bromine, chlorine, hydroxy, alkoxy having a maximum of four carbon atoms, trifluoromethyl, phenoxy, mono and dihalogenated phenoxy said halogen being chlorine or bromine and the group



said group being in the 3-position wherein R<sup>4</sup> and R<sup>5</sup> are each independently selected from the group consisting of hydrogen and alkyl having a maximum of four carbon atoms; R<sup>6</sup>, R<sup>7</sup> and R<sup>8</sup> are each independently selected from the group consisting of hydrogen, alkyl having a maximum of twelve carbon atoms, alkenyl having a maximum of six carbon atoms provided that the acetylenic linkage is not on the carbon attached to the nitrogen, hydroxyalkyl having a maximum of six carbon atoms, two of the groups R<sup>5</sup>, R<sup>6</sup> and R<sup>7</sup> can be joined together to form an alkylene having four to seven carbon atoms, provided that when two of the groups R<sup>5</sup>, R<sup>6</sup> and R<sup>7</sup> are joined together the remaining group is hydrogen, and further provided that the groups R<sup>5</sup>, R<sup>6</sup> and R<sup>7</sup> are not all hydrogen.

3,736,123

### HERBICIDAL CONTROL OF CRABGRASS

Angelo John Speziale, Creve Coeur, and Lowell R. Smith, Chesterfield, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Application Apr. 12, 1968, Ser. No. 721,062, now Patent No. 3,642,863, which is a continuation-in-part of application Ser. No. 454,209, May 7, 1965, now Patent No. 3,450,747, which in turn is a continuation-in-part of application Ser. No. 221,302, Sept. 4, 1962. Divided and this application Nov. 11, 1971, Ser. No. 197,954

Int. Cl. A01n 9/20

U.S. Cl. 71—111

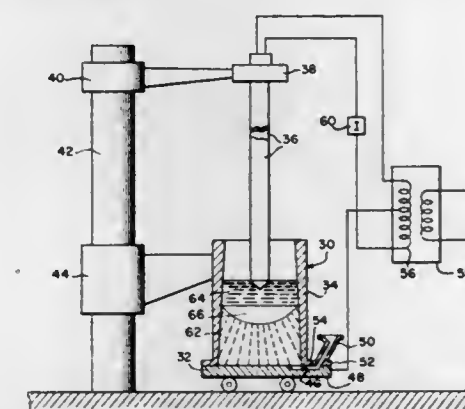
4 Claims

The growth of crabgrass is inhibited by applying to the

soil compounds of the class of alkyl esters of N-(2-nitrobenzoyl) carbamic acid.

3,736,124  
METHOD FOR ELECTROSLAG REMELTING OF METALS WITH SLAG INTRODUCTION  
Boris Evgenievich Paton, Jury Vadimovich Latash, Boris Izrailevich Medovar, and July Georgievich Emelianenko, Kiev, and Mikhail Markovich Kljuev, Elektrosal, U.S.S.R., assignors to Institut Elektrosvarki Im. E. O. Patona, Kiev, U.S.S.R.  
Continuation-in-part of applications Ser. No. 592,054, Nov. 4, 1966, Ser. No. 10,419, and Ser. No. 10,485, both Feb. 11, 1970, all now abandoned. Said Ser. Nos. 10,419 and 10,485 being a continuation-in-part of said application Ser. No. 592,054. This application Sept. 1, 1970, Ser. No. 68,661

Int. Cl. C22d 7/00; H05b 7/18; C21c 5/52  
U.S. Cl. 75—10 C 38 Claims



Molten slag is introduced through the lower portion of a crucible device into the bottom of the remelting zone in an electroslag remelting process using single or plural consumable electrodes in an amount sufficient to achieve a predetermined depth in the remelting zone. The achievement of the predetermined depth is signalled when current flows as a result of the slag level contacting and closing a circuit through an energized electrode disposed in the remelting zone.

3,736,125

### TWO STAGE SELECTIVE LEACHING OF COPPER AND NICKEL FROM COMPLEX ORE

Thomas C. Wilder, Cambridge, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.

Filed July 16, 1970, Ser. No. 55,306

Int. Cl. C22b 3/00; C21b 1/02, 3/00

U.S. Cl. 75—21

4 Claims

Copper and nickel may be selectively leached from a complex ore containing manganese, iron, copper, nickel, cobalt and molybdenum by leaching a reduced ore with a solution of an ammonium salt in ammonium hydroxide at approximately room temperature to remove the copper values and then leaching the residue at a higher temperature to extract the nickel.

3,736,126

### GOLD RECOVERY FROM AQUEOUS SOLUTIONS

James S. Fritz, Ames, and William G. Millen, Cedar Rapids, Iowa, assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Sept. 24, 1971, Ser. No. 183,659

Int. Cl. C22b 11/04

U.S. Cl. 75—118

10 Claims

Gold is separated from an aqueous solution and from other metal ions in an aqueous solution by acidifying the solution and adding chloride ion to complex the gold ions



present, thus forming a feed solution, and passing the feed solution through an adsorption bed of a polymer of an acrylic or methacrylic ester which selectively adsorbs the gold ions while permitting other metal ions to pass through the bed.

3,736,127

# METHOD OF TREATING AND HANDLING MOLTEN METAL

Friedrich Kocks, 1 Freiligrathstrasse,  
4 Dusseldorf, Germany

No Drawing. Filed Mar. 2, 1971, Ser. No. 120,320  
Claims priority, application Germany, Mar. 2, 1970,  
P 20 09 641.7

Int. Cl. C22b 9/00

U.S. Cl. 75—93 R

9 Claims

A process is provided for producing and casting metal melts in which ingots are cast one after another in chronological sequence at equally spaced time intervals corresponding to the individual cycle times for the next succeeding processing step such as rolling, forging or the like.

3,736,128

# STAINLESS STEEL WITH A HIGH BORON CONTENT

Jean-Jacques de Cadenet, Ugine, and André Gueussier  
and Roland Tricot, Albertville, France, assignors to  
Pechiney Ugine Kuhlmann, Paris, France

No Drawing. Continuation-in-part of application Ser. No.  
780,551, Dec. 2, 1968. This application June 4, 1971,  
Ser. No. 150,237

Int. Cl. C22c 39/14

U.S. Cl. 75—126

3 Claims

A stainless steel comprising from 20 to 30% by weight chromium, up to 5% nickel and from 2 to 6% boron which can be worked.

3,736,129

# ALLOY STEEL

Bill N. Briggs, Santa Ana, Calif., assignor to the United  
States of America as represented by the Secretary of  
the Army

No Drawing. Filed May 13, 1971, Ser. No. 143,232

Int. Cl. C22c 39/20

U.S. Cl. 75—128 W

1 Claim

Disclosed is a low carbon-low alloy content steel which is highly responsive to thermal-mechanical processing with air hardening capability. The steel is compatible process-wise with typical tool steels useful in the impact layer of armor. The alloy steel of this invention yields a high toughness material useful as the backing material for the impact layer of armor.

3,736,130

# ALLOY

Frederick T. Wisnle, 2350 Pine St.,  
Seaford, N.Y. 11783

No Drawing. Continuation of abandoned application Ser.  
No. 664,227, Aug. 2, 1967. This application Sept. 17,  
1970, Ser. No. 73,074

Int. Cl. C22c 9/06

U.S. Cl. 75—154

4 Claims

An alloy comprising the following constituents in the following range of percentages by weight: nickel 5 to 27%, castability promoting elements 1.2 to 8%, hardness promoting elements .5 to 9.5%, with the balance being copper.

3,736,131

# FERRITIC-AUSTENITIC STAINLESS STEEL

Ronald H. Espy, Randallstown, Md., assignor to Armco Steel  
Corporation, Middletown, Ohio

Filed Dec. 23, 1970, Ser. No. 101,096

Int. Cl. C22c 39/14

U.S. Cl. 75—126 B

12 Claims

An austenitic-ferritic stainless steel consisting essentially of up to about 0.06 percent carbon, about 4.0 to less than 11.0

percent manganese, about 19 to about 24 percent chromium, about 0.12 to about 0.26 percent nitrogen, nickel up to about 3.0 percent, and remainder substantially iron except for incidental impurities. The austenite-ferrite balance, ranging between 10 percent and 50 percent austenite, is stable, and the steel exhibits high toughness, corrosion resistance and excellent weldability.

3,736,132

# METHOD FOR PRODUCING REFRACTORY METALS

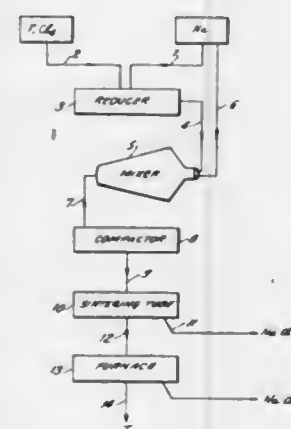
Harold H. Morse, Cincinnati, and Cecil L. Easterday,  
deceased, by Dorothy E. Easterday, representative,  
Washington Court House, and Layne S. Plock, Geneva,  
Ohio, and Fred K. Morgan, Cold Springs, Ky., assignors  
to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 17, 1971, Ser. No. 209,094

Int. Cl. B22f 1/00; C22b 53/00, 61/02

U.S. Cl. 75—200

7 Claims



A process for the manufacture of titanium from titanium tetrachloride by reduction with sodium, in which a partially reduced material principally corresponding to  $\text{Na}_2\text{TiCl}_4$  is continuously formed, is improved by continuously mixing the partially reduced material with sodium at a temperature below about  $200^\circ\text{C}$ . so as to form an intermediate material corresponding to at least 15% by weight  $\text{Na}_2\text{TiCl}_4$ , compacting the intermediate material at a temperature of less than  $100^\circ\text{C}$ . to form a continuous rod of the composite material without substantial further reduction of the titanium chloride content thereof and continuously heating the rod formed at temperatures above  $800^\circ\text{C}$ . to complete reduction of the titanium chloride component thereof, to effect sintering of the resulting titanium metal, and to simultaneously melt the salt by-product and thereby facilitate separation and removal of the salt from the rod-shaped, sintered titanium metal product.

3,736,133

# TRANSPARENT INK ABSORBENT LACQUERS

John W. Weigl, Webster, and Joseph Mammino and Alan  
R. Amidon, Penfield, N.Y., assignors to Xerox Corporation,  
Rochester, N.Y.

No Drawing. Filed June 21, 1971, Ser. No. 155,361

Int. Cl. G03g 5/02; B41n 1/00

U.S. Cl. 96—1.5

5 Claims

A method for forming ink absorbent transparencies is provided comprising applying a lacquer to a polymeric film transparency, said lacquer comprising a substantially transparent resinous binder pigmented with an ink absorptive pigment exhibiting substantially the same refractive index as that of the binder, and drying said lacquer on said transparency.

3,736,134

# HUMIDITY RESISTANT PHOTOCONDUCTIVE COMPOSITIONS

Donald W. Gosselink, North St. Paul, Minn., and Einar  
D. Horne, Hudson, Wis., assignors to Minnesota Mining  
and Manufacturing Company, St. Paul, Minn.

Filed Oct. 14, 1970, Ser. No. 80,567

Int. Cl. G03g 5/08

U.S. Cl. 96—1.8

17 Claims

Improvement in the humidity resistance of photoconductive titanium dioxide containing electrographic elements is achieved by combining therewith a carboxylic acid or metal salt thereof such as abietic acid or zinc abietate with an inorganic metal oxide such as zinc oxide.

3,736,135

# METHOD OF INCREASING IMAGE CONTRAST

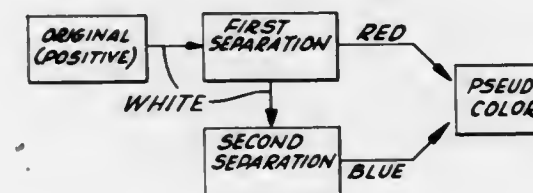
Roy H. Stratton, Woodland Hills, Calif., assignor to The  
Rand Corporation, Santa Monica, Calif.

Filed Sept. 7, 1971, Ser. No. 178,092

Int. Cl. G03c 5/08, 7/00

U.S. Cl. 96—23

10 Claims



A method of increasing the visual contrast of photographs having various low contrast areas, such as X-ray plates, aerial photographs, etc. By this process, the various shades of grey are converted to various colors which can be more easily distinguished by the eye.

3,736,136

# DYE DIFFUSION TRANSFER PROCESS FOR THE PRODUCTION OF POSITIVE COLOR PHOTOGRAPHIC IMAGES

Justus Danhauser and Paul Marx, Cologne, Germany,  
assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen,  
Germany

No Drawing. Filed June 30, 1971, Ser. No. 158,552

Claims priority, application Germany, July 2, 1970,  
P 20 32 711.1

Int. Cl. G03c 5/54, 7/00, 1/34

U.S. Cl. 96—3

12 Claims

Positive color photographic images are produced by a modified dye diffusion transfer process including exposure of a silver halide emulsion layer transfer of a diffusing development inhibiting substance from the exposed areas to an unexposed developable emulsion layer whereby development is inhibited by the said transferred development inhibiting substance and transfer of a dye from the said second emulsion layer which is split off from a non-diffusing dye-giving compound upon development, to an image-receiving element, whereby the non-diffusing dye-giving compound has the formula defined below.

3,736,137

# APERTURE MASK FOR, AND METHOD OF SCREENING, A COLOR CATHODE-RAY TUBE

Sam H. Kaplan, Chicago, Ill., assignor to Zenith Radio  
Corporation, Chicago, Ill.

Filed Oct. 22, 1971, Ser. No. 191,653

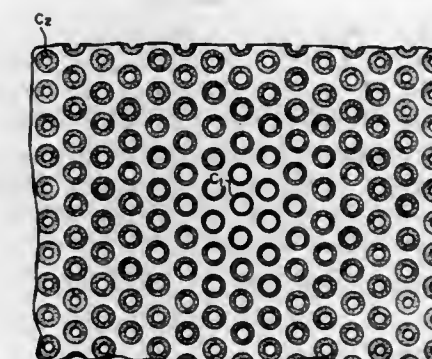
Int. Cl. G03c 5/00

U.S. Cl. 96—36.1

4 Claims

The screen of a color cathode-ray tube is formed by means of a photographic method in which a photosensitive coating applied to the screen area is exposed through the apertures of a shadow mask. To obtain phosphor dots that are smaller in size than the apertures of the mask

and larger in the center than at the edges of the screen, the mask apertures, which initially are of the same diameter, are temporarily closed down by the application of a removable coating having a thickness which increases



progressively with radial spacing from the center toward the edge of the mask. After the screening is completed, the coating is removed from the apertures, conditioning the mask for utilization as the color selection electrode of the tube.

3,736,138

# PROCESS FOR TRANSFERRING IMAGES FROM A SURFACE TO A TEMPORARY SURFACE AND TO A FINAL SURFACE

Robert Paul Held, Englishtown, N.J., assignor to E. I. du  
Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed June 30, 1969, Ser. No. 837,902

Int. Cl. G03c 11/12

U.S. Cl. 96—28

7 Claims

An image-forming process comprising, in order: (1) image-wise exposing photohardenable material to actinic radiation to harden the exposed areas only, (2) transferring the underexposed areas to a transfer sheet by applying pressure thereto at a temperature at which there is cohesive failure of the underexposed areas of the photohardenable material and adhesive failure at the release sheet-photohardened interface, and (3) pressure transferring the underexposed image from the pressure release sheet to a receptor.

3,736,139

# HEAT AND LIGHT STABILIZATION OF PHOTOSENSITIVE ELEMENTS CONTAINING POLYHALOGENATED HYDROCARBONS, N-VINYLCARBAZOLES AND DIFURFURYLIDENE PENTATERYTHRITOLS

Hiroshi Yamashita, Nobuyoshi Sekikawa, and Hisatake  
Ono, Asaka, Japan, assignors to Fuji Photo Film Co.,  
Ltd., Kanagawa, Japan

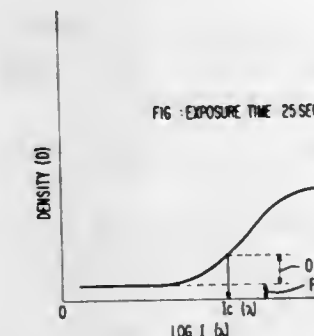
Filed Dec. 29, 1971, Ser. No. 213,536

Claims priority, application Japan, Dec. 29, 1970,  
46/121,450

Int. Cl. G03c 1/52, 5/24

U.S. Cl. 96—48 R

6 Claims



Photosensitive elements comprising a polyhalogenated hydrocarbon, N-vinylcarbazole and difurfurylidene pen-



taerythritol dispersed in a water soluble binder, and, if desired, a stabilizer and a sensitizer.

3,736,140

# UNFOGGED, PRIMITIVE, SILVER HALIDE EMULSIONS CONTAINING DESENSITIZING AMOUNTS OF OPTICAL SENSITIZING DYES AND THE USE THEREOF IN REVERSAL PROCESSES

Susan Starr Collier, Le Roy, and Paul Brewster Gilman, Jr., Rochester, N.Y., Henry Linschitz, Waltham, Mass., and Ronald George Raleigh, Brockport, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed June 17, 1971, Ser. No. 154,154

Int. Cl. G03c 5/24

U.S. Cl. 96—64

13 Claims

Improved processes are disclosed for obtaining positive images in an unfogged, primitive, silver halide emulsion wherein a photographic element comprising a support and said emulsion are imagewise-exposed and then either (1) developed in a silver halide developer in the presence of a silver halide fogging agent or (2) given a high-intensity light flash before development in a silver halide developer. In one aspect, the silver halide emulsions of this invention are unfogged, primitive, silver halide emulsions which contain a desensitizing concentration of a spectral-sensitizing dye. In one preferred embodiment, the primitive silver halide emulsion containing a desensitizing level of a desensitizing dye is (1) imagewise-exposed, (2) given an over-all flash exposure with a relatively short-duration, high-intensity light and (3) developed in a silver halide developer.

3,736,141

# PHOTOSOLUBILIZATION PROCESS USING CHEMICALLY SENSITIZED PHOTOSOLUBLE SILVER HALIDE LAYERS

Joseph D. Overman, New Shrewsbury, N.J., and Jack F. Strange, Rochester, N.Y., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation of abandoned application Ser. No. 739,630, June 25, 1968, which is a continuation-in-part of application Ser. No. 689,331, Dec. 11, 1967. This application Aug. 2, 1971, Ser. No. 168,459

Int. Cl. G03c 5/24

U.S. Cl. 96—64

9 Claims

Process for increasing photographic speed by exposing a chemically or chemically plus dye sensitized photosoluble element and developing the resulting direct positive latent image to a silver halide direct positive image by treating in a silver halide solution in the presence of a reducing agent.

3,736,142

# NUCLEATION-RECORDING MEDIUM COMPRISING A PHOTOCONDUCTOR, A NUCLEATION-ENHANCING METAL SALT, AND A PHTHALOCYANINE DYE FORMER

Alfred F. Kaspaul and Erika E. Kaspaul, Malibu, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 5, 1971, Ser. No. 196,170

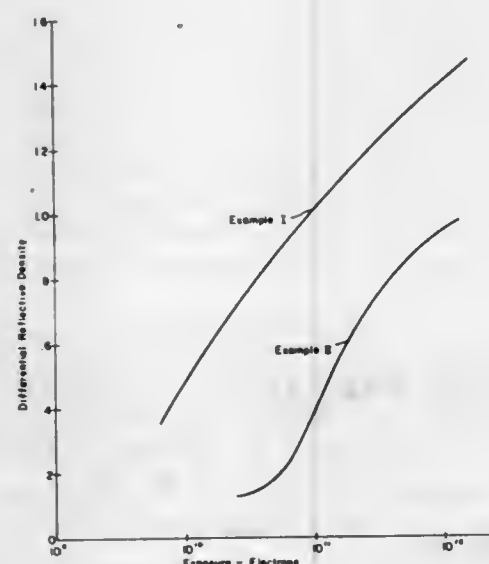
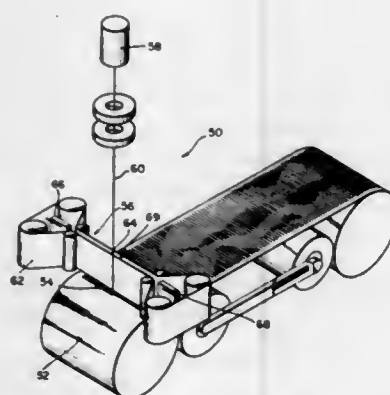
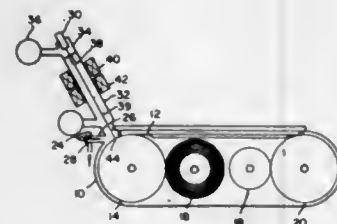
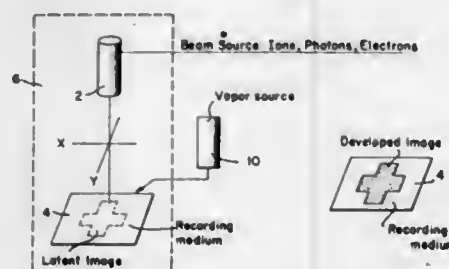
Int. Cl. G03c 1/52

U.S. Cl. 96—90 R

1 Claim

Image recording media sensitive to electron and/or photon exposure, and developable by metal deposit from a vapor, contains photon or electron sensitive material, nucleation-inducing compound and image density-en-

hancing and stabilizing additions such as phthalonitrile in a film-forming binder, which can act as a catalyst in



the film-forming binder to promote imagewise formation of optically dense macrocyclic compounds thereon.

3,736,143

# LIGHT-SENSITIVE DIAZONIUM COMPOUNDS AND DIAZOTYPE MATERIALS

Hans-Dieter Frommelt, Wiesbaden-Blebrich, Siegfried Scheler, Wiesbaden-Schierstein, and Arno Brauning, Wiesbaden-Blebrich, Germany, assignors to Kenfell & Esser Company, Morristown, N.J.

No Drawing. Filed Dec. 14, 1970, Ser. No. 98,061  
Claims priority, application Germany, Dec. 17, 1969,  
P 19 63 252.1

Int. Cl. G03c 1/54

U.S. Cl. 96—91 R

2 Claims

Diazotype material of increased light-sensitivity and rate of dye image development is obtained with an ortho-acylamino - meta - halo-para-amino benzene diazonium compound. One-component material capable of rapid neutral development may be prepared, as well as two-component material when utilizing couplers of lower activity.

3,736,144

# PREPARATION OF PHOTOGRAPHIC EMULSION CONTAINING NARROW SIZE DISTRIBUTION OF OCTAHEDRAL SILVER HALIDE GRAINS SENSITIZED WITH GOLD COMPOUND

Tadashi Nagae, Takeo Shimada, and Kellchi Suzuki, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed July 20, 1970, Ser. No. 56,672

Claims priority, application Japan, July 18, 1969,  
44/56,838

Int. Cl. G03c 1/28

U.S. Cl. 96—108 R

16 Claims

A process for preparing a silver halide photographic emulsion having a very narrow distribution of grain sizes and a reduced fog formation on being sensitized with a gold-containing chemical sensitizer comprising adding a water-soluble silver salt solution and a water-soluble alkali metal halide solution simultaneously and gradually to an aqueous solution of gelatin while maintaining the concentration of silver ion at a constant value within a range of 10<sup>-6</sup> to 10<sup>-10</sup> mol/liter, reducing the silver ion concentration to less than 1/2 the previous concentration used after adding 1/20 to 1/2 of the total silver salt, continuing the addition at this concentration, rinsing the emulsion free of water-soluble salts, and chemically sensitizing the emulsion with a chemical sensitizer containing at least a gold compound is disclosed. Photographic elements containing the silver halide emulsion are also disclosed.

3,736,145

# LIGHT-SENSITIVE PHOTOGRAPHIC MATERIAL HAVING EXCEPTIONALLY HIGH RESOLVING POWER

Akira Hirata, 27-12, 5-chome, Kugayama, Suganami-ku; and Akio Kobayashi, 5-2, 6-chome, Tamadaira, Hino-shi, both of Tokyo, Japan; Eiichi Sakamoto, 12, 5-chome, Hon-machi, Hanno-shi, Hanno, Japan; and Shizuo Salto, 1400 Ohwada-cho, Hachioji-shi, Tokyo, Japan

No Drawing. Filed Nov. 13, 1970, Ser. No. 69,174  
Claims priority, application Japan, Nov. 25, 1969,  
44/94,229

Int. Cl. G03c 1/22

U.S. Cl. 96—140

7 Claims

A photographic emulsion orthomatically spectral-sensitized by addition of a dimethine merocyanine dye to an ultramicrofine silver iodobromide emulsion of less than 0.1 micron in particle diameter is increased in gamma without being lowered in speed thus resulting in an image free from blur due to radiation and extremely high in acutance.

3,736,146

# RUMINANT FEED OF UREA-FURFURAL REACTION PRODUCT

Larry P. Milligan; Alexander R. Robblee, both of Edmonton, Alberta, Canada; John C. Wood, Piedmont, Calif., and Sujit K. Chakrabarty, Edmonton, Alberta, Canada, assignors to Canadian Patents & Development Limited, Ottawa, Ontario, Canada

Filed May 7, 1970, Ser. No. 35,577

Int. Cl. A23k 1/00

U.S. Cl. 99—2 ND

9 Claims

A reaction product of urea and furfural containing about 21 to 26 percent by wt. nitrogen has been prepared and found to be an efficient non-protein nitrogen source for animals particularly ruminants. A reaction product having about 3 moles of urea with two of furfural is preferred. The nitrogen is released slowly and gives enhanced nitrogen retention in the animal without toxicity.

3,736,147

# PROCESS FOR PREPARING PROTEIN PRODUCTS

Guillermo Arturo Iacobucci, Dirck van Buren Myers, and Kazuyoshi Okubo, Atlanta, Ga., assignors to The Coca-Cola Company, Atlanta, Ga., and Kikkoman Shoyu Co., Ltd., Tokyo, Japan, fractional part interest to each

Filed Apr. 5, 1971, Ser. No. 131,328

Int. Cl. A23j 1/14

U.S. Cl. 99—17

14 Claims

A process is provided for preparing plant protein products having low phytic acid content by subjecting protein isolates to ultrafiltration in the presence of a suitable chemical reagent.

3,736,148

# MEAT FOOD ANALOGS RESISTANT TO MICROBIAL SPOILAGE

Morris H. Katz, St. Louis Park, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

No Drawing. Filed June 28, 1971, Ser. No. 157,685

Int. Cl. A23i 3/34, 1/34

U.S. Cl. 99—17

10 Claims

Meat food analogs which are resistant to microbial spoilage are comprised of vegetable protein, water, food solids other than vegetable protein dissolved or colloidal dispersed in the water to reduce the water activity ( $a_w$ ) of the analogs to below 0.95, and sufficient acid to adjust the pH to between 3.0 and 5.4. The meat food analogs are analogous in texture, taste and apparent moist eating quality to freshly cooked, meat-type foods having a water content of over 55% and an  $a_w$  of more than 0.98.

3,736,149

# STABILIZED FLAVORING COMPOSITIONS

William A. Knapp, Matawan, N.J., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Nov. 9, 1970, Ser. No. 88,244

Int. Cl. A23i 1/00, 1/04, 1/20

U.S. Cl. 99—78

13 Claims

Stabilized flavoring compositions comprising a flavoring agent fixed in a matrix material comprising lactose, hydrocolloid gum and a starch hydrolysate. Processes for preparing stabilized flavoring compositions and dry-mix food products containing same.

3,736,150

# BEVERAGE CONTAINING EGG ALBUMEN AND AMINO ACID

Jude A. Basso and Charles V. Fulger, Battle Creek, and Joseph J. Thompson, East Jordan, Mich., assignors to Kellogg Company, Battle Creek, Mich.

No Drawing. Continuation-in-part of application Ser. No. 801,141, Feb. 20, 1969. This application Aug. 4, 1971, Ser. No. 169,067

Int. Cl. A23i 1/00

U.S. Cl. 99—78

7 Claims

Egg albumen and an amino acid, such as glycine, are combined in the form of a water soluble powder. The



powder is combined with other ingredients such as food acid, flavoring, and sweeteners to form a dry beverage mix in which the egg albumen and glycine are present as the major sources of protein. The proteinaceous beverage produced by hydrating the mix does not possess the characteristic egg flavor and odor of the albumen.

3,736,151

**DUST-FREE LEAVENING AGENT**

Leo B. Post, New City, and Herbert J. Rosen, Yonkers, N.Y., and J. Howard Zeh, Houston, Tex., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Jan. 6, 1970, Ser. No. 1,022  
Int. Cl. A21d 2/02

U.S. Cl. 99-95

20 Claims

A novel dust-free leavening agent is provided containing sodium aluminum phosphate and a binder which comprises a non-toxic salt capable of forming a hydrate. Illustrative of the salts used as binders are dialkali phosphates, or alkali acid pyrophosphates, and more specifically, disodium phosphate, sodium acid pyrophosphate, aluminum sulfate or sodium aluminum sulfate. The novel leavening agent is substantially dust-free and is useful, for example, in self-rising flours.

3,736,152

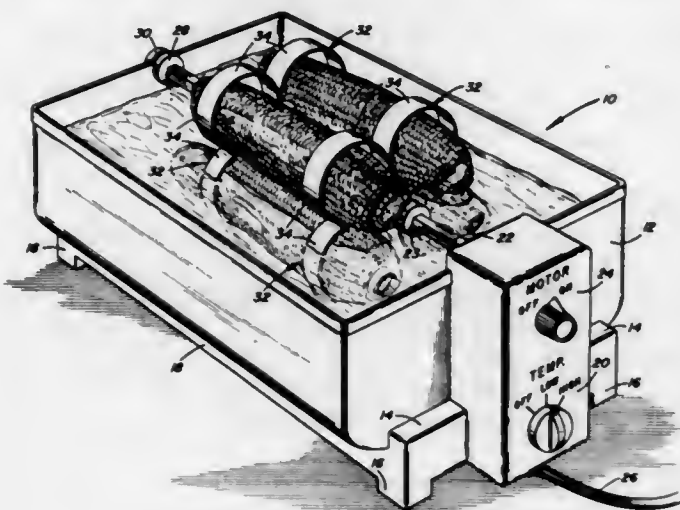
**METHOD OF BUTTERING CORN EARS**

David Turner, 410 NE. 22nd St.,  
Fort Lauderdale, Fla. 33305

Continuation of application Ser. No. 11,593, Feb. 16, 1970. This application Mar. 13, 1972, Ser. No. 234,356  
Int. Cl. A231 1/00

U.S. Cl. 99-100 R

1 Claim



A method of buttering corn ears wherein a container is provided having heated water with melted butter floating on the surface thereof. The corn ears are inserted in each of a plurality of pairs of ring supports mounted on a rotatable shaft disposed across the top of the container. The shaft is then rotated whereby the corn ears are successively immersed in and withdrawn from the fluid butter and each corn ear is caused to rotate about its own axis while being passed through the fluid butter.

3,736,153

**PROCESSING OF SEAFOOD INCLUDING SHELL-FISH AND CRUSTACEANS**

Dan S. Spears, Columbia, S.C., assignor to The Blue Channel Corp., Port Royal, S.C.

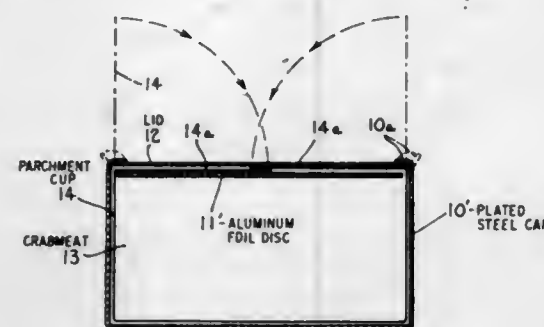
Filed June 11, 1970, Ser. No. 45,443  
Int. Cl. A23b 3/00

U.S. Cl. 99-188

1 Claim

A package containing seafood products in a processing liquid containing copper or iron ions and the like, includes

a metallic can containing the seafood covered within the can with aluminum foil and the like, said package having



been processed by subjecting the can and its contents to elevated temperature.

3,736,154

**PREVENTION OF FREEZE-DAMAGE IN PERISHABLE FOODS**

Bernard J. Finkle, Kensington, Calif., assignor to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed June 28, 1971, Ser. No. 157,760  
Int. Cl. A23b 7/04

U.S. Cl. 99-193

1 Claim

Freeze-damage in perishable comestibles is substantially reduced by an ultra-slow cooling process.

3,736,155

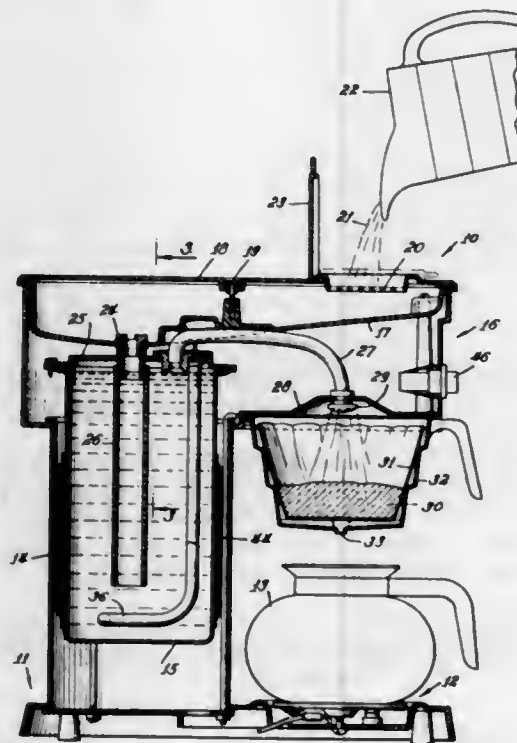
**COLD WATER POUR-IN BEVERAGE MAKER WITH BLANKET HEATER AND DIMETALLIC THERMOSTAT**

John C. Martin, Springfield, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.

Filed May 15, 1972, Ser. No. 253,556  
Int. Cl. A47j 31/00

U.S. Cl. 99-282

5 Claims



Water is heated in a tank under the control of a bi-metallic thermostat which has a wide temperature operating range. Normal heat loss is made up by a blanket heater that maintains the water at a temperature intermediate the range of the bimetallic thermostat.

3,736,156

**ELECTROLESS COPPER PLATING**

Frank E. Stone, Trumbull, and Edward B. Saubestre, Hamden, Conn., assignors to Enthone, Incorporated, New Haven County, Conn.

No Drawing. Continuation-in-part of application Ser. No. 62,649, Aug. 10, 1970. This application Feb. 4, 1972, Ser. No. 223,690  
Int. Cl. C23c 3/02

U.S. Cl. 106-1

8 Claims

No bail-out, formaldehyde odor-reducing or eliminating method for replenishing depleted or spent electroless copper plating baths which eliminates the prior requirement of removing or bailing out material amounts of liquid solution from the bath during replenishing to maintain constant volume, and which considerably reduces or eliminates the irritating odor of formaldehyde otherwise emanating from the bath. A replenisher concentrate solution is added to the depleted electroless copper plating bath, such replenisher concentrate solution containing the following constituents within the proportion ranges set forth below:

Percent by weight

Cupric nitrate ----- About 1 to saturation.  
Formaldehyde - methanol reaction product comprising primarily  $\text{CH}_2\text{O}-\text{CH}_2\text{O}-\text{CH}_3$  ----- About 1-50.  
Formalin ----- About 15-75.  
Methanol, concentrated ----- About 1-83.

The formaldehyde-methanol reaction product comprising primarily the pleasant smelling methylal, i.e.



is present in the replenisher concentrate solution within the aforesaid proportion range in an effective amount, sufficient to reduce considerably the formaldehyde odor of the electroless copper plating bath.

3,736,157

**ELECTROLESS COPPER TIN PLATING SOLUTION AND PROCESS**

Kenneth J. Hacias, Sterling Heights, Mich., assignor to Oxy Metal Finishing Corporation, Warren, Mich.

No Drawing. Filed Jan. 17, 1972, Ser. No. 218,485  
Int. Cl. C23c 3/00

U.S. Cl. 106-1

10 Claims

An aqueous acidic composition useful for forming a copper tin coating on a ferrous metal surface without the application of electric current, which comprises copper ions in the range of from about 0.01 to 30% by weight calculated as  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ , tin ions within the range of about 0.01 to 30% by weight calculated as  $\text{SnSO}_4$  and a long chain aliphatic amine in the range of about 0.01 to 10% by weight.

3,736,158

**CZOCHELSKI-GROWN SPINEL FOR USE AS EPITAXIAL SILICON SUBSTRATE**

Glenn Wherry Cullen, Princeton, and Stephen Ray Bolin, Hightstown, N.J., Andrew David Morrison, Winchester, Mass., and Chih Chun Wang, Hightstown, N.J., assignors to RCA Corporation

Filed Mar. 19, 1971, Ser. No. 126,113  
Int. Cl. C04b 35/44

U.S. Cl. 106-42

2 Claims

An improved single-crystal magnesium aluminate spinel is grown from alumina-rich melts so that the resulting spinel crystal displays a single lattice constant. This material exhibits superior qualities for use as an epitaxial silicon substrate, especially in view of its chemical stability. A method is given for producing these improved spinel crystals by an adaptation of the Czochralski method such that crystals can be prepared from nonstoichiometric melts.

3,736,159

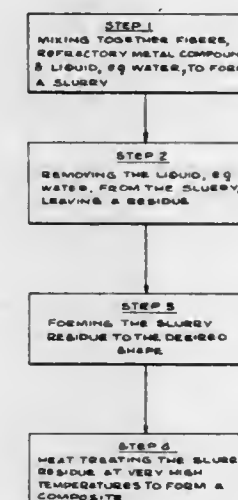
**COMPOSITES HAVING LOW THERMAL EXPANSION**

James O. Gibson and Robert L. Schumacher, Richland, and Kay L. Myler, Benton City, Wash., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Mar. 2, 1970, Ser. No. 15,526  
Int. Cl. C04b 35/54

U.S. Cl. 106-56

22 Claims



Process wherein short lengths of fibers, e.g. graphite fibers, extremely small particles of a refractory metal compound, e.g. NbC of 0.02 micron particle size, and liquid, e.g. water, to make a slurry, are thoroughly mixed together, the liquid e.g. water is then removed from the slurry, leaving a slurry residue which can be formed to the desired shape as by pressing and finally heat treated at very high temperatures, e.g. 3000° C., to form a composite with fibres, e.g. graphite fibers, dispersed in a matrix of refractory metal compound, e.g. NbC. A composite produced by the above process.

3,736,160

**FIBROUS ZIRCONIA CEMENT COMPOSITES**

Bernard H. Hamling, Warwick, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Continuation-in-part of applications Ser. No. 700,031, Jan. 24, 1968, and Ser. No. 717,367, Mar. 29, 1968. This application May 11, 1970, Ser. No. 36,410  
Int. Cl. C04b 35/48

U.S. Cl. 106-57

24 Claims

Composites comprising fibrous zirconia in a matrix of zirconia are prepared by subjecting fibrous zirconia impregnated with a mixture of a liquid containing a zirconium compound and a refractory powder to a temperature sufficient to insure conversion of substantially all of the zirconium compound to zirconia. The composites are useful as heat shields, insulation and the like.

3,736,161

**PRODUCTION METHODS FOR DOLOMITE-MAGNESITE REFRACTORY MATERIAL**

Ronald Staut and Joseph L. Stein, Cherry Hill, N.J., assignors to General Refractories Company, Philadelphia, Pa.

No Drawing. Filed Mar. 29, 1971, Ser. No. 129,205  
Int. Cl. C04b 35/04

U.S. Cl. 106-58

9 Claims

A light burned, low flux dolomite is partially hydrated and a magnesium-containing compound that decomposes to form  $\text{MgO}$ , or light-burned magnesium oxide, is admixed with the partially hydrated dolomite to produce a composition that contains 45-98% by weight magnesium



oxide after firing. Subsequently, the partially hydrated admixture is fired to produce a dense refractory grain possessing improved hydration resistance. Preferred results occur when the composition contains over 50% by volume of magnesium oxide after firing, because at these MgO levels, the fired grain tends to exhibit a continuous magnesium oxide matrix.

3,736,162

### CEMENTS CONTAINING MINERAL FIBERS OF HIGH CORROSION RESISTANCE

Vaclav Chvalovsky, Prague, and Lumir Mach and Helena Machova, Ostrava, Czechoslovakia, assignors to Ceskoslovenska Akademie Ved., Prague, Czechoslovakia

No Drawing. Application Sept. 26, 1969, Ser. No. 861,471, which is a continuation-in-part of abandoned application Ser. No. 762,615, Sept. 25, 1968. Divided and this application Feb. 10, 1972, Ser. No. 225,323

Int. Cl. C04b 7/02

U.S. Cl. 106—99

6 Claims

Mineral fibers of high corrosion resistance are made by employing a base material or composition containing a plurality of oxides of metals from at least one of the groups II, III, IV and VIII of the Periodic Table; adjusting the base raw material or composition so as to furthermore include TiO<sub>2</sub> in an amount of at least 1.5% by weight of the total composition and at least one oxide of a metal from the group II or IVa in an amount of at least 2.5% by weight of the total composition; melting the said raw material or composition; spinning the molten mass into fibers and then coating the thus-formed fibers with a polysiloxane resin. The fibers are particularly suited for incorporation in a cement medium where they may totally or partially replace asbestos fibers previously used for this purpose.

3,736,163

### FIBER REINFORCED INSULATING SEGMENTS

Harry P. Hoopes, Berkeley, and Horst L. Weber, Walnut Creek, Calif., assignors to Fibreboard Corporation, San Francisco, Calif.

No Drawing. Filed Feb. 2, 1971, Ser. No. 112,072

Int. Cl. C04b 15/06

U.S. Cl. 106—120

1 Claim

Molded segments of lightweight high temperature calcium silicate insulating material are reinforced by use of nodulated mineral wool fibers in place of conventional asbestos fibers.

3,736,164

### ORGANOPHOBIC AND HYDROPHOBIC SURFACE COATINGS

Melville Willard Uffner, Media, Pa., assignor to Air Products & Chemicals, Inc., Allentown, Pa.

No Drawing. Filed July 16, 1971, Ser. No. 163,417

Int. Cl. C08b 25/02

U.S. Cl. 106—213

15 Claims

Surface coating compositions comprising a blend of an active fluorine-containing phosphate material, a chelating agent and a solvent, and the use of such surface coating compositions in providing oil, grease and solvent resistance to treated cellulosic materials are disclosed.

3,736,165

### METHOD FOR PROCESSING KAOLIN CLAY

Edgar W. Sawyer, Jr., Edison, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Woodbridge Township, N.J.

No Drawing. Filed July 21, 1971, Ser. No. 164,945

Int. Cl. C09c 3/02; B03d 3/00

U.S. Cl. 106—288 B

1 Claim

In the wet processing of kaolin clay, the clay crude is initially deflocculated (dispersed) with a salt of a polymeric carboxylic acid as the primary dispersant. The deflocculated clay then undergoes further processing, e.g.,

fractionation, floccing, bleaching, filtration, rinsing and re-deflocculation. The preferred floccing agent is aluminum sulfate.

3,736,166

### HEAT REACTIVE TRANSPARENT COPY SHEET

William R. Lawton, Salem, N.H., assignor to Arkwright-Interlaken, Inc., Fiskeville, R.I.

No Drawing. Filed Apr. 7, 1971, Ser. No. 132,207

Int. Cl. B41m 5/18

U.S. Cl. 117—36.8

7 Claims

A transparent copy sheet capable of acquiring a stable color in selected regions contrasting with the background color of the sheet upon exposing these regions to an elevated temperature, comprising a transparent substrate and a coating comprising (1) ninhydrin; (2) an organic amino compound containing at least one amino group selected from the class consisting of primary and secondary amines, and which is normally reactive with ninhydrin at temperatures below this elevated temperature to form a dye; and (3) a selected substituted urea or thiourea stabilizer.

3,736,167

### ELECTROLESS NICKEL PLATING PROCESS

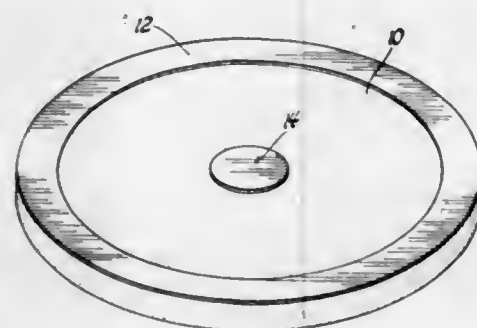
James L. Bachman and Robert M. Martin, Golden, Colo., assignors to Coors Porcelain Company, Golden, Colo.

Filed Apr. 1, 1971, Ser. No. 130,132

Int. Cl. B44d 1/20

U.S. Cl. 117—37 R

5 Claims



A method for nickel plating ceramic parts having refractory-metalized areas wherein a thin, possibly discontinuous, coating of nickel is placed on the part by burnishing or tumbling. Thereafter, the part is electrolessly plated with a eutectic nickel-phosphorous composition. The coated parts are heated until the composition melts and runs off of only the ceramic, having the refractory-metalized areas uniformly nickel plated regardless of area.

3,736,168

### PRESSURE-SENSITIVE PHTHALIDE COMPOUND COPYING PAPERS

Minoru Ozutsumi, Yoshihide Miyazawa, Katsuki Motohashi, and Satoshi Ogawa, Tokyo, and Shizuo Mishima, Shizuoka, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, and Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed May 17, 1971, Ser. No. 144,402

Claims priority, application Japan, May 15, 1970, 45/40,954; June 17, 1970, 45/51,888

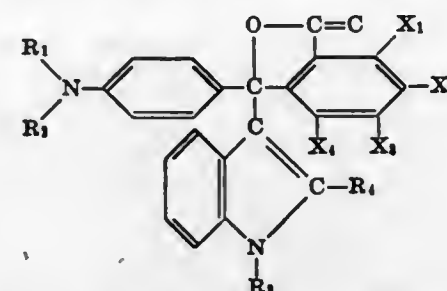
Int. Cl. B41m 5/16; C07d 27/00

U.S. Cl. 117—36.2

2 Claims

A pressure-sensitive transferring sheet, adapted for use with another sheet having an electron accepting layer, comprising a support having thereon a pressure-rupturable microcapsule layer, said microcapsule containing an oil

having dissolved therein as a color former at least one phthalide compound represented by the following general formula



wherein X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, X<sub>4</sub>, R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are described hereinafter, is disclosed.

3,736,169

### PYROLYTIC DEPOSITION PROCESS FOR APPLYING A MULTI-LAYER COATING TO A NUCLEAR FUEL KERNEL

Leslie Wilfred Graham, Wimborne, Eric Handley Voice, Weymouth, and Heinz Ulrich Brinkmann, Dorchester, England, assignors to United Kingdom Atomic Energy Authority, London, England

No Drawing. Filed Nov. 5, 1970, Ser. No. 87,348  
Claims priority, application Great Britain, Nov. 5, 1969, 54,350/69

Int. Cl. G21c 3/06

U.S. Cl. 117—46 CG

10 Claims

A pyrolytic deposition process for applying a multi-layer coating to a nuclear fuel kernel, at least one of the layers being a metal carbide. The optimum temperature range for deposition of the metal carbide is determined and the other layers are deposited pyrolytically at a temperature within this range.

3,736,170

### PROCESS FOR IMPROVED ADHESION OF ELECTROLESS COPPER TO A POLYIMIDE SURFACE

John C. Lo, Endwell, and Michael T. Orinik, Binghamton, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

No Drawing. Filed June 28, 1971, Ser. No. 157,626

Int. Cl. B44d 1/092; C23b 5/64

U.S. Cl. 117—47 A

9 Claims

A polyimide surface is prepared for metal plating by immersion in a quaternary ammonium hydroxide compound solution such as, benzyl trimethyl ammonium hydroxide, tetramethyl ammonium hydroxide, tetraethyl ammonium hydroxide and the like. The resultant hydrolyzed surface is activated by immersion in a solution of high fluoride ion concentration such as, KF, NaF, or HF and thereafter immersed in an electroless deposition bath for metal plating thereon. The resultant metal film is found to be strongly bonded to the polyimide surface.

3,736,171

### METHOD OF STRENGTHENING CERAMICS USING ION EXCHANGE

Henry P. Kirchner, 700 S. Sparks St., State College, Pa., and Dennis R. Platts, Boalsburg, Pa.; said Platts assignor to said Kirchner

Filed June 19, 1969, Ser. No. 834,729

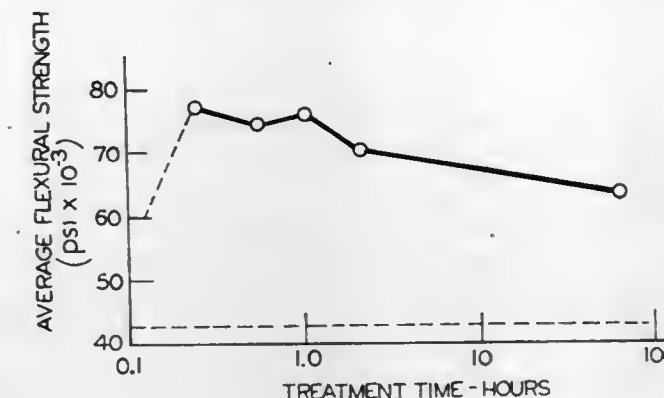
Int. Cl. B44d 1/44; C04b 41/06

U.S. Cl. 117—62

9 Claims

A method of strengthening a body of alumina, having a glaze coating on at least one surface thereof, the glaze coating containing replaceable alkali metal ions taken from the group consisting of sodium and lithium and said glaze coating having approximately the same coefficient of expansion as that of the alumina of the body, said method comprising contacting the glaze coating with a material which is a source of replacement alkali ions taken from the group consisting of potassium and sodium, which replacement ions are larger than the replace-

able ions in the glaze coating replaced and which will exchange with the replaceable ions in the glaze coating, and supplying heat to the contacted glaze coating and re-



placement ion source material at a temperature and for a time less than are necessary for relaxing the glaze for carrying out the ion exchange.

3,736,172

### METHOD TO PREVENT CONDENSATE ACCUMULATION ON A SURFACE

Richard Delano, Box 96 11785, and Chad J. Raseman, 15 Blueberry Ridge Road 11733, both of Setauket, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 827,069, May 22, 1969. This application Aug. 23, 1971, Ser. No. 174,235

Int. Cl. B32b 27/06

U.S. Cl. 117—95

8 Claims

The interior surface of a plastic enclosure having therein a high humidity, such as a plastic greenhouse or pool enclosure, is coated to prevent dripping of condensate. The method consists of coating the interior surface with a dilute aqueous dispersion of a surfactant and colloidal alumina.

3,736,173

### METHOD OF PREPARING CURABLE POLYOLEFIN GRANULES CONTAINING A CROSS-LINKING AGENT

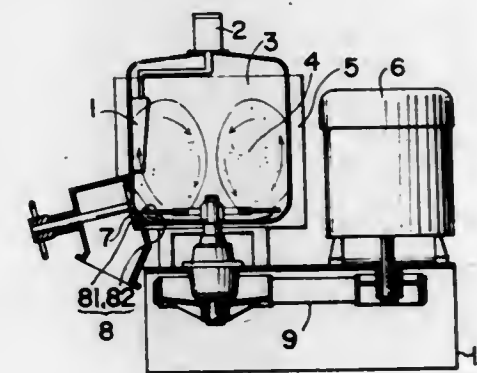
Masaaki Okada, Hayashi Takemori, Toshio Kita, Toshiaki Nakai, Masaaki Ohtsui, Yasuhiro Fujiwara, Shoji Tamura, and Kozo Morita, Amagasaki, Japan, assignors to Dainichi-Nippon Cables, Ltd., Amagasaki-shi, Japan  
Continuation of abandoned application Ser. No. 769,048, Oct. 21, 1968. This application Jan. 18, 1971, Ser. No. 107,574

Claims priority, application Japan, Oct. 20, 1967, 42/67,577

Int. Cl. B32b 27/26, 27/32

U.S. Cl. 117—100 C

8 Claims



A method of preparing curable polyolefin granules comprising stirring polyolefin granules and a crosslinking agent

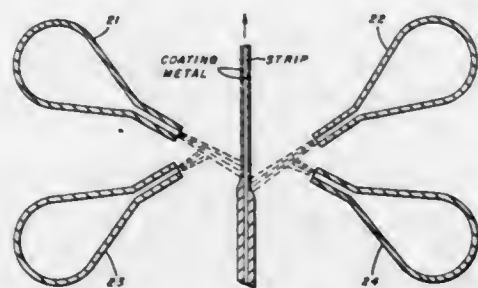


in a high speed stirring apparatus to locally fuse the surfaces of the polyolefin granules by the friction and collision of polyolefin granules, while preventing cohesion of the polyolefin granules with each other, and to cause the crosslinking agent to penetrate and diffuse into the granules of polyolefin.

### 3,736,174 VARYING ANGLE OF GAS IMPINGEMENT IN GAS KNIFE PROCESS FOR REMOVING EX- CESS COATING

Robert C. Moyer, Monroeville Boro, Pa., assignor to  
United States Steel Corporation  
Filed Dec. 16, 1971, Ser. No. 208,709  
Int. Cl. B05c 11/06; C23c 1/00  
U.S. Cl. 117—102 M

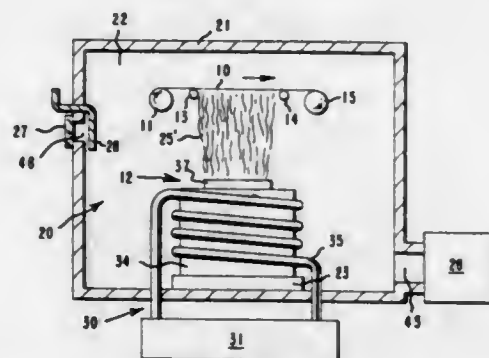
6 Claims



In the gas knife process for controlling the weight of an applied coating, the angle of gas impingement on the strand is varied, by employing at least two thin gaseous streams which are caused to impinge upon each other, prior to striking the strand. The resultant jet (analogous to the resultant vector of several forces acting on a particular body) is then employed to act as a gaseous barrier to excess liquid on the strand. The angle of impingement of the resultant jet is easily manipulated by varying the ratio of the flow rates of the individual gaseous streams.

3,736,175  
VACUUM COATING METHOD  
John T. Carleton, Upper Arlington, Ohio, assignor to  
E. I. du Pont de Nemours and Company, Wilmington,  
Del.  
Continuation of abandoned application Ser. No. 98,824,  
Dec. 16, 1970. This application June 2, 1972, Ser.  
No. 259,116  
Int. Cl. C23c 17/02  
U.S. Cl. 117—107.1

1 Claim



In vacuum metallizing, creep within a crucible is inhibited by heating the body portion of the crucible to a temperature above the vaporization temperature of the metal coating stuff while heating a vertically extending lip portion of the crucible to a temperature which is below said vaporization temperature but above the melting point temperature of said metal coating stuff.

### 3,736,176 COMPOSITION, ARTICLES PREPARED THERE- FROM AND METHOD OF PREPARING SUCH ARTICLES

Josef Francel and Fred E. Mansur, Toledo, Ohio,  
assignors to Owens-Illinois, Inc.  
No Drawing. Continuation of application Ser. No.  
671,096, Sept. 27, 1967, which is a continuation-  
in-part of application Ser. No. 432,877, Feb. 15,  
1965, both now abandoned. This application July  
21, 1971, Ser. No. 164,922  
Int. Cl. C03c 17/22  
U.S. Cl. 117—124 A

17 Claims

A glass surface coating composition which when heat-fused on a glass surface provides the glass surface with a protective scratch resistant and optically transparent coating in addition to providing anti-glare and high optical resolution characteristics. The coated glass surface is produced by a method comprising the steps of heat-bonding onto the glass surface an aqueous composition consisting essentially of the following constituents in the indicated range of percent by weight:

| Constituents:      | Percentage by weight |
|--------------------|----------------------|
| Phosphoric acid    | 2-23                 |
| Aluminum phosphate | 5-41                 |

together with other beneficial constituents in the following indicated range of percentage by weight:

| Constituents:                         | Percentage by weight |
|---------------------------------------|----------------------|
| Sodium phosphate                      | 0-30                 |
| Ammonium phosphate                    | 0-10                 |
| Aniline phosphate                     | 0-7                  |
| Magnesium oxide, carbonate or nitrate | 0-7                  |
| Zinc oxide, carbonate or nitrate      | 0-7                  |
| Aluminum halide                       | 0-7                  |
| Iron halide                           | 0-7                  |
| Total other beneficial constituents   | ≥1                   |

### 3,736,177 WATER AND OIL-RESISTANT, ANTISTATIC AND ABRASION-RESISTANT FINISH FOR NYLON FABRICS

Norman S. Buchan, Chelmsford, and Gil M. Dias, Fall  
River, Mass., assignors to the United States of America  
as represented by the Secretary of the Army  
No Drawing. Filed May 12, 1971, Ser. No. 143,184  
Int. Cl. B32b 27/06; C09j 3/16

U.S. Cl. 117—138.8 N

6 Claims

A water and oil-resistant, antistatic and abrasion-resistant finish is imparted to a nylon fabric, said nylon prepared from hexamethylenediamine and adipic acid or its derivatives, by applying an aqueous emulsion containing a long chain aliphatic isocyanate, an organic fluoropolymer, and a reaction product of a water soluble polyamine having polyalkylene oxide groups and an epoxide or halohydrin compound and curing said composition on the nylon fabric at temperatures in excess of 300° F.

### 3,736,178 CELLULOSE MATERIAL TREATED WITH A CELLULOSE DERIVATIVE, DIGLYCOLAMINE AND AN ALKYLKETENE DIMER

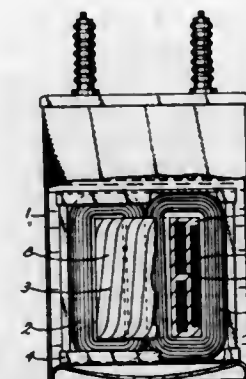
Fred S. Sadler, Racine, Wis., and Frank W. Heinrichs,  
McMurray, Pa., assignors to McGraw-Edison Com-  
pany, Milwaukee, Wis.  
Filed Jan. 14, 1971, Ser. No. 106,506  
Int. Cl. D21h 1/42

U.S. Cl. 117—157

2 Claims

Cellulose material having improved physical properties and having particular application as insulation in electrical apparatus. The cellulose material, such as 100% Kraft fiber paper, is treated with a combination of a cellulose derivative, diglycolamine and an alkylketene dimer.

The treatment with this combination of ingredients improves the thermal stability of the cellulose material with intermediate sintering prior to the application of the front contact.



significantly lower dielectric loss characteristics, as well as improving the mechanical properties of the material.

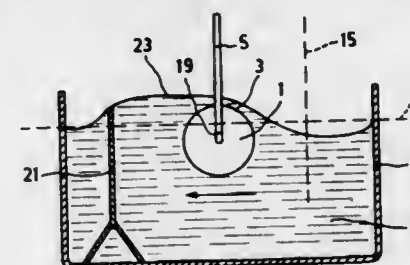
### 3,736,179 DIP LACQUERING OF ELECTRICAL COMPONENTS

Nico Arle de Gler and Simon van der Kooij, Emmasingel,  
Eindhoven, Netherlands, assignors to U.S. Philips Cor-  
poration, New York, N.Y.  
Filed May 10, 1971, Ser. No. 141,479

Claims priority, application Netherlands, May 15, 1970,  
7007041  
Int. Cl. B44d 1/06; C23c 9/00

U.S. Cl. 117—201

3 Claims



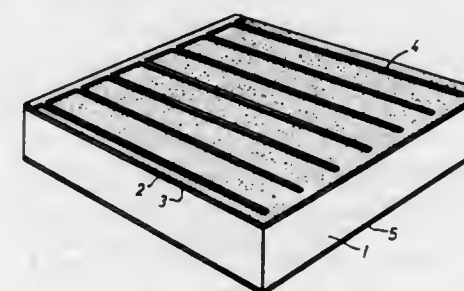
Method of providing a cylindrical electrical component having radial connecting wires with a layer of lacquer by dipping in a viscous lacquer. The component is suspended from its connecting wires and partly immersed in the bath of lacquer. It is then moved through the lacquer at such a speed that a wave is produced in the lacquer so as to flush the surface of the component extending above the lacquer.

3,736,180  
METHOD OF PRODUCING SOLAR CELLS  
Horst Fischer, Reinhard Gereth, and Karl-Heinz Kreuzer,  
Heilbronn, Germany, assignors to Licentia Patent-  
Verwaltungs-G.m.b.H., Frankfurt am Main, Germany  
Filed Nov. 10, 1970, Ser. No. 88,445

Claims priority, application Germany, Nov. 17, 1969,  
P 19 57 659.1

Int. Cl. C23b 5/50; H01 15/02  
U.S. Cl. 117—217

4 Claims



A method of producing solar cells includes subjecting the back contacts of the cells to a separate intensified

3,736,181  
METHOD OF COATING CrO<sub>2</sub> WITH ALUMINA  
Donald George Pye, Wilmington, Del., assignor to E. I.  
du Pont de Nemours and Company, Wilmington, Del.  
No Drawing. Original application Oct. 19, 1970, Ser. No.  
82,117. Divided and this application June 9, 1972, Ser.  
No. 261,213

Int. Cl. H01f 10/02

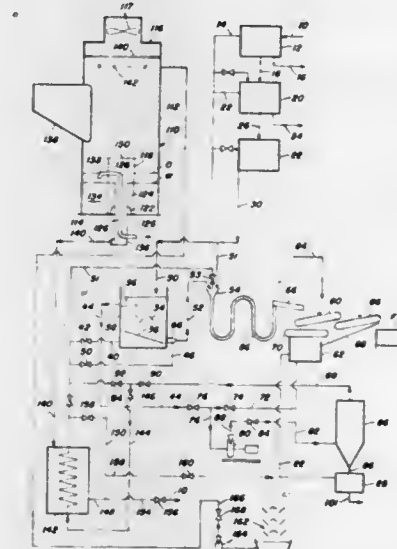
U.S. Cl. 117—234  
The alumina coating is produced by slurrying CrO<sub>2</sub> particles in water, in a solution of an aluminum-containing salt, in an acid, or in a base, and adding with agitation in any order, sequentially or simultaneously, a solution of at least one of an aluminum-containing salt, an acid, or a base in sufficient quantity to establish and maintain, the pH of the slurry in the range of 4 to 10.

3,736,182  
PROCESS AND APPARATUS FOR WASHING  
PARTICULATE COMESTIBLE MATERIALS  
Edward S. Wright, Pittsburgh, Pa., and John W. Angstadt,  
Williamsville, N.Y., assignors to Blaw-Knox Food and  
Chemical Equipment, Inc., Buffalo, N.Y.  
Filed June 25, 1971, Ser. No. 156,765

Int. Cl. C13l 1/00

U.S. Cl. 127—24

13 Claims



Process and apparatus for substantially reducing wash liquid requirements for the washing of raw particulate comestible materials, particularly potato slices to remove surface starch prior to cooking such slices. Washing of the slices is effected in an elongated zone having an upwardly extending portion wherein the potato slices are passed in concurrent contact with wash water to remove starch exposed during slicing of raw whole potatoes. The potato slices are separated from a starch-enriched wash liquid and are passed to a deep-fat cooking fryer. The starch-enriched liquid is introduced into a concentrator to form a concentrated starch slurry withdrawn for subsequent processing and a lean wash liquid which is returned to the washing step.

3,736,183  
APPARATUS FOR AND METHOD OF EDGE  
MACHINING FLEXIBLE CONTACT LENSES  
Israel Schrier, 30 Northfield Road,  
Irondequoit, N.Y. 14617  
Filed July 6, 1971, Ser. No. 160,015  
Int. Cl. B08b 7/00, 3/00; B24b 7/00, 9/00

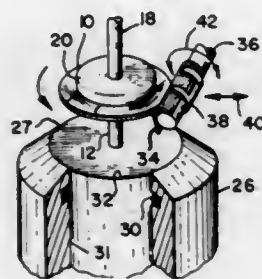
U.S. Cl. 134—33

8 Claims

A machine for centering a hydrophilic lens between rotatable spindles to engage a polishing pad for contouring



the edge of the lens comprises a rotatable spindle having an extensible sleeve concentrically disposed about it for raising to form a chamber for holding a fluid for floating and centering a hydrophilic lens. A clamping spindle is provided for engaging and moving the hydrophilic lens against the rotatable support spindle and to thereafter cooperatively spin the lens to displace fluids therefrom to condition the edge of the lens for contouring by en-



gaging a slurry coated polishing pad. A novel method for preparing the hydrophilic lens for polishing comprises the steps of floating the lens on the fluid filled chamber, centering the lens concentrically with the support spindle axis, concentrically clamping the lens upon the spindle and rotating the spindle to centrifugally displace at least some fluid from the lens and thereby condition the lens for contouring of its edge.

3,736,184

#### METAL PHOSPHATE AND METAL ARSENATE ORGANIC ELECTROLYTE CELLS

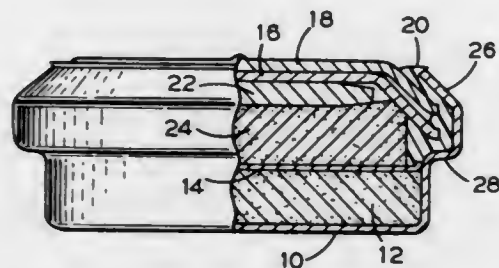
Arabinda N. Dey, Needham, and Robert W. Holmes, Dedham, Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Mar. 29, 1972, Ser. No. 239,123

Int. Cl. H01m 35/02

U.S. Cl. 136-6 LN

17 Claims



A cathode active material is described utilizing the phosphates and arsenates of copper, iron, silver, cobalt, nickel, mercury, thallium, lead and bismuth. These materials are particularly suitable for use as positive electrodes in non-aqueous electrolyte cells and such electrodes and the cells are described. A method for fabrication of the active material into cathodes is included.

3,736,185

#### NON-GASSING BATTERY SEPARATOR AND METHOD OF PRODUCTION

Joseph S. Smatko, Santa Barbara, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Nov. 27, 1970, Ser. No. 92,963

Int. Cl. H01m 3/02, 41/00

U.S. Cl. 136-30

23 Claims

Production of inorganic porous sintered battery separator essentially eliminating formation of gas when in contact with a zinc electrode, and permitting long cycle

life of a high energy density battery such as a silver-zinc battery, produced according to one embodiment by initially firing a mixture of magnesium-bearing material, e.g., MgO, lead-bearing material, e.g., PbO, and silica (SiO<sub>2</sub>), at temperature in the range of about 1,100 to about 1,550° C., to produce a magnesium silicate-lead silicate composition, granulating and compacting said composition into plaques, and sintering said compacted plaques at temperature ranging from about 800 to about 1,250° C., to produce porous sintered separator members, in the form of a sintered composition or composite of magnesium silicate and lead silicate, having good transverse strength and low resistivity.

3,736,186

#### SEPARATOR AND ELECTROLYTE MATERIAL FOR SOLID ELECTROLYTE BATTERY SYSTEMS

Charles C. Liang, Andover, Mass., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

No Drawing. Filed June 16, 1971, Ser. No. 153,794

Int. Cl. H01m 11/00

U.S. Cl. 136-83 R

10 Claims

A solid electrolyte material comprising an alkali metal halide electrolyte embedded into the pores of molecular sieves and having a conductivity range between  $2 \times 10^{-7}$  ohm<sup>-1</sup> cm.<sup>-1</sup> and  $3 \times 10^{-5}$  ohm<sup>-1</sup> cm.<sup>-1</sup> at room temperature.

3,736,187

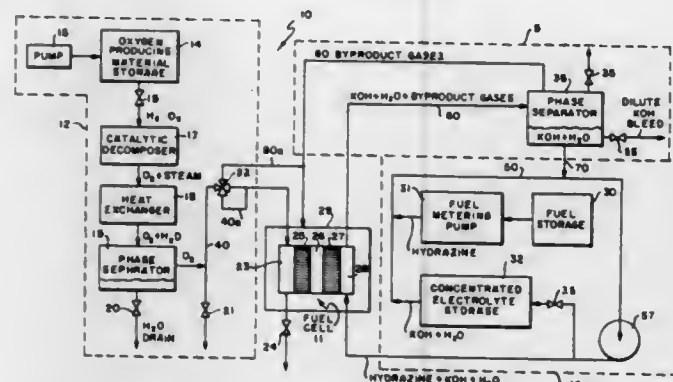
#### PRESSURE EQUILIBRATED GAS FUEL CELLS AND METHOD

John H. Harrison, Severna Park, Robert J. Bowen and Herman B. Urbach, Annapolis, and David E. Icenhauer, Glenn Dale, Md., assignors to the United States of America as represented by the Secretary of the Navy Continuation-in-part of application Ser. No. 844,767, July 25, 1969. This application Sept. 14, 1971, Ser. No. 180,351

Int. Cl. H01m 27/00

U.S. Cl. 136-86 B

4 Claims



A self-pressurized fuel cell system for operation at deep sea ambient pressures includes a fuel cell having oxygen and fuel manifolds. Oxygen is produced and fed within the system to the oxygen manifold, and a fuel solution is produced and fed within the system to the fuel manifold. Pressure is maintained within a relatively flexible low strength housing surrounding the cell substantially the same as pressure ambient to the housing due to byproduct gases produced by the cell being fed to the housing.

3,736,188

#### BATTERY OF RESERVE CELLS

Gordon E. Kaye, Irvington, N.Y., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Mar. 6, 1972, Ser. No. 231,819

Int. Cl. H01m 21/10

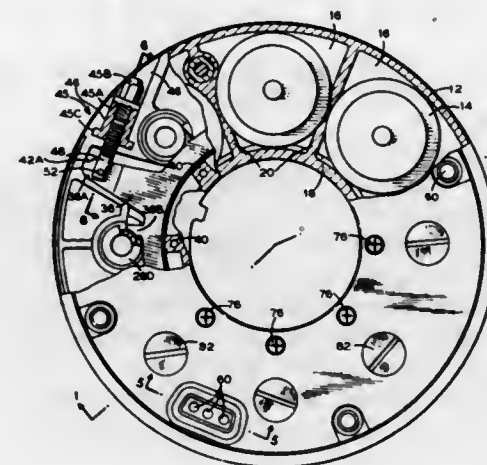
U.S. Cl. 136-90

11 Claims

A battery of reserve cells, each containing a hermetically sealed vial of fluid electrolyte with normally restrained

stored-energy impact device to fracture said vial to release said electrolyte to operative activating position in

introducing the electrolyte. The filling portal is provided with a resilient primary sealing means at the internal lower portion of the portal for engaging resiliently a male-



each cell; and unitary means, for normally restraining all said impact devices, and at will, to render all the reserve cells immediately active.

3,736,189

#### LOCKING DEVICE FOR BATTERY STICKS

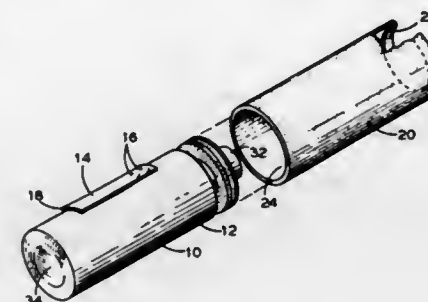
Frank Ciliberti, Ossining, N.Y., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Feb. 29, 1972, Ser. No. 230,324

Int. Cl. H01m 1/02

U.S. Cl. 136-132

4 Claims



This invention relates to means and methods for preventing the formation of corrosion between the outer metal can of a battery and its circumscribing insulative jacket or sleeve. A cantilever type of metal tab is affixed to usually the central portion of the battery. The tab, having a gouging finger edge portion, allows the insulative jacket to slip over the can, but the finger portion will dig into the internal surface of the jacket making it extremely difficult for the jacket to be withdrawn once it is placed over the tab. The insulative jacket, or sleeve has a crimped end and an open end, with the crimped end abutting a disc terminal of the battery so as to preclude any further downward travel on the metal can.

3,736,190

#### HERMETICALLY SEALED STRUCTURES FOR ORGANIC ELECTROLYTE SYSTEMS

Arabinda N. Dey, Needham, and Robert W. Holmes, Dedham, Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

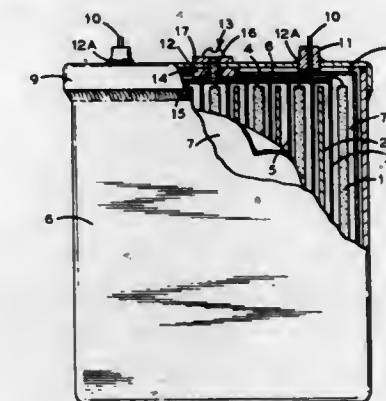
Filed Mar. 2, 1972, Ser. No. 231,167

Int. Cl. H01m 1/02

U.S. Cl. 136-133

8 Claims

A hermetically sealed battery or cell casing is described comprising a casing enclosing the cell or cells and provided with a cover sealed to its casing and having, in addition to sealed electrode and leads, a filling portal for



threaded closure means, said male-threaded closure means being fusibly sealed to the outer and upper portion of the portal.

3,736,191

#### METHOD OF PROVIDING A TERMINAL ON AN ELECTRIC STORAGE BATTERY

Kenneth George Blandford, 1270 Yardley Wood Road, Solihull, England

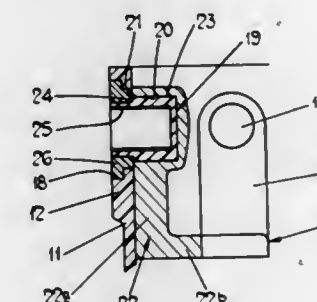
Filed Mar. 30, 1971, Ser. No. 129,455

Claims priority, application Great Britain, Apr. 11, 1970, 17,335/70

Int. Cl. H01m 5/00

U.S. Cl. 136-135 S

10 Claims



A method of providing a terminal on an electric storage battery comprises starting with a conductive lug having an aperture therein and locating the lug in contact with the inner surface of a side or end wall of the battery box so that an integral extension of the lug engages a conductive bar, the conductive bar interconnecting sets of battery plates in a pair of adjacent cell compartments of the battery. The aperture in the lug communicates with, but is of smaller cross section than an aperture in the side or end wall of the battery so that the lug defines an inwardly extending shoulder presented to the aperture in the side or end wall, and a terminal support member is engaged in the aperture in the lug. The support member defines an outwardly extending shoulder and an annular conductive washer is located in the aperture in the side or end wall so that one face of the washer abuts against the shoulders on the lug and the support member respectively. A seal is effected between the washer and the lug to trap the support member therebetween, a terminal is engaged with the support member, and an electrical connection is provided from the terminal through the lug to the conductive bar.



3,736,192

**INTEGRATED CIRCUIT AND METHOD OF MAKING THE SAME**

Takashi Tokuyama, Hoya-shi, Takashi Tsuchimoto, Kodaira-shi, Takahide Ikeda, Kokubunji-shi, and Shigeru Nishimatsu and Hisumi Sano, Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 3, 1969, Ser. No. 881,739

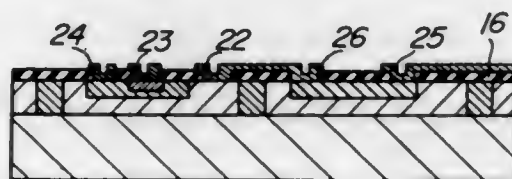
Claims priority, application Japan, Dec. 4, 1968,

43/88,303

Int. Cl. H011 7/54

U.S. Cl. 148—1.5

9 Claims



An integrated circuit comprising a semiconductor epitaxial layer having two or more semiconductor circuit elements such as a transistor, diode and resistor formed on one surface thereof, and a high resistivity region formed by implantation of ions from the surface of the epitaxial layer, the semiconductor circuit elements being electrically divided into a plurality of groups by the high resistivity region of the epitaxial layer formed by ion implantation.

3,736,193

**SINGLE CRYSTAL-POLYCRYSTALLINE PROCESS FOR ELECTRICAL ISOLATION IN INTEGRATED CIRCUITS**

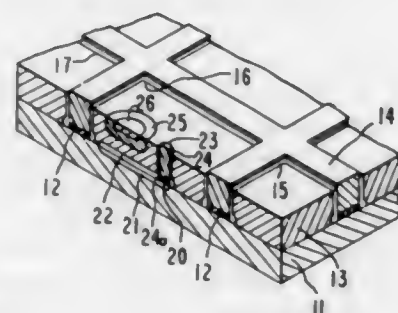
Ross N. Tucker, Menlo Park, and Michael L. Barry, Palo Alto, Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Original application July 29, 1969, Ser. No. 845,822, now abandoned. Divided and this application Oct. 26, 1970, Ser. No. 84,096

Int. Cl. H011 7/36, 19/00, 5/00

U.S. Cl. 148—175

12 Claims



A semiconductor wafer, suitable for use in forming integrated circuits, contains, on a substrate, islands of single crystal silicon of one conductivity type, each island being isolated from adjacent islands by walls of polycrystalline silicon of opposite conductivity type. Polycrystalline silicon pipes in the single crystal silicon provide controlled resistance contacts from the top surface of the single crystal silicon to buried collector layers underlying the single crystal silicon.

3,736,194

**METHOD OF PREPARING A COMPOSITE EXPLOSIVE WITH A WATER-WET ENERGETIC COMPOUND**

Harry Heller, Silver Spring, Md., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Feb. 18, 1966, Ser. No. 530,253

Int. Cl. C06b 19/02, 21/00

U.S. Cl. 149—19

7 Claims

1. A process for producing a solid energetic composition of the composite type wherein an energetic compound is dispersed in a resinous binder comprising:

- (a) mixing a water-wet energetic compound with resinous binder components comprising a liquid polymer and a liquid cross-linking agent, said polymer and cross-linking agent being denser than, insoluble in and higher boiling than water,
- (b) removing water from the mixture and
- (c) curing said mixture to form a solid energetic composite.

3,736,195

**GELLED HYDRAZINE CONTAINING ROCKET FUEL**

George W. Burdette, China Lake, Calif., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Feb. 11, 1966, Ser. No. 527,382

Int. Cl. C06b 15/00, 15/04

U.S. Cl. 149—36

2 Claims

1. A gelled rocket fuel formulation which is stable at temperatures ranging from  $-65^{\circ}$  to  $+165^{\circ}$  F. consisting essentially of 92.5% by weight of a fuel composed of a mixture of monomethylhydrazine and hydrazine, 6% by weight silicon dioxide and 1.5% by weight hydroxyethylcellulose.

3,736,196

**PREPARATION OF EXPLOSIVE NITRIC ESTER GELS**

Gordon M. Gay, Tacoma, Wash., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

No Drawing. Filed Feb. 24, 1971, Ser. No. 118,507

Int. Cl. C06b 1/04

U.S. Cl. 149—48

3 Claims

A process for the preparation of an explosive composition containing nitrocellulose and an explosive nitric ester, such as nitroglycerine. The nitrocellulose is first mixed with a liquid dispersing agent, such as ethylene glycol and/or glycerine, and thereafter mixed with the explosive nitric ester.

3,736,197

**POWDERLESS ETCHING BATH COMPOSITIONS AND ADDITIVES**

Harold J. Messerschmidt, Stockholm, Karl Heyman, Montclair, and Bernadou W. Johnson II, Paterson, N.J., assignors to Mona Industries, Inc., Paterson, N.J.

No Drawing. Filed Mar. 29, 1972, Ser. No. 239,383

Int. Cl. B44n 3/02; C23g 1/26

U.S. Cl. 156—14

26 Claims

Improved powderless etching bath additive compositions, especially for etching magnesium photo-engraving plates, containing

- (a) at least one water-soluble or water-dispersible sulfonated fatty acid of from 8 to 24 carbon atoms, wherein the sulfur atom in the sulfonate group is directly bonded to a carbon atom, and
- (b) at least one saturated or olefinically unsaturated monocarboxylic acid of from 8 to 24 carbon atoms,
- (c) at least one polyhydric alcohol of from 2 to 10 carbon atoms or an ether derivative thereof; and, optionally,

- (d) at least one lower mono-carboxylic acid of from 2 to 6 carbon atoms and/or polycarboxylic acid of from 2 to 10 carbon atoms;

and etching baths containing such compositions and nitric acid and water, give good etching performance, particularly improved definition of the printable area of the plate, depth, of half-tones, and side wall smoothness.

3,736,198

**METHOD OF FORMING A NAILING STRIP BY APPLYING A HOT MELT LIQUID PLASTIC**

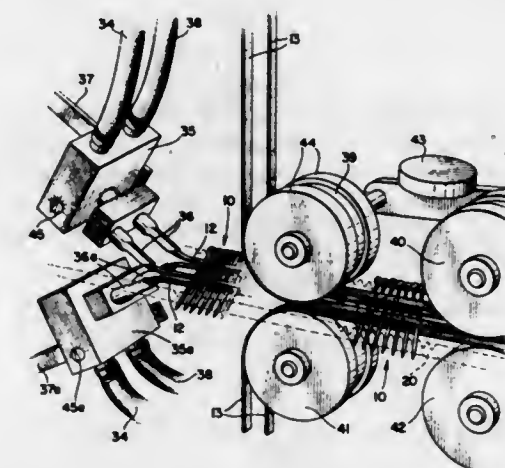
Walter Herman Leistner, 97 Alamosa Drive, Willowdale, Ontario, Canada

Continuation-in-part of abandoned application Ser. No. 737,629, June 17, 1968. This application Feb. 8, 1971, Ser. No. 113,458

Int. Cl. B32b 31/18, 31/20, 31/30

U.S. Cl. 156—65

3 Claims



This specification discloses a method of forming nails into a nailing strip of the type which is used in power operated nailing hammers, in which nailing strips the nails are supported spaced apart from one another by easily breakable material. The breakable material is applied in a hot liquid or semi-liquid state to both sides of the nails simultaneously and squeezed into the space between them. Covering material may be applied to the exterior of the hot material so as to add strength, and also to avoid accumulations of such material on the apparatus. The specification also discloses apparatus for performing such a method in which the nails are arranged to lie on a movable conveyor which is oriented in a plane angled relative to the horizontal whereby to employ both the horizontal and the vertical component of gravitational force acting on the nails and in which the hot material is extruded directly over and under the nails as they are carried on the conveyor from both sides in a direction slanted towards the direction of movement of the conveyor.

3,736,199

**DEVICE AND METHOD FOR INSTALLING SURFACE MOLDING**

John R. Mason, Los Angeles, Calif., assignor to Dracon Industries, Chatsworth, Calif.

Filed May 3, 1971, Ser. No. 139,358

Int. Cl. E04b 13/10

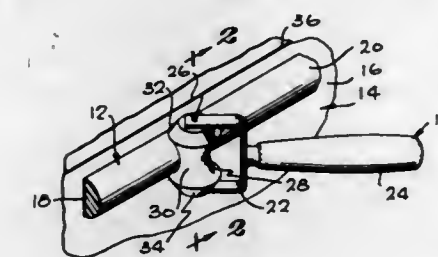
U.S. Cl. 156—71

6 Claims

Surface molding has a uniform cross section for extrusion, and has an adhesive-faced surface for attachment to a body. Its convex outer face defines the configuration of the surface of revolution on a molding-applying roller. The molding applying roller is manually operable and rotatable on the axis of the surface of revolution.

The method comprises engaging the adhesive-faced surface of the molding upon a body, and engaging the curved

surface of revolution of the roller against the outer molding face, moving the roller in a direction along the length of the molding normal to the axis of the roller, and applying



ing a force having a component normal to both the direction of motion and the direction of the axis so that the molding is adhesively attached to the body.

3,736,200

**METHOD FOR VACUUM MOLDING BOOK BINDINGS**

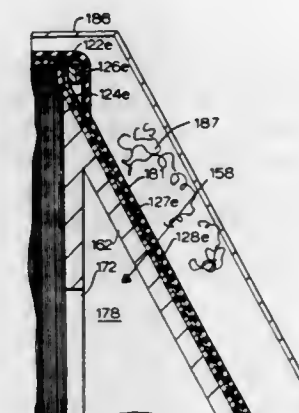
William H. Abildgaard, Los Altos Hills, and Charles T. Grosz, Palo Alto, Calif., and Hans L. Melgaard, Mound, Minn., assignors to Abildgaard Laboratories Inc., Mountain View, Calif.

Original application June 16, 1969, Ser. No. 833,382, now Patent No. 3,608,116, dated Sept. 28, 1971. Divided and this application Mar. 10, 1971, Ser. No. 122,949

Int. Cl. B29c 17/04, 27/00; B42c 19/00; B32d 31/00

U.S. Cl. 156—85

11 Claims



The method involves softening thermoplastic book covers and spine caps by application of heat and simultaneously applying a vacuum on the inside of a flexible membrane so that atmospheric pressure forces the membrane against the covers and spine, molding the same together and joining the spine to the edges of the pages. By use of a prepared casting release paper, simulated grain may be embossed in the covers and various legends and ornamentation applied. The molding of the cover may laminate various layers of plastic of different thicknesses, colors, etc. The edges of the covers are rounded during molding. Panels or imbedded inserts may be formed in the covers or spine.

3,736,201

**METHOD FOR MOLDING BOWL-SHAPED ARTICLES**

Sholchi Teraoka, 5-32 Nishi 2-chome, Senriyama, Suita-shi, Osaka, Japan

Filed Nov. 19, 1970, Ser. No. 91,028

Int. Cl. B29c 17/07; B32b 31/20

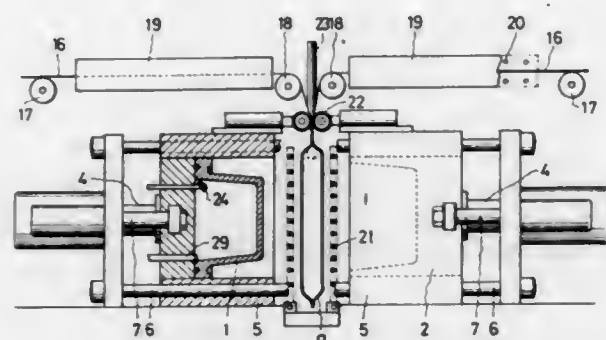
U.S. Cl. 156—145

8 Claims

A method of molding bowl-shaped plastic articles having a multi-layer wall structure is disclosed. In the present method a parison is supplied to the space between the



male and female members of a split mold, at least one of which members includes a shelly-shaped mold slidably mounted thereon for engagement with the other member. The shelly-shaped mold is moved into engagement with the other member while holding the parison in position between the male and female members to thereby close the upper and lower edge portions of the parison while confining the parison within a limited space that is de-



fined by the shelly-shaped mold and by the inner walls of the male and female members. The split mold is fully closed by bringing the male and female members into final engagement with each other and concurrently therewith, introducing air under pressure into the interior of the parison to cause the parison to engage fully the inner walls of the members and to conform to the shape and configuration thereof.

3,736,202

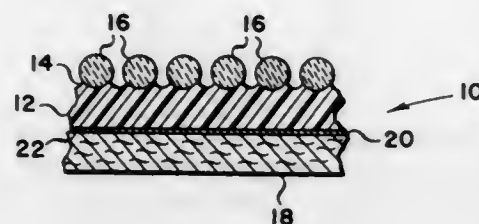
#### COMPOSITE SHEETS AND PROCESSES OF MANUFACTURING THE SAME

Vernon S. Sorenson, Valencia, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.  
Continuation-in-part of application Ser. No. 507,806, Nov. 15, 1965. This application Jan. 22, 1970, Ser. No. 5,120

Int. Cl. B65h 81/02

U.S. Cl. 156-172

7 Claims



A method of manufacturing composite sheets for structural fabrication wherein a lamina of unpolymerized resin is heated sufficiently to cause it to become tacky, but below its polymerization temperature; monofilament strands are laid up on the tacky lamina and thereafter the composite sheet is heated under pressure to yield a polymerized composite in which the strands are coated and bonded to the sheet.

3,736,203

#### METHOD OF FORMING ANNULAR SHAPED WRAPPING

Isago Miura, 1-4-19 Honcho, Asaka, Japan  
Filed Feb. 8, 1971, Ser. No. 113,376

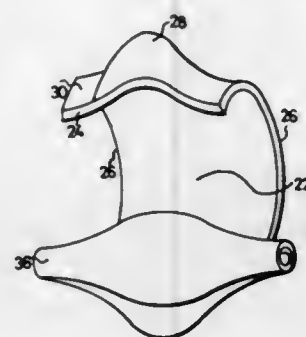
Int. Cl. B65h 81/00

U.S. Cl. 156-189

7 Claims

A method and an apparatus is provided for forming packing or wrapping material of an elastic plastic sheet material for products of special shapes and particularly

annular articles. The sheet of material is permanently stretched in a longitudinal direction with the amount of stretching varying across the width of the sheet so that



the sheet assumes a permanent shape to insure wrapping of an annular article without any air gaps between the wrapping material and the article.

3,736,204

#### REVERSE OSMOTIC WATER PURIFICATION

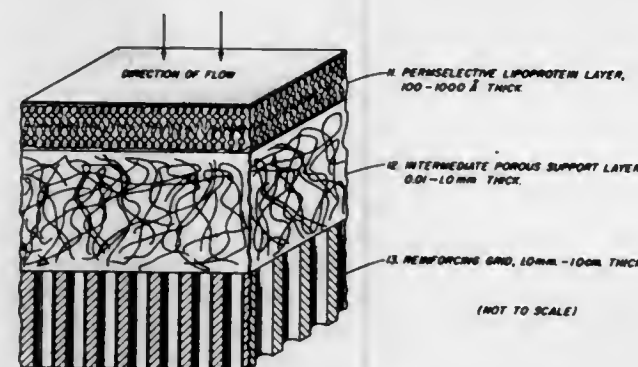
Lewis Smith Meriwether, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Original application Aug. 8, 1969, Ser. No. 848,475, now Patent No. 3,593,852. Divided and this application July 19, 1971, Ser. No. 163,676

Int. Cl. B01d 13/00

U.S. Cl. 156-242

3 Claims



Brackish or saline water may be purified by forcing the water under comparatively high pressure through a reverse osmotic membrane consisting of the reconstituted membranes derived from living cells such as red blood cells, which reconstituted membranes themselves are in the order of 50 to 150 angstroms thick with at least one and perhaps several layers of such reconstituted membranes supported on a support layer which may be of a water permeable cellulose which in turn is mechanically reinforced by a grid, porous plate or ceramic type plate which has high mechanical strength. The membrane is formed by ultrasonic rupturing of the cell membranes followed by the reaggregation of the resulting lipoprotein subunits into a continuous membrane having a thickness and composition similar to that of the intact cell membrane but of much greater size.

3,736,205

#### METHOD FOR ADHERING MATERIALS TOGETHER

Eugene F. Sullivan, San Jose, Calif., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.

Continuation-in-part of abandoned application Ser. No. 73,377, Sept. 17, 1970. This application Mar. 26, 1971, Ser. No. 128,248

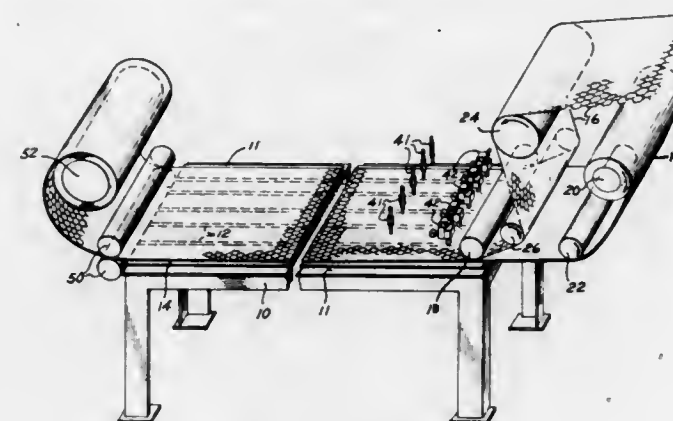
Int. Cl. B32b 7/14

U.S. Cl. 156-291

11 Claims

A method for continuously attaching a length of magnetically attractable material to a length of a non-mag-

netically attractable material. The magnetically attractable material rests in contact with and adjacent to the other material, both being moved in unison along a support. Adhesive is applied at selected contacting positions of the magnetically attractable material and the other material where the two materials move past the inlet end



of the support. An air blast shapes and cools the adhesive immediately after it is applied. Magnets in the support draw the magnetically attractable material against the other and maintain the two materials in a fixed, adjacent relationship. The adhesive sets as the two materials move to the discharge end of the support.

3,736,206

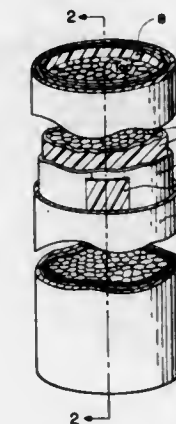
#### METHOD FOR MAKING A PYROTECHNIC DEVICE

Vern Thomas Dinsdale and Russell Reed, Jr., Brigham City, and Robert E. Meyer, North Ogden, Utah, assignors to Thiokol Chemical Corporation, Bristol, Pa.  
Original application Feb. 10, 1969, Ser. No. 797,906, now Patent No. 3,605,624. Divided and this application May 18, 1971, Ser. No. 144,680

Int. Cl. B32b 29/00; C06d 1/10

U.S. Cl. 156-293

4 Claims



A flare body for a parachute type flare providing superior brilliance and sustained output of illumination even after 14 days of 24 hour temperature cycling between -65 and 165° F. is obtained by means of a novel, castable illuminant flare composition comprising an uncured, high oxygen content liquid polymeric binder material, particularly a liquid saturated polyester polymer/liquid epoxy resin system, which is loaded into a flare body casing lined on its inner bottom and side surfaces with at least partially cured liner material comprising

the binder material and further comprising an anchor sheet material bonded completely on its inner surface to the outer surface of the liner and on its outer surface to the inner casing wall essentially only by a relatively narrow anchor strip of material running from the top to the bottom of the casing. The loaded casing and its contents then are heated to cure the polymeric binder material in the composition, liner and anchor strip.

3,736,207

#### METHOD OF MAKING PHOTOCELLS

John Milton Grant, 11645 Woodley Ave.,

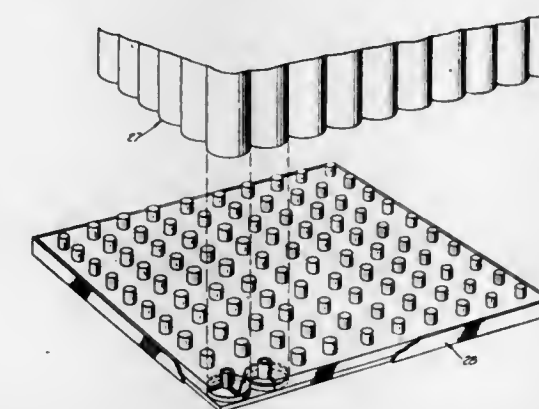
Granada Hills, Calif. 91344

Original application Mar. 23, 1970, Ser. No. 21,918, now Patent No. 3,634,690. Divided and this application Apr. 14, 1971, Ser. No. 133,948

Int. Cl. B29b 27/12

U.S. Cl. 156-294

6 Claims



3,736,208

#### AUTOMATIC LABELING MACHINE

Jack A. Kraft, 119 Elm Lane, New Hyde Park, N.Y. 11040, and Harold D. Kraft, 147-14 70th Ave., Flushing, N.Y. 11367

Filed Aug. 20, 1970, Ser. No. 65,523

Int. Cl. B65c 3/02, 9/18, 9/36

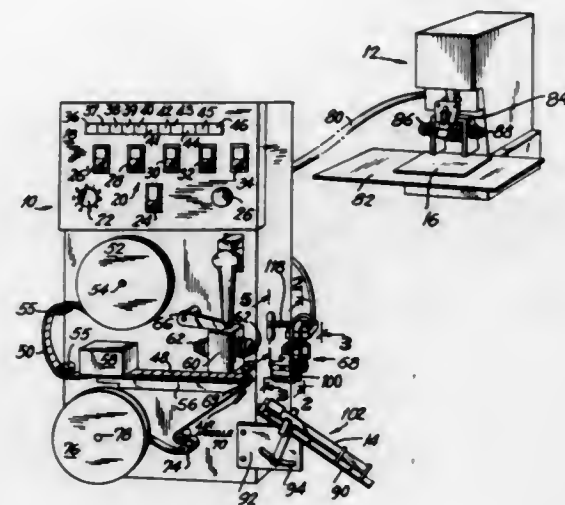
U.S. Cl. 156-361

25 Claims

A labeling apparatus for directly applying a label to an item immediately after the label is printed with a coded symbol. The labeling apparatus is provided with a master and a slave labeling unit with each capable of operating independently of the other. Each is capable of printing the same code a predetermined number of times with the slave unit generally printing the same code as the master unit. For use in medical laboratories, for instance, the master unit may label test tubes while the slave unit labels corresponding requisition slips. An applicator is provided to carry the label after being printed to an applying position where the applicator applies the label to a test tube or the like. The applicator includes a pair



of spread apart pads which are spaced apart a distance great enough to avoid obliterating the printed code on the



3,736,209

# **APPARATUS FOR MAKING PILE FABRIC**

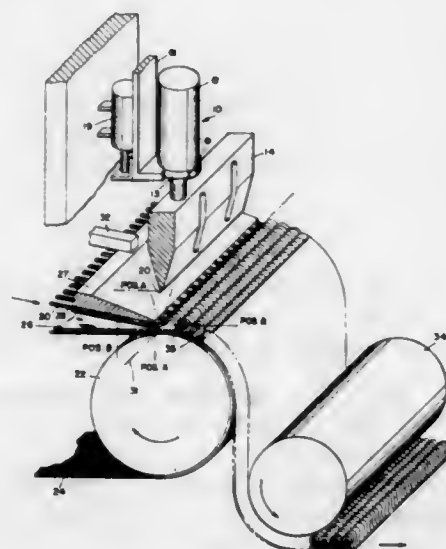
Charles W. Carpenter, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Application Nov. 29, 1968, Ser. No. 780,038, now Patent No. 3,640,786, which is a continuation-in-part of abandoned application Ser. No. 731,221, May 22, 1968. Divided and this application Oct. 16, 1970, Ser. No. 81,510

Int. Cl. D04h 11/00

U.S. Cl. 156-435

7 Claims



This invention relates to apparatus for making pile fabric wherein thermoplastic pile yarn is fusion bonded to a thermoplastic backing by means of sonic energy, thereby effecting localized heating of the pile yarn and backing at the points of contact without loss of orientation in either the pile yarn or the backing, if an oriented backing is used, between the bond points.

# **3,736,210 APPARATUS FOR PRODUCING SOLID ELECTRICAL INSULATORS**

Alexandre Kaczerginski, Vichy, Allier, France, assignor to Societe Europeenne d'Isolateurs en Verre Sediver, Paris, France

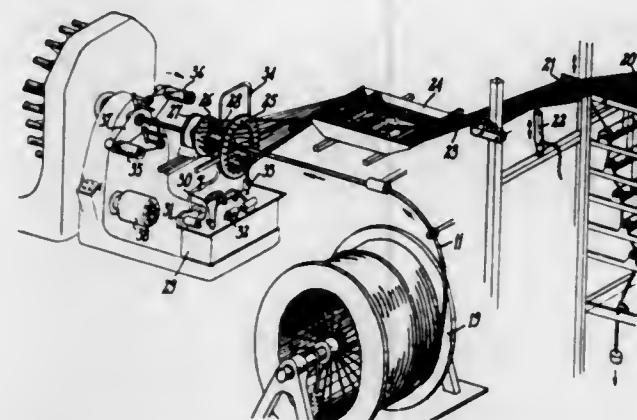
Original application Oct. 7, 1968, Ser. No. 765,524, now Patent No. 3,567,541. Divided and this application Sept. 16, 1970, Ser. No. 72,731

Claims priority, application France, Oct. 13, 1967, 124,412

Int. Cl. B31c 13/00

U.S. Cl. 156-431

5 Claims



The continuous production of laminated sections of general cylindrical formation having excellent mechanical and electrical properties to render them especially adapted for use as insulators in electrical transmission networks, and comprising a central core of cellular plastic foam sheathed by one or more layers of resin reinforced with resin-impregnated glass filaments extending longitudinally and circumferentially as well as by an outer relatively thick covering layer of resin, with or without fillers, which is molded before hardening with a smooth cylindrical, fluted or finned outer surface. The invention contemplates the inclusion of anchoring sockets at pre-determined spacings along the central core, which, upon severance into individual units, serve for the sealing therein of supporting devices for the units.

# **3,736,211 TWO-PLANAR DEFLECTOR FOR DISPERSING AND DEPOSITING NONWOVEN FILAMENTARY STRUCTURES**

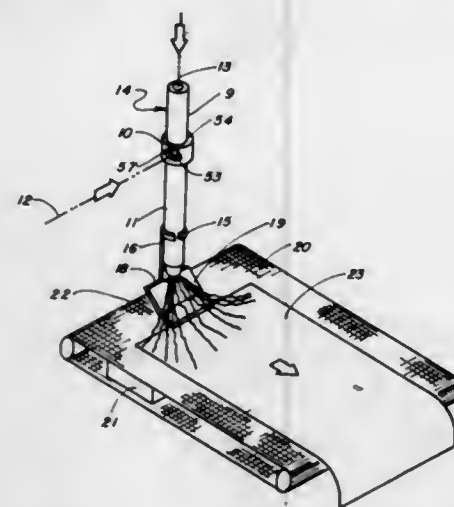
Walter Peter Lipscomb and Garland Linwood Turner, Chesterfield County, Va., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 28, 1971, Ser. No. 184,420

Int. Cl. D04h 3/00

U.S. Cl. 156-441

7 Claims



An apparatus for augmenting dispersal and for improving deposition of a plurality of continuous filaments onto

a continuously moving surface whereby random distribution of the filaments is provided for the production of uniformly distributed nonwoven webs. A nonmoving two-planar deflector is positioned near the exit of an aspirator so as to provide greater openness and greater random lay-down of filaments.

# **3,736,212 STAMP APPLICATOR**

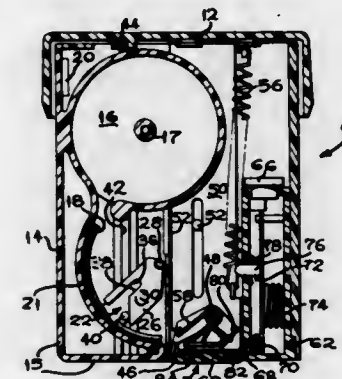
Nicholas W. Fedrick, Sunnyvale, Calif., assignor to P F Ventures, Inc., Santa Clara, Calif.

Filed May 12, 1971, Ser. No. 142,479

Int. Cl. B65c 11/04; B32b 31/18

U.S. Cl. 156-517

7 Claims



A stamp applicator including a housing with a depressible cap thereon for actuating the feeding of a strip of stamps from a hopper to a dispensing position whereat a single stamp is severed and then pressed against a surface wetted by moisture dispensing means which are also contained within the housing and actuated by depression of the said cap.

# **3,736,213 LABEL EXTRACTOR IN A LABELING MACHINE**

Norbert Jörss and Erich Eder, Neutraubling, Germany, assignors to Hermann Kronseder, Neutraubling Germany

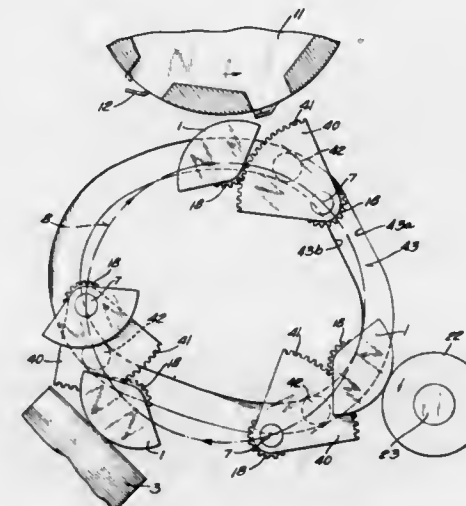
Filed Feb. 23, 1971, Ser. No. 118,117

Claims priority, application Germany, Mar. 6, 1970, P 20 10 652.9; France, Nov. 6, 1970, 7040126

Int. Cl. B65c 9/12; B65h 3/06

U.S. Cl. 156-570

10 Claims



Apparatus for extracting labels from a stationary label magazine having a geometry in which the axis of oscillation of the label transfer shoe is offset toward the shoe surface from the center of curvature of the shoe surface such a distance that the center of curvature of

the shoe describes substantially a straight line parallel to the extraction plane of the foremost label in the magazine when the surface rolls over the foremost label. The ratio between the maximum radius of shoe surface oscillation and the distance between the rotor axis and the axis of shoe surface oscillation substantially corresponds to the ratio between one-half of the label length plus one-half of the spacing between successive labels and the shortest distance between the foremost label and the rotor axis.

# **3,736,214 CAKE COVER**

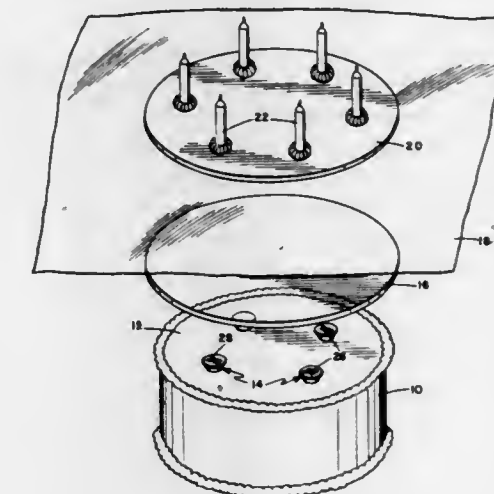
Percival J. McBlirnie, 530 Arbor Drive, San Diego, Calif. 92103

Filed July 20, 1971, Ser. No. 164,253

Int. Cl. B65b 25/16

U.S. Cl. 161-18

4 Claims



A cake cover protector having a thin transparent sheet that completely covers a cake, which sheet is draped over a plate that is supported on the top of the cake and is spaced from the cake, which plate also supports candles above the transparent sheet. The cover protects the cake from being sprayed with spittle when the candles are blown out and is easily removed for cutting the cake and is entirely transparent allowing a complete view of the cake.

# **3,736,215 METHOD AND APPARATUS FOR FABRICATING GLASS FIBER CUSHIONING MATERIAL**

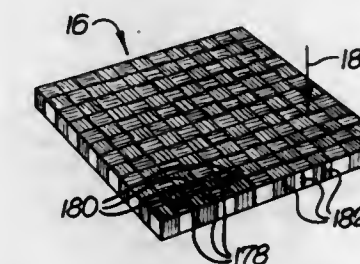
John W. Felder, Jr., Palos Verdes Peninsula, and Sterling Barnett, Sepulveda, Calif., assignors to L. S. Associates, Inc., Torrance, Calif.

Filed Aug. 11, 1971, Ser. No. 170,824

Int. Cl. B32b 3/10, 3/14, 5/12, 31/06, 31/18

U.S. Cl. 161-36

14 Claims



Method and apparatus for fabricating an improved glass fiber multisectioned cushioning material with



laminae of adjacent sections normal to each other having uniform alignment of fibers in a primary load direction. Continuously moving the glass fiber forwardly while simultaneously performing different steps on different portions of the glass fiber including slitting the glass fiber into longitudinal strips, assembling the strips into a single-layered structure with the laminae of the adjacent strips normal to each other, assembling a plurality of single-layered structures into a multilayered structure with the laminae of adjacent strips normal to each other, and slicing crosswise through the multilayered structures.

3,736,216

### TEXTILE ADHESIVE LAMINATES BASED ON POLYURETHANE LATICES

David Trimble Hermann, Belle Mead, and Kenneth Herald Remley, Warner, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Original application Dec. 20, 1968, Ser. No. 785,779, now Patent No. 3,640,924. Divided and this application Sept. 28, 1971, Ser. No. 184,610  
Int. Cl. C08g 22/16

U.S. Cl. 161—62

6 Claims

Aqueous adhesive compositions containing a dispersed polyurethane polymer, the method of using the adhesive composition in textile applications, and the textile materials thus obtained. The adhesive composition is an aqueous dispersion of a particular class of self-dispersible or emulsifiable polyurethane polymers. The aqueous dispersions are obtained by adding a particular class of isocyanate-terminated polyurethane prepolymers having pendant carboxyl groups to water containing a tertiary aliphatic amine and allowing chain extension with water to proceed until all of the isocyanate groups have been reacted. The resulting polyurethane latex is thickened to the desirable viscosity with suitable thickening agents.

3,736,217

### LIGHT-CONDUCTING FIBER MATERIAL

Kazuyoshi Nagao, Yokohama, Japan, assignor to American Optical Corporation, Southbridge, Mass.  
Original application Sept. 29, 1969, Ser. No. 861,871, now Patent No. 3,666,587. Divided and this application Jan. 28, 1971, Ser. No. 110,757  
Int. Cl. B32b 3/00

U.S. Cl. 161—143

3 Claims



Plastic light-conducting fiber ribbons are formed of a transparent high refractive index strip of plastic material covered with thin films of relatively low refractive index plastic material. The covered strip is heated and rolled to the configuration of a multiplicity of interconnected juxtaposed fibers from which monofilaments may be cut longitudinally of the ribbon.

3,736,218

### SHRINKABLE PERMEABLE TEXTURE FILM

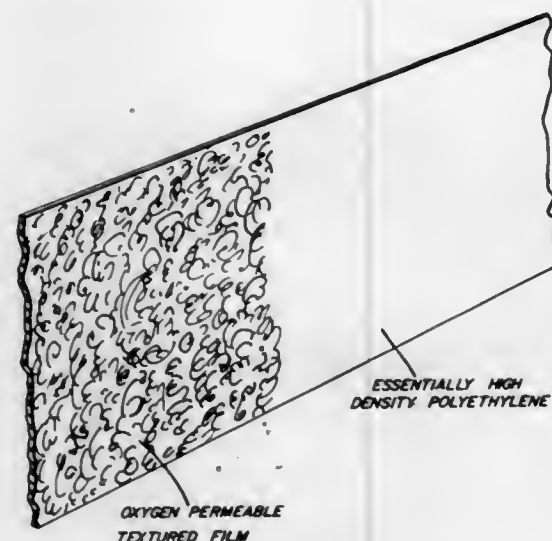
Razmic S. Gregorian, Arken, S.C., Charles C. Kirk, Laurel, Md., and James A. Cote, Arlington Heights, Ill., assignors to W. R. Grace & Co., New York, N.Y.  
Original application Jan. 10, 1969, Ser. No. 790,422, now Patent No. 3,576,927, dated Apr. 27, 1971. Divided and this application Oct. 19, 1970, Ser. No. 82,135  
Int. Cl. B32b 27/06, 27/16, 33/00

U.S. Cl. 161—164

1 Claim

Polyethylene films, highly permeable to oxygen, are made by sintering grains of high-density polyethylene, ir-

radiating the resulting sheet to about 3 megarads, melting out the sintered structure, and irradiating a second time.



When the sheet is stretched, oxygen permeability is increased as much as 10 times.

3,736,219

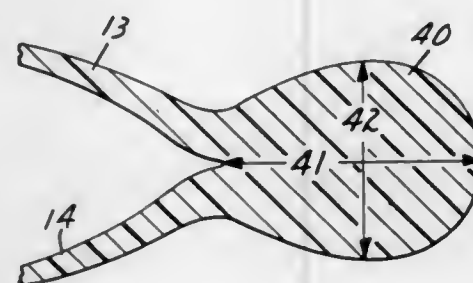
### HEAT SEALED POLYESTER FILM

Larry S. McTaggart, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 30, 1971, Ser. No. 175,945  
Int. Cl. B32b 3/02

U.S. Cl. 161—147

3 Claims



Oriented, heat set polyethylene terephthalate film edges can be joined in a strong, flexible seal by passing superposed congruent edges over a gas flame under conditions which fuse the edges into a bead having an elliptical cross section of specific dimensions and configuration.

3,736,220

### THIN DECORATIVE SHEET AND A DECORATIVE LAMINATE PRODUCED THEREFROM

Bipin Manubhai Shah, Bombay, India, assignor to Formica Corporation, Cincinnati, Ohio  
No Drawing. Filed Mar. 30, 1971, Ser. No. 129,624  
Int. Cl. B32b 5/28, 5/30

U.S. Cl. 161—156

10 Claims

A decorative paper sheet for use in a decorative laminate impregnated with an acrylic polymer composition and preferably with a melamine resin-acrylic polymer composition and surfaced with finely divided particles of a polymer of acrylonitrile and to the laminates produced therefrom.

3,736,221

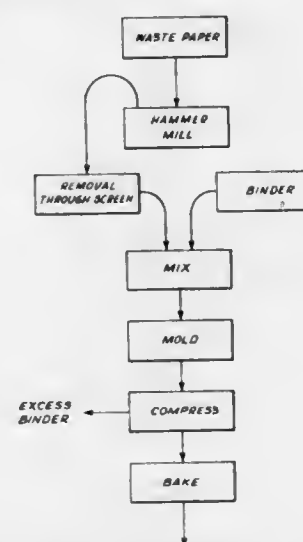
### STRUCTURAL SHAPE BASED ON WASTE PAPER AND METHOD OF PROVIDING THE SAME

King W. Evers, 963 Kollin St., Pleasanton, Calif. 94566, and George H. Larsen, 761 Hayes Court, Livermore, Calif. 94550

Filed July 29, 1971, Ser. No. 167,363  
Int. Cl. B32b 5/02, 31/20

U.S. Cl. 161—170

9 Claims



A structural shape is provided by treating dry waste paper in a hammer mill having a peripheral speed of about 4500 feet per minute until the waste paper is reduced to individual paper fibers. The fibers are withdrawn by vacuum from the hammer mill through a screen. They are coated thoroughly with an aqueous binder, such as polyvinyl chloride, urea-formaldehyde or phenolic resin. A sufficient mass of so-coated fibers is then compressed (with release of water) under pressure of about 6000 pounds per square inch and is then baked in compressed form for six to eight hours at about 250° Fahrenheit to result in a geometrical body having a density of about 40 pounds per cubic foot. The completed body is adequately strong and is otherwise suitable for construction or building purposes.

3,736,222

### CERAMIC ARTICLES AND METHOD OF SEALING CERAMICS

Ronald H. Arendt, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.  
No Drawing. Filed Apr. 28, 1971, Ser. No. 138,306  
Int. Cl. C04b 35/10, 37/00, 39/00

U.S. Cl. 161—182

10 Claims

A method of forming a seal between high-density alumina bodies is provided. The method involves placing an  $Al_2O_3$ - $Ga_2O_3$  mixture between the bodies to be sealed and heating the mixture to a temperature above the melting point of  $Ga_2O_3$  and below the deformation temperature of the bodies such that a solid solution of  $Al_2O_3$ - $Ga_2O_3$  forms as a seal between the alumina bodies. Ceramic articles having a gas tight seal are made by the method.

3,736,223

### WASTE TREATMENT AND FIBER RECLAMATION SYSTEM

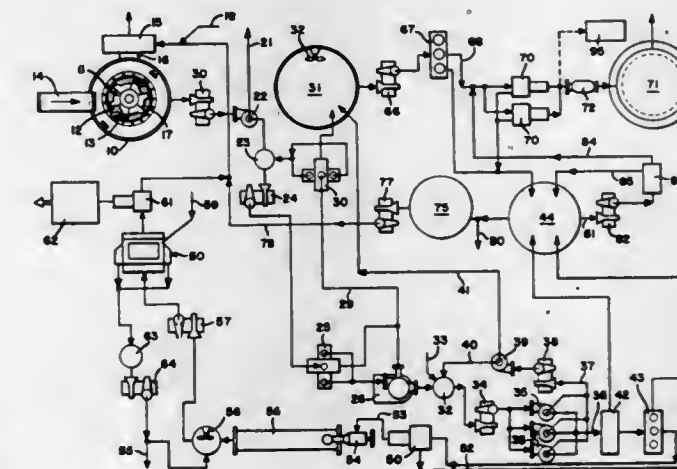
Paul G. Marsh, Hamilton, Ohio, assignor to The Black Clawson Company, Hamilton, Ohio  
Continuation-in-part of abandoned application Ser. No. 14,431, Feb. 26, 1970. This application Dec. 1, 1970, Ser. No. 94,084  
Int. Cl. D21b 1/08

U.S. Cl. 162—4

13 Claims

A process for recovering reusable papermaking fiber from municipal refuse includes mixing the refuse with liquid in a treatment vessel and reducing the relatively

frangible portions of the refuse by subjecting the mixture to hydraulic and mechanical shear while separately removing relatively infrangible portions from the vessel. The resulting slurry of frangible refuse and water is centrifugally cleaned to remove inorganics such as glass, and the centrifugally cleaned slurry is then screened to separate reusable papermaking fibers from the fine fibrous material and other organics, in excess of 25% of the paper fibers being rejected with the screened materials. The latter, which will usually be rich in synthetic resins, may then be treated under heat and pressure to produce hardboard, or merely dewatered and burned. The fibers separated from the other portions of the slurry may be



classified by means of a fiber selector, subjected to further centrifugal cleaning and dewatered, and the resulting dewatered fiber subjected to additional treatment such as digestion, deinking, bleaching, floatation and washing to upgrade the quality of the fiber for subsequent reuse. Additionally, the slurry may be treated by refining equipment operating at low consistency and tackle clearances and then subjected to froth floatation and/or further centrifugal cleaning. The inorganics removed by centrifugal cleaning, as well as the relatively infrangible portions of the refuse, may be further classified for reuse, particularly the metal and glass fractions, or they may be disposed of by landfill methods.

3,736,224

### CATALYZED OXYGEN BLEACHING

Martin Grayson, Stamford, and Charles Edward Farley, Norwalk, Conn., assignors to American Cyanamid Company, Stamford, Conn.  
No Drawing. Filed June 16, 1971, Ser. No. 153,679  
Int. Cl. D21c 9/10

U.S. Cl. 162—65

12 Claims

A method for the delignification and bleaching of lignocellulosic materials under the action of oxygen and alkali in an alkaline medium and in the presence of from about 0.005% to about 5.0%, by weight, based on the weight of said material, of a copper-containing material which converts, at least in part, to copper oxide in the presence of said alkali in said alkaline medium.

3,736,225

Allan Barker, Chester, and Maurice Arthur Perks, Warrington, England, assignors to United Kingdom Atomic Energy Authority, London, England  
Filed July 27, 1970, Ser. No. 58,454

Claims priority, application Great Britain, Aug. 8, 1969, 39,924/69  
Int. Cl. G21c 3/00

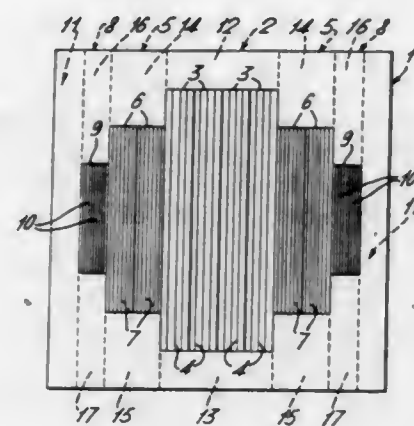
U.S. Cl. 176—40

4 Claims

A fast reactor core structure comprises inner, intermediate and outer core zones. The fuel members of the inner zone are longer and more widely spaced than the



fuel members of the intermediate zone. Likewise the fuel members of the intermediate zone are longer and more widely spaced than the fuel members of the outer zone.



Such an arrangement provides a more uniform power distribution across the core using a constant pin diameter and fissile content for the whole core.

3,736,226

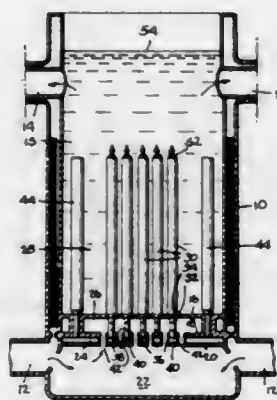
#### HOLD-DOWN ARRANGEMENT FOR NUCLEAR REACTOR FUEL SUBASSEMBLIES

Naoki Sakurama, Hitachi, Japan, assignor to Atomic Power Development Associates, Inc., Detroit, Mich.  
Filed Nov. 6, 1970, Ser. No. 87,432

Int. Cl. G21c 15/00

U.S. Cl. 176—50

7 Claims



This invention relates to means for retaining a nuclear fuel subassembly in position on support means by using hydraulic pressure. The support means divides the reactor vessel into four plenums by means of three support plates disposed one above the other. The fuel subassemblies are mounted on the top support plate and have portions which project through the second plate and are exposed to the pressure conditions of the lower medial plenum. Communication means interconnect the upper plenum with the lower medial plenum at substantially the same relatively low pressure while communication means interconnect the lower plenum and the upper medial plenum to maintain them both at substantially the same relatively high pressure. Inlets for the fuel subassemblies are disposed in the upper medial plenum and outlets from the fuel subassemblies are in the upper plenum.

3,736,227

#### NUCLEAR REACTOR FUEL ELEMENT SPACER ASSEMBLY LOCK

Susumu Nakazato, Pittsburgh, Pa., assignor to Continental Oil Company, Ponca City, Okla.  
Filed June 1, 1970, Ser. No. 41,989

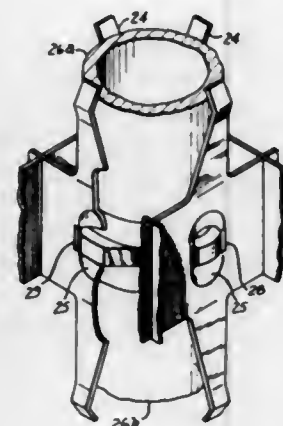
Int. Cl. G21c 3/34

U.S. Cl. 176—78

9 Claims

A nuclear reactor fuel element spacer arrangement has a fuel element supporting and spacing means through

which respective fuel rods extend and which permits axial movement of the individual fuel rods while restraining them against lateral movement. In order to restrict axial movement of the spacer with respect to the entire assembly of rods, the fuel rod spacer is fastened to one of



the fuel rods by a spring-loaded snap-in locking device. This prevents the fuel rod spacer distance along the fuel rods from being shifted as, for example, from fuel rod vibration or coolant drag force on the spacer or as a result of channel placement during installation.

3,736,228

#### PROCESS FOR PRODUCING INOSINE

Kiyoshi Nakayama, Sagami-hara, Akira Furuya, Kawasaki, and Fumio Kato, Tokyo, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan  
No Drawing. Filed Jan. 27, 1971, Ser. No. 110,280

Claims priority, application Japan, Feb. 5, 1970, 45/9,614

Int. Cl. C12d 13/06

U.S. Cl. 195—28 N

14 Claims

Inosine is produced by fermentation using an inosine-producing microorganism belonging to the genus *Brevibacterium*, preferably *Brevibacterium ammoniagenes*. The strains employed have the characteristic that their system for the biosynthesis of 5'-inosinic acid undergoes no feedback inhibition and/or repression.

3,736,229

#### FERMENTATION PROCESS FOR THE PRODUCTION OF D-MANNITOL

John R. De Zeeuw, Stonington, and Edward J. Tynan III, Gales Ferry, Conn., assignors to Pfizer Inc., New York, N.Y.

No Drawing. Filed Feb. 18, 1971, Ser. No. 116,670

Int. Cl. C12d 13/02

U.S. Cl. 195—28 R

4 Claims

A process for producing D-mannitol by aerobically fermenting an aqueous hydrocarbon-containing nutrient medium with a new strain of the yeast, *Candida lipolytica*.

3,736,230

#### PROCESS FOR PRODUCING 6-AMINO-PENICILLANIC ACID

Per Staffan Delin, Villagaten 24; Bertil Ake Ekstrom, Kummelvagen 26; Lars Solve Nathorst-Westfeld, Kummelvagen 32; Berndt Olof Harald Sjöberg, Kummelvagen 24; and Karl Hugo Thelin, Fornminnesvagen 9, all of Sodertalje, Sweden

No Drawing. Continuation-in-part of application Ser. No. 799,983, Feb. 17, 1969, now Patent No. 3,622,462. This application Nov. 22, 1971, Ser. No. 200,826

Int. Cl. C12d 1/02

U.S. Cl. 195—36 P

15 Claims

A process for the production of hypoallergenic 6-aminopenicillanic acid by enzymatic degradation of a natural

penicillin with an *Escherichia coli* penicillin acylase chemically fixed to a polymeric support.

3,736,231

#### PREPARATION OF INSOLUBILIZED ENZYMES

William L. Stanley, Richmond, and Alfred C. Olson, El Cerrito, Calif., assignors to the United States of America as represented by the Secretary of Agriculture  
No Drawing. Filed Nov. 1, 1971, Ser. No. 194,475

Int. Cl. C07g 7/02

U.S. Cl. 195—63

7 Claims

Insolubilized but active enzymes are prepared by reacting an enzyme with tannic acid and glutaraldehyde.

3,736,232

#### PROCESS FOR GROWING MICROORGANISMS

Robert G. Dworschack, James C. Chen, William R. Lamm, and Larry G. Davis, Clinton, Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 765,015, Oct. 4, 1968. This application Apr. 9, 1971, Ser. No. 132,818

Int. Cl. C12d 13/10

U.S. Cl. 195—65

11 Claims

Under submerged, aerobic culture conditions, microorganisms of the *Streptomyces* genus produce glucose isomerase. The presence of sorbitol in the fermentation medium induces microorganisms of the *Streptomyces* genus to produce greater quantities of glucose isomerase.

3,736,233

#### PROCESS OF PYROLYZING AND DESULFURIZING SULFUR BEARING AGGLOMERATIVE BITUMINOUS COAL

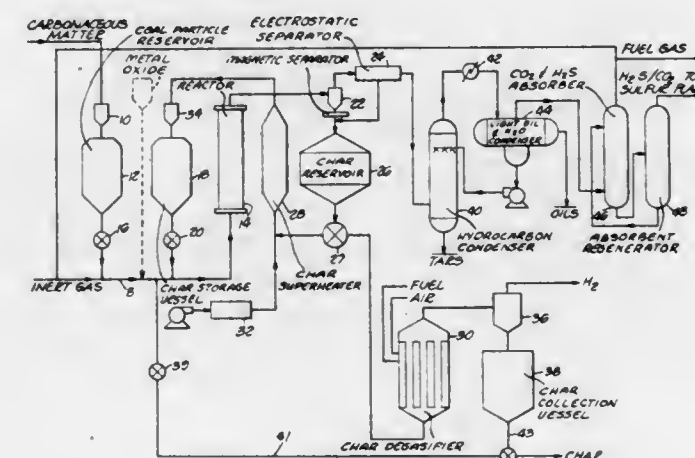
Allan Sass, South Pasadena, and Clem Finney and Harry McCarthy, Claremont, Calif., and Paul Kaufman, Vienna, W. Va., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed July 23, 1970, Ser. No. 57,582

Int. Cl. C10b 57/00

U.S. Cl. 201—17

16 Claims



This invention discloses an efficient economical continuous method of pyrolyzing and desulfurizing agglomerative bituminous coal in a transport reactor to recover volatile hydrocarbons and hydrogen by heating the particulate coal and char having particle sizes of less than 65 microns entrained in an inert carrier gas having pyrolysis reactor residence times of under three seconds.

#### 3,736,234 HIGH-PURITY DISTILLED WATER PRODUCING APPARATUS

Shiro Miyamoto, Amagasaki, Japan, assignor to Toshin Industrial Machine Co., Ltd., Osaka, Japan  
Filed Mar. 26, 1971, Ser. No. 128,309

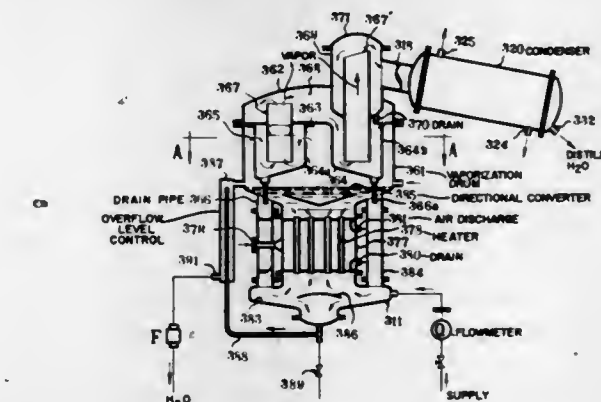
Claims priority, application Japan, June 18, 1970, 45/60,561; Dec. 17, 1970, 45/127,209; Dec. 26, 1970, 45/126,250, 45/136,240

Int. Cl. B01d 3/00, 3/10, 3/14, 45/00, 39/06, 45/12; F16t 1/00; F22b 37/26

U.S. Cl. 202—185 R

2 Claims

The present invention relates to an improvement of an apparatus for producing high-purity distilled water which comprises a mist separator means mounted in a steam generator, a tubular member for introducing steam into a condenser, upper portion of said tubular member being adapted to heat-exchange said steam with liquid condensed at substantially high temperature and collected near the



upper portion, at least one liquid receiving means arranged within the condenser for receiving required amount of the liquid, and at least one gas removing container means in which occluded gas is continuously evacuated by a gas aspirating means.

3,736,235

#### HEATER PUMPS FOR DISTILLAND HEATING WITH HOT DISTILLATE

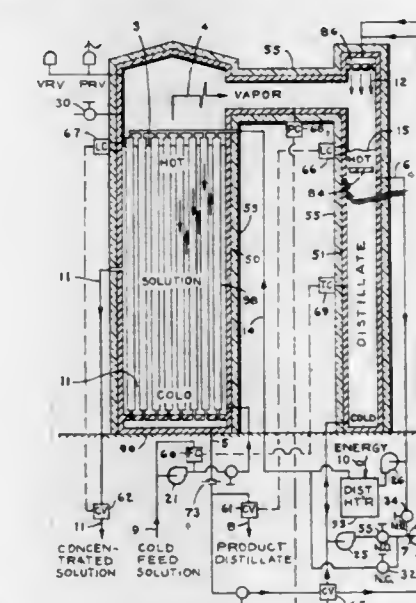
Charles T. Sundquist, 12566 SE. 53rd, Bellevue, Wash. 98006

Filed Dec. 4, 1970, Ser. No. 95,053

Int. Cl. B01d 3/00, 3/08, 3/10

U.S. Cl. 202—236

1 Claim



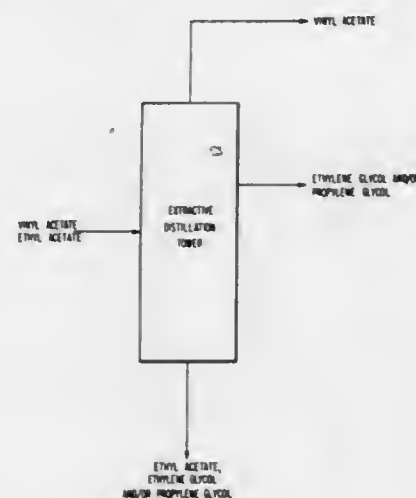
A pump pressurizes the heated hot sump distillate in the distillation process, distilland heating with hot distillate, thus leading to the reduction of overhead clearance requirements for the distiller.



**3,736,236**  
**METHOD OF SEPARATING VINYL ACETATE FROM LIQUID MIXTURES BY EXTRACTIVE DISTILLATION WITH A GLYCOL**  
 Lucio di Fiore, Milan, Claudio Divo, Saronno, and Marcello Ghirga, Bresso, Italy, assignors to Società Italiana Resine S.p.A., Milan, Italy

Filed June 10, 1971, Ser. No. 151,948  
 Claims priority, application Italy, July 1, 1970, 26,852/70  
 Int. Cl. B01d 3/40; C07c 67/06  
 U.S. Cl. 203—51

7 Claims



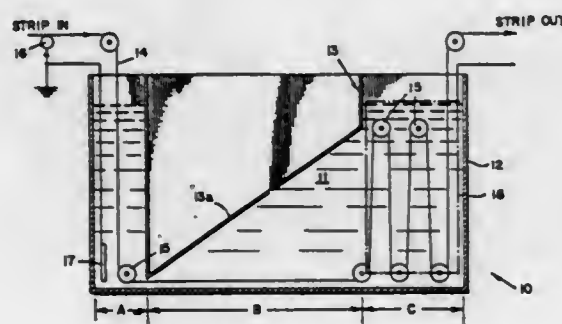
Vinyl acetate is separated from mixtures with ethyl acetate by ethylene glycol and/or propylene glycol, introduced to a distillation column above the feed point of the mixture, and with a reflux ratio of 2 to 7 and a ratio vinyl acetate to glycol of 0.03:1 to 2:1.

## ERRATUM

For Class 204—266 see:  
 Patent No. 3,736,322

**3,736,237**  
**CONTINUOUS FORMING OF ANODES FOR CAPACITORS**  
 Milton Kallianides, 52 Gifford St., Brockton, Mass. 02401, and Gerhart P. Klein, 45 Raymond, Manchester, Mass. 01944  
 Application Dec. 10, 1969, Ser. No. 880,487, which is a continuation of application Ser. No. 670,723, Sept. 26, 1967. Divided and this application Feb. 19, 1971, Ser. No. 117,023  
 Int. Cl. C23b 9/02; B01d 3/00  
 U.S. Cl. 204—28

6 Claims



A method of forming an oxide film on metal strip comprising functionally dividing a tank containing a forming electrolyte into an entrance, a formation, and an aging section, and continuously passing a strip through the tank from the generation of an anodic oxide thereon.

**3,736,238**  
**PROCESS FOR THE RECOVERY OF METALS FROM SULFIDE ORES THROUGH ELECTROLYTIC DISSOCIATION OF THE SULFIDES**  
 Paul R. Kruesi, Wheatridge, and Duane N. Goens, Golden, Colo., assignors to Cyprus Metallurgical Processes Corporation, Los Angeles, Calif.

No Drawing. Filed Apr. 21, 1972, Ser. No. 246,435  
 Int. Cl. C22d 1/10, 1/14, 1/16

U.S. Cl. 204—105 R

37 Claims

A pollution-free process for the electrolytic dissociation of sulfide ores of the metals of Groups I-B, II-B, IV-A, V-A, VI-A and VIII of the Periodic Table in aqueous acidic media with the formation of metal ions and elemental sulfur followed by recovery of the metal ions from solution in the electrolyte media, the process characterized by certain process conditions, these being the use of:

- (1) An electrolyte comprising a soluble metal chloride selected from the group consisting of soluble chlorides of aluminum, chromium, copper, iron, manganese, nickel, zinc and rare earth metals alone or mixed or in combination with alkali metal and/or alkaline earth metal chlorides, the electrolyte being at least .5 normal in chloride ion,
- (2) A sulfide feed of average particle size smaller than about 60 mesh U.S. Standard,
- (3) A pH range of up to about 3.9,
- (4) An electrolyte temperature range between about 50° C.—105° C., and
- (5) An anode current density above about 12 ampere/ft.<sup>2</sup>

**3,736,239**  
**NEUTRALIZATION OF METAL CONTAINING WASTES**

Lawrence C. George and Lee N. Ballard, Rolla, and Vernon H. Feeler, Vienna, Mo., assignors to the United States of America as represented by the Secretary of the Interior

Filed Mar. 18, 1971, Ser. No. 125,573  
 Int. Cl. C22d 1/16; C01c 3/08

U.S. Cl. 204—108

10 Claims

A cyanide and metal-containing liquid waste stream is treated by addition of a second liquid waste stream which contains acids and dissolved metals. Free cyanide ions are quantitatively removed from the wastes by precipitation as metal cyanides at neutral to slightly acid conditions.

**3,736,240**  
**POST-CHLORINATED VINYL CHLORIDE RESIN AND PROCESS THEREFOR USING RADIATION**  
 Lester Weintraub, Livingston, N.J., assignor to Air Products and Chemicals, Inc., Allentown, Pa.  
 No Drawing. Filed Dec. 28, 1970, Ser. No. 102,041  
 Int. Cl. B01j 1/10, 1/12

U.S. Cl. 204—159.18

11 Claims

Post-chlorinated polyvinyl chloride resin having high thermal stability, heat deflection temperature and impact strength, together with an adequate melt flow rate, is prepared by chlorinating vinyl chloride homopolymer or vinyl chloride-ethylene or propylene interpolymers, while irradiated with ultraviolet light in a chloroform solution, to a chlorine content of at least about 65 weight percent.

**3,736,241**  
**POLYMERIZATION OF ACRYLONITRILE**  
 Ilie G. Murgulescu, Tatiana Oncescu, and Ion I. Vlagiu, Bucharest, Rumania, assignors to Ministerul Invatamintului, Bucharest, Rumania  
 No Drawing. Filed Apr. 22, 1970, Ser. No. 30,959  
 Claims priority, application Rumania, Jan. 4, 1968, 55,558  
 Int. Cl. C08f 1/16

U.S. Cl. 204—159.22

9 Claims

The radiochemical polymerization of acrylonitrile. Such polymerization can be carried out (a) in dimethylsulfoxide,

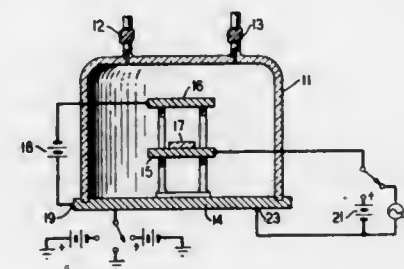
ide, (b) with dimethylsulfoxide in the presence of vinylic monomers and carboxylic groups, or (c) with dimethylsulfoxide in the presence of the oxalic complex manganese diaquodioxolate potassium) generating the oxalic radical. One obtains polymers with good tinctorial qualities, pure and stable under heat and light. The reaction time is four times smaller than for the classical synthesis of this type of polymers. The apparatus required is simple, thereby offering an increased economic advantage. The solution of polymers produced in accordance with the invention may be used, for example, for the spinning of acrylonitrile fibers.

**3,736,242**  
**SPUTTERING TECHNIQUE**  
 Newton Schwartz, Morris Township, Morris County, and Frederick Vratny, Berkeley Heights, N.J., assignors to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.  
 Application Jan. 31, 1968, Ser. No. 701,964, now Patent No. 3,589,994, which is a continuation-in-part of abandoned application Ser. No. 372,537, June 4, 1964. Divided and this application Dec. 4, 1970, Ser. No. 95,144

Int. Cl. C23c 15/00

U.S. Cl. 204—192

1 Claim



The electrical and physical properties of cathodically sputtered films may be controlled by utilizing alternatively, electron negative ion, and positive ion bombardment of substrate surfaces during the course of the sputtering process.

**3,736,243**  
**CORROSION PROTECTED RAZOR BLADE**  
 Jeremiah J. Duggan, Madison, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.  
 Filed May 18, 1971, Ser. No. 144,511  
 Int. Cl. C23f 13/00

U.S. Cl. 204—196

3 Claims



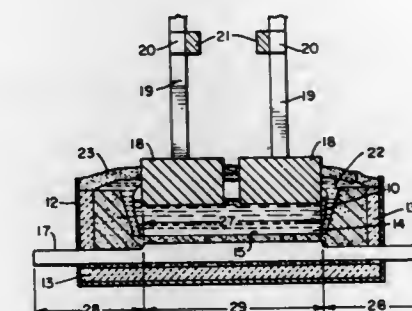
A razor blade and holder combination is protected from corrosion by the application of appropriate electrical potential. The electrical circuit comprises a battery connected through a resistor for determining the desired current to the frame of the razor. A second connection is made to a separate electrode placed near the blade seat of the razor. The circuit is rendered operable by the action of the electrolyte solution normally present during use of the razor-blade combination.

**3,736,244**  
**ELECTROLYTIC CELLS FOR THE PRODUCTION OF ALUMINUM**  
 Hans Bohner, Fehraltorf, and Wolfgang Schmidt-Hatting, Chippis, Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Apr. 30, 1971, Ser. No. 139,154  
 Claims priority, application Switzerland, May 1, 1970, 6,582/70

Int. Cl. C22d 3/02; B01k 3/04  
 U.S. Cl. 204—243 R

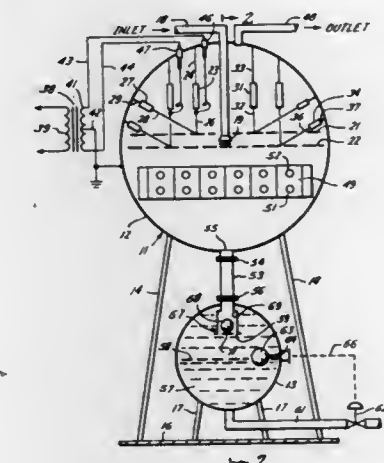
2 Claims



An electrolytic cell for the recovery of aluminum comprising a pot for the fluoride electrolyte with a carbon bottom and iron cathode bars extending through the carbon bottom to emerge from each side of the cell in which the cross section of the bars on each side of the central length which lies beneath the anodes is less than that of the central length of the bars.

**3,736,245**  
**SHIPBOARD ELECTRICAL TREATER**  
 Frederick D. Watson and Howell R. Jarvis, Houston, Tex., assignors to Petrolite Corporation, St. Louis, Mo.  
 Filed Aug. 31, 1971, Ser. No. 176,465  
 Int. Cl. B01d 13/02; B03c 5/02  
 U.S. Cl. 204—302

20 Claims



An electrical treater for resolving water-in-oil dispersions in a first enclosure positioned above a second enclosure in a shipboard mounting. The first enclosure contains dispersion inlet means, oil phase removing means and a coalescing section containing an electrical field to effect separation of the dispersion into continuous oil and water phases. An upright passageway transfers the water phase from the first enclosure to the second enclosure into a water accumulator with a body of accumulated water being maintained below the upright passageway. Flow control means associated with the upright passageway provide for relatively unobstructed downward flow and restricted upward flow of the water phase between the first and second enclosures.



3,736,246

**APPARATUS FOR THE PREPARATION AND TREATMENT OF THIN LAYERS**

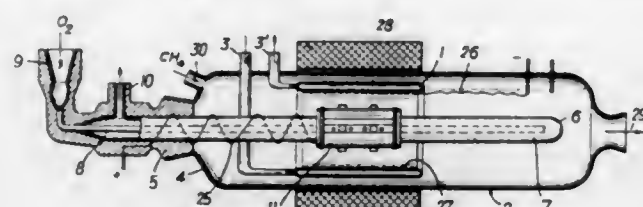
Fritz Grasenick, 19 Schuchardstrasse, Graz, Austria  
Continuation-in-part of application Ser. No. 778,908, Oct. 25, 1968, which is a continuation-in-part of application Ser. No. 481,556, Aug. 23, 1965, both now abandoned. This application Nov. 4, 1971, Ser. No. 195,792

Claims priority, application Austria, Aug. 25, 1964, 7,362/64

Int. Cl. C23c 15/00; B01k 1/00

U.S. Cl. 204—298

7 Claims



A device for the production and treatment of thin layers on objects by means of electric gas discharges within an evacuable container comprising a coolable or heatable coaxial carrier tube mounted within a cooled double-walled hollow cylinder, an object carrier arranged slidable and fixable on said carrier tube, means for maintaining an electric gas discharge, means for the production of a magnetic field within the container and means to induce treatment and cooling media into the container.

3,736,247

**RETORTING OF SOLID CARBONACEOUS MATERIAL**

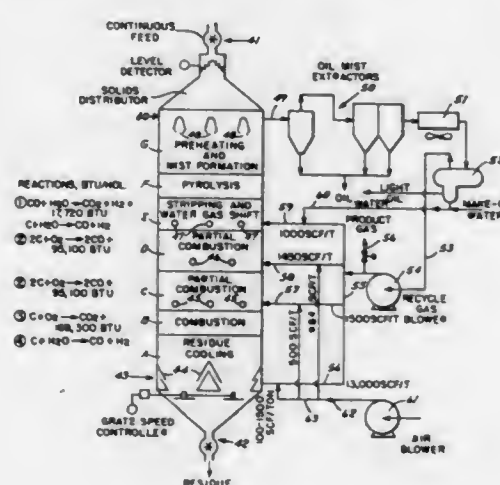
John B. Jones, Jr., and Adam A. Reeves, Denver, Colo., assignors to Paraho Corporation, Boulder, Colo.

Filed Nov. 1, 1971, Ser. No. 194,455

Int. Cl. C10b 53/06

U.S. Cl. 208—11

17 Claims



A process for the destructive distillation of the organic material in solid hydrocarbonaceous material in shaft vessels having a pulverulent solid moved downwardly in a continuous column through successive zones of pre-heat, destructive distillation, residue stripping, and water-gas shift, controlled combustion of carbonaceous residue at one or more levels of injection of an oxygenous gas, and finally cooling and withdrawing the solid through a heat recovery zone. The gas stream leaving the top of the vessel is only slightly above the temperature of the entering hydrocarbonaceous material, generally providing a mist of oil droplets entrained in the gas stream.

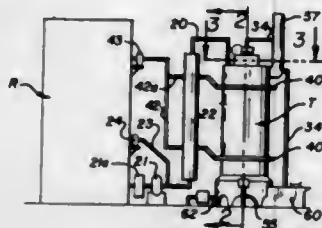
3,736,248

**METHOD FOR THE MANUFACTURE OF COKE**

George Richard Hussong, Godfrey, Ill. 62035  
Continuation of application Ser. No. 741,749, July 1, 1968. This application May 25, 1972, Ser. No. 257,003  
Int. Cl. C10g 9/42

U.S. Cl. 208—46

4 Claims



A method of and an apparatus for manufacturing coke from reduced crude oil wherein small drops of oil fall through a vertical chamber forming a tall, heated tower. This chamber is maintained at coking temperature, and thus, the volatile constituents in the oil drops vaporize while the remainder is coked during the fall. The vapors are removed from the tower through side outlets and the coke is collected at the base of the tower in a pond or in a funnel.

3,736,249

**HYDROCARBONACEOUS FEED TREATMENT**

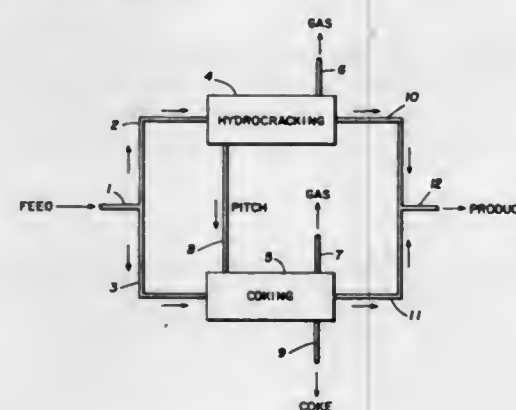
John E. Lawson, Jr., Richardson, Tex., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Feb. 22, 1972, Ser. No. 227,949

Int. Cl. C10b 55/00; C10g 23/02

U.S. Cl. 208—80

12 Claims



A method for treating a hydrocarbonaceous feed which contains at least one residue fraction wherein a portion of the feed is subjected to residual hydrocracking conditions while another portion of the feed is subjected to coking conditions, utilizing the pitch residue obtained from the hydrocracking step as feed to the coking step and combining the liquid hydrocarbonaceous output of the hydrocracking and coking steps to form the final product of the process.

3,736,250

**CATALYTIC HYDROGENATION USING KCl-ZnCl<sub>2</sub> MOLTEN SALT MIXTURE AS A CATALYST**

Lloyd Berg, Bozeman, Mont., and John S. Malsam, St. Paul, Minn., assignors to the United States of America as represented by the Secretary of the Interior

No Drawing. Filed Nov. 17, 1971, Ser. No. 199,764

Int. Cl. C10g 13/08, 29/12

U.S. Cl. 208—10

6 Claims

KCl is incorporated with molten ZnCl<sub>2</sub> catalyst in a coal or coal extract hydrocracking zone so that any reaction product and unreacted feedstock entrained in the catalyst can be separated from spent catalyst in a simple gravity separation vessel.

3,736,251

**HYDROTREATING HYDROCARBONS WITH A Pt-Ge-Re-CATALYST**

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Application Sept. 5, 1969, Ser. No. 855,725, which is a continuation-in-part of application Ser. No. 839,086, July 3, 1969. Divided and this application May 10, 1971, Ser. No. 142,080

Int. Cl. C10g 23/04

U.S. Cl. 208—143

6 Claims

A process for hydrotreating hydrocarbons and mixtures of hydrocarbons utilizing a catalytic composite of a porous carrier material, a rhenium component, a germanium component and a Group VIII noble metal component. Applicable to processing charge stocks containing sulfurous compounds and aromatic hydrocarbons, the hydrotreating conditions can be controlled to effect a particular end result including the ring-opening of cyclic hydrocarbons for producing jet fuel components, desulfurization, denitrification, selective olefin saturation, etc.

3,736,252

**HYDROTREATING OF HYDROCARBONS**

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Application July 7, 1969, Ser. No. 839,643, now Patent No. 3,607,727, dated Sept. 21, 1971, which is a continuation-in-part of application Ser. No. 828,762, May 28, 1969, now Patent No. 3,578,584, dated May 11, 1971. Divided and this application Aug. 17, 1970, Ser. No. 64,643

Int. Cl. C10g 23/02

U.S. Cl. 208—255

3 Claims

A process for hydrotreating hydrocarbons and mixtures of hydrocarbons utilizing a catalytic composite of a porous carrier material, a Group VIII noble metal component and a germanium component. Applicable to charge stocks containing sulfurous compounds and aromatic hydrocarbons, the hydrotreating conditions can be controlled to effect a particular end result including the ring-opening of cyclic hydrocarbons, desulfurization, denitrification, selective olefin saturation, etc.

3,736,253

**PROCESS AND APPARATUS FOR REMOVING MERCURY FROM WASTE WATER**

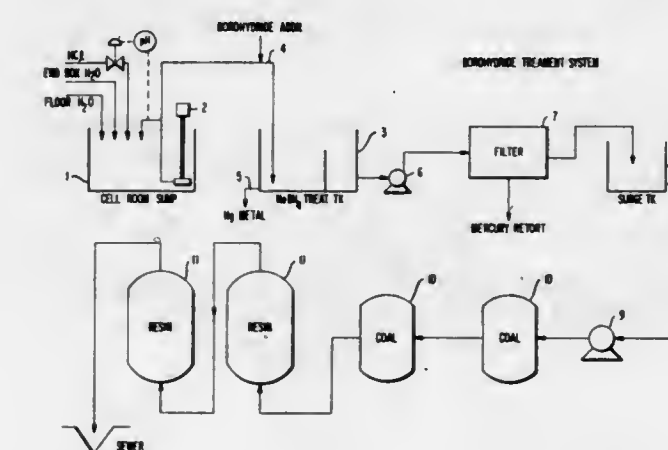
Peter De Angelis and Alfred R. Morris, Brewer, and Alan L. MacMillan, Belfast, Maine, assignors to Sobin Chlor-Alkali, Inc., Orrington, Maine

Filed Apr. 10, 1972, Ser. No. 242,326

Int. Cl. B01j 1/22; C02b 1/14

U.S. Cl. 210—27

14 Claims



A method for removing mercury from water contaminated with mercury comprising contacting water containing metallic mercury with finely divided anthracite coal. The mercury laden water can be first treated with sodium

borohydride to reduce dissolved mercury to the metallic form. The water treated with reducing agent, is filtered through a pressure leaf filter coated with a filter aid, contacted with anthracite coal and contacted with chelating resin.

3,736,254

**SYSTEM FOR REMOVING COLOR FROM PAPER MILL LIQUID WASTE**

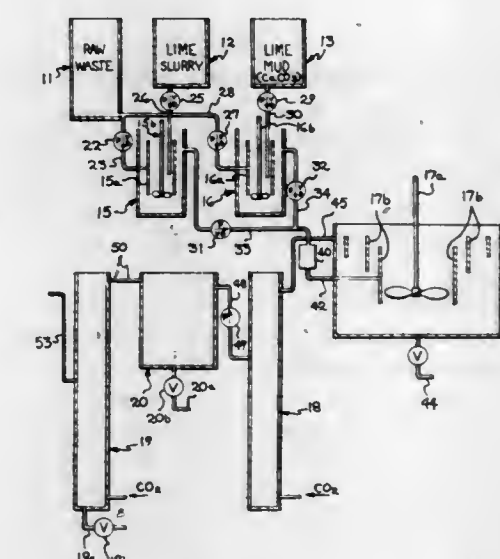
Hardy C. Croom, Valdosta, Ga., assignor to Owens-Illinois, Inc.

Filed June 3, 1971, Ser. No. 149,534

Int. Cl. C02c 5/02

U.S. Cl. 210—51

7 Claims



Waste effluent liquid from a paper mill is intimately mixed with a water slurry of lime and a water slurry of lime mud, composed principally of calcium carbonate, under alkaline conditions; the resulting mixture being subjected to clarification separation of formed precipitants; following which, the liquid effluent overflow is carbonated by the bubbling of carbon dioxide gas therethrough to precipitate calcium carbonate and residual color-imparting entities and to effect adjustment of the pH to approximately neutral conditions whereby the resultant liquid is adapted for discharge.

3,736,255

**WATER DECOLORIZATION**

Masood Ghassemi, Canoga Park, Howard L. Recht, Northridge, and Eugene V. Kleber, Woodland Hills, Calif., assignors to North American Rockwell Corporation

No Drawing. Filed Oct. 1, 1970, Ser. No. 77,391

Int. Cl. C02c 5/02

U.S. Cl. 210—45

15 Claims

A method is provided for chemically removing coloring matter from water by treating the coloring matter-containing water with a trivalent rare earth salt, generally as a mixture of such salts, to form an insoluble rare earth precipitate and then separating the precipitate from the water. The rare earth precipitant salt, such as lanthanum chloride or lanthanum sulfate, may be regenerated by first heating the rare earth precipitate to form rare earth oxides and to drive off the organic components by converting them to carbon dioxide and water. The rare earth oxide may be used directly in acidic waters or converted to a soluble rare earth salt by using acid such as dilute hydrochloric or sulfuric acid.



3,736,256

**NITRITE CONTAINING CORROSION-INHIBITING GREASE COMPOSITIONS**

Edward Albert Cross, Houston, Tex., and Frederic Charles McCoy, Beacon, and Raymond Charles Schlacht, Fishkill, N.Y., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed Dec. 29, 1970, Ser. No. 102,550

Int. Cl. C10m 3/18; C09k 3/00

U.S. Cl. 252—18

12 Claims

This invention concerns synergistic combinations of inorganic nitrites and certain amines which when incorporated into alkali-metal soap and/or alkaline earth metal soap based greases inhibit corrosion.

3,736,257

**HIGHLY CONDUCTIVE CARRIER PARTICLES**

Howard A. Miller, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 799,967, Feb. 17, 1969. This application Dec. 21, 1970, Ser. No. 100,299

Int. Cl. G03g 9/02

U.S. Cl. 252—62.1

16 Claims

Electrically conductive carrier particles for use in applying electroscopic toner material to electrostatic charge patterns are prepared by overcoating a magnetic core material, such as by electroless deposition or electroplating methods, with a thin continuous layer of an electrically conducting metal having a resistance to aerial oxidation greater than that of iron. These carrier particles retain their electrical properties during repeated usage and are highly abrasion resistant.

3,736,258

**THERMAL CONDITIONING OF "HYDROX" COMPOSITIONS**

Allen A. Duswalt, West Chester, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed June 4, 1971, Ser. No. 149,978

Int. Cl. C06b 19/06; C06d 5/06

U.S. Cl. 252—184

9 Claims

A process for improving the stability of a gas generating composition comprised of an alkali metal nitrite, ammonium salt, and magnesium oxide or other basic stabilizing agent. The gas generating composition is stabilized by heating the composition at an elevated temperature until the measured rate of decomposition of the composition at the heating temperature becomes constant. When the rate of decomposition is constant, heating is stopped. The resulting composition is a heat stabilized gas generating composition.

3,736,259

**CLEANING COMPOSITIONS AND METHOD**

Charles Edward Buck, Caldwell, and Victor Earl Sheaffer, Glen Gardner, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 20,398, Mar. 17, 1970. This application July 9, 1971, Ser. No. 161,276

Int. Cl. C11d 7/50

U.S. Cl. 252—89

8 Claims

A cleaning composition for shampooing carpets including water, a detergent and an aliphatic C<sub>14</sub>-C<sub>20</sub> fatty alcohol, finely divided silica, and a water-soluble alkali metal phosphate or borax or a mixture thereof for retarding the formation of sediment.

3,736,260

**ANAEROBIC COMPOSITION IN AEROSOL FORM**

Denis J. O'Sullivan, Sutton, Dublin, and Bernard J. Bolger, Foxrock, Dublin, Ireland, assignors to Loctite (Ireland), Limited, Dublin, Ireland

No Drawing. Filed June 8, 1971, Ser. No. 150,937

Claims priority, application Ireland, June 25, 1970, 829/70

Int. Cl. C09k 3/30

U.S. Cl. 252—188.3 R

10 Claims

Polymerizable anaerobic compositions are packaged in aerosol containers, pressurized with a propellant containing oxygen as one component. The compositions remain stable and usable for periods of six months or longer.

3,736,261

**METHOD FOR THE PRODUCTION OF STABLE WATER FOGS USING AN EMULSIFIED WATER-EVAPORATION RETARDING CHEMICAL MIXTURE**

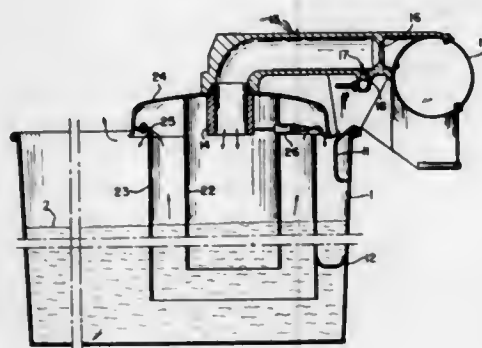
Egil K. Bjornerud and Glenn L. Keister, Seattle, Wash., assignors to Applied Technology Corporation, Seattle, Wash.

Filed Dec. 12, 1969, Ser. No. 884,560

Int. Cl. C09k 3/30

U.S. Cl. 252—305

16 Claims



Stable water fogs are made by heating an emulsified mixture of two immiscible liquids, water and a long-chain monohydric fatty alcohol above the melting point of the fatty alcohol. The water and fatty alcohol evaporate at a rate proportional to their respective vapor pressures at the temperature to which the mixture is heated. The emulsifier may be an anionic, cationic, or non-ionic surfactant or a mixture of such surfactants. Electrolytes may also serve as the emulsifying agent. Preferably a buffer is added to the water-alcohol mixture in amounts sufficient to give a pH of 7 or above.

The emulsified water-fatty alcohol mixture is heated by hot combustion gases from a removable combustion unit placed in a container of water.

3,736,262

**COLLOIDAL COMPOSITION USEFUL AS VEHICLE FOR DIAGNOSTIC RADIOISOTOPES**

Othel L. Pirtle, Jr., 2718 Stratford, Pearland, Tex. 77581

No Drawing. Filed Jan. 28, 1969, Ser. No. 794,809

Int. Cl. B01j 13/00; C01b 17/10

U.S. Cl. 252—313 R

8 Claims

A composition useful as a vehicle for diagnostic radioisotopes which comprises the colloidal composition resulting from mixing at elevated temperatures, water, an antimony salt of a polyhydroxy acid and ammonium sulfide. The diagnostic radioisotope is dispersed in the colloidal composition and adsorbed by the particles of such colloidal composition.

3,736,263

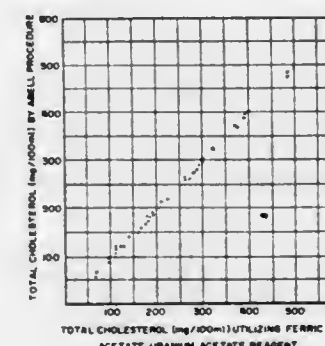
**REAGENT FOR DETERMINING CHOLESTEROL**

Amritlal C. Parekh and David H. Jung, Indianapolis, Ind., assignors to Research Corporation, New York, N.Y.

Original application Feb. 5, 1970, Ser. No. 8,954. Divided and this application May 13, 1971, Ser. No. 143,264

Int. Cl. G01n 33/16

U.S. Cl. 252—408



A reagent for producing a color forming reaction with solubilized cholesterol comprising a mixture of ferrous sulfate and sulfuric acid and, optionally, acetic acid.

3,736,264

**CATALYST COMPOSITION AND THE PROCESS FOR POLYMERIZING UNSATURATED HYDROCARBONS USING THIS COMPOSITION**

Yves Chauvin, Saint Germain-en-Laye, France, assignor to Institut Francais du Pétrole des Carburants et Lubrifiants, Rueil-Malmaison, and Société Nationale des Pétroles d'Aquitaine, Tour Aquitaine, Courbevoie, France

No Drawing. Filed June 26, 1970, Ser. No. 50,337

Claims priority, application France, July 2, 1969, 22,453; Nov. 25, 1969, 40,688

Int. Cl. C07c 3/10

U.S. Cl. 252—429 R

15 Claims

This invention relates to new catalyst compositions which may be used for polymerizing unsaturated compounds. They comprise a flouride of a Group V-A, V-B or VI-B element together with a nickel organo compound, for example a zerovalent nickel compound, a nickel-phosphine complex, a  $\pi$ -allyl nickel complex or a cyclopentadienyl nickel complex.

3,736,265

**STABILIZED PALLADIUM-CARBON CATALYSTS**

Robert M. Suggitt, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

No Drawing. Filed Nov. 6, 1970, Ser. No. 87,599

Int. Cl. B01j 11/06

U.S. Cl. 252—445

16 Claims

A Group VII-B or VIII metal on carbon catalyst is stabilized by heating the catalyst at a temperature of from 500 to 1200° F. in a non-oxidizing atmosphere. The heat treated composition is provided with stabilized activity and improved crush strength in low temperature catalytic reactions involving the reduction of nitrated or oxygenated hydrocarbons to amines and alcohols where copious amounts of by-product water is formed and is particularly suited for utilization as a hydrogenation catalyst such as in the selective conversion of mononitroparaffins to secondary alkyl primary amines.

3,736,266

**PREPARATION OF CARBON SUPPORTED PALLADIUM CATALYSTS**

Albert Schrage, East Orange, N.J., assignor to Dart Industries Inc., Los Angeles, Calif.

No Drawing. Filed Aug. 18, 1971, Ser. No. 172,944

Int. Cl. B01j 11/06

U.S. Cl. 252—447

9 Claims

Palladium on carbon hydrogenation catalysts having increased activity may be prepared by adding a basic compound to a solution of a soluble palladium compound in the presence of finely divided carbon wherein the basic compound is uniformly added at such a rate that the pH of the solution, which is initially in the range of 0 to 3, rises to at least about 12 in a period of one-half to one hour, and then reducing the precipitated palladium to metallic palladium.

3,736,267

**CATALYST AND CATALYST CARRIER COMPOSITION**

Ronald K. Bart, Sterling Junction, and Joseph R. Kivovsky, Worcester, Mass., assignors to Norton Company, Worcester, Mass.

Filed June 2, 1969, Ser. No. 829,323

Int. Cl. B01j 11/22

U.S. Cl. 252—466

2 Claims

Spinel and calcium zirconate bonded zirconia shapes are an improved catalyst carrier for catalysts such as Co-CoO for use in steam reforming of hydrocarbons.

3,736,268

**ANTISTATIC COMPOSITION**

Teiji Habu and Kyusaku Yoshida, Tokyo, Katsutoshi Machida, Sagami, Natsuko Wada, Kodaira, and Masao Ishihara, Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

No Drawing. Filed July 29, 1971, Ser. No. 167,472

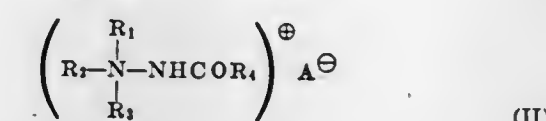
Claims priority, application Japan, Aug. 5, 1970, 45/67,989

Int. Cl. H01b 1/06; G03c 1/82

U.S. Cl. 252—500

7 Claims

An antistatic composition which comprises a protective colloid solution and, dispersed therein, a solution prepared by dissolving in a substantially water-insoluble organic solvent lower in specific gravity than the protective colloid, an antistatic agent of the Formula I or II,



wherein R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are individually an alkyl group or an aralkyl group; R<sub>4</sub> is an alkyl group, an aryl group or a hetero ring; and A is XO<sub>4</sub>, X or BX<sub>4</sub>, where X is a halogen atom.

The composition is particularly suitable for use in photographic materials.

3,736,269

**SOLID COMPOUND OF RHODIUM AND TELLURIUM AND MANUFACTURING PROCESS THEREFOR**

Louis Degueudre and Yves Gobillon, Brussels, Lucien Clerbois, Vilvoorde, and Louis Bourgeois, Brussels, Belgium, assignors to Solvay & Cie, Brussels, Belgium

No Drawing. Filed July 29, 1971, Ser. No. 167,516

Claims priority, application Belgium, July 29, 1970, 61,434

Int. Cl. H01b 1/08; C01b 19/00; C01g 55/00

U.S. Cl. 252—518

3 Claims

Rh<sub>2</sub>TeO<sub>6</sub> crystallized in the tetragonal system under the trirutile form, the parameters a<sub>0</sub> and c<sub>0</sub> being 4.54



and 9.245 Å., respectively, having an electrical conductivity of  $10^{-4}$  (ohm·cm.) $^{-1}$  and an energy gap of 0.04 eV.

3,736,270

# SOLID COMPOUND OF RHODIUM AND TUNGSTEN AND MANUFACTURING PROCESSES THEREFOR

Louis Degueldre and Yves Gobillon, Brussels, Lucien Clerbois, Vilvoorde, and Louis Bourgeois, Brussels, Belgium, assignors to Solvay & Cie, Brussels, Belgium. No Drawing. Filed July 29, 1971, Ser. No. 167,517. Claims priority, application Belgium, July 29, 1970, 61,435.

Int. Cl. C01g 41/00, 55/00; H01b 1/08

U.S. Cl. 252-518

3 Claims

Rh<sub>2</sub>WO<sub>6</sub> crystallized in the tetragonal system under the trirutile form, the parameters  $a_0$  and  $c_0$  being 4.609 and 9.083 Å. respectively, having an electrical conductivity of  $10^{-4}$  (ohm·cm.) $^{-1}$  and energy gap of 0.03 eV.

3,736,271

# CONVERSION OF WASTE POLYMERS TO USEFUL PRODUCTS

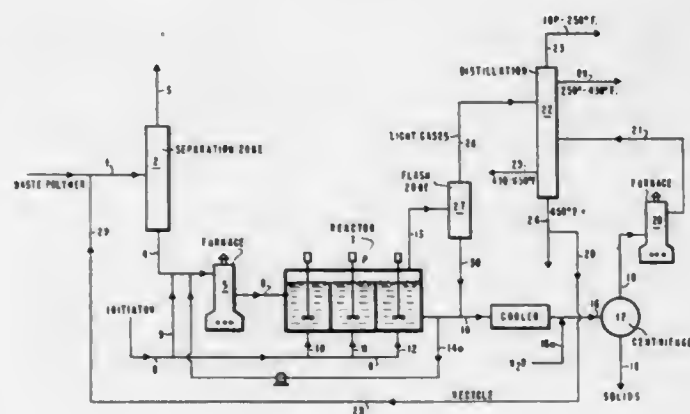
Henry G. Schutze and James A. Dinwiddie, Baytown, Tex., assignors to Esso Research and Engineering Company.

Filed Dec. 24, 1970, Ser. No. 101,227

Int. Cl. C08f 47/24

U.S. Cl. 260-2.3

13 Claims





containing from 5 to 40 weight percent ethylene and, by weight of the composition from 0.05 to 2% of a mercapto silane which is preferably a mercaptoalkyl trialkoxysilane.

3,736,284

# METAL COATING COMPOSITIONS PREPARED FROM AQUEOUS DISPERSIONS OF A CARBOXYL CONTAINING OLEFIN COPOLYMER AND A MODIFIED UREA FORMALDEHYDE RESIN

Chester W. Flitko, Chicago, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

No Drawing. Filed June 19, 1972, Ser. No. 264,125  
Int. Cl. C08g 51/24

U.S. Cl. 260—29.4 UA 8 Claims  
Metal surfaces are coated with an aqueous dispersion of a water dispersible carboxyl containing olefin copolymer and a heat-curable, thermosetting modified urea formaldehyde resin, namely alkylated urea formaldehyde condensates and methylolated alkeneureas.

3,736,285

# AQUEOUS COATING COMPOSITION CONTAINING PARTIALLY REHYDRATED METAKAOLIN PIGMENT AND NEUTRAL LATEX

Barry S. Miller, Roselle, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Woodbridge Township, N.J.

No Drawing. Continuation-in-part of application Ser. No. 723,602, Apr. 23, 1968. This application Nov. 12, 1970, Ser. No. 89,082

Int. Cl. C08f 45/24

U.S. Cl. 260—29.6 R 1 Claim  
Ammonia is employed to impart a basic pH and to disperse an aqueous suspension of a normally acidic, adsorptive dye-sensitive pigment during the preparation of an aqueous coating composition containing the pigment. Sheets coated with the ammonia-treated coating composition are used as receiving sheets for printing with transfer sheets containing encapsulated color-reactant dye material.

3,736,286

# AQUEOUS PIGMENTED ACRYLIC DISPERSION COMPOSITIONS HAVING IMPROVED RHEOLOGY

Joseph David Scott, Philadelphia, and Gabriel L. De Tommaso, Lansdale, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

No Drawing. Filed June 30, 1971, Ser. No. 158,524

Int. Cl. C08f 29/46

U.S. Cl. 260—29.6 RW 9 Claims  
This invention is based on the discovery that an exceptionally good thickening effect is obtained in pigmented coating compositions, including water-base paints, the binder of which is a polymer of predominantly acrylic ester type, by the use of a water-soluble copolymer of N-vinylpyrrolidone (55–95%) and ethyl acrylate (45–5%).

3,736,287

# AQUEOUS VINYL ACRYLIC INTERPOLYMER EMULSION AND USE THEREOF IN LATEX PAINTS

Ralph F. Patella, South Plainfield, N.J., assignor to Celanese Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 78,255, Oct. 5, 1970. This application Feb. 19, 1971, Ser. No. 117,156

Int. Cl. C08f 45/24; C09d 5/02

U.S. Cl. 260—29.6 TA 13 Claims  
An aqueous polymer emulsion derived from the interpolymerization of a short-chain alpha, beta-unsaturated mono- or polycarboxylic acid, acrylonitrile, a short-chain alpha, beta-unsaturated amide, an alkyl acrylate, and vinyl acetate or an alkyl methacrylate, when combined with a pigmentary material provides a latex paint which, when applied to a surface and cured, forms a coating exhibiting a high degree of burnish resistance, scrub resistance, ease of stain removal, and low temperature coalescence.

3,736,288

# DRAG REDUCING FORMULATIONS

Julius J. Stratta, New City, Carl W. Frank, White Plains, and John A. Barrere, Jr., Valley Cottage, N.Y., assignors to Union Carbide Corporation, New York, N.Y.  
No Drawing. Continuation-in-part of application Ser. No. 118,442, Feb. 24, 1971. This application July 9, 1971, Ser. No. 161,280

Int. Cl. C08g 51/34

U.S. Cl. 260—33.4 R 10 Claims  
This invention relates to improved hydrodynamic drag reducing formulations which comprise (a) particulate ethylene oxide polymer, (b) an inert, normally-liquid, water-miscible organic vehicle which is a non-solvent for said ethylene oxide polymer such as propylene glycol, (c) a suspending agent which is non-reactive with said ethylene oxide polymer and said organic vehicle such as colloidal silica, and (d) a surface active agent. The use of the surface active agent results in systems which are characterized by their improved handling characteristics such as fluidity, pumpability, and/or pourability. Though the viscosity of the system is significantly decreased, the hydrodynamic drag deduction efficiency characteristic remains practically unaffected. Moreover, at such decreased viscosity levels one can now increase, to a significant extent, the concentration of ethylene oxide polymer in the system and still maintain a viscosity level which is no greater than comparable systems formulated without a surface active agent.

3,736,289

# STABILIZATION OF UNSATURATED POLYESTERS AND RESULTING PRODUCTS

Clifford D. Marshall, Cherry Hill, N.J., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed June 7, 1971, Ser. No. 150,736

Int. Cl. C08g 45/04

U.S. Cl. 260—837 R 10 Claims  
New compositions containing stabilized unsaturated polyesters are disclosed. These compositions comprise: (1) a hydroxy-containing ethylenically unsaturated polyester of a glycidyl polyether of a polyhydric phenol and an ethylenically unsaturated monocarboxylic acid; (2) a dissimilar ethylenically unsaturated monomer; and (3) a half ester of an aliphatic alcohol and a polycarboxylic acid or anhydride, e.g., a mono-alkyl maleate. Also disclosed is the use of the above stabilized polyesters containing a copolymerizable unsaturated monomer such as styrene in the preparation of laminates.

3,736,290

# METHOD FOR MAKING POLYIMIDE BLOCK COPOLYMERS

William A. Fessler, Albany, N.Y., assignor to General Electric Company

No Drawing. Filed Mar. 1, 1972, Ser. No. 230,965

Int. Cl. C08f 11/04

U.S. Cl. 260—46.5 E 5 Claims  
A method is provided for making polyimide-organic block polymers, such as polyimide-polydiorganosiloxane block copolymers involving the reaction of bisimides and organo diamines in the presence of an organic solvent, such as hexamethylphosphorotriamide.

3,736,291

# POLY(ARYLENE OXIDES)

Herward A. Vogel, 2501 Hudson Road, Oakdale Township, Washington County, Minn. 55101

No Drawing. Continuation of application Ser. No. 567,367, July 25, 1966, which is a continuation-in-part of application Ser. No. 269,140, Mar. 29, 1963, both now abandoned. This application Oct. 14, 1971, Ser. No. 189,137

Int. Cl. C07c 43/28; C08g 23/00

U.S. Cl. 260—47 R 9 Claims  
Film and fiber forming poly(arylene oxides) are produced from monomers of the formula X—Ar—OH

wherein X is a halogen atom and Ar is a linear chain of from 2–10 unsubstituted phenylene groups bonded together directly or through ether oxygen. The monomer is converted to an alkali metal salt which is then heated in the presence of a copper catalyst.

3,736,292

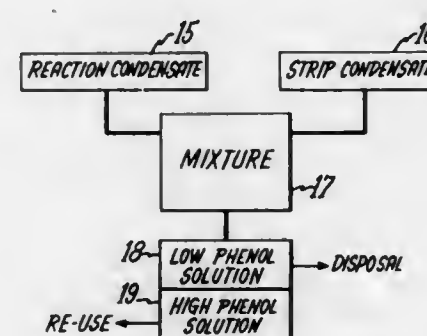
# METHOD OF REDUCING PHENOLIC WASTE

James H. Thayer, Lanesboro, and Edward C. Y. Fan, Pittsfield, Mass., assignors to General Electric Company

Filed Mar. 29, 1971, Ser. No. 128,988

Int. Cl. C08g 5/06

U.S. Cl. 260—57 R 11 Claims



Phenol content is markedly reduced in waste discharged from apparatus used for producing phenol-aldehyde resins. Aqueous solutions produced by the reaction between the phenol and aldehyde at different stages of the reaction and containing different proportions of phenol are mixed together at a temperature in the range of about 30° C. to about 45° C. to provide rapid separation into two solution layers, of which one contains low phenol concentration and may be discharged as waste, and the other contains high phenol concentration which is returned to the reaction vessel for further use in resin production. The low phenol waste solution thus discharged enables a reduction in pollution of streams into which products of the resin process are usually discharged.

3,736,293

# POLYETHERS CONTAINING REPEATING PERCHLOROAROMATIC UNITS

Ernest R. Novak, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation of abandoned application Ser. No. 41,063, May 27, 1970, which is a continuation-in-part of application Ser. No. 847,763, Aug. 5, 1969.

This application Aug. 23, 1971, Ser. No. 174,225

Int. Cl. C08g 23/00

U.S. Cl. 260—61 12 Claims  
Normally solid polyethers of the structure



wherein —A— and —A'— are —O— or —S—, —Ar— is a divalent perchlorinated aromatic group and —Ar'— is a divalent aromatic group. The process of producing the above polymers by reacting a compound of the formula Cl—Ar—Cl with a compound of the formula H—A—Ar'—A—H at from 25 to 250° C. in the liquid phase and preferably in a solvent for one or both of the monomers.

3,736,294

# POLY(ETHYLENE TEREPHTHALATE) FROM BIS (HYDROXYETHYL)TEREPHTHALATE AND TEREPHTHALIC ACID

Hidehiko Kobayashi, Kiichiro Sasaguri, Hiroshi Komoto, Sukeo Kawashima, and Mitsuo Kohno, Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka City, Osaka Prefecture, Japan

Continuation-in-part of application Ser. No. 48,878, June 15, 1970, which is a continuation of application Ser. No. 698,412, Jan. 17, 1968. This application Sept. 13, 1971, Ser. No. 179,979

Claims priority, application Japan, Jan. 24, 1967, 42/4,484

Int. Cl. C08g 17/01

U.S. Cl. 260—75 M 7 Claims  
Novel process for the preparation of fibre-forming polyethylene terephthalate containing no metal compound catalyst from bis(β-hydroxyethyl) terephthalate and terephthalic acid, wherein a specific ratio-mixture of the starting materials is subjected to a pre-treatment at 260–300° C. under a pressure defined by the formula

$$1 \leq p \leq \frac{1}{1.96} \times 10^{-3} (t-100)^2$$

wherein  $p$  represents the pressure of the reaction system (atm.) and  $t$  represents the temperature of the reaction system until an apparently uniform melt is formed and subsequently the pre-treated mixture is subject to a polycondensation, said pre-treatment and said polycondensation being carried out in the absence of any metal compound catalyst. The present process can produce fibre-forming polyethylene terephthalate which is as white as magnesium oxide and excellent in spinnability and dyeing properties in a reasonable polymerization reaction period, leading to great advantage from the industrial point of view.

3,736,295

# POLYURETHANE ELASTOMERS FROM AROMATIC DIAMINES CONTAINING ETHER GROUPS

Walter Meckel, Dusseldorf, and Klaus König, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Original application Nov. 6, 1969, Ser. No. 874,684, now Patent No. 3,654,364. Divided and this application Sept. 16, 1971, Ser. No. 181,224

Claims priority, application Germany, Nov. 15, 1968, P 18 09 172.0

Int. Cl. C08g 22/16

U.S. Cl. 260—75 NH 9 Claims  
Novel aromatic diamines containing ether groups and having chlorine atoms in the o-position to the amino groups are useful to prepare polyurethane elastomers therefrom with an organic diisocyanate and an organic compound containing at least two hydroxyl groups and having a molecular weight of from about 800 to about 5000.

3,736,296

# CHAIN EXTENDERS FOR URETHANE ELASTOMERS

Gayle Dameron Edwards, Nederland, and Philip Hotchkiss Moss, Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

No Drawing. Original application May 26, 1969, Ser. No. 827,989, now Patent No. 3,681,456. Divided and this application Aug. 2, 1971, Ser. No. 168,840

Int. Cl. C08g 22/16

U.S. Cl. 260—77.5 AQ 2 Claims

New compounds having the formula  
[HO—alkylene—(O—alkylene)<sub>x</sub>NH]<sub>2</sub>C=S  
are chain extenders for polyurethanes.



3,736,297

## ACYLATION OF PYRAZOLE CONTAINING POLYMERS

William J. I. Bracke, Brussels, Belgium, assignor to Labofina S.A., Brussels, Belgium

Filed Jan. 5, 1972, Ser. No. 215,686

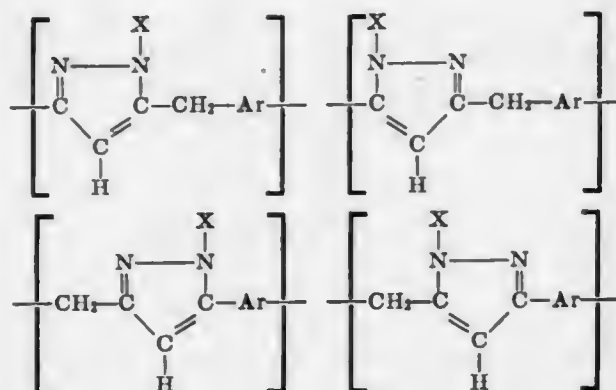
Claims priority, application Belgium, Apr. 21, 1971, 766,039

Int. Cl. C08g 22/02

U.S. Cl. 260—77.5 C

12 Claims

Polymer compositions having a molecular weight above 1000 and containing the repeating units, distributed at random:



wherein Ar is a divalent radical selected from the group consisting of aliphatic radicals, alicyclic radicals, aliphatic-aicyclic radicals, carbocyclic and heterocyclic aryl radicals and X is the radical of an acid selected from the group consisting of organic and inorganic acids and substituted such acids.

3,736,298

## POLYISOCYANURATE PREPARATION USING DOUBLE ALKOXIDE CATALYSTS

Paul F. Schmit, Stillwater, and George M. Rambosek, Maplewood, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Sept. 30, 1971, Ser. No. 185,410

Int. Cl. C08g 22/40, 22/46

U.S. Cl. 260—77.5 NC

7 Claims

Isocyanates are polymerized, or reacted with polyols, in the presence of double alkoide catalysts to produce polyisocyanurates or poly(urethane-isocyanurate) polymers.

This invention relates to a process for trimerizing polyisocyanates to produce polyisocyanurates. In another aspect, it relates to a process for reacting polyisocyanates with polyols to produce cross-linked poly(urethane-isocyanurate) polymers.

3,736,299

THERMALLY STABLE POLYMERS HAVING CONTIGUOUS PYRAZINE, IMIDAZOLE AND Δ<sup>3</sup>-PYRROLINE RINGS

Carl S. Marvel, Tucson, Ariz., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed June 30, 1971, Ser. No. 158,521

Int. Cl. C08g 33/02

U.S. Cl. 260—78 R

11 Claims

The polymerization of 2,3-diamino-5,6-dicyanopyrazine or its hydrolysis and alcoholysis products with a catalyst such as polyphosphoric acid gives polymers having recurring fused pyrazine, imidazole and Δ<sup>3</sup>-pyrroline rings. The polymers have high thermal stability and are useful for the preparation of molded objects, especially by high pressure techniques.

3,736,300

## PERFLUOROALKYLSULFONAMIDO-ALKYL ESTERS OF FUMARIC ACID AND OTHER ETHYLENICALLY UNSATURATED POLY-BASIC ACIDS AND POLYMERS THEREOF

Eduard K. Kleiner, New York, N.Y., assignor to Ciba-Gelgy Corporation

No Drawing. Original application Apr. 1, 1969, Ser. No. 812,439, now Patent No. 3,636,085. Divided and this application May 5, 1971, Ser. No. 140,616

Int. Cl. C08f 3/62, 3/70, 3/92

U.S. Cl. 260—78.4 E

10 Claims

Monomeric perfluoroalkylsulfonamido-alkyl esters of fumaric, maleic, citraconic, mesaconic, itaconic, aconitic, and methylene malonic acid form homopolymers and form copolymers with other ethylenically unsaturated comonomers. The polymers obtained have valuable soil repellent properties and are therefore especially useful in textile finishes. A preferred compound exemplified is bis[2-(N-ethyl - n - perfluorooctanesulfonamido)ethyl] itaconate.

3,736,301

## CURABLE POLYSULFIDE POLYMERS

Morris Benjamin Berenbaum, 132 Chaumont Drive, Williamsburg, N.Y. 14221; and John Michael Pachuta, 9 Alton Road 08619; and Earl Harry Sorg, 108 Greenland Ave. 08638, both of Trenton, N.J.

No Drawing. Filed Aug. 20, 1971, Ser. No. 173,694

Int. Cl. C08g 23/00

U.S. Cl. 260—79

5 Claims

A one-package sealant composition consisting essentially of liquid mercaptan-terminated polysulfide polymer having polysulfide groups interconnected by divalent aliphatic hydrocarbon groups wherein the carbon atoms may be interrupted with oxygen atoms, a dual purpose curing agent and adhesion improver which is a mixture of a polyol diacrylate and a polyol triacrylate, said polyols having 2 to 8 carbon atoms, the amount of said acrylate mixture being at least the stoichiometric amount needed to react with the mercaptan groups of said polymer, and a curing catalyst which is an amine-impregnated molecular sieve. The compositions disclosed herein cure rapidly and are especially useful and show good adhesion to vinyl base plastic substrates, acrylonitrilebutadiene-systems (ABS), or polyvinyl chloride or polyvinylidene chloride substrates.

3,736,302

## PROCESS FOR POLYMERIZING VINYL COMPOUNDS USING PREMIXED REDOX CATALYST OR NITROUS COMPOUNDS/SULFOXY COMPOUNDS

Yasushi Joh and Teruhiko Sugimori, Otake, Japan, assignors to Mitsubishi Rayon Company Limited, Tokyo, Japan

No Drawing. Filed July 23, 1971, Ser. No. 165,716

Claims priority, application Japan, July 30, 1970, 45/66,769

Int. Cl. C08f 3/76, 7/04, 15/02

U.S. Cl. 260—79.3 MU

5 Claims

In an improved process for polymerizing or copolymerizing a vinyl compound, particularly acrylonitrile, in the presence of a redox catalyst combination of either nitrous acid or its salt and a reducing sulfoxy compound, a main feature of which is such that both the catalyst components are previously reacted with each other under a batch system while the pH of the reaction system is maintained within the range of 7.0 to 4.0 or 3.0 to 1.0, or

first 7.0 to 4.0 and successively 3.0 to 1.0, and thereafter, the resultant catalyst solution is fed into a polymerization vessel.

Polymers, thus obtained, have advantageous properties suitable for most textile applications.

3,736,303

## VINYLIDENE CHLORIDE COPOLYMER

David R. Smith and Howard Peterson, Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

No Drawing. Continuation of abandoned application Ser. No. 819,957, Apr. 28, 1969. This application June 24, 1971, Ser. No. 156,479

Int. Cl. C08f 15/40, 37/00

U.S. Cl. 260—79.3 M

3 Claims

A stable polyvinylidene chloride latex composition suitable for coating substrates, particularly unprimed polyethylene and polypropylene, comprising a copolymer of (A) 70 to 95% by weight vinylidene chloride, (B) 0.1 to 3% by weight ethylenically unsaturated sulfur acid having sulfur in valence state 6, (C) 0 to 5% by weight ethylenically unsaturated carboxylic acid and (D) 2 to 29.9% by weight ethylenically unsaturated monomer other than (A), (B) or (C).

3,736,304

## PRODUCTION OF POLYMERS COMPRISING ACRYLONITRILE AND A TERTIARY AMINO ALKYL ESTER OF AN UNSATURATED ACID

James C. Masson, Chapel Hill, and Lester A. Self, Roxboro, N.C., assignors to Monsanto Company, St. Louis, Mo.

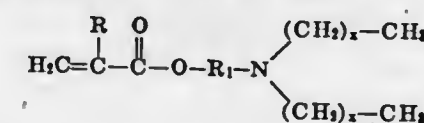
No Drawing. Filed Aug. 27, 1971, Ser. No. 175,712

Int. Cl. C08f 15/22

U.S. Cl. 260—85.5 R

8 Claims

By using a varied monomer feed rate to a polymerization reactor and acidifying the reaction mass with a monobasic acid a markedly improved process for obtaining excellent conversion and high yields of polymers is achieved, the polymers comprising acrylonitrile and a tertiary amino alkyl ester having the general formula:



wherein R is hydrogen or methyl, R<sub>1</sub> is an alkylene of two to four carbon atoms, —CH<sub>2</sub>—CH(OH)—CH<sub>2</sub>—, or —CH<sub>2</sub>—CH<sub>2</sub>—O—CH<sub>2</sub>—CH<sub>2</sub>—, and x is an integer zero to three, inclusive.

3,736,305

## PRODUCTION OF COPOLYMERS OF ETHYLENE

Klaus Kinkel, Rodenkirchen, Helmut Pfannmueller, Limburgerhof, Georg Schmidt-Thomee, Heidelberg, and Franz Georg Mietzner and Volker Gierth, Ludwigshafen, Germany, assignors to Badische Anilin- &amp; Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Dec. 19, 1968, Ser. No. 785,355

Int. Cl. C08f 15/40

U.S. Cl. 260—80.78

2 Claims

Production of copolymers of ethylene which contain polymerized units of (1) major amounts of ethylene; (2) minor amounts of C<sub>3</sub> to C<sub>12</sub> alkenecarboxylic acids; (3) minor amounts of C<sub>3</sub> to C<sub>8</sub> alkenes; and, if desired, (4) minor amounts of esters of C<sub>3</sub> to C<sub>12</sub> alkene carboxylic acids with C<sub>3</sub> to C<sub>8</sub> secondary or C<sub>4</sub> to C<sub>8</sub> tertiary alkanols and/or (4<sup>2</sup>) minor amounts of conventional other monomers which are copolymerizable with ethylene.

3,736,306

## POLYMERIZATION OF VINYL CHLORIDE WITH BLENDS OF PEROXIDE INITIATORS

Robert E. Light, Jr., Williamsville, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

No Drawing. Filed Sept. 14, 1970, Ser. No. 72,148

Int. Cl. C08f 1/60

U.S. Cl. 260—87.1

18 Claims

Process for the polymerization of vinyl chloride or the copolymerization of vinyl chloride and vinyl acetate at temperatures of less than about 70° C., in the presence of a polymerization initiator which is a blend of an acetyl alkylsulfonyl peroxide with (A) a peroxydicarbonate, (B) a diacyl peroxide and a tertiary-alkyl neoacid peroxyester or (C) a diacyl peroxide and a peroxydicarbonate.

3,736,307

## ETHYLENE-PROPYLENE COPOLYMER PRODUCTION WITH TRIPHENYLPHOSPHITE AS CATALYST ADJUVANT

Robert J. Perry, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Oct. 26, 1970, Ser. No. 84,146

Int. Cl. C08f 15/04

U.S. Cl. 260—88.2 R

5 Claims

Ethylene-propylene copolymer is produced in a catalyst system comprising diethylaluminum chloride and titanium trichloride and as an adjuvant, triphenylphosphite. At a level of about 4–10 mol percent triphenylphosphite based on the mols of titanium trichloride, polymer is produced which is more easily handled in conventional finishing equipment and which can be fabricated into film which is virtually free of fish eyes and other imperfections.

3,736,308

## METHOD FOR THE PREPARATION OF POLYEPOXIDES BY POLYMERIZING 1,2-EPOXIDES BY THE USE OF A NOVEL CATALYST

Koji Hashimoto, Yokohama-shi, Noboru Mogi, Kawasaki-shi, and Makoto Shindo, Urawa-shi, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Feb. 14, 1966, Ser. No. 527,083

Claims priority, application Japan, Feb. 20, 1965, 40/9,358; Sept. 24, 1965, 40/58,079

Int. Cl. C08f 7/12; C08d 3/04

U.S. Cl. 260—88.3 A

12 Claims

A process of preparing polyepoxides comprising polymerizing or copolymerizing 1,2-epoxides, using as the novel catalyst a composition composed of the following two components:

- A specific metal salt of a carboxylic acid;
  - A specific organoaluminum compound to obtain a polymer having high crystallinity;
- or three components consisting of (a) and (b) above and (c), a specific ether when it is desirable to obtain low crystallinity.

3,736,309

## PRODUCTION OF DIHYDROPYRIDACENE POLYMERS WHICH ARE FREE OF INTER-MOLECULAR CROSS-LINKING

Klaus Hannes Gump, Gillette, and Dagobert Engelbert Stuetz, Westfield, N.J., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Filed Nov. 10, 1970, Ser. No. 88,487

Int. Cl. C08f 3/76, 15/22, 27/00

U.S. Cl. 260—88.7 R

22 Claims

A process is provided for the conversion of an acrylic polymer to a form exhibiting increased thermal stability



wherein pendant nitrile groups are catalytically cyclized to form a product which is free of inter-molecular cross-linking. The cyclization reaction is conducted at an elevated temperature in an oxygen-free zone in the homogeneous phase and is catalyzed by an organic cyclization promoting agent selected from the group consisting of a carboxylic acid, a sulfonic acid, and a phenol, or alternatively by the use of a Lewis acid cyclization promoting agent in combination with the organic cyclization promoting agent.

The resulting polymeric product may be utilized as an adhesive, a coating polymer, a matrix polymer, or formed into shaped articles, such as fibers or films when of sufficient molecular weight.

In a preferred embodiment of the process an acrylonitrile homopolymer is fully cyclized to form polydihydropyridacene homopolymer which is free of inter-molecular cross-linking.

3,736,310

# PROCESS FOR PRODUCING DIHYDRO-PYRIDACENE POLYMERS WHICH ARE FREE OF INTER-MOLECULAR CROSS-LINKING

Klaus Hannes Gump, Gillette, and Dagobert Engelbert Stuetz, Westfield, N.J., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Filed Nov. 10, 1970, Ser. No. 88,489

Int. Cl. C08f 3/76, 15/22, 27/00

U.S. Cl. 260—88.7 R

12 Claims

An improved process is provided for the conversion of an acrylic polymer to a form exhibiting increased thermal stability wherein pendant nitrile groups are catalytically cyclized to form a product which is free of inter-molecular cross-linking. The cyclization reaction is conducted at an elevated temperature in an oxygen-free zone in the presence of 2-pyrrolidinone which has been found capable of catalyzing the reaction. The cyclization reaction may be conducted (1) in the homogeneous phase with the acrylic polymer being initially dissolved in 2-pyrrolidinone, or (2) by way of a slurry transformation technique.

The resulting polymeric product may be utilized as an adhesive, a coating polymer, a matrix polymer, or formed into shaped articles, such as fibers or films.

In a preferred embodiment of the process an acrylonitrile homopolymer is fully cyclized to form dihydropyridacene homopolymer which is free of inter-molecular cross-linking.

3,736,311

# PROCESS FOR IMPROVING THE THERMAL STABILITY OF POLYVINYL ALCOHOL WITH A POLYMERIC POLYCARBOXYLIC ACID

Pallatheri M. Subramanian, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Mar. 2, 1972, Ser. No. 231,363

Int. Cl. C08f 27/16

U.S. Cl. 260—91.3 PV

6 Claims

The thermal stability of polyvinyl alcohol is improved by mixing a sufficient amount of a polymeric polycarboxylic acid such as polyacrylic acid; polymethacrylic acid; copolymers of acrylic acid, methacrylic acid or maleic acid containing more than 10 percent acidic monomer, provided that such copolymers or their salts are water soluble at the specified pH levels; and vinyl methyl ether/maleic anhydride copolymer, with polyvinyl alcohol to convert the alkali metal acetate contained with the polyvinyl alcohol to acetic acid and an alkali metal salt of the polymeric carboxylic acid, such that when the composition is made up as a 10 percent solution in water, the solution has a pH of from about 4.0 to about 4.5.

3,736,312

# PROCESS FOR POLYMERIZING CONJUGATED DIENE MONOMERS

Adel F. Halasa, Bath, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation-in-part of applications Ser. No. 854,273, Aug. 29, 1969, and Ser. No. 143,169, May 13, 1971, which is a continuation of application Ser. No. 854,286, Aug. 29, 1969, all now abandoned. This application June 7, 1971, Ser. No. 150,716

Int. Cl. C08d 3/04, 3/06, 3/08

U.S. Cl. 260—94.2 T

22 Claims

Conjugated dienes are polymerized by a new catalyst system which permits control of the molecular weight and gives a more easily processed product. This catalyst system comprises (1) a lithium allyl compound having 3–10 carbon atoms, and (2) a sodium oxyhydrocarbon compound of 1–10 carbon atoms in which the hydrocarbon portion can be a tertiary alkyl radical, but is preferably a secondary alkyl radical, or a potassium tertiary alkoxide of 4–10 carbon atoms. The diene polymers produced by this process have controllable molecular weights in the range of 5,000 to 1,000,000, preferably 100,000 to 500,000, broad molecular weight distribution, high glass transition temperatures, high degree of branching and are more easily processed in the production of rubber and other compositions for commercial use.

3,736,313

# ERYTHROMYCIN DERIVATIVES

Peter Hadley Jones, Lake Forest, and Thomas John Perun, Libertyville, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation of abandoned application Ser. No. 821,016, May 1, 1969. This application Feb. 26, 1971, Ser. No. 119,418

Int. Cl. C07c 129/18

U.S. Cl. 260—210 E

7 Claims

The 2',4''-di-O-alkanoyl and the 2',4'',11-tri-O-alkanoyl derivatives of erythromycin are prepared by esterification of erythromycin with an appropriate acid anhydride. These resulting ester derivatives are initially de-esterified in the 2'-position to prepare the 4''-O-alkanoyl or the 4'',11-di-O-alkanoyl erythromycin, and then, if desired, these de-esterification products are reacted with another acid anhydride to prepare a dissimilarly di-substituted or tri-substituted ester. Through repetitive esterification and de-esterification, combinations of the mono substituted and the similarly or dissimilarly multiple substituted erythromycin esters are prepared. These compounds have antibiotic activity.

3,736,314

# UNSATURATED NUCLEOSIDE PHOSPHONATES, PHOSPHONIC ACIDS AND PHOSPHONIC ACID SALTS

Gordon H. Jones, Palo Alto, and John G. Moffatt, Los Altos, Calif., assignors to Syntex Corporation, Panama, Republic of Panama

No Drawing. Continuation-in-part of application Ser. No. 709,234, Feb. 29, 1968, which is a continuation-in-part of applications Ser. No. 654,056, July 18, 1967, now abandoned, and Ser. No. 805,792, Mar. 10, 1969, which is a continuation-in-part of application Ser. No. 643,078, June 2, 1967, now Patent No. 3,524,846, which in turn is a continuation-in-part of application Ser. No. 679,218, Oct. 30, 1967, now Patent No. 3,446,793. This application Oct. 20, 1970, Ser. No. 82,555

Int. Cl. C07d 51/52, 51/54

U.S. Cl. 260—211.5 R

12 Claims

The 5',6'-dideoxy-ribo-hex-5'-enofuranosyl nucleoside 6'-phosphonates, 5',6'-dideoxy-arabino-hex-5'-enofuranosyl nucleoside 6'-phosphonates, and 5',6'-dideoxyxylo-hex-5'-enofuranosyl nucleoside 6'-phosphonates; and the

2'-deoxy, 3'-deoxy and 2',3'-dideoxy counterparts thereof and the corresponding 6'-phosphonic acids, and their pharmaceutically acceptable salts are valuable pharmacological agents and are useful as intermediates for the corresponding saturated nucleoside 6'-phosphonates. For example, they are useful in regulating and controlling metabolism and for producing metabolic deficiencies in biological systems.

3,736,315

# 1-(3,4-DIMETHOXY-PHENYL) - 4 - METHYL-5-ETHYL-7,8-DIMETHOXY - 5H-2,3-BENZODIAZEPINE

Jeno Korosi, Tibor Lang, Endre Komlos, and Lujza Erdelyi, Budapest, Hungary, assignors to Egyesult Gyogyszer-es Tapszergyar, Budapest, Hungary

No Drawing. Continuation-in-part of abandoned application Ser. No. 688,674, Dec. 7, 1967. This application Mar. 4, 1971, Ser. No. 121,203

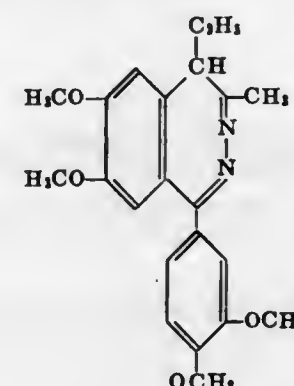
Claims priority, application Hungary, Dec. 9, 1966, GO-1,000

Int. Cl. C07d 53/04

U.S. Cl. 260—239 BD

1 Claim

1-(3,4 - dimethoxy - phenyl) - 4 - methyl - 5 - ethyl-7,8-dimethoxy-5H - 2,3 - diazepine having the following formula



This new compound is non-toxic and pharmacologically active. Its acid addition salts also have useful pharmacological activities.

3,736,316

# 1,2,5-BENZOTRIAZEPIN-4-ONES AND THEIR PREPARATION

Silvano Rossi, Milan, Italy, assignor to Roussel-UCLAF, Paris, France

No Drawing. Continuation of application Ser. No. 709,824, Mar. 1, 1968. This application July 28, 1970, Ser. No. 59,025

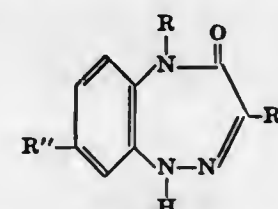
Claims priority, application Italy, Mar. 7, 1967, 13,439/67

Int. Cl. C07d 33/54

U.S. Cl. 260—239.3 B

17 Claims

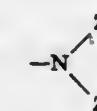
This invention relates to new heterocyclic compounds with polynitrogenic structure having the formula



wherein R is hydrogen, an alkyl radical having from 1 to 6 carbon atoms, an aryl radical or an aralkyl radical having at most eight carbon atoms, a cycloalkyl radical having at most seven carbon atoms.

R' is hydrogen, a carboxy group free or esterified with an alkanol having from 1 to 4 carbon atoms, a cyano group, a mercapto group having the general formula S—X (in which X represents an alkyl, aryl, aralkyl, carbalkoxy alkyl, carboxyalkyl, dialkylaminoalkyl, or

an alkyleneaminoalkyl), an amino group having the formula



(in which Z<sub>1</sub> represents a hydrogen, an alkyl radical, a carbalkoxy group or an acyl group and Z<sub>2</sub> is hydrogen, or an alkyl radical) the radical



(Y is selected from the group consisting of amino, hydrazino, substituted hydrazino and guanidino or a halogen atom) and R'' is hydrogen, hydroxy, methoxy, a nitro group, a carbalkoxy group in which the alkyl radical has from 1 to 3 carbon atoms, a halogen or the trifluoromethyl group and their acid addition salts with a therapeutically compatible inorganic or organic acid. These compounds possess interesting tranquilizing properties and can be used in human or veterinary therapy for the treatment of mental illness or behaviour disorders.

3,736,317

# 2,2 - DIMETHYL-6,7α-DIFLUOROMETHYLENE-20-SPIROX-4-ENE-3-ONES OR 3-OLS AND ACYL ESTERS THEREOF

Glen E. Arth, Cranford, and Gary H. Rasmussen, Watchung, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed July 28, 1971, Ser. No. 167,017

Int. Cl. C07c 173/06

U.S. Cl. 260—239.55 R

2 Claims

2,2 - dimethyl-6,7α-difluoromethylene-20-spirox-4-ene-3-ones and the corresponding 3-ols and their acyl ester derivatives are provided which have antiandrogenic activity.

3,736,318

# 6-(2-SUBSTITUTED-3-PHENYL-2H-ISOINDOLE-1-CARBOXAMIDO)PENICILLANIC ACIDS

Ronald J. McCauly, Malvern, and Stanley C. Bell, Penn Valley, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Sept. 9, 1971, Ser. No. 179,174

Int. Cl. C07d 99/16

U.S. Cl. 260—239.1

2 Claims

Novel 6-(2-substituted-3-phenyl-2H-isoidole-1-carboxamido)penicillanic acids are described which are useful as antibacterial agents.

3,736,319

# NOVEL CYCLOPENTANONE-2-CARBOXYLATES

Jacques Martel, Bondy, and Edmond Toromanoff, Paris, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Filed Apr. 28, 1971, Ser. No. 138,274

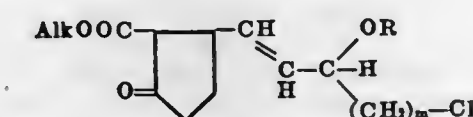
Claims priority, application France, Apr. 30, 1970, 15,908

Int. Cl. C07d 7/04

U.S. Cl. 260—240 R

7 Claims

Novel alkyl 3-(3' - OR - trans 1'-alkenyl)-cyclopentanone-2-carboxylates of the formula



(I)



wherein Alk is alkyl of 1 to 7 carbon atoms, R is selected from the group consisting of hydrogen, acyl of an organic carboxylic acid of 1 to 18 carbon atoms and  $\alpha$ -tetrahydropyranyl and  $m$  is 3, 4 or 5 which are intermediates for prostaglandins and their preparation and novel intermediates.

3,736,320

# METHOD OF PREPARING HEXAHYDRO-1,3,5-TRIAZYL-S-TRIAZINES

George A. Karustis, Jr., Westfield, N.J., assignor to GAF Corporation, New York, N.Y.

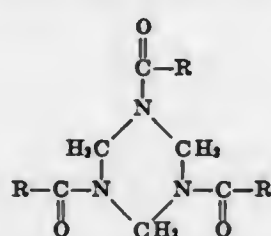
No Drawing. Filed Aug. 17, 1970, Ser. No. 64,573

Int. Cl. C07d 55/14

U.S. Cl. 260—248 NS

13 Claims

A process is provided for the preparation of hexahydro-1,3,5-triazyl-s-triazines having the structural formula:



wherein R is a lower aliphatic hydrocarbon radical or a halogenated lower aliphatic hydrocarbon radical comprising reacting a polymeric formaldehyde, a lower aliphatic anhydride and a lower aliphatic or halogenated lower aliphatic nitrile in the presence of a catalytically effective amount of an aryl sulfonic acid containing from about 0.5 to about 7.0% sulfuric acid and from 0 to about 10% water, and thereafter recovering the resulting product.

3,736,321

# NOVEL CYANINE DYES WITH PYRROLOQUIN-OXALINE OR PYRROLOPYRAZINE NUCLEI

John D. Mee, Donald W. Heseltine, and Wilbur S. Gaugh, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Original application Feb. 15, 1968, Ser. No. 705,595, now Patent No. 3,598,595. Divided and this application June 22, 1970, Ser. No. 59,815

Int. Cl. C09b 23/06, 23/10

U.S. Cl. 260—240.6

6 Claims

Cyanine dyes which feature a pyrrolo[2,3-b]quinoxaline nucleus or a pyrrolo[2,3-b]pyrazine nucleus, joined at the 3-carbon atom thereof to the methine linkage of the cyanine dye, sensitize photographic silver halide emulsions.

3,736,322

# CHLORINATOR CELL WITH INTERNAL PRESSURE REGULATION

Herman Helber, Azusa, and Ernest L. Littauer, Hollywood, Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed July 19, 1971, Ser. No. 163,732

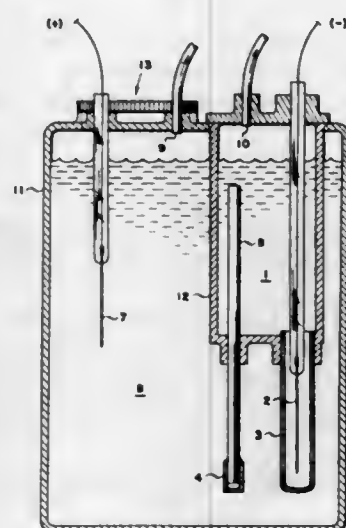
Int. Cl. B01k 3/10

U.S. Cl. 204—266

4 Claims

An electrolytic cell for the generation of chlorine wherein a pressure relief device is used to equalize pressures in the anode and cathode compartments. The pressure relief device comprises a tube, interconnecting the anode and cathode compartments, covered with a diaphragm of

a greater porosity than the diaphragm separating the anode from the cathode compartment. The unequal pres-



sures are caused by an initial absorption of chlorine when the cell is started.

3,736,323

# 1-AMINOALKYL-2,6-DIARYL-4,5,6,7-TETRAHYDROINDOLES

Michael Flinizio, Howard Beach, and Karl Schoen, Kew Gardens, N.Y., assignors to Endo Laboratories Inc., Garden City, N.Y.

No Drawing. Original application Mar. 18, 1968, Ser. No. 714,067, now Patent No. 3,621,027. Divided and this application Feb. 3, 1971, Ser. No. 112,419

Int. Cl. C07d 29/28

U.S. Cl. 260—293.61

4 Claims

1 - aminoalkyl - 2,6 - diaryl - 4,5,6,7-tetrahydroindoles are useful as analgetics and anti-tussives.

3,736,324

# 4,5-DIHYDRO-1H[1,4]DIAZEPINO[1,2-a]INDOLE 2(3H)-CARBOXAMIDES

Meier E. Freed and Elisabeth Hertz Freed, Paoli, Italy, assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 769,388, Oct. 21, 1968, now Patent No. 3,641,030. This application Apr. 1, 1971, Ser. No. 130,523

Int. Cl. C07d 53/02

U.S. Cl. 260—293.59

2 Claims

This invention concerns tetrahydropyrazinoindole-2-carboxamides and dihydrodiazepinoindole-2-carboxamides which are pharmacologically active as central nervous depressants.

3,736,325

# HYDRAZINES OF ISOXAZOLOPYRIDINE CARBOXYLIC ACIDS AND ESTERS

Theodor Denzel, Nuremberg, and Hans Hoehn, Tegernheim, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

No Drawing. Filed Mar. 29, 1971, Ser. No. 129,200

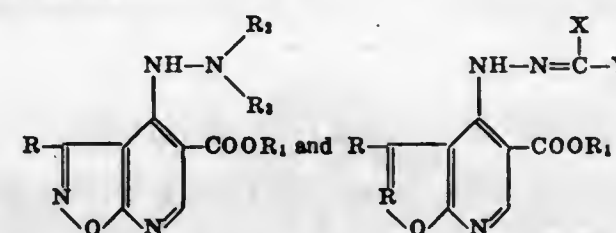
Int. Cl. C07d 39/00

U.S. Cl. 260—295.5 B

5 Claims

New hydrazines, hydrazides and hydrazones of isox-

azolopyridine carboxylic acids and esters having the general formula



and salts thereof, are useful as central nervous system depressants and also increase the intracellular concentration of adenosine-3',5'-cyclic monophosphate.

3,736,326

# ISOXAZOLOPYRIDINE CARBOXYLIC ACIDS AND ESTERS

Theodor Denzel, Nuremberg, and Hans Hoehn, Tegernheim, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

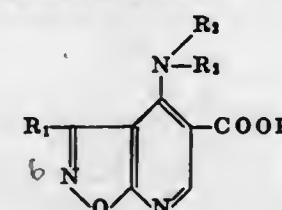
No Drawing. Filed Mar. 29, 1971, Ser. No. 129,199

Int. Cl. C07d 39/00

U.S. Cl. 260—295.5 B

11 Claims

New isoxazolo[5,4-b]pyridine-5-carboxylic acids and esters having the general formula



as well as their salts, are useful as central nervous system depressants. These compounds also increase the intracellular concentration of adenosine-3',5'-cyclic monophosphate.

3,736,327

# ISOXAZOLOPYRIDINE KETONE DERIVATIVES

Theodor Denzel, Nuremberg, and Hans Hoehn, Tegernheim, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

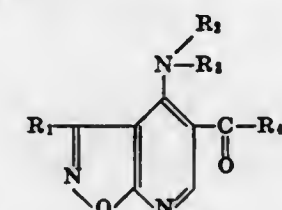
No Drawing. Filed Mar. 29, 1971, Ser. No. 129,198

Int. Cl. C07d 39/00

U.S. Cl. 260—296 H

7 Claims

New isoxazolo[5,4-b]pyridine-5-ketones having the general formula



as well as their salts, are useful as central nervous system depressants. These compounds also increase the intracellular concentration of adenosine-3',5'-cyclic monophosphate.

3,736,328

# CERTAIN 3-HALO-5-SULFINYL-1,2,4-THIADIAZOLES

Lawrence S. Wittenbrook, 720 W. 5th St., and Richard J. Timmons, 222 Grand Ave., both of Marysville, Ohio 43040

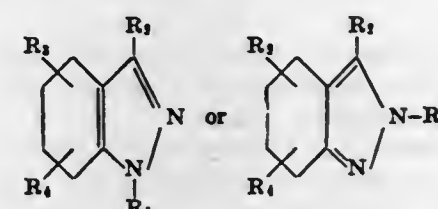
No Drawing. Continuation-in-part of application Ser. No. 578,991, Sept. 13, 1966. This application Feb. 28, 1969, Ser. No. 803,411

Int. Cl. C07d 91/60

U.S. Cl. 260—302 SD

4 Claims

Novel 3 - (halogen) - 5 - (organothio)-, (sulfinyl)-, and (sulfonyl)-1,2,4-thiadiazoles and their production and use.



3,736,329

# 5-NITRO-2-THIOCARBAMYL THIAZOLE

John Pomfret Verge, Henley-on-Thames, and Peter Graham Hughes, Sunningdale, England, assignors to Lilly Industries Limited, London, England

No Drawing. Filed Mar. 29, 1971, Ser. No. 129,238. Claims priority, application Great Britain, Apr. 15, 1970, 18,068/70

Int. Cl. C07d 91/32

U.S. Cl. 260—302 R

1 Claim

5-nitro-2-thiocarbamyl thiazole prepared by reaction of 5-nitro-2-cyanothiazole and thioacetamide is useful as a plant fungicide.

3,736,330

# BIOCIDALLY ACTIVE CARBOXAMIDE DERIVATIVES

Pieter Ten Haken, Herne Bay, Kent, England, assignor to Shell Oil Company, New York, N.Y.

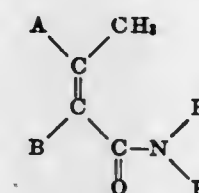
No Drawing. Filed Apr. 19, 1971, Ser. No. 135,389. Claims priority, application Great Britain, Apr. 15, 1970, 17,956/70

Int. Cl. C07d 91/34

U.S. Cl. 260—306.8 R

2 Claims

Certain novel fungicidal carboxamide derivatives having the formula



wherein R represents one of certain heterocyclic moieties containing at least one nitrogen atom, A represents alkyl and B represents hydrogen or A and B together with the indicated carbon atoms forms a benzene ring or a hetero ring containing oxygen.

3,736,331

# ISOTHIOUREAS

James Whyte Black, Hempstead, Graham John Durant, Welwyn Garden City, John Colin Emmett, Kimpton, and Charon Robin Ganellin, Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

No Drawing. Filed Oct. 14, 1970, Ser. No. 80,819

Int. Cl. C07d 49/36, 31/40, 91/42

U.S. Cl. 260—309

14 Claims

N-(heterocyclic-alkyl)isothioureas. These compounds inhibit histamine activity.

3,736,332

# METHOD FOR THE PREPARATION OF 4,5,6,7-TETRAHYDROINDAZOLES

Ivan Butula, Zagreb, Yugoslavia, assignor to PLIVA, Pharmaceutical and Chemical Works, Zagreb, Yugoslavia

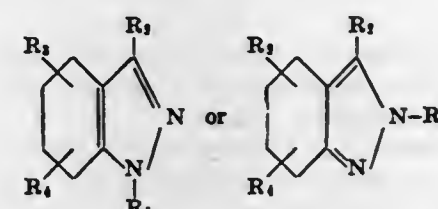
No Drawing. Filed Sept. 18, 1970, Ser. No. 73,643. Claims priority, application Germany, Sept. 26, 1969, P 19 48 793.5

Int. Cl. C07d 49/18

U.S. Cl. 260—310 R

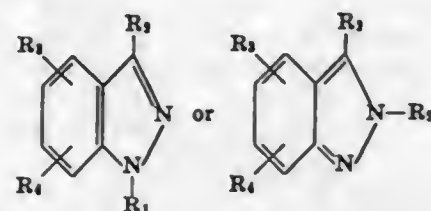
11 Claims

A method for the preparation of 4,5,6,7-tetrahydroindazoles of the formula:





in which an indazole of the general formula:



is hydrogenated in the presence of palladium, rhodium or platinum or catalysts containing mixtures of them and in the presence of a strong acid in a molar equivalent at least equal to that of the basic groups.

3,736,333

## THIENYL ALKYL TIN COMPOUNDS

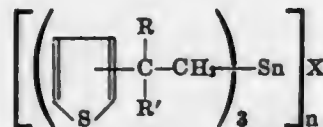
James P. Foster and Samuel B. Soloway, Modesto, Calif., assignors to Shell Oil Company, New York, N.Y.  
No Drawing. Filed July 12, 1971, Ser. No. 161,965

Int. Cl. C07d 63/12

U.S. Cl. 260—329 ME

Organo-tin compounds of the formula

5 Claims



wherein R is a lower alkyl, R' is H or R, n is 1 or 2 and X is a Cl or OH when n is 1 and —O— when n is 2 are useful in controlling mites.

3,736,334

## ANTI-CHOLESTEROL PHENOXYACETIC ACID ESTERS

Werner Winter, Viernheim, Hesse, Max Thiel, Mannheim, Kurt Stach, Mannheim-Waldhof, Felix Helmut Schmidt, Mannheim-Seckenheim, and Harald Stork, Lampertheim, Hesse, Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany  
No Drawing. Filed Jan. 19, 1971, Ser. No. 107,822

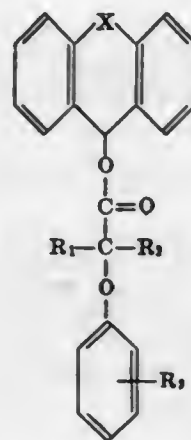
Claims priority, application Germany, Jan. 23, 1970, P 20 02 941.8

Int. Cl. C07d 7/42

U.S. Cl. 260—335

Phenoxyacetic acid esters of the formula

2 Claims



wherein

X is a valency bond, a sulfur or oxygen atom, a saturated or unsaturated alkylene radical or an oxamethylene or thiamethylene radical,  
R<sub>1</sub> and R<sub>2</sub>, which may be the same or different, are hydrogen atoms or methyl radicals, and  
R<sub>3</sub> is a hydrogen or halogen atom,

which compounds serve to reduce the cholesterol level in blood. The process of making and using the compounds are also covered.

3,736,335

## PROSTAGLANDINS AND METHODS OF MAKING SAME

Norman L. Wendler, Summit, and David Taub, Metuchen, N.J., assignors to Merck & Co., Inc., Rahway, N.J.  
No Drawing. Filed June 22, 1970, Ser. No. 48,548

Int. Cl. C07d 13/04

U.S. Cl. 260—340.9

3 Claims

(±)-prostaglandin E<sub>1</sub> is totally synthesized with a high degree of stereoselectivity and in good yield at the various steps from 6-methoxy-3-indanol by a sequence of reactions proceeding through 6-methoxy-3-indeneheptanoic acid ester, 2,6-dioxo-4,5,6,7-tetrahydro-7-methyl-3-indanheptanoic acid ester 2-cyclic ethylene acetal, cis-3,4,5,7a-tetrahydro-7-methyl-2-oxoindanheptanoic acid esters, trans-trans 3-acetyl-2-(2-carboxy-ethyl)-5-oxocyclopentane heptanoic acid ester 5-cyclic-ethylene acetal, 3-acetoxy-2-formyl-5-oxocyclopentaneheptanoic acid ester 5-cyclic ethylene acetal, and 15-dehydro (±)-prostaglandin E<sub>1</sub>. The end compound has the biological activity of naturally occurring prostaglandin E<sub>1</sub>.

3,736,336

## 4,5-DISUBSTITUTED-2,3-EPOXYCYCLOPENTANONES

Donald P. Strike, Rosemont, and Herchel Smith, Bryn Mawr, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Application Nov. 12, 1969, Ser. No. 876,116, which is a continuation-in-part of application Ser. No. 765,020, Oct. 4, 1968, which in turn is a continuation-in-part of application Ser. No. 702,185, Feb. 1, 1968, all now abandoned. Divided and this application Apr. 15, 1971, Ser. No. 134,465

Int. Cl. C07d 1/20, 1/22

U.S. Cl. 260—345.7

5 Claims

4,5-disubstituted-3-hydroxycyclopentanones (I) are prepared by hydrogenolyzing the corresponding 4,5-disubstituted-2,3-epoxycyclopentanone (IV) which in turn is provided by reacting the corresponding 4,5-disubstituted-2-cyclopenten-1-one (III) with alkaline hydrogen peroxide. Compounds III are prepared by cyclizing the corresponding 2,3-disubstituted levulinialdehyde (II) with a base. The products of the process are biologically active, especially Compound I substituted in the 4-position with 3'-hydroxyoctyl and in the 5-position with 6'-carboxyhexyl. This compound has prostaglandin-like activity, especially blood pressure lowering and bronchodilator activity, and is a totally-synthetic dihydroprostaglandin E<sub>1</sub> (dihydro PGE<sub>1</sub>). The process of the invention may also be used to obtain compounds with prostaglandin-like activity from appropriately substituted naturally occurring cyclopentanones, e.g. those isolated from the Caribbean gorgonian, *Plexaura homomalla*.

3,736,337

## TETRAHALOGENATED CHROMOGENIC COMPOUNDS AND THEIR USE

(1) Sheldon Farber, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

No Drawing. Filed Apr. 27, 1971, Ser. No. 137,952

Int. Cl. C07d 5/32, 27/22, 27/56

U.S. Cl. 260—343.3

18 Claims

Tetrahalogenated chromogenic compounds are disclosed. One such compound is 3-(p-diethylaminophenyl)-3-(1,2-dimethylindol-3-yl)-4,5,6,7-tetrachlorophthalide. These colorless, but colorable dyes are employed in pressure-sensitive record material and mark-forming manifold

systems. The tetrahalogenated compounds of this invention demonstrate good fade resistance both in respect to reflective intensity and quantity of color present.

3,736,338

## BENZODIOXOLE DERIVATIVES USEFUL AS PESTICIDES

Peter Stuart Gates, Cambridge, and John Gillon, Great Shelford, England, assignors to Fisons Limited, Suffolk, England

No Drawing. Continuation-in-part of application Ser. No. 706,628, Feb. 19, 1968. This application Apr. 1, 1971, Ser. No. 130,487

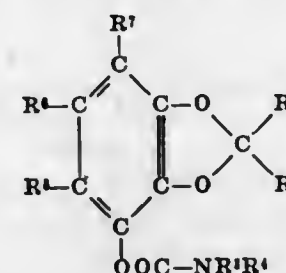
Claims priority, application Great Britain, Feb. 21, 1967, 8,174/67; Japan, Aug. 12, 1970, 45/70,147

Int. Cl. C07d 13/10

U.S. Cl. 260—340.5

7 Claims

Substituted benzodioxoles of the formula:



wherein R<sup>1</sup> and R<sup>2</sup> are hydrogen or alkyl of 1 to 6 carbon atoms or together with the linking carbon atom form a cycloalkane ring of 5 to 7 carbon atoms;  
R<sup>3</sup> is hydrogen, alkyl of 1 to 4 carbon atoms or acetyl;  
R<sup>4</sup> is alkyl of up to 4 carbon atoms, alkenyl of up to 4 carbon atoms, or alkynyl of up to 4 carbon atoms; and  
one of R<sup>5</sup>, R<sup>6</sup> and R<sup>7</sup> is hydrogen, halogen or alkyl of 1 to 4 carbon atoms; and  
the others of R<sup>5</sup>, R<sup>6</sup> and R<sup>7</sup> each represents a hydrogen atom are valuable pesticides, particularly insecticides.

3,736,339

## SODIUM EXO-CIS-1,4-ENDOXO-1-SUBSTITUTED CYCLOHEX-5-ENE-2,3-DICARBOXYLATE COMPOUNDS

Vincent Lambert, Upper Saddle River, and Robert Reardon, Tenafly, N.J., assignors to Lever Brothers Company, New York, N.Y.

No Drawing. Filed Feb. 25, 1971, Ser. No. 118,972

Int. Cl. C07d 5/32

U.S. Cl. 260—347.3

2 Claims

The use of exo-cis-1,4-endoxo-allycyclic-2,3-dicarboxylates such as sodium exo-cis-1,4-endoxocyclohexene-2,3-dicarboxylate and derivatives thereof as builders in detergent compositions.

3,736,340

## METHOD FOR THE QUANTITATIVE DETERMINATION OF CHOLESTEROL

Amritlal C. Parekh and David H. Jung, Indianapolis, Ind., assignors to Research Corporation, New York, N.Y.

Original application Feb. 5, 1970, Ser. No. 8,954. Divided and this application May 13, 1971, Ser. No. 143,189

Int. Cl. C07c 167/42

U.S. Cl. 260—397.25

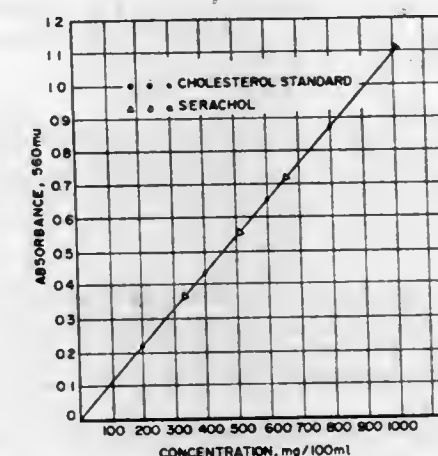
7 Claims

In a method for the determination of total cholesterol in blood serum, plasma or other cell free body fluid the steps of adding a reagent comprising a mixture of ferric acetate [Fe(C<sub>2</sub>H<sub>3</sub>O<sub>2</sub>)<sub>3</sub>] and uranum acetate



to the fluid whereby the total cholesterol content thereof is solubilized and those chromogens which interfere with

the determination are precipitated and separating the liquid phase containing solubilized cholesterol from the



precipitate. The cholesterol content is then determined quantitatively.

3,736,341

## ACRYLOXYACYL CHLORIDES

Martin J. Diamond, 6131 Hillegass Ave., Oakland, Calif. 94618, and Howard L. Needles, Davis, Calif. 95618

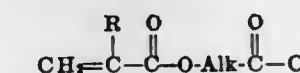
No Drawing. Original application Mar. 20, 1970, Ser. No. 21,499, now Patent No. 3,615,554. Divided and this application Nov. 12, 1971, Ser. No. 198,471

Int. Cl. C07c 69/54

U.S. Cl. 260—405

4 Claims

Acryloxyacyl chlorides of the structure—



wherein R is H or CH<sub>3</sub> and Alk is a bivalent hydrocarbon radical containing 1 to 21 carbon atoms. These compounds may be homopolymerized or copolymerized with a different polymerizable monomer (e.g., a lower alkyl acrylate or methacrylate). The polymers are useful for application to fibrous materials, for example, to wool to make it shrink resistant.

3,736,342

## PROCESS FOR PRODUCING TRIALKOXYALUMINUM

Eichi Ichiki, Kazuo Iida, Michio Kozai, and Yoshihiro Kondo, Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Higashi-ku, Osaka, Japan  
No Drawing. Filed July 27, 1971, Ser. No. 166,630

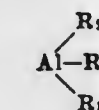
Claims priority, application Japan, Aug. 18, 1970, 45/72,641

Int. Cl. C07f 5/06

U.S. Cl. 260—448 AD

14 Claims

A trialkoxyaluminum is produced from an alkylaluminum compound,



wherein R<sub>1</sub> and R<sub>2</sub> represent alkyl groups having 2 to 30 carbon atoms, and R<sub>3</sub> an alkyl or alkoxy groups having 2 to 30 carbon atoms through oxidation by contacting the alkylaluminum compound with a molecular oxygen-containing gas in a state of film having a thickness of not more than 5 mm., preferably not more than 3 mm., at —20° to 150° C., preferably 0° to 100° C. under a pressure of not more than 50 kg./cm.<sup>2</sup> absolute, preferably 0.5 to 40 kg./cm.<sup>2</sup> absolute.



3,736,343

**LOWER ALKYL 3-(5-CHLOROSALICYLIDENE) DITHIOCARBAZATES**

John F. Olin, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.  
No Drawing. Original application Aug. 13, 1969, Ser. No. 849,902, now Patent No. 3,629,447. Divided and this application May 3, 1971, Ser. No. 139,966  
Int. Cl. C07c 155/08

U.S. Cl. 260—455 A 5 Claims  
Control of the scab fungus, *Venturia inaequalis*, employing a lower alkyl 3-(5-chlorosalicylidene)dithiocarbazate.

3,736,344

**LOW MOLECULAR WEIGHT ACYL PEROXYCARBONIC ESTERS**

Roger N. Lewis, Pinole, and Ronald L. Friedman, San Rafael, Calif., assignors to Argus Chemical Corp., Brooklyn, N.Y.  
No Drawing. Original application Dec. 26, 1967, Ser. No. 693,187, now Patent No. 3,585,232. Divided and this application Jan. 8, 1971, Ser. No. 105,130  
Int. Cl. C07c 69/00

U.S. Cl. 260—463 6 Claims  
Low molecular weight (4-7 carbon atoms) acyl peroxycarbonic aliphatic esters.

3,736,345

**STEROID-LIKE COMPOUNDS AND METHOD OF SYNTHESIS**

Marinus Los, Princeton, N.J., assignor to American Cyanamid Company, Stamford, Conn.  
No Drawing. Continuation-in-part of abandoned application Ser. No. 834,492, June 18, 1969. This application May 18, 1971, Ser. No. 144,687  
Int. Cl. C07c 121/02, 121/48

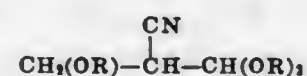
U.S. Cl. 260—465 D 3 Claims  
This invention relates to novel steroid-like compounds, a method for the synthesis thereof as intermediates for preparing other steroids and for the use of such compounds as estrogenic, androgenic or antiovarian agents in the treatment of domestic and laboratory animals.

3,736,346

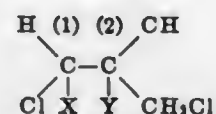
**METHOD FOR THE PRODUCTION OF 1,1,3-TRIALKOXY-2-CYANOPROPANES**

Masaaki Tsurushima, Kyoto, and Kozo Yatani, Yamaguchi, Japan, assignors to Takeda Chemical Industries, Ltd., Higashi-ku, Osaka, Japan  
No Drawing. Filed May 28, 1971, Ser. No. 148,147  
Claims priority, application Japan, June 15, 1970, 45/52,270

U.S. Cl. 260—465.6 5 Claims  
The present invention relates to a process for the production of a 1,1,3-trialkoxy-2-cyanopropane of the formula



wherein R stands for a lower alkyl having 1 to 3 carbon atoms, which comprises reacting a chlorocyanohydrocarbon of the formula



wherein X stands for hydrogen and Y stands for chlorine atom, or X and Y form together a bond between the carbon atom at the 1-position and at the 2-position, with an alkali metal alcoholate or with an alcoholic alkali metal hydroxide, the alcohol for the alcoholate or alcoholic alkali metal hydroxide being an aliphatic monohydric alcohol of 1 to 3 carbon atoms, at a temperature of from 0° C. to the boiling point of the abovementioned alcohol.

3,736,347

**SUBSTITUTED ALKENOIC ACIDS AND ESTERS AND SALTS THEREOF**

Eric Harold Billett, Harlow, and David Miller, Sevenoaks, England, assignors to Beecham Group Limited, Brentford, Middlesex, England  
No Drawing. Filed Aug. 3, 1970, Ser. No. 60,729  
Claims priority, application Great Britain, Aug. 5, 1969, 39,123/69

Int. Cl. C07c 63/44, 69/76  
U.S. Cl. 260—469 11 Claims  
Substituted alkenoic acids having two phenyl or lower alkoxyphenyl groups and certain derivatives have been found to have estrogenic, e.g., anti-fertility properties for treating menopausal disorders or for estrogenic replacement. Typical compounds are 2-carboxy-5,5-diphenyl-4-methylpent-4-enoic acids, 2-methyl-4-ethyl-5,5-diphenyl-2-carboxypent-4-enoic acid and 2,4-dimethyl-5-phenyl-5-(4-methoxy-phenyl)pent-4-enoic acid. The new compounds are formulated as tablets and capsules for oral use and as injectables with sterile water.

3,736,348

**PLASTICISING COMPOSITION**

Arthur Gough and Alan John Tompsett, Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England  
Filed Aug. 20, 1970, Ser. No. 65,479  
Claims priority, application Great Britain, Aug. 27, 1969, 42,710/69

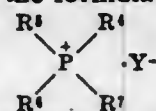
Int. Cl. C07c 69/80  
U.S. Cl. 260—475 R 7 Claims  
A plasticising composition suitable for use in PVC comprises di-esters of one or more C<sub>4</sub>-C<sub>14</sub> alkanols, particularly primary alkanols, with a mixture of acids including or consisting of o-phthalic, iso-phthalic, terephthalic, trimelic and trimellitic acids. The mixture of acids is advantageously obtained by oxidising a C<sub>8</sub> to C<sub>10</sub> alkylaromatics fraction obtained as byproduct in benzene, toluene and xylene production processes.

3,736,349

**FLAME-RETARDANT AGENTS FOR THERMOPLASTIC PRODUCTS**

Helen Currier Gillham, Princeton, and Allan Ellis Sherr, Warren, N.J., and Harvey Gerald Klein, New York, N.Y., assignors to American Cyanamid Company, Stamford, Conn.  
No Drawing. Division of application Ser. No. 753,739, Aug. 19, 1968, now Patent No. 3,654,342, which is a division of application Ser. No. 479,599, Aug. 13, 1965, which in turn is a continuation-in-part of application Ser. No. 296,364, July 19, 1963, now abandoned. This application Oct. 27, 1970, Ser. No. 84,484

Int. Cl. C07c 57/02, 69/52  
U.S. Cl. 260—486 R 2 Claims  
Compounds having the formula



wherein R<sup>4</sup> is carboxyalkenyl or carboalkoxyalkenyl, R<sup>3</sup>, R<sup>2</sup> and R<sup>1</sup> are, individually, alkyl; alkenyl; hydroxy; imidazol or carboxy substituted alkyl; aryl; aralkyl; vinyl; halo, polyhalo or nitro ar-substituted aralkyl; dialkylaminoalkyl or carboalkoxyalkyl radicals and Y is bromine or chlorine.

3,736,350

**AROMATIC DIAMINES CONTAINING ESTER GROUPS**

Walter Meckel, Dusseldorf, and Erwin Muller, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany  
No Drawing. Filed Oct. 14, 1969, Ser. No. 866,373  
Claims priority, application Germany, Oct. 17, 1968, P 18 03 635.6

Int. Cl. C07c 101/54  
U.S. Cl. 260—471 R 3 Claims  
Novel aromatic diamines containing ester groups wherein the amino groups are in the m and/or p-position rela-

tive to the ester group, and with a substituent in the o-position to at least one amino group are useful to prepare polyurethane elastomers therefrom with an organic diisocyanate and an organic compound containing at least two hydroxyl groups and having a molecular weight of from about 800 to about 5000.

3,736,351

**INTERMEDIATES FOR TRICYCLIC AMINES**

Gerald Rey-Bellet and Hans Spiegelberg, Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.  
No Drawing. Original application Mar. 3, 1967, Ser. No. 620,241, now Patent No. 3,527,806, dated Sept. 8, 1970. Divided and this application Apr. 23, 1970, Ser. No. 31,397

Int. Cl. C07c 119/00  
U.S. Cl. 260—501.21 3 Claims  
N-alkylidene or aralkylidene-N-alkyl-N-[3-(substituted dibenzo[a,d]cycloheptene-5-yl)-propyl] ammonium salts and their preparation are disclosed, such salts possessing utility as intermediates in the preparation of 5-(amino-propylidene)-dibenzo[a,d]cycloheptenes having antidepressant activity.

3,736,352

**PROCESS FOR RECOVERING ORGANIC SULFONYL HALIDES**

Carl D. Kennedy and Allan J. Lundeen, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.  
No Drawing. Continuation-in-part of application Ser. No. 868,922, Oct. 29, 1969. This application Apr. 7, 1972, Ser. No. 242,245

Int. Cl. C07c 143/70  
U.S. Cl. 260—543 R 10 Claims  
Organic monosulfonyl halides are purified. A mixture comprising organic sulfonyl halides and unreacted paraffins is deparaffinized by admixing with a nitroalkane having 2 to 6 carbon atoms, cooling to precipitate the paraffin, and removing the solid paraffin from the liquid. Prior to deparaffinization, the mixture can be extracted with a selective solvent such as nitromethane to extract organic polysulfonyl halides and leave a mixture comprising monosulfonyl halides and paraffin, which is then deparaffinized. Subsequent to deparaffinization of a mixture comprising organic sulfonyl halides and unreacted paraffins, the polysulfonyl halides can then be extracted with a selective solvent such as nitromethane to leave purified monosulfonyl halides as a product.

3,736,353

**PROCESS FOR PRODUCTION OF MELLITIC ACID**

Eugene Paul Gosselink, Colerain Township, Hamilton County, and John H. Henderson, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio  
No Drawing. Filed Mar. 31, 1971, Ser. No. 130,019

Int. Cl. C07c 51/26  
U.S. Cl. 260—523 A 9 Claims  
An improved process for synthesizing mellitic acid by two-stage nitric acid oxidation of hexakis(methoxymethyl)benzene. Specification of particular reaction procedures maximizes product yield and minimizes the need for expensive high pressure reaction equipment.

3,736,354

**PROCESS FOR THE PRODUCTION OF ACRYLIC ACID**

Masaya Yanagita, Tokyo, Masao Kitahara, Chiba-shi, and Yoshimichi Abe, Tokyo, Japan, assignors to Rikagaku Kenkyusho, Saitama-ken, Japan  
Filed May 8, 1969, Ser. No. 823,112  
Claims priority, application Japan, May 13, 1968, 43/32,102; June 12, 1968, 43/89,358

Int. Cl. C07c 51/26  
U.S. Cl. 260—530 N 9 Claims  
A high yield process for producing pure acrylic acid by

3,736,355

**PROCESS FOR THE PREPARATION OF UNSATURATED ACIDS**

Mauro Croci, deceased, late of Novara, Italy, by Angelo Croci and Margherita Biagioni, heirs, and Enrico Cavaterra, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy  
No Drawing. Filed Dec. 12, 1969, Ser. No. 884,734  
Claims priority, application Italy, Dec. 16, 1968, 25,137/68

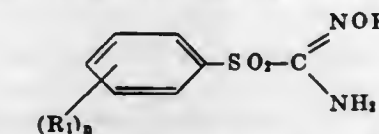
Int. Cl. C07c 51/32, 57/04  
U.S. Cl. 260—533 N 2 Claims  
Alpha-beta unsaturated olefins, particularly propylene, are oxidized in the vapor phase by molecular oxygen, with the production of the corresponding unsaturated carboxylic acids, particularly acrylic acid.

3,736,356

**ARYLSULFONYLFORMAMIDOXIMES**

Uwe D. Trenner, Regensburg, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.  
No Drawing. Filed Oct. 19, 1971, Ser. No. 190,693  
Int. Cl. C07c 103/10

U.S. Cl. 260—562 R 11 Claims  
Arylsulfonylformamidoximes of the general formula



are useful as antimicrobial agents, hypoglycemic agents and antiinflammatory agents.

3,736,357

**HIGH MOLECULAR WEIGHT MANNICH CONDENSATION PRODUCTS FROM TWO DIFFERENT ALKYL-SUBSTITUTED HYDROXY-AROMATIC COMPOUNDS**

Edmund J. Plasek, Chicago, Ill., and Robert E. Karl, Munster, Ind., assignors to Standard Oil Company, Chicago, Ill.  
No Drawing. Continuation-in-part of application Ser. No. 502,368, Oct. 22, 1965, now Patent No. 3,539,633, dated Nov. 10, 1970. This application Apr. 14, 1969, Ser. No. 816,124

Int. Cl. C07c 91/28  
U.S. Cl. 260—570.5 P 5 Claims  
Products of the condensation of (1) a high molecular weight alkyl-substituted hydroxyaromatic compound whose alkyl substituent has upward from 40 to 20,000 carbon atoms, (2) a lower molecular weight alkyl-substituted phenol whose alkyl-substituent has 2 to 20 carbon atoms, (3) an amine having two primary amino (—NH<sub>2</sub>) groups and (4) an aldehyde in the respective molar ratio of reactants of 2.0:0.7-1.0:1.4-2.0:2.8-4.0, are novel ashless-type (metal free) mineral-oil soluble addition agents having dispersant detergent and anti-oxidant functions affording anti-sludge and anti-varnish deposition and corrosion inhibition in crankcase lubricating compositions subjected to low or high temperature in-service use. Such condensation products are prepared either by single step reaction conducted by subjecting all four of the reactants in the stated molar ratio of reactants to a single condensation reaction under known Mannich condensation reaction conditions or by a two step reaction wherein reactants (1), (3) and (4) are first subjected to Mannich condensation conditions in the respective molar ratio of 2:1.4-2.0:1.4-2.0 and the resulting first step product is further condensed with reactants (2) and (4) used in the respective molar ratio of 0.7-1.0:1.4-2.0.



# ELECTRICAL

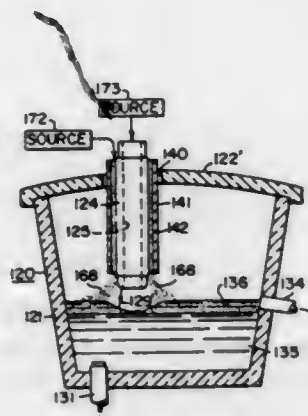
3,736,358

## PROCESS FOR IRON ORE REDUCTION AND ELECTRIC FURNACE FOR IRON ORE REDUCTION HAVING AT LEAST ONE NONCONSUMABLE ELECTRODE

Serafino M. DeCorso, Pittsburgh, and Armin M. Bruning, Export, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.  
Division of Ser. No. 584,799, Oct. 6, 1966, abandoned. This application July 30, 1971, Ser. No. 167,820  
Int. Cl. H05b 7/08

U.S. Cl. 13-9

2 Claims



Furnace apparatus for iron ore reduction comprises a furnace having a wall composed of refractory material and non-consumable electrode apparatus having at least one axially extending passageway therethrough mounted in the furnace, and means for energizing the electrode apparatus and producing an arc which melts the ore and liquifies the same.

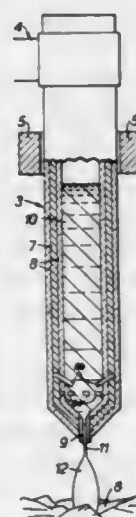
3,736,359

## ELECTRIC FURNACE

Brian Bowman, Geneva, Switzerland, assignor to British Steel Corporation, London, England  
Filed Mar. 29, 1972, Ser. No. 239,107  
Int. Cl. H05b 7/08

U.S. Cl. 13-9

17 Claims



Particulate metal in flowable form or liquid metal is continually dispensed on to the charge in the furnace vessel

through a tubular non-consumable electrode constituting a reservoir for this metal. The metal discharges through a nozzle on the tip of the electrode and an arc is sustained in the metal flowing between this nozzle and the charge surfaces. In the case of particulate metal this would normally comprise only part of the total metal charge ultimately in the furnace, unless the application is in respect of vacuum arc re-melting or refining where it would constitute the whole charge. Where liquid metal is employed this only constitutes a small proportion of the total charge. In the latter embodiment starting presents no problem since a conductive path is provided but, with particulate metal, where a conductive path is not provided initially, starting is effected with the aid of an auxiliary electrode.

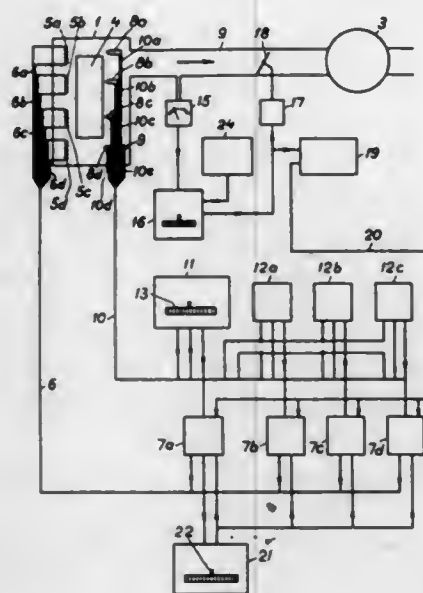
3,736,360

## CONTROL SYSTEM FOR VACUUM FURNACES

Carl Bergman, and Paul Larsson, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden  
Filed Oct. 27, 1971, Ser. No. 192,999  
Claims priority, application Sweden, Oct. 27, 1970, 14477/70  
Int. Cl. F27d 7/06

U.S. Cl. 13-24

10 Claims



A control system for an electrically heated furnace for sintering powder bodies, especially bodies of hard metal, has a vacuum pump connected to the interior of the furnace chamber by a suction conduit. The furnace includes a plurality of heating elements for different zones, a temperature sensitive instrument for each zone and a controlled measuring instrument for one of the zones which is the master zone. These instruments are connected to a master regulator for the furnace and slave regulators for the individual zones. A throttle valve in the vacuum conduit, or a controlled tap connected to the vacuum conduit, make it possible to keep the pressure in the furnace constant despite the fact that the pump runs at a constant speed. A pressure-sensing member connected to the vacuum conduit is also connected to the regulators for the heating elements.

MAY 29, 1973

ELECTRICAL

1687

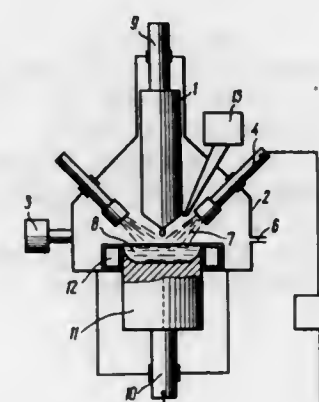
3,736,361

## METHOD FOR THE PLASMA REMELTING OF A CONSUMABLE METAL BAR IN A CONTROLLED ATMOSPHERE

Viktor Iosifovich Lakomsky, ulitsa Bastionnaya, 10, kv. 30; Oleg Semenovitch Zabarlo, ulitsa Chapaeva, 2/16, kv. 3; Gennady Fedorovich Torkhov, ulitsa Kapitanovskaya, 28, kv. 65, all of Kiev; Igor Stepanovich Pryanishnikov, ulitsa Sovetskaya, 2/102, kv. 27, Elektrostal Moskovskoi Oblasti; Valentin Vasilievich Topilin, ulitsa Koresheva, 12, kv. 8, Elektrostal Moskovskoi Oblasti; Michail Markovich Kijuev, ulitsa Sovetskaya, 15, kv. 6, Elektrostal Moskovskoi Oblasti, and Vladimir Nikiforovich Zhuchin, ulitsa Mira, 2, kv. 77, Elektrostal Moskovskoi Oblasti, all of U.S.S.R.  
Filed June 14, 1971, Ser. No. 152,556  
Int. Cl. H05b 7/00

U.S. Cl. 13-34

3 Claims



A method for the plasma-arc remelting of a consumable metal bar into ingots under controlled atmospheric conditions in which remelting is effected through the use of plasmatrons which serve for heating nitrogen gas to the plasma-state and feeding it together with activated metal for its remelting and alloying, and whereby an ingot is performed in a cooled mould which is coupled to a power source.

3,736,362

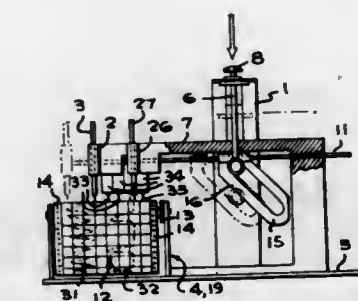
## APPARATUS FOR PRACTISING RESUSCITATION BY INSUFFLATION AND EXTERNAL HEART MASSAGE

Asmund S. Laerdal, Stavanger, Norway  
Filed Dec. 4, 1970, Ser. No. 95,078  
Claims priority, application Germany, Dec. 11, 1969, P 19 62 083.8

U.S. Cl. 35-17

Int. Cl. G09b 23/32

9 Claims



A practising apparatus for a training of resuscitation by synchronized insufflation and external heart massage in which a dummy torso is provided with an imitation thorax and imitation lungs. Writing means associated with said imitation thorax and lungs records on an advanceable record sheet the movements of the lungs and thorax in insufflation and heart massage.

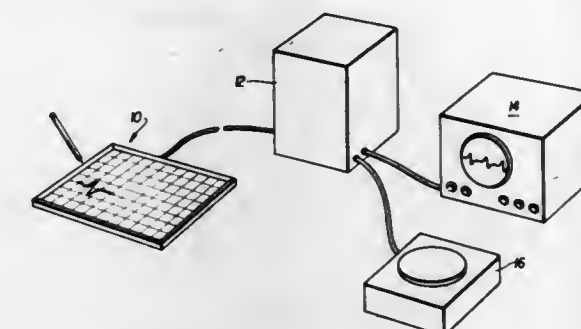
3,736,363

## PHYSIOLOGIC FUNCTION SIMULATOR

Lee R. Baessler, Manhattan Beach; Adelbert W. Vallensi, Los Angeles, and Harvey F. Glasner, Carson, all of Calif., assignors to Humetrics Corporation, Los Angeles, Calif.  
Filed Nov. 9, 1971, Ser. No. 196,997  
Int. Cl. G09b 23/28

U.S. Cl. 35-17

7 Claims



A method and apparatus for selectively and repetitively providing an analog electrical signal. The desired waveform may be drawn on a pen/digital device and the digital Y coordinate signal stored. The storage may thereafter be cyclically addressed by the X coordinate signal for repetitive reproduction of the waveform.

3,736,364

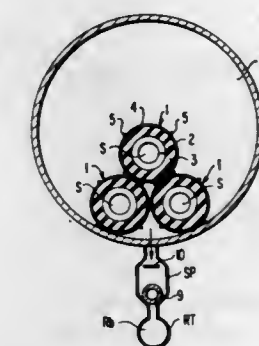
## ELECTRIC POWER TRANSMISSION CABLE WITH EVAPORATIVE COOLING SYSTEM

Hiroshi Kubo, Osaka, Japan, assignor to Sumitomo Electric Industries Ltd., Osaka, Japan  
Filed May 30, 1972, Ser. No. 257,622  
Claims priority, application Japan, May 5, 1971, 46/36828; June 22, 1971, 46/41576

U.S. Cl. 174-11 R

Int. Cl. H01b 7/34

9 Claims



This invention provides an electric power transmission cable with an evaporative cooling system in which a valve device is provided to separate the vapor phase coolant from the liquid and vapor phase mixture coolant or to control the amount of the whole coolant. The cooling system is divided into two types, that is, an R type arrangement and an L type arrangement. In the R type arrangement, an insulating layer is pervious to gas, and the coolant penetrates the insulating layer to flow out of the cable conductor, thus evaporative cooling may be accomplished in the radial direction during the process of the penetration. In the L type arrangement, the coolant circulates in the longitudinal direction to gradually become a gas-liquid mixture and finally a vapor phase coolant, thereby accomplishing refrigeration. The valve device according to this invention may function to separate the vapor phase from the liquid and vapor phase mixture coolant, and also to control the amount of the whole coolant in either the R or L type arrangement.



3,736,365

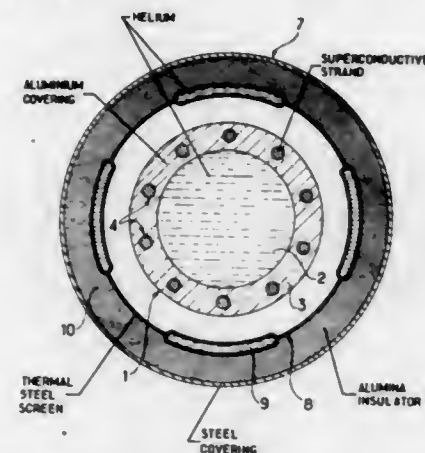
## CRYOGENIC CABLE

Jean-Claude Bobo, Saint-Michel-sur-Orge; Andre Dubois, Orsay, and Marcel Aupoix, Paris, all of France, assignors to Compagnie Generale d'Electricite, Paris, France  
Filed Apr. 14, 1972, Ser. No. 244,166

Claims priority, application France, Apr. 14, 1971, 7113090  
Int. Cl. H01v 11/00; H01b 7/34

U.S. Cl. 174-15 C

5 Claims



A cryogenic cable enabling the transfer of considerable electric power, characterized in that the electrical insulating means, between two coverings capable of being brought to different electric potentials, consists essentially of a volume of gas at a pressure between  $10^{-6}$  and  $10^{-2}$  Torr.

3,736,366

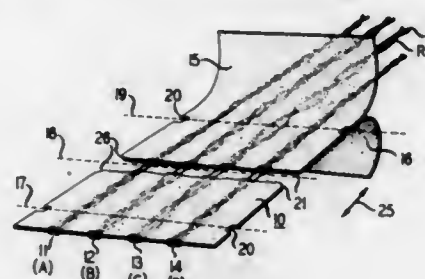
## MASS BONDING OF TWISTED PAIR CABLES

Albert Malcolm Wittenberg, Short Hills, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Apr. 27, 1972, Ser. No. 248,311

Int. Cl. H01b 11/04

U.S. Cl. 174-34

5 Claims



A tape cable structure includes several sets of twisted wire pairs which are laminated so that the twist points are in a fixed phase relation with each other. In one embodiment, even twist length ratios between the adjacent twisted pairs are used. The relationship between the twist points can be adjusted to permit mass termination of the cable. When severed as by a heat knife along a transverse section of the tape at which the twists of all pairs are in phase, the two tape sections are drawn apart to expose substantially parallel bare wires ready for connection.

3,736,367

## LEAD FRAMES AND METHOD OF MAKING SAME

Frederick Jay Heinlen, Eters, and Randy Marshall Manning, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 9, 1971, Ser. No. 132,852

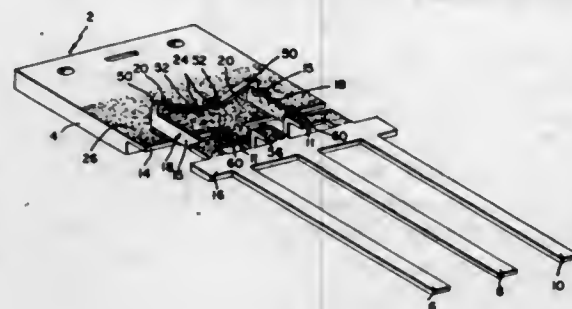
Int. Cl. H01l 5/00

U.S. Cl. 174-52 S

3 Claims

The disclosure relates to a lead frame having a plate-like heat sink portion and three leads, one of which is integral with

the heat sink, are manufactured by blanking heat sink and leads, bending the integral lead relative to the heat sink, form-



ing ends of the remaining leads, and again bending integral leads so that leads are in a plane which is parallel to, and spaced from the heat sink.

3,736,368

## TECHNIQUE FOR ENCODING AND DECODING T.V. TRANSMISSIONS BY MEANS OF A CODED ELECTRONIC TICKET

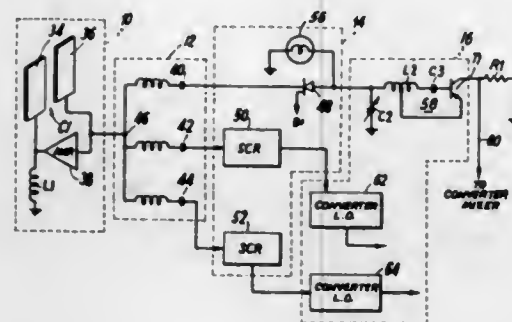
Joseph H. Vogelmann, Roslyn; Will Baklin, Huntington, and Ira Kamen, Lloyd Harbor, all of N.Y., assignors to Theatre Vision, Inc., Woodbury, L.I., N.Y.

Filed Jan. 28, 1972, Ser. No. 221,700

Int. Cl. H04n 1/44

U.S. Cl. 178-5.1

27 Claims



A television program is transmitted at a carrier frequency outside the regular television reception channels. The subscriber-viewer is provided with a coded ticket which, when inserted into a receptacle, establishes a resonant frequency for a tuned circuit in that receptacle. The resonant frequency signal is processed to actuate a converter local oscillator which translates the carrier of the received program signal to a designated television channel of a conventional television receiver that is not normally employed for receiving broadcast television programs.

3,736,369

## TECHNIQUE FOR ENCODING AND DECODING SCRAMBLED T.V. TRANSMISSIONS BY THE SIMULTANEOUS TRANSMISSION OF THE ENCODING AND DECODING SIGNALS

Joseph H. Vogelmann, Roslyn, and Ira Kamen, Lloyd Harbor, both of N.Y., assignors to Theatre Vision, Inc., Woodbury, N.Y.

Filed Mar. 13, 1972, Ser. No. 234,014

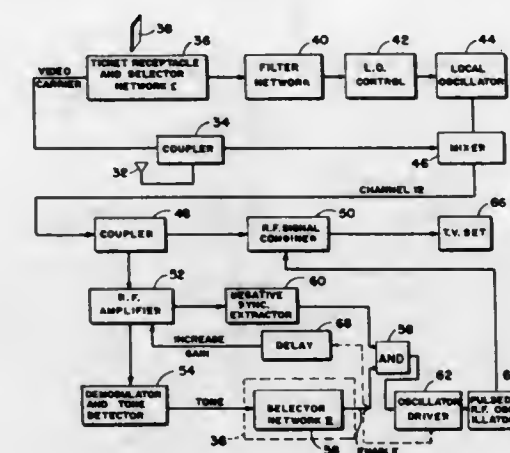
Int. Cl. H04n 1/44

U.S. Cl. 178-5.1

12 Claims

A subscriber television system in which the television signal is encoded at the transmitter in a manner that causes the video and/or audio portion of the signal to be received in a scrambled form at the receiver. A decoder at the receiver operates in response to the subscriber's use of a program-select and decoding element having a conducting pattern thereon. When

a program-select ticket having the proper conducting pattern is utilized, a network on the decoder produces an enabling



signal which actuates the decoding or unscrambling circuitry at the receiver to thereby decode the received, scrambled signal.

3,736,370

## IMPROVED CHROMA CLAMPING CIRCUIT

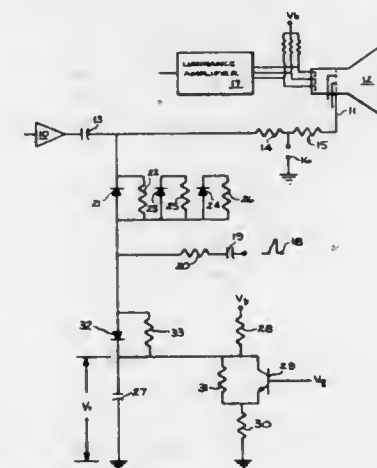
Roger C. Thielking, North Syracuse, N.Y., assignor to General Electric Company, Portsmouth, Va.

Filed Jan. 18, 1971, Ser. No. 107,229

Int. Cl. H04n 9/00, 5/18

U.S. Cl. 178-5.4 R

10 Claims



A clamping circuit for use in a color television receiver. The DC voltage level of color signal transmission paths is reestablished during horizontal retrace periods by applying a clamping pulse derived from the horizontal output transformer directly to the transmission path. The maximum excursion of the voltage thus applied is limited by a diode reverse-biased by means of a reference voltage network, which includes a transistor resistively coupled between a voltage source and ground. The transistor passes a constant flow of current such that changes in the value of the voltage source are added to the reverse bias on the limiting diode. The maximum voltage of the clamping pulse is thus varied to reflect changes in the value of the voltage source.

3,736,371

## METHOD AND ARRANGEMENT FOR REDUCING THE COLOR LINE NOISE IN THE STORAGE AND TRANSMISSION OF COLOR TELEVISION SIGNALS

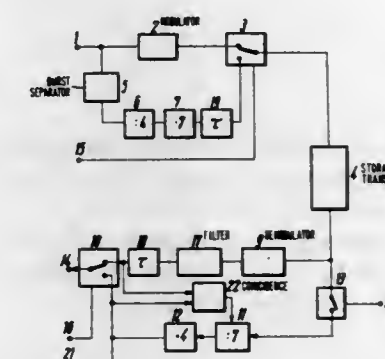
Gerhard Krause, Ebersberg, Munich, Germany, assignor to Robert Bosch Fernseh Anlagen, GmbH, Stuttgart, Germany  
Filed Sept. 18, 1970, Ser. No. 73,571

Claims priority, application Germany, Sept. 22, 1969, P 19 47 826.3

Int. Cl. H04n 5/78, 5/04; G11b 5/04

U.S. Cl. 178-5.4 CD

23 Claims



The color synchronizing signal is derived from the color television signal before the latter is modulated onto a carrier. After modulation a signal derived from the color synchronizing signal by frequency multiplication and/or division, is added to the modulated color television signal. The derived signal can be the blanking value or the synchronizing value. Before the television signal is demodulated, the derived signal is removed, and the color synchronizing signal reobtained by a mathematical operation that is a reciprocal of the first operation.

3,736,372

## ELECTRICAL CIRCUIT

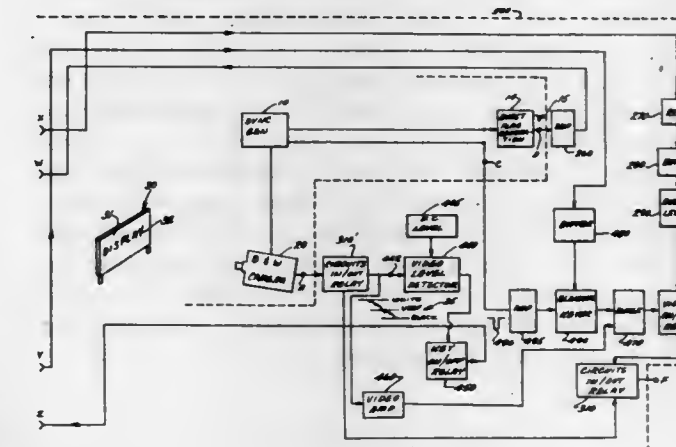
Peter W. Vanderwel, 780 North Mitzie Drive, North Muskegon, Mich.

Filed Feb. 18, 1972, Ser. No. 227,386

Int. Cl. H04n 9/02

U.S. Cl. 178-5.4 R

17 Claims



An electrical circuit for providing preselected two color television signals in response to luminance signals from a black and white video signal source at a television transmitting station. The electrical circuit includes a frequency divider which receives color subcarrier signals and provides sub-multiple frequency signals therefrom. A pair of color signal generating circuits are coupled to the frequency dividing circuit, receive the sub-multiple frequency signals therefrom and provide color signals having hue and saturation parameters which can be adjusted in a predetermined manner to provide



the desired color output signals therefrom. A video level detecting circuit detects the amplitude of the luminance signals and develops a control signal representative thereof. An electrically operated switching circuit receives the color signals from each color generating circuit and the control signal from the video level detecting circuit and applies one or the other of the color signals to a mixer circuit in response to the control signal. A mixer circuit combines the color signals with the luminance signals in timed relationship to provide composite two color television signals corresponding in a predetermined manner to the original black and white video signals.

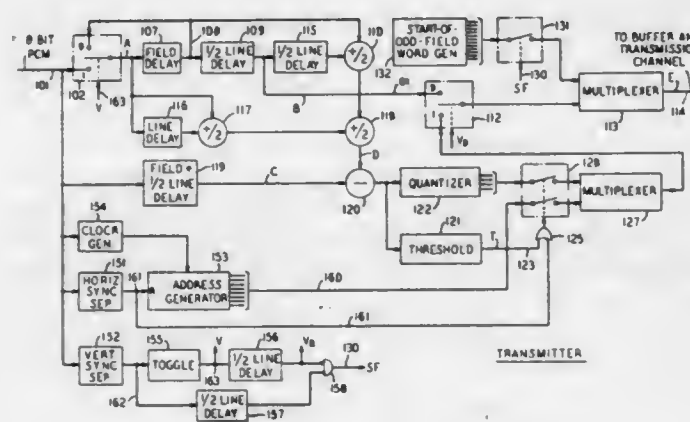
3,736,373

### CONDITIONAL VERTICAL SUBSAMPLING IN A VIDEO REDUNDANCY REDUCTION SYSTEM

Roger Fabian Wedgwood Pease, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hills, N.J.  
Filed Dec. 13, 1971, Ser. No. 206,991  
Int. Cl. H04n 7/12

U.S. Cl. 178-6

11 Claims



Alternate fields of a two-field interlaced video signal are transmitted without encoding from a transmitting encoder to a receiving location. In the encoder, a predicted value for each picture element in an in-between field is developed by spatially and temporally interpolating the amplitude values of picture elements in the fields preceding and following the in-between field. Each developed predicted value is compared with the actual picture element amplitude corresponding to that predicted value. If the difference between the two values is determined to exceed a threshold level, the difference is quantized and sent to the receiving location along with an address which properly locates the difference in the in-between field. In the receiver, an interpolated value is developed for each of the picture elements in the in-between field. If an error signal is received for any one of the picture elements, this error signal is added to the interpolated value.

3,736,374

### WIRED BROADCASTING SYSTEMS

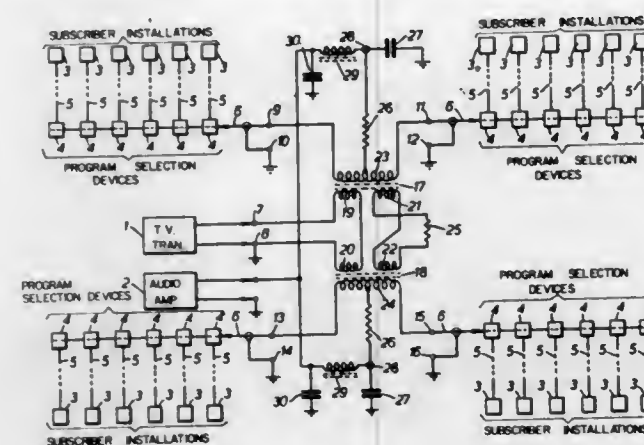
Eric J. Gargini, West Drayton, England, assignor to Communications Patents Limited, London, England  
Filed June 2, 1970, Ser. No. 42,772. The portion of the term of this patent subsequent to Sept. 15, 1980, has been disclaimed.  
Claims priority, application Great Britain, June 3, 1969, 27,927/69  
Int. Cl. H04n 7/10

U.S. Cl. 178-6

6 Claims

A hybrid coupling transformer system is used in wired broadcasting systems with two transformers coupled through a

pair of series windings on the respective transformers carrying TV signals. A second winding is coupled in series anti-phase



and output windings are coupled to subscriber stations. Audio signals are separately connected in some embodiments to center-tapped output windings.

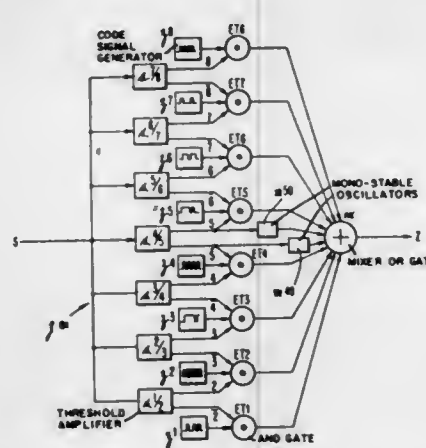
3,736,375

### PROCESS AND APPARATUS FOR CREATING CODIFIED CARTOGRAPHIC REPRESENTATIONS OF VARIABLE QUANTITIES

Bernard Parnet, Courbevoie, France, assignor to Saint-Gobain Industries, Neuilly sur Seine, France  
Filed Oct. 23, 1970, Ser. No. 83,476  
Claims priority, application France, Oct. 27, 1969, 6936743  
Int. Cl. H04n 5/14, 7/18

U.S. Cl. 178-6.8

26 Claims



A process and apparatus for creating a visible coded cartographic representation of a phenomenon, such as luminosity, temperature and the like, which may vary in a given superficial field and is susceptible of expression by a characteristic quantity, the representation comprising differently hatched adjacent areas or zones each representing values of the phenomenon under investigation between selected threshold values thereof, superimposed traces representing one or more of said threshold values for purposes of reference, and superposed transverse contours at selected intervals representing point to point variations in the value of the phenomenon.

3,736,376

### AUTOMATIC CONTROL SYSTEM FOR VIDEO TRACKER

Paul S. Kato, Jr., Torrance, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.  
Filed Mar. 30, 1967, Ser. No. 628,232  
Int. Cl. H04n 3/00

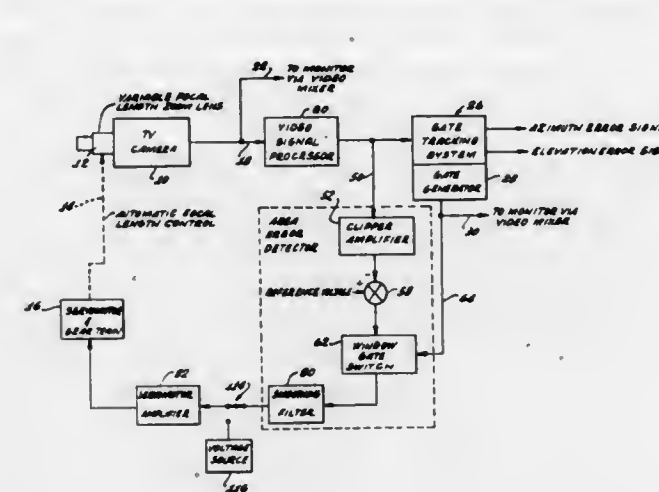
U.S. Cl. 178-6.8

14 Claims

A control system for video trackers with monitor receivers on which tracking gate windows are displayed. Signals from a

video tracker are shaped, gated and filtered, and then utilized to automatically maintain a substantially constant ratio between the window size and the portion of the window occu-

forms the combined functions of video demodulation, automatic gain control voltage generation, horizontal synchroniz-



ried by the image of the object being tracked. For a camera with zoom lens, the signals are used to operate a motor drive for the lens. For a camera with fixed focus lens, the signals are used for automatic gate size control in the video tracker.

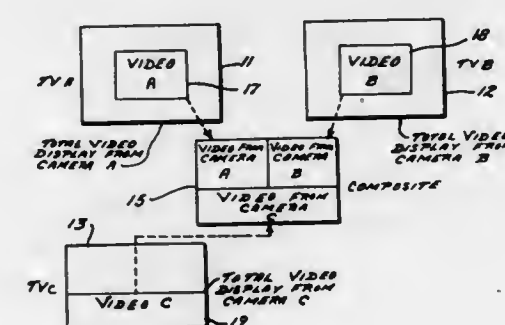
3,736,377

### MULTIPLE CHANNEL VIDEO SWITCHING SYSTEM

Robert H. Warren, Jr., 2102 E. Broadway Apt. 34, Mesa, Ariz.  
Filed May 10, 1971, Ser. No. 141,559  
Int. Cl. H04n 5/22

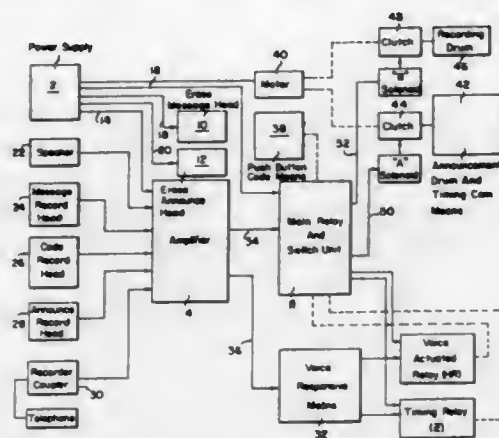
U.S. Cl. 178-7.2

3 Claims





been previously recorded on a recording drum. The invention is characterized by the provision of voice-code responsive



means for activating the playback means only when a given oral sound is presented at predetermined code-responsive timing intervals.

3,736,381

## TIME DIVISION SWITCHING SYSTEM

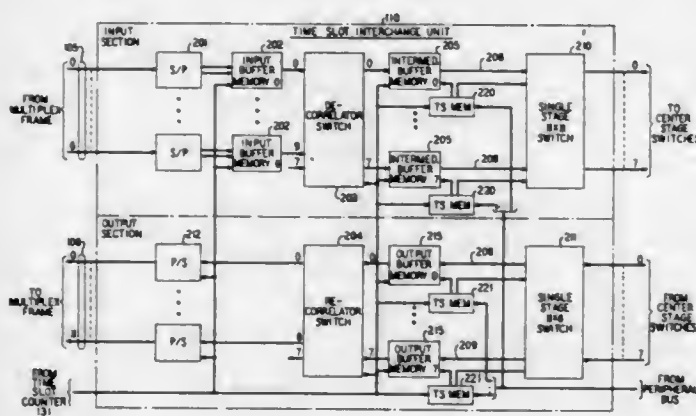
Glover Douglas Johnson, Naperville; Keith Lynn Nicodemus, Wheaton; George Charles Schumacher, Glen Ellyn, and Matthew Francis Slana, Naperville, all of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 1, 1971, Ser. No. 185,748

Int. Cl. H04J 3/00

U.S. Cl. 179-15 AQ

8 Claims



A toll telephone switching system for switching PCM data among time division multiplex lines is disclosed. The system comprises a symmetrical time-shared space division network and interface circuits which buffer incoming PCM data and distribute the incoming data from a group of multiplex lines over a group of input ports of the network. The interface circuits also buffer outgoing PCM data at the output side of the network and distribute the data from a group of output ports of the network over a group of outgoing multiplex lines.

3,736,382

## SERIALLY CONTENT ADDRESSABLE MEMORY CONTROLLED CALL FORWARDING SYSTEM

Edwin Julius Braun, and Roderic Romero, both of Boulder, Colo., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Oct. 15, 1971, Ser. No. 189,597

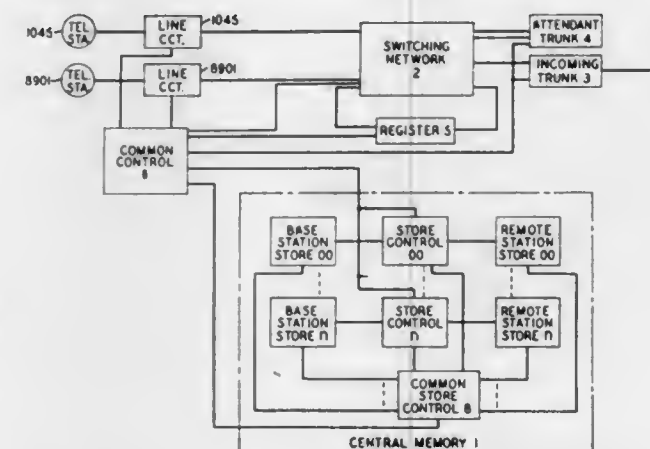
Int. Cl. H04m 3/54

U.S. Cl. 179-18 BE

20 Claims

A call forwarding arrangement for use in a telephone switching system wherein a call directed to a base station may

be established to a remote station arbitrarily chosen by either the base or an attendant station user. Base station and attendant station users are each enabled to dial remote station directory numbers into a digit register. Digital pulse trains representing the registered remote station number are serially read into an idle remote station store of a content addressable memory. Additional pulse trains representing the digits of the base station number are serially read into a base station store



3,736,383

## MULTICUSTOMER CENTRALIZED CALL DIVERTER

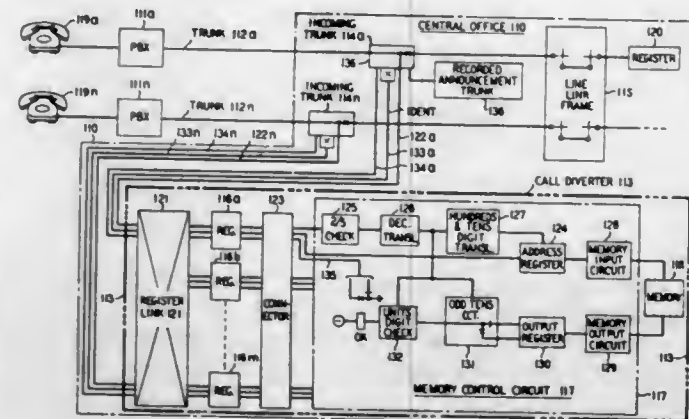
Theodore Le Baron, Oak Park, Ill., assignor to American Telephone and Telegraph Company, New York, N.Y.

Filed Oct. 28, 1971, Ser. No. 193,448

Int. Cl. H04m 3/38

U.S. Cl. 179-18 HA

9 Claims



A central office located call diverter for permitting a multitude of PBX (Private Branch Exchange) customers to restrict outgoing calls on PBX trunks. A diverter register registers the first three digits dialed over a diverter trunk on each outgoing call and a common memory control unit compares them with a customer selected and changeable repertory of allowed three-digit codes stored in a common memory. In response to the code comparison, the outgoing call is either terminated or allowed to be completed and all diverter equipment associated with the call is released to service another outgoing call.

3,736,384

## MULTIPLE CONNECTION DEVICE FOR A TELEPHONE UNIT

Yves Mevel, Gilcourt par Orrouy, and Yves Renaudin, Montigny-les-Cormelles, both of France, assignors to Societe Francaise Des Telephones Ericsson, Colombes, Hauts-de-Seine, France

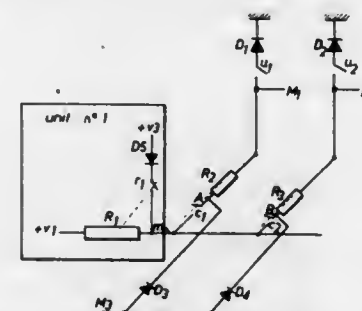
Filed Dec. 6, 1971, Ser. No. 205,097

Claims priority, application France, Dec. 8, 1970, 7044184

Int. Cl. H04q 3/42

U.S. Cl. 179-18 GE

4 Claims



Device for multiple connection of a primary telephone unit to at least two secondary units by means of relay type selectors namely intended to respectively interconnect primary and secondary wires of a telephone exchange, comprising a relay in said primary unit and a main line to which the inputs of said secondary units are parallel-connected, said inputs being connected to a line fed with a positive potential controlling said secondary units, said primary unit further comprising a contact connected to another positive potential intended to feed said main line when a second secondary unit is connected to said primary element without disconnecting an already connected secondary unit.

3,736,385

## STORAGE AND RETRIEVAL OF ANALOG INFORMATION WITH MAGNETO-OPTIC READOUT

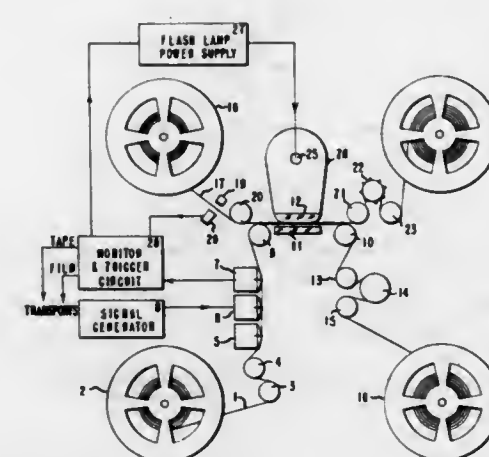
Robert K. Waring, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 1, 1971, Ser. No. 148,703

Int. Cl. G11b 11/10, 5/02

U.S. Cl. 179-100.2 CH

11 Claims



A method is disclosed for the storage and retrieval of analog information by magnetic recording of the information as a modulated carrier frequency on magnetic recording member such as magnetic tape followed by magneto-optic read out. The signal field from the tape is combined with a bias field constant with time and directed at an angle to the signal field from the tape so that a resultant field is produced for application to the magneto-optic surface which varies angularly with the intensity of the signal field. The direction of magnetization

of elements of the magneto-optic film can be varied transiently by the signal and bias field, or, with suitable framing techniques storage type transfer to suitable magneto-optic surfaces can be accomplished. Read-out of the pattern of magnetization on the magneto-optic surface with polarized light effects full wave rectification of the carrier frequency and recovery of the analog information.

3,736,386

## MEANS FOR SAMPLING TRANSMISSIONS IN TELECOMMUNICATION SYSTEMS

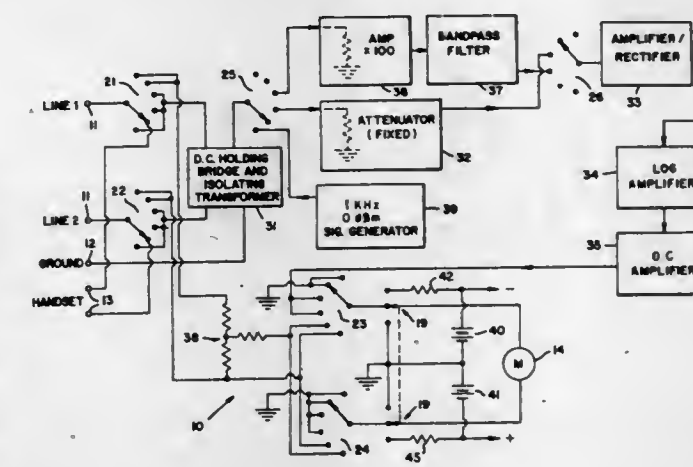
Delos W. Everton, San Jose, and David D. Mescham, Redwood City, both of Calif., assignors to Pearson Electronics, Inc., Palo Alto, Calif.

Filed Sept. 24, 1970, Ser. No. 75,153

Int. Cl. H04b 3/46

U.S. Cl. 179-175.3

6 Claims



A method of sampling transmissions in telecommunication systems including the steps of rectification and logarithmic amplification of the voltage present at a point in the system and application of such rectified and logarithmically amplified voltage to a linear voltage indicating device is disclosed. Apparatus for practicing the method and particular circuitry for use in such apparatus is described, which circuitry includes a half wave voltage rectifier circuit including a direct current feedback loop.

3,736,387

## METHOD AND ACCESSORY FOR TESTING THE SERVICEABILITY OF TELEPHONE CONDUCTORS

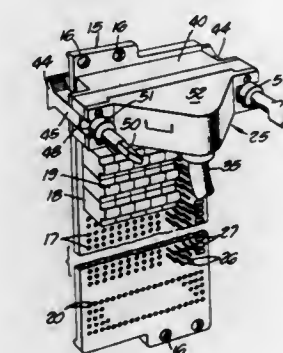
John T. Thompson, 244 Loring St., Los Angeles, Calif., and George W. Gillemot, 2331 20th St., Santa Monica, Calif.

Filed Dec. 14, 1970, Ser. No. 97,531

Int. Cl. H04m 3/22

U.S. Cl. 179-175

6 Claims



An improved accessory, technique and method for testing telephone conductors at a central station main frame equipped with terminal boards having a separate contactor for each conductor. The testing equipment is connectable to the



conductors terminating at any terminal board through a flexible patching cable provided at one end with a separate contact pin for each terminal board contactor and with manually operable clamping jaws for holding these pins assembled to the contactors. In larger installations the patching cable is made in separable sections, a plurality of one of these sections being permanently installed and selectively connectable to the test equipment using a mobile patching section to connect a terminal board to the adjacent end of the nearest end of the permanently installed sections.

3,736,388

# METHOD AND ACCESSORY FOR TESTING THE SERVICEABILITY OF TELEPHONE CONDUCTORS

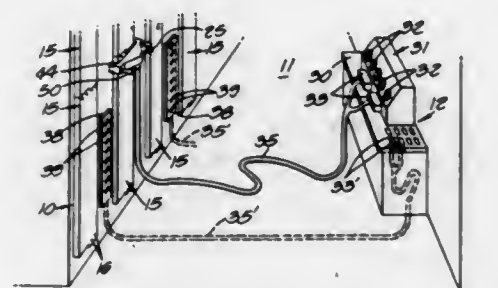
John T. Thompson, 244 Laning Street, Los Angeles, Calif., and George W. Gillemot, 2331 20th Street, Santa Monica, Calif. Division of Ser. No. 97,531, Dec. 14, 1970. This application

Dec. 27, 1971, Ser. No. 212,576

Int. Cl. H04m 3/22

U.S. Cl. 179-175

7 Claims



An improved accessory, technique and method for testing telephone conductors at a central station main frame equipped with terminal boards having a separate contactor for each conductor. The testing equipment is connectable to the conductors terminating at any terminal board through a flexible patching cable provided at one end with a separate contact pin for each terminal board contactor and with manually operable clamping jaws for holding these pins assembled to the contactors. In larger installations the patching cable is made in separable sections, a plurality of one of these sections being permanently installed and selectively connectable to the test equipment using a mobile patching section to connect a terminal board to the adjacent end of the nearest end of the permanently installed sections.

3,736,389

# CONTACT CONNECTION

Herbert Stroppel, Basel, and Zeljko Radovic, Sissach, both of Switzerland, assignors to Sybron Corporation, Rochester, N.Y.

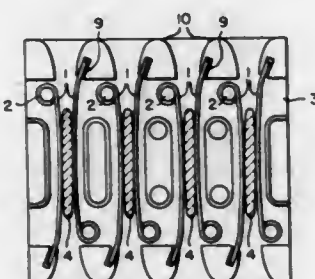
Filed Oct. 5, 1971, Ser. No. 186,643

Claims priority, application Germany, Dec. 31, 1970, P 20 64 688.2

Int. Cl. B60t 5/08

U.S. Cl. 191-48

2 Claims



Disclosed is a device for carrying an electrical signal to a moving trolley as the trolley moves past a fixed control station, the electrical contact at the control station being biased to

move transversally of the trolley track, and a pair of opposed contacts on the trolley which are biased together for engaging each side of the fixed contact as the trolley moves by the station, the leading portion of the moving contacts being shaped to funnel the fixed contact between them.

3,736,390

# ROTARY SWITCH ASSEMBLY WITH PRINTED CIRCUIT ROTOR AND MULTILAYER HOUSING FEATURES

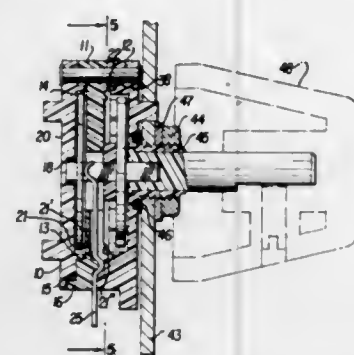
Joseph LaRue Lockard, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 10, 1971, Ser. No. 206,665

Int. Cl. H01h 19/58, 21/78

U.S. Cl. 200-11 DA

32 Claims



A rotary switch is provided which is adaptable for being stacked in multiple layers for multi-function use by a single control shaft. A printed circuit board and a brush member are supported in a dust-proof housing in contacting relation and means are provided for rotating one of the board and the brush relative to the other to any of a predetermined number of distinct positions. Additionally, the inputs and outputs of the switch are all aligned in a single plane.

3,736,391

# TIMING DEVICE WITH ADJUSTABLE CAM OPERATED MICROSWITCH ASSEMBLY

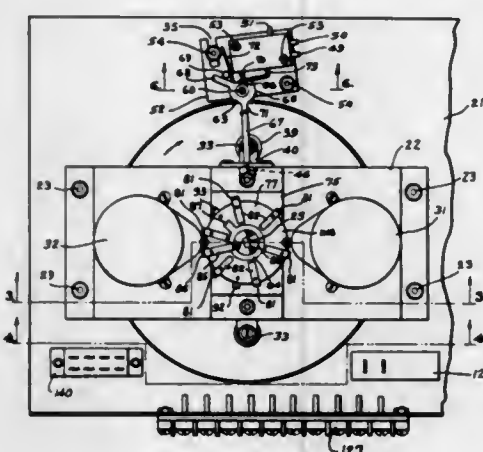
Lee Caviar, 705 E. 31st St., Kansas City, Mo.

Filed May 1, 1972, Ser. No. 249,201

Int. Cl. H01h 43/10

U.S. Cl. 200-38 R

6 Claims



A timing disk has switch controlling members mounted in a circular series about its axis of rotation and independently rotatable about their axes to adjust the position of a pin projecting laterally from a radially outwardly extending arm on each controlling member. The movable contact of a microswitch, biased toward a first position controlling a first motor for driving the disk, is movable into a second position controlling a second motor, driving the disk at a much slower speed than the first motor. A cam having an arcuate high por-

tion is rotatable about an axis out of the pin path and has a finger movable with it projecting into this path to rotate the cam through an arc dependent on how long the pin contacts the finger. A switch operating member holds the movable contact in its second position as long as a follower engaging the operating member engages the cam high portion. A spring rotates the cam to engage its low portion with the follower upon disengagement of the pin from the finger. A contact moving with the disk successively engages a circular series of stationary contacts concentric with the disk, each corresponding to a controlling member and each in the circuit of a different electrically operated valve. A ring contact concentric with and rotating with the disk has a gap and cooperates with a stationary contact to open both motor circuits upon completion of a rotation of the disk.

3,736,392

# DIRECTIONAL SIGNAL APPARATUS

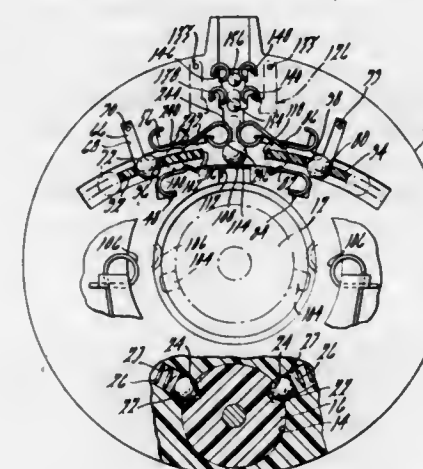
Robert M. Dyksterhouse, Blue Dot Farms, Rural Route 3, Charlevoix, Mich.

Continuation-in-part of Ser. No. 63,838, Aug. 14, 1970. This application July 15, 1971, Ser. No. 162,847

Int. Cl. H01h 3/16

U.S. Cl. 200-61.27

34 Claims



A switch which is mounted on the steering column of a vehicle and may be actuated to indicate either right or left turn information, right or left lane changing information or emergency information. The switch is transferred to the lane-change or turn mode by an actuator member which moves ball contact assemblies into various contact relations thereby making electrical contact to the various lights of the vehicle. The system also includes a circuit interconnecting the various lamps on the vehicle through a flasher, the energization of the lights being controlled by the turn signal switch. In one case a standard and emergency flasher are utilized and in the other case two standard flashers are utilized and a system is provided to short one of the lamps by means of the flasher thereby giving a sequential affect to the energization of the inboard and outboard lamps. Certain preferred modifications include a five-ball and three-ball switch.

3,736,393

# POSITIVE RETAINED ACTUATION SWITCH

Myron L. Apple, and Harold W. Hughes, both of Saint Joseph, Mich., assignors to The Bendix Corporation, South Bend, Ind.

Filed Dec. 13, 1971, Ser. No. 207,365

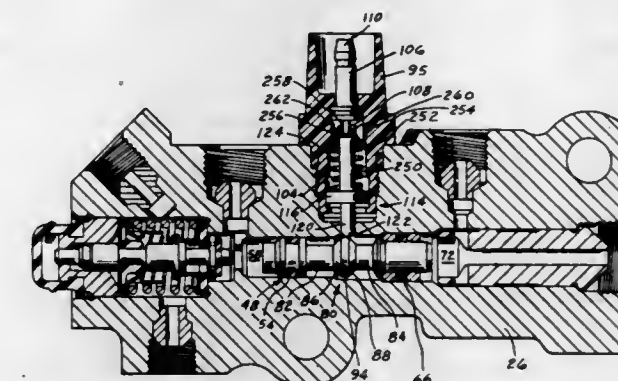
Int. Cl. H01h 35/38, 13/52

U.S. Cl. 200-82 D

2 Claims

A warning switch having a housing with a central cavity separated by a first piston and a second piston into a first chamber and a second chamber. The first chamber is con-

nected to a first pressure and the second chamber is connected to a second pressure. The first and second pistons are separated by a stem with an annular land section. The land section is flanked by annular ramps leading to a cylindrical section on the stem. A non-conductive body having a cylindrical bore is secured to the housing. A plunger member with an axial projection is located in the cylindrical bore and extends into the central cavity to contact the land section on the stem. A clip having a plurality of prongs is attached to the rear of the axial projection. A pressure differential between the first and



second chambers will move the first and second pistons toward the lower pressure chamber permitting the axial projection to move off the land section down the ramp to the cylindrical section on the stem. As the axial projection moves down the ramp in response to the resilient member, the clip engages the terminal to initiate an operational signal to a pressure differential indicator. Upon termination of the pressure differential, a resilient member holds the prongs in contact with the terminal until de-activated by equalized pressure in the first and second chambers returning the axial projection to the land section.

3,736,394

# CONDITION SENSING ASSEMBLY POSITIONED AS WASHER

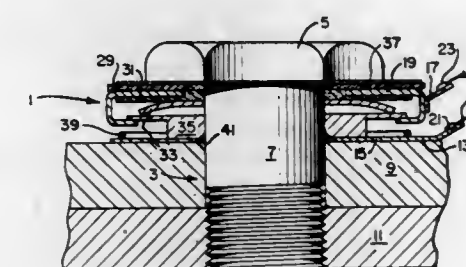
Don K. Rumbaugh, 1668 Los Altos Road, San Diego, Calif.

Filed Sept. 14, 1971, Ser. No. 180,284

Int. Cl. H01h 3/40

U.S. Cl. 200-158

6 Claims



A sensing element mounted like a washer having an outer fiber layer bonded to and insulating the flat, circular top surface of an upper metal sheet, which, in cross section, is hook shaped on opposite, outer sides. The other side of the upper metal surface is insulated by a bottom fiber layer. A circular Belleville spring washer contacts the bottom fiber layer on one side and a circular metal support structure on the other side. In cross section the support structure has an elongated vertical part extending from the shaft location outward, terminated by a flange which extends further under and to the end of the spring. The hook shaped part ends in the area under the flange. A point on the upper sheet is jointed to a tab to which an electrical lead is soldered. The bottom of the support is sweat soldered to a thin, circular metal sheet, the end of which at one point is jointed to a tab which extends past the top sheet and to which a second electrical lead is soldered. Upon



loosening of a nut or bolt with which the invention is used, the spring forces the upper and lower elements apart until the hook shaped part contacts the flange of the support, thereby completing an electrical circuit between the two leads which signals the loose condition.

3,736,395

## DIRECT-ACTION SWITCH

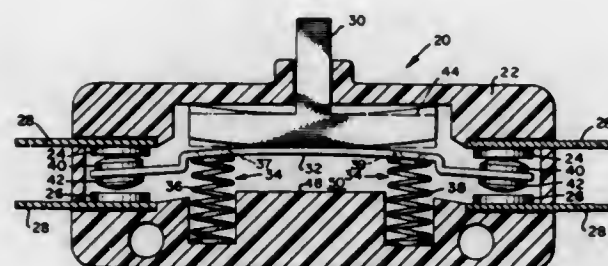
Edwin A. Miller, 11 Old Elm Road, Bridgeport, Conn.

Filed Feb. 3, 1971, Ser. No. 112,258

Int. Cl. H01h 3/12, 3/14, 13/64

U.S. Cl. 200—159 A

10 Claims



A movable blade incorporating conducting surfaces is disposed between an actuator and a biasing resilient fulcrum assembly, all of which are positioned within a housing. The movement of the actuator against the blade initially causes the blade to pivot about the fulcrum points of the fulcrum assembly. This pivoting movement causes the conducting end portions of the movable blade to increase the contact force with a first set of conductors mounted to the housing, creating a wiping contacting action. This causes an increasingly firm engagement between the conductors until the movement of the actuator prevents further pivoting and, instead, compresses the blade and the resilient fulcrum assembly sufficiently to wipingly break the initial contact, and move the conducting end portions of the blade into pressed contact with a second set of conductors mounted to the housing. When actuator pressure is removed, the biasing force of the resilient fulcrum assembly returns the blade and its conductors to their original position.

3,736,396

## MINIMUM FRICTION CONTACTORS

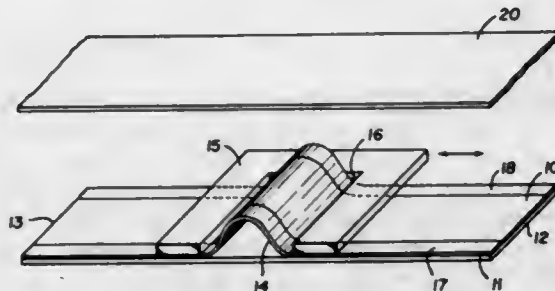
Henry Siegel, 3 Talbot Drive, Lake Success, N.Y.

Filed Aug. 6, 1970, Ser. No. 61,748

Int. Cl. H01h 1/16, 36/00

U.S. Cl. 200—166 BH

14 Claims



A device having a flexible ribbon member with conductive portions, selectively bulged or urged into contact with an adjacent cooperating unit having conductive portions. The location of the contact is controlled by an element or elements capable of translation parallel to the longitudinal axes of the ribbon and cooperating unit.

### 3,736,397 KEYBOARD SWITCH ASSEMBLY WITH PUSHBUTTON MAGNETIC LATCHING STRUCTURE FOR NON- OPERATIVE POSITION

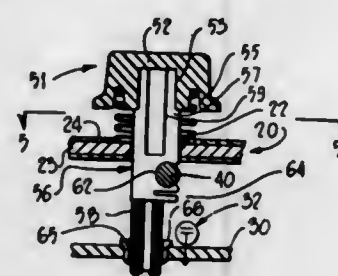
Egon A. Pedersen, Diablo, Calif., assignor to The Singer Company, New York, N.Y.

Continuation of Ser. No. 86,678, Nov. 4, 1970, Pat. No. 3,693,123. This application Jan. 24, 1972, Ser. No. 220,053

Int. Cl. H01h 3/20

U.S. Cl. 200—169 PB

10 Claims



A keyboard comprising a plurality of key assemblies mounted in a mounting member and a base member. Each key assembly is provided with a magnet which provides both a magnetic latching and an electrical switching action. The mounting member is constructed from a magnetic material having low magnetic remanence and is provided with an upper layer of resilient, foam material to provide key cushioning and a lower layer of resilient material to space the magnet from the mounting member. Each key assembly is also provided with a means for preventing formation of a vacuum between the bottom of an actuated key and the upper resilient layer of the mounting member.

3,736,398

### METHOD AND MEANS FOR CONTROLLING ELECTROMAGNETIC WAVE ENERGY LEAKAGE IN MICROWAVE OVENS

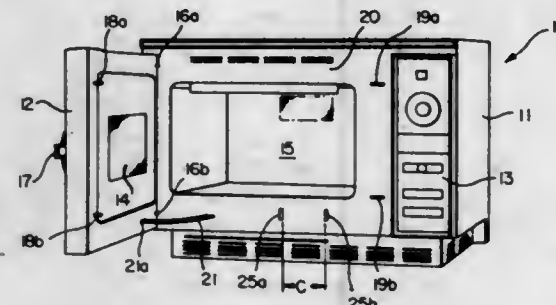
George A. Jarvis, Minneapolis, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Nov. 15, 1971, Ser. No. 198,802

Int. Cl. H05b 9/06

U.S. Cl. 219—10.55

2 Claims



A method and means for controlling electromagnetic wave energy leakage in microwave ovens. The hinges, latches, and other pairs of metallic protruding members that are located in proximity of the perimeter of the door of the microwave oven are separated by distance equal to a multiple of  $\frac{1}{2}$  wave lengths of the fundamental operating frequency of the magnetron. A method for preventing the escape of an excessive amount of electromagnetic wave energy from around the perimeter of the microwave oven door including the steps of monitoring the field of electromagnetic wave energy in the vicinity of the perimeter of the microwave oven door and mounting a pair of metallic reflective projections across the path of any excessive leakage of electromagnetic wave energy.

3,736,399

## ELECTROMAGNETIC WAVE ENERGY SEAL

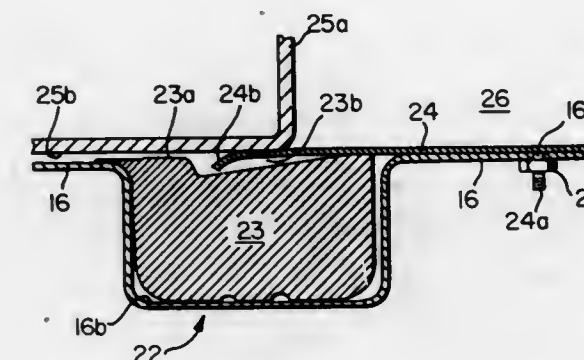
George A. Jarvis, Minneapolis, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Nov. 15, 1971, Ser. No. 198,803

Int. Cl. H05b 9/06

U.S. Cl. 219—10.55

15 Claims U.S. Cl. 219—98



An improved electromagnetic wave energy seal for microwave ovens which incorporates a continuous capacitive-type seal that cooperates with a continuous choke-type seal for preventing the escape of electromagnetic wave energy from the cavity of such microwave ovens. The capacitive-type seal is a flexible seal plate which abuts the surface defining the opening of the cavity of the microwave oven, and the choke-type seal is an irregularly shaped piece of dielectric material located within a metallic housing and having a concave portion which allows entry therein of the perimeter of the flexible seal plate.

3,736,400

### APPARATUS FOR DAMMING PIPE ENDS FOR WELDING

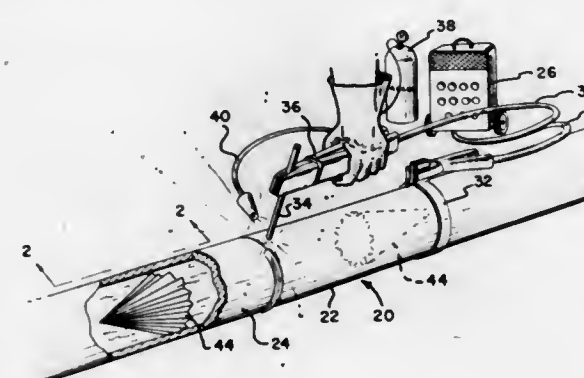
Jacob Spiegel, Philadelphia, Pa.; Albert Miller, Somerdale, N.J., and Irving Klukoff, Flushing, N.Y., assignors to Gilbreth Company, Philadelphia, Pa., by said Miller and Klukoff

Filed Aug. 31, 1971, Ser. No. 176,628

Int. Cl. B23k 9/02

U.S. Cl. 219—60 A

6 Claims



A method and apparatus for welding together a pair of pipe ends. The method comprises providing a water soluble dam at each pipe end, inserting an inert gas into the ends between the dams, welding the ends together and passing a fluid containing water through the pipe to dissolve the dam.

3,736,401

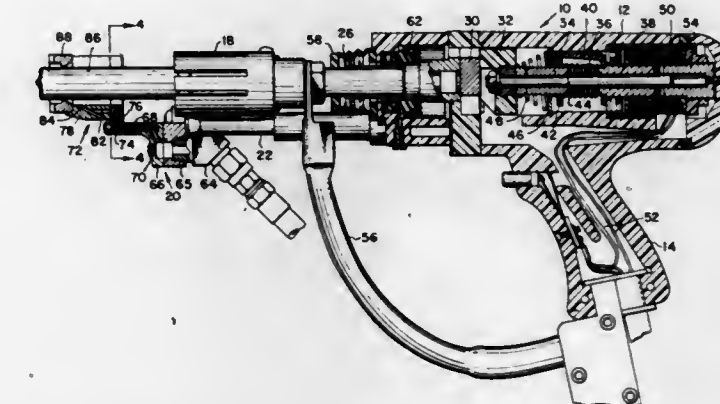
## THROUGH DECK WELDING

Thomas E. Shoup, Amherst, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed July 9, 1970, Ser. No. 53,368

Int. Cl. B23k 9/20

3 Claims



This invention is directed at a drawn-arc welding gun with means for providing a rotary flow of air, or stream of fluid, around the weld area. This invention is also directed at ferules which are designed to enhance movement of air or fluid around the weld area.

3,736,402

## AUTOMATED LASER TOOL

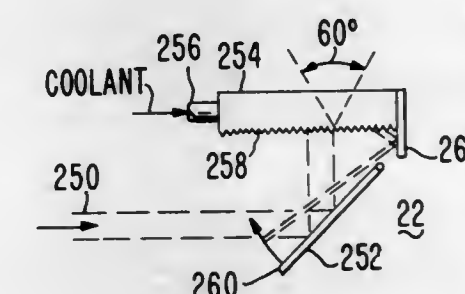
Wayne S. Mefford, Palo Alto, and Wendall C. Gates, Santa Clara, both of Calif., assignors to Coherent Radiation

Filed Sept. 17, 1970, Ser. No. 73,142

Int. Cl. H01s 3/00; B23k 9/00

U.S. Cl. 219—121 LA

4 Claims



An automated laser tool including a work table upon which a work piece is placed, a stationarily mounted laser, and optical means for directing the output beam from the laser along a controlled path to effectuate a cutting operation on the work piece.

3,736,403

### HANDHELD AUTOMATIC WIRE ELECTRODE TRANSPORT UNIT SUPPLIED WITH POWER FROM A SINGLE RECTIFIER UNIT

Laurence B. Rogers, Escondido; Malcolm A. Neumann, El Cajon, and Dwain K. Dolan, San Diego, all of Calif., assignors to Cubic Corporation, San Diego, Calif.

Filed Jan. 4, 1971, Ser. No. 103,393

Int. Cl. B23k 9/10

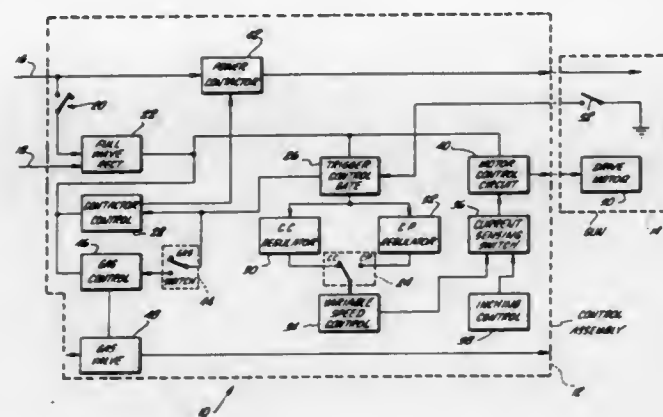
U.S. Cl. 219—131 F

8 Claims

A welding gun and control assembly is adapted to connect alternatively to constant potential or constant current power supplies for an arc welding operation. The gun assembly includes an internal drive motor which automatically advances the electrode wire. The control assembly, which requires only a single cable from the main power supply, provides power to



the drive motor and for welding, irrespective of the power supply. In alternative embodiments, the gun and control assemblies can be adapted to operate with a shielding gas, in



which case the cable connecting the gun assembly to the control assembly includes a gas hose. The gun assembly is then provided with a shielding gas cowl to enclose the bell portion of the gun.

3,736,404

### COMBINED DEMISTING AND DEFROSTING HEATING PANEL FOR WINDOWS AND OTHER TRANSPARENT AREAS

Paul Eisler, 57 Exeter Road, London, England

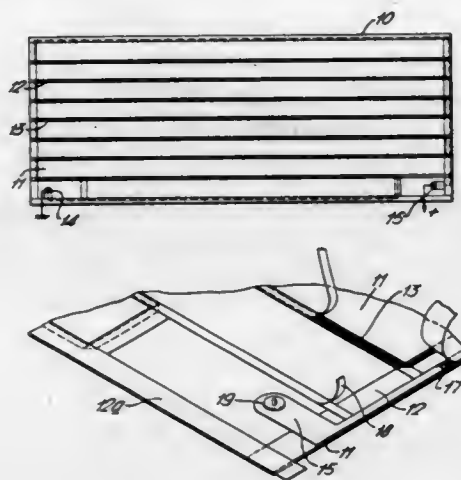
Filed Dec. 8, 1970, Ser. No. 96,218

Claims priority, application Great Britain, Dec. 18, 1969, 61,684/69; Jan. 29, 1970, 4,448/70; July 18, 1970, 34,971/70

Int. Cl. H05b 3/10

U.S. Cl. 219-203

12 Claims



Heater panel for application of heat to a transparent area, demisting and de-icing of vehicle rear windows. A panel form, adherent to the transparent area, has a transparent base of plastics material onto which there is made adherent a series of spaced parallel electrical solid conductor elements in meander form. The conductor elements are covered with an adhesive for ensuring sticking of them to the transparent area and to assist direct heat conduction to the transparent area. For variable rates of heating selective switching of series or parallel arrangements of the conductor elements is possible.

3,736,405

### ELECTRIC HEATERS

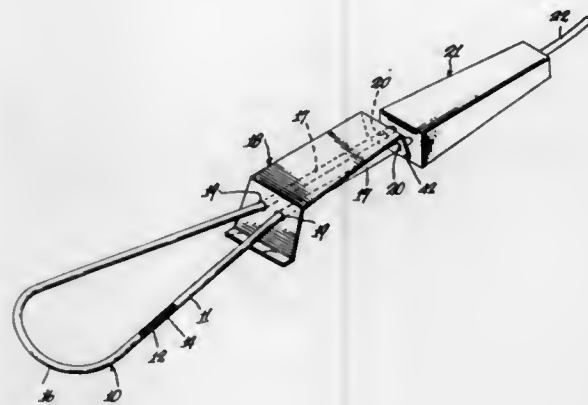
Charles E. Bryson, Jr., and Gary I. Barton, both of Murfreesboro, Tenn., assignors to Emerson Electric Co., Saint Louis, Mo.

Filed Nov. 24, 1971, Ser. No. 201,753

Int. Cl. F23q 7/22

U.S. Cl. 219-270

2 Claims



A sheathed electric heater, particularly of the charcoal lighter type, having a resistor within the sheath, terminal pins electrically connected to the ends of the resistor, and an insulated power supply cord having a pair of current conductors electrically connected to respective terminal pins, the improvement comprising a handle for the heating element which is formed of electric insulating material and molded around adjoining parts of the sheath and cord and extending unbroken therebetween to completely encapsulate such parts, the terminal pins extending from the sheath and the electrical connection between the terminal pins and the current conductors.

3,736,406

### THERMOGRAPHIC PRINT HEAD AND METHOD OF MAKING SAME

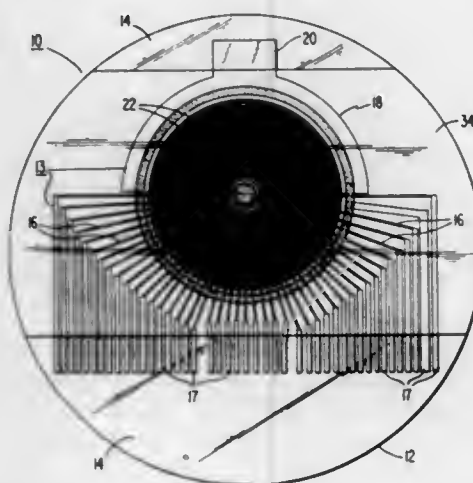
John Louis Vossen, Somerville, and John Joseph O'Neill, Belle Meade, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed June 21, 1972, Ser. No. 264,832

Int. Cl. H05b 1/00

U.S. Cl. 219-216

9 Claims



A thermographic print head for encoding labels on thermographic paper is made by a method of depositing, on an electrically insulating substrate, first and third layers of electrically conductive material separated by a second layer of insulating material. The first layer comprises a plurality of separated terminal leads, and the third layer comprises a plurality of

separated concentric ring conductors, each of which is connected to selected terminals of the first layer through vias in the separating second layer of electrically insulating material.

3,736,407

### AUTOMATIC RESETTING TIMER

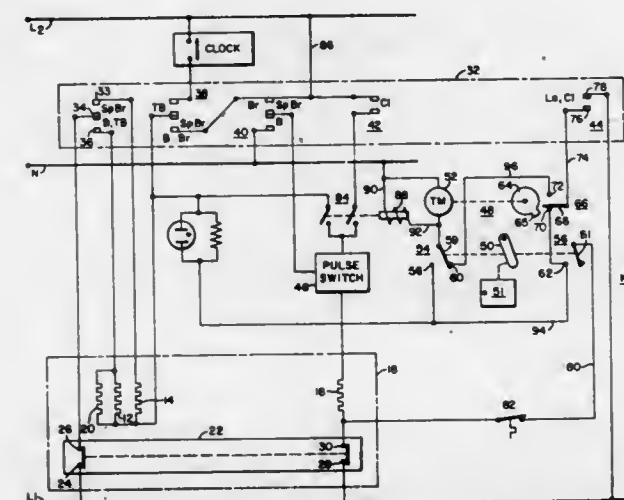
James A. Leach, Shelby, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 7, 1971, Ser. No. 187,433

Int. Cl. H05b 1/02

U.S. Cl. 219-492

4 Claims



An apparatus for timing the clean cycle of a self-cleaning pyrolytic range, terminating the clean cycle and resetting itself is disclosed. The timing device is actuated by movement of a door latch handle to latch position and is reset after a predetermined time by moving the door latch handle to its unlatched position. No undesired mechanical linkage is required that extends between the front and rear of the self-cleaning range when utilization of the circuitry disclosed is had.

3,736,408

### TAXI METER WITH AUTOMATIC RATE ADJUSTMENT

Herbert Klenze, Villingen, Germany; Walter Dellheim, Long Island City, N.Y., and Heinz Kelch, Buchenberg, Germany, assignors to Klenze Apparate GmbH, Villingen, Germany

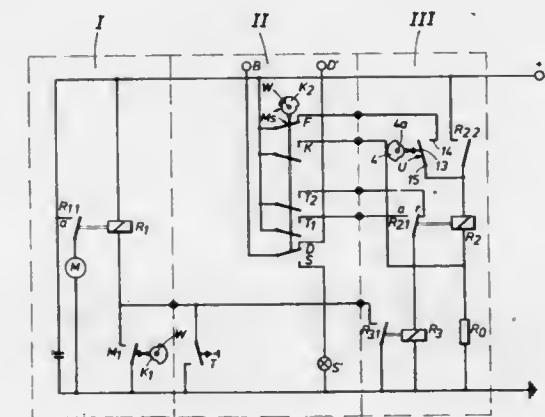
Filed July 23, 1971, Ser. No. 165,854

Claims priority, application Germany, July 25, 1970, P 20 37 048.3

Int. Cl. G07b 13/10

U.S. Cl. 235-30

9 Claims



A known taxi meter computes fares at a first rate at the start on each ride and at a second rate upon completion of a predetermined time or mileage. Interconnected with this automatically shifting taxi meter is a time switch which causes the taxi meter to advance to the second rate immediately upon activation at determined times of the day or during holidays.

3,736,409

### MANAGEMENT SYSTEM AND METHOD

Edwin A. Boyan, Riverside, Calif., assignor to Program Control Corporation, Van Nuys, Calif.

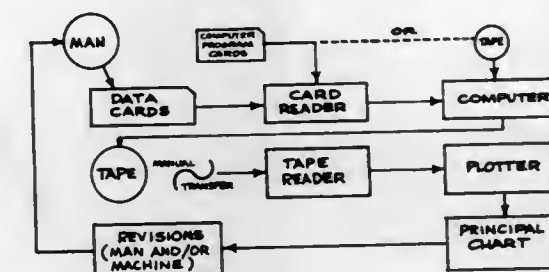
Continuation of Ser. No. 652,969, July 12, 1967, abandoned.

This application Jan. 11, 1971, Ser. No. 105,658

Int. Cl. G05b 15/00; G06f 15/00; G06k 15/00

U.S. Cl. 235-61.6 R

1 Claim



A system and process for managing a plurality of operations and activities of diverse characteristics which when completed result in the production of a complex physical system or object. The managing process comprises step procedures and activities, including man-machine procedures, which step procedures may in instances be independent and in others interdependent and may be in part at least partially concurrent in time. The system effectively optimizes the time-relationships and completions of the activities and correlated operations to bring the production of the physical system or object to a conclusion with optimum utilization of time at minimum expense, while during the production period admitting of changes in activities both as to content, operatives involved and time used and timing.

3,736,410

### HAND HELD APPARATUS FOR SENSING DATA BITS CARRIED ON A SHEET

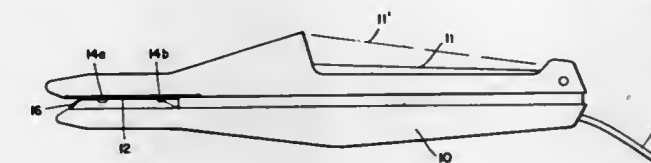
Evan L. Ragland, Atherton, and Robert D. Carlson, Danville, both of Calif., assignors to American Regitel Corporation, San Carlos, Calif.

Filed Dec. 6, 1971, Ser. No. 205,073

Int. Cl. G01n 21/30; G06k 7/14; H04m 1/26

U.S. Cl. 235-61.11 E

9 Claims



A compact, hand held punch-hole-code ticket reader includes a matrix of light emitting diodes lying in a plane with a substantially planar large area photo-voltaic detector of unitary construction juxtaposed, parallel and coextensive with the light emitting diodes. A ticket is inserted between the diodes and detector. The diodes are scanned or sequentially activated and the detector provides a serial data output.

3,736,411

### GRAPHICS DISPLAY SYSTEM

Carl W. Berndt, Danville, Calif., assignor to The United States of America as represented by the Atomic Energy Commission, Washington, D.C.

Continuation-in-part of Ser. No. 816,349, April 15, 1969, abandoned. This application May 17, 1971, Ser. No. 144,035

Int. Cl. G03b 29/00

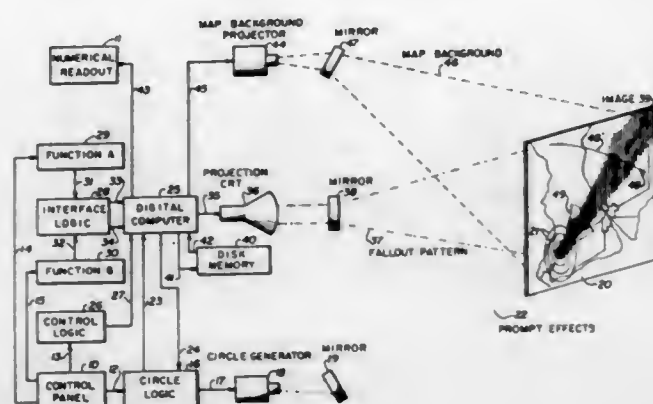
U.S. Cl. 235-151

7 Claims

A system for computing and displaying prompt and delayed effects of nuclear explosions with respect to a geographical



area. The display is based on various input parameters concerning the initial conditions under which an explosive is detonated. The display is a superposition of prompt effects, viz., blast, thermal effects, etc., represented by concentric circles; fallout, represented by a time varying growing and variegated mosaic pattern; and a map whose scale is controllable upon command, this being accomplished by three separate images simultaneously projected on a screen from three separate sources. A computer controls the display and makes changes on it, utilizing relationships which characterize nuclear effects as functions of time. The apparatus is useful for understanding, analyzing, demonstrating and predicting the effects of nuclear weapons.



ble upon command, this being accomplished by three separate images simultaneously projected on a screen from three separate sources. A computer controls the display and makes changes on it, utilizing relationships which characterize nuclear effects as functions of time. The apparatus is useful for understanding, analyzing, demonstrating and predicting the effects of nuclear weapons.

3,736,412

### CONVERSION OF BASE B NUMBER TO BASE R NUMBER, WHERE R IS A VARIABLE

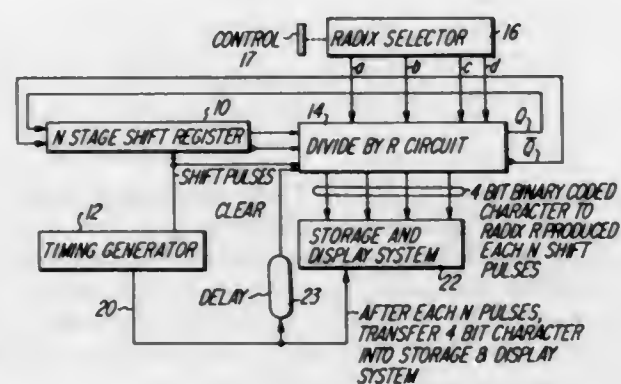
Carl Macey Wright, Cinnaminson, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 17, 1971, Ser. No. 143,863

Int. Cl. H04I 3/00

U.S. Cl. 235-155

1 Claim



A binary number stored in an N stage register is shifted a bit at a time, most significant bit first, into a serial divider. The divider is adjustable in the sense that it may be set to divide by any number R, where R is the radix of the number system into which the binary number is to be converted. The divider produces a quotient bit in response to each bit it receives and produces a multiple bit, binary-coded character to the new base after each N shift pulses. The quotient bits are shifted back into the least significant bit position of the register as they are produced.

### 3,736,413 PRE-CONDITIONED DIVISOR TRIAL QUOTIENT DIVIDER

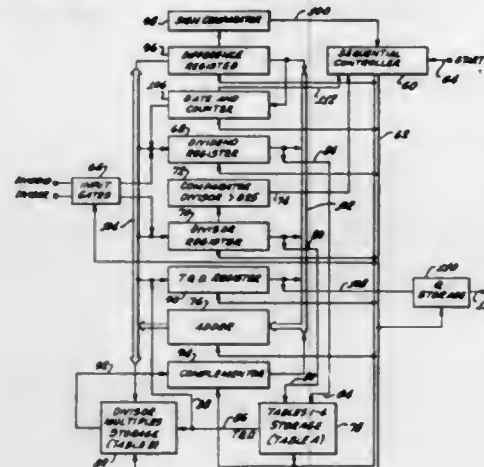
David E. Ferguson, Santa Monica, Calif., assignor to Program-matics, Inc., Los Angeles, Calif.

Filed Mar. 15, 1971, Ser. No. 123,968

Int. Cl. G06F 7/52

U.S. Cl. 235-156

6 Claims



A method and apparatus for performing division by selecting a trial quotient digit from a table derived from a consideration of only the leading digits of the dividend and divisor. The trial quotient digit is the maximum of a restricted range of possible quotient digits and is used to select a corresponding multiple of the divisor which is then tested by subtraction from the dividend. The trial quotient digit is subsequently adjusted if necessary. A basic apparatus and a computer program is also described to illustrate the implementation of the method by means of a digital computer. A table look-up procedure for obtaining the multiples of the divisor may also be used in a method of multiplication.

3,736,414

### TRANSVERSAL FILTER EQUALIZER FOR PARTIAL RESPONSE CHANNELS

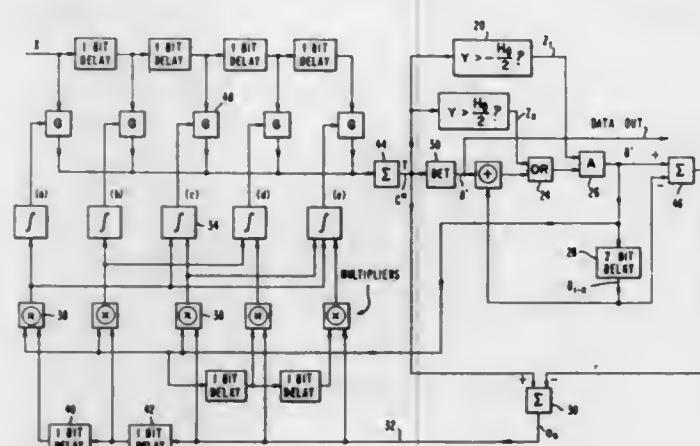
Gerald K. McAuliffe, Mahopac, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1971, Ser. No. 158,464

Int. Cl. H04b 3/14; G06g 7/19

U.S. Cl. 235-181

10 Claims



The present invention relates to a fast converging transversal filter equalizer for partial response channels including a multi-tap delay line. In the preferred embodiment the equalizer multiplies an error signal and a recreated signal as received by the equalizer. The multiplier outputs in turn feed integrators whose outputs represent correlation functions which control the gain from a series of delay line tap outputs.

the summation of the tap outputs comprising the output of the equalizer. In a further embodiment of the invention, the error signal is correlated with the tap outputs themselves and the outputs of the correlators control the tap outputs from the delay line to produce the final output signal in a different configuration.

3,736,415

### ELECTRIC ANALOG CALCULATING CIRCUITS

John Malcolm Morrison, Edinburgh, Scotland, assignor to Ferranti Limited, Hollinwood, England

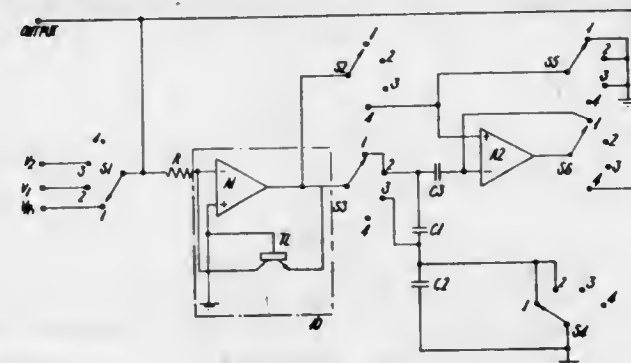
Filed Sept. 14, 1971, Ser. No. 180,308

Claims priority, application Great Britain, Sept. 19, 1970, 44726/70

Int. Cl. G06g 7/24

U.S. Cl. 235-193

5 Claims



An electric analog calculating circuit uses a single logarithmic stage for all steps of a calculation. Each input quantity is applied to the stage and the resulting output stored in a signal storage device. The stored quantities are then combined in the required manner and the logarithmic stage is used in the negative feedback path of a comparator to provide the required output quantity.

3,736,416

### LIGHTING SYSTEMS FOR ROAD VEHICLES

Alan Goodwin, 520 Hob Moor Road, Birmingham, England

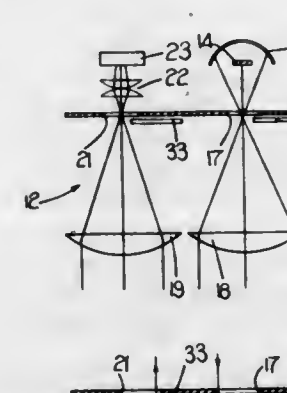
Filed Nov. 11, 1971, Ser. No. 197,864

Claims priority, application Great Britain, Nov. 14, 1970, 54,307/70

Int. Cl. F21v 11/18

U.S. Cl. 240-46.21

6 Claims



A lighting system for a road vehicle includes a projector for producing a well defined beam of light illuminating the road in front of the vehicle and a receiver including a light sensitive device for receiving light from a remote light source in front of the vehicle in use. The system includes a shutter movable in response to light received by the receiver, to cut off a sufficient amount of the projected beam to ensure that the projected beam does not fall on the remote light source, and the system includes a light directing arrangement for directing light from the projector into the receiver in the operative condition of the system where there is no remote light source in the field of view of the receiver.

### 3,736,417 LIGHTING FIXTURE

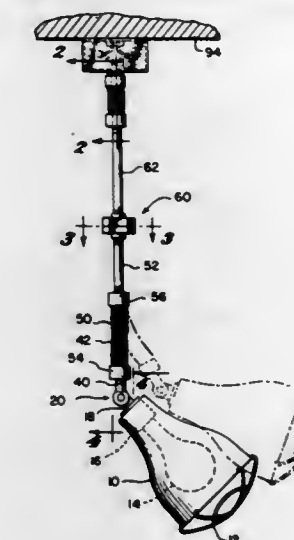
Charles S. Williams, 4013-49th St., Lubbock, Tex.

Continuation-in-part of Ser. No. 846,000, July 30, 1969, abandoned. This application July 27, 1970, Ser. No. 58,622

Int. Cl. F21s 1/00

U.S. Cl. 240-78 R

22 Claims



A light support portion is interconnected preferably through an adjustable joint to a lower spring means. The lower spring means is interconnected with an upper spring means by an intermediate relatively rigid means preferably a swivel joint connected at an intermediate point thereof. The upper spring means is attached to a support means. The upper spring means is shorter and more rigid than the lower spring means whereby the upper spring means mainly serves to absorb horizontal forces while the lower spring means absorbs both horizontal and vertical forces.

3,736,418

### SHADE FOR A LIGHT

Milada Havlova, nee Stribray, 114 Munich, Germany, assignor to Messrs. Vest Ges. m.b.H., Vienna, Austria

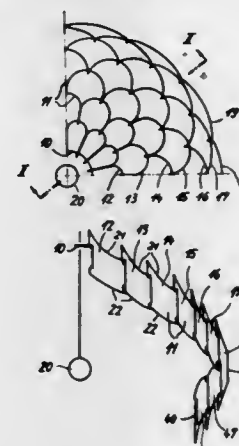
Filed Dec. 10, 1970, Ser. No. 96,842

Claims priority, application Germany, Dec. 13, 1969, P 19 62 694.9

Int. Cl. F21v 1/00

U.S. Cl. 240-108 R

13 Claims



Shade for a light consisting of laminar elements which are individually bent and arranged in a plurality of parallel rows. Each element is provided with hook-like projections at both opposite lateral edges and recesses displaced in relation to the hook-like projections. Each of the plurality of adjacent rows consisting of the elements is offset to a preceding row thus forming a three-dimensional shade body.



# 3,736,419 MAGNETORESISTIVE SENSING OF BUBBLE DOMAINS WITH NOISE SUPPRESSION

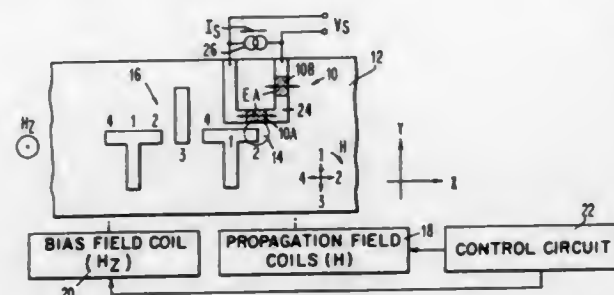
George S. Almasi, Purdy Station, and George E. Keefe, Montrose, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 26, 1971, Ser. No. 192,547

Int. Cl. G11c 11/14

U.S. Cl. 340-174 EB

24 Claims



A magnetoresistive sensing device for detection of cylindrical magnetic domains (bubble domains) in magnetic bubble sheets. Cancellation of noise due to fields (such as the propagation (drive) field) which intercept the sensing element is achieved by using two magnetoresistive sensing elements whose combined voltage (or current) output is constant in the absence of a bubble domain. In one sensing element, the measuring current through the element is substantially parallel to the magnetization direction of that element, while in the second element, the measuring current is substantially perpendicular to the magnetization direction of the second element. In a preferred embodiment, two sensing elements are electrically connected in series and the sum of their resistances is constant when the device is being operated, in the absence of domains. When a domain is present, the sum of the resistances is different, so the output of the device changes. Each sensor can be associated with a different information channel (or group of channels) in which domains are propagated.

# 3,736,420 SWITCH CONTROL ARRANGEMENT FOR RAILROAD CLASSIFICATION YARDS

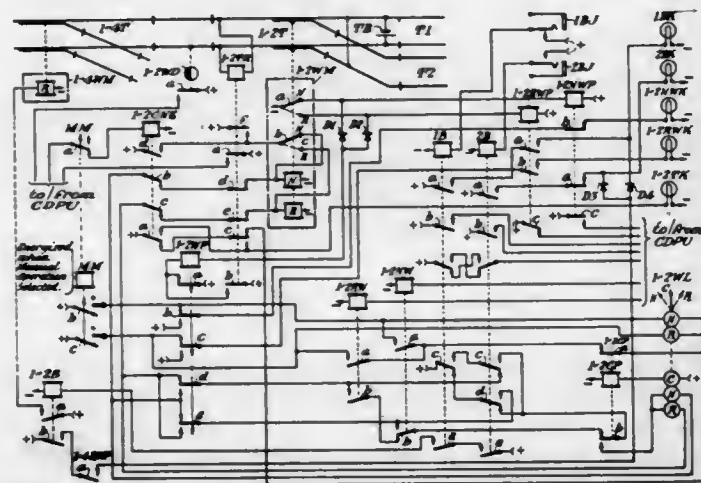
J. Calvin Elder, and William B. Dufer, both of Penn Hills Township, Allegheny County, Pa., assignors to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Sept. 13, 1971, Ser. No. 179,728

Int. Cl. B611 19/14

U.S. Cl. 246-182 AA

12 Claims



The central data processor controlling the automatic switching system also compares the initial axle count, registered when a car enters the yard, with the axle count for that car from a wheel detector in the approach to each switch

along the selected route. As long as the compared counts are not equal, the data processor holds energized an added detector relay. Back contacts of this relay interrupt the switch control circuit network to inhibit switch operation to the position selected for the next car, in the same manner as switch detector track circuit relay contacts are used. Thus the switch is locked against movement, not only when the associated track circuit is occupied but by lack of comparison between the axle counts if the track circuit is spanned, and full operating safety is maintained even with long cars. Blocking jacks for each storage track are provided in the track diagram on the yard control console. Insertion of a plug into a jack, to block further entry of cars in that track, activates a circuit network which bypasses and thus inhibits control of the key switch for that track by the data processor. Rather the key switch is positioned and held, overriding all other controls, to route all approaching cars away from the route to the blocked track or tracks.

# 3,736,421 DETERMINATION OF CRYSTALLINE SILICA AND OTHER MATERIAL DUSTS IN AIR

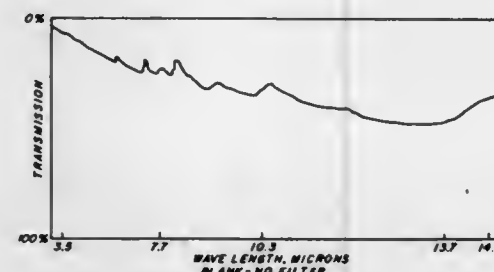
John P. Strange, Murrysville; Ray S. Freilino, Pittsburgh, and Paul W. McConaughy, Wilkinsburg, all of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed July 27, 1971, Ser. No. 166,494

Int. Cl. G01n 21/16, 31/00, 33/28

U.S. Cl. 250-43.5 R

6 Claims



According to the invention crystalline silica in the form of particles finer than 10 microns (respirable dust) in air, such as mine atmospheres, is determined by removing from the air particulate matter larger than 10 microns and then passing the air through a membrane filter to collect the residual particulate matter including respirable dust, if any. The filter with its adherent dust provides an analytical sample which is placed in one beam of a double-beam infrared spectrophotometer; an unused, clean membrane filter of the same material and size is placed in the other beam of the spectrophotometer as a reference, and the two beams are subjected to infrared radiation to produce a spectrum of the dust on the sample filter. The presence of respirable crystalline silica is shown qualitatively by the presence of twin peaks of the spectrum at 12.52, 12.82 microns.

In like manner the method of this invention may be applied to the determination of other crystalline minerals in the form of particles finer than the wave length of the infrared radiation, including other dusts hazardous to the health of workmen, including mixtures of such other crystalline minerals with one another or with silica. In most cases such other crystalline minerals will be finer than 20 microns although in some instances they may be finer than about 35 microns.

The various crystalline minerals possess, like crystalline silica, characteristic absorption peaks, which may be used to identify the minerals of a given sample, just as in the case of crystalline silica, and in general these identifying peaks have been reported in the literature of infrared mineral spectroscopy.

# 3,736,422 APPARATUS FOR IMPROVING THE SIGNAL INFORMATION IN THE ELECTRON BEAM EXAMINATION OF SAMPLE TOPOGRAPHY

Ulrich Weber, 7500 Karlsruhe 21, and Jurgen Gullasch, 6741 Minderslachen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

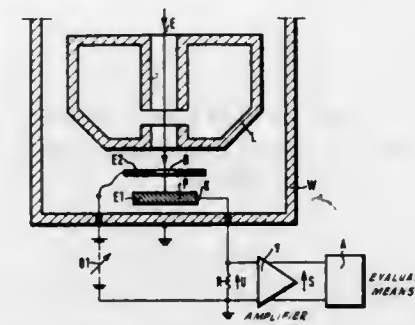
Filed Feb. 8, 1971, Ser. No. 112,919

Claims priority, application Germany, Feb. 7, 1970, P 20 05 682.0

Int. Cl. G01n 23/22

U.S. Cl. 250-49.5 PE

13 Claims



In order to enhance the current of secondary electrons flowing from a sample scanned by a primary electron beam, there are provided means to generate at the sample an electric field of such intensity and direction that a substantial portion of the secondary electrons emitted by the primary electron bombardment is drawn away from the sample surface. The electric field may be periodically varied. The sample current is applied to an image forming apparatus correlated to the scanning motion of the primary electron beam.

# 3,736,423 ELECTRON LENS OF MAGNETIC FIELD TYPE FOR AN ELECTRON MICROSCOPE AND THE LIKE

Shinjiro Katagiri, and Syozo Kasai, both of Hachioji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

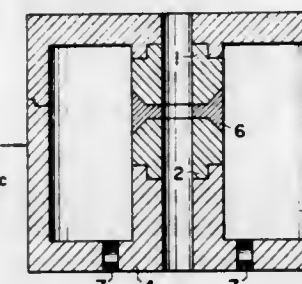
Filed May 12, 1971, Ser. No. 142,606

Claims priority, application Japan, May 13, 1970, 45/40630

Int. Cl. H01j 37/10

U.S. Cl. 250-49.5 D

12 Claims



An electron lens of the magnetic field type, wherein a plurality of compensating coils are installed in a magnetic cover for a lens coil and wherein compensating currents are supplied to said compensating coils, whereby astigmatism appearing in the lens and undesired deflection of an electron beam passing through the lens are compensated by adjusting said currents.

# 3,736,424 CORONA DISCHARGE DEVICE

Thomas F. Cecil, II, and Ronald V. Davidge, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 3, 1971, Ser. No. 204,464

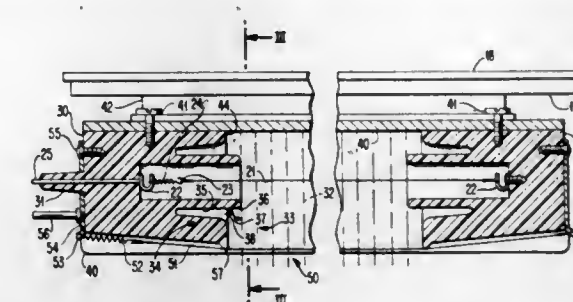
Int. Cl. H01j 37/00

U.S. Cl. 250-49.5 ZC

12 Claims

The continued performance of a charge corona for an electrostatic copy machine is enhanced by the provision of spe-

cially configured corona wire support blocks that minimize current leakage through hygroscopic salts accumulating on the support block surface. The support blocks are configured



to include a surface interruption that provides a cul-de-sac including surface which is shielded from the path of corona current and ionized gas thereby preventing accumulation of salts on the shielded portion.

# 3,736,425 SCREEN FOR ION IMPLANTATION

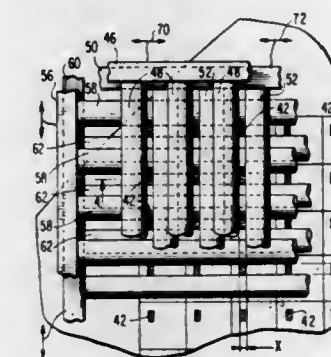
Fred Chernow, Boulder, Colo., assignor to Implama A.G. Z U G, Switzerland

Filed Mar. 27, 1972, Ser. No. 238,400

Int. Cl. H01j 37/00; G01n 23/00

U.S. Cl. 250-49.5 T

6 Claims



Ion implantation doping of a semiconductor wafer to form multiple integrated circuits is carried out by placing a variable opening mask between a large ion beam and the semiconductor wafer. The mask has a plurality of identical openings, one for each IC to be created, which may be varied in size by shifting the positions of elements which make up the mask. The elements are themselves masks having fixed openings. The relative movement of the elements causes a variation of the alignment of the several element masks to thereby vary the overall openings provided by the combination of the element masks.

# 3,736,426 METHODS OF AND APPARATUS FOR INSPECTING CRYSTALS

Albin R. Anderson, Lowell; Robert P. Grenier, Newburyport, both of Mass., and Peter R. Perri, Atkinson, N.H., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Mar. 1, 1972, Ser. No. 230,673

Int. Cl. G01n 23/20; H01j 37/20

U.S. Cl. 250-51.5

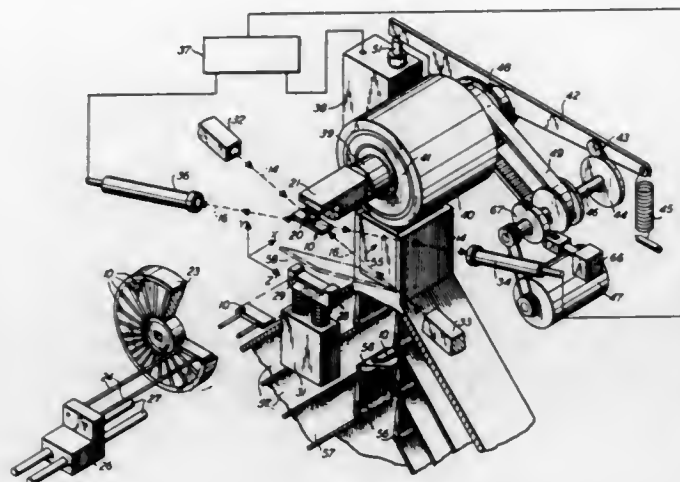
7 Claims

In order to determine the angular orientation of atomic planes in a crystal relative to a reference surface thereof, the crystal is inspected by an X-ray defraction technique in which a pair of X-ray beams are sequentially passed through the crystal from opposite directions while the crystal is rotated through a small arc and monitored for Bragg angle reflections. The two angles at which reflections occur are then averaged to



determine an average Bragg angle of reflection. This technique compensates for the situation in which the atomic

light in a direction perpendicular to the travel of said aircraft, detecting visible light emanating from said surface, and



planes of the crystal are completely oblique to the reference surface by cancelling component vectors of reflection introduced by the complete obliqueness.

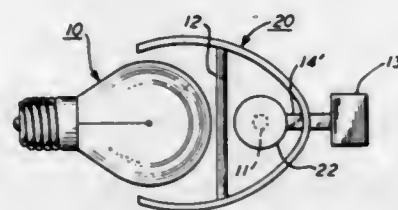
3,736,427

**SHORT WAVELENGTH FLUORESCENT LIGHT SOURCE**  
Robert W. Allington, Lincoln, Nebr., assignor to Instrumentation Specialties Company, Inc., Lincoln, Nebr.  
Division of Ser. No. 654,303, June 26, 1967, abandoned, which is a continuation-in-part of Ser. No. 590,071, Oct. 27, 1966, abandoned. This application July 24, 1970, Ser. No. 64,856

Int. Cl. G01n 21/38

U.S. Cl. 250-71 R

12 Claims



Devices providing 270-320  $\mu$  and preferably 280  $\mu$  fluorescent light are described in which a primary source of shorter wavelength light is incident upon an elongated thallium-activated alkali halide fluorescent crystal having rounded ends serving as lenses to collimate fluorescent light emanating from said ends. Methods and means are also described for prolonging the useful life of the fluorescent crystal, including optical means for filtering out the deleterious wavelengths of the light from the primary source, means for dissipating heat from the crystal to reduce its degrading effect, and a method and means for cleaning and maintaining the crystals free of surface contamination adversely affecting its fluorescent properties.

3,736,428

#### DETECTING WITH ULTRAVIOLET LIGHT

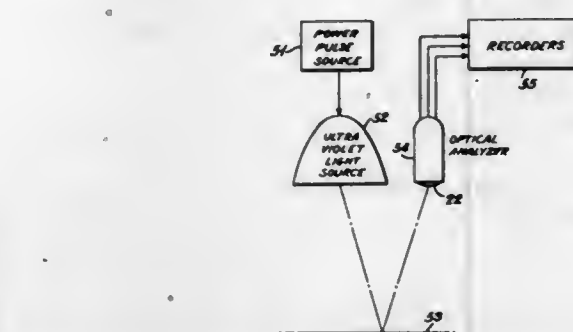
John N. Monroe, Waco, Tex., assignor to Thompson Ramo Wooldridge Inc., Euclid, Ohio  
Continuation-in-part of Ser. No. 628,824, Dec. 17, 1956, abandoned. This application Mar. 27, 1958, Ser. No. 724,473

Int. Cl. G01n 21/00

U.S. Cl. 250-71 G

6 Claims

1. A method of detection in the presence of ambient light comprising the steps of beaming a source of ultraviolet light pulsed at a predetermined frequency upon a surface under scrutiny from an aircraft, scanning the beam of ultraviolet



eliminating the effect of light whose intensity varies at a rate below said predetermined frequency from light detected in said step of detecting visible light.

3,736,429

#### RANDOM SOURCE INTERROGATION SYSTEM

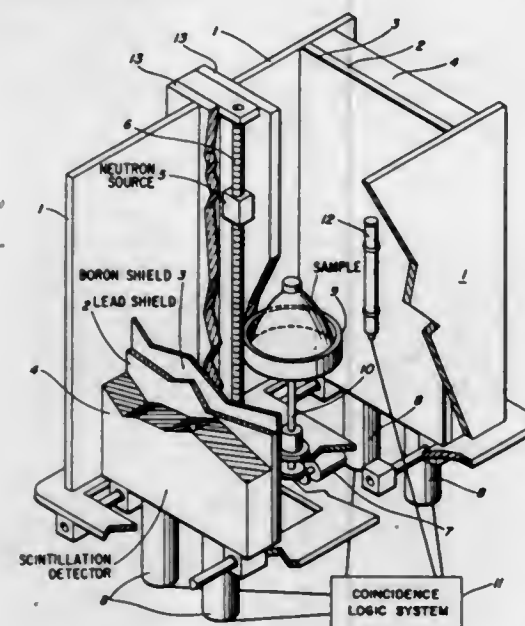
John E. Foley, Los Alamos, N. Mex., assignor to The United States of America as represented by The United States Atomic Energy Commission

Filed June 28, 1972, Ser. No. 266,961

Int. Cl. G01j 39/18

U.S. Cl. 250-71.5 R

6 Claims



A system to assay fissionable material comprising a sample container, a neutron source of americium-lithium, lead shielding, a plastic scintillator neutron detector using fast photomultiplier tubes electrically connected to a coincidence logic system, and rotating the sample by any well known means along with varying the position of the said neutron source.

3,736,430

#### POSITION INDICATING SYSTEM AND METHOD THEREFOR

Rimvydas Kaminskas, 312 Camino de Las Calinas, Redondo Beach, Calif., granted to United States Atomic Energy Commission under the provisions of 42 U.S.C. 2182

Filed Oct. 23, 1969, Ser. No. 868,704

Int. Cl. G01t 1/16

U.S. Cl. 250-83.3 R

25 Claims

An aircraft landing system based upon two or more beams of nuclear radiation. Each beam is shaped to conform to a desired pattern and is frequency modulated for identification and comparison purposes. Overlapping of two beams provides a spatial plane to serve as one reference such as a glide slope. A second pair of overlapping beams aligned substantially per-

pendicular to the first reference provides a second spatial plane to serve as a second reference such as a localizer beam.



Appropriate circuitry aboard approaching aircraft is provided to determine the position of the aircraft with respect to the two reference beams.

3,736,431

#### SYSTEM FOR MONITORING A FLUID STREAM

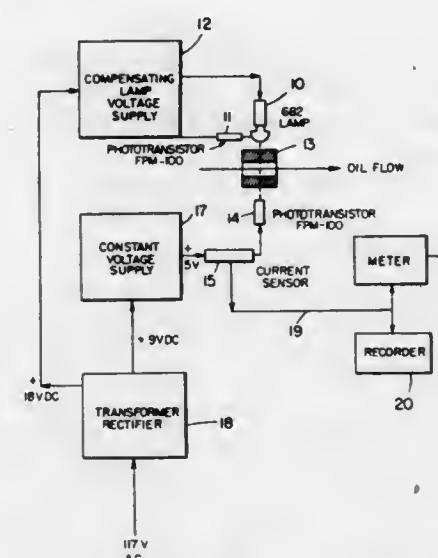
Elbert B. Childs, Hastings-on-Hudson, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 30, 1971, Ser. No. 139,121

Int. Cl. G01n 21/26; G08b 21/00; G01j 1/32

U.S. Cl. 250-205

7 Claims



The specific disclosure provides a device which includes a circuit having a pair of phototransistors. One of the phototransistors senses the amount of light transmission from a light source through an oil chamber. The other phototransistor is in direct optical communication with the light source, and generates a signal in response to ambient temperature which is used as a basis for adjusting the intensity of light emitted by the light source. A diminution of light transmission through the chamber is indicative of a degradation of the oil therein.

3,736,432

#### BACTERIAL COLONY COUNTING METHOD AND APPARATUS

Richard G. Sweet, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Mar. 22, 1971, Ser. No. 126,778

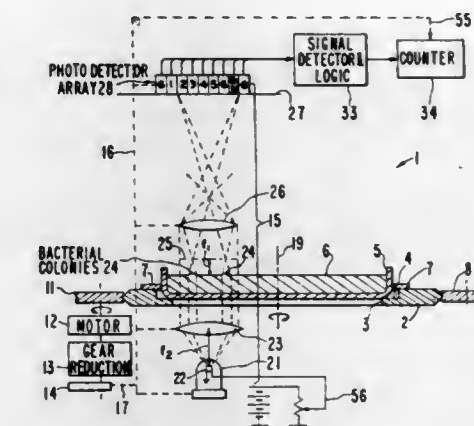
Int. Cl. G06k 7/00

U.S. Cl. 250-222 PC

7 Claims

Light from a localized source is projected through a transparent bacterial culture medium having a multitude of bacterial colonies formed on the surface thereof. The bacterial colonies serve as lenses for focusing images of the light source into

a pattern of images which are projected into an image plane forming a pattern of light images corresponding to the pattern of bacterial colonies. A linear array of photodetectors is disposed in the projected image plane. The optical system is scanned relative to the bacterial colony culture such that adjacent scanning tracks overlap each other by approximately



the track width of two photodetectors of the array of photodetectors. An output pulse, which is to be counted, from one detector inhibits counting output pulses from its nearest neighbors and the output pulses from the detectors at opposite ends of the array are not counted to form guard detectors, whereby colonies are accurately counted and colonies which overlap adjacent scanning tracks are counted but only once.

3,736,433

#### DIAGNOSTIC UNIT

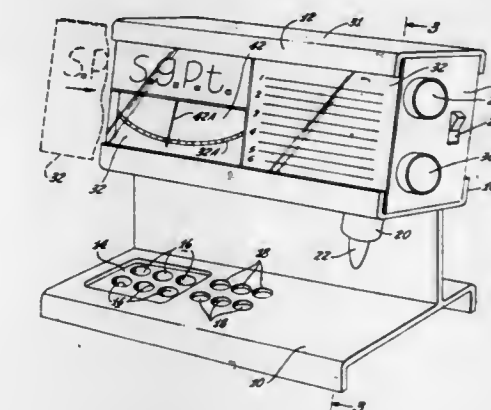
Forrest Wm. Davis, Altadena, and Lamont J. Seltz, Huntington Beach, both of Calif., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

Continuation of Ser. No. 809,318, March 21, 1969, abandoned. This application July 6, 1971, Ser. No. 160,044

Int. Cl. G01n 21/26

U.S. Cl. 250-218 R

1 Claim



An improved probe photometer type of diagnostic unit is provided which includes a light source, a probe having light transmitting means for conducting light from the source and a photocell light receiving means spaced therefrom, an electronic amplifying circuit electrically connected to the output of the photocell and an electric meter connected to the output of the amplifying circuit, and a transparent removable slide member which is inserted into the unit for a particular test, providing a scale for the meter so that it may indicate direct readings corresponding to the particular test being conducted.



3,736,434

**FAIL-SAFE ELECTRONIC COMPARATOR CIRCUIT**

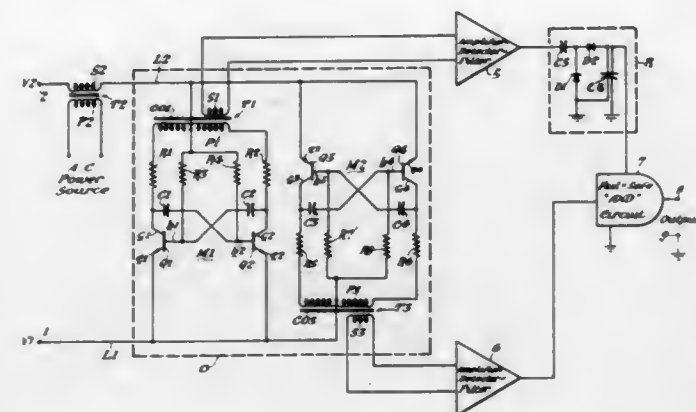
John O. G. Darrow, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed June 7, 1971, Ser. No. 150,550

Int. Cl. H03k 5/20

U.S. Cl. 307—235 R

17 Claims



This disclosure relates to a fail-safe comparator circuit having a pair of free-running multivibrators powered by two separate d.c. supply voltages. An a.c. modulating signal is coupled to the multivibrators for alternately pulsing the multivibrators into conduction. An amplifier-detector-filter circuit is coupled to each of the multivibrators for amplifying and demodulating the signals produced by the multivibrators. A rectifier network is coupled to one of the amplifier-detector-filter circuits for producing a d.c. voltage. The d.c. voltage and the demodulated signals of the other amplifier-detector-filter circuit are coupled to a fail-safe "AND" gate so that a periodic output signal is passed by when and only when the two d.c. supply voltages are in agreement and no critical component or circuit failure is present.

3,736,435

**ARRANGEMENT FOR PREVENTING THE LOCKING OF WHEELS OF MOTOR VEHICLES**

Detlev Runge, Gerlingen, and Werner Gotz, Monsheim, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

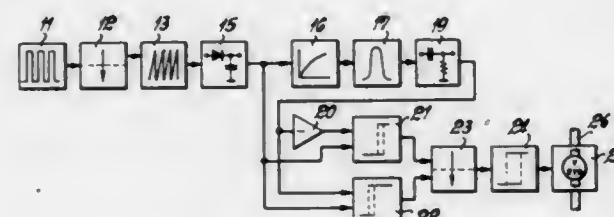
Filed Dec. 21, 1971, Ser. No. 210,400

Claims priority, application Germany, Dec. 28, 1970, P 20 64 067.9

Int. Cl. B60t 8/10

U.S. Cl. 307—10 R

27 Claims



A D.C. voltage of amplitude inversely proportional to vehicle speed is directly applied to the second inputs of a first and second comparator stage. The D.C. voltage is also applied to a logarithmic circuit and then differentiated. The output of the differentiator is applied to the first input of the second comparator stage and further, through an inverter, to the first input of the first comparator stage. The outputs of the comparator stages control, through a switching amplifier, the operation of an electrically operated pressure decreasing brake valve.

3,736,436

**ELECTRET PRESSURE TRANSDUCER**

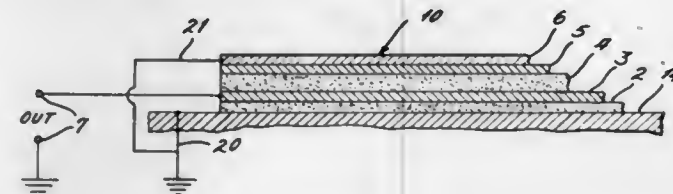
Roger C. Crites, Florissant, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Nov. 4, 1971, Ser. No. 195,750

Int. Cl. H01g 7/02; H04r 19/00

U.S. Cl. 307—88 ET

7 Claims



An electret pressure transducer consisting of a very thin insulating coating applied to the surface of a body to be investigated when under stress, a thin layer of conductive paint or metallic deposit configured to extend over the area to be investigated, a layer of a solid elastic material, the electret-film containing a permanent electric charge, and a metallic deposit on the electret film. The layer of conductive paint and the metallic deposit constitute the two plates of a parallel-plate capacitor, and the elastic material in conjunction with the electric charge provided by the electret determines the sensitivity, linearity, and frequency response of the transducer.

3,736,437

**VACUUM SWITCH APPARATUS**

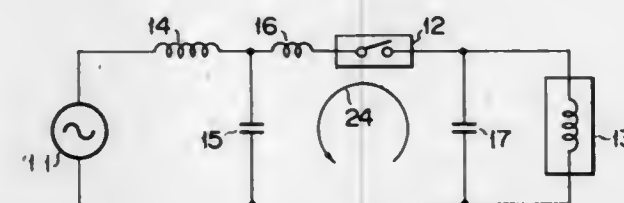
Akira Nabae, and Mikio Okawa, both of Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Jan. 12, 1971, Ser. No. 105,933

Int. Cl. H01f 27/42

U.S. Cl. 307—93

7 Claims



A vacuum switch apparatus comprising a vacuum switch having a pair of electrodes, and a series circuit consisting of a resistor and capacitor disposed between one of said electrodes and ground to suppress the oscillation of abnormal voltage generated at the opening of said switch. The resistor preferably has a value of 100 ohms and the capacitor preferably has a value of 0.1  $\mu$ F.

3,736,438

**APPARATUS FOR SEQUENTIALLY ENERGIZING ELECTRICAL UTILIZATION DEVICES**

Thomas C. Matty, and Robert H. Perry, both of East Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 29, 1971, Ser. No. 167,139

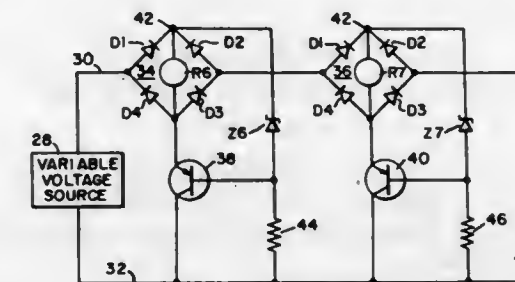
Int. Cl. H01b 47/00

U.S. Cl. 307—130

3 Claims

Apparatus for energizing in sequence each of a plurality of electrical utilization devices, such as relays, with the use of

reverse voltage breakdown elements. The invention finds particular, but by no means exclusive, utility in the control of



vehicles in a train of vehicles, each of which is driven by its own separate drive motor means (e.g., a subway train).

3,736,439

**CURRENT-LIMITING SWITCH EMPLOYING LOW TEMPERATURE RESISTOR**

Fritz Kesselring, Kunsnacht, Switzerland, assignor to Siemens Aktiengesellschaft, Berlin and Munchen, Germany Division of Ser. No. 39,040, May 20, 1970, Pat. No. 3,617,807.

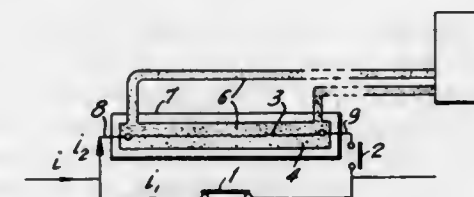
This application July 22, 1971, Ser. No. 165,310

Claims priority, application Germany, May 23, 1969, P 19 26 972.8

Int. Cl. H02h 7/22

U.S. Cl. 307—135

3 Claims



A circuit interrupter is provided with a parallel-connected resistor which is cooled to a temperature of from 4° K to 80° K, but higher than the critical temperature of the resistance material. The resistor is connected in parallel with the circuit interrupter contacts at either an arbitrary time or just prior to a current zero value. The heating of the resistor during current-limiting operation increases its resistivity by about 100 times.

3,736,440

**CIRCUIT BREAKER**

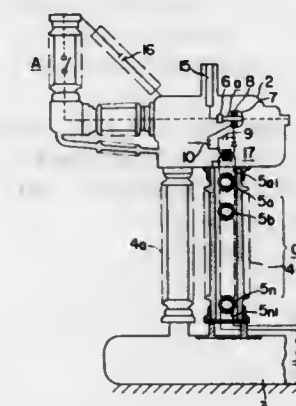
Yoshio Nitta; Nobuaki Kiyokuni, and Kikuo Kawasaki, all of Kawasaki, Japan, assignors to Fuji Denki Seizo Kabushiki Kaisha, Kanagawaken, Japan

Filed Oct. 8, 1971, Ser. No. 187,783

Int. Cl. H01b 3/26

U.S. Cl. 307—140

8 Claims



Disclosed herein is a circuit breaker comprising as its constructive elements, an insulation transformer adapted to

supply an electric power from the ground potential portion to a control device placed on a high potential portion, or a current transformer connected to a line potential portion, a stray capacity of the insulation transformer or current transformer being skillfully utilized whereby measurement or observation of a system voltage can be readily achieved without use of a separate capacitor type potential divider for measuring a voltage between contacts of the circuit breaker.

3,736,441

**GALVANO-MAGNETRO EFFECT APPARATUS**

Noburu Masuda, Kawaguchi, and Masai Kuroyanagi, Tokyo, both of Japan, assignors to Denki Onkyo Co., Ltd., Tokyo, Japan

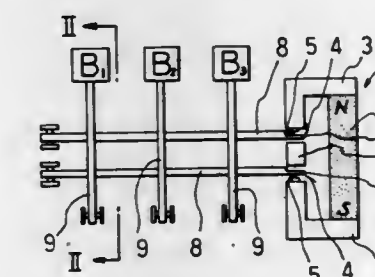
Filed May 10, 1972, Ser. No. 252,090

Claims priority, application Japan, May 12, 1971, 31760/71

Int. Cl. H02j 3/00

U.S. Cl. 307—149

12 Claims



A galvano-magnetron effect apparatus, wherein a plural number of gaps are formed in a direction at a right angle to the direction of a magnetic flux flowing in a looped magnetic path, galvano-magnetron effect devices are fixedly provided in said gaps, magnetic pieces which move in a direction at a right angle to the direction of the magnetic flux are provided in said gaps and said galvano-magnetron effect devices are selectively operated by actuating said magnetic pieces with a selecting means.

3,736,442

**REGENERATIVE SWEEP CIRCUITS USING FIELD EFFECT TRANSISTORS**

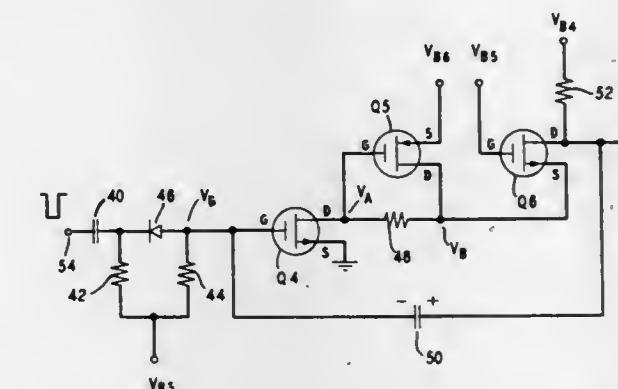
Steven Gary Miller, Highlands, N.J., and Leonard Strauss, New York, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., by said Strauss

Filed June 16, 1971, Ser. No. 153,735

Int. Cl. H03k 4/08

U.S. Cl. 307—228

22 Claims



Regenerative sweep circuits for developing a Miller sweep output voltage are disclosed. Three circuits are utilized, each employing three connected field effect transistors which interact in response to a trigger pulse to switch the circuit from a steady state into a Miller sweep region and then, after a preselected period of time, to switch the circuit automatically back to its steady state.

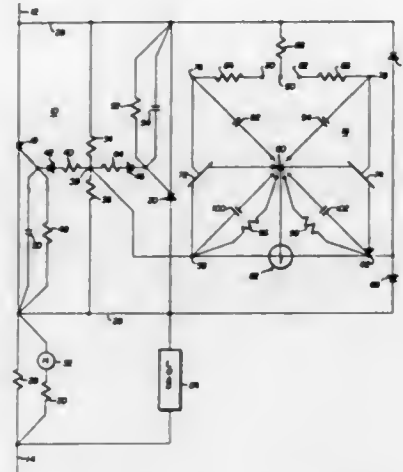


### 3,736,443 TRIGGER CIRCUIT

Lewis G. Striggow, 1115 Marion Drive, Holly, Mich.  
Filed May 16, 1968, Ser. No. 729,704  
Int. Cl. H03k 17/00

U.S. Cl. 307—252

2 Claims



A trigger circuit is disclosed which is particularly useful in controlling the conduction of a switching or relay circuit utilizing silicon controlled rectifiers. The relay circuit includes two silicon controlled rectifiers connected in inverted parallel relation with a common gate resistor network. The trigger circuit is connected to the gate resistor network and includes a silicon unilateral switch and a control network. When the silicon unilateral switch is conducting, the relay circuit is turned off, and when the silicon unilateral switch is non-conducting, the relay circuit is turned on. The control network of the trigger circuit can be connected to provide several functions such as sensitivity control, momentary-on and momentary-off control, locking of the on and off conditions and touch control.

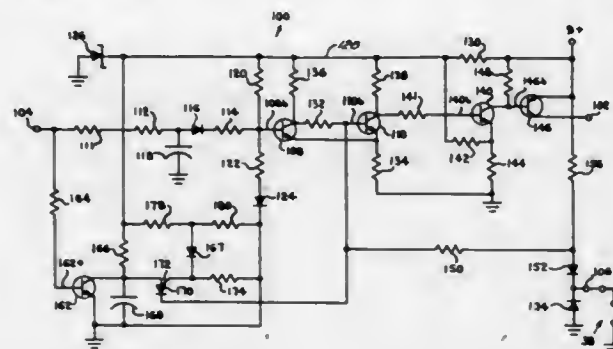
### 3,736,444

#### A CIRCUIT FOR CONTROLLABLY DRIVING A SCHMITT TRIGGER IN RESPONSE TO PRESELECTED VARIATIONS IN AN ANALOG INPUT SIGNAL AND IN A DIGITALIZED INPUT SIGNAL

David G. Luchaco, Horseheads, N.Y., assignor to The Bendix Corporation, Southfield, Mich.  
Division of Ser. No. 183,907, Sept. 27, 1971. This application Oct. 29, 1971, Ser. No. 193,824  
Int. Cl. H03k 3/26

U.S. Cl. 307—290

5 Claims



A circuit is disclosed for controllably driving a Schmitt trigger in response to variations in both an analog and a digitalized input signal. A Schmitt trigger normally comprises a pair of electronic devices, each of the devices having a control electrode. The circuit of the present invention applies the analog signal to one of the control electrodes and applies the digitalized signal to the other of the control electrodes. The

control electrodes of the Schmitt trigger are biased by voltage divider means so that the electronic device whose electrode is receiving the analog signal is normally in the nonconducting or "off" condition while the electronic device receiving the digitalized information is normally in the conducting or "on" condition. A portion of the digitalized signal is derived by suitable switching means from the input analog signal.

### 3,736,445

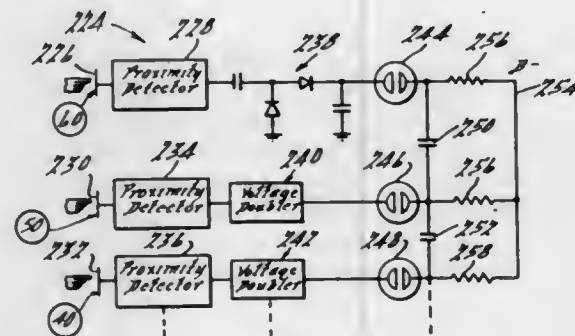
#### PROXIMITY DETECTOR

Truman Ted Van Sickle, Saline, Mich., assignor to Medar, Inc., Ann Arbor, Mich.

Filed Jan. 12, 1970, Ser. No. 2,021  
Int. Cl. H03k 17/00

U.S. Cl. 307—308

2 Claims



A proximity detector having a plate for receiving electromagnetic radiation coupled from a source thereof by a human member or the like and a field effect transistor for detecting coupled energy above a threshold level and providing an amplified output signal in response thereto. The proximity detector may be used as an on-off switch by incorporating a bistable circuit operated by the amplified output signal, and an electronic switch responsive to the two stable states of the bistable circuit.

A dimmer control having a proximity detector as described above in combination with an operational amplifier for yielding an output signal representative of the time that electromagnetic energy above a threshold level is coupled to the receiving plate, and a control circuit for adjusting its output power level in accordance with the level of the output signal from the operational amplifier.

A circuit for selecting one of a plurality of parameters and automatically cancelling all previous selections having a proximity detector as described above for each parameter in combination with a glow discharge tube receiving the output of the respective proximity detectors. The glow discharge tubes are coupled at their output by capacitors so that the energization of one automatically deenergizes the other glow discharge tubes.

### 3,736,446

#### PIEZOELECTRIC TRANSFORMER

Don A. Bertinocourt, Chagrin Falls, and Lawrence S. Sliker, Shaker Heights, both of Ohio, assignors to Vernaltron Corporation, Bedford, Ohio

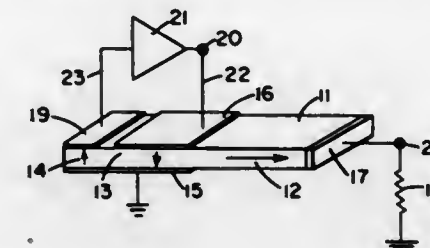
Continuation-in-part of Ser. Nos. 651,875, July 7, 1967, abandoned, and Ser. No. 734,416, June 4, 1968, Pat. No. 3,562,792. This application Oct. 27, 1970, Ser. No. 84,350  
Int. Cl. H01v 7/00

U.S. Cl. 310—8

2 Claims

A body of ceramic piezoelectric material of the lead titanate, lead zirconate type with an additive of the iron oxide type is provided having regions electrode and polarized such that the electrical impedances are markedly different. High voltage transformations are obtained in this manner between input and output electrodes. A third set of electrodes coupled to one of the other sets of electrodes enables the transformer

to accomplish self-oscillation. In order to enable the body to be supported at more than one vibration node, the body is caused to vibrate at a harmonic of its fundamental frequency



of vibration or more precisely in a mode with one full acoustic wavelength along the ceramic body, or two or more half wavelengths.

### 3,736,447

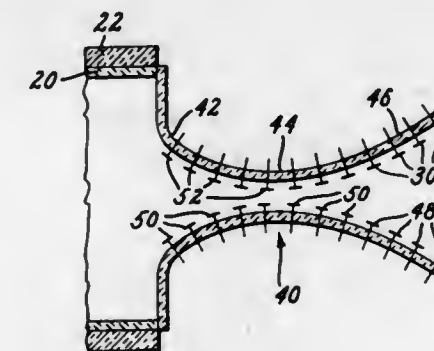
#### UNIFORM IONIZATION MEANS FOR MHD GENERATORS

Bert Zauderer, Bala Cynwyd, Pa., assignor to General Electric Company, New York, N.Y.

Filed Sept. 27, 1971, Ser. No. 183,792  
Int. Cl. H02k 45/00

U.S. Cl. 310—11

5 Claims



Temperature limitations imposed by available materials require provision of other than purely thermal means for ionizing gas used in hot-gas magnetohydrodynamic (MHD) generators. Efficiency of such generators is markedly reduced by non-uniform ionization. Prior art ionization means, even when adequate, require use of appreciable fraction of length of expensive MHD channel to achieve high and uniform conductivity of gas plasma. Hot, cesium-seeded partially ionized gas passes through large-diameter conduit from source to nozzle feeding MHD channel. Magnetic field in pre-channel nozzle and conduit portions causes current flow in gas between short-circuited electrode pairs or pairs are fed repeated short high-voltage pulses continued by longer lower voltage pulses. Such current flow increases ionization everywhere in gas to desirable high and uniform level. Alternatively, gas not so seeded is ionized by irradiation from nuclear heat source; or gas not ionized is preionized by discharges between first pairs of electrodes, and then fully and uniformly ionized by discharges between later pairs of electrodes.

### 3,736,448

#### DISPLACEMENT TRANSDUCER

August G. Hebel, Jr., and August G. Hebel, III, both of 1257 18th Street, Detroit, Mich.

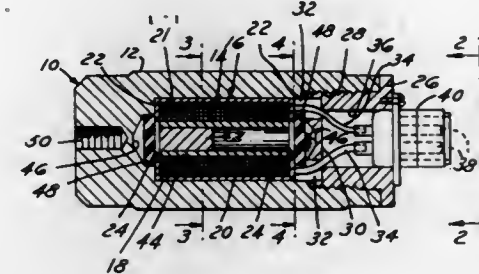
Filed Nov. 1, 1971, Ser. No. 194,373  
Int. Cl. H02k 35/02

U.S. Cl. 310—15

2 Claims

An electromechanical transducer for developing electrical signal measurements of mechanical vibrations. A magnet is

guided for lengthwise movement within a coil whose length is substantially equal to that of the magnet. A high-permeability casing surrounds the coil and serves to concentrate the magnetic flux of the magnet such that the magnet tends to center



itself lengthwise of the coil. Upon oscillation of the transducer body on which the coil and the casing are fixedly mounted, the magnet oscillates lengthwise within the coil to develop the electric signal voltage.

### 3,736,449

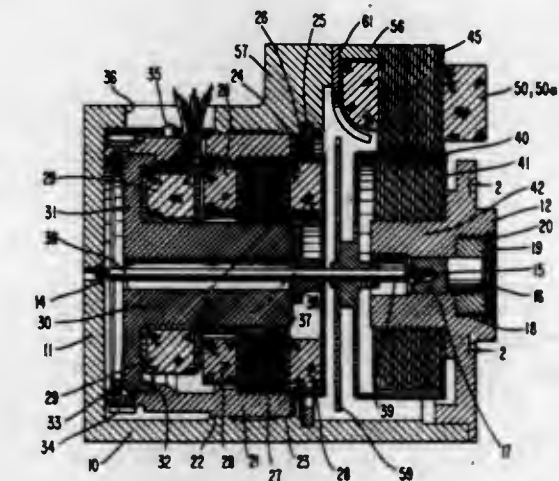
#### ELECTRICAL APPARATUS

Charles C. Honeywell, and L. H. Volge, both of Montrose, Pa., assignors to The Bendix Corporation, Teterboro, N.J.  
Division of Ser. No. 707,043, Feb. 21, 1968, Pat. No. 3,614,577. This application Jan. 18, 1971, Ser. No. 107,555

Int. Cl. H02k 17/44

U.S. Cl. 310—171

19 Claims



A synchro electrical signal generator or rotary control transformer in combination with an induction servo motor, said transformer and motor having a common rotor shaft.

### 3,736,450

#### UNIPOLAR DOUBLE INDUCTOR DYNAMO

Raffaello Emaidi, Via Arduino 25, 10134 Turin, Italy  
Filed Nov. 17, 1971, Ser. No. 199,467

Int. Cl. H02k 31/00

U.S. Cl. 310—178

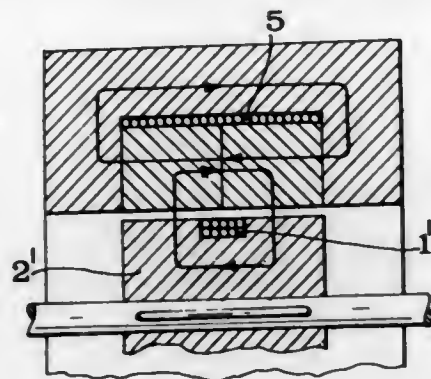
3 Claims

A unipolar double inductor dynamo having an anti-inductor winding for eliminating the axial flux produced by the induc-



tor windings in an armature or stator by generating a high anti-inductor flux and consequently a high saturation in the mag-

By suitable choice of the location of the transition between the cylindrical top portion of the envelope and the widened part relative to the location between the end faces of the two fila-



netic circuit of the anti-inductor, the inductor and anti-inductor rotating in opposite directions.

3,736,451

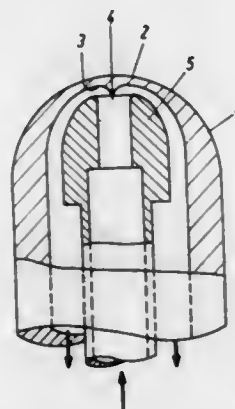
### COOLED ELECTRODE FOR HIGH POWER ELECTRIC DISCHARGE LAMPS

Gerhard Weninger, 15 Gabriele-Munter-Strasse, and Hanns-Peter Popp, 60 Hoffbrunnstrasse, both of Munich, Germany  
Filed July 12, 1972, Ser. No. 271,012

Claims priority, application Germany, July 29, 1971, P 21 37 987.3

Int. Cl. H01J 61/52

U.S. Cl. 313-32



To prevent blackening of the discharge tube, the interior space of the electrode has an axially disposed tube forming a central supply duct and an outer discharge duct for the coolant therein. The face is of highly heat-conductive material, such as copper, with a wall thickness of at most that of the outer tube. The interior face is provided in its center with an internally projecting part and extends radially outwardly in concave curvature while the duct formed between supply tube and interior face is of a width small relative to the discharge duct. The projecting part which may be a depending tip, or a rod extends towards or may be mounted inside the supply tube.

3,736,452

### HALOGEN MOTORCAR LAMP

Johannes Rijnders, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.  
Filed Sept. 24, 1971, Ser. No. 183,548

Claims priority, application Netherlands, Sept. 30, 1970, 7014336

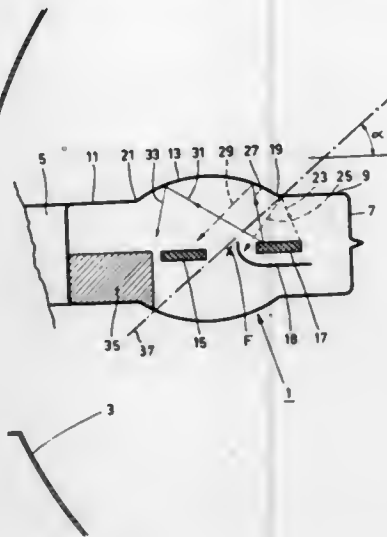
Int. Cl. H01k 1/26

U.S. Cl. 313-115

2 Claims

A halogen filament lamp having two filaments for motorcar headlights. The envelope comprises two cylindrical end portions and a rotationally symmetric widened intermediate part.

Arc stabilization resulting in greater steadiness, and increased power input resulting in increased and brighter light



ments facing each other it is achieved that parasitic light sources emanating from the anti-dazzle filament which would supply a dazzling beam do not occur.

3,736,453

### ARC CONTROL IN COMPACT ARC LAMPS

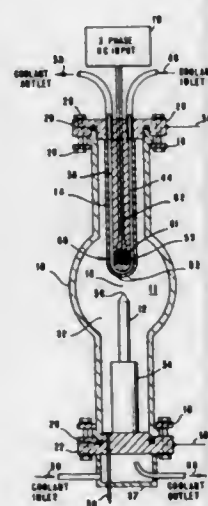
Charles G. Miller, Los Angeles, and Ralph E. Bartera, La Canada, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jan. 22, 1971, Ser. No. 108,810

Int. Cl. H01J 1/02

U.S. Cl. 313-146

17 Claims



output in compact arc lamps are made possible by the use of magnetic fields or of equivalent mechanical motion to control the location of the attachment point of the arc to the anode. In one embodiment, magnets disposed within the anode and particularly, within a novel toroidal shaped anode are utilized to rotate the arc foot around a larger area of the tip. In another embodiment, magnets external to the lamp are utilized to the same effect. In yet another embodiment, mechanical movement of the anode causes the same effects. This allows increased power handling capability by tungsten-tipped anodes. For thin copper anodes, an improved cooling circuit allows the area of high efficiency heat exchange to coincide with the larger area of the anode subjected to arc attachment. Additionally, an axial gas circulating arrangement for the cathode can be pumped toward the flue of the toroidal anode to contribute to the cooling of both electrodes and the axial laminar jet of cooling gas around the arc stream is used to stabilize the arc, to increase the power input and the brightness of the lamp, and to increase the light output of the lamp.

3,736,454

### ELECTRIC FILAMENT LAMP OR DISCHARGE LAMP

Johan Elisa Lambert Cornelis Huyskens, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

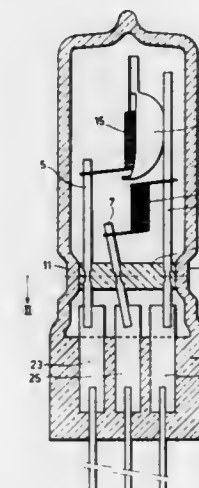
Filed Mar. 25, 1971, Ser. No. 128,342

Claims priority, application Netherlands, Apr. 11, 1970, 7005232

Int. Cl. H01J 1/88, 1/92, 5/02

U.S. Cl. 313-243

5 Claims



An electric filament or gas discharge lamp comprising a tubular glass lamp vessel which is sealed at one end by a pinch seal and has a number of filaments or electrodes supported by stiff current conductors or members. The conductors or members are passed through a common transverse support and are secured to a metal foil connection outside of the pinch seal and preferably in the space of the lamp vessel.

3,736,455

### SUPPORT FOR THE FILAMENT BODY OF A TUBULAR LAMP

Victor Rosalie Neteleers, and Eduard Jozef Philomenn Janssen, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 24, 1971, Ser. No. 174,354

Claims priority, application Netherlands, Aug. 27, 1970, 7012669

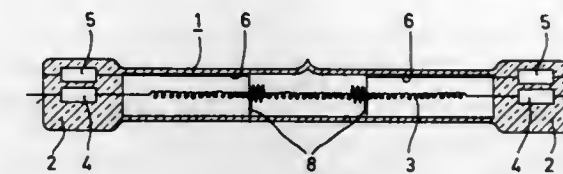
Int. Cl. H01J 1/96

U.S. Cl. 313-274

2 Claims

A support for the filament body of tubular incandescent lamps, the support being formed by a length of metal wire having a coiled end surrounding the filament body and having an

equally coiled portion engaging the inner wall of the lamp vessel, characterized in that the length of wire comprises a por-



tion extending in the direction of length of the vessel and being secured in the pinch of the vessel.

3,736,456

### ELECTRIC FILAMENT LAMP WITH IMPROVED FILAMENT SUPPORTING MEANS

Joris Leendert Middelhoeck, and Joseph Willem Saudo, Terneuzen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

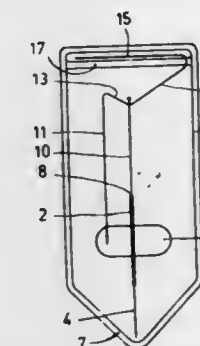
Filed June 25, 1971, Ser. No. 156,857

Claims priority, application Netherlands, July 3, 1970, 7009852

Int. Cl. H01J 1/94

U.S. Cl. 313-278

2 Claims



In order to obtain a good fixation of the location of the filament in the envelope of an electric incandescent lamp, in particular a miniature lamp, a slit or pit-like depression is made in the bottom of the envelope against the sides of which the bent ends of pole or supporting wires present in the lamp are located.

3,736,457

### RADIATION SHIELDED ELECTRON DISCHARGE DEVICE

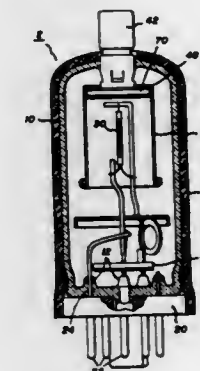
William F. Cullen, Philpot, Ky.; Fred F. Holub, Schenectady, N.Y., and Michael R. McCormick, Louisville, Ky., assignors to General Electric Co.

Filed Mar. 25, 1971, Ser. No. 128,056

Int. Cl. H01J 1/52, 19/40

U.S. Cl. 313-313

9 Claims



An electron discharge device is provided with shields to protect against inadvertent emission of penetrating elec-



tromagnetic radiation. The positions and mounting of the shields is designed to provide shielding in all directions which is relatively undefeatable by inadvertent tampering by the user.

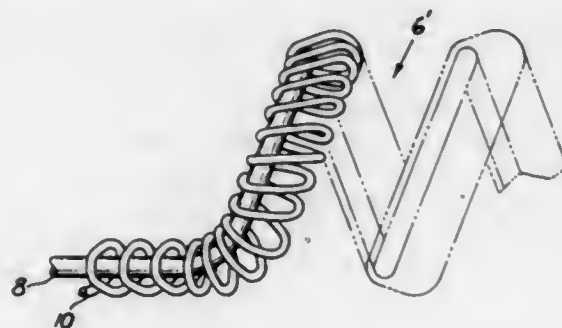
### 3,736,458 FILAMENTARY ELECTRODE AND FABRICATION THEREOF

Viktor W. Miller, Jr., Highland Heights, and John L. Ballard, Columbus, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed July 6, 1971, Ser. No. 159,801  
Int. Cl. H01k 1/14

U.S. Cl. 313-344

6 Claims



A filamentary electrode of the coiled coil loose fitting overwind type for low pressure discharge lamps. The fine overwind is coiled in oversized primary turns around the permanent primary mandrel wire which in turn is coiled into non-circular, suitably oval or egg-shaped secondary turns. The overwind is thereby prevented from unscrewing from the primary mandrel wire and the need for crimping, flattening or welding the ends of the coil prior to dissolving out the temporary mandrel wires used in coiling is avoided. Where there is further coiling into tertiary turns as in triple-coiled electrodes, tangling and shrinkage are minimized.

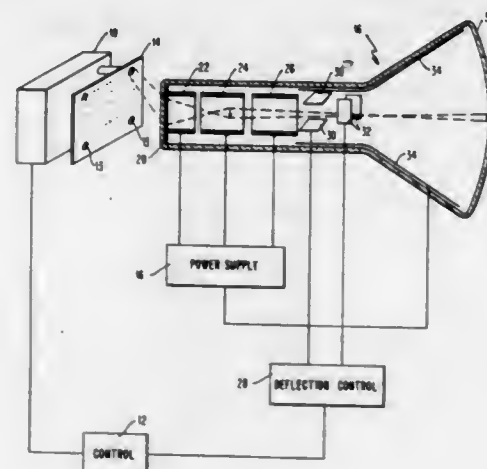
### 3,736,459 LAYER ACTIVATED HOLOGRAPHIC DATA SELECTION AND DISPLAY APPARATUS

Thomas J. Harris, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 19, 1971, Ser. No. 134,943  
Int. Cl. H01j 31/48

U.S. Cl. 315-11

4 Claims



A character generator which is capable of producing a large and arbitrary character set. The character set is stored as a set

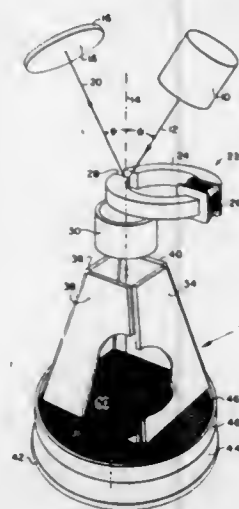
of holograms on a hologram plate. The character that is desired to be generated is selected by the hologram selector which produces a beam of energy which illuminates the hologram of the desired character producing a reconstructed image of the desired character. The reconstructed image illuminates a photocathode internal to a vacuum envelope. The photocathode produces an electron image within the vacuum envelope which is then amplified, focused and positioned in the appropriate display position on a phosphor screen thus allowing an externally stored character to be reconstructed and displayed within the vacuum envelope. The provision is also made for changing the size of said character on display.

### 3,736,460 OFF-AXIS RETURN BEAM TUBE

Robert E. Rutherford, Jr., New Canaan, Conn., assignor to Columbia Broadcasting System, Inc., New York, N.Y.  
Filed June 28, 1971, Ser. No. 157,143  
Int. Cl. H01j 31/48

U.S. Cl. 315-11

10 Claims



An electron beam tube of the return beam type in which the return beam follows a distinct path from the path of the primary beam to permit placement of a detector separated from the source at a position of minimum return beam diameter. A magnetic deflection field is provided to steer the primary beam from an electron gun on-axis into the focusing and deflection system for scanning of a target surface, and to oppositely steer the return beam off-axis for detection.

### 3,736,461 DARK TRACE STORAGE TUBE SYSTEM

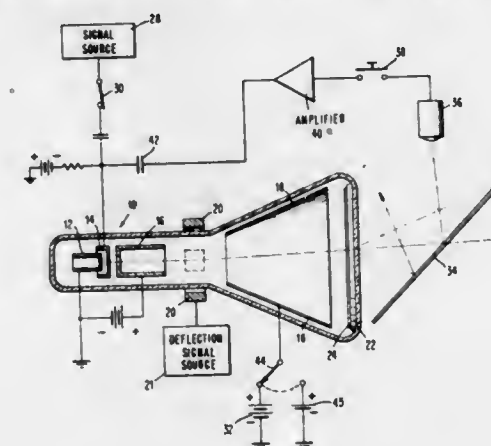
Benjamin Kazan, Bedford Hills, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed Aug. 27, 1971, Ser. No. 175,550  
Int. Cl. H01j 29/36

U.S. Cl. 315-12

6 Claims

An electro-optical signal storing device is disclosed and more particularly, an improved "dark-trace" cathode ray storage tube. A cathode ray tube structure is provided having a cathodochromic viewing screen with a thin phosphor layer on its back surface. An electron gun produces an electron beam which is modulated by an input signal. Voltage is ap-

plied to the accelerating anode of the tube to allow the beam to penetrate the phosphor layer and darken the cathodochromic screen in the regions determined by the input signal and therefore produces a pattern on the screen. During the initial writing mode, the screen is scanned with a relatively low beam current and a high writing speed, thereby producing a dark-trace pattern having minimal contrast. After the dark trace pattern is written, the input signal is cut off and the anode voltage is reduced. By scanning the screen in raster fashion, the electron beam generates a flying light spot on the phosphor layer which is partially penetrated, causing limited darkening of the cathodochromic screen. During the scanning



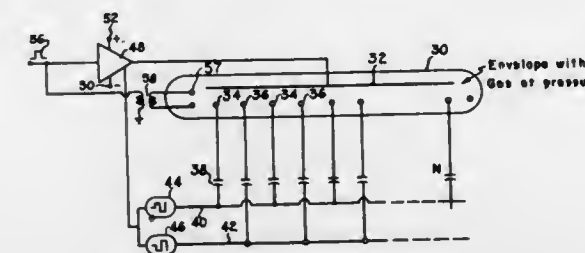
operation, the light from the phosphor screen which passes through the cathodochromic screen is reflected from a partially transmissive mirror and is sensed by a photocell capable of intercepting light over a wide angle. The output of the photocell is amplified and fed back to the control grid of the cathode ray tube. When the photocell senses a decrease in light, the beam current is increased so that when the beam scans a darkened area, the reduced light produces an increased beam current through the feedback loop such that, during scanning, the previously darkened areas will be further darkened relative to undarkened areas resulting in a high contrast image.

### 3,736,462 CLOCKED SCANNING SYSTEM

Lawrence S. Silker, Welland, Ontario, Canada, assignor to International Scanning Devices, Inc., Fort Erie, Canada  
Filed May 25, 1971, Ser. No. 146,752  
Int. Cl. H01j 17/48

U.S. Cl. 315-84.6

2 Claims



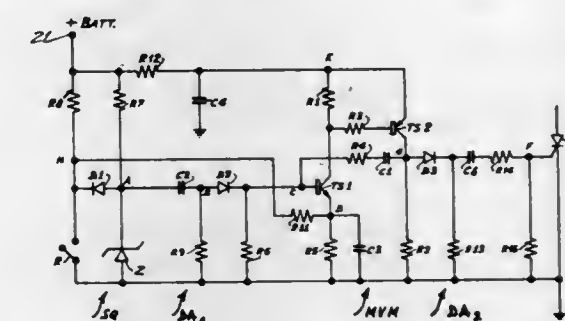
A clocked scanning glow discharge device wherein the rate of scan from end to end of a series of side by side glow discharge gaps between opposed electrodes in a common envelope is governed by a pair of alternating potential sources of opposite phase which add or subtract to a bias potential on one of the electrodes an increment of potential sufficient to initiate or extinguish the glow discharge, capacitors for each gap being charged to effect extinguishment and prevent reversed scanning.

### 3,736,463 ELECTRONIC DEVICE FOR CONTROLLING A SILICON CONTROLLED RECTIFIER IN A CAPACITOR DISCHARGE ELECTRONIC IGNITION CIRCUIT

Eugenio Basso, Levico; Giacomo Gulino, Monza, and Antonio Veronese, Padova, all of Italy, assignors to Fabbbrica Italiana Magneti Marelli S.p.A., Milan, Italy  
Filed June 7, 1971, Ser. No. 150,466  
Claims priority, application Italy, June 5, 1970, 25544 A/70  
Int. Cl. H03k 17/56

U.S. Cl. 315-209 SC

7 Claims



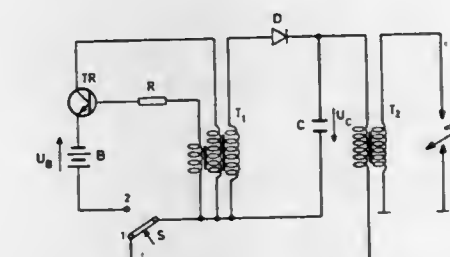
A silicon controlled rectifier controls a capacitor discharge into an electronic ignition circuit for internal-combustion engines. Spurious signals are prevented from operating the controlled rectifier.

### 3,736,464 CIRCUIT ARRANGEMENT FOR PRODUCING A HIGH VOLTAGE PULSE

Peter Lohberg, Rodheim V.D.H.; Hans Jurgen Katté, and Herbert Blieske, both of Frankfurt/Main, all of Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Germany  
Filed July 23, 1971, Ser. No. 165,056  
Claims priority, application Germany, July 27, 1970, P 20 37 079.0  
Int. Cl. H05b

U.S. Cl. 315-209 T

1 Claim



A circuit arrangement for producing a high voltage pulse comprising a capacitor, a switching device having a first switching position and a second switching position, a source of power, the switching device in the first position thereof couples the capacitor with the source, a transducer having a primary winding and a secondary winding, the switching device in the second position thereof coupling the capacitor to the primary winding of the transducer and producing thereby a high voltage pulse in the secondary winding of the transducer, the power source comprising a semi-conductor blocking oscillator having a transistor therein with a collector, base and emitter electrodes, the collector and base electrodes of the transistor being coupled inductively with the transducer, the collector and base electrodes of the transistor device being coupled by means of the switching device in the first position thereof with one terminal of a d.c. source, the emitter electrode being coupled with the other terminal of the d.c. source, the inductances in the collector and base circuits of the transistor have a third inductance coupled thereto, a diode



and a capacitor connected into a charging circuit for the capacitor, means including a further transducer means connected in a discharge circuit for the capacitor in another position of the switching device and a sparkgap connected across the discharge circuit.

### 3,736,465 VOLTAGE SUPPLY ARRANGEMENTS

James Howard Rowe, Addlestone, England, assignor to Plessey Handel und Investments A.G., Zug, Gartenstrasse, Switzerland

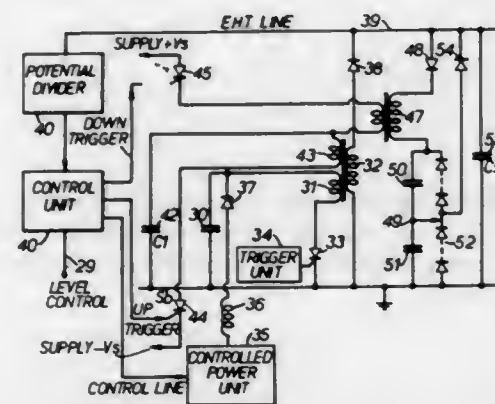
Filed Dec. 29, 1971, Ser. No. 213,387

Claims priority, application Great Britain, Jan. 1, 1971, 35/71

Int. Cl. H03k 4/02

U.S. Cl. 315-239

6 Claims



An E.H.T. voltage supply system comprising a relatively high voltage d.c. supply having a relatively high output impedance and low output capacitance, a second voltage supply arranged to charge a storage capacitor, and switch means for discharging the capacitor through the primary winding of a transformer to produce a higher voltage of the secondary winding which is combined with the voltage provided by the first voltage supply means.

### 3,736,466

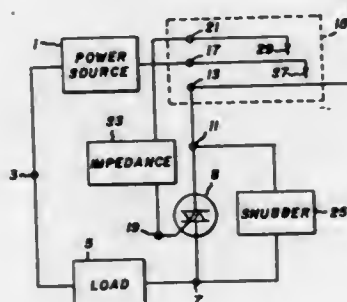
NON-ARCING SWITCH SYSTEM AND PROCESS  
Richard W. Fox, Syracuse, and Robert L. Davies, Union Springs, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed July 13, 1971, Ser. No. 162,221

Int. Cl. H01h 9/30

U.S. Cl. 317-11 A

7 Claims



In order to prevent arcing upon opening a mechanical switch it is proposed to place an electronic signal controlled switch in series with the mechanical switch and to provide a second mechanical switch for opening the signal path to the electronic signal controlled switch before the mechanical switch is opened.

### 3,736,467 REED RELAY CIRCUIT FOR CONTROLLING INDUCTIVE LOADS

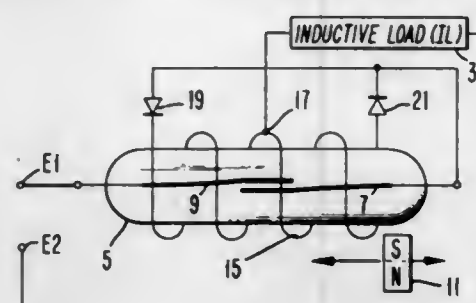
Herbert E. Meier, Vestal, and James C. Yarrington, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 13, 1971, Ser. No. 171,667

Int. Cl. H01h 83/00, 9/30

U.S. Cl. 317-11 A

8 Claims



A reed relay circuit may be utilized to govern highly inductive loads without destructive arcing at the reed relay contacts by governing the relay in such manner that an auxiliary flux field is supplied by rectification of the current to the load, which provides an auxiliary field in which the current and the flux decay to zero at least once during each cycle. When the controlling flux is removed, the reed relay contacts will not open until the auxiliary flux decreases to a point at which its generating current is sufficiently low that adverse arcing and other current effects at the contacts are eliminated.

### 3,736,468

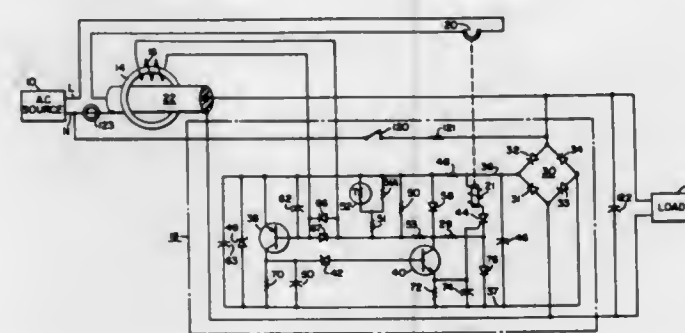
GROUND FAULT INTERRUPTER APPARATUS  
John R. Reeves, Trafford; George F. Bogel, Pittsburgh, and Francis T. Thompson, Murrysville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 30, 1971, Ser. No. 158,338

Int. Cl. H02h 3/28

U.S. Cl. 317-18 D

4 Claims



A differential transformer for sensing the fault current in a ground fault interrupter includes a magnet toroid with the power leads extending through it in a co-axial arrangement to provide single turn primary conductors. Stray current resulting from uneven placement of the power conductors within the toroid is thereby avoided; the relation of each of the coaxial conductors to the toroid is the same. Single turn coaxial conductors are highly advantageous in providing a miniaturized differential transformer with which there may be employed new miniature trip circuits of solid state components providing good noise immunity, high input impedance, inverse time delay and temperature compensation.

### 3,736,469 SWITCHING REGULATOR OVERLOAD PROTECTION CIRCUIT

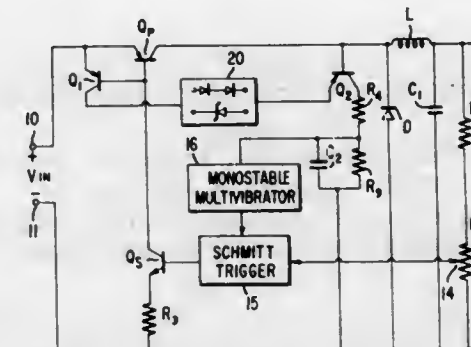
Dale Milton Baugher, Flemington, N.J., and Kenneth Walter Awkward, Hauppauge, N.Y., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 14, 1972, Ser. No. 226,076

Int. Cl. H02h 3/08

U.S. Cl. 317-22

14 Claims



An overload protection circuit for a voltage regulator of the type having a series pass element connected between a source of unregulated voltage and a load. The regulator includes a feedback circuit connected between the output terminals and the series pass element for regulating the load voltage. A protection circuit is connected between one main terminal of the series pass element and the feedback circuit to sense an overcurrent through the pass element and to provide a signal which renders the pass element non-conductive.

### 3,736,470

METHOD AND APPARATUS FOR DETECTING PHASE  
IMBALANCES

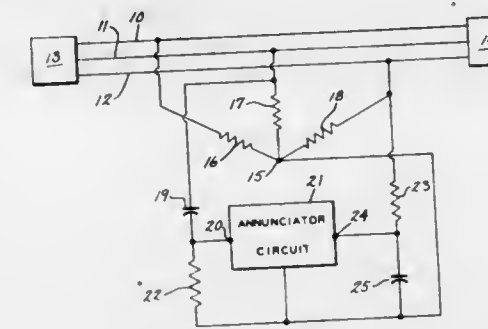
David E. Ford, Milwaukee, and Richard W. Waltz, New Berlin, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Nov. 15, 1971, Ser. No. 198,597

Int. Cl. H02h 3/28

U.S. Cl. 317-27 R

9 Claims



A reference point is established by phase resistors connected to each of three power lines. The referenced voltage established across one of the phase resistors has a 30° phase lag imparted to it and the voltage established across a second phase resistor has a thirty degree phase lead imparted to it. Under normal operating conditions the two phase-displaced voltages cancel when summed by an annunciator circuit, but when an imbalance or phase failure occurs in the power source, cancellation is not obtained and an annunciation signal is generated. A second embodiment imparts a 60° phase lead to a first referenced voltage and a 60° phase lag to a second referenced voltage. The phase-displaced voltages are identical under normal operating conditions, but when an imbalance or phase failure occurs in the power source, a difference is sensed by the annunciator circuit and an annunciation signal is generated.

### 3,736,471 ASSEMBLY ELEMENT FOR FUNCTIONAL UNIT WITH CARD CONNECTOR MEANS

Michel Douze; Bernard Claude Kohler, and Gerard Philippe Manoussi, Paris, France, assignors to Societe Industrielle Honeywell Bull (Societe Anonyme); Paris, France

Filed Nov. 16, 1971, Ser. No. 199,204

Claims priority, application France, Nov. 18, 1970, 7041369

Int. Cl. H02b 1/02

U.S. Cl. 317-101 D

4 Claims



A read-only memory wherein a complete unit thereof is fabricated as a pluggable circuit board, the board being adapted to function with different storage components by supporting the storage components in a removable pluggable fashion, the board proper holding in fixed form those elements and circuits which are invariant for different storage components.

### 3,736,472

CIRCUIT BOARD GUIDE AND SUPPORT APPARATUS  
HAVING IMPROVED FASTENINGS FOR RIGID  
ASSEMBLY

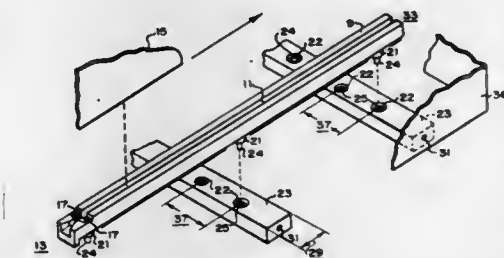
Edward M. Muldoon, Jr., 3817 Mistral Drive, Huntington Beach, Calif.

Filed Oct. 4, 1971, Ser. No. 186,251

Int. Cl. H05k

U.S. Cl. 317-101 DH

2 Claims



An improved circuit board guide includes an element which has a longitudinal board-receiving groove in the front surface and which has spaced, cylindrical protrusions on the back surface, each protrusion having a central bore therein which receives a mounting pin that is attached to a mounting bar. The cylindrical protrusions are received in recesses about the mounting pins to form a rigid structure that supports a circuit board along opposite longitudinal edges.

### 3,736,473 DRIVER CIRCUITRY

Charles D. Pugh, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed July 1, 1971, Ser. No. 158,965

Int. Cl. H01f 7/18

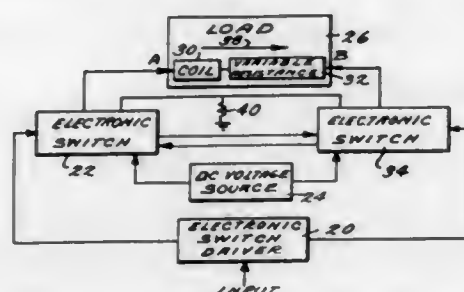
U.S. Cl. 317-137

10 Claims

A clutch or similar device electronic driver circuit whereby the clutch coil is connected in series with a variable resistance circuit, such as a parallel connected diode and resistor, which displays a first resistance when current flows through the serial combination in a first direction to actuate the clutch and a second greater resistance when current flows through the serial combination in an opposite direction to produce a small reverse bias voltage across the coil which serves to demagnetize the coil.



netize it and thus increase the speed of response of the coil as it is deactuated. Two electronic switching circuits are connected to the load for reversing the polarity of the voltage across the load and accordingly actuate and demagnetize the clutch alternately in response to input signals. A high transient



current is produced at the time the coil is activated to ensure a quick response from the clutch. In the embodiment set forth below, the load comprises two alternately connected coils each having a variable resistance connected in series with it so that one coil is actuated while the other is being demagnetized and vice versa.

3,736,474

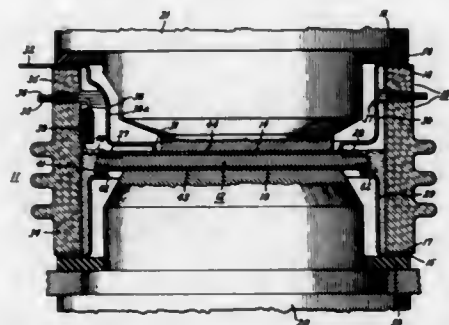
**SOLDERLESS SEMICONDUCTOR DEVICES**  
Frederick R. Sims, Wellington, Pa., assignor to General Electric Company, Philadelphia, Pa.

Division of Ser. No. 827,116, May 16, 1969, which is a continuation of Ser. No. 585,428, Oct. 10, 1966. This application Dec. 21, 1970, Ser. No. 100,327

Int. Cl. H011 3/00, 5/00

U.S. Cl. 317-234 R

4 Claims



In a solderless semiconductor device, a disc of semiconductor material is sandwiched between opposing electrodes of a sealed housing where it is centered by a metal ring which is removably seated on a peripheral flange of one of the electrodes.

3,736,475

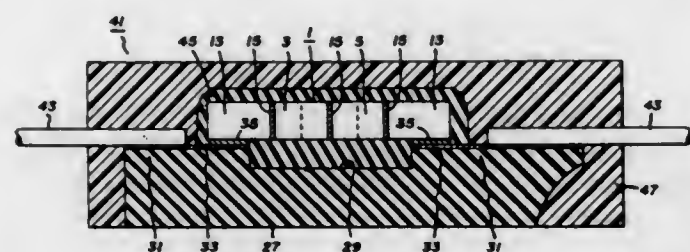
**SUBSTRATE SUPPORTED SEMICONDUCTIVE STACK**  
Warren E. Berner, Camillus, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Oct. 2, 1969, Ser. No. 863,209

Int. Cl. H011 3/00, 5/00

U.S. Cl. 317-234 R

6 Claims



A plurality of junction containing semiconductive elements are bonded in series relation with semiconductive attachment

elements of low resistivity bonded to opposite ends of the stack to form a semiconductive sub-assembly. The sub-assembly is bonded to metallized spaced lands with the junction containing elements spaced from the intervening surface of the substrate. Electrical conductors are bonded to the metallized lands in spaced relation to the semiconductive sub-assembly. The sub-assembly is etched in position on the lands and thereafter encapsulated with a passivant without intermediate handling. A plastic casement is molded around the sub-assembly and passivant. A plurality of substrates are initially integrally associated.

3,736,476

**METHOD OF MANUFACTURING ELECTRONIC DEVICES**

Ties Siebolt Te Velde, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

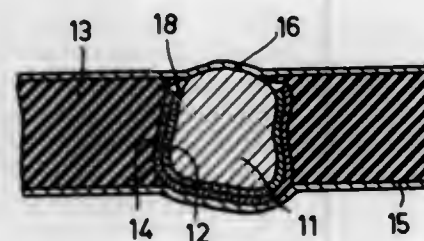
Continuation of Ser. No. 861,345, Sept. 26, 1969, abandoned.

This application Oct. 21, 1971, Ser. No. 191,526

Int. Cl. H011 5/00

U.S. Cl. 317-234 R

2 Claims



An electronic device comprising a layer of grains consisting of grains having a low-ohmic core and a high-ohmic enveloping layer which are embedded in a plastic foil, from which grain parts project on both sides, said projecting parts being contacted.

3,736,477

**MONOLITHIC SEMICONDUCTOR CIRCUIT FOR A LOGIC CIRCUIT CONCEPT OF HIGH PACKING DENSITY**

Horst H. Berger, Sindelfingen, Germany, and Siegfried K. Wiedmann, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

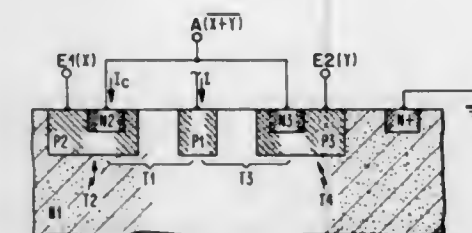
Filed Apr. 14, 1971, Ser. No. 134,008

Claims priority, application Germany, May 5, 1970, P 20 21 824.0

Int. Cl. H011 19/00

U.S. Cl. 317-235 R

14 Claims



A monolithic semiconductor circuit comprises a lateral PNP transistor and an inversely operated vertical NPN transistor. The lateral transistor is formed by a pair of mutually spaced P-type regions diffused in an N-type semiconductor body. The collector region has diffused therein a region of N-type and constituting the collector of the vertical transistor. The semiconductor body constitutes the base region of the lateral transistor and the emitter region of the vertical transistor.

3,736,478

**RADIO FREQUENCY TRANSISTOR EMPLOYING HIGH AND LOW-CONDUCTIVITY BASE GRIDS**

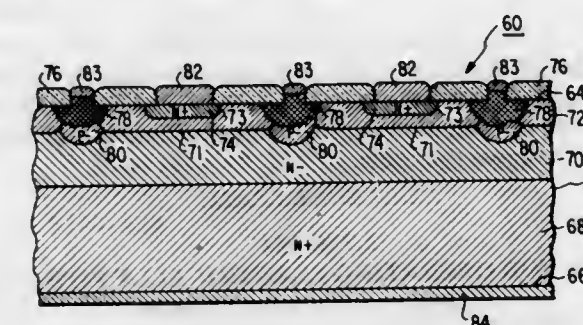
Harold Seymour Veloric, Morristown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 1, 1971, Ser. No. 176,811

Int. Cl. H011 5/02, 11/08

U.S. Cl. 317-235 R

6 Claims U.S. Cl. 318-51



An RF transistor has base and collector regions and a plurality of discrete emitter segments extending into the base region. A highly conductive intermetallic, such as PtSi grid extends into the base region and individually surrounds each emitter segment. The highly conductive intermetallic, such as PtSi grid is separated from the collector region by a highly resistive grid of the same conductivity type as the base region.

3,736,479

**SPEED CONTROL DEVICE FOR SINGLE PHASE MOTORS**

Katsuji Soeda, Sukagawa-shi, Japan, assignor to Yamamoto Electric Industrial Co., Ltd., Sukagawa-shi, Japan

Continuation-in-part of Ser. No. 139,567, May 3, 1971, abandoned.

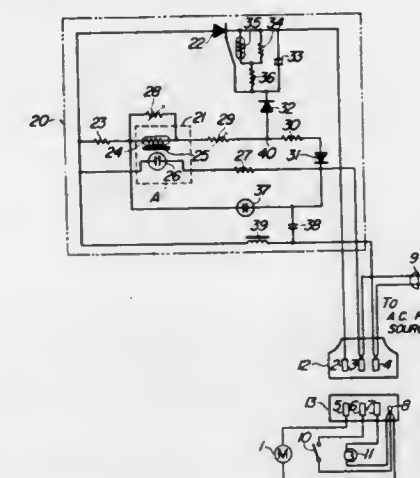
This application Oct. 12, 1971, Ser. No. 188,273

Claims priority, application Japan, May 31, 1971, 46/44923

Int. Cl. H02p 5/28

U.S. Cl. 318-245

6 Claims



A speed control device for single phase motors is disclosed, which comprises a thyristor connected in series with a motor, and a trigger signal generator means for controlling the triggering phase of the thyristor, said trigger signal generator means including a series circuit of a variable resistor means, a resistor and a rectifier connected between both terminals of an a-c source and a capacitor connected between the cathode of said thyristor and the connection of said variable resistance means and said resistor and also across the cathode and the anode of said thyristor. The variable resistor means includes a light source, a light-sensitive element facing the light source and having its resistance varied in accordance with the amount of incident light from the light source, and a movable shutter plate interposed between the light source and the light-sensitive element and capable of being moved between a position to interrupt the light from the light source and a position not to interrupt the light from the light source.

3,736,480

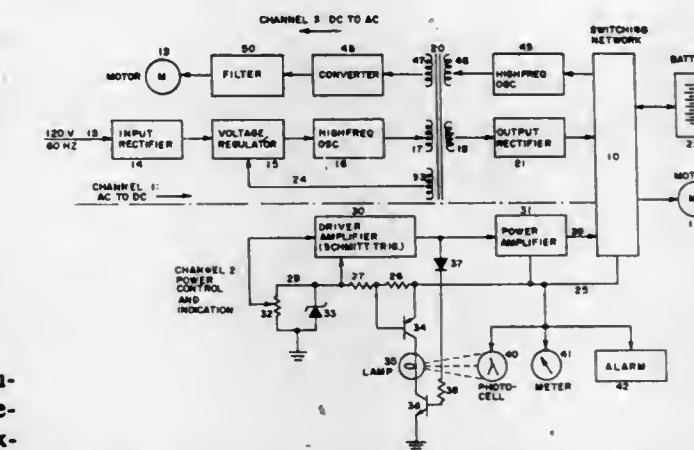
**BATTERY RUN D-C MOTOR SPEED CONTROL, CHARGING AND STEERING SYSTEMS**

Joo C. Lee, c/o Temptron, Inc., 1684 S. Wolf Road, Wheeling, Ill.

Filed Feb. 11, 1972, Ser. No. 225,565

Int. Cl. H02m 3/14; H02p 5/46

18 Claims



A first system for energizing a d-c motor includes a switching network for passing energy to and from a battery, and to the d-c motor. The battery can energize the motor over the switching network, and the battery can be recharged over a first channel supplied with a-c energy which is rectified and passed through the switching network to the battery. A second channel provides power control to regulate the level of d-c energy to the motor and thus control motor speed, and also provide an indication of the battery power available. A third channel energizes an r-f oscillator over the switching network from the battery. The a-c voltage from the r-f oscillator is rectified, filtered and applied to an alternate d-c motor.

Another system includes a pair of d-c motor groups, with two separate channels for energizing each motor group simultaneously or independently. This provides a steering function in addition to the optional battery charging speed control arrangements already described.

3,736,481

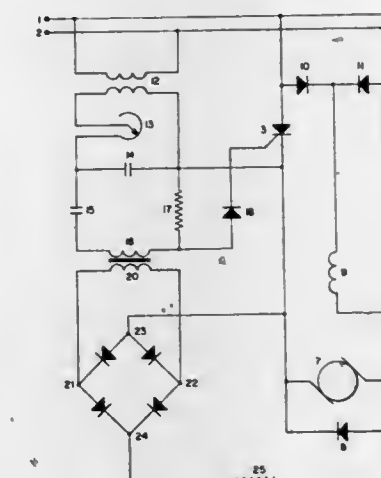
**ADJUSTABLE SPEED MOTOR CONTROL SYSTEM**  
Ernst F. W. Alexanderson, 1132 Adams Road, Schenectady, N.Y.

Filed Mar. 19, 1968, Ser. No. 714,363

Int. Cl. H02p 5/16

U.S. Cl. 318-331

6 Claims



A motor speed control comprising an SCR phase control having saturable reactor means modified by EMF feedback from the motor through a diode bridge arrangement.







3,736,489

## TEMPERATURE SENSING SYSTEM FOR RECHARGEABLE BATTERIES

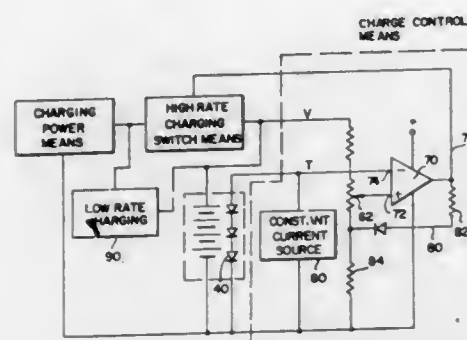
Ferdinand H. Mullersman, Gainesville, Fla., assignor to General Electric Co., Owensboro, Ky.

Filed May 21, 1971, Ser. No. 145,724

Int. Cl. H02J 7/10

U.S. Cl. 320—35

6 Claims



An improved temperature sensing system for rechargeable batteries is provided which utilizes the voltage developed across one or a group of series connected diodes such as, for example, silicon diodes, at a preselected constant current to indicate the temperature of the battery and to accordingly adjust the level of battery voltage at which charge control action should be accomplished.

When constant current charging is used, the proportionality between the voltage across the diodes and the desired voltage at which a high charge rate is modified can be made constant over a large temperature range by selecting the proper level of constant current to be passed through the diodes.

3,736,490

## BATTERY CHARGER WITH VOLTAGE COMPARATOR CONTROL CIRCUIT WHICH IS INSENSITIVE TO LINE VOLTAGE VARIATIONS

William H. Fallon, Parma; Paul P. Rieger, North Olmsted, and Donald K. Richards, Cleveland, all of Ohio, assignors to General Battery Corporation, Reading, Pa.

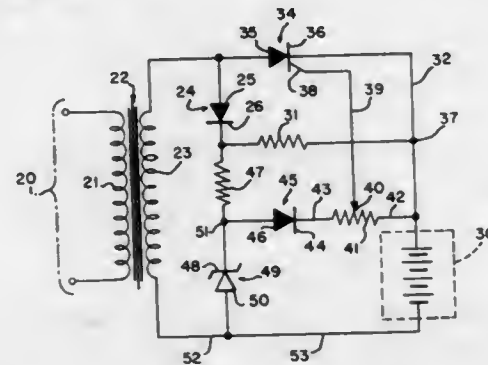
Continuation of Ser. No. 863,919, Oct. 6, 1969, abandoned.

This application Apr. 13, 1971, Ser. No. 133,695

Int. Cl. H02J 7/02

U.S. Cl. 320—39

3 Claims



Control circuits are disclosed, capable for use for charging batteries, for providing a first continuous power output to a load and a second supplemental controlled output responsive to the voltage level of the load. Both single phase and three phase embodiments utilize a controlled rectifier having its gate signal controlled by a signal developed on the tap of a variable resistor connected to the load. The voltage on the load is compared to a reference voltage across a zener diode so that when the load voltage drops, the controlled rectifier conducts to provide supplemental direct current output to the load. A high leakage transformer is utilized in both the single

phase and three phase embodiments, the high leakage transformer acting to maintain the reference voltage across the zener during variations of line voltage, so that the control circuit is continuously operative during such line variations.

3,736,491

## DC-TO-DC REGULATED CONVERTER CURRENT FOLDBACK POWER

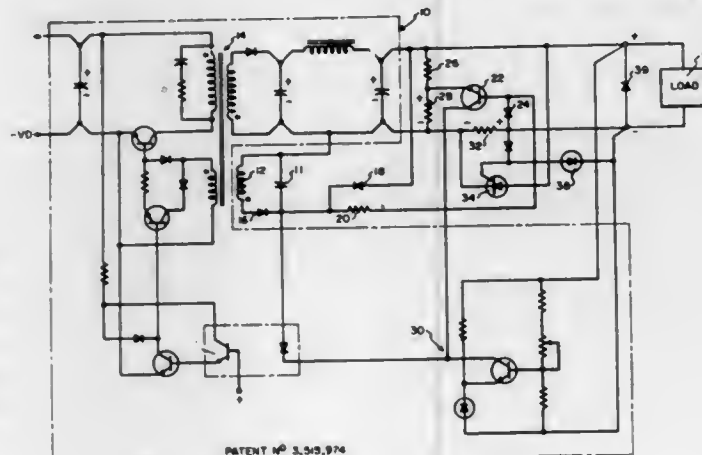
Karl H. Kuster, Glendale Heights, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Apr. 7, 1972, Ser. No. 242,172

Int. Cl. H02m 1/18; H02n 7/14

U.S. Cl. 321—14

4 Claims



An improved current foldback power supply wherein a foldback regulating transistor circuit is coupled across the power supply to limit output current in an overload state without dissipating excessive power. Instantaneous large overloads have overcurrent protection provided by a crowbar circuit.

3,736,492

## FILM TREATING METHOD

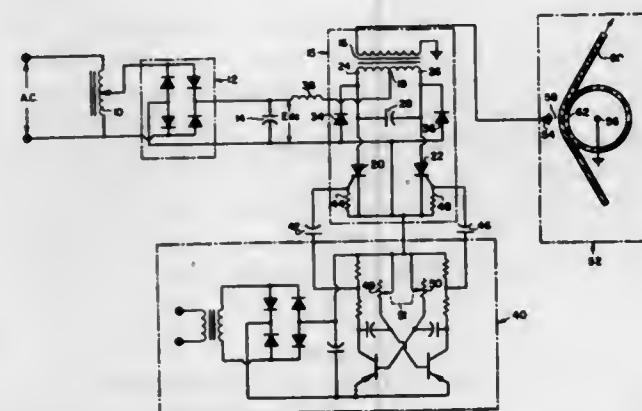
Louis A. Rosenthal, Highland Park, and Donald A. Davis, Somerville, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 862,412, Sept. 30, 1969, abandoned. This application Jan. 14, 1971, Ser. No. 106,376

Int. Cl. H02m 7/48

U.S. Cl. 321—45 R

2 Claims



A method is disclosed for the surface treatment of a plastic body by exposure to a high intensity voltage accompanied by corona discharge wherein said voltage is a sequence of alternating-directional, sonic frequency pulses of electrical voltage.

3,736,493

## FILM TREATING PROCESS

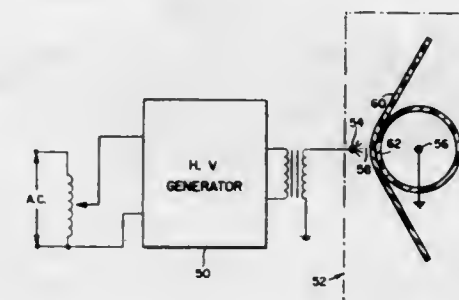
Louis A. Rosenthal, Highland Park, and Donald A. Davis, Somerville, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 862,307, Sept. 30, 1969, abandoned. This application Jan. 14, 1971, Ser. No. 106,377

Int. Cl. H02m 7/48

U.S. Cl. 321—45 R

4 Claims



A process is disclosed for the surface treatment of a plastic body, employing an alternating voltage of high intensity accompanied by corona discharge, which comprises exposing said surface to high frequency alternating voltage and accompanying corona discharge, the frequency of said alternating voltage being adjusted to effect surface treatment under optimum loading conditions at any selected constant voltage level.

3,736,494

## APPARATUS FOR FILM TREATMENT

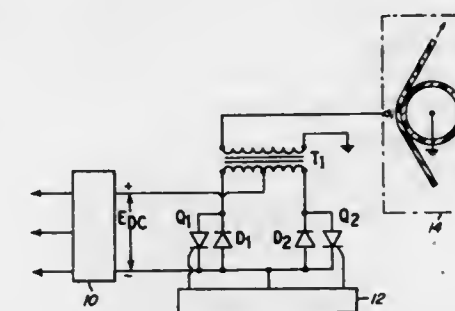
Louis A. Rosenthal, Highland Park, and Donald A. Davis, Somerville, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 66,833, Aug. 25, 1970, abandoned, which is a continuation-in-part of Ser. No. 862,307, Sept. 30, 1969, abandoned, and a continuation-in-part of Ser. No. 862,412, Sept. 30, 1969, abandoned. This application July 12, 1971, Ser. No. 161,598

Int. Cl. H02m 7/48

U.S. Cl. 321—45 R

16 Claims



Method and apparatus are disclosed for the surface treatment of a plastic body by exposure to a high intensity voltage in the sonic frequency range accompanied by corona discharge, which comprises employing as said voltage a series of alternating-directional pulses of electrical voltage produced by energizing a pulse-forming network in which the requisite inductance and capacitance are provided exclusively by the transformer and the film treating load.

3,736,495

## SWITCHING REGULATOR WITH HIGH EFFICIENCY TURNOFF LOSS REDUCTION NETWORK

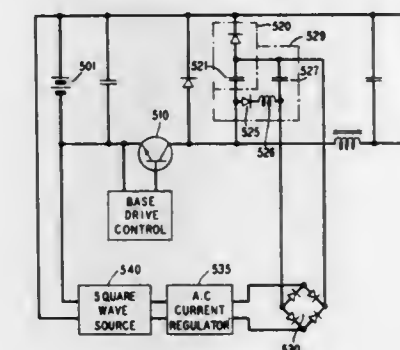
Edwin Theodore Calkin, Parsippany; Billy Harold Hamilton, Summit, and Frank Carl La Porta, Livingston, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 22, 1972, Ser. No. 236,833

Int. Cl. G05f 1/56

U.S. Cl. 323—17

4 Claims



A switching regulator includes a turnoff loss reduction network to reduce switching losses in the switching transistor during turnoff. A capacitive energy storage device is discharged during the turnoff of the switching transistor to retard the collector-emitter voltage rise. The regulator, in addition, includes a charging network to losslessly charge the capacitive energy storage device.

3,736,496

## ENERGY PUMP VOLTAGE REGULATOR

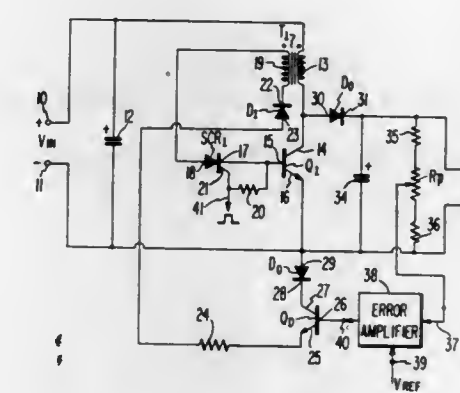
Eugene Lachocki, Turnersville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 13, 1971, Ser. No. 207,286

Int. Cl. G05f 1/56

U.S. Cl. 323—22 T

7 Claims



A circuit for increasing and regulating the voltage appearing at the input terminals of a power supply. A plurality of cascaded stages are provided. Each stage comprises: an inductive energy storage device; a switching device; a control device; and a discharge path. Control signals, having a selectable sequential time relation therebetween, are provided to the stages so that energy discharged from adjacent stages is caused to overlap in time. The amount of overlap is adjustable and is dependent upon the sequential time relation between the control signals which is selected.



3,736,497

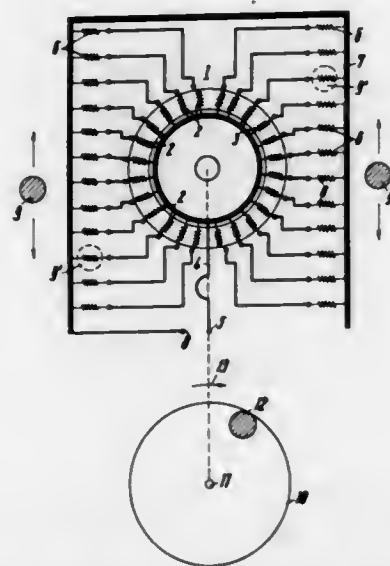
**CONTACTLESS DEVICE FOR ACTUATING A SIGNAL**  
 Horst Schweikart, Offenburg, Germany, assignor to Gehap Gesellschaft für Handel und Patentverwertung mbH & Co. KG, Sasbachwalden, ab. Achem, Germany  
 Filed Nov. 1, 1971, Ser. No. 194,419

Claims priority, application Germany, Oct. 31, 1970, P 20 53 524.4

Int. Cl. H01c 7/16

U.S. Cl. 323-80

8 Claims



A device for triggering a signal without the use of mechanical contacts for application in alarm clocks, signal clocks, time switching clocks for electronic devices, start and stop time clocks, short time clocks and the like, consisting of a magnetic dependent electronic control circuit coupled to the clockwork so that a signal is triggered as desired by a changing magnetic field within the clockwork. A plurality of preferably 24 magnetic field dependent resistors are mounted equally from each other on a ring and connected to an inner distribution bar. A second row of magnetic field dependent resistors are connected with an outer distribution bar so that small permanent magnets mounted on a disc and connected with the clockwork of the clock are moved adjacent to the magnetic field dependent resistors at desired preset time intervals so as to operate the electronic control circuit and produce and indication signal.

3,736,498

**BATTERY TESTER**

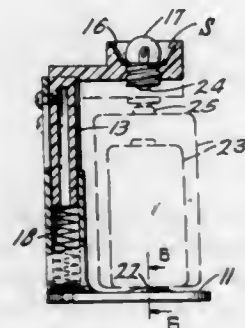
William G. Skutch, Jr., 3724 Sulphur Springs Road, Toledo, Ohio

Filed Aug. 25, 1971, Ser. No. 174,866

Int. Cl. G01n 27/42, 31/02

U.S. Cl. 324-29.5

5 Claims



A battery tester comprising an indicator lamp carried by an arm extending over a base which receives a battery to be tested. The arm is attached to a plunger, vertically slidable

within a stem connected to the base. A bias spring urges the arm to an uppermost position on the stem. Conductive means on the base, stem, plunger and arm provide a partial circuit between the lamp and a first pole of the battery in contact with the base. Depression of the arm from its uppermost position places a protruding terminal on the lamp in contact with a second pole on the battery thereby completing a circuit between the battery and the lamp.

3,736,499

**SYSTEM AND METHOD FOR MAGNETICALLY TESTING PLATED WIRE**

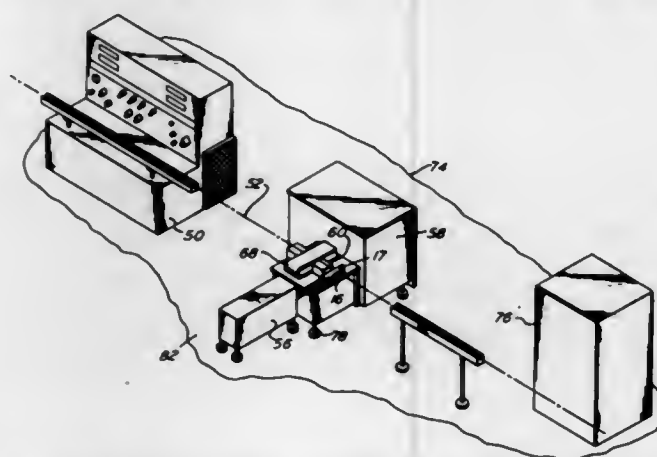
James M. Major, Willingboro; Peter J. Truscello, Berlin, both of N.J., and Robert Provasnik, Philadelphia, Pa., assignors to Computer Test Corporation, Cherry Hill, N.J.

Filed Aug. 17, 1970, Ser. No. 64,309

Int. Cl. G01r 33/12

U.S. Cl. 324-34 R

24 Claims



A method and system for magnetically testing discrete regions of plated wire used to provide storage memory elements in computers. The system provides for controlled movement and positioning of the plated wire within an electronic test station responsive to coded current test signals from a magnetic test system. A motorized drive assembly moves the plated wire through the test station and is actuated by command signals sent by a control system. The control system may be automatically controlled by signals generated from the magnetic test system or manually by operator instructions to actuate the motorized drive assembly.

3,736,500

**LIQUID IDENTIFICATION USING MAGNETIC PARTICLES HAVING A PRESELECTED CURIE TEMPERATURE**

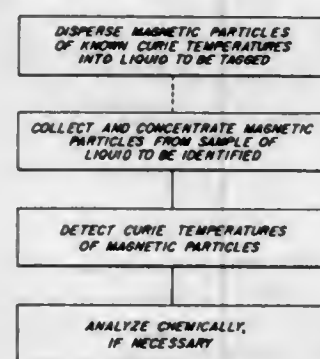
Ami E. Berkowitz, Schenectady, and William H. Melklejohn, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 26, 1971, Ser. No. 192,246

Int. Cl. G01r 33/12

U.S. Cl. 324-34 R

15 Claims



Methods are disclosed for uniquely identifying liquids so that a particular liquid may be distinguished from other similar

liquids. In one embodiment, an identification tag comprising sub-micron size magnetic particles of at least one pre-selected-Curie temperature is introduced into the liquid to be tagged. That liquid is then distinguishable from other similar liquids by its unique identification tag. Identification of a particular liquid, such as crude oil, for example, is then achieved by detecting the presence of the previously introduced identification tag. In the event of an "oil spill," for example, the party liable for the spill can then be readily determined, merely by measuring the Curie temperatures of magnetic particles extracted from a sample of the spilled oil.

3,736,501

**ROTATABLE TEST DEVICE HAVING DIAMETRICALLY OPPOSED SENSORS AND COUNTERWEIGHTS INTERLINKED FOR RADIAL MOVEMENT BY CENTRIFUGAL FORCE**

Thomas R. Donkin, Chelsea, Mich., assignor to Automation Industries, Inc., Century City, Calif.

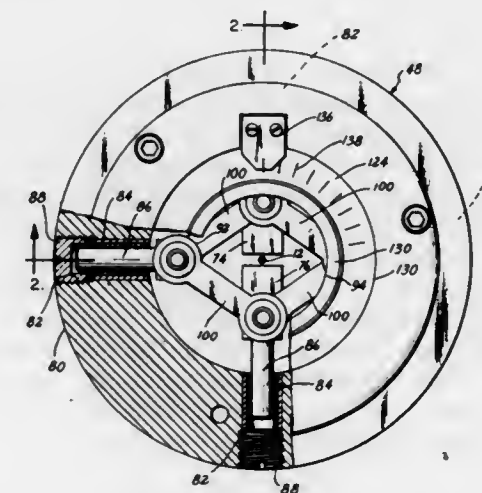
Continuation of Ser. No. 840,437, July 9, 1969, abandoned.

This application Mar. 25, 1971, Ser. No. 128,174

Int. Cl. G01r 33/12

U.S. Cl. 324-37

6 Claims



A material tester is described in the embodiments set forth herein which is adapted to rotate pickup probes about a workpiece such as a continuous wire or rod. Weights are spatially connected to pickup probes and are biased towards the workpiece. The weights and probes are pivotally mounted to one another and are carried by a rotatable housing. Guide shafts are attached to the weights and probes and are slidable in mating openings within the rotatable housing. The guide shafts are disposed within the rotating housing normal to the centerline of the axis of rotation of the housing where the workpiece is disposed. By rotation the weights move away from the center of rotation and overcome the biasing thereon. This moves the probes towards the workpiece. A cam included in the described embodiments is used to adjust the movement of the weights and probes in order to inspect various sizes of workpieces.

3,736,502

**SERIES STRING FLUX GATE MAGNETIC SENSOR APPARATUS WITH ADDITIVE RESPONSE**

Erick O. Schonstedt, Reston, Va., assignor to Schonstedt Instrument Company, Reston, Va.

Filed Jan. 28, 1971, Ser. No. 110,535

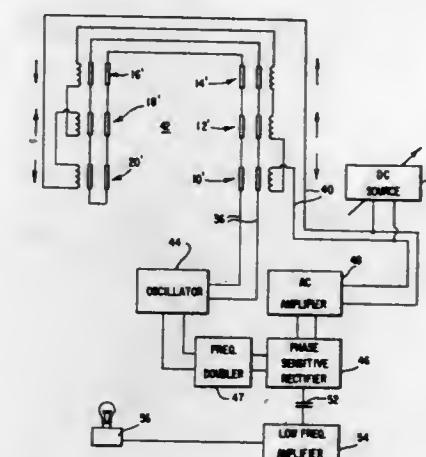
Int. Cl. G01r 33/04

U.S. Cl. 324-43 R

9 Claims

Multiple-unit, flux-gate, magnetic sensor apparatus in which a single excitation wire passes through the magnetic cores of the sensor units in succession. The signal pickup windings of the units are connected in series, the polarity of certain

windings being opposite to that of others for balancing out ambient fields, and DC being supplied to the pickup windings for neutralizing any residual unbalance. A string of magnetic sen-



sor units may be employed in the frame of a doorway for perimeter surveillance to detect magnetic articles such as guns. The units are arranged in pairs, with signal winding polarities selected to produce additive response.

3,736,503

**MULTIPLE CONDUCTOR CONTINUITY AND SHORT CIRCUIT TESTING DEVICE**

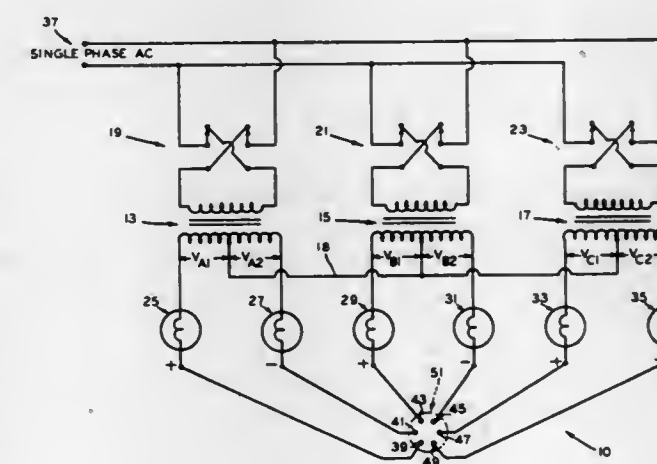
Kenneth W. Coleman; John R. Peltz, and Clayton L. Stoldt, all of Warren, Pa., assignors to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Oct. 4, 1971, Ser. No. 186,013

Int. Cl. G01r 31/02

U.S. Cl. 324-51

8 Claims



An electrical continuity and short circuit testing device adapted for checking pairs of electrical conductors each of which are insulatively oriented from each other. The device utilizes a plurality of transformers each having their primary windings electrically connected to a common power source and each of their secondary windings electrically connected to a pair of current flow indicators. These indicators are in turn each electrically connected to one of said electrical conductors. To provide various combinations for testing, at least one reversing switch is utilized, this switch electrically interconnected between the primary windings of one of the transformers and the common power source.



3,736,504

## BROADBAND SPECTRAL INTENSITY MEASUREMENT SYSTEM

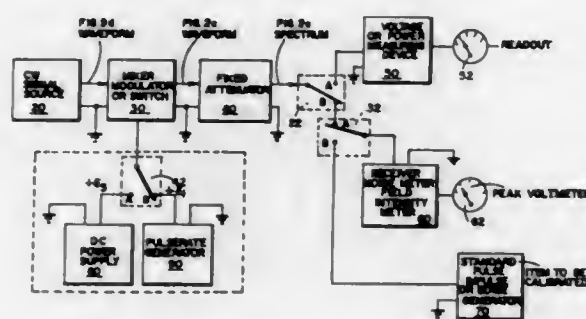
Frank K. Kolde, Fullerton, and Frederick R. Hume, Brea, both of Calif., assignors to North American Rockwell Corporation, El Segundo, Calif.

Filed Mar. 16, 1970, Ser. No. 19,578

Int. Cl. G01r 19/04, 19/26

U.S. Cl. 324-74

5 Claims



The invention is directed to a method and system for calibrating impulse generators and the like; a system consisting of a receiver which is tunable to a group of individual calibration frequencies and which is connectable to an impulse generator under calibration so as to provide an indication of the signal level from the impulse generator at each of the calibration frequencies. In addition, a CW signal source tunable to the same group of individual calibration frequencies has its output fed to a modulation means, which modulation means can modulate the CW signal source with either a pulse signal or with a constant level signal having a level identical to the peak level of the pulse signal and wherein means are provided for measuring the particular level of the CW signal at each of the individual calibrating frequencies after the pulsed signal is fed to the receiver and its amplitude adjusted so that the receiver provides an indication which is identical for the signal received from the impulse generator and from the pulse modulated CW signal source. The following formula is then used to compute the spectral intensity of the impulse generator:

$$S = E_{rms} T_o$$

Where:

S is the spectral intensity in rms volts per Hertz

E is the rms voltage level of the CW signal

$T_o$  is the pulse width of the pulse signal used to modulate the CW signal.

The above formula applies in a general case by definition. However, in a particular case when using a thin film thermoelectric or thermistor mount power measuring device, the spectral intensity of the impulse generator is determined by:

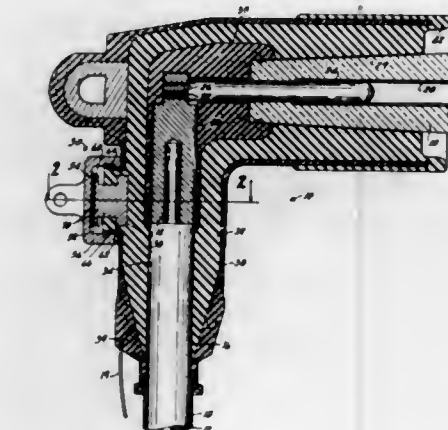
$$S = \left[ \sqrt{\frac{P|Z|}{\cos \theta}} \right] T_o$$

Where:

P is the power level of the CW signal

|Z| is the absolute impedance of the power measuring device

$\theta$  is the phase angle between the resistive component and the impedance Z and quite often known as the power factor.



An electrical connector for terminating a high voltage cable of the type having an electrically conductive sheath, a cable insulation and an electrical conductor, the connector including an insulator surrounding the cable insulation and the conductor, an electrically conductive electrode embedded in said insulator in spaced relation to the conductor and projecting outwardly from the outer surface of said insulator, and a conductive shield covering the outer surface of the insulator and being spaced from the electrode. A conductive cap is releasably secured to said shield to enclose the outwardly extending end of the electrode and an electrically non-conductive disc is located between the inner surface of the cap and the end of the conductive electrode.

3,736,506

## METHOD OF TESTING INTEGRATED CIRCUITS

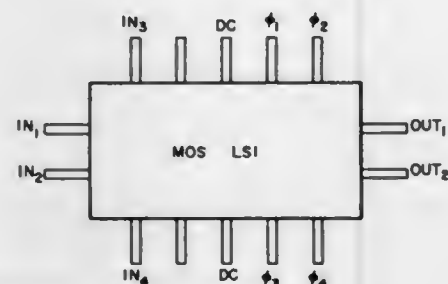
Ronald G. Griffin, Costa Mesa, Calif., assignor to Collins Radio Company, Dallas, Tex.

Filed Feb. 26, 1971, Ser. No. 119,317

Int. Cl. G01r 31/26

U.S. Cl. 324-158 R

4 Claims



An economical method for life testing complex integrated circuit arrays including numerous internal nodes and requiring a variety of input signal combinations, including in combination with requisite clocking signals the use of one or more ramp voltages as input signals.

3,736,507

## PHASE AMBIGUITY RESOLUTION FOR FOUR PHASE PSK COMMUNICATIONS SYSTEMS

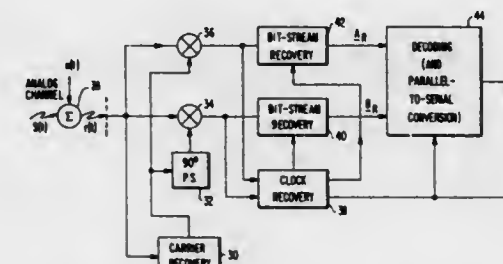
Chester J. Wolejza, Jr., and Eugene R. Cacciannani, Jr., both of Rockville, Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Aug. 19, 1971, Ser. No. 173,191

Int. Cl. H04j 1/20

U.S. Cl. 325-30

11 Claims



In a four phase PSK modulation/demodulation communications link phase ambiguity is resolved. At the transmitter a separate unique word modulates each of the phase quadrature components of the carrier frequency. At the receive end of the link, if the recovered carrier is locked onto the 0° phase of the received signal the two unique words will appear correctly in respective quadrature channels. However, if the recovered coherent carrier locks onto the wrong phase of the received carrier any combination of the following errors will occur: the unique words will appear in the wrong channels, the unique word in the first channel will be inverted, the unique word in the second channel will be inverted. Also the data will be garbled. The unique words, or their complements, are detected in the quadrature channels, and the channel outputs are altered, e.g., inverted or reversed, to result in the correct unique word appearing correctly at the outputs of the quadrature channels. The correction of the unique word results in an ungarbling of the data bits at the receiver.

3,736,508

## MODULATOR AND DEMODULATOR RESPECTIVELY FOR USE IN ADAPTIVE DELTA MODULATION

Gunnar Erik William Sparrendahl, Haden, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

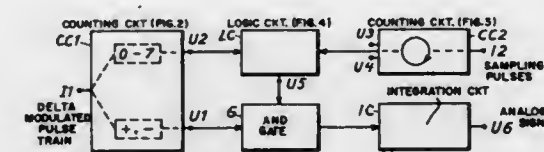
Filed May 13, 1971, Ser. No. 143,108

Claims priority, application Sweden, June 5, 1970, 7824/70

Int. Cl. H04b 1/00

U.S. Cl. 325-38 B

9 Claims



A delta modulator and delta demodulator respectively generate a synthesized analog signal by supplying to an integration circuit a signal pulse train which consists of pulses having a constant amplitude value, a polarity which is dependent on the polarity of an instantaneous pulse and a varying duration which is dependent on a previous pulse pattern in a delta modulated pulse train. The signal pulse train is generated in a circuit arrangement including a first counting circuit, a second counting circuit, a logical circuit and a gate. In the first counting circuit at each pulse in the delta modulated pulse train there is detected and registered the instantaneous pulse polarity and a digit value which defines the polarity pattern of a number of pulses in the delta modulated pulse train. The logical circuit is connected to the first counting circuit and to the

second counting circuit which terminates a counting cycle during a pulse period in the delta modulated pulse train, and produces control signals whose length is dependent on the registered digit value. From the first counting circuit, through the gate which is opened during the control signals, pass signals with a constant amplitude value and a polarity which is dependent on the registered instantaneous polarity, which latter signals form the signal pulse train.

3,736,509

## FREE RUNNING PULSE POSITION MODULATION SYSTEM WITH RECEIVER BLANKING

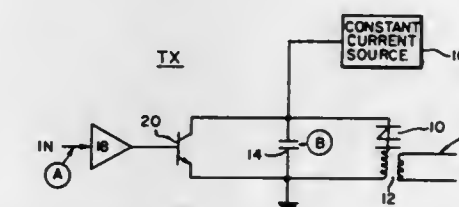
Summer T. Munn, Arkport, N.Y., assignor to Cunningham Corporation, Honeoye Falls, N.Y.

Continuation-in-part of Ser. No. 109,871, Jan. 26, 1971, abandoned. This application June 7, 1971, Ser. No. 150,315

Int. Cl. H03k 4/50

U.S. Cl. 325-143

10 Claims



The transmitter pulse is generated by an avalanche device triggered by the voltage developed across a capacitor charged from a constant current source. The timing of transmitter pulses is varied by varying the conductance of a device which shunts the capacitor in accordance with the modulating signal being transmitted. The receiver for the system is blanked, i.e., its input is closed to incoming signals, during intervals of predetermined duration immediately following detection of each transmitted pulse, making the receiver remarkably immune to noise during the intervals between incoming system pulses.

3,736,510

## FREQUENCY AND MODULATION MONITOR

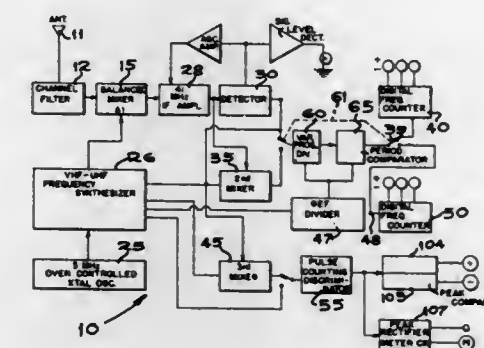
Joseph C. Wu, Sunnyvale, Calif., assignor to Time and Frequency Technology, Inc., Sunnyvale, Calif.

Filed Mar. 25, 1971, Ser. No. 128,006

Int. Cl. G01r 17/00

U.S. Cl. 325-134

5 Claims

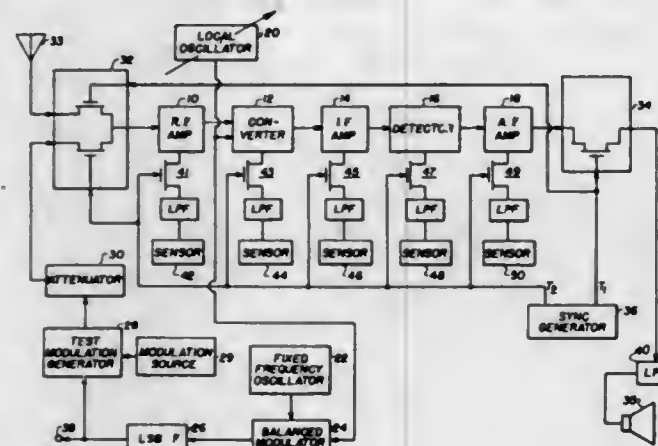


A frequency and modulation monitor for off the air monitoring of aural and visual frequencies of a transmitter in which a frequency synthesizer along with mixers provide a triple-conversion superheterodyne receiver for detecting a visual carrier frequency error, an aural carrier frequency error, and the intercarrier frequency spacing error. The signals from the output of the mixers operate digital frequency differential counters so that a digital readout indicates the errors of the respective carrier frequencies. Toward this end, the signal



from the mixers in the form of square waves are fed to a programmed divider to reduce the frequencies thereof toward a reference frequency. The output signals from the divider are transmitted to one input of a period comparator. The other input of the period comparator receives a square wave signal of the reference frequency. The output signals of the period comparator represents the difference or error, if any, and controls the operation of gates, which in turn control the time counters to enable the time counters to receive the output signals from the mixers to produce a digital readout of the respective errors, if any.

injected signal is time multiplexed with the incoming antenna signal so that the received signal, at any point in the receiver,



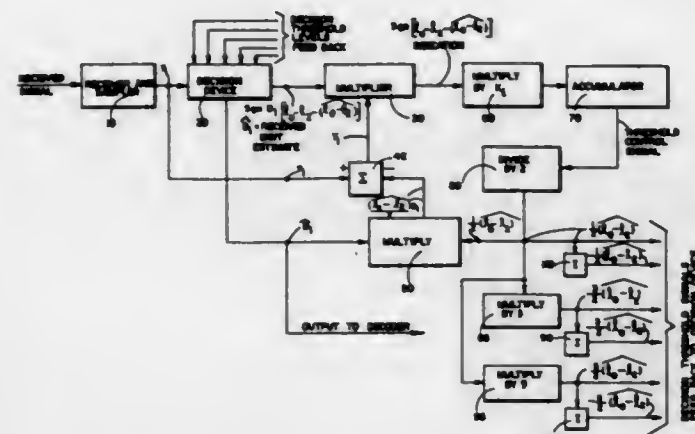
3,736,511

**AUTOMATIC DECISION THRESHOLD ADJUSTMENT**  
Earl D. Gibson, Huntington Beach, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.  
Filed June 11, 1971, Ser. No. 152,123  
Int. Cl. G06F 3/00

U.S. Cl. 325-321

13 Claims

can be compared to a locally generated standard, all without interfering with the incoming signal from the antenna.



The automatic decision threshold adjuster of the present invention is comprised of a decision device which compares a sampled received data signal against a set of automatically adjusted reference levels to provide an estimate of the level of the received digit and a signal indicative of the sign of the received digit. Means are connected to the decision device to provide for learning the different in amplitude levels of the two main samples of the data transmission system impulse response. Adjustable reference level means are provided for receiving the stored amplitude samples and for providing a set of adjustable reference level signals which are adjust to respectively corresponding predetermined proportions of the difference between the two amplitude samples.

3,736,512

**NON-INTERFERING ON-LINE COMMUNICATION RECEIVER TEST SYSTEM**

Richard L. Gowan, Beakka, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 24, 1972, Ser. No. 228,978  
Int. Cl. H04b 1/10

U.S. Cl. 325-363

9 Claims

A locally generated signal of the same frequency to which a superheterodyne receiver is tuned, is injected by means of a two channel multiplexer into the front end of the receiver. The

A harmonic generator produces simulated station signals which are heterodyned in the mixer stage of a receiver. A local oscillator of the receiver is swept through its frequency bandwidth, producing an IF pulse each time the receiver tunes one of the simulated stations. The IF pulses are counted, and upon reaching a number preset on station selection switches, convert the sweep circuit to an AFC amplifier, maintaining the receiver tuned to a desired station frequency.

3,736,514

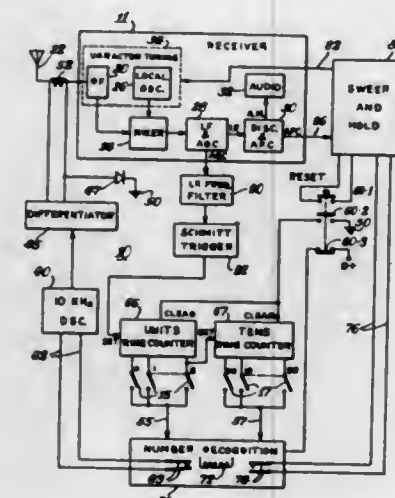
**SIGNAL PROCESSING APPARATUS**

Francis F. Lee, 35 Highland Avenue, Lexington, Mass.  
Filed Mar. 10, 1971, Ser. No. 122,964  
Int. Cl. H03k 5/00, 5/159, 19/08

U.S. Cl. 328-55

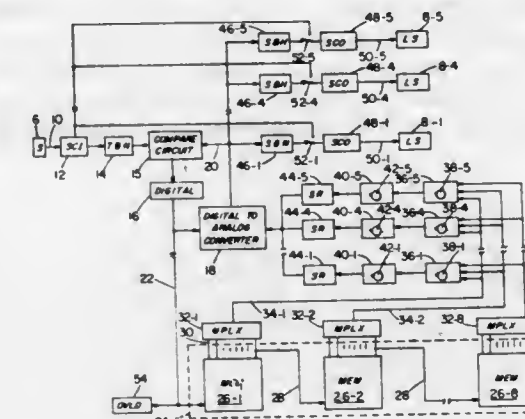
13 Claims

A delay system for analog signals includes a digital-to-analog converter which is employed during a first portion of each cycle to convert an analog sample to binary form and during a second portion of each cycle to convert delayed binary signals to analog form. The binary signals are applied to



dynamic storage through which the data is moved at a predetermined rate, and data is extracted from a particular

precise frequency when the circuit operates in a second mode. A fixed frequency pulse generator applies a pulse train having a fixed frequency to one input of a pulse frequency modifying circuit. A variable frequency pulse generator applies a pulse train having a variable frequency to another input of the pulse frequency modifying circuit. When the latter circuit operates in its first mode, the state of the voltage at the circuit output is



output (selected as a function of the time delay desired) for application to the digital-to-analog converter for reconversion to analog form.

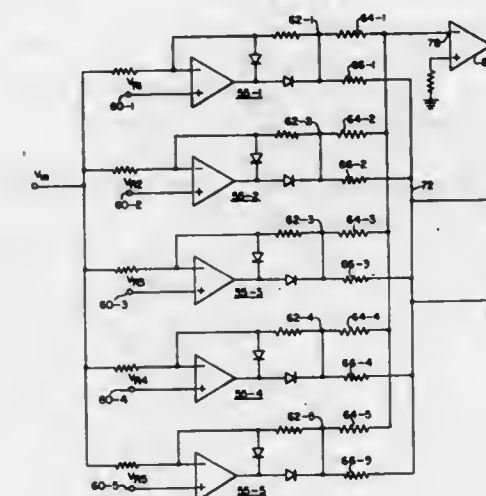
3,736,515

**NON-LINEAR FUNCTION GENERATOR**

Don G. Kadron, Pasadena; Wallace J. Hoff, and Robert L. Parks, both of Ellicott City, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.  
Filed Feb. 11, 1971, Ser. No. 114,530  
Int. Cl. G06g 17/12

U.S. Cl. 328-143

4 Claims



A circuit providing for the segmented approximation of non-linear analog function. One input of each of a plurality of operational amplifiers receive a variable analog signal. Each of the operational amplifiers receives at its other input a reference voltage. Diodes are connected in various feedback paths between the output and one of the inputs of the operational amplifier. The output derived from each operational amplifier will depend upon the relationship between the variable input voltage and the reference voltage and how they combine to affect the diodes.

3,736,516

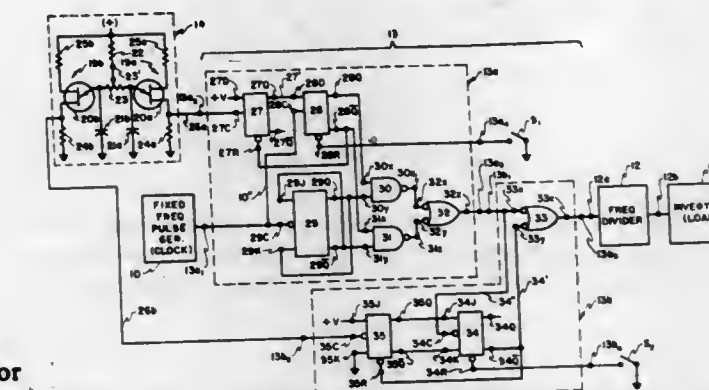
**VARIABLE FREQUENCY PULSE GENERATING CIRCUIT**  
Charles W. Ellis, Lorain, Ohio, assignor to Lorain Products Corporation, Lorain, Ohio

Filed June 14, 1971, Ser. No. 152,642  
Int. Cl. H03k 5/20

U.S. Cl. 328-134

5 Claims

A circuit for providing an output pulse train which has a variable frequency when the circuit operates in a first mode and for providing an output pulse train which has a fixed,



controlled in accordance with both the fixed and variable frequency input pulse trains and the output pulse train reflects the algebraic sum thereof. When, however, the circuit operates in its second mode, the effect of the variable frequency input pulse train is suppressed and the output frequency is controlled solely in accordance with the frequency of the fixed frequency pulse generator.

3,736,517

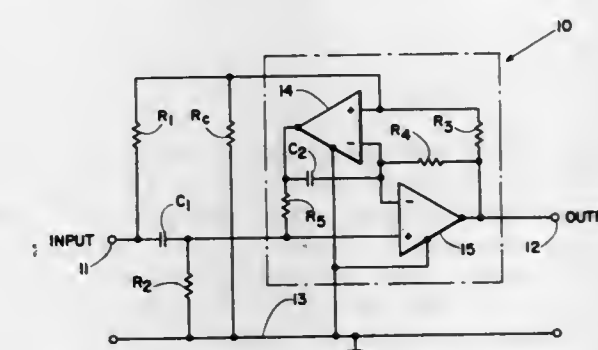
**ACTIVE DELAY-EQUALIZER NETWORK**

Jim Twan Lim, Kanata, Ontario, Canada, assignor to Bell Canada-Northern Electric Research Limited, Ottawa, Ontario, Canada

Filed Feb. 4, 1972, Ser. No. 223,606  
Int. Cl. H03h 11/00

U.S. Cl. 328-167

5 Claims



An active delay-equalizer network which utilizes only two operational amplifiers and a number of resistive or capacitive components to provide a second-order network. The circuit has a low impedance output and hence is readily connected in tandem.

3,736,518

**MASER INCORPORATING CRYSTAL HAVING F-CENTERS**

Charles Hammond Anderson, Oxford, England; Bernard Robert Feingold, Waltham, Mass., and Edward Stephen Sabisky, Trenton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 22, 1971, Ser. No. 200,715  
Int. Cl. H01s 1/02

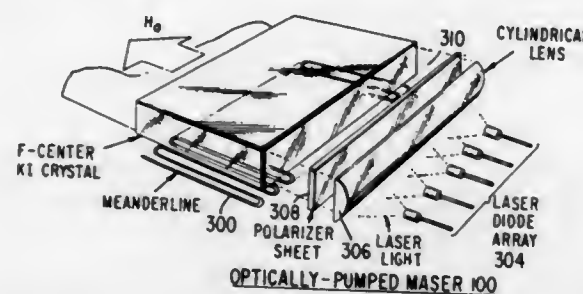
U.S. Cl. 330-4

19 Claims

A maser incorporating a crystal having F-centers. The crystal, which may be an alkali halide such as KI, exhibits



dichroism and may be pumped by selective absorption with circularly polarized light energy. The light energy is preferably derived from a diode laser, such as gallium aluminum arse-



nide, and has a wavelength coinciding with a point on the band edge of the optical absorption band of the crystal. Both a resonant cavity and a traveling wave configuration are disclosed.

3,736,519

# AMPLIFIER FOR PRODUCING A CURRENT DEPENDENT ON THE OUTPUT VOLTAGE

Robert C. Smyth, Huntington Beach, N.Y., assignor to Digital Apparatus Corporation, Deer Park, N.Y.

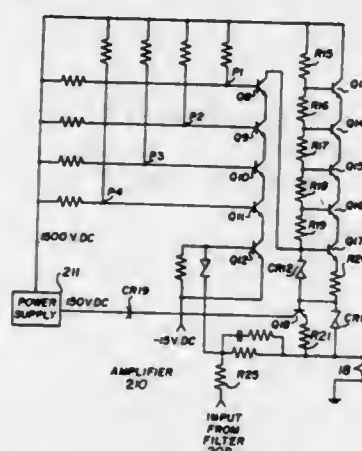
Continuation of Ser. No. 23,301, March 27, 1970, abandoned.

This application Jan. 14, 1972, Ser. No. 217,986

Int. Cl. H03F 3/42; H03G 3/30

U.S. Cl. 330-18

5 Claims



A high precision power supply generates voltage with an accuracy of at least thirty parts per million and is comprised of a digital section interconnected with an analog section by pulse transformers. Numbered keyboard switches in the digital section select a desired output voltage which is displayed numerically by electronic digital display tubes. A shift register in circuit with number storage means enables any one of the displayed numbers to be changed without changing any other displayed number. The analog section includes a stable reference voltage generator, electronic switch, filter and a high gain amplifier which produces an output voltage corresponding to the displayed numbers. The electronic switch passes proportional parts of the reference voltage to the amplifier via the filter under control of pulses received from the digital section. The amplifier is capable of producing current in one of the two ranges depending upon the output voltage.

3,736,520

# PRECISION VARIABLE GAIN AMPLIFIER WITH LINEAR LOG-GAIN VERSUS CONTROL-VOLTAGE CHARACTERISTIC

William F. Acker, Seminole, Fla., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Nov. 23, 1971, Ser. No. 201,459

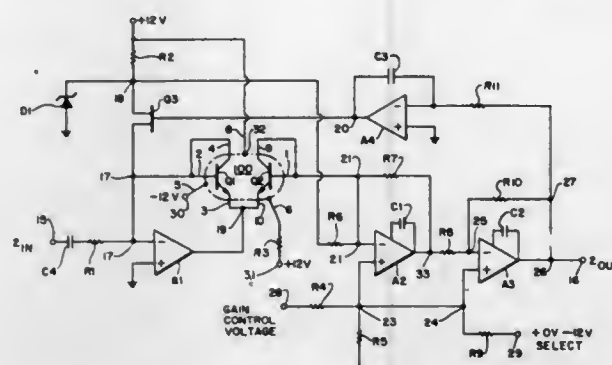
Int. Cl. H03G 3/30

U.S. Cl. 330-29

20 Claims

A precision variable gain amplifier with linear log-gain versus control-voltage characteristic having an automatically ad-

justed input diode bias current proportional to the nominal input signal level. A fixed bias current is supplied to the output diode where the AGC (automatic gain control) keeps the nominal signal level constant. Input bias and input signal currents are applied through the input diode, transformed to a voltage in accordance with the logarithmic forward current-voltage characteristic of the diode, a fixed bias voltage which is proportional to the AGC signal control-voltage is subtracted



from the logarithmic diode voltage and this differential voltage is applied across the output diode, the antilogarithmic voltage-current characteristic of the diode transforms this voltage into a current linearly proportional to the bias and signal currents in the input diode, this current is converted to a voltage which appears at the output of the variable gain amplifier, the output signal is applied to an integrator which adjusts the bias current through the input diode in such a manner as to drive the d-c bias of the output signal toward zero.

3,736,521

# MOS AMPLIFIER UTILIZING PARASITIC CONDUCTION STATE OPERATION

Lamar T. Baker, West Islip, Long Island, N.Y., assignor to General Instrument Corporation, Newark, N.J.

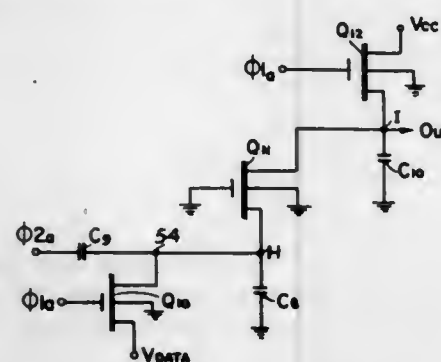
Division of Ser. No. 31,490, April 24, 1970, Pat. No.

3,656,119. This application June 2, 1971, Ser. No. 149,332

Int. Cl. H03F 3/16

U.S. Cl. 330-35

3 Claims



An amplifier suitable for use in an MOS-type memory array in which practical use is made of the usually undesirable parasitic PNP transistor action of an MOS circuit.

3,736,522

# HIGH GAIN FIELD EFFECT TRANSISTOR AMPLIFIER USING FIELD EFFECT TRANSISTOR CIRCUIT AS CURRENT SOURCE LOAD

Clarence W. Padgett, Huntington Beach, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed June 7, 1971, Ser. No. 150,492

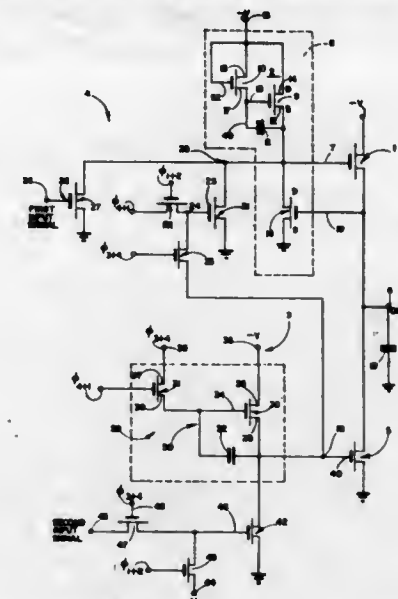
Int. Cl. H03F 3/16

U.S. Cl. 330-35

3 Claims

The amplifier drives one half of a push-pull output stage and receives voltage changes feedback from the output to regulate

the output voltage. The amplifier has a current source in electrical series with a regulating field effect transistor which is controlled by the output feedback. The push-pull output stage is driven by a voltage level at a common point between the current source and the regulating field effect transistor. Due to



the high gain characteristics of the amplifier, the voltage changes at the common point are large relative to the voltage changes on the gate electrode of the regulating field effect transistor. As a result, relatively small output changes are quickly corrected by changing the drive voltage for the field effect transistor push-pull circuit.

3,736,523

# FAILURE DETECTION CIRCUIT FOR ULTRASONIC APPARATUS

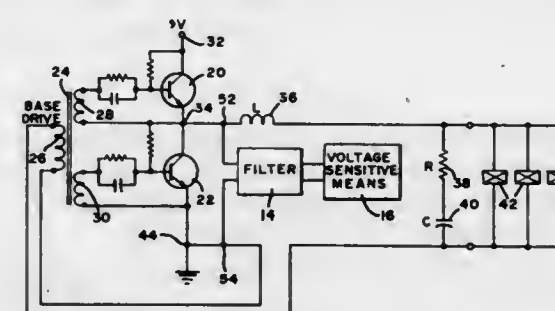
William L. Paskas, Trumbull, Conn., assignor to Branson Instruments, Incorporated, Stamford, Conn.

Filed July 31, 1972, Ser. No. 276,559

Int. Cl. H01V 7/00

U.S. Cl. 331-64

10 Claims



A failure detection circuit for a power oscillator driven by a set of transistors which are switched to provide a square wave drive voltage to the oscillator comprises a narrow band pass filter and a voltage sensitive means. The band pass filter is coupled for receiving the square wave voltage and permits the passage of a predetermined odd-harmonic signal to the voltage sensitive means. The amplitude appearing at the voltage sensitive means, such as a lamp, is indicative of the operation of the oscillator.

3,736,524

# LASER MEDIA CONTAINING FLUORINATED ALCOHOLS

Karl H. Drexhage, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 1, 1971, Ser. No. 149,055

Int. Cl. H01s 3/20

U.S. Cl. 331-94.5

9 Claims

Certain fluorinated alcohols are useful as solvents for fluorescing dyes in the formation of lasing media.

3,736,525

# UNITIZED INTERNALLY MODULATED GAS LASER

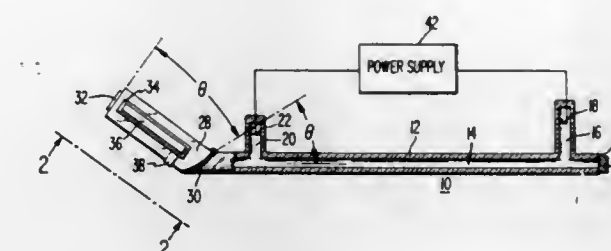
Donald Jones Channin, and Jacob Meyer Hammer, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 6, 1971, Ser. No. 204,812

Int. Cl. H01s 3/11

U.S. Cl. 331-94.5

11 Claims



A unitized, integral, acousto-optic, internally modulated gas laser, which may be mass-produced as a single article of manufacture.

3,736,526

# METHOD OF AND APPARATUS FOR GENERATING ULTRA-SHORT TIME-DURATION LASER PULSES

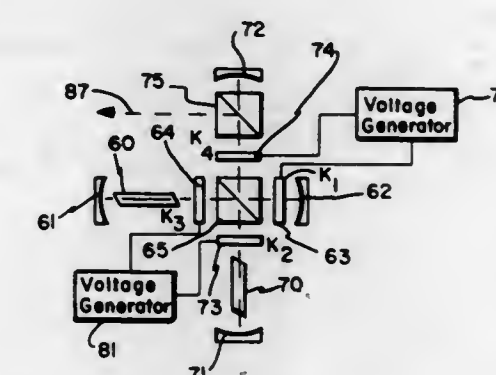
William W. Simmons, Peninsula, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 143,515, May 14, 1971, Pat. No. 3,701,956. This application Aug. 7, 1972, Ser. No. 278,373

Int. Cl. H01s 3/11

U.S. Cl. 331-94.5

3 Claims



Both a method and an apparatus are disclosed for generating laser pulses having a time duration on the order of sub-nanoseconds. These light pulses also have a high output power. They are generated by causing a laser to lase and removing the bulk of the radiation contained in the laser cavity. The remaining radiation or light extends over only a short length of the cavity. This light pulse is mode locked, that is it consists of individual Fourier components of the proper phase so that the short light pulse retains its shape while being amplified again in the laser cavity. This short-duration light pulse may then be made to issue from the cavity. Alternatively, the amplified light may be made to issue as a pulse train or set of pulses. Finally, a single pulse may be utilized for mode locking another laser where the ultra-short time-duration pulse may be amplified again. This may be considered priming and subsequent mode locking of the second laser.



3,736,527

## PRECISION VOLTAGE BIAS FOR JOSEPHSON OSCILLATORS

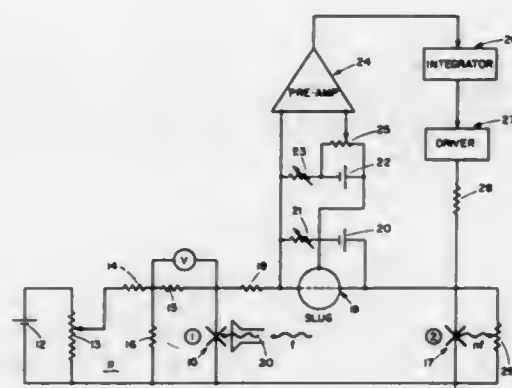
Andrew Longacre, Jr., Rochester, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 21, 1972, Ser. No. 291,125

Int. Cl. H03b 3/04

U.S. Cl. 331-107 S

6 Claims



A Josephson junction irradiated with signal energy of frequency  $f$  and current biased to a particular radio frequency induced step in its I-V characteristic is employed as a voltage standard to precisely voltage bias a second Josephson junction so as to have its AC oscillations occur at a selected harmonic of said frequency  $f$ . A SLUG is utilized in the control circuit which automatically equalizes the voltages across these junctions.

3,736,528

## VOLTAGE CONTROLLED OSCILLATOR

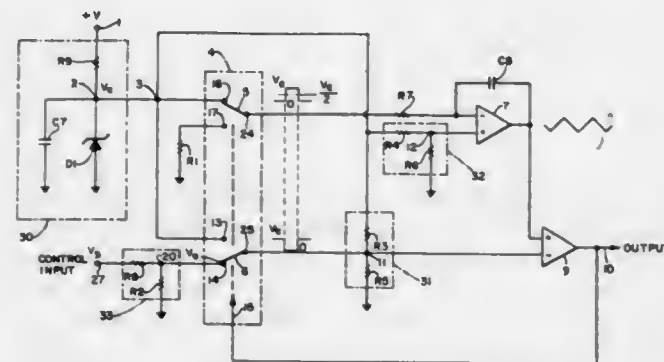
William F. Acker, Seminole, and Gordon F. Bremer, St. Petersburg, both of Fla., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Nov. 24, 1971, Ser. No. 201,674

Int. Cl. H03k 3/15

U.S. Cl. 331-143

9 Claims



A voltage controlled oscillator having a wide tuning range and being stable in frequency and phase as a function of temperature and/or time. The threshold voltage of a comparator is periodically varied abruptly to produce oscillations. The frequency of oscillations is electrically varied by varying the period between the threshold voltage changes.

3,736,529

## ELECTRICAL CIRCUIT FOR GENERATING PRECISE HIGH FREQUENCY OSCILLATION INTERMITTENTLY MODULATABLE IN FREQUENCY

Hans O. van der Floe, Selzach, and Johann Christian Friedli Langendorf, both of Switzerland, assignors to Autophon Aktiengesellschaft, Solothurn (Canton of Soleure), Switzerland

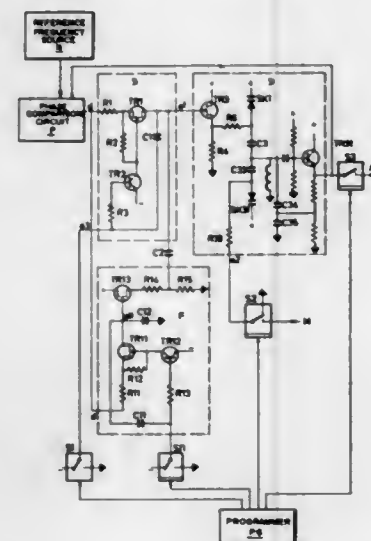
Filed July 9, 1971, Ser. No. 161,210

Claims priority, application Switzerland, July 10, 1970, 10456/70

Int. Cl. H03c 3/08

U.S. Cl. 332-18

2 Claims



An electrical circuit arrangement for generating a high frequency oscillation of high frequency precision intermittently modulatable in its frequency so that a frequency modulated signal can be periodically delivered. A high frequency semi-conductor oscillator receives two voltage inputs for controlling the output of the same, one of the inputs being of a predetermined modulated value, with the other input being a function of a correction signal derived by comparing the output of the oscillator with a predetermined unmodulated signal for maintaining the output at the desired frequency.

3,736,530

## ADJUSTABLE EQUALIZER CONTROL APPARATUS

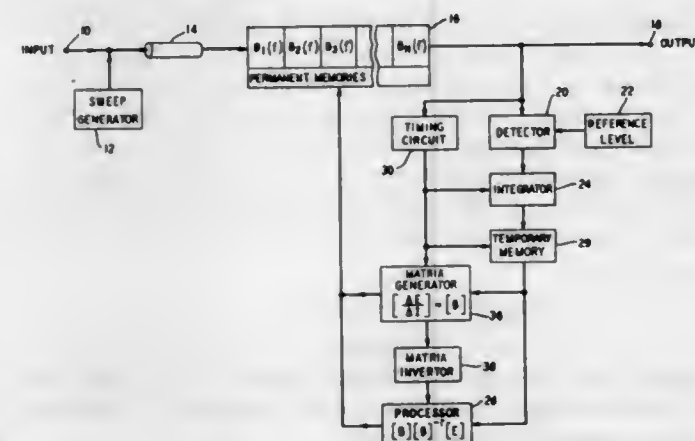
Roderick Campbell MacLean, Atkinson, N.H., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 22, 1972, Ser. No. 227,740

Int. Cl. H04b 3/04

U.S. Cl. 333-18

19 Claims



In apparatus for controlling the several sections of an adjustable bump equalizer in a transmission system, the effectiveness of each equalizer section is determined directly each

time the equalizer is to be adjusted by measuring the sensitivity of the equalizer frequency response to a small change in the control signal for each section. This sensitivity information is used in the processing of other signal information indicative of the misalignment of the transmission system to produce signals suitable for adjusting the equalizer to reduce transmission system misalignment.

3,736,531

## ADJUSTABLE EQUALIZER CONTROL APPARATUS

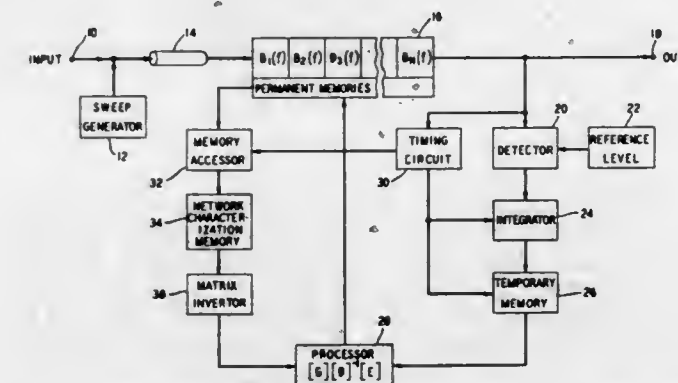
Roderick Campbell MacLean, Atkinson, N.H., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 22, 1972, Ser. No. 227,741

Int. Cl. H04b 3/04

U.S. Cl. 333-18

12 Claims



In apparatus for controlling the several sections of an adjustable bump equalizer by solving a set of simultaneous equations relating equalizer misalignment to the effectiveness of each equalizer section, signal information descriptive of the effectiveness of each equalizer section as a function of the setting of that section is stored in a memory. When the equalizer is to be adjusted, this information is accessed on the basis of the present settings of the equalizer sections and the information thus retrieved is used in the processing of misalignment signal information.

3,736,532

## ULTRASONIC DELAY LINES

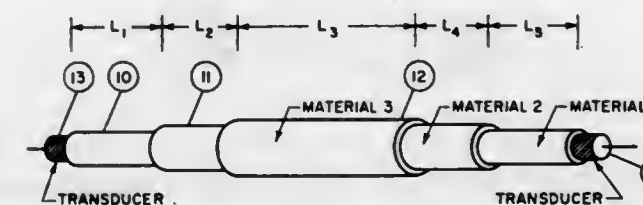
Anthony E. Armenakas, Beachhurst, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 14, 1971, Ser. No. 162,583

Int. Cl. H03h 9/30

U.S. Cl. 333-30 R

3 Claims



Delay lines with a variety of delay versus frequency characteristics are obtained by fabricating the delay line apparatus from multilayer materials. In one modification, the delay line is of rod construction and in another, of strip design.

3,736,533

## APPARATUS FOR EFFICIENTLY CONVERTING ACOUSTIC ENERGY INTO ELECTRICAL ENERGY

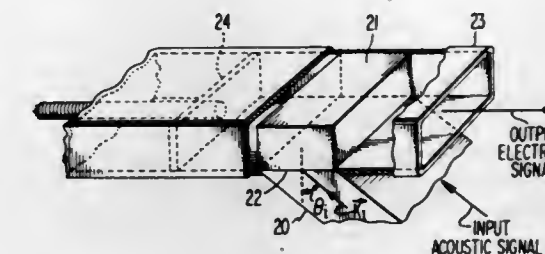
Gerard Argant Alphonse, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 15, 1971, Ser. No. 208,344

Int. Cl. H03h 7/30

U.S. Cl. 333-30

7 Claims



An acoustic signal propagated in an acoustic medium having an interface with a piezoelectric transducer is efficiently converted by the transducer into electrical signal energy by the establishment of an evanescent electrical field within the piezoelectric transducer.

3,736,534

## PLANAR-SHIELDED MEANDER SLOW-WAVE STRUCTURE

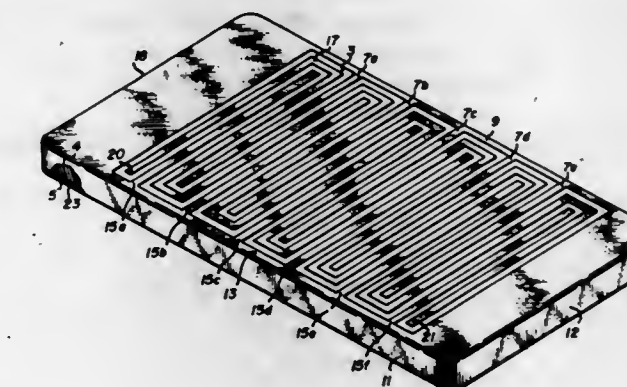
Edwin George Chaffee, Redwood City, Calif., assignor to Litton Systems, Inc., San Carlos, Calif.

Filed Oct. 13, 1971, Ser. No. 188,893

Int. Cl. H03h 7/30

U.S. Cl. 333-31 R

8 Claims



A novel slow wave structure capable of ultrabroadband operation includes a meander line of a predetermined length on a layer of insulative material, a first series of spaced metal fingers forming a comb line are attached to the layer and extend in parallel from a front edge of the layer into the facing concave portions of the meander line and a second series of spaced metal fingers forming a comb line are attached to the layer and extend in parallel into the concave portions of the meander line from the opposed back edge of the layer. A metal layer or ground plane is connected to the underside of the layer and both series of metal projecting fingers are placed electrically in common together with the bottom ground plane. In a preferred method of manufacturing of the invention the insulative layer is completely coated or covered with metal on all surfaces and using a photoresist etching process the insulative spaces between the meander lines and the fingers are etched out leaving the desired structure.



3,736,535

# PHASE SHIFTING SYSTEM USEABLE IN PHASED ARRAY FOR DISCRIMINATING RADAR ECHOES FROM RAINDROPS

Max C. Mohr, Chelmsford; Leo Malancon, Dover, and Stephen R. Monaghan, Harvard, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 1, 1972, Ser. No. 249,125

Int. Cl. H01p 1/18

U.S. Cl. 333—31 A

14 Claims

3,736,537

# ARMATURE ASSEMBLY FOR AN ELECTROMAGNETIC RELAY

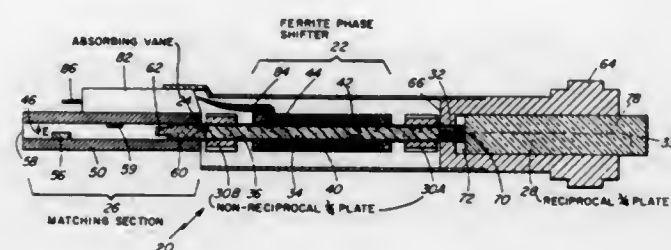
Kurt Arne Dietsch, Farsta, and Petrus Franciscus Philippus Van Opdorp, Johanneshov, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation-in-part of Ser. No. 38,157, May 18, 1970, abandoned. This application Jan. 31, 1972, Ser. No. 222,217

Int. Cl. H01h 50/58

U.S. Cl. 335—135

3 Claims



An array of phase shifting elements each of which is suitable for forming a microwave lens in a radar tracking system and for attenuating radar echoes from raindrops. Each phase shifting element comprises a ferrite rod enclosed by a metallic overlay for providing phase shift in a circular polarization mode, current carrying windings for impressing a magnetic field within the ferrite rod, a pair of nonreciprocal quarter wave plates biased by permanent magnets and located at the ends of the ferrite rod, a vane adjacent the back end of the ferrite rod for absorbing radiant energy having a polarization associated with rainfall reflections, an impedance matching section at the back end of the phase shifting element and a quarter wave plate at the front end of the phase shifting element. Means are also disclosed for focussing the array of phase shifters for airport surveillance.

3,736,536

# MICROWAVE FILTER

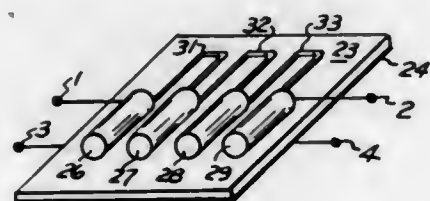
Robert J. Wenzel, Woodland Hills, Calif., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 14, 1971, Ser. No. 133,926

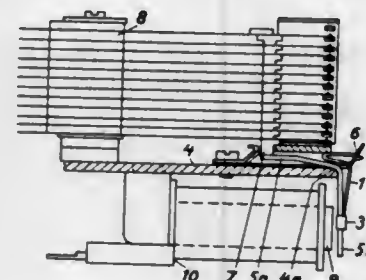
Int. Cl. H03h 7/04; H01p 3/08

U.S. Cl. 333—73 R

18 Claims



The inventive microwave filter is based upon the utilization of a prototype filter of known type, and a recognition of the properties of microwave C-sections, and parallel coupled line capacitance arrays. A prior art filter is chosen as a prototype filter and is partitioned into a general equivalent circuit derived by applying electrical constraints to the standard equivalent circuits for microwave C-sections and parallel coupled line capacitance arrays. A set of general equations is then written for the equivalent circuit, and by using the equations it is possible to design filters having a wide range of desired filter characteristics simply by substituting the values from the prototype filter into the equations. It is therefore possible to construct a wide variety of filters from a few standard parts. Strip line filters can also be made utilizing the general equations.



An electromagnetic relay has a generally L-shaped armature which rests at its bend on a bearing edge of the yoke of the relay for pivoting the armature about said edge as a fulcrum. One branch of the armature coacts with the core of the relay for controlling the angular position of the armature by the state of magnetization of the core and the other branch of the armature underlies a contact spring assembly for control of the same by the angular position of the armature. A generally V-shaped leaf spring extends between the armature and the spring assembly. One leg of this spring is secured to the branch of the armature coacting with the core and the other leg has a nose which is hooked on a clamping member fixedly secured to the yoke of the relay. As a result, the spring holds the armature in its position on the bearing edge. Detachment of the armature together with the spring is effected by simply unhooking the nose of the spring from the clamping member.

3,736,538

# ELECTRIC CONTROL DEVICES WITH MECHANICAL INTERLOCK

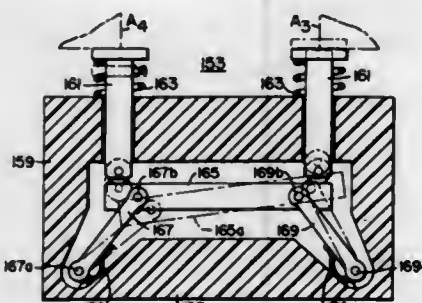
Edward A. Owen, Oakmont, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 28, 1972, Ser. No. 238,952

Int. Cl. H01h 9/26

U.S. Cl. 335—160

10 Claims



An improved electric control combination characterized by two similar contactors mounted in a side-by-side relationship with a mechanical interlock interposed therebetween which interlock limits the contactors to alternate operation. The interlock includes a cross beam and a pair of links, the links being pivotally mounted on the cross beam and the cross beam being reciprocally moveable between first and second positions.

3,736,539

# MOMENT-FREE TOROIDAL MAGNET DESIGN

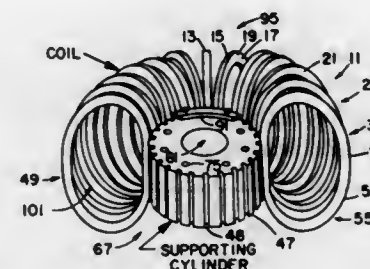
Joseph File, Trenton; Robert G. Mills, Princeton; George V. Sheffield, Hopewell, and Peter Bonanos, E. Brunswick, all of N.J., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Apr. 18, 1972, Ser. No. 245,147

Int. Cl. H01f 7/22

U.S. Cl. 335—216

6 Claims



Apparatus for confining a high temperature plasma column having a large cross-section in a strong magnetic field for increasing the plasma confinement time. The apparatus, comprises a large superconducting moment-free toroidal magnet having coil strands in pure-tension that are self-supported on an inner cylindrical member. In one embodiment, two examples are given for a DT reactor and a catalyzed DD fusion reactor.

3,736,540

# MOUNTING OF AN ARMATURE PLATE IN A THERMOELECTRIC PILOT SAFETY DEVICE

Dieter Westphal, Hückeswagen, Germany, assignor to Voh. Vaillant KB, Remscheid, Germany

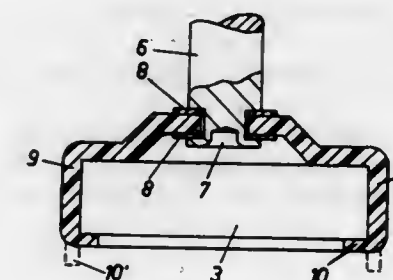
Filed Mar. 31, 1971, Ser. No. 115,680

Claims priority, application Austria, Apr. 2, 1970, A/3026

Int. Cl. H01f 7/08

U.S. Cl. 335—279

9 Claims



A thermoelectric pilot safety apparatus includes an electromagnet and a plate shaped armature having one face adjacent the electromagnet. Extending in the direction away from the other face is a stem which connects to a valve closure. A disk is secured to the plate end of the stem. A ring connects the plate and the disk. In one embodiment the disk and ring are integral and formed of a thermoplastic with the edge of the ring at the one face turned over the plate by hot working after assembly. In another embodiment the ring is thermoplastic and it is the edge at the disk that is turned over into engagement by hot working. The stem may be integral with the disk or be of a thermoplastic material which is beaded out by hot working to provide the connection between the two.

3,736,541

# DETECTOR PROBE FOR MAPPING DISCONTINUITIES IN ELECTROMAGNETIC PATHS

Reginald J. Gould, Riverside, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed Feb. 28, 1972, Ser. No. 229,801

Int. Cl. H01f 15/04, 17/06

U.S. Cl. 336—84

6 Claims



An electromagnetic field probe shielded to render the probe non-sensitive to ambient electromagnetic fields. The probe consists of an electromagnetic circuit which includes a ferrite core, an air gap, and a pickup coil surrounding a portion of the ferrite core. The pickup coil and a major portion of the core is electromagnetically shielded by an overlapping wrapping of insulated copper material shielding the circuit everywhere except in the vicinity of the air gap.

The invention herein described was made in the course of or under a contract or sub-contract thereunder, with the Department of the Air Force.

3,736,542

# HIGH VOLTAGE TRANSFORMER

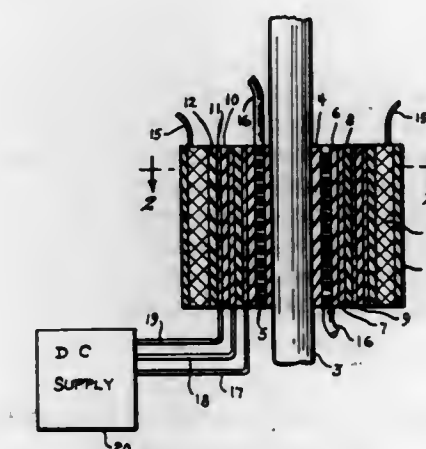
Harry Ashe, 1040 Euclid St., Santa Monica, Calif.

Filed June 15, 1971, Ser. No. 153,310

Int. Cl. H01f 15/00

U.S. Cl. 336—70

1 Claim



A high voltage transformer whose primary and secondary windings are separated by a lamination of solid insulation and conductive sheets alternately arranged. The conductive sheets are charged with discrete direct current voltages to provide a predetermined voltage gradient across the composite insulator structure. In a preferred embodiment the insulating components and the conductive components are in the form of concentric cylinders.



3,736,543

**PHOTOETCHED INDUCTION COIL ASSEMBLY**

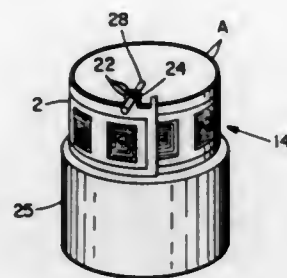
Ernest E. Lademann, Park Ridge, and James J. O'Connor, Old Bridge, both of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Mar. 31, 1972, Ser. No. 240,081

Int. Cl. H01f 27/30

U.S. Cl. 336-200

5 Claims



An induction coil assembly includes circuits photoetched on metallic laminates bonded to a flexible substrate. The substrate is wound on an arbor and pinned, after which it is removed from the arbor, impregnated and machined to provide an induction coil having close mechanical and electrical tolerances.

3,736,544

**HIGH VOLTAGE TEMPERATURE SWITCH**

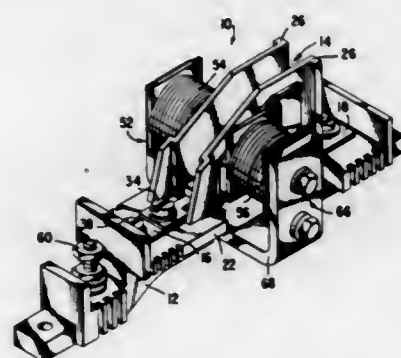
Chester H. Fluder, Wheeling, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed July 16, 1971, Ser. No. 163,197

Int. Cl. H01h 85/38

U.S. Cl. 337-282

3 Claims



A high voltage temperature switch for application in either a direct current or an alternating circuit or both and including a body formed of insulating material and defining an arc chute within which a fusible conductor or link is positioned, wherein the link establishes a circuit and opens upon being subjected to a given temperature to interrupt the circuit, and means for generating an electromagnetic field across the arc chute about the fusible link to blow out the arc in the event the link opens.

3,736,545

**HIGH-SPEED COMMUTATION DEVICE FOR HEAVY POWER APPLICATIONS**

Joseph-Paul-Marie Refouvet, 65-Tarbes, and Joseph Jean Francois Pontico, 65-Hautes-Pyrenees, both of France, assignors to ETAT Français Paris, France

Filed Aug. 6, 1970, Ser. No. 61,601

Claims priority, application France, Aug. 27, 1969, 6929291

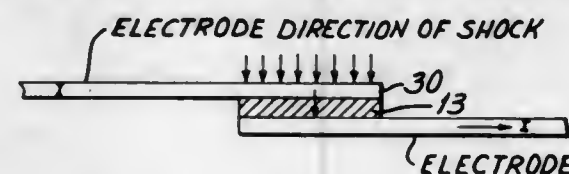
Int. Cl. H01c 7/00

U.S. Cl. 338-13

10 Claims

A high-speed commutation device using the effect of the fall of resistivity in pressure responsive materials under the action

of very high pressures. Pressure is obtained in the form of a pressure wave generated by the detonation of an explosive excited by an electric detonator. The core of insulating material is located between two electrodes under the explosive



sive charge and the transit of the shock wave causes a heavy fall of resistivity which establishes a contact of low residual resistance between the two electrodes. The invention is applied to the construction of starting switches and other similar devices and to switching methods.

3,736,546

**ILLUMINATION PLATTER ON A MOBILE VEHICLE**

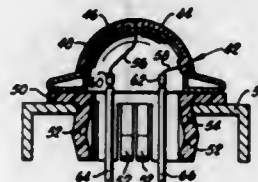
Jack D. Jones, 11508 N. Victoria, Oklahoma City, Okla.

Division of Ser. No. 782,640, Dec. 10, 1968, Pat. No. 3,582,210. This application May 3, 1971, Ser. No. 141,047

Int. Cl. H01c 7/08

U.S. Cl. 338-15

3 Claims



An illumination platter for plotting illumination characteristics of thoroughfare lighting systems including a vehicle, an adjustable length, horizontally extending, supporting bar mounted on the top of said vehicle, and a pair of light intensity sensing devices mounted on opposite ends of the supporting bar. The sensing devices are connected to an amplifier carried in the vehicle, and the amplifier is connected to a recording system. The sensing devices each have convex, upwardly facing light sensitive surfaces to obtain maximum exposure to light emanating from above.

3,736,547

**THREE WIRE GROUNDED RECEPTACLE WITH SAFETY LOCK**

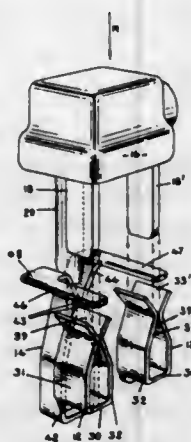
Gerhard Koenig, 58 Westview Crescent, Elliot Lake, Ontario, Canada

Filed Sept. 22, 1971, Ser. No. 182,592

Int. Cl. H01r 3/06

U.S. Cl. 339-14 R

10 Claims



A grounded receptacle to receive a conventional plug with two live sockets to receive the two live prongs of the plug and

3,736,550

**CONNECTING ADAPTER FOR ELECTRIC CABLE AND FUSE**

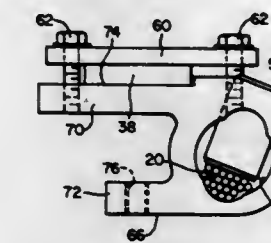
James B. Wallace, Beaver, and Robert H. Hill, Beaver Falls, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 22, 1972, Ser. No. 228,133

Int. Cl. H01r 7/26

U.S. Cl. 339-265 F

10 Claims



a grounded socket to receive the ground prong of the plug. Previous grounded receptacles of this type had the disadvantage that they were as equally suited to be used with plugs without a ground prong as with plugs with a ground prong. The grounded socket of this receptacle has at least one blocking plate which normally extends to a position blocking insertion of one of the live prongs of the plug into the corresponding live sockets of the receptacle, but which is resiliently displaced by insertion of a ground prong into the grounded socket to a position in which such insertion of the live prong is permitted.

3,736,548

**ELECTRICAL COUPLER**

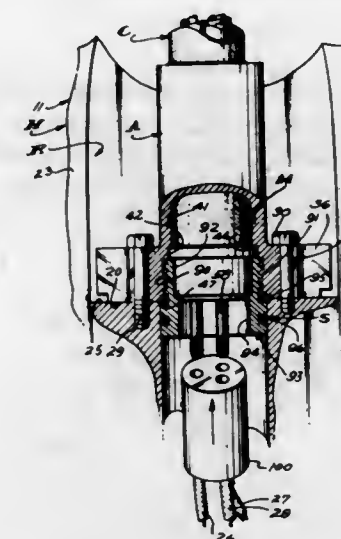
Richard L. Double, Long Beach, Calif.

Filed July 28, 1971, Ser. No. 166,701

Int. Cl. H01r 13/52

U.S. Cl. 339-31 R

8 Claims



An electrical connector structure establishing bonded and sealed engagement with the lower end of an elongated submersible electric power conducting cable and engageable with submersible, electric oil well pumps, said connector being engageable with different makes of oil well pumps having distinct power cable connecting means parts and/or portions.

3,736,549

**ELECTRICAL CONNECTOR**

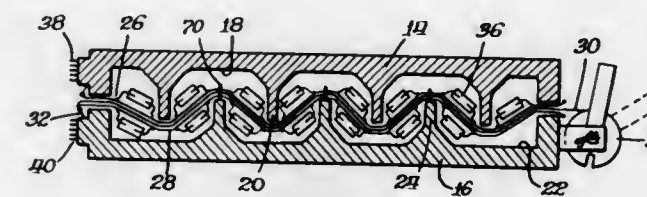
John W. Clements, Route 3 Indian Hill Woods, Naperville, Ill.

Filed Aug. 10, 1970, Ser. No. 62,453

Int. Cl. H01r 13/54

U.S. Cl. 339-75 MP

1 Claim



Apparatus for connecting flexible flat conductored cables each to the other and for connecting the conductors of a cable selectively to the conductors of a multi-layered cable at particular points along the conductors.

3,736,551

**SWIMMERS TACTILE COMMAND NAVIGATION APPARATUS**

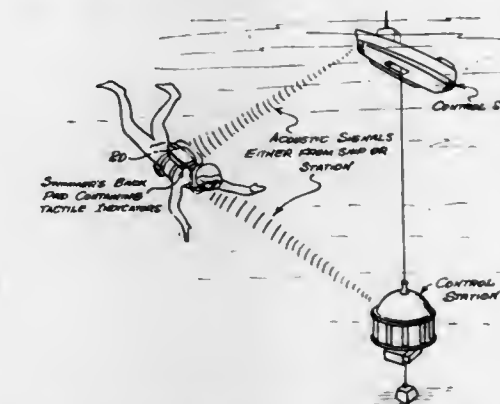
Joseph Hirsch, Santa Ana, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Nov. 16, 1970, Ser. No. 89,921

Int. Cl. H04b 11/00

U.S. Cl. 340-5 R

8 Claims



A command navigation apparatus including a back pad; a plurality of tactile indicators mounted in the back pad for providing tactile sensory indicators on the back, the tactile indicators being arranged in a pair of rows which are substantially perpendicular with respect to one another; and means for mounting the pad on a person's back so that one row of tactile indicators extends longitudinal and the other row of tactile indicators extends transverse the back. Upon sequentially energizing the tactile indicators in selected rows the person receives command indications to progress in various directions.

3,736,552

**ACOUSTIC IMAGING DEVICE USING MULTIPLE ELEMENT ELECTRET TRANSDUCER**

Gerhard Martin Seisler, Summit, N.J., and Kenneth James Taylor, Doubleview, Australia, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 27, 1971, Ser. No. 166,366

Int. Cl. G01s 9/66

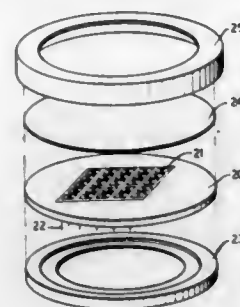
U.S. Cl. 340-5 MP

13 Claims

In an acoustic imaging system, the shape of an object may be reconstructed by directing sound energy on the object and



sensing the sound field scattered by it. An improved sensing unit, which exhibits high resolution, large aperture and good sensitivity and which is sufficiently robust to be used as a field instrument, utilizes a large area, divided-backplate foil



electret transducer. Each backplate unit, with its share of the overlying foil electret, constitutes an individual transducer element. The resulting array is capable of real time operation, responds to relatively small acoustic energy densities, and is suitable for operation in either a gaseous or liquid medium.

3,736,553

## SOUND ORIGIN DIRECTION FINDER

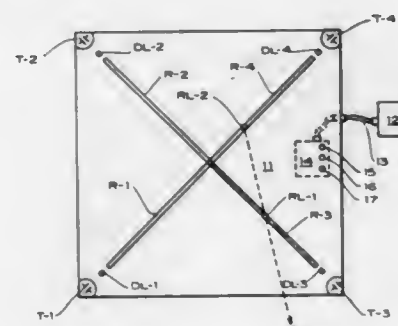
David Winston Kermode, P. O. Box 126, Ridgecrest, Calif.

Filed Dec. 3, 1971, Ser. No. 204,573

Int. Cl. G01s 3/00

U.S. Cl. 340-6 S

3 Claims



A sound origin direction indicator comprising a flat square-shaped form having four sound transducer/amplifier units mounted at its four corners, four rows of solid state lamps radiating from its center to the corners and an electronics system attached to the transducers and lamps to operate the device.

3,736,554

## SEISMIC EXPLORATION

Maurice Barbier, Osmes, France, assignor to Societe Anonyme dite: Societe Nationale Des Petroles D'Aquitaine, County of Courbevoie, France

Filed June 19, 1969, Ser. No. 834,813

Claims priority, application France, June 27, 1968, 68156787

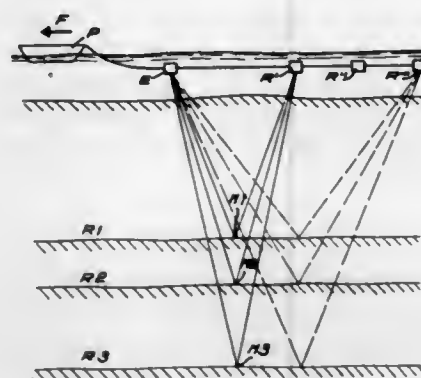
Int. Cl. G01v 1/38

U.S. Cl. 340-7 R

5 Claims

Seismic exploration is effected using a seismic transmitter and at least one receiver which are moved in a continuous manner at a constant distance apart while the transmitter

transmits a continuous series of long signals and the received signals are recorded without interruption. The transmitted



signals are then correlated with corresponding parts of recorded signals to obtain seismic information.

3,736,555

## ELECTROACOUSTIC TRANSDUCERS

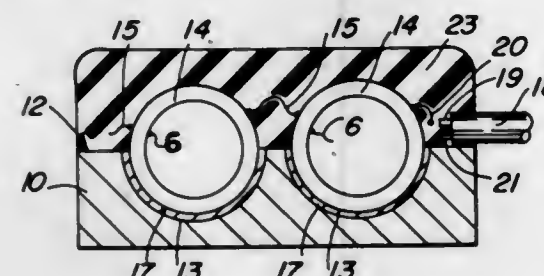
Gilbert C. Barrow, Scituate, Mass., assignor to Massa Division, Dynamics Corporation of America, Hingham, Mass.

Filed Aug. 20, 1971, Ser. No. 173,476

Int. Cl. H04b 13/00

U.S. Cl. 340-8

9 Claims



A rugged low-cost transducer is used in a multiple array to provide greater power with a more precise sound pattern. The transducers are cylindrical elements which are partially recessed in a rigid baffle plate or housing structure. The only radiation takes place from the exposed parts of the cylindrical transducer shell.

3,736,556

## METHOD AND APPARATUS FOR INCREASING SEISMIC SIGNAL-TO-NOISE RATIO

Frederick J. Barr, Jr., San Antonio, Tex., assignor to Petty Geophysical Engineering Company, San Antonio, Tex.

Filed Sept. 8, 1971, Ser. No. 178,654

Int. Cl. G01v 1/24

U.S. Cl. 340-15.5 EC

18 Claims

An improved technique for enhancing the signal-to-noise ratio in the automatic processing of seismic data is provided according to the present invention. Signals from horizontally and vertically oriented geophones, representing two functions of time, are separately recorded. The product of these two

signals is formed as a signal representative of a third function of time. The product signal thus formed is then used in various ways as an "enhancement function" signal, to attenuate noise components and enhance seismic signal components. One technique for utilizing the enhancement function signal involves half-wave rectifying the enhancement function signal and then multiplying the rectified signal by the original signal from the vertically oriented geophone. Another technique involves using the enhancement function signal to produce a gating signal to cancel the original output signal from the vertically oriented geophone whenever the enhancement function signal is other than negative.

3,736,557

## ACOUSTIC LOCATOR WITH ARRAY OF MICROPHONES

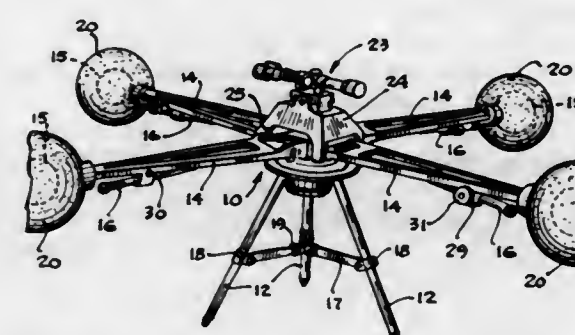
George Brynk, Raton, N. Mex., assignor to A.R.F. Products, Incorporated, Raton, N. Mex.

Filed Nov. 26, 1969, Ser. No. 880,026

Int. Cl. G01s 3/00

U.S. Cl. 340-16 R

7 Claims



Acoustic locator comprising an array of microphones located on the outer ends of radial arms extending from a central support. The inner ends of the arms are pivotally connected to a housing rotatably mounted on a table of the support which also comprises a plurality of legs. A sighting device is applied to the arms for orienting the microphones, once the support is set up. After orientation, longitudinally adjustable posts are swung downwardly from the arms into engagement with the ground for supporting the arms and microphones.

3,736,558

## DATA-SIGNALING APPARATUS FOR WELL DRILLING TOOLS

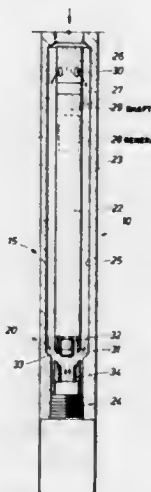
Walter E. Cubberty, Jr., Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed July 30, 1970, Ser. No. 59,393

Int. Cl. G01v 1/14

U.S. Cl. 340-18 LD

19 Claims



In the preferred embodiment of the invention disclosed herein, a well tool having new and improved data-signaling ap-

paratus and carrying a drill bit on its lower end is dependently coupled from a drill string and lowered into a borehole being excavated. During the drilling operation, measurements are successively made of selected borehole conditions, formation properties, or the like, which are converted by the data-signaling apparatus into coded electrical signals for repetitively opening and closing a valve including a valve member and a movable valve seat operatively arranged on the tool for selectively interrupting and then resuming the flow of the drilling fluid being circulated through the drill string. In this manner, the valve functions to produce a series of encoded pressure pulses in the drilling fluid which are representative of the measurements being obtained. These pressure pulses are transmitted through the drilling fluid to the surface where they are sensed and converted into meaningful indications of the measurements.

3,736,559

## PILOT WARNING INDICATOR SYSTEM

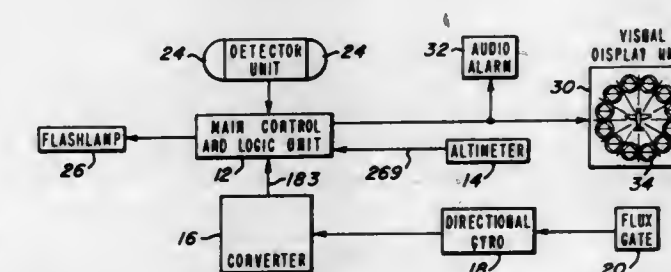
James H. Trageser, and Joseph A. Cail, both of Dayton, Ohio, assignors to Technology Incorporated, Dayton, Ohio

Filed June 19, 1970, Ser. No. 47,823

Int. Cl. G08g 5/00

U.S. Cl. 340-27 R

21 Claims



A system for detecting the presence of intruder aircraft within the region of a given aircraft and for warning the pilot of the given aircraft if an intruder aircraft is traveling in such a manner that a collision may result. The system includes signaling means carried by the intruder aircraft which continuously indicates the altitude and/or heading thereof. The system includes means for providing signals related to the heading and/or altitude of the given aircraft. The system also includes means for decoding signals received from the intruder aircraft and for comparing such signals with the signals related to the altitude and/or heading of the given aircraft and for providing a warning if a potential collision condition exists.

3,736,560

## APPARATUS FOR DETECTING AND SIGNALING LIGHT ATTENUATION

Atlee S. Hart, 27530 Abington Road, Southfield, Mich.

Filed Aug. 11, 1971, Ser. No. 170,834

Int. Cl. B60q 1/00; 356 206

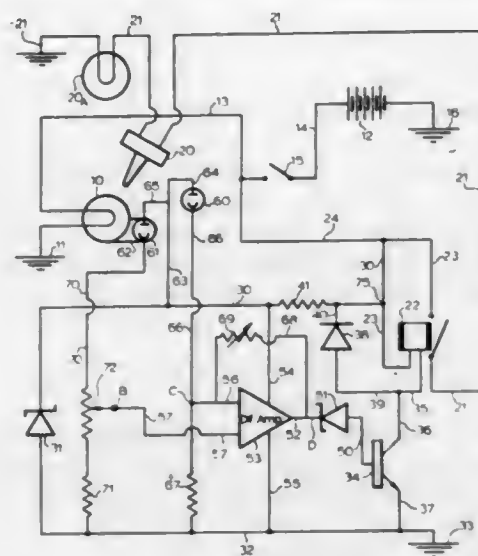
U.S. Cl. 340-53

5 Claims

An apparatus for detecting the light output loss of a headlamp due to deposited dirt-film obstructing light emission for activating washing mechanism and/or for signaling the driver to wash the headlamps and/or to actuate the headlamp washing mechanism to remove the deposited dirt-film, having a reference photo electric cell on the lamp surface to prevent dirt-film entry therebetween and a reading photo electric cell spaced from the lamp surface to permit dirt-film to enter and deposit therebetween. The output from each cell is fed to a differential amplifier and any substantial output from the amplifier actuates the signal to the driver and/or the headlamp washing mechanism. A potentiometer and/or a variable resistor in the lines between the cells and the amplifier allows balancing the amplifier at null or low output when the headlamp is devoid of dirt-film. Upon the presence of dirt-film



between the reading cell and the headlamp, the amplifier becomes unbalanced and emits sufficient EMF to power a signal to the driver and/or to actuate headlamp washing



mechanism. The apparatus is automatic, may be turned on and off with the headlamps of a vehicle, and may actuate washing mechanism and/or a warning lamp directly or through a relay.

3,736,561

## PATROL TOUR SYSTEM

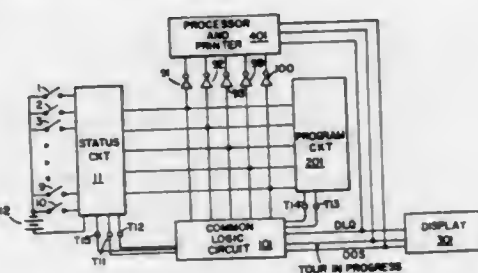
Delbert O. Rumpel, Mundelein, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 24, 1972, Ser. No. 237,834

Int. Cl. G08b 25/00

U.S. Cl. 340-147 P

20 Claims



A patrol tour system for insuring that the tour station switches are operated in the proper sequence and within a predetermined amount of time by the guard making the tour which system comprises a common logic circuit for providing an indication of a delinquency in the time between the operation of the tour stations, an indication when the tour stations are operated out of a prescribed sequence, a tour in process indication, and a tour end indication, a status circuit having latching circuits connected to each of the tour station switches for prohibiting the repetitive reset of a common logic timing means by repetitive operation of only one of the tour station switches, and optionally a program circuit for establishing a predetermined sequence of operations of the tour stations.

3,736,562

## PROGRAMMABLE ELECTRICAL CONTROL SYSTEM FOR A TRANSPORT HOIST

Leo Z. Zeleny, Warren, Mich., assignor to Ionic International, Inc., Warren, Mich.

Filed Nov. 24, 1969, Ser. No. 879,353

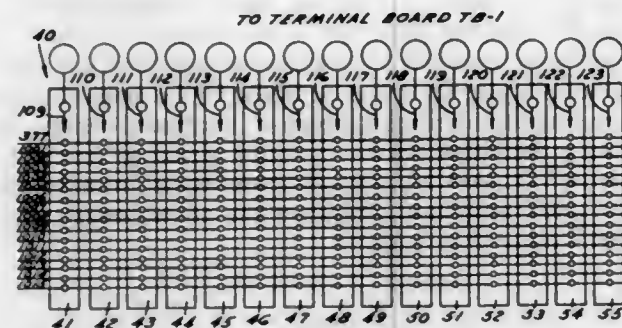
Int. Cl. H04q 3/00

U.S. Cl. 340-149 R

18 Claims

A work transfer apparatus movable along a row of stations and including a vertically movable hoist for raising and lower-

ing a barrel or tray of work at selected stations. A programmable control system moves the apparatus from one station to



another in a predetermined sequence and for raising or lowering the hoist at each station in the program.

3,736,563

## PROGRAM CONTROL UNIT FOR A DIGITAL DATA PROCESSING INSTALLATION

Gunter Beckinger; Hannes Goulon, both of Munich; Gerhard Wiest, Gauting; Klaus Wehrend, and Hans-Albrecht Kiessling, both of Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

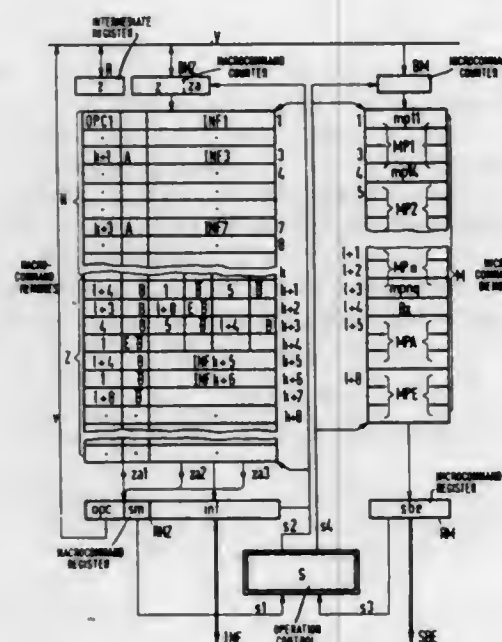
Filed Mar. 30, 1971, Ser. No. 129,542

Claims priority, application Germany, Mar. 31, 1970, P 20 15 272.1

Int. Cl. G06f 9/12, 9/16

U.S. Cl. 340-172.5

11 Claims



A program control unit for a digital data processing installation is described. The program control delivers macro-commands from a macro-command memory, and micro-commands from a micro-command memory. The micro-commands can be delivered singly or in selected combinations. In addition to the main commands in the macro-command memory which act as macro-commands for directly releasing micro-programs, there are also main commands which follow each other and indirectly cause the delivery of one or more micro-commands. Indirect delivery of micro-commands is caused in any case by a machine address of a memory cell, belonging to the pertinent main command, related to the macro-command memory for another macro-command. At least one auxiliary command which can be called up by different main commands is contained in a memory cell of this type. Each auxiliary command determines, by means of a micro-command machine address related thereto of the memory cell in the micro-command memory, the delivery of this micro-command or the delivery of this micro-command and the micro-command which follows in the micro-command memory.

3,736,564

## ELECTRONICALLY GENERATED PERSPECTIVE IMAGES

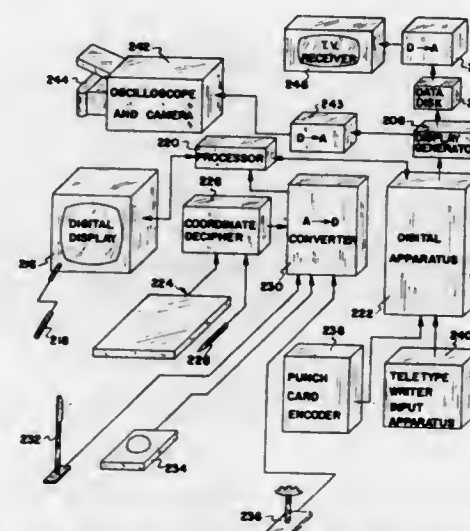
Gary S. Watkins, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed June 1, 1971, Ser. No. 148,801

Int. Cl. G06f 15/20; G06g 7/48

U.S. Cl. 340-172.5

55 Claims



A method and system for electronically generating and displaying shaded perspective images of three-dimensional objects on a two-dimensional view plane by providing electrical signals representative of the surfaces of an object and identifying and utilizing only the signals representing visible surfaces to display the perspective images. More specifically, electrical signals defining surfaces of a three-dimensional object are converted to define the projections of the surfaces onto a two-dimensional image or view plane defined by a raster scan display device. The converted signals defining surfaces which are to be displayed, depending on the desired orientation of the object, are determined by comparing the relative depths of segments of the surfaces along each scan line of the display and selectively subdividing the scan lines according to the visual characteristics of the segments when necessary. Signals defining the visible segments are then utilized to control the intensity of the display. The visibility determination and subsequent displaying of the visible surfaces are provided at a real time rate, i.e., at the scanning rate of the display which may be on the order of 1/30 second.

3,736,565

## PROGRAMMABLE TRANSPORT CONTROLLER

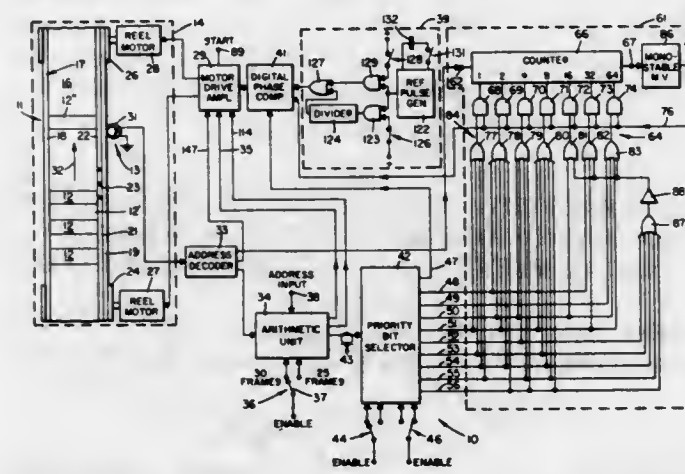
George B. Sidline, Belmont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Nov. 16, 1970, Ser. No. 89,567

Int. Cl. G06f 13/04

U.S. Cl. 340-172.5

21 Claims



A magnetic head is located to reproduce signals recorded in binary notation along a track of magnetic video tape to identify

fy its frames. The frame identifying signals carry clock and address signal information and are recorded in a code to address consecutive frames sequentially. As the magnetic tape is advanced to position a particular frame at the magnetic head location, the frame identifying signals are reproduced and decoded to obtain the frame address signals and the clock signal. The reproduced frame address signals are compared to the address signal of the particular frame to generate signals representative of the distance the particular frame must be advanced to position it at the magnetic head. The clock signal obtained from the decoded frame identifying signals is coupled to an adjustable frequency divider. When the particular frame is further than a certain distance from the magnetic head location, the tape transport is commanded to advance the tape at the maximum possible speed. As the particular frame is advanced to be within each of certain ranges of distances of the magnetic head location, the corresponding distance representative signal sets the divider to divide the frequency of reproduced clock signal by one of a set of selected numbers. The divided clock signal frequency is compared to a reference frequency signal to command the tape transport drive motor to advance the magnetic tape at a speed corresponding to a clock signal frequency which, after being divided, equals the frequency of the reference frequency signal. The distance representative signal is coupled to stop the advance of the tape when the particular frame arrives at the magnetic head location.

3,736,566

## CENTRAL PROCESSING UNIT WITH HARDWARE CONTROLLED CHECKPOINT AND RETRY FACILITIES

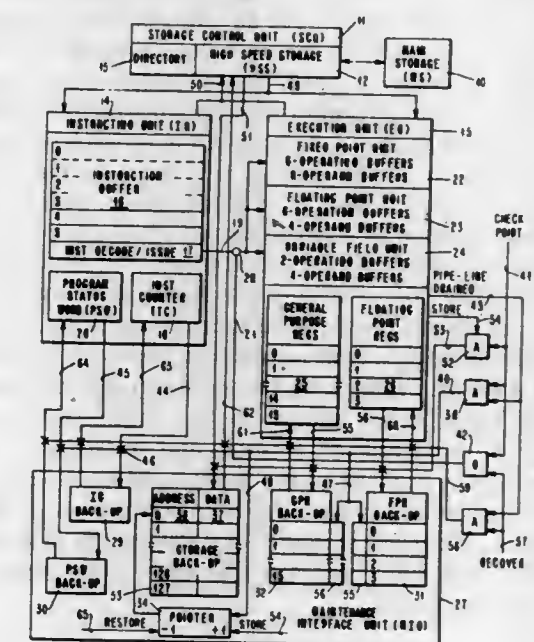
David W. Anderson, Poughkeepsie; Richard N. Gustafson, Hyde Park; Lance H. Johnson; Francis J. Sparacio, both of Poughkeepsie; William M. Tomas, Saugerties, and James J. Webster, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 18, 1971, Ser. No. 172,804

Int. Cl. G06f 11/04

U.S. Cl. 340-172.5

7 Claims



A data processing system with a central processing unit (CPU), main store (MS), and high speed storage (HSS) interposed between the CPU and store. The CPU has a high degree of overlap and pipelining. That is, a plurality of instructions are buffered and predecoded through several stages prior to issuance to individual execution units where further instruction and operand buffering takes place. The execution units may be highly pipelined, wherein succeeding instructions can be issued to the execution unit prior to the completion of execution of a prior instruction. Additional hardware is added



providing the ability to periodically establish a checkpoint which stores a minimum amount of CPU status information to permit processing to proceed with a plurality of instructions with the ability to cause the CPU to re-establish all of the data operated on and the status at the time the checkpoint was made.

3,736,567

## PROGRAM SEQUENCE CONTROL

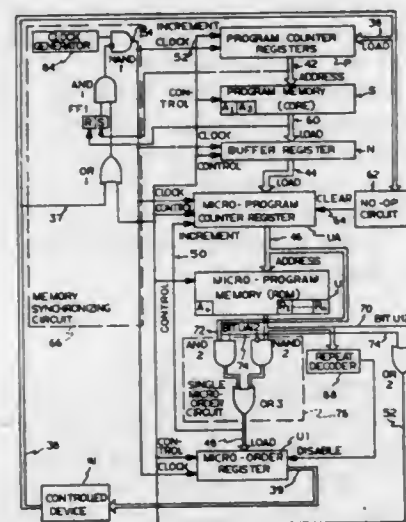
Amram Lotan, Holon, Israel, and Dixon Teh-Chao Jen, Monroe, Conn., assignors to Banker Ramo Corporation, Oak Brook, Ill.

Filed Sept. 8, 1971, Ser. No. 178,695

Int. Cl. G06F 9/00

U.S. Cl. 340—172.5

24 Claims



Program sequence control is described in connection with a computer having a main system program and one or more micro-order programs. The instructions in the system program are of two types: one type actually comprises a micro-order, and the other type designates an address where a sequence of micro-orders begins in a micro-order program. The sequence controller is able to load single micro-order instructions directly into its micro-order register for execution, or alternatively it addresses the micro-program to fetch a sequence of micro-orders which correspond to a multiple micro-order instruction. A special type of multiple micro-order instruction requires repetition of a particular micro-order any number of times up to a predetermined maximum. The system employs a single marked bit to distinguish single and multiple micro-order instructions, and also to identify the last micro-order in any multiple micro-order instruction, including the last repetition of a repeat cycle. A buffer register is also provided which permits more rapid access to the main system program through a "look ahead" feature, and provision is made for discarding the content of the buffer register when the "look ahead" assumption is invalidated by subsequent program contingencies. Provision is made for delaying the micro-program memory cycle when necessary to allow the system program memory to catch up.

3,736,568

## SYSTEM FOR PRODUCING A MAGNETICALLY RECORDED DIGITALLY ENCODED RECORD IN RESPONSE TO EXTERNAL SIGNALS

Richard K. Snook, Bridgeton, Mo., assignor to Digimetics Incorporated, Bridgeton, Mo.

Division of Ser. No. 12,322, Feb. 18, 1970, Pat. No. 3,665,115.

This application Sept. 8, 1971, Ser. No. 178,755

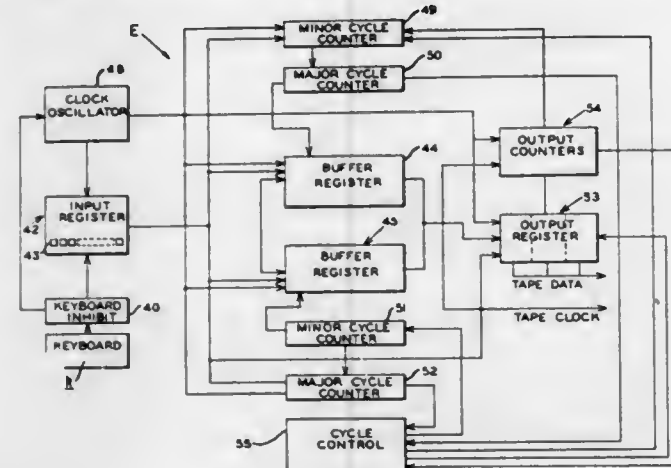
Int. Cl. G06F 3/06

U.S. Cl. 340—172.5

11 Claims

An apparatus for producing a magnetically recorded digitally encoded record in response to receipt of external

signals, such as from a key operated machine capable of generating such external signals. The source of the external signals may be interfaced to an electrical circuit of a recorder forming part of the aforesaid apparatus for producing a magnetic tape record. The recorder generally includes an input register and two internal buffer registers controlling information transfer rates between the keyboard and the magnetic tape unit. A clock oscillator permits transfer from the input register to the buffer registers and from the buffer registers to an out-



put register. An input major cycle counter and an input minor cycle counter is associated with each of the buffer registers for accumulating the number of words in storage. As counts from the two cycle counters are accumulated, the input from a buffer register is transferred to the output register and written on the tape in pretimed relationship to movement of the tape. Thus, the apparatus provides a magnetically recorded record which is readable by digital computing equipment for automatically preparing a transcription of the record.

3,736,569

## SYSTEM FOR CONTROLLING POWER CONSUMPTION IN A COMPUTER

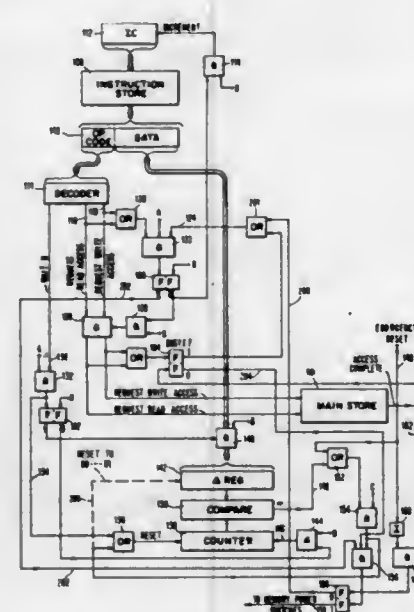
Willard G. Bouricius, Katonah; Donald C. Jessep, Jr., Pound Ridge, both of N.Y.; William C. Carter, Ridgefield, Conn., and Aspl B. Wadia, Chappaqua, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 13, 1971, Ser. No. 188,922

Int. Cl. G06F 9/06

U.S. Cl. 340—172.5

6 Claims



The disclosed system causes power to be removed from the memory for a chosen time duration after each time that the

memory is used. The time duration can be chosen as desired and is specified by a "WAIT N" instruction. When this instruction appears, the power to the memory is removed therefrom and accesses to the memory are prevented. The time duration is entered into a register and the contents of this register are compared with the contents of a counter which has a clock pulse train applied thereto until equality is attained whereby an equality signal issues. The latter signal is applied to restore power to the memory and, with appropriate logic, permits accesses to the memory, read or write, for example. When the memory accessing is completed, the N units specified by the "WAIT N" instruction would be usable at the option of the program to control access to the memory and to remove power therefrom for the duration of N time units. A new "WAIT N" instruction can change the time duration.

3,736,570

## MULTIPLE STATE MEMORY CIRCUIT

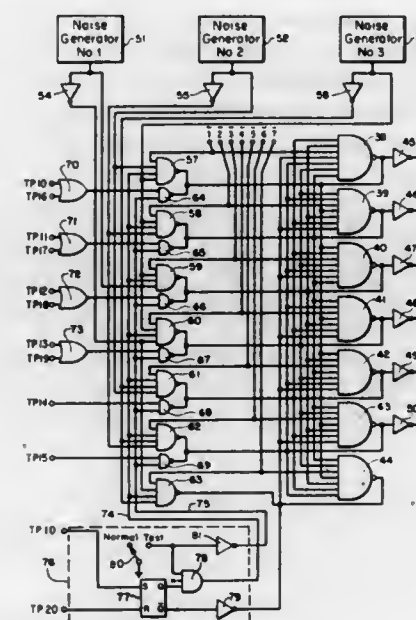
Melvin C. Hendrickson, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Nov. 4, 1971, Ser. No. 195,717

Int. Cl. G11c 5/02

U.S. Cl. 340—173 R

5 Claims



An inhibitable random pulse generator for a subscription television system or the like generates an output pulse indicative of a random one of a plurality of possible counting states, one or more of which may be inhibited to narrow selection to the remaining states. A plurality of logic elements within the generator are connected in a novel mutually exclusive circuit whereby one and only one can produce an output at a time. Individual sources of random noise applied to each element produce an output from an unpredictable one of the elements. Provision is made for inhibiting selected generator outputs by preventing the application of noise to the associated element, and a test mode is provided wherein timing pulses are applied to the elements to obtain a repetitive predictable output.

3,736,571

## METHOD AND SYSTEM FOR IMPROVED OPERATION OF CONDUCTOR-INSULATOR-SEMICONDUCTOR CAPACITOR MEMORY HAVING INCREASED STORAGE CAPABILITY

Mitchell S. Cohen, Lexington, and John S. Moore, Belmont, both of Mass., assignors to Micro-Bit Corporation, Lexington, Mass.

Filed Feb. 10, 1971, Ser. No. 114,113

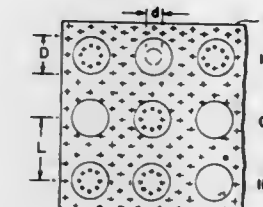
Int. Cl. G11c 11/42

U.S. Cl. 340—173 CR

40 Claims

A computer memory system employing a planar metal-insulator semiconductor-metal memory capacitor sandwich for

selectively storing an array of electric charges in the insulator near the insulator-semiconductor interface in patterns which are representative of binary encoded data. The method and system for initially uniformly charging the planar surface of the insulator of a memory capacitor employing p-type semiconductors with positive polarity electric charges, maintaining the positive electric charges at those data bit sites representative of binary "1's" and removing positive charges at the binary "0" data sites to form non-charged areas of diameter D surrounding the binary 0 data bit sites where D is the equivalent or greater than several electron path diffusion lengths in the semiconductor. The positive charges are formed in the insulator layers by bombarding the insulator with an electron beam while maintaining a positive polarity electric field across the memory capacitor. At the data bit sites where binary "0's" are to be written, a negative polarity field gradient is established across the capacitor while irradiating the selected bit site with the electron beam. At each bit site the electron beam is appropriately manipulated by causing it to trace out a circular path of diameter  $D > d$  where d is the diameter of the electron beam. By spacing the data bit sites apart a distance  $L > D$  where the center-to-center spacing distance L is on the order of 20 microns or less, a grid-like lattice of positive electric charges is formed at the insulator-semiconductor interface which surrounds all of the data bit sites. This in turn induces a corresponding interconnected grid-like lattice layer of strongly inverted and highly conducting semiconductor adjacent to the insulator-semiconductor interface. This highly conductive inverted semiconductor lattice layer surrounds and interconnects substantially all of the posi-



tively charged data bit sites but is separated from the non-charged, binary 0 bit sites by the distance  $D/2$  which is the equivalent of or  $>$  several electron path diffusion lengths in the semiconductor. In memory capacitors using n-type semiconductors, the inverse of the charge states in p-type semiconductors is employed. During reading, a read-out electron beam selectively probes the data bit sites while a substantially zero voltage or slightly negative bias potential is maintained across the memory capacitor. Upon probing a charged binary 1 bit site, electron-hole pair carriers are formed and are separated by the electric field of a depletion region induced in semiconductor layer as a consequence of the positive charges. The electron current is conductively connected to the highly conducting grid-like inverted lattice layer in the semiconductor and results in a relatively large capacitor charging current to the memory capacitor and a corresponding large output signal. Upon impinging into a non-charged binary 0 data bit site, electron-hole pair carriers produced in the semiconductor by the electron beam recombine within the non-charged region of diameter D prior to reaching the strongly conducting, inverted, grid-like layer. Hence, at most only a minimal charging current to the memory capacitor is produced that is readily distinguished from the output current produced at the charged binary 1 data bit sites. Enhanced operation is obtained by pretreatment of the semiconductor through gold doping or annealing in oxygen at the high temperatures in order to enhance recombination rates in the non-charged areas of diameter D. Treatment of the metalized face of the insulator that is subjected to the write-read electron beam to produce a metal thickness on the order of 2,000 Å units plus or minus 500 Å units results in overcoming undesired disturb



effects produced by scattering electrons. By appropriate read-rewrite techniques interaction on adjacent bit sites by scattering electrons can be minimized and long term degradation of the memory over a number of operating cycles prevented.

3,736,572

# BIPOLAR DRIVER FOR DYNAMIC MOS MEMORY ARRAY CHIP

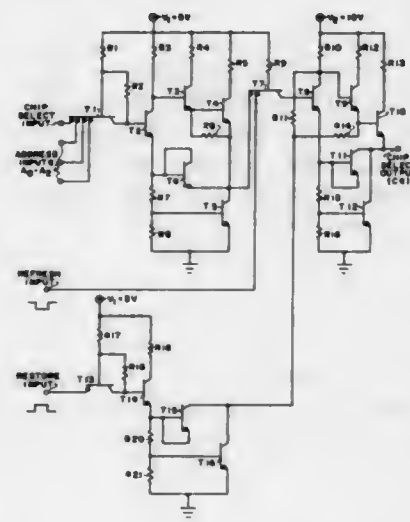
George K. Tu, Wappingers Falls, N.Y., assignor to Cogar Corporation, Wappingers Falls, N.Y.

Filed Aug. 19, 1970, Ser. No. 65,226

Int. Cl. G11c 11/24, 11/40

U.S. Cl. 340-173 DR

40 Claims



A bipolar driver for a dynamic MOS memory array chip. The drive signal which is generated consists of a high-level pulse if a read or write operation is to be performed on a cell in the array, followed by an intermediate level pulse if during the same cycle all cells in the array are to be refreshed. A pulse generator is normally operative to apply a high-level potential to an output terminal under the control of an input decoder. When a refresh pulse is to be generated, the pulse generator is made to energize its output terminal independent of the operation of the decoder, but a diversion of current in the pulse generator at this time causes the potential at the output terminal to be at a lower level.

3,736,573

# RESISTOR SENSING BIT SWITCH

Frederick T. Blount, Wappingers Falls, N.Y.; Henry A. Geller, Richmond, Va.; Richard D. Moore, Hopewell Junction, N.Y.; Howard Leung; Scott C. Lewis, both of Essex Junction, Vt., and Joseph M. Redmond, Philadelphia, Pa., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 11, 1971, Ser. No. 197,910

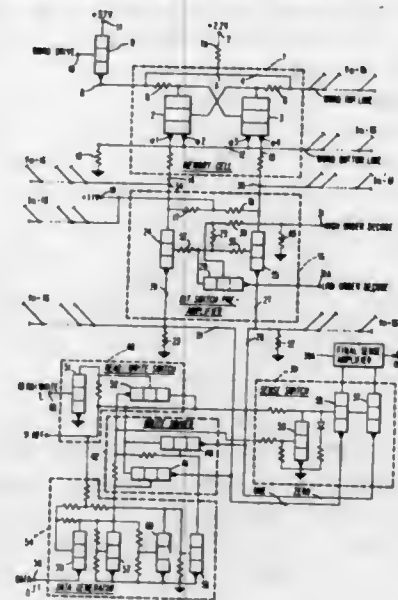
Int. Cl. G11c 11/40

U.S. Cl. 340-173 R

40 Claims

A data storage circuit utilizing a bistable memory cell and a resistor sensing bit switch preamplifier for performing read and write operations. The cell contains two double-emitter semiconductor elements having their bases and collectors cross-coupled to form a bistable circuit. Each element has one emitter connected in common to a resistor terminated word line to permit bilevel conduction of the elements from a low level standby state to a higher level power-up state for access operations. The second emitter of each element is coupled through collector-emitter paths of a pair of amplifying and switching transistors to corresponding ones of resistor terminated bit sense lines. The amplifying transistors are concurrently biased on and off by a gating transistor under selective control of a bit driver decoding circuit. In read operations, the stored data is sensed at the bit sense line resistors by a final sense amplifier.

For write operations, a write driver is provided to provide appropriate voltages at the bit sense line resistor as required for storage of required data in the memory cell. The final



sense amplifier is adapted to be isolated from the circuit by connection to the bit lines through the collector-emitter path of a normally forward-biased control transistor which is reverse-biased during write operations.

3,736,574

# PSEUDO-HIERARCHY MEMORY SYSTEM

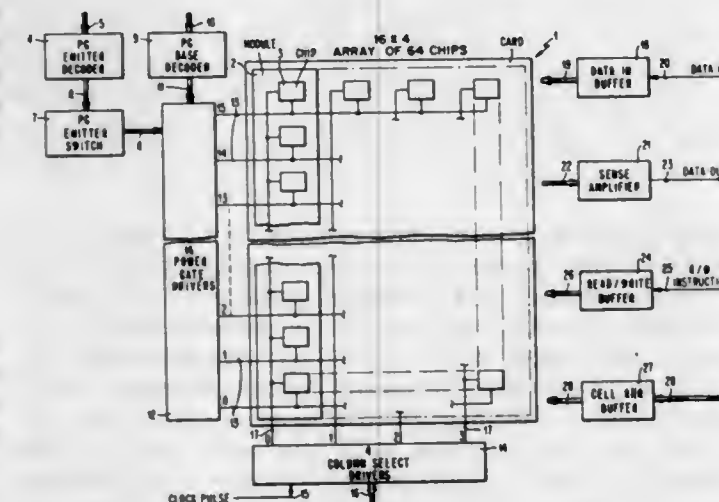
John Edwin Gersbach, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1971, Ser. No. 214,199

Int. Cl. G11c 11/40

U.S. Cl. 340-173 R

23 Claims



A monolithic memory system for a digital computer comprises an array of monolithic chips arranged in rows. Each chip includes an array of memory cells, associated support circuits, and current reference sources connected to the support circuits. Each of a plurality of power gate drivers has a line connected to the current reference sources of a respective row of chips. One power gate driver is actuated to supply power to the current reference sources of a selected row of chips which includes the selected memory cell to be addressed and the power is uninterruptedly maintained for so long as the successive cells being addressed are within the selected row of chips. When the cell being currently addressed is within a different row of chips, the original power gate driver is deactuated and a new power gate driver is actuated to supply power to the current reference sources of the new row of chips containing the memory cell to be addressed.

3,736,575

# SINGLE LINE PER BIT ASYNCHRONOUS CIRCUIT AND SYSTEM

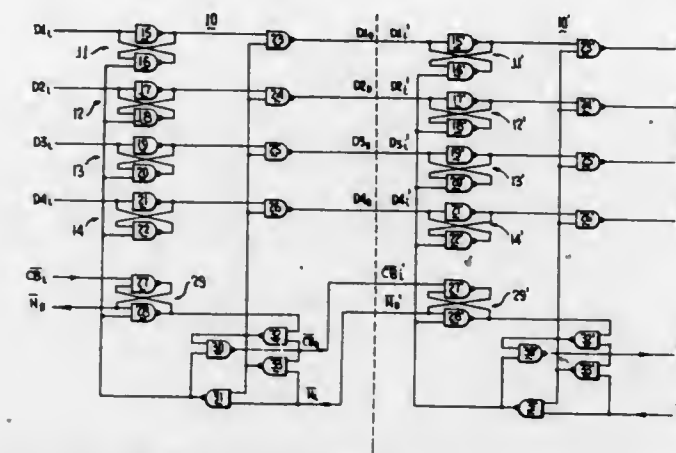
Dallas J. Mallerich, Jr., Ellicott City, Md., assignor to Dyad Systems, Inc., Randallstown, Md.

Filed Feb. 1, 1972, Ser. No. 222,520

Int. Cl. G11c 19/00

U.S. Cl. 340-173 R

17 Claims



A single line per bit logic circuit serves as one of plural cascaded stages in a binary register through which data characters are shifted asynchronously, serially by character, parallel by bit. Each stage has a neutral state (no stored information) and an information state (stored information). Control logic in each stage controls shifting as follows: stage  $i$  receives information from stage  $(i-1)$  only if stage  $(i-1)$  is in its information state and stage  $i$  is in its neutral state; likewise, stage  $i$  shifts information to stage  $(i+1)$  only if  $i$  is in its information state and stage  $(i+1)$  is in its neutral state. A single line per data bit configuration is made possible by rendering the shift control logic independent of the data bits. In one embodiment, each circuit stores four parallel bits, the shifting of which is controlled by independent logic circuitry in that circuit.

## ERRATUM

For Class 340-174 see:  
Patent No. 3,736,419

3,736,576

# PLATED WIRE MAGNETIC MEMORY DEVICE

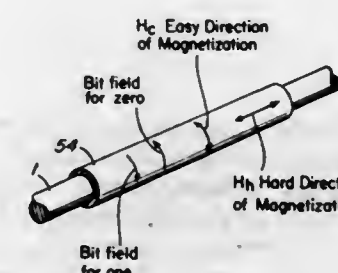
Emil Toledo, Natick, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 27, 1970, Ser. No. 93,333

Int. Cl. G11c 11/14

U.S. Cl. 340-174 PW

8 Claims



An electropolished, copper plated, beryllium copper wire is plated with a composite coating of a nickel-iron-cobalt alloy. Such coating consists of a layer having a high anisotropic field parameter, of the order of 6 oersteds or higher, adjacent the surface of the wire, superimposed by a layer having a lower

anisotropic field parameter, of the order of 4 oersteds or less. The wire is plated in two plating cells, the first of which is provided with a plurality of passages directing the flow of a plating electrolyte with a major component of flow across the wire and a minor component of flow in one direction along the wire. The second plating cell is provided with a plurality of passages directing the flow of a plating electrolyte substantially transverse to the wire. The electrolyte supplied to the first cell contains salts of iron, nickel and cobalt, with cobalt being present in a relatively high concentration. A similar electrolyte is supplied to the second cell except that its maximum concentration of cobalt is about one fifth of that of the first electrolyte.

3,736,577

# DOMAIN TRANSFER BETWEEN ADJACENT MAGNETIC CHIPS

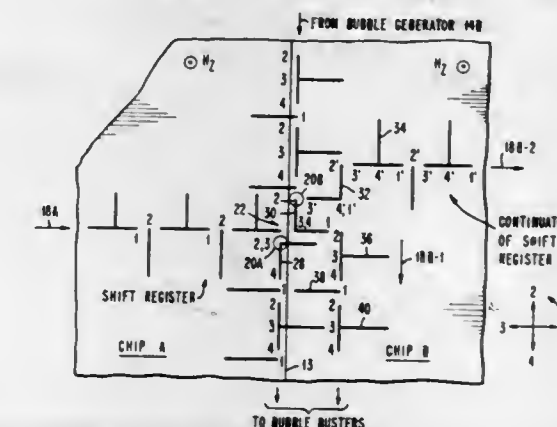
Hau Chang, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1970, Ser. No. 103,047

Int. Cl. G11c 21/00, 11/14

U.S. Cl. 340-174 TF

22 Claims



A structure for cylindrical, single wall magnetic domains using a plurality of magnetic chips to achieve large size devices, such as long shift registers. The magnetic chips are pieced together and domain propagation from one chip to another is effected by an interaction between domains located on adjacent chips. The domains themselves are not able to cross the boundary between adjacent chips. Propagation means in one chip brings domains representing information bits in that chip closely enough to a second chip that these domains will magnetically interact with other domains in the second chip, causing the domains in the second chip to then propagate as information bits. Consequently, a large device is comprised of a number of smaller segments which cooperatively interact. This overcomes the constraint of bit capacity limitation due to the dimensions of magnetic chips. This also facilitates the combined use of chips with different properties as designed for different functions.

3,736,578

# GALVANO-MAGNETRO EFFECT APPARATUS

Noboru Masuda, Kawaguchi, Japan, assignor to Denki Onkyo Co., Ltd., Tokyo, Japan

Filed Dec. 31, 1970, Ser. No. 103,151

Claims priority, application Japan, Dec. 31, 1969, 44/1363

Int. Cl. G11c 11/18, 11/02

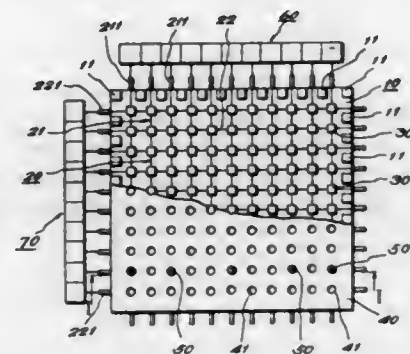
U.S. Cl. 340-174 HA

12 Claims

A galvano-magnetron effect apparatus wherein a matrix, comprising a plurality of 4-terminal Hall effect devices which



form intersections in the matrix, and at least one magnetic pole is provided so that the magnetic flux can be concentrated onto at least one of the Hall effect devices, and input current is



supplied from one of the vertical and horizontal terminal sides of the matrix and output voltage is obtained at the other terminal side of the matrix.

3,736,579

## CIRCULAR MAGNETIC DOMAIN DEVICES

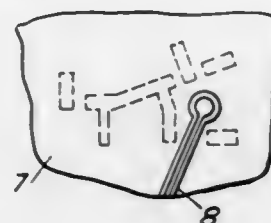
Anthony Marsh, Blisworth, England, assignor to Plessey Handel Und Investments A.G., Zug, Switzerland

Filed Feb. 2, 1972, Ser. No. 222,747

Int. Cl. G11c 11/14

U.S. Cl. 340—174 TF

10 Claims



A circular magnetic domain device which includes a layer of uniaxial magnetic material formed on or in a surface of a magnetic member having at least one easy magnetization direction substantially parallel to the said surface thereof, the layer material having a single unique easy magnetization direction substantially normal to the said surface. A first pattern of a soft magnetic material is interposed between the uniaxial magnetic layer and the magnetic member, and a pattern of an electrically conductive material is formed on the upper surface of the uniaxial magnetic layer. The magnetic member can be formed on the surface of a non-magnetic substrate, and a second soft magnetic pattern can be formed on the upper surface of the uniaxial magnetic layer. The second soft magnetic pattern can be complementary to, and in register with, the first pattern in order to obtain higher propagation rates for the circular magnetic domains.

3,736,580

## PLAY BACK - MACHINE CONTROL (POSITION INFORMATION STORAGE AND REPRODUCTION DEVICE)

Jiro Chiba, Koshoku-ku, Yokohama-shi, Kanagawa-ken, and Tadaaki Kanazaki, Komae-shi, Tokyo, both of Japan, assignors to Tokyo Seimitsu Sokki Kabushiki Kaisha, Kawasaki-shi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 154,630, June 18, 1971, abandoned, which is a continuation of Ser. No. 836,818, June 26, 1969, abandoned. This application Apr. 24, 1972, Ser. No. 246,787

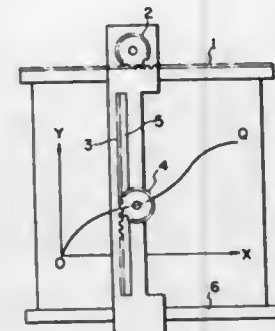
Int. Cl. H03k 13/02

U.S. Cl. 340—174.1 J

15 Claims

A control unit for storing the information of the coordinates corresponding to many-dimensional motion of a moving point

and for reproducing this motion by the stored information wherein pulse trains corresponding to the information data of each coordinate are counted by a reversible counter during a predetermined time in such a manner that the number of pulses in these trains is represented in a binary coded form so as to constitute data blocks including each one binary digit show-



ing the forward or reverse direction of the motion, data blocks thus formed are sequentially stored in series into a storage device (preferably a rotating magnetic drum or disk) and the stored data blocks are read out one by one through the output gates of a linear interpolation circuit, so that the reproduced pulse trains may approximate the original motion by a line-segment motion.

3,736,581

## HIGH DENSITY DIGITAL RECORDING

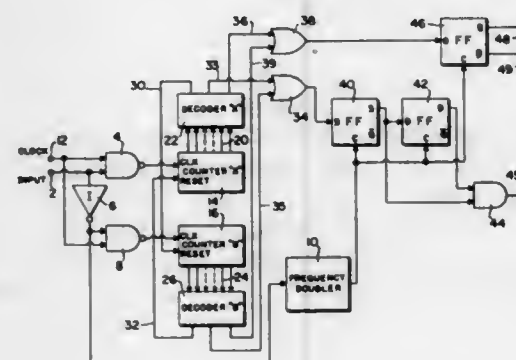
Ivars P. Brekka, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed July 2, 1971, Ser. No. 159,356

Int. Cl. G11b 5/02

U.S. Cl. 340—174.1 A

10 Claims



A playback system for a high density digital recording carrying digital information in the form of a code composed of pulse lengths between successive zero crossings. Random variations in these pulse lengths after playback of the recorded information are compensated by converting the duration of the pulse lengths into counts of a fixed clock and, subsequently, decoding the count data into binary form by sensing a first plurality of counts for one type of binary data and a second plurality of counts for a second type of binary data. The two types of binary data are temporarily stored in respective flip-flop circuit between successive decoding operations controlled by a clock signal derived from a frequency multiplication of the input signals.

3,736,582

## GALLOPING BASE LINE COMPENSATING CIRCUIT

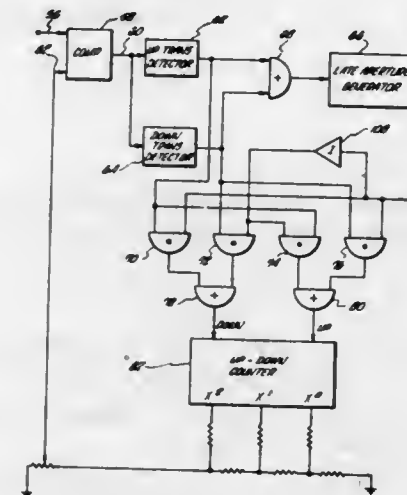
Kermit A. Norris, Duarte, Calif., assignor to Leach Corporation, Azusa, Calif.

Filed Mar. 20, 1972, Ser. No. 236,379

Int. Cl. G11b 5/02, 5/44

U.S. Cl. 340—174.1 H

18 Claims



A compensation circuit that operates to appropriately adjust upward or downward the zero threshold or base line used in recovering digital data recorded in a coded form susceptible to galloping base lines, is disclosed. The compensation circuit operates to detect each transition of the coded signal with respect to the zero threshold. The transitions are further detected to be either an up-going or down-going transition and either early or late with respect to a selected time at which such transition should properly threshold. Adjustment of the zero threshold level is made in accordance with the detected characteristics, i.e., up-going or down-going, early or late, of each transition.

3,736,583

## APPARATUS FOR DETECTING THE PRESENCE OF HARD SOLID PARTICLES IN A BODY OF SOFTER SOLID SUBSTANCE

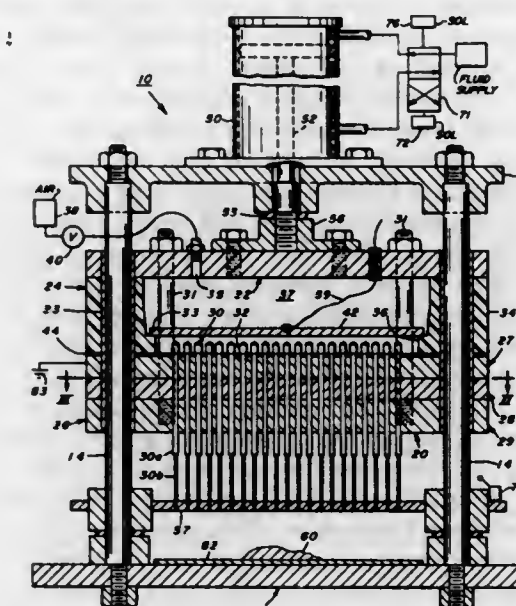
Richard A. Smith, Gibsonia, and Elmer E. Harris, Glenahaw, both of Pa., assignors to H. J. Heinz Company, Pittsburgh, Pa.

Filed Jan. 13, 1971, Ser. No. 106,043

Int. Cl. G08b 21/00

U.S. Cl. 340—240

11 Claims



Apparatus for detecting the presence of hard solid particles in a body of softer solid substance, such as the presence of

bone fragments in chicken flesh, is disclosed. The apparatus includes a probing unit having a matrix of uniformly spaced probes slidably received in a plate. Above the plate is a chamber into which is supplied pressurized fluid which acts to urge each probe downwardly against the plate with equal pressure. Means are provided for driving the probing unit downwardly to force the probes through the solid substance to be examined. An electrical conductor plate is arranged over all of the upper terminal portions of the probes for sensing the upward movement of the probes when the fluid pressure is insufficient to restrain the probe against such upward movement. Upward movement of any of the probes will result when a hard object is encountered. A signal means is activated to indicate the presence of a hard particle when any of the terminal portions of the probes contacts the conductor plate.

3,736,584

## MOTION DETECTOR AND INTRUDER ALARM SYSTEM

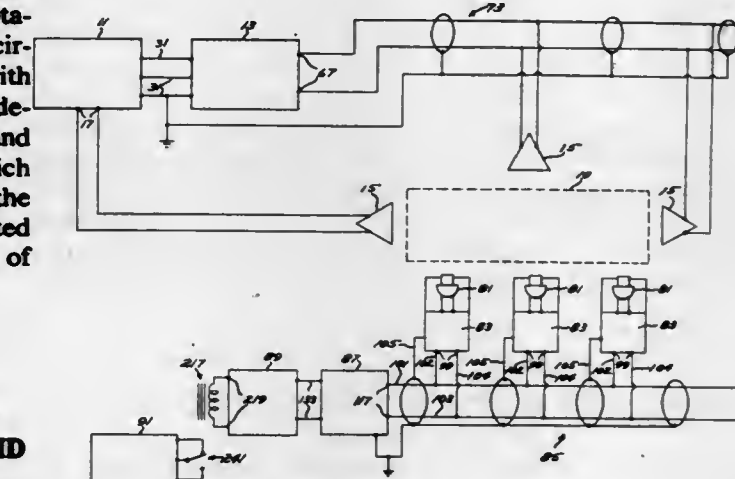
Kenneth R. Hackett, Boulder, and Ralph W. Goble, Boulder, both of Colo., assignors to Sonitrix, Inc., Boulder, Colo.

Filed Aug. 13, 1971, Ser. No. 171,420

Int. Cl. G08b 13/16

U.S. Cl. 340—258 A

15 Claims



Sound is generated at a reference frequency within a selected area to be protected and a plurality of sound sensing transducers are positioned to individually sense echo signals carrying Doppler beat frequencies produced by the movement of an object, hence an intruder, within the protected area. Amplifiers substantially isolated from electrical interference are connected to each transducer to amplify each sensed signal and the amplified signals are summed and processed to detect the Doppler beat frequency and generate an alarm actuating signal to indicate the presence of an intruder.

3,736,585

## APPARATUS FOR INDICATION OF MEASURING VALUES

Hans Langheinrich, Offenbach/Main, Germany, assignor to VDO Tachometer Werke, Adolf Schindling GmbH, Frankfurt/Main, Germany

Filed Feb. 24, 1970, Ser. No. 13,363

Claims priority, application Germany, Feb. 22, 1969, P 19 09 026.7

Int. Cl. H03k 13/02

U.S. Cl. 340—324 R

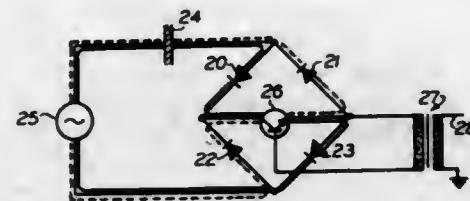
19 Claims

An apparatus for indication of measuring values, which comprises a plurality of luminous cells excitable by means of alternating voltage and disposed in bargraph display succession. An electric switch is provided in form of a rectifier



bridge. The luminous cells are disposed in the alternating current path of the rectifier bridge. A one-direction-switching

tromagnetic carrier frequency. A continuous stream of coded sequences is generated by utilizing a tapped delay line as a



element is also arranged, and the rectifier bridge is capable of being short-circuited by means of the one-direction-switching element.

3,736,586

## ANALOGUE-TO-DIGITAL VOLTAGE CONVERTER

Jacques Donjon, Paris 15, France, assignor to Societe de Fabrication d'Instruments de Mesure SFIM

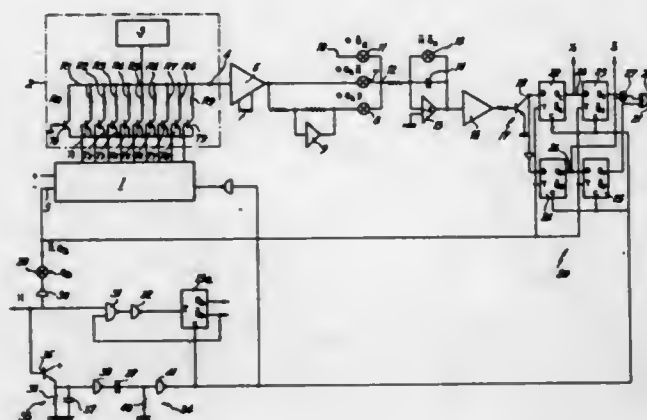
Continuation of Ser. No. 33,681, May 1, 1970, abandoned.

This application Mar. 22, 1972, Ser. No. 251,540

Int. Cl. H03k 13/02

U.S. Cl. 340—347 NT

8 Claims



The invention relates to an analogue-to-digital converter. The converter comprises a generator for supplying reference voltages decreasing in amplitude in accordance with a binary law, means for adding the reference voltages algebraically in succession to the input voltage in decreasing order, these voltages being added with a sign such that the successive sums tend towards zero, means for supplying a signal representing the sign of a particular algebraic sum, this signal being used to give the following reference voltage the sign suitable for the following algebraic sum to approach zero, and digital processing means for the signal representing the sign for supplying, in serial form, the numerical information representing the amplitude.

3,736,587

## COHERENT FREQUENCY HOPPED, PHASE MODULATED ACOUSTIC SURFACE WAVE GENERATOR

Henry J. Bush, Rome; John N. Entzminger, Jr., Clinton, and Walter R. Richard, Herkimer, all of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 26, 1971, Ser. No. 147,048

Int. Cl. G08c 1/00

U.S. Cl. 340—351

4 Claims

An apparatus utilizing an acoustic surface wave having an ordered-code form to provide bi-phase modulation of an elec-

sequence generator in conjunction with a shift register which is actuated by an adjustable reference code.

3,736,588

## ONE OR TWO OF FIVE CODE ROTARY MAGNETIC POSITION INDICATOR

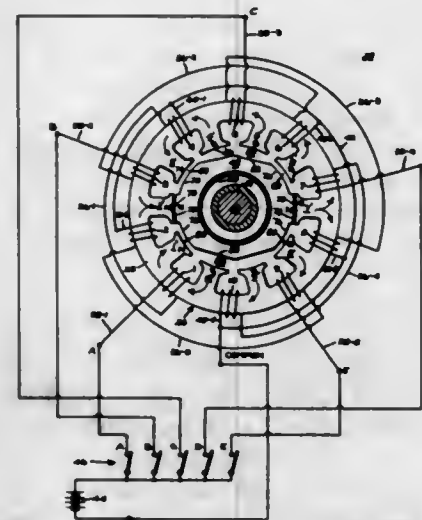
Phillip L. Harden, Ft. Wayne, Ind., assignor to Bowmar Instrument Corporation, Ft. Wayne, Ind.

Filed Nov. 19, 1971, Ser. No. 200,316

Int. Cl. G08b 5/00

U.S. Cl. 340—378 R

19 Claims



A rotary magnetic position indicator for displaying 10 discrete indicia in response to a one or two of five code or a one of five reverse polarity code. A stator core has a yoke with 10 equally spaced, inwardly extending teeth having inner ends defining a bore. A permanent magnet rotor member is rotatably mounted in the bore and has oppositely polarized diametrically opposite ends each spanning the inner ends of three stator teeth and forming air gaps therewith. Five identical field windings are provided each having first and second ends and each comprising first and second coils on the yoke, there being one coil between each different pair of teeth and the two coils of each different winding having a different group of three teeth therebetween. The first end of each different winding is connected to a different external terminal and the second ends of all the windings are connected to a common terminal. The windings are arranged so that upon connection of each different one of the external terminals and the common terminal to a source of direct current, a different group of three adjacent teeth are excited with one polarity, and so that upon connection of the external terminals respectively connected to each different pair of adjacent windings and the common terminal to the source, a different group of five adjacent teeth are excited with one polarity with the middle one of the group of five teeth having a higher magnetic flux density therein than the remaining projections of the group.

3,736,589

## MEANS FOR GENERATING A FLAT-TOPPED PULSE WITH SINE-SQUARED RISE AND FALL CHARACTERISTICS

Sheldon I. Rambo, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 13, 1971, Ser. No. 207,452

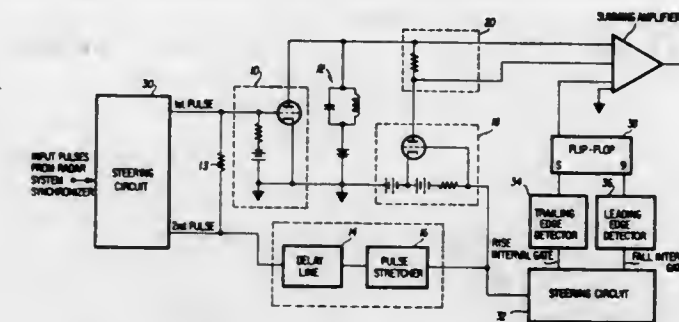
Int. Cl. G01s 7/28

U.S. Cl. 343—17.1 R

6 Claims

U.S. Cl. 343—702

15 Claims



A summing amplifier receives a square wave pulse and portions of a sine-squared wave and, under control of gating pulses, produces a flat-topped pulse having sine-squared rise and fall characteristics, the timing and duration of which are determined by the gating pulses. The resulting pulse permits the functions of target illumination and tracking to be combined in a single radar transmitter.

3,736,590

## LORAN-C RECEIVER

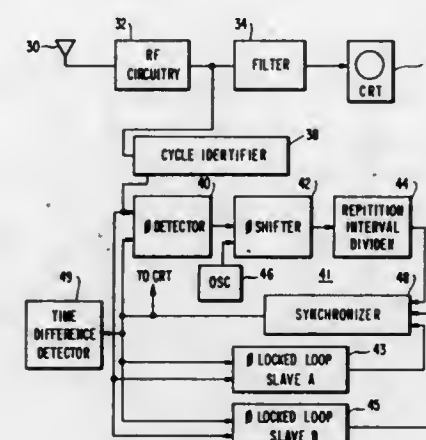
Elmer M. Lipsey, Annandale, and Arnold Swagerty, Vienna, both of Va., assignors to A-T-O Inc., Willoughby, Ohio

Filed May 12, 1971, Ser. No. 142,713

Int. Cl. G01s 1/24

U.S. Cl. 343—103

14 Claims



A Loran-C receiver pulse groups from master and slave transmitting stations and locally generates precisely timed sample trigger pulses which occur in substantial coincidence with the third cycle of the carrier frequency of each received pulse. A cycle identifier compares the time of occurrence of the sample trigger pulses with the third cycle of the received pulses and provides an indication if the sample trigger pulses are not in coincidence with the third cycle of a carrier of the received pulses. A phase-locked loop in the receiver maintains the sample trigger pulses in phase with the carrier frequency of the received pulses. A phase shifter in the phase-locked loop is capable of achieving phase shift increments which are equal to a half cycle of the highest frequency locally generated in said receiver. The phase-locked loop also includes a repetition interval divider which is variably controlled to skip a predetermined number of counts to achieve a variation in the period of the repetition interval.

3,736,591

## RECEIVING ANTENNA FOR MINIATURE RADIO RECEIVER

Larry W. Rennels, Margate, Fla., and William J. Wilson, Chicago, Ill., assignors to Motorola, Inc., Franklin Park, Ill.

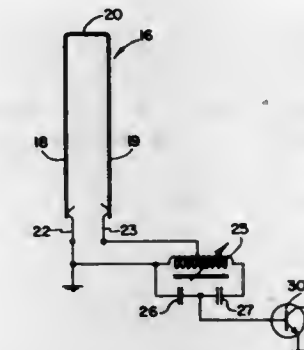
Continuation-in-part of Ser. No. 85,429, Oct. 30, 1970,

abandoned. This application Oct. 4, 1971, Ser. No. 186,154

Int. Cl. H01q 1/24

U.S. Cl. 343—702

15 Claims



Receiving antenna for miniature radio receiver formed by conducting U-shaped member having substantially parallel elongated arms which form sides of the housing of the receiver and a connecting portion which forms one end of the housing. When the receiver is in the normal position for use, the arms are positioned vertically with the connecting portion at the top, and the U-shaped member acts as an inductive loop antenna to detect the H-field of the electro-magnetic wave. A reactance network, which is capacitive in the frequency range of interest, is connected to the open ends of the arms. The reactance network can be adjustable to tune the antenna for various frequencies, the antenna having been found suitable for use in the frequency range from 148 to 173 megacycles.

3,736,592

## MULTIPLE BEAM RETRODIRECTIVE ARRAY WITH CIRCULAR SYMMETRY

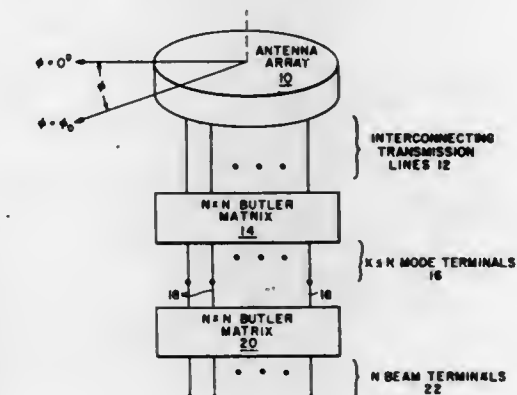
H. Paris Coleman, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 25, 1972, Ser. No. 256,856

Int. Cl. H01q 3/26

U.S. Cl. 343—854

2 Claims



A method and apparatus for obtaining automatic, selective retrodirective performance from a circularly symmetric antenna array. This system may be employed in an active or passive manner and accomplishes selective retrodirectivity by manipulation of beam terminals of a multiple beam matrix which in turn controls a multimodal network. The combination of the two matrix networks provide N separate beams from the circular antenna array. Also, by providing gain networks, control of the reradiated beam pattern is possible. This



system has the ability to identify the angle of incidence of any particular transmission, and is particularly suited for navigational beacon systems since the reradiated signal can provide bearing information in response to interrogation.

arrangement for establishing the nozzle vibration frequency to be a function of the video signals' frequency and the shape of the video signals.

# ERRATUM

For Class 346—74 sec:  
Patent No. 3,736,046

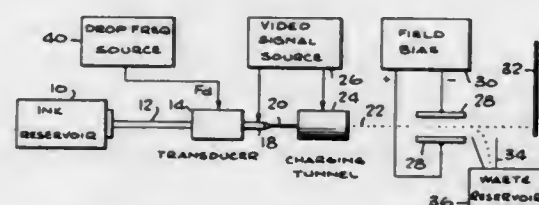
3,736,593

## INK DROP WRITING SYSTEM WITH NOZZLE DRIVE FREQUENCY CONTROL

Robert I. Keur, Niles, and Henry A. Dahl, Mount Prospect, both of Ill., assignors to A. B. Dick Company, Chicago, Ill.  
Filed Oct. 12, 1971, Ser. No. 187,976  
Int. Cl. G01d 15/18

U.S. Cl. 346—75

8 Claims



In an apparatus of the type wherein ink under pressure is applied to a nozzle which is vibrated, and the ink emitted by the nozzle thereafter breaks down into ink drops which are charged in a charging tunnel in response to video signals, an

A partially folded strip electrode of electrically conducting sheet material is held curved around a drum by a coiled spring, elastic strand or spring tensioned wire attached to the drum whose intermediate portion overlies and yieldingly holds the strip against the drum with one fold extending flexibly away from the drum for cooperating with a blade electrode in marking an intermediate strip of electrical recording paper.

3,736,594

## FACSIMILE RECORDING DRUM ELECTRODE

Frederick W. Simpkins, Hudson, and Ernest Bludnikas, Brockton, both of Mass., assignors to Alden Research Foundation, Westboro, Mass.  
Continuation-in-part of Ser. No. 130,111, April 1, 1971, abandoned. This application Nov. 22, 1971, Ser. No. 200,678  
Int. Cl. G01d 15/06

U.S. Cl. 346—139 C

30 Claims



# DESIGNS

MAY 29, 1973

226,995

## BEAN BAG CHAIR

Eugene J. Costabile, Oak Lawn, Ill., assignor to Mohasco Industries, Inc., Amsterdam, N.Y.  
Filed July 30, 1971, Ser. No. 167,892  
Term of patent 14 years  
Int. Cl. D6—02

U.S. Cl. D6—26



226,996

## DISPLAY STAND

Glenn B. Jenkins, Charlotte, N.C.  
(11301 Idlewild Road, Matthews, N.C. 28105)  
Filed Apr. 8, 1971, Ser. No. 132,637  
Term of patent 14 years  
Int. Cl. D6—04

U.S. Cl. D6—186



226,997

## SOFA OR SIMILAR ARTICLE

William H. Oliver, 1219 N. 50th, Seattle, Wash.  
Filed Mar. 15, 1971, Ser. No. 124,614  
Term of patent 14 years  
Int. Cl. D6—02

U.S. Cl. D6—61



226,998  
CHAIR

Eugene J. Costabile, Oak Lawn, Ill., assignor to Mohasco Industries, Inc., Amsterdam, N.Y.  
Filed Apr. 22, 1971, Ser. No. 136,639  
Term of patent 14 years  
Int. Cl. D6—02

U.S. Cl. D6—71

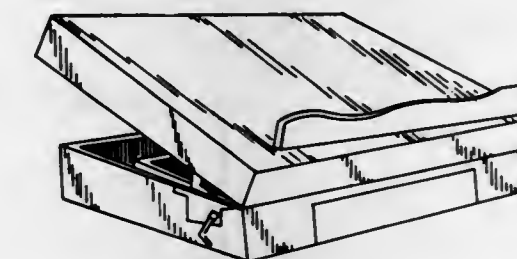


226,999

## ELEVATING DESK

George N. Jessen, 554 Tam O'Shanter Drive, Las Vegas, Nev. 89109  
Filed Mar. 15, 1971, Ser. No. 124,654  
Term of patent 14 years  
Int. Cl. D6—03

U.S. Cl. D6—156



227,000

## ELECTROMECHANICAL ARTICLE STORAGE AND RETRIEVAL UNIT

John L. Gianfagna, Marietta, Ohio, assignor to Sperry Rand Corporation, New York, N.Y.  
Filed Oct. 30, 1970, Ser. No. 25,750  
Term of patent 14 years  
Int. Cl. D6—04

U.S. Cl. D6—189

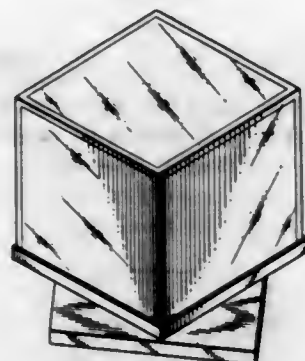




**227,001**  
**COMBINED DISPLAY CUBE AND**  
**STAND THEREFOR**

Robert H. Dembar, Croton, N.Y., assignor to Graphicana Corporation, Ossining, N.Y.  
Filed Nov. 3, 1971, Ser. No. 195,528  
Term of patent 14 years  
Int. Cl. D6—06

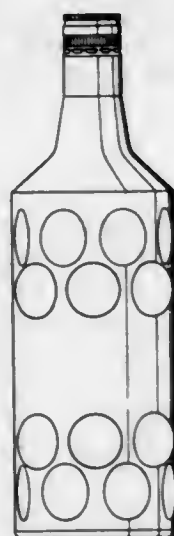
U.S. Cl. D6—235



**227,002**  
**COMBINED BOTTLE AND CAP THEREFOR**  
Reginald Malcolm Broadhead, Maldenhead, England,  
assignor to Drum Horse Distillers Limited, London,  
England

Filed Oct. 5, 1971, Ser. No. 186,714  
Claims priority, application Great Britain June 25, 1971  
Term of patent 14 years  
Int. Cl. D9—01

U.S. Cl. D9—72



**227,003**  
**JAR**  
Bette C. Graham, Dallas, Tex., assignor to Liquid Paper Corporation, Dallas, Tex.  
Filed Oct. 22, 1971, Ser. No. 191,951  
Term of patent 14 years  
Int. Cl. D9—01

U.S. Cl. D9—141

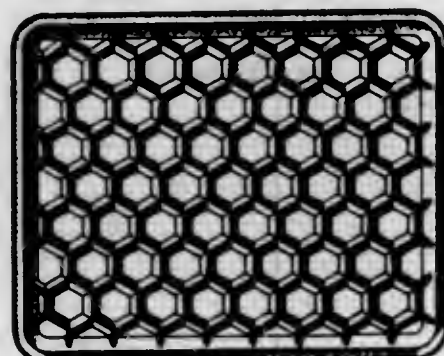


**227,004**  
**MOLDED PACKAGING TRAY FOR MEAT**  
**OR THE LIKE**

Roland G. Roy, Westbrook, Maine, Richard F. Relfers, New Canaan, Conn., and Kenneth D. Bixler, Huntington, and Robert E. Ralphs, Katonah, N.Y., assignors to Diamond International Corporation, New York, N.Y.

Filed Nov. 26, 1971, Ser. No. 202,733  
Term of patent 14 years  
Int. Cl. D9—03

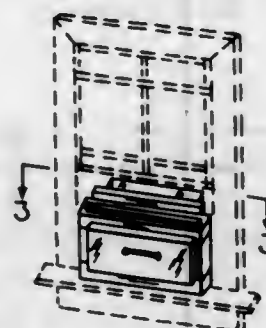
U.S. Cl. D9—219



**227,005**  
**RETRACTABLE WINDOW CASE STRUCTURE**  
**AND SUPPORT THEREFOR**

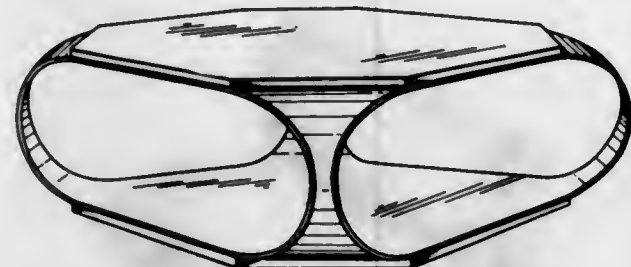
John P. Francis, 20 Boston St., Haverhill, Mass. 01830  
Filed Sept. 9, 1971, Ser. No. 179,248  
Term of patent 14 years  
Int. Cl. D25—02

U.S. Cl. D13—1 M



**227,006**  
**HOUSE**  
Hannu Vilho Sakari Laitinen, Helsinki, Finland, assignor to Oy Polykem AB, Helsinki, Finland  
Filed May 27, 1971, Ser. No. 147,721  
Claims priority, application Sweden Nov. 30, 1970  
Term of patent 14 years  
Int. Cl. D25—03

U.S. Cl. D13—1 A



**227,007**  
**MULTIPLE UNIT TOWNHOUSE**  
Peter H. Edwards, Upper Arlington, Harvey R. Gelger, Columbus, and W. Byron Ireland, Upper Arlington, Ohio, assignors to Multicon Properties, Inc., Columbus, Ohio

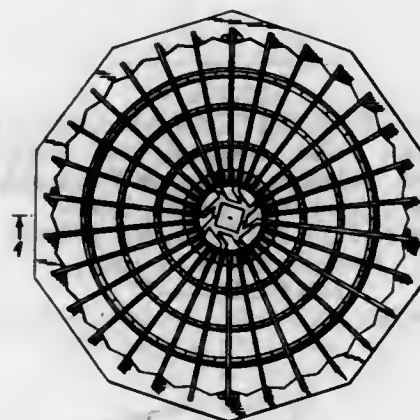
Filed June 15, 1971, Ser. No. 153,486  
Term of patent 14 years  
Int. Cl. D25—03

U.S. Cl. D13—1 A



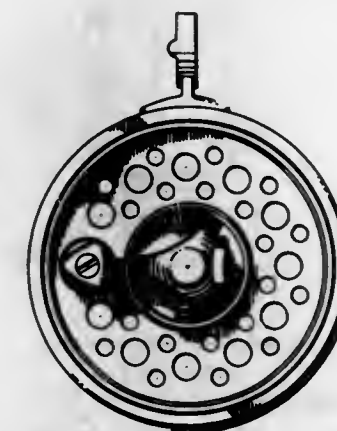
**227,008**  
**BASKET FOR TREATING OBJECTS**  
Victor C. Wallestad, Minneapolis, Minn., assignor to Fluoroware, Inc., Chaska, Minn.  
Filed Feb. 24, 1971, Ser. No. 118,593  
Term of patent 14 years  
Int. Cl. D15—99

U.S. Cl. D16—1 R



**227,009**  
**FLY CASTING FISHING REEL**  
Jean-Paul Lemery, Cluses, France, assignor to Etablissements Carpano et Pons, Haute-Savoie, France  
Filed Sept. 29, 1971, Ser. No. 184,985  
Term of patent 14 years  
Int. Cl. D22—05

U.S. Cl. D22—25



**227,010**  
**SHOWER ENCLOSURE**  
Fred C. Alexander, New Castle, Pa., assignor to Universal-Rundle Corporation, New Castle, Pa.  
Filed June 23, 1971, Ser. No. 156,167  
Term of patent 14 years  
Int. Cl. D23—02

U.S. Cl. D23—57





227,011

**DESICCANT PLUG**

Steve Kovac, Rte. 2, Box 199, Mundelein, Ill. 60060;  
Sally Kovac, administrator of the estate of said Steve Kovac, deceased

Filed Aug. 6, 1971, Ser. No. 169,891

Term of patent 14 years

Int. Cl. D23—99

U.S. Cl. D23—146



227,012

**MOLDED BLOWER WHEEL**

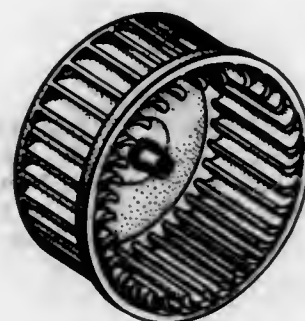
James R. Ranz, Wilmington, and Chester Ward, Dayton, Ohio, assignors to Lau Incorporated, Dayton, Ohio

Filed Aug. 31, 1971, Ser. No. 176,791

Term of patent 14 years

Int. Cl. D23—04

U.S. Cl. D23—165



227,013

**STYLUS ARM FOR RECORDERS**

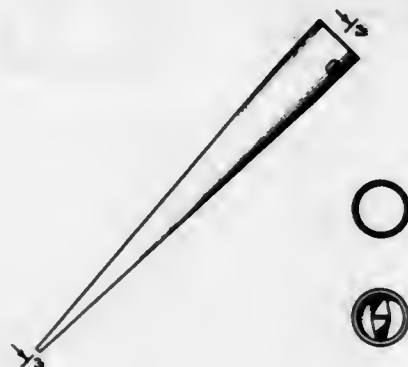
Howard N. Fawcett, Briarcliff Manor, N.Y., assignor to Cambridge Instrument Company, Inc., Ossining, N.Y.

Filed Mar. 16, 1971, Ser. No. 125,011

Term of patent 14 years

Int. Cl. D14—01

U.S. Cl. D26—14 B



227,014

**CASING AND CONTROLS FOR A DUAL TELEPHONE COMMUNICATOR**

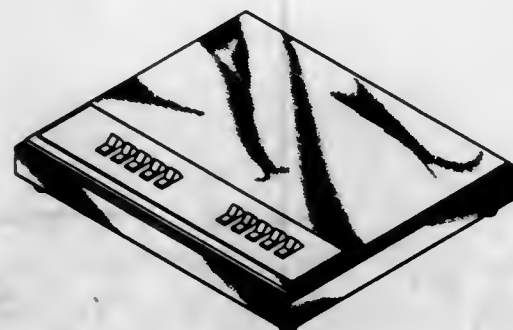
Anthony A. Ardolino, Miami, Fla., assignor to Howard Research and Development Corporation, Miami, Fla.

Filed May 26, 1971, Ser. No. 147,297

Term of patent 14 years

Int. Cl. D14—03

U.S. Cl. D26—14



227,015

**CASING AND CONTROLS FOR A TELEPHONE COMMUNICATOR**

Anthony A. Ardolino, Miami, Fla., assignor to Howard Research and Development Corporation, Miami, Fla.

Filed May 26, 1971, Ser. No. 147,298

Term of patent 14 years

Int. Cl. D14—03

U.S. Cl. D26—14



227,016

**TELEPHONE OR SIMILAR ARTICLE**

Kazunari Shirai, Fujio Takaragi, and Shoji Matsuda, Tokyo, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Oct. 13, 1971, Ser. No. 189,073

Term of patent 14 years

Int. Cl. D14—03

U.S. Cl. D26—14

227,017  
**MEDAL**

Ira Milton Jones, Milwaukee, Wis., assignor to World War I Overseas Flyers, Inc., Milwaukee, Wis.

Filed Apr. 19, 1971, Ser. No. 135,533

Term of patent 14 years

Int. Cl. D11—03

U.S. Cl. D29—19 R

227,018  
**MEDAL**

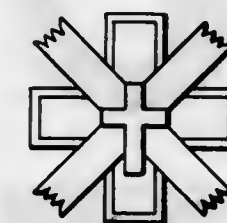
John E. Hand, 150 NE. 38th, Oakland Park, Fla. 33308

Filed Apr. 29, 1971, Ser. No. 138,844

Term of patent 7 years

Int. Cl. D11—02

U.S. Cl. D29—23

227,019  
**MEDAL**

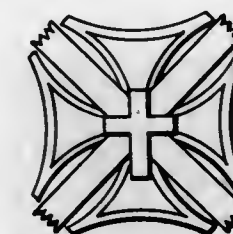
John E. Hand, 150 NE. 38th, Oakland Park, Fla. 33308

Filed May 7, 1971, Ser. No. 141,469

Term of patent 7 years

Int. Cl. D11—02

U.S. Cl. D29—23



227,020

**COMBINED REFLECTOR AND HOOD COVER FOR AQUARIUMS OR SIMILAR ARTICLES**

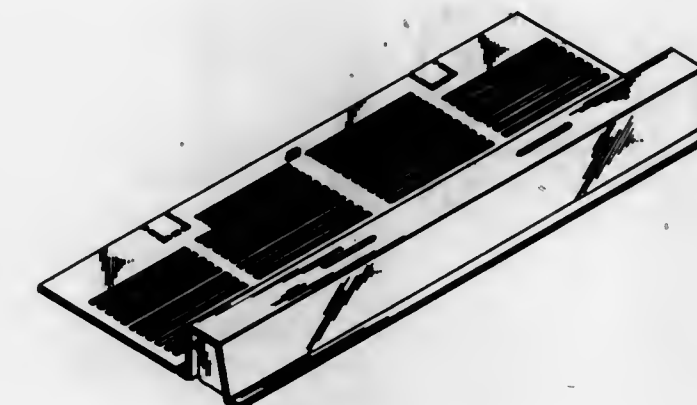
George J. Gould, 791 Meacham Ave., Elmont, N.Y. 11003

Filed Apr. 21, 1971, Ser. No. 136,305

Term of patent 14 years

Int. Cl. D30—02

U.S. Cl. D30—12



227,021

**TOY TRAINING DOLL**

Dane B. Coe, Manhattan Beach, Calif., assignor to Innova Incorporated, Playa Del Rey, Calif.

Filed Dec. 28, 1970, Ser. No. 26,675

Term of patent 14 years

Int. Cl. D21—01

U.S. Cl. D34—4



227,022

**EXERCISER**

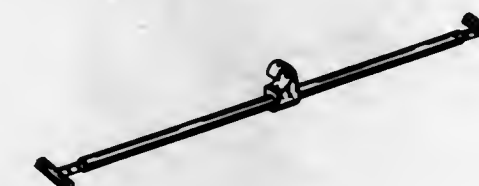
Robert M. Martin, 90 N. Hudson, Pasadena, Calif. 91101

Filed Sept. 3, 1971, Ser. No. 177,924

Term of patent 14 years

Int. Cl. D21—02

U.S. Cl. D34—5 K

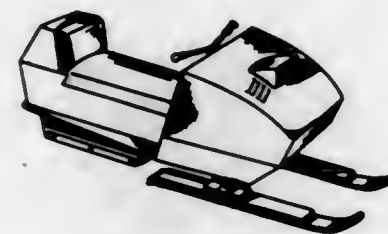




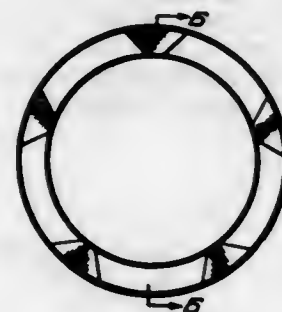
227,023  
TOY CONSTRUCTION PIECE OR  
SIMILAR ARTICLE  
Raymond W. Baker, 596 Bishop Ave.,  
Bridgeport, Conn. 06610  
Filed Sept. 30, 1970, Ser. No. 25,274  
Term of patent 14 years  
Int. Cl. D21-01; D18-03  
U.S. Cl. D34-15 GG



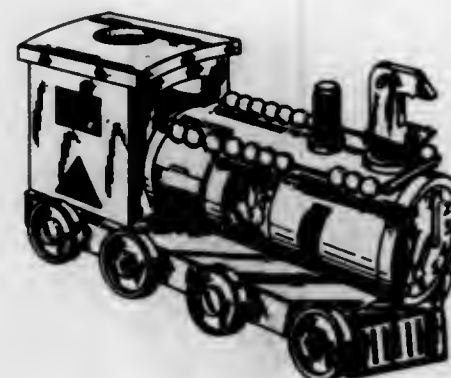
227,024  
SLED  
Ronald C. Westendorf, 114 Slater,  
Lake Orion, Mich. 48035  
Filed Feb. 16, 1971, Ser. No. 115,918  
Term of patent 14 years  
Int. Cl. D12-14  
U.S. Cl. D34-15 AK



227,025  
HOOP TOY  
Robert Catron, 5718 Cambridge St.,  
St. Louis Park, Minn. 55416  
Filed May 12, 1971, Ser. No. 142,857  
Term of patent 14 years  
Int. Cl. D21-01  
U.S. Cl. D34-15 G



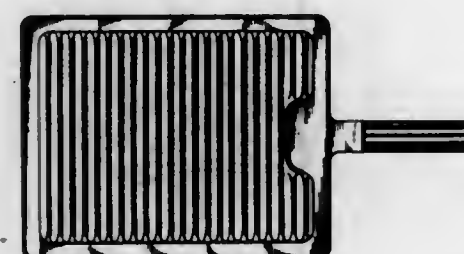
227,026  
TOY LOCOMOTIVE  
Walter L. Strauss, P.O. Box 252,  
Scarborough, N.Y. 10510  
Filed May 17, 1971, Ser. No. 144,356  
Term of patent 14 years  
Int. Cl. D21-01  
U.S. Cl. D34-15 MM



227,027  
FLOWER POT  
Leon Tissot, 22 Rue du Mercier, Nantua, France  
Filed Jan. 4, 1971, Ser. No. 103,938  
Term of patent 14 years  
Int. Cl. D11-02  
U.S. Cl. D35-3



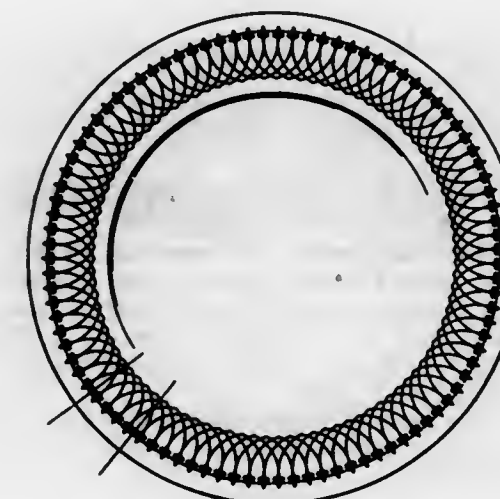
227,028  
SKILLET-GRILL, OR SIMILAR ARTICLE  
John Behm, Santa Ana, Calif., assignor to National  
Silver Company, New York, N.Y.  
Filed June 14, 1971, Ser. No. 153,150  
Term of patent 14 years  
Int. Cl. D7-02  
U.S. Cl. D44-1 J



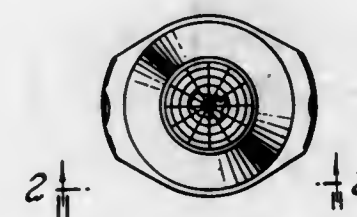
227,029  
ADJUSTABLE HOT TRAY LIFTER  
James Demetreou, 5704 Hillside Drive,  
Kansas City, Mo. 64151  
Filed Jan. 25, 1971, Ser. No. 109,744  
Term of patent 14 years  
Int. Cl. D7-02  
U.S. Cl. D44-4



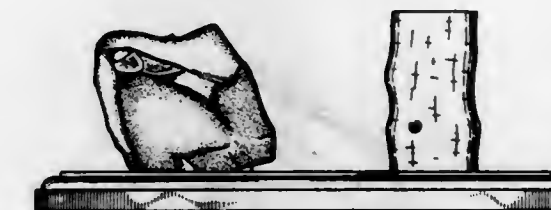
227,030  
DINNER PLATE OR SIMILAR ARTICLE  
Michael J. Szymanski, Camillus, N.Y., assignor to  
Syracuse China Corporation, Syracuse, N.Y.  
Filed Apr. 22, 1971, Ser. No. 136,643  
Int. Cl. D7-01  
U.S. Cl. D44-15



227,031  
FINGER RING  
Robert Sciotti, 31821 Wellston,  
Warren, Mich. 48093  
Filed Apr. 23, 1971, Ser. No. 137,106  
Term of patent 14 years  
Int. Cl. D11-01  
U.S. Cl. D45-10 B



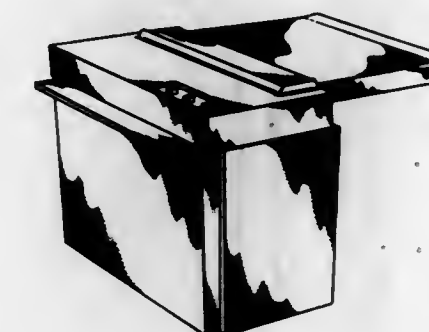
227,032  
MATCH HOLDER  
Kenneth P. Nash, 14719 Avis Ave.,  
Lawndale, Calif. 90260  
Filed Apr. 21, 1971, Ser. No. 136,283  
Term of patent 7 years  
Int. Cl. D27-99  
U.S. Cl. D48-28



227,033  
SCRAPING AND CLEANING DEVICE  
Wayne R. Hutter, Sanford, Mich., assignor to The Dow  
Chemical Company, Midland, Mich.  
Filed June 1, 1971, Ser. No. 149,097  
Term of patent 14 years  
Int. Cl. D7-05  
U.S. Cl. D49-23



227,034  
DOCUMENT FEEDER FOR A XEROGRAPHIC  
REPRODUCTION MACHINE  
Dan R. Derby, Cupertino, Calif., and Ruediger W. Knodt,  
Rochester, N.Y., assignors to Xerox Corporation, Stam-  
ford, Conn.  
Filed Sept. 21, 1970, Ser. No. 25,076  
Term of patent 14 years  
Int. Cl. D16-03  
U.S. Cl. D61-1 Q

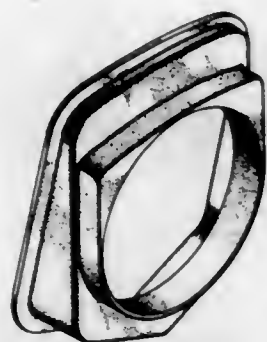




227,035

**TRANSOM ADAPTER FOR THE JET-EXHAUST  
CONDUIT FROM A WATER-JET POWERED BOAT**  
Robert K. Ridlon, Anaheim, Calif., assignor to H. N.  
Bailey & Associates, Santa Ana, Calif.  
Filed Mar. 29, 1971, Ser. No. 129,316  
Term of patent 14 years  
Int. Cl. D12-99

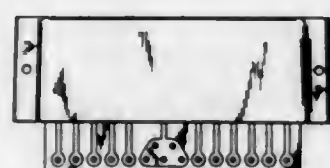
U.S. Cl. D71-1 S



227,036

**SECURITY ALARM SYSTEM CONTROL MODULE**  
Thomas J. Holce, Portland, Oreg., assignor to Kentrox  
Industries, Inc., Portland, Oreg.  
Filed May 11, 1971, Ser. No. 142,427  
Term of patent 14 years  
Int. Cl. D29-99

U.S. Cl. D72-1 R

227,037  
PEN

Harold F. Bajusz, Woodridge, N.J., assignor to  
Accutec Inc., Wallington, N.J.  
Filed May 14, 1971, Ser. No. 143,729  
Term of patent 14 years  
Int. Cl. D19-06

U.S. Cl. D74-17 B



227,038

**COMBINED PEN AND HOUSING FOR  
THERMOMETER OR THE LIKE**  
Harold F. Bajusz, Woodridge, N.J., assignor to  
Accutec Inc., Wallington, N.J.  
Filed May 14, 1971, Ser. No. 143,749  
Term of patent 14 years  
Int. Cl. D19-06

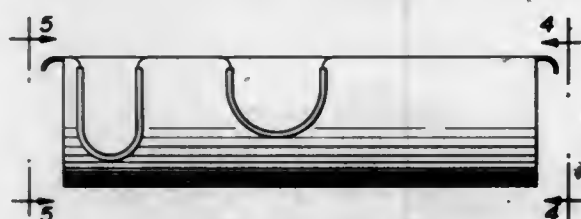
U.S. Cl. D74-17 B



227,039

**STRETCHER PAN FOR ADMINISTERING  
INHALATION THERAPY**  
Harry L. Davis, Gambrills, and Paul C. Swing, Glen  
Burnie, Md.; said Davis assignor to the United States  
of America as represented by the Secretary of the Army  
Continuation-in-part of abandoned design application  
Ser. No. 25,320, Sept. 8, 1970. This application June  
14, 1971, Ser. No. 153,130  
Term of patent 14 years  
Int. Cl. D24-01

U.S. Cl. D83-1 D



227,040

**REVERSIBLE FORCEPS**  
Gerald J. Lockwood, Edison, N.J., assignor to E. R.  
Squibb & Sons, Inc., Princeton, N.J.  
Filed Oct. 27, 1971, Ser. No. 193,230  
Term of patent 14 years  
Int. Cl. D24-02

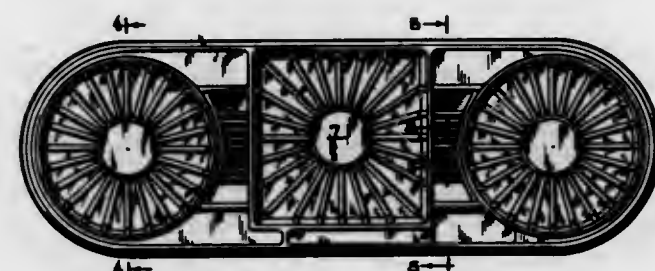
U.S. Cl. D83-12 R



227,041

**SURGICAL SCRUB TRAY**  
Martin Link, North Brunswick, N.J., assignor to  
Johnson & Johnson  
Filed July 29, 1971, Ser. No. 167,544  
Term of patent 14 years  
Int. Cl. D24-02; D9-03

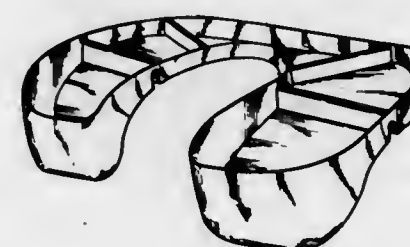
U.S. Cl. D83-1 U



227,042

**HAIRDRESSER'S TRAY**  
Kenneth Altemare, 413 Faith Drive,  
Pittsburgh, Pa. 15236  
Filed July 8, 1971, Ser. No. 160,980  
Term of patent 14 years  
Int. Cl. D28-03

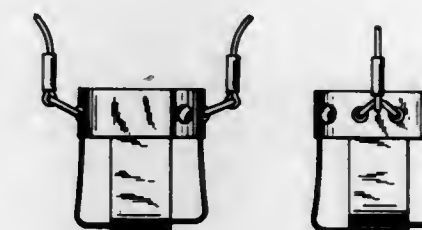
U.S. Cl. D86-10 A



227,043

**CARRIER FOR A BEVERAGE CONTAINER  
OR THE LIKE**  
Richard H. Van Den Berg, Glendale, Wis., assignor to  
Dimensional Products, Inc., Milwaukee, Wis.  
Filed Mar. 15, 1971, Ser. No. 124,650  
Term of patent 14 years  
Int. Cl. D3-02

U.S. Cl. D87-1 R



227,044

**STORAGE BAG FOR FOOD OR  
SIMILAR ARTICLE**  
Richard H. Camp, P.O. Box 62, Haines, Oreg. 97833  
Filed Apr. 28, 1971, Ser. No. 138,401  
Term of patent 14 years  
Int. Cl. D3-99

U.S. Cl. D87-1



227,045

**BICYCLE STEERING POST**  
Carlton P. Pawsat, Maysville, Ky., assignor to Wald  
Manufacturing Company, Inc., Maysville, Ky.  
Continuation-in-part of abandoned design applications Ser.  
No. 22,184 and Ser. No. 22,185, both Apr. 1, 1970.  
This application Nov. 5, 1970, Ser. No. 26,362  
Term of patent 14 years  
Int. Cl. D12-11

U.S. Cl. D90-9





# LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF MAY, 1973

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Anderson, Marvin H. Filter system. 3,735,872, Cl. 210-167.000.

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Berger, Milton: See—  
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Bergman, Carl; and Larsson, Paul, to Allmanna Svenska Elektriska Aktiebolaget. Control system for vacuum furnaces. 3,736,360, Cl. 13-24.000.

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Berndt, Carl W., to United States of America, Atomic Energy Commission. Graphics display system. 3,736,411, Cl. 235-151.000.

Berner, Warren E., to General Electric Company. Substrate supported semiconductor stack. 3,736,475, Cl. 317-234.00r.

Bernett, Frank E., to Tile Council of America, Inc. Methods for grouting tile. 3,735,545, Cl. 52-744.000.

Berney, Jean-Claude, to Golay, Bernard, S.A. Hairspring assembly for oscillator. 3,735,586, Cl. 58-114.000.

Berryman, William O., to Baker Oil Tools, Inc. Down-hole adjustable hydraulic fishing jar. 3,735,827, Cl. 175-296.000.

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Bertrand, Marcel J., to Uniroyal Englebert Deutschland AG. Pneumatic tire. 3,735,790, Cl. 152-36.100.

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Billi, G., & C., S.p.A.: See—  
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Bink, Werner R.; and Dempster, George, to Sherritt Gordon Mines Limited. Diverting and sampling gate. 3,735,641, Cl. 73-423.00r.

Binks, Chester; and Herbert, Ronald M., to Restaurant Technology, Inc. Bun steam injector. 3,735,749, Cl. 126-20.000.

Bird, Martin George, to Eastman Kodak Company. Apparatus for coating a continuous web. 3,735,729, Cl. 118-50.000.

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Bjornrud, Egil K.; and Keister, Glenn L., to Applied Technology Corporation. Method for the production of stable water fogs using an emulsified water-evaporation retarding chemical mixture. 3,736,261, Cl. 252-305.000.

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Blackledge, Keith; and Rushton, Harold, to British Layland Truck and Bus Division Limited. Motor vehicle suspensions. 3,735,999, Cl. 280-124.00f.

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- Bobst, Gerhard, to Von Roll AG. Hydrostatic reversible drive. 3,735,590, Cl. 60-468.000.
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- Bottcher, Rolf, to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Stack forming and handling machine. 3,735,695, Cl. 100-7.000.
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- Bower, Richard, to E. H. Research Laboratories, Inc. Computer core handler. 3,735,866, Cl. 209-73.000.
- Bowers, David L.; and Mohalak, John E., to General Electric Company. Optional unipolar-bipolar body organ stimulator. 3,735,766, Cl. 128-419.00r.
- Bowman, Brian, to British Steel Corporation. Electric furnace. 3,736,359, Cl. 13-9.000.
- Bowman, Cadet E.; and Hayward, Frank, to Olin Corporation. Integral regulated hand torch. 3,736,093, Cl. 431-89.000.
- Bowmar Instrument Corporation: See—  
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- Boyan, Edwin A., to Program Control Corporation. Management system and method. 3,736,409, Cl. 235-61.60r.
- Boylan, Joseph W., to Armstrong Cork Company. Connection joint for a concealed ceiling suspension system. 3,736,012, Cl. 287-189.36a.
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- Brauninger, Arno: See—  
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- Briggs, Bill N., to United States of America, Army, mesne. Alloy steel. 3,736,129, Cl. 75-128.00w.
- Brigham, Emerson W.; La Branche, Harvey W.; Nash, Alan W. B.; Newman, Howard F.; See, Thomas E.; and Smith, Marjorie Ann M., to Mattel, Inc. Looped traffic accessory. 3,735,923, Cl. 238-10.00e.
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- Brothers, Charles Dale: See—  
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- Brough, Denis William; and Gibbons, Douglas, to Scragg, Ernest, & Sons Limited. Textile apparatus with braking arrangement. 3,735,577, Cl. 57-89.000.
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- Brown, Ronald D.; and Stark, Marvin L., to Armco Steel Corporation. Water quench method and apparatus. 3,735,967, Cl. 266-3.00r.
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- Bruasov, Lev Petrovich; Vasilevsky, Dmitry Pavlovich; Dorokhov, Vasily Ivanovich; and Onoprienko, Vasily Petrovich. Method of thermal and chemical treatment of finely-divided materials. 3,735,969, Cl. 266-24.000.
- Bryan, Graham W.; and Green, David T., to United States Surgical Corporation. Instrument for ligating suturing and dividing organic tubular structures. 3,735,762, Cl. 128-305.000.
- Brynk, George, to A.R.F. Products, Incorporated. Acoustic locator with array of microphones. 3,736,557, Cl. 340-16.00r.
- Bryson, Charles E., Jr.; and Barton, Gary I., to Emerson Electric Co. Electric heaters. 3,736,405, Cl. 219-210.000.

- Buchan, Norman S.; and Dias, Gil M., to United States of America, Army. Water and oil-resistant, antistatic and abrasion resistant finish for nylon fabrics. 3,736,177, Cl. 117-138.80n.
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- Buckler, Sheldon A.; Kennedy, David P.; and Norland, Kenneth S., to Polaroid Corporation. Container for film units and flash illumination devices. 3,735,680, Cl. 95-11.001.
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- Burdette, George W., to United States of America, Navy. Gelled hydrazine containing rocket fuel. 3,736,195, Cl. 146-36.000.
- Burke, Alun, to Contraves AG. Level feeler. 3,735,636, Cl. 73-290.00r.
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- Butula, Ivan, to PLIUA Pharmaceutical and Chemical Works. Method for the preparation of 4,5,6,7-tetrahydropyridazoles. 3,736,332, Cl. 260-370.00r.
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- Capgras, Rene. Automobile suspension. 3,736,001, Cl. 280-124.00f.
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- Gump, Klaus Hanne; and Stuetz, Dagobert Engelbert, 3,736,310.
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- Channin, Donald Jones; and Hammer, Jacob Meyer, to RCA Corporation. Unitized internally-modulated gas laser. 3,736,525, Cl. 331-94.500.
- Chauvin, Yves, to Institut Francais du Pétrole des Carburants et Lubrifiants and Societe Nationale des Petroles d'Aquitaine. Catalyst composition and the process for polymerizing unsaturated hydrocarbons using this composition. 3,736,264, Cl. 252-429.00r.
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- Chia, Enrique C.; Ward, George C.; and Lenaus, George E. Casting machine with low profile conveyor. 3,735,802, Cl. 164-278.000.
- Chiba, Jiro; and Kanazaki, Tadaaki, to Tokyo Seimitsu Sokki Kabushiki Kaisha. Play back-machine control (position information storage and reproduction device). 3,736,580, Cl. 340-174.10j.
- Childs, Elbert B., to Mobil Oil Corporation. System for monitoring a fluid stream. 3,736,431, Cl. 250-205.000.
- Chizhov, Leonid Vladimirovich; Lengauer, Dmitry Emelyanovich; and Daniil, Sergei Alexandrovich. Apparatus for injecting a sample into a gas chromatograph. 3,735,640, Cl. 73-422.00c.
- Churchill, John P.; and Thompson, Tommy Lewis, to Life Support, Inc. Oxygen generator cell. 3,736,104, Cl. 23-281.000.
- Chvalovsky, Vaclav; Mach, Lumir; and Machova, Helena, to Ceskoslovenska akademie ved. Cements containing mineral fibers of high corrosion resistance. 3,736,162, Cl. 106-99.000.
- Ciba-Geigy Corporation: See—  
Kleiner, Eduard K., 3,736,300.
- Ciccotelli, Luciano: See—  
Ferrari, Arch Renzo; and Ciccotelli, Luciano, 3,735,548.



Ciliberti, Frank, to Mallory, P. R., & Co., Inc. Locking device for battery sticks. 3,736,189, Cl. 136-132.000.

Clark Equipment Company, mesne: See—  
Brownell, Roy D.; and Rogers, Richard E., 3,735,876.

Clements, John W. Electrical connector. 3,736,549, Cl. 339-75.0mp.

Clerbois, Lucien: See—  
Degueudre, Louis; Gobillon, Yves; Clerbois, Lucien; and Bourgeois, Louis, 3,736,269.

Degueudre, Louis; Gobillon, Yves; Clerbois, Lucien; and Bourgeois, Louis, 3,736,270.

Clinical Sciences, Inc.: See—  
Markovits, Arthur L.; and Wolfson, Stanley W., 3,736,042.

Clinton, Russell M.; Condrion, James A.; and Mator, Richard T., to Gulf Research & Development Company. Vapor-over-liquid temperature analyzer. 3,735,634, Cl. 73-64.200.

CMI Corporation: See—  
Swisher, George W., Jr.; Smith, Don W.; and Spivey, Gordon L., 3,735,818.

Coca-Cola Company, The: See—  
Iacobucci, Guillermo Arturo; Myers, Dirck Van Buren; and Okubo, Kazuyoshi, 3,736,147.

Codina, Jorge G. Gyroscopic reference system. 3,736,033, Cl. 308-10.000.

Cogar Corporation: See—  
Tu, George K., 3,736,572.

Cogger, John F.: See—  
Unfried, Happy H.; and Cogger, John F., 3,735,707.

COHEL-Compagnie d'Horlogerie et Electronique S.A.: See—  
Nava, Riccardo Giuseppe; Romani, Giorgio Augusto; Soffientini, Duccio Riccardo; Subert, Aldo Rodolfo; Ubertazzi, Alessandro Giuseppe; and Vetter, Peter Roman, 3,735,580.

Cohen, Mitchell S.; and Moore, John S., to Micro-Bit Corporation. Conductor-insulator-semiconductor capacitor memory having increased storage capability. 3,736,571, Cl. 340-173.0cr.

Coherent Radiation: See—  
Mefferd, Wayne S.; and Gates, Wendall C., 3,736,402.

Coleman, H. Paris, to United States of America, Navy. Multiple beam retrodirective array with circular symmetry. 3,736,592, Cl. 343-854.000.

Coleman, Kenneth W.; Peltz, John R.; and Stoldt, Clayton L., to GTE Sylvania Incorporated. Multiple conductor continuity and short circuit testing device. 3,736,503, Cl. 324-51.000.

Colgate-Palmolive Company: See—  
Buck, Charles Edward; and Sheaffer, Victor Earl, 3,736,259.

Jundermann, Werner Otto, 3,735,918.

Collier, Susan Starr; Gilman, Paul Brewster, Jr.; Linschitz, Henry; and Raleigh, Ronald George, to Eastman Kodak Company. Unfogged, primitive, silver halide emulsions containing desensitizing amounts of optical sensitizing dyes and the use thereof in several processes. 3,736,140, Cl. 96-64.000.

Collins Radio Company: See—  
Griffin, Ronald G., 3,736,506.

Collura, Peter C.; and Desmond, John D., to Container Corporation of America. Sift-proof dispensing carton. 3,735,914, Cl. 229-17.00r.

Columbia Broadcasting System, Inc.: See—  
Rutherford, Robert E., Jr., 3,736,460.

Combustion Engineering Inc.: See—  
Micheller, Rudolph J.; and Patterson, Robert C., 3,735,569.

Mitchell, Robert Davis, 3,736,083.

Mitchell, Robert Davis, 3,736,084.

Mitchell, Robert Davis, 3,736,085.

Comfort, Samuel T., to Allis-Chalmers Corporation. Sideload lift truck with powered deck and carriage rollers. 3,735,885, Cl. 214-520.000.

Commercial Solvents Corporation: See—  
Gay, Gordon M., 3,736,196.

Communications Patents Limited: See—  
Gargini, Eric J., 3,736,374.

Communications Satellite Corporation: See—  
Wolljaza, Chester J., Jr.; and Cacciamani, Eugene R., Jr., 3,736,507.

Computer Test Corporation: See—  
Major, James M.; Truscillo, Peter J.; and Provasnik, Robert, 3,736,499.

Concast AG: See—  
Burkhardt, Max, 3,735,801.

Condra, James, to Allis-Chalmers Corporation. Elevator support adjustment for elevating scraper. 3,735,509, Cl. 37-8.000.

Condrion, James A.: See—  
Clinton, Russell M.; Condrion, James A.; and Mator, Richard T., 3,735,634.

Conlee, George D. Motorized overhead door opener. 3,736,483, Cl. 318-469.000.

Conner, James M.; and Salvador, Henry J., to Polaroid Corporation. Photographic apparatus for motion picture projection. 3,736,051, Cl. 352-72.000.

Constant, Paul C., Jr.; Hodge, Walter; Barker, Frank; and Keller, Edward S., to Fedderson, Don, Productions, Inc. Dynamic advertising display system. 3,735,513, Cl. 40-32.000.

Constantinescu, Dorin; Cruceanu, Sever; Spataru, Eugen; and Mereanu, Nicolae, to ICPUP Institutul de Proiectari si Cercetari Pentru Utilaj Petrolier. Sealed bearing with hydrostatic pressure balancing for core barrels. 3,735,826, Cl. 175-228.000.

Container Corporation of America: See—  
Collura, Peter C.; and Desmond, John D., 3,735,914.

Continental Can Company Inc.: See—  
Fitko, Chester W., 3,736,284.

Continental Oil Company: See—  
Kennedy, Carl D.; and Lundeen, Allan J., 3,736,352.

Continental Oil Company, mesne: See—  
Nakazato, Susumu, 3,736,227.

Contraves AG: See—  
Burke, Alun, 3,735,636.

Cook, Gordon Henry; and Merigold, Peter Arnold, to Rank Organisation Limited. The. Optical objectives of variable equivalent focal length. 3,736,048, Cl. 350-186.000.

Cook, Harold D.; and Davis, Owen F., to Teletype Corporation. Stepping motor drive circuit. 3,736,487, Cl. 318-696.000.

Cook, John Daniel: See—  
Godfrey, Leonard Robert; and Cook, John Daniel, 3,735,510.

Cooke, Alf, Limited: See—  
Haddock, George, 3,735,674.

Coopman, Frans, to N.V. Bekaert S.A. Apparatus and method for winding wire on coils. 3,735,938, Cl. 242-83.000.

Coors Porcelain Company: See—  
Bachman, James L.; and Martin, Robert M., 3,736,167.

Cornelius, Kenneth T., to United States of America, Navy. Pressure actuated release device. 3,736,014, Cl. 292-256.500.

Cosden Oil & Chemical Company: See—  
Swann, Jimmie R., 3,735,658.

Coughlan, Edward H., to Polaroid Corporation. Reflex camera with means to reduce mirror rebound. 3,735,684, Cl. 95-42.000.

Coughran, Samuel J., Jr., to Lome Industries, Incorporated. Tree harvesting apparatus. 3,735,788, Cl. 144-309.0ac.

Courteulds Limited: See—  
Flavell, John; Betts, Max William; and Robinson, Frank, 3,735,812.

Coutor, Simone: See—  
Caruel, Jacques E. J.; Castellant, Jean-Pierre J. E.; Coutor, Simone; and Jean-Baptiste, Armand, 3,735,589.

Cowell, Harold E., Sr. Musician's pick. 3,735,663, Cl. 84-322.000.

Crachy, Rudolf; and Jacoby, Hans, to Werkzeugmaschinenfabrik Gildemeister & Comp., Aktiengesellschaft. Bearing, centering and indexing means for the spindle carriers of multiple spindle machines. 3,735,460, Cl. 29-48.500.

Craig, Fred A.: See—  
Rosa, Lee F.; Wilkinson, James E.; Craig, Fred A.; and Hudson, Allan M., 3,736,089.

Crawford, Cullen B. Tube coupling. 3,736,008, Cl. 285-342.000.

Crawford Fitting Company: See—  
Dodge, Harry G., 3,735,621.

Crites, Roger C., to Mc Donnell Douglas Corporation. Electret pressure transducer. 3,736,436, Cl. 307-88.0et.

Croci, Angelo: See—  
Croci, Mauro; and Cavaterra, Enrico, 3,736,355.

Croci, Mauro; deceased (by Croci, Angelo; and Biagioni, Margherita; heirs); and Cavaterra, Enrico, to Montecatini Edison S.p.A. Process for the preparation of unsaturated acids. 3,736,355, Cl. 260-533.00n.

Croom, Hardy C., to Owens-Illinois, Inc. System for removing color from paper mill liquid waste. 3,736,254, Cl. 210-51.000.

Cross, Edward Albert; McCoy, Frederick Charles; and Schlicht, Raymond Charles, to Texaco Inc. Nitrite containing corrosion-inhibiting grease compositions. 3,736,256, Cl. 252-18.000.

Crowne, Francis Raymond; and Peer, Vladimir, to Canada Wire and Cable Company Limited. Electrocoating bath compositions. 3,736,276, Cl. 260-19.0ep.

Cruceanu, Sever: See—  
Constantinescu, Dorin; Cruceanu, Sever; Spataru, Eugen; and Mereanu, Nicolae, 3,735,826.

Cubberly, Walter E., Jr., to Schlumberger Technology Corporation. Data-signaling apparatus for well drilling tools. 3,736,558, Cl. 340-18.0cd.

Cubic Corporation: See—  
Rogers, Laurence B.; Neumann, Malcolm A.; and Dolan, Dwain K., 3,736,403.

Cude, Leion. Magnetic casket seal assembly. 3,735,456, Cl. 27-17.000.

Cullen, Glenn Wherry; Bolin, Stephen Ray; Morrison, Andrew David; and Wang, Chih Chun, to RCA Corporation. Czochralski-grown spinel for use as epitaxial silicon substrate. 3,736,158, Cl. 106-42.000.

Cullen, Patrick: See—  
Karter, Jesse; and Cullen, Patrick, 3,735,492.

Cullen, William F.; Holub, Fred F.; and McCormick, Michael R., to General Electric Company. Radiation shielded electron discharge device. 3,736,457, Cl. 313-313.000.

Cunningham Corporation: See—  
Munn, Sumner T., 3,736,509.

Curington, Alfred R., to Baker Oil Tools, Inc. Bore hole air hammer. 3,735,820, Cl. 173-78.000.

Curtis, Willard S.: See—  
Kerr, David; and Curtis, Willard S., 3,735,955.

Curtis-Wright Corporation: See—  
Moskowitz, Seymour; and Horvath, Joseph A., 3,735,588.

Moskowitz, Seymour; and Leto, Anthony, 3,736,070.

Cushing, Charles J.; Schwind, Kurt C.; and Vander Neut, Richard D., to Philco-Ford Corporation. Radiation sensitive means for detecting optical flaws in glass. 3,736,065, Cl. 356-239.000.

Cushman Industries, Incorporated: See—  
Smithson, Grodon W., 3,735,670.

Cute, James A.: See—  
Gregorian, Razmic S.; Kirk, Charles C.; and Cute, James A., 3,736,218.

Cutillo, Louis J.: See—  
Kreten, Bernhard; and Cutillo, Louis J., 3,735,432.

Cyprus Metallurgical Processes Corporation: See—  
Kruesi, Paul R.; and Goens, Duane N., 3,736,238.

Czumber, Frank E.: See—  
Wiltshire, Arthur J.; Ranallo, Henry U.; and Czumber, Frank E., 3,736,086.

Dahl, Henry A.: See—  
Keur, Robert I.; and Dahl, Henry A., 3,736,593.

Dahlstrom Corporation: See—  
Pfund, Alvin F., 3,735,539.

Dainichi-Nippon Cables, Ltd.: See—  
Okada, Masaaki; Takemori, Hayashi; Kita, Toshio; Nakai, Toshiaki; Ohtsui, Nasaaki; Fujiwara, Yasuhiro; Tamura, Shoji; and Morita, Koji, 3,736,173.

Dane, Ernest Blaney, Jr. Hoist piping for deep-sea mineral slurry. 3,736,077, Cl. 417-424.000.

Danfoss A/S Nordborg: See—  
Gravensen, Niels P. G.; and Sorensen, Carl, 3,735,776.

Danhausen, Justus; and Marx, Paul, to Agfa-Gevaert Aktiengesellschaft. Dye diffusion transfer process for the production of positive color photographic images. 3,736,136, Cl. 96-3.000.

Danilin, Sergei Alexandrovich: See—  
Chizhov, Leonid Vladimirovich; Lengauer, Dmitry Emelyanovich; and Danilin, Sergei Alexandrovich, 3,735,640.

Danno, Mitsuaki: See—  
Ohno, Eiichi; Danno, Mitsuaki; Yamazaki, Eizo; Ohkawa, Kiyoto; and Watanabe, Osamu, 3,736,063.

Darling, Alan Sydney; and Selman, Gordon Leslie, to Johnson, Matthey & Co., Limited. Method of coating refractory metals for protection at high temperatures and resulting article. 3,736,109, Cl. 29-195.000.

Darrow, John O. G., to Westinghouse Air Brake Company. Fail-safe electronic comparator circuit. 3,736,434, Cl. 307-235.00r.

Dart Industries, Inc.: See—  
Schrage, Albert, 3,736,266.

Dashev, Stephen S.; and Wills, Arnold, to La Mesa Industries, Inc., mesne. Concrete beam forms. 3,735,953, Cl. 249-28.000.

Data Packaging Corporation: See—  
Mathus, Gregory, 3,736,036.

Dattilo, Donald J., to Motorola, Inc. Cartridge locking mechanism with adjustable tension means. 3,735,989, Cl. 274-4.00b.

Davidge, Ronald V.: See—  
Cecil, Thomas F., II; and Davidge, Ronald V., 3,736,424.

Davidge, Ronald V.; Hobgood, George W., Jr.; Queener, Carl A.; Spears, Jesse W.; and Thompson, Bernard G., to International Business Machines Corporation. Reproduction apparatus incorporating alternate redevelopment and reimaging cycles for multiple copies. 3,736,055, Cl. 355-14.000.

Davies, Robert L.: See—  
Fox, Richard W.; and Davies, Robert L., 3,736,466.

Davis, Donald A.: See—  
Rosenthal, Louis A.; and Davis, Donald A., 3,736,492.

Rosenthal, Louis A.; and Davis, Donald A., 3,736,493.

Rosenthal, Louis A.; and Davis, Donald A., 3,736,494.

Davis, Forrest Wm.; and Seitz, Lamont J., to Baxter Laboratories, Inc. Diagnostic unit. 3,736,433, Cl. 250-218.00r.

Davis, Larry G.: See—  
Dworschack, Robert G.; Chen, James C.; Lamm, William R.; and Davis, Larry G., 3,736,232.

Davis, Owen F.: See—  
Cook, Harold D.; and Davis, Owen F., 3,736,487.

Davis, Richard P. Ice and snow removal machine. 3,736,028, Cl. 299-25.000.

Davydov, Vladimir Sergeevich: See—  
Prostov, Igor Semenovich; and Davydov, Vladimir Sergeevich, 3,735,992.

Day, John J.; and Zajac, Jaroslav, to Gulf Research & Development Company. Method for increasing the mobility of waxy crude oils. 3,735,770, Cl. 137-13.000.

Dayger, Jonas E.; Drejza, John E.; and Moneagle, Otto F., to International Business Machines Corporation. Front-back printer. 3,735,696, Cl. 101-93.00c.

DCA Educational Products, Inc.: See—  
Brown, Milton T.; and Bilek, Zdenek, 3,736,035.

De Angelis, Peter; Morris, Alfred R.; and Mac Millan, Alan L., to Sobin Chlor-Alkali, Inc. Process and apparatus for removing mercury from waste water. 3,736,253, Cl. 210-27.000.

De Cadenet, Jean-Jacques; Gueussier, Andre; and Tricot, Roland, to Pechiney Ugine Kuhlmann. Stainless steel with a high boron content. 3,736,128, Cl. 75-126.00p.

De Corso, Serafino M.; and Bruning, Armin M., to Westinghouse Electric Corporation. Process for iron ore reduction and electric furnace for iron ore reduction having at least one nonconsumable electrode. 3,736,358, Cl. 13-9.000.

De Gier, Nico Arie; and Van Der Kooij, Simon, to U.S. Philips Corporation. Dip lacquering of electrical components. 3,736,179, Cl. 117-201.000.

De Groff, Mark E.: See—  
Richards, Joseph M.; and De Groff, Mark E., 3,735,756.

de Haas, Frank; and Miller, Dean E. Falling breech block action for a single shot firearm. 3,735,517, Cl. 42-23.000.

De Tommaso, Gabriel L.: See—  
Scott, Joseph David; and De Tommaso, Gabriel L., 3,736,286.

De Zeeuw, John R.; and Tynan, Edward J., III, to Pfizer Inc. Fermentation process for the production of D-mannitol. 3,736,229, Cl. 195-28.00r.

Decker, Harold D. Hand loading press for field use or the like. 3,735,666, Cl. 86-24.000.

Dederer, Robert: See—  
Vanderhoof, Frank B.; and Dederer, Robert, 3,735,867.

Dedona, Francis A.; and Lucas, James W., to Scionics Business Products, Inc., mesne. Card cover sheet aperturing apparatus. 3,735,655, Cl. 83-140.000.

Deering Milliken Research Corporation: See—  
Pearce, Larry N., 3,735,609.

Shortte, Willard H., Jr., 3,735,441.

Degueudre, Louis; Gobillon, Yves; Clerbois, Lucien; and Bourgeois, Louis, to Solvay & Cie. Solid compound of rhodium and tellurium and manufacturing process therefor. 3,736,269, Cl. 252-518.000.

Degueudre, Louis; Gobillon, Yves; Clerbois, Lucien; and Bourgeois, Louis, to Solvay & Cie. Solid compound of rhodium and tungsten and manufacturing process therefor. 3,736,270, Cl. 252-518.000.

Deike, Robert F., 1/4 each to Chamberlain, William H. Chamberlain, Anna B. Manually actuated jack hammer. 3,735,822, Cl. 173-118.000.

Delano, Richard; and Raseman, Chad J. Method to prevent condensate accumulation on a surface. 3,736,172, Cl. 117-95.000.

Delin, Per Staffan; Ekstrom, Bertil Ake; Nathorst-Westfelt, Lars Solve; Sjoberg, Berndt Olof Harald; and Thelin, Karl Hugo. Process for producing 6-aminopenicillanic acid. 3,736,230, Cl. 195-36.00p.

Dellheim, Walter: See—  
Kienzie, Herbert; Dellheim, Walter; and Kelch, Heinz, 3,736,408.

Demag Aktiengesellschaft: See—  
Genge, Ulrich, 3,735,970.

deMan, Albert: See—  
Diebel, Howard; and deMan, Albert, 3,735,613.

Dempster, George: See—  
Bink, Werner R.; and Dempster, George, 3,735,641.

Dendix Brushes Limited: See—  
Godfrey, Leonard Robert; and Cook, John Daniel, 3,735,510.

Denisov, Genrikh Alexandrovich: See—  
Fedotov, Alexandr Mikhailovich; Alexeev, Evgeny Stepanovich; Denisov, Genrikh Alexandrovich; Rundkvist, Konstantin Alexandrovich; and Skrunde, Artur Avgustovich, 3,735,868.

Denki Onkyo Co., Ltd.: See—  
Masuda, Noboru, 3,736,578.

Masuda, Noboru; and Kuroyanagi, Masai, 3,736,441.

Dennison Manufacturing Company: See—  
Kinney, John E.; and Bone, Arnold R., 3,735,908.

Denton Plastic Products Corporation: See—  
Adey, George R.; and Souder, Wilmer, Jr., 3,736,090.

Denzel, Theodor; and Hoehn, Hans, to Squibb, E. R., & Sons, Inc. Hydrazines of isoxazopyridine carboxylic acids and esters. 3,736,325, Cl. 260-295.50b.

Denzel, Theodor; and Hoehn, Hans, to Squibb, E. R., & Sons, Inc. Isoxazopyridine carboxylic acids and esters. 3,736,326, Cl. 260-295.50b.

Denzel, Theodor; and Hoehn, Hans, to Squibb, E. R., & Sons, Inc. Isoxazopyridine ketone derivatives. 3,736,327, Cl. 260-296.00h.

D'Ercolo, Anthony C.; and Schwartz, David N., to Eastman Kodak Company. Web separating device. 3,735,936, Cl. 242-71.100.

Derderian, Edward J. Article handling machine. 3,735,552, Cl. 53-63.000.

Deribas, Andrei Andreevich; Kudinov, Vladimir Mikhailovich; Matveenko, Felix Iovich; Oksak, Vladimir Ivanovich; Simonov, Valery Alexandrovich; and Ostapenko, Nikolai Gerasimovich; deceased (by Ivanova, Klara Mikhailovna; and Ostapenko, Alexei Nikolaevich; administrators). Method of manufacturing components with cavities by explosive welding of metal blanks. 3,735,476, Cl. 29-470.100.

Desmond, John D.: See—  
Collura, Peter C.; and Desmond, John D., 3,735,914.

Detterbeck, Heinrich; Ackermann, Josef; and Schmalzgruber, Bruno, to Siemens-Elektrogerate GmbH. Baking and roasting oven. 3,735,750, Cl. 126-197.000.

Deutscher, Hans-Christian; and Bauer, Und Kurt, to SWF Spezialfabrik fuer Autozubehoer Gustav Rau GmbH. Windshield wiper blade construction. 3,735,443, Cl. 15-250.360.

Devac AB: See—  
Astrum, Nils Osten, 3,735,824.

Dey, Arabinda N.; and Holmes, Robert W., to Mallory, P. R., & Co., Inc. Metal phosphate and metal arsenate organic electrolyte cells. 3,736,184, Cl. 136-6.0ln.

Dey, Arabinda N.; and Holmes, Robert W., to Mallory, P. R., & Co., Inc. Hermetically sealed structures for organic electrolyte systems. 3,736,190, Cl. 136-133.000.

Deyeri, Herman F.: See—  
Reynolds, Robert J.; and Deyeri, Herman F., 3,736,484.

Di Fiore, Lucio; Divo, Claudio; and Ghirga, Marcello, to Societa Italiana Resine S.p.A. Method of separating vinyl acetate from liquid mixtures by extractive distillation with a glycol. 3,736,236, Cl. 203-51.000.

Diamond, Martin J.; and Needles, Howard L. Acryloxyacyl chlorides. 3,736,341, Cl. 260-405.000.

Dias, Gil M.: See—  
Buchan, Norman S.; and Dias, Gil M., 3,736,177.

Dick, A. B., Company: See—



Keur, Robert I.; and Dahl, Henry A., 3,736,593.  
 Diebel, Howard; and deMan, Albert, to Moyer Diebel Limited. Retractable door handle and lock. 3,735,613, Cl. 70-208.000.  
 Diebold Incorporated: See—  
 Shoop, James D., 3,735,714.  
 Dierks, James J.; and Stoneham, Jeffrey R., to Eastman Kodak Company. Winding mechanism for a camera. 3,736,015, Cl. 242-71.200.  
 Dietrich Manufacturing, Inc.: See—  
 Dietrich, William J., Sr., 3,736,029.  
 Dietrich, William J., Sr., to Dietrich Manufacturing, Inc. Attachment dual drive wheel. 3,736,029, Cl. 301-39.00r.  
 Dietsch, Kurt Arne; and Van Opdorp, Petrus Franciscus Philippus, to Telefonaktiebolaget L. M. Ericsson. Armature assembly for an electromagnetic relay. 3,736,537, Cl. 335-135.000.  
 Digimetics Incorporated: See—  
 Snook, Richard K., 3,736,568.  
 Digital Apparatus Corporation: See—  
 Smyth, Robert C., 3,736,519.  
 Dille, Alfred; and Thamm, Udo, to Hansel, Otto, GmbH, Firma. Apparatus for insertion of sweet parts, in particular of pralines, in wrapping cases. 3,735,556, Cl. 53-240.000.  
 Dinsdale, Vern Thomas; Reed, Russell, Jr.; and Meyer, Robert E., to Thiokol Chemical Corporation. Method for making a pyrotechnic device. 3,736,206, Cl. 156-293.000.  
 Dinsmore, Robert L.: See—  
 Owsen, Ernest H., Jr.; and Dinsmore, Robert L., 3,736,110.  
 Dinwiddie, James A.: See—  
 Schutze, Henry G.; and Dinwiddie, James A., 3,736,271.  
 Display Engineers Inc.: See—  
 Juhnke, Lawrence H., 3,736,009.  
 Divo, Claudio: See—  
 Di Fiore, Lucio; Divo, Claudio; and Ghirga, Marcello, 3,736,236.  
 Dodge, Harry G., to Crawford Fitting Company. Hand operated tube bender. 3,735,621, Cl. 72-156.000.  
 Doepeke, Donald G. H., to General Electric Company. Pack level adjustment apparatus in an appliance cabinet. 3,736,037, Cl. 312-351.000.  
 Doi, Kaname: See—  
 Yabuta, Keiichiro; and Doi, Kaname, 3,736,031.  
 Dolan, Dwain K.: See—  
 Rogers, Laurence B.; Neumann, Malcolm A.; and Dolan, Dwain K., 3,736,403.  
 Donelan, James Arthur Francis, to Pirelli General Cable Works Limited. Method of and apparatus for corrugating tubing. 3,735,616, Cl. 72-77.000.  
 Donjon, Jacques, to Societe de Fabrication d'Instruments de Mesure S.F.I.M. Analogue-to-digital voltage converter. 3,736,586, Cl. 340-347.00t.  
 Donze, Michel; Kohler, Bernard Claude; and Manoussi, Gerard Philippe, to Societe Industrielle Honeywell Bull (Societe Anonyme). Assemblage element for functional unit with card connector means. 3,736,471, Cl. 317-101.00d.  
 Dorokhov, Vasily Ivanovich: See—  
 Brusov, Lev Petrovich; Vasilevsky, Dmitry Pavlovich; Dorokhov, Vasily Ivanovich; and Onoprienko, Vasily Petrovich, 3,735,969.  
 Double, Richard L. Electrical coupler. 3,736,548, Cl. 339-31.00r.  
 Dow, Bruce R.; and Thompson, Francis T., to Westinghouse Electric Corporation. Programmed instructional system. 3,735,503, Cl. 35-9.00a.  
 Dow Chemical Company, The: See—  
 Marriott, Lee Walter, 3,735,475.  
 Dowdell, Stewart Harold; and Pachaly, Robert W., to Gulf Research & Development Company. Apparatus and process for liquefaction of natural gases. 3,735,600, Cl. 62-39.000.  
 Dracon Industries: See—  
 Mason, John R., 3,736,199.  
 Drejza, John E.: See—  
 Dayger, Jonas E.; Drejza, John E.; and Moneagle, Otto F., 3,735,696.  
 Drelich, Arthur H.: See—  
 Glor, Paul R.; and Drelich, Arthur H., 3,736,097.  
 Dresser Industries, Inc.: See—  
 Keller, Wilbur Stanley, 3,735,825.  
 Myers, Nijah F., 3,735,815.  
 Tucker, Andrew J., 3,735,814.  
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 Droz, Julius, to Lee, Raymond, Organization, Inc., The. Hat with ventilating means. 3,735,423, Cl. 2-171.300.  
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- Osojnak, Boris M. Sealing ring with integral label holder. 3,735,863, Cl. 206-53.000.
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- Ostapenko, Nikolai Gerasimovich: See—  
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- Ostbo, Karl Robert Ambjorn. Plate heat exchanger. 3,735,810, Cl. 165-142.000.
- O'Sullivan, Denis J.; and Bolgep, Bernard J., to Loctite (Ireland), Limited. Anaerobic composition in aerosol form. 3,736,260, Cl. 252-188.30r.
- Otto Bock Orthopädische Industrie KG: See—  
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- Ovalstrapping, Inc.: See—  
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- Overman, Joseph D.; and Strange, Jack F., to Du Pont de Nemours, E. I., and Company. Photosolubilization process using chemically sensitized photosoluble silver halide layers. 3,736,141, Cl. 96-64.000.
- Owen, Edward A., to Westinghouse Electric Corporation. Electric control devices with mechanical interlock. 3,736,538, Cl. 335-160.000.
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- Owston, Ernest H., Jr.; and Dinsmore, Robert L., to Atlantic Richfield Company. Mono- and dicresyl phosphate amine rust inhibitors. 3,736,110, Cl. 44-56.000.
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- Oxy-Dry Sprayer Corporation: See—  
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- Pabalan, Javier A., Jr., to Sybron Corporation. Dental shielding device. 3,735,491, Cl. 32-33.000.
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- Pachuta, John Michael: See—  
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- Pagano, Henry A., to Lee, Raymond, Organization, Inc., The. Automatic jar shaker. 3,735,962, Cl. 259-72.000.
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- Paintin, John D. Hanger assembly for automobile exhaust systems. 3,735,950, Cl. 248-62.000.
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- Panissidi, Hugo A., to International Business Machines Corporation. Pneumatic reader for perforated media. 3,735,771, Cl. 137-15.000.
- Panker, Bent Jorgen. Carpet base element. 3,735,537, Cl. 52-660.000.
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- Paraho Corporation: See—  
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- Plantard, Bernard. Continuous sheet slitting mills. 3,735,937, Cl. 242-75.200.
- Plasser, Franz; and Eglseer, Franz, to Plasser, Franz, Bahnbau-maschinen und Industrie-gesellschaft m.b.H. Mobile track survey apparatus for determining grade variations. 3,735,495, Cl. 33-144.000.
- Plasser, Franz; and Theurer, Josef. Drive for vibrating a track maintenance machine tool. 3,735,708, Cl. 104-12.000.
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- Waddington, William T., to Buchanan Electrical Products Corporation. Wire tie. 3,735,448, Cl. 24-16.0pb.
- Wadia, Aspi B.: See—  
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- Waecker, Norman J.: See—  
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- Wagner, George J., Jr., to United States Steel Corporation. Adjustable conducting roll apparatus. 3,735,804, Cl. 164-282.000.
- Wahle, Gunter: See—  
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- Wallace, James B.; and Hill, Robert H., to Westinghouse Electric Corporation. Connecting adapter for electric cable and fuse. 3,736,550, Cl. 339-265.00r.
- Wallach, Harvey. Convertible shipping and display packing device. 3,735,861, Cl. 206-45.110.
- Waller, Gustav Martin, to Amsted Industries Incorporated. Expandable wheel. 3,735,535, Cl. 51-374.000.
- Walmsley, Robert Edwin, to Lucas, Joseph, Industries Limited. Pump control mechanism. 3,736,073, Cl. 417-222.000.
- Walto, Joseph: See—  
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- Waltz, Richard W.: See—  
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- Warburton, Richard T., to Mobil Oil Corporation. Egg carton construction. 3,735,917, Cl. 229-44.00r.
- Ward, George C.: See—  
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- Ward, James E., to Tool & Equipment Mfg. Co., Inc. Quick disconnect tool coupling. 3,736,011, Cl. 287-103.00a.
- Ward, William C., to International Business Machines Corporation. Integrated circuit chip repair tool. 3,735,911, Cl. 228-19.000.
- Waring, Robert K., Jr., to Du Pont de Nemours, E. I., and Company. Storage and retrieval of analog information with magneto-optic readout. 3,736,385, Cl. 179-100.2ch.
- Warner-Lambert Company: See—  
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- Warren, Robert H., Jr. Multiple channel video switching system. 3,736,377, Cl. 178-7.200.
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- Watkins, Gary S., to University of Utah. Electronically generated perspective images. 3,736,564, Cl. 340-172.500.
- Watkins, Reynold K., to United States Steel Corporation. Reinforced soil bridge. 3,735,595, Cl. 61-16.000.
- Watson, Frederick D.; and Jarvis, Howell R., to Petrolite Corporation. Shipboard electrical treater. 3,736,245, Cl. 204-302.000.
- Watson, Geoffrey Walter; and Jenkinson, Brian Edward, to A. I. Welders Limited. Friction welding. 3,735,910, Cl. 228-2.000.
- Watson, James Power, to RCA Corporation. Document picker. 3,735,976, Cl. 271-94.000.
- Watts, Thomas E.; and Ballard, Clifford L. Sprinkler mounting and pipe connector. 3,735,928, Cl. 239-267.000.
- Way, James A., to Schoger, H. L., & Associates, Inc. Furnace carrier and handling system. 3,735,965, Cl. 34-227.000.
- Wayson, Andrew J.; and O'Connell, John T., to Merriman, Inc. Spinning ring. 3,735,578, Cl. 57-119.000.
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- Weigl, John W.; Mannino, Joseph; and Amidon, Alan R., to Xerox Corporation. Transparent ink absorbent lacquers. 3,736,133, Cl. 96-1.500.
- Weinger, Gerhard; and Pupp, Hanns-Peter, to Patent-Treuhand-Gesellschaft für Elektrische Glühlampen mbH. Cooled electrode for high electric discharge lamps. 3,736,451, Cl. 313-32.000.
- Weintraus, Lester, to Air Products and Chemicals, Inc., mesne. Post-chlorinated vinyl chloride resin and process therefor using radiation. 3,736,240, Cl. 204-159.180.
- Weiss, Robert E. Stilt ball game apparatus. 3,735,980, Cl. 272-70.100.
- Wellman, Donald C., to Carrier Corporation. Electrostatic air cleaning apparatus. 3,735,560, Cl. 55-129.000.
- Wendler, Norman L.; and Taub, David, to Merck & Co. Inc. Prostaglandins and methods of making same. 3,736,335, Cl. 260-340.900.
- Wendt, Peter G.: See—  
Kilbane, John R.; and Wendt, Peter G., 3,736,074.
- Weng, Francis H., Jr. Extractor tool. 3,735,650, Cl. 81-53.200.
- Wenstrom, Roger A., to Holes-Webway Company, The. Pocketed album page. 3,735,516, Cl. 40-104.180.
- Wenzel, Robert J., to Bendix Corporation, The. Microwave filter. 3,736,536, Cl. 333-73.00r.
- Werkzeugmaschinenfabrik Gildemeister & Comp., Aktiengesellschaft: See—  
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- Reeves, John R.; Bogel, George F.; and Thompson, Francis T., 3,736,468.
- Smart, Ernest F., 3,735,467.
- Wallace, James B.; and Hill, Robert H., 3,736,550.
- Weston, David. Floatation of copper ores. 3,735,931, Cl. 241-24.000.
- Westphal, Dieter, to Vaillant, Joh., KG. Mounting of an armature plate in a thermoelectric pilot safety device. 3,736,540, Cl. 335-279.000.
- White, Robert Anthony: See—  
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- Wick, Kurt; and Holl, Norbert, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Steam chamber. 3,736,082, Cl. 425-4.000.
- Wiedmann, Siegfried K.: See—  
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- Wiig, Chester M., to Littell, F. J., Machine Company. Disc brake structure. 3,735,843, Cl. 188-72.100.
- Wilder, Thomas C., to Kennecott Copper Corporation. Two stage selective leaching of copper and nickel from complex ore. 3,736,125, Cl. 75-21.000.
- Wilding, Edwin L., to Griffin & Company. Method of processing tobacco in a blend-bulk silo. 3,735,881, Cl. 214-152.000.
- Wiles, Donald Ray: See—  
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- Willow Hill Industries, Inc.: See—  
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- Wills, Arnold: See—  
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- Wilson, Donald A., to Warwick Electronics Inc. Receiver tuning system. 3,736,513, Cl. 325-421.000.
- Wilson, James R.: See—  
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- Wilson, Richard C., to Aluminum Company of America. Method of fabricating a hollow bat and product thereof. 3,735,473, Cl. 29-421.000.
- Wilson, Richard W., to Motorola, Inc. Method of providing thermally conductive ground connections for integrated circuits. 3,735,485, Cl. 29-591.000.
- Wilson, William J.: See—  
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- Wiltshire, Arthur J.; Ranallo, Henry U.; and Cumber, Frank E., to Structural Fibers, Inc. Apparatus for making fiber preform. 3,736,086, Cl. 425-92.000.
- Winkler, Alfred, to Agfa-Gevaert Aktiengesellschaft. Camera with im-peller-actuated source of artificial light. 3,735,679, Cl. 95-11.50r.
- Winter, Werner; Thiel, Max; Stach, Kurt; Schmidt, Felix Helmut; and Stork, Harald, to Boehringer Mannheim GmbH. Anti-cholesterol phenoxyacetic acid esters. 3,736,334, Cl. 260-335.000.
- Wirth, Hermann, to Bosch, Robert, G.m.b.H. Electrostatic spraying apparatus for pulverulent material. 3,735,924, Cl. 239-15.000.
- Wishnie, Frederick T. Alloy. 3,736,130, Cl. 75-154.000.
- Witt, Anthony Ronald: See—  
Elstow, William Rupert Brooke; and Witt, Anthony Ronald, 3,735,706.
- Wittenberg, Albert Malcolm, to Bell Telephone Laboratories, Incorporated. Mass bonding of twisted pair cables. 3,736,366, Cl. 174-34.000.
- Wittenbrook, Lawrence S.; and Simmons, Richard J. Certain 3-halo-5-sulfinyl-1,2,4-thiadiazoles. 3,736,328, Cl. 260-302.00d.
- Wojcik, Joseph D. Corn-on-the-cob butterer. 3,735,487, Cl. 30-124.000.
- Wolfson, Stanley W.: See—  
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- Woljiza, Chester J., Jr.; and Cacciamani, Eugene R., Jr., to Communications Satellite Corporation. Phase ambiguity resolution for four phase PSK communications systems. 3,736,507, Cl. 325-30.000.
- Wood, John C.: See—  
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- Wood, Lloyd Murray, to Polymer Corporation Limited. Carton packing device. 3,735,561, Cl. 53-245.000.
- Wood, Robert Spurgeon: See—  
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- Woodrow, Harold E.: See—  
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- Woolard, William J. Combination fireplace cover and article of furniture. 3,736,024, Cl. 297-217.000.
- Worthington-Cei Incorporated: See—  
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- Wrhen, Wilmer C.: See—  
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- Wright Aluminum Limited: See—  
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- Wright, Carl Macey, to RCI Corporation. Conversion of base B number to base R number, where R is a variable. 3,736,412, Cl. 235-155.000.
- Wright, Edward S.; and Angstadt, John W., to Blaw-Knox Food and Chemical Equipment, Inc. Process and apparatus for washing particulate comestible materials. 3,736,182, Cl. 127-24.000.
- Wright, Orval George, to Wright Aluminum Limited. Snow vehicle attachment. 3,736,005, Cl. 280-150.00c.
- Wu, Joseph C., to Time and Frequency Technology, Inc. Frequency and modulation monitor. 3,736,510, Cl. 325-134.000.
- Wurl, Ernst: See—  
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- Xerox Corporation: See—  
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- Yabuta, Keiichiro; and Doi, Kaname, to Nissan Motor Company, Limited and Sumitomo Electric Industries, Limited. Hydraulic brake fluid pressure proportioning valve. 3,736,031, Cl. 303-6.00c.
- Yamamoto Electric Industrial Co., Ltd.: See—  
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- Yamashita, Hiroshi; Sekikawa, Nobuyoshi; and Ono, Hisatake, to Fuji Photo Film Co., Ltd. Heat and light stabilization of photosensitive elements containing polyhalogenated hydrocarbons, N-vinylcarbazoles and difurfurylidene pentaerythritols. 3,736,139, Cl. 96-48.00r.
- Yamazaki, Eizo: See—  
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- Yanagita, Masaya; Kitahara, Masao; and Abe, Yoshimichi, to Rikagaku Kenkyusho. Process for the production of acrylic acid. 3,736,354, Cl. 260-530.00m.
- Yarrington, James C.: See—  
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- Yatani, Kozo: See—  
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- Yates, John S.: See—  
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- Yeamans, Wilfred Harold, to General Electric Company. Polytetrafluoroethylene end plug seal for electrolytic capacitors. 3,735,480, Cl. 29-570.000.
- Yee, William C.; and Stout, Perry R., to United States of America, Atomic Energy Commission. Method for growing edible aquatic animals on a large scale. 3,735,736, Cl. 119-2.000.
- Yoshida, Kyusaku: See—  
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- Yovanovich, Joseph T., 1/2 to Berger, Milton. Apparatus for continuously producing bodies of synthetic thermoplastic material. 3,736,081, Cl. 425-4.00c.
- Zaba, Tadeusz: See—  
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- Zabarilo, Oleg Semenovich: See—  
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- Zajac, Jaroslav: See—  
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- Zatorsky, Nicholas Ignatius, Jr., to Textron Inc. Hand-held power tool with rotary tool disc at end of reversible forwardly projecting arm. 3,735,489, Cl. 30-390.000.
- Zauderer, Bert, to General Electric Company. Uniform ionization means for MHD generators. 3,736,447, Cl. 310-11.000.
- Zaugg, Roland: See—  
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- Zbikowski, Theodore H.; Pauly, Ronald R.; and Pfeilsticker, Lee J., to Tonka Corporation. Ladder for toy fire engine. 3,735,528, Cl. 46-215.000.
- Zeeh, Bernd; Koenig, Karl-Heinz; and Jung, Johann, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Agent for stunting the growth of plants. 3,736,121, Cl. 71-76.000.
- Zeh, J Howard: See—

- Post, Leo B.; Rosen, Herbert J.; and Zeh, J Howard, 3,736,151.
- Zeleney, Leo Z., to Ionic International, Inc. Programmable electrical control system for a transport hoist. 3,736,562, Cl. 340-149.00r.
- Zenith Radio Corporation: See—  
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- Zettlemoyer, James E.; and McGee, Charles I., 1/3 to Juten, Milford A. Replaceable molten metal nozzle structure. 3,735,906, Cl. 222-567.000.
- Zhuchin, Vladimir Nikoforovich: See—  
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- Ziegler, Horst; and Thill, Albert, to Volkswagenwerk Aktien-gesellschaft. Device for positioning a seating arrangement especially in motor vehicles. 3,736,026, Cl. 297-379.000.
- Zimmer Aktiengesellschaft: See—  
Keinath, Hans; Kroger, Klaus; and Lauerbach-Lehmeier, Robert, 3,735,959.
- Zindler, Jerrold, to Instrumentation Laboratory, Inc. Dispenser apparatus. 3,735,902, Cl. 222-363.000.
- Zivi, Samuel M.; and Humberstone, Gordon H., to TRW Data Systems, Inc. Coherence extender for Q-switched lasers for use in holography. 3,736,040, Cl. 350-3.500.
- Zocco, George, to Slumberland Products Co. Spring construction. 3,735,431, Cl. 5-267.000.
- Zook, Elmer S., to Reed Rolled Thread Die Company. Method and apparatus for internal gear rolling. 3,735,618, Cl. 72-91.000.
- Zook, James D., to Honeywell Inc. Optical spot size changer. 3,736,046, Cl. 346-74.00m.



## LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF MAY, 1973

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Artzer, Charles W., and A. M. DiCicco. Center plate assembly. Re. 27,651, 5-29-73, Cl. 308—137.  
Baum, Gilbert. Method and apparatus for the display and re-decoration of signals. Re. 27,650, 5-29-73, Cl. 340—3.  
Cohen, Herman. Process for preserving citrus fruit food products. Re. 27,646, 5-29-73, Cl. 99—186.  
DiCicco, Alexander M.: See—  
Artzer, Charles W., and DiCicco. Re. 27,651.  
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Kelly, Peter B., and Grosheilm. Re. 27,644.  
Grussen, Jean. Plastic bottle cap with integral handle. Re. 27,648, 5-29-73, Cl. 215—41.  
Kelly, Peter B., and G. E. Grosheilm, to Formica Corp. Decorative laminate backcoated with a polyvinyl acetate. Re. 27,644, 5-29-73, Cl. 161—162.  
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Mirowski, Mieczyslaw, M. M. Mower, and W. S. Staewen, to Medtronic, Inc. Electronic standby defibrillator. Re. 27,652, 5-29-73, Cl. 128—419.  
Mower, Morton M.: See—  
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North American Rockwell Corp.: See—  
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Oskam, Aane A., to Technische Industrie A. C. Koot N.V. Electric adjusting means for azimuth and elevation adjustment. Re. 27,653, 5-29-73, Cl. 350—289.  
Robinson, John E.: See—  
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Staewen, William S.: See—  
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Armstrong Nurseries, Inc.: See—  
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Garabedian, John M., to Superior Farming Co. Apricot tree. 3,345, 5-29-73, Cl. 39.  
Jackson & Perkins Co.: See—  
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Lee, Charles H., to Monrovia Nursery Co. Raphiolepis plant. 3,349, 5-29-73, Cl. 54.  
Monrovia Nursery Co.: See—  
Lee, Charles H. 3,349.  
Skimlin, Conrad A. 3,344.  
Moore, Ralph S. Miniature rose plant. 3,346, 5-29-73, Cl. 7.  
Skimlin, Conrad A., to Monrovia Nursery Co. Pyracantha plant. 3,344, 5-29-73, Cl. 54.  
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Bajusz, Harold F. 227,038.  
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Altamare, Kenneth. Hairdresser's tray. 227,042, 5-29-73, Cl. D86—10.  
Ardolino, Anthony A., to Howard Research and Development Corp. Casing and controls for dual telephone communicator. 227,014, 5-29-73, Cl. D26—14.  
Ardolino, Anthony A., to Howard Research and Development Corp. Casing and controls for telephone communicator. 227,015, 5-29-73, Cl. D26—14.  
Bailey, H. N., & Associates: See—  
Ridlon, Robert K. 227,035.  
Bajusz, Harold F., to Accutec Inc. Pen. 227,037, 5-29-73, Cl. D74—17.  
Bajusz, Harold F., to Accutec Inc. Combination of pen and housing for thermometer or the like. 227,038, 5-29-73, Cl. D74—17.  
Baker, Raymond W. Toy construction piece or similar article. 227,023, 5-29-73, Cl. D34—15.  
Behm, John, to National Silver Co. Skillet-grill, or similar article. 227,028, 5-29-73, Cl. D44—1.  
Bixler, Kenneth D.: See—  
Roy, Roland G., Reifers, Bixler, and Ralphs. 227,004.  
Broadhead, Reginald M., to Drum Horse Distillers Ltd. Combined bottle and cap therefor. 227,002, 5-29-73, Cl. D9—72.  
Cambridge Instrument Co., Inc.: See—  
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Camp, Richard H. Storage bag for food or similar article. 227,044, 5-29-73, Cl. D87—1.  
Catron, Robert. Hoop toy. 227,025, 5-29-73, Cl. D34—15.  
Coe, Dane B., to Innova Inc. Toy training doll. 227,021, 5-29-73, Cl. D34—4.  
Constable, Eugene J., to Mohasco Industries, Inc. Bean bag chair. 226,995, 5-29-73, Cl. D6—26.  
Constable, Eugene J., to Mohasco Industries, Inc. Chair. 226,998, 5-29-73, Cl. D6—71.  
Davis, Harry L., and P. C. Swing: said Davis assignor to United States of America, Army. Stretcher pan for administering inhalation therapy. 227,039, 5-29-73, Cl. D83—1.  
Dembar, Robert H., to Graphicana Corp. Combined display cube and stand therefor. 227,001, 5-29-73, Cl. D6—235.  
Demetreon, James. Adjustable hot tray lifter. 227,029, 5-29-73, Cl. D44—4.  
Derby, Dan R., and R. W. Knodt, to Xerox Corp. Document feeder for a xerographic reproduction machine. 227,034, 5-29-73, Cl. D61—1.  
Diamond International Corp.: See—  
Roy, Roland G., Reifers, Bixler, and Ralphs. 227,004.  
Dimensional Products, Inc.: See—  
Van den Berg, Richard H. 227,043.  
Dow Chemical Co.: See—  
Hutter, Wayne R. 227,033.  
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Edwards, Peter H., H. R. Gelger, and W. B. Ireland, to Multicon Properties, Inc. Multiple unit-townhouse. 227,007, 5-29-73, Cl. D13—1.  
Etablissements Carpano et Pons: See—  
Lemery, Jean-Paul. 227,009.  
Fawcett, Howard N., to Cambridge Instrument Co., Inc. Stylus arm for recorders. 227,013, 5-29-73, Cl. D26—14.  
Fluoroware, Inc.: See—  
Wallestad, Victor C. 227,008.  
Francis, John P. Retractable window case structure and support therefor. 227,005, 5-29-73, Cl. D13—1.  
Gelger, Harvey R.: See—  
Edwards, Peter H., Gelger, and Ireland. 227,007.  
Gianfagna, John L., to Sperry Rand Corp. Electromechanical article storage and retrieval unit. 227,000, 5-29-73, Cl. D6—189.  
Graham, Bette C., to Liquid Paper Corp. Jar. 227,003, 5-29-73, Cl. D9—141.  
Graphicana Corp.: See—  
Dembar, Robert H. 227,001.  
Hand, John E. Medal. 227,018, 5-29-73, Cl. D29—23.  
Hand, John E. Medal. 227,019, 5-29-73, Cl. D29—23.  
Holce, Thomas J., to Kentrox Industries, Inc. Security alarm system control module. 227,036, 5-29-73, Cl. D72—1.  
Howard Research and Development Corp.: See—  
Ardolino, Anthony A. 227,014.  
Ardolino, Anthony A. 227,015.  
Hutter, Wayne R., to Dow Chemical Co. Scraping and cleaning device. 227,033, 5-29-73, Cl. D49—23.  
Innova Inc.: See—  
Coe, Dane B. 227,021.  
Ireland, W. Byron: See—  
Edwards, Peter H., Gelger, and Ireland. 227,007.

## LIST OF DESIGN PATENTEEES

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Jenkins, Glen B. Display stand. 226,996, 5-29-73, Cl. D6—186.  
Jessen, George N. Elevating desk. 226,999, 5-29-73, Cl. D6—156.  
Johnson & Johnson: See—  
Link, Martin. 227,041.  
Jones, Ira M., to World War I Overseas Flyers, Inc. Medal. 227,017, 5-29-73, Cl. D29—19.  
Kentrox Industries, Inc.: See—  
Holce, Thomas J. 227,036.  
Knodt, Ruediger W.: See—  
Derby, Dan R., and Knodt. 227,034.  
Kovac, Sally: See—  
Kovac, Steve. 227,011.  
Kovac, Steve: Sally Kovac, administrator of the estate of said Steve Kovac, deceased. Desiccant plug. 227,011, 5-29-73, Cl. D23—146.  
Laitinen, Hanno V. S., to Oy Polykem AB. Design for a house. 227,006, 5-29-73, Cl. D13—1.  
Lau Inc.: See—  
Ranz, James R., and Ward. 227,012.  
Lemery, Jean-Paul, to Etablissements Carpano et Pons. Fly casting fishing reel. 227,009, 5-29-73, Cl. D22—25.  
Link, Martin, to Johnson & Johnson, Surgical scrub tray. 227,041, 5-29-73, Cl. D83—10.  
Liquid Paper Corp.: See—  
Graham, Bette C. 227,003.  
Lockwood, Gerald J., to E. R. Squibb & Sons, Inc. Reversible forcera. 227,040, 5-29-73, Cl. D83—12.  
Martin, Robert M. Exerciser. 227,022, 5-29-73, Cl. D34—5.  
Matsuda, Shoji: See—  
Shirai, Kazunari, Takaragi, and Matsuda. 227,016.  
Mohasco Industries, Inc.: See—  
Constable, Eugene J. 226,995.  
Constable, Eugene J. 226,998.  
Multicon Properties, Inc.: See—  
Edwards, Peter H., Gelger, and Ireland. 227,007.  
Nash, Kenneth P. Match holder. 227,032, 5-29-73, Cl. D48—28.  
National Silver Co.: See—  
Behm, John. 227,028.  
Nippon Telegraph and Telephone Public Corp.: See—  
Shirai, Kazunari, Takaragi, and Matsuda. 227,016.  
Oliver, William H. Sofa or similar article. 226,997, 5-29-73, Cl. D6—61.  
Oy Polykem AB: See—  
Laitinen, Hanno V. S. 227,006.  
Pawsat, Carlton P., to Wald Mfg. Co., Inc. Bicycle steering post. 227,045, 5-29-73, Cl. D90—9.  
Ralphs, Robert E.: See—  
Roy, Roland G., Reifers, Bixler, and Ralphs. 227,004.  
Ranz, James R., and C. Ward, to Lau Inc. Molded blower wheel. 227,012, 5-29-73, Cl. D23—165.  
Reifers, Richard F.: See—  
Roy, Roland G., Reifers, Bixler, and Ralphs. 227,004.  
Ridlon, Robert K., to H. N. Bailey & Associates. Transom adapter for the jet-exhaust conduit from a water-jet powered boat. 227,035, 5-29-73, Cl. D71—1.  
Roy, Roland G., R. F. Reifers, K. D. Bixler, and R. E. Ralphs, to Diamond International Corp. Molded packaging tray for meat or the like. 227,004, 5-29-73, Cl. D9—219.  
Sciotti, Robert. Finger ring. 227,031, 5-29-73, Cl. D45—10.  
Shirai, Kazunari, F. Takaragi, and S. Matsuda, to Nippon Telegraph and Telephone Public Corp. Telephone or similar article. 227,016, 5-29-73, Cl. D26—14.  
Sperry Rand Corp.: See—  
Gianfagna, John L. 227,000.  
Squibb, E. R., & Sons, Inc.: See—  
Lockwood, Gerald J. 227,040.  
Strauss, Walter L. Toy locomotive. 227,026, 5-29-73, Cl. D34—15.  
Swing, Paul C.: See—  
Davis, Harry L., and Swing. 227,039.  
Syracuse China Corp.: See—  
Szymanski, Michael J. 227,030.  
Szymanski, Michael J., to Syracuse China Corp. Dinner plate or similar article. 227,030, 5-29-73, Cl. D44—15.  
Takaragi, Fujio: See—  
Shirai, Kazunari, Takaragi, and Matsuda. 227,016.  
Tissot, Leon. Flower pot. 227,027, 5-29-73, Cl. D35—3.  
United States of America, Army: See—  
Davis, Harry L., and Swing. 227,039.  
Universal-Rundle Corp.: See—  
Alexander, Fred C. 227,010.  
Van den Berg, Richard H., to Dimensional Products, Inc. Carrier for a beverage container or the like. 227,043, 5-29-73, Cl. D87—1.  
Wald Mfg. Co., Inc.: See—  
Pawsat, Carlton P. 227,045.  
Wallestad, Victor C., to Fluoroware, Inc. Basket for treating objects. 227,008, 5-29-73, Cl. D16—1.  
Ward, Chester: See—  
Ranz, James R., and Ward. 227,012.  
Westendorf, Ronald C. Sled. 227,024, 5-29-73, Cl. D34—15.  
World War I Overseas Flyers, Inc.: See—  
Jones, Ira M. 227,017.  
Xerox Corp.: See—  
Derby, Dan R., and Knodt. 227,034.



**ISSUED MAY 29, 1973**

|        |           |        |           |          |           |      |           |          |           |           |           |
|--------|-----------|--------|-----------|----------|-----------|------|-----------|----------|-----------|-----------|-----------|
| 3R     | CLASS 2   | 195    | 3,736,109 | 7        | CLASS 49  | 187  | 3,735,601 | CLASS 83 | 124       | 3,735,699 |           |
| 22     | 3,735,418 | 200A   | 3,735,464 | 362      | 3,735,530 | 184  | 3,735,602 | 1        | 3,735,653 | 228       | 3,735,700 |
| 146    | 3,735,419 | 202D   | 3,735,465 |          | 3,735,531 | 210  | 3,735,603 | 100      | 3,735,654 | 269       | 3,735,701 |
| 150    | 3,735,420 | 203B   | 3,735,466 | CLASS 51 |           | 316  | 3,735,604 | 140      | 3,735,655 | 425       | 3,735,702 |
| 158    | 3,735,421 | 203D   | 3,735,467 | 9        | 3,735,532 |      | CLASS 64  | 198      | 3,735,656 | CLASS 102 |           |
| 171.3  | 3,735,422 | 207.5R | 3,735,469 | 14       | 3,735,536 | 6    | 3,735,605 | 209      | 3,735,657 | 16        | 3,735,703 |
| 221    | 3,735,423 | 207.5  | 3,735,468 | 34E      | 3,735,533 |      | CLASS 65  | 433      | 3,735,658 | 23        | 3,735,704 |
|        | CLASS 3   | 208F   | 3,735,470 | 57       | 3,735,534 | 2    | 3,736,116 | 524      | 3,735,659 | 28R       | 3,735,705 |
| 1.1    | 3,735,425 | 261    | 3,735,471 | 181R     | 3,735,542 | 32   | 3,736,117 | 560      | 3,735,660 | 34.1      | 3,735,706 |
| 12.8   | 3,735,426 | 272    | 3,735,472 | 225      | 3,736,113 | 110  | 3,736,118 | 675      | 3,735,661 | 81        | 3,735,707 |
|        | CLASS 4   | 421    | 3,735,473 | 2385     | 3,736,114 | 204  | 3,736,119 | 830      | 3,735,662 | CLASS 104 |           |
|        | CLASS 5   | 451    | 3,735,474 | 284      | 3,736,115 |      | CLASS 66  |          | 3,735,663 | 12        | 3,735,708 |
| 97     | 3,735,428 | 455    | 3,735,475 | 374      | 3,735,535 | 1    | 3,735,606 | 322      | 3,735,664 | 130       | 3,735,709 |
| 172.19 | 3,735,427 | 470.1  | 3,735,476 | CLASS 52 |           | 60   | 3,735,607 |          | 3,735,665 | 168       | 3,735,710 |
| 213    | 3,735,429 | 470.9  | 3,735,477 | 36       | 3,735,538 | 104  | 3,735,612 | 10E      | 3,735,666 | CLASS 105 |           |
|        | CLASS 6   | 477.3  | 3,735,478 | 73       | 3,735,539 | 125R | 3,735,608 | 71       | 3,735,667 | 199CB     | 3,735,711 |
|        | CLASS 7   | 498    | 3,735,479 | 94       | 3,735,540 |      | CLASS 68  |          | 3,735,668 | 376       | 3,735,712 |
| 118    | 3,735,430 | 570    | 3,735,480 | 98       | 3,735,539 | 5C   | 3,735,609 | 24       | 3,735,669 | CLASS 106 |           |
| 267    | 3,735,431 | 571    | 3,735,481 |          | 3,735,541 | 12R  | 3,735,610 |          | 3,735,670 | 1         | 3,736,156 |
| 348    | 3,735,432 | 578    | 3,735,482 | 235      | 3,735,544 | 30   | 3,735,611 | 1.814    | 3,735,668 | 42        | 3,736,157 |
|        | CLASS 8   | 580    | 3,735,483 | 262      | 3,735,549 |      | CLASS 69  | 33CA     | 3,735,667 | 56        | 3,736,158 |
| 12A    | 3,735,433 | 591    | 3,735,485 | 553      | 3,735,543 |      | CLASS 70  |          | 3,735,669 | 57        | 3,736,159 |
|        | CLASS 9   |        | CLASS 30  | 660      | 3,735,537 | 38A  | 3,735,612 |          | 3,735,670 | 58        | 3,736,160 |
| 8.1R   | 3,735,434 | 78     | 3,735,486 | 731      | 3,735,547 | 208  | 3,735,613 | 1        | 3,735,671 | 99        | 3,736,161 |
|        | CLASS 10  | 124    | 3,735,487 | 744      | 3,735,545 | 377  | 3,735,614 | 32       | 3,735,672 | 98        | 3,736,162 |
| 62     | 3,736,096 | 210    | 3,735,488 | 749      | 3,735,546 |      | CLASS 71  | 90       | 3,735,671 | 120       | 3,736,163 |
| 131    | 3,736,097 | 390    | 3,735,489 | CLASS 53 |           | 9    | 3,736,120 |          | 3,735,672 | 213       | 3,736,164 |
|        | CLASS 11  |        | CLASS 32  | 22A      | 3,735,551 | 76   | 3,736,121 | 1C       | 3,735,673 | 288B      | 3,736,165 |
| 8P     | 3,735,435 | 33     | 3,735,491 | 22R      | 3,735,550 | 103  | 3,736,122 | 35R      | 3,735,673 | CLASS 108 |           |
|        | CLASS 12  | 60     | 3,735,492 | 63       | 3,735,552 | 110  | 3,736,123 | 58R      | 3,735,674 | 53        | 3,735,713 |
| 96R    | 3,735,436 |        | CLASS 33  | 86       | 3,735,553 | 111  | 3,736,123 | 61A      | 3,735,675 | CLASS 109 |           |
|        | CLASS 13  | 125R   | 3,735,493 | 116      | 3,735,554 |      | CLASS 72  |          | 3,735,677 | 59        | 3,735,714 |
| 1R     | 3,735,437 | 126.7R | 3,735     |          |           |      |           |          |           |           |           |



|           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 141       | 3,735,744 | 570       | 3,736,213 | CLASS 182 | 15        | 3,735,838 | 6DK       | 3,735,880 | 68.3      | 3,735,935 | 80.78     | 3,736,305 |           |
| 182       | 3,735,745 | CLASS 159 | 4CC       | 3,735,792 | CLASS 185 | 29        | 3,735,839 | 14        | 3,735,879 | 71.1      | 3,735,941 | 85.5R     | 3,736,304 |
| 193P      | 3,735,746 | 28P       | 3,735,793 | CLASS 160 | 39        | 3,735,840 | 152       | 3,735,881 | 71.2      | 3,736,015 | 87.1      | 3,736,306 |           |
| 11A       | 3,735,747 | 135       | 3,735,794 | CLASS 161 | 181T      | 3,735,842 | 332       | 3,735,882 | 75.2      | 3,735,937 | 88.2R     | 3,736,307 |           |
| 12        | 3,735,748 | 348       | 3,735,795 | CLASS 162 | 5         | 3,735,841 | 454       | 3,735,883 | 83        | 3,735,938 | 88.3A     | 3,736,308 |           |
| 20        | 3,735,749 | 18        | 3,736,214 | CLASS 163 | 67        | 3,735,842 | 515       | 3,735,884 | 198       | 3,735,939 | 88.7R     | 3,736,309 |           |
| 197       | 3,735,750 | 36        | 3,736,215 | CLASS 164 | 72.1      | 3,735,843 | 520       | 3,735,885 | 199       | 3,735,940 | 91.3PV    | 3,736,310 |           |
| 24        | 3,736,182 | 62        | 3,736,216 | CLASS 165 | 32        | 3,735,845 | 730       | 3,735,886 | CLASS 244 | 94.2T     | 3,736,312 | 94.2T     | 3,736,312 |
| 2F        | 3,735,751 | 147       | 3,736,219 | CLASS 166 | 48        | 3,736,389 | 9         | 3,735,887 | ISS       | 3,735,942 | 210E      | 3,736,313 |           |
| 2.08      | 3,735,752 | 156       | 3,736,220 | CLASS 167 | 35        | 3,735,847 | 11B       | 3,735,888 | 3.15      | 3,735,944 | 211.5R    | 3,736,314 |           |
| 2.1E      | 3,735,753 | 164       | 3,736,218 | CLASS 168 | 53A       | 3,735,846 | 41        | 3,735,889 | 17.19     | 3,735,945 | 239BD     | 3,736,315 |           |
| 24A       | 3,735,754 | 170       | 3,736,221 | CLASS 169 | 108       | 3,735,849 | 61        | 3,735,890 | 54        | 3,735,946 | 239.3B    | 3,736,316 |           |
| 25R       | 3,735,755 | 182       | 3,736,222 | CLASS 170 | 35R       | 3,735,848 | 10.55     | 3,736,398 | 119       | 3,735,947 | 239.55R   | 3,736,317 |           |
| 36        | 3,735,757 | 4         | 3,736,223 | CLASS 171 | 28N       | 3,736,228 | 60A       | 3,736,399 | 122A      | 3,735,948 | 240R      | 3,736,319 |           |
| 82        | 3,735,758 | 65        | 3,736,224 | CLASS 172 | 28R       | 3,736,229 | 98        | 3,736,400 | 155A      | 3,735,949 | 240.6     | 3,736,321 |           |
| 216       | 3,735,760 | 23        | 3,735,796 | CLASS 173 | 36P       | 3,736,230 | 121LA     | 3,736,401 | CLASS 246 | 3,736,420 | 248NS     | 3,736,320 |           |
| 218M      | 3,735,761 | 72        | 3,735,797 | CLASS 174 | 63        | 3,736,231 | 131F      | 3,736,403 | CLASS 248 | 3,736,420 | 293.59    | 3,736,324 |           |
| 305       | 3,735,762 | 94        | 3,735,798 | CLASS 175 | 65        | 3,736,232 | 203       | 3,736,404 | 62        | 3,735,950 | 293.61    | 3,736,325 |           |
| 322       | 3,735,763 | 147       | 3,735,799 | CLASS 176 | 82        | 3,735,850 | 216       | 3,736,406 | 340       | 3,735,951 | 296H      | 3,736,327 |           |
| 328       | 3,735,764 | 250       | 3,735,800 | CLASS 177 | 16R       | 3,735,851 | 270       | 3,736,407 | 358R      | 3,735,952 | 302SD     | 3,736,328 |           |
| 335       | 3,735,765 | 273       | 3,735,801 | CLASS 178 | 19        | 3,735,852 | 492       | 3,736,407 | CLASS 249 | 3,735,953 | 302R      | 3,736,329 |           |
| 419D      | 3,735,766 | 281       | 3,735,803 | CLASS 179 | 20        | 3,735,853 | 26S       | 3,735,891 | 28        | 3,735,954 | 306.8R    | 3,736,330 |           |
| 419P      | 3,735,766 | 282       | 3,735,804 | CLASS 180 | 33AB      | 3,735,855 | 54        | 3,735,892 | 91        | 3,735,954 | 310R      | 3,736,332 |           |
| 25        | 3,735,767 | 33        | 3,735,768 | CLASS 181 | 58        | 3,735,856 | 63R       | 3,735,893 | CLASS 250 | 3,736,421 | 329ME     | 3,736,333 |           |
| 9         | 3,735,768 | 69        | 3,735,806 | CLASS 182 | 155       | 3,735,857 | 97D       | 3,735,894 | 43.5R     | 3,736,422 | 335       | 3,736,334 |           |
| 33        | 3,736,183 | 103       | 3,735,808 | CLASS 183 | 195       | 3,735,858 | 210       | 3,735,896 | 49.5PE    | 3,736,422 | 340.5     | 3,736,338 |           |
| 6LN       | 3,736,184 | 142       | 3,735,810 | CLASS 184 | 220BG     | 3,735,859 | CLASS 221 | 3,735,896 | 49.5ZC    | 3,736,424 | 340.9     | 3,736,335 |           |
| 30        | 3,736,185 | 160       | 3,735,811 | CLASS 185 | 11DA      | 3,736,390 | CLASS 222 | 3,735,897 | 49.5D     | 3,736,425 | 343.3     | 3,736,337 |           |
| 83R       | 3,736,186 | 183       | 3,735,813 | CLASS 186 | 38R       | 3,736,391 | CLASS 223 | 3,735,898 | 49.5T     | 3,736,425 | 345.7     | 3,736,336 |           |
| 86B       | 3,736,187 | 217       | 3,735,814 | CLASS 187 | 61.2D     | 3,736,392 | CLASS 224 | 3,735,899 | 51.5      | 3,736,426 | 347.3     | 3,736,339 |           |
| 90        | 3,736,188 | 313       | 3,735,815 | CLASS 188 | 82D       | 3,736,393 | CLASS 225 | 3,735,900 | 71G       | 3,736,428 | 397.25    | 3,736,340 |           |
| 132       | 3,736,189 | 332       | 3,735,816 | CLASS 189 | 158       | 3,736,394 | CLASS 226 | 3,735,901 | 71R       | 3,736,427 | 405       | 3,736,341 |           |
| 133       | 3,736,190 | 335       | 3,735,817 | CLASS 190 | 159A      | 3,736,395 | CLASS 227 | 3,735,902 | 71.5R     | 3,736,429 | 448AD     | 3,736,342 |           |
| 135S      | 3,736,191 | 44        | 3,735,818 | CLASS 191 | 166BH     | 3,736,396 | CLASS 228 | 3,735,903 | 83.3R     | 3,736,430 | 453A      | 3,736,343 |           |
| 13        | 3,735,769 | 532       | 3,735,819 | CLASS 192 | 169PB     | 3,736,397 | CLASS 229 | 3,735,904 | 205       | 3,736,431 | 463       | 3,736,344 |           |
| 15        | 3,735,770 | 785       | 3,735,820 | CLASS 193 | 17        | 3,736,233 | CLASS 230 | 3,735,905 | 218R      | 3,736,433 | 463.6     | 3,736,346 |           |
| 74        | 3,735,772 | 21        | 3,735,821 | CLASS 194 | 183R      | 3,736,234 | CLASS 231 | 3,735,906 | 222PC     | 3,736,432 | 469       | 3,736,347 |           |
| 155       | 3,735,774 | 78        | 3,735,822 | CLASS 195 | 236       | 3,736,235 | CLASS 232 | 3,735,907 | CLASS 251 | 3,736,432 | 469       | 3,736,347 |           |
| 318       | 3,735,775 | 104       | 3,735,823 | CLASS 196 | 51        | 3,736,236 | CLASS 233 | 3,735,908 | 471R      | 3,736,435 | 471R      | 3,736,350 |           |
| 359       | 3,735,776 | 119       | 3,735,824 | CLASS 197 | 11R       | 3,736,364 | CLASS 234 | 3,735,909 | 475R      | 3,736,436 | 501.21    | 3,736,351 |           |
| 514.5     | 3,735,777 | 151R      | 3,736,364 | CLASS 198 | 15C       | 3,736,365 | CLASS 235 | 3,735,910 | 501.21    | 3,736,437 | 523A      | 3,736,353 |           |
| 604       | 3,735,778 | 34        | 3,736,366 | CLASS 199 | 52S       | 3,736,367 | CLASS 236 | 3,735,911 | 523A      | 3,736,438 | 533N      | 3,736,355 |           |
| 624.2     | 3,735,779 | 105R      | 3,736,368 | CLASS 200 | 159.18    | 3,736,368 | CLASS 237 | 3,735,912 | 533N      | 3,736,439 | 543R      | 3,736,352 |           |
| 625.48    | 3,735,780 | 108       | 3,736,369 | CLASS 201 | 159.22    | 3,736,369 | CLASS 238 | 3,735,913 | 543R      | 3,736,440 | 562R      | 3,736,356 |           |
| 625.69    | 3,735,781 | 192       | 3,736,370 | CLASS 202 | 196       | 3,736,371 | CLASS 239 | 3,735,914 | 562R      | 3,736,441 | 570.5P    | 3,736,357 |           |
| 39        | 3,735,782 | 243R      | 3,736,371 | CLASS 203 | 266       | 3,736,372 | CLASS 240 | 3,735,915 | 837R      | 3,736,442 | 3R        | 3,735,966 |           |
| 123       | 3,735,783 | 298       | 3,736,373 | CLASS 204 | 298       | 3,736,373 | CLASS 241 | 3,735,916 | CLASS 266 | 3,735,966 | 24        | 3,735,967 |           |
| 93.2      | 3,735,784 | 302       | 3,736,374 | CLASS 205 | 302       | 3,736,374 | CLASS 242 | 3,735,917 | CLASS 267 | 3,735,971 | 27        | 3,735,970 |           |
| 20        | 3,735,785 | 40        | 3,736,375 | CLASS 206 | 40        | 3,736,375 | CLASS 243 | 3,735,918 | CLASS 268 | 3,735,972 | 182       | 3,735,971 |           |
| 133R      | 3,735,786 | 50        | 3,736,376 | CLASS 207 | 50        | 3,736,376 | CLASS 244 | 3,735,919 | CLASS 269 | 3,735,973 | 228       | 3,735,972 |           |
| 309AC     | 3,735,787 | 78        | 3,736,377 | CLASS 208 | 78        | 3,736,377 | CLASS 245 | 3,735,920 | CLASS 270 | 3,735,975 | 296       | 3,735,973 |           |
| 36        | 3,736,195 | 16A       | 3,736,378 | CLASS 209 | 45.11     | 3,736,378 | CLASS 246 | 3,735,921 | CLASS 271 | 3,735,977 | 31        | 3,735,974 |           |
| 1.5       | 3,736,192 | 46.2      | 3,736,379 | CLASS 210 | 53        | 3,736,379 | CLASS 247 | 3,735,922 | CLASS 272 | 3,735,978 | 61F       | 3,735,975 |           |
| 175       | 3,736,193 | 56AC      | 3,736,380 | CLASS 211 | 56AC      | 3,736,380 | CLASS 248 | 3,735,923 | CLASS 273 | 3,735,979 | 75        | 3,735,977 |           |
| 19        | 3,736,194 | 58        | 3,736,381 | CLASS 212 | 58        | 3,736,381 | CLASS 249 | 3,735,924 | CLASS 274 | 3,735,980 | 88        | 3,735,978 |           |
| 48        | 3,736,196 | 10        | 3,736,382 | CLASS 213 | 10        | 3,736,382 | CLASS 250 | 3,735,925 | CLASS 275 | 3,735,981 | 94        | 3,735,976 |           |
| CLASS 152 | 3,735,789 | 11        | 3,736,383 | CLASS 214 | 11        | 3,736,383 | CLASS 251 | 3,735,926 | CLASS 276 | 3,735,982 | CLASS 276 | 3,735,982 |           |
| 352       | 3,735,791 | 46        | 3,736,384 | CLASS 215 | 46        | 3,736,384 | CLASS 252 | 3,735,927 | CLASS 277 | 3,735,983 | CLASS 277 | 3,735,983 |           |
| 361       | 3,735,790 | 80        | 3,736,385 | CLASS 216 | 80        | 3,736,385 | CLASS 253 | 3,735,928 | CLASS 278 | 3,735,984 | CLASS 278 | 3,735,984 |           |
| 6         | 3,736,374 | 143       | 3,736,386 | CLASS 217 | 143       | 3,736,386 | CLASS 254 | 3,735,929 | CLASS 279 | 3,735,985 | CLASS 279 | 3,735,985 |           |
| 14        | 3,736,197 | 255       | 3,736,387 | CLASS 218 | 255       | 3,736,387 | CLASS 255 | 3,735,930 | CLASS 280 | 3,735,986 | CLASS 280 | 3,735,986 |           |
| 65        | 3,736,198 | 10E       | 3,736,388 | CLASS 219 | 10E       | 3,736,389 | CLASS 256 | 3,735,931 | CLASS 281 | 3,735,987 | CLASS 281 | 3,735,987 |           |
| 71        | 3,736,199 | 15        | 3,736,390 | CLASS 220 | 15        | 3,736,390 | CLASS 257 | 3,735,932 | CLASS 282 | 3,735,988 | CLASS 282 | 3,735,988 |           |
| 85        | 3,736,200 | 16        | 3,736,391 | CLASS 221 | 16        | 3,736,391 | CLASS 258 | 3,735,933 | CLASS 283 | 3,735,989 | CLASS 283 | 3,735,989 |           |
| 145       | 3,736,201 | 26        | 3,736,392 | CLASS 222 | 26        | 3,736,392 | CLASS 259 | 3,735,934 | CLASS 284 | 3,735,990 | CLASS 284 | 3,735,990 |           |
| 172       | 3,736,202 | 41        | 3,736,393 | CLASS 223 | 41        | 3,736,393 | CLASS 260 | 3,735,935 | CLASS 285 | 3,735,991 | CLASS 285 | 3,735,991 |           |
| 189       | 3,736,203 | 46.21     | 3,736,394 | CLASS 224 | 46.21     | 3,736,394 | CLASS 261 | 3,735,936 | CLASS 286 | 3,735,992 | CLASS 286 | 3,735,992 |           |
| 242       | 3,736,204 | 78R       | 3,736,395 | CLASS 225 | 78R       | 3,736,395 | CLASS 262 | 3,735,937 | CLASS 287 | 3,735,993 | CLASS 287 | 3,735,993 |           |
| 291       | 3,736,205 | 108R      | 3,736,396 | CLASS 226 | 108R      | 3,736,396 | CLASS 263 | 3,735,938 | CLASS 288 | 3,735,994 | CLASS 288 | 3,735,994 |           |
| 293       | 3,736,206 | 24        | 3,736,397 | CLASS 227 | 24        | 3,736,397 | CLASS 264 | 3,735,939 | CLASS 289 | 3,735,995 | CLASS 289 | 3,735,995 |           |
| 294       | 3,736,207 | 39R       | 3,736,398 | CLASS 228 | 39R       | 3,736,398 | CLASS 265 | 3,735,940 | CLASS 290 | 3,735,996 | CLASS 290 | 3,735,996 |           |
| 361       | 3,736,208 | 75R       | 3,736,399 | CLASS 229 | 75R       | 3,736,399 | CLASS 266 | 3,735,941 | CLASS 291 | 3,735,997 | CLASS 291 | 3,735,997 |           |
| 431       | 3,736,210 | 162       | 3,736,400 | CLASS 230 | 162       | 3,736,400 | CLASS 267 | 3,735,942 | CLASS 292 | 3,735,998 | CLASS 292 | 3,735,998 |           |
| 435       | 3,736,209 | 33GE      | 3,736,401 | CLASS 231 | 33GE      | 3,736,401 | CLASS 268 | 3,735,943 | CLASS 293 | 3,735,999 | CLASS 293 | 3,735,999 |           |
| 441       | 3,736,211 |           |           | <         |           |           |           |           |           |           |           |           |           |

|           |           |           |           |           |           |      |           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|------|-----------|-----------|-----------|-----------|-----------|-----------|
| 150C      | 3,736,005 | 149       | 3,736,441 | 101DH     | 3,736,472 | 363  | 3,736,512 | CLASS 339 | 103       | 3,736,590 |           |           |
| CLASS 283 |           | 228       | 3,736,442 | 101D      | 3,736,471 | 421  | 3,736,513 | 14R       | 736,547   | 702       | 3,736,591 |           |
| 6         | 3,736,006 | 235R      | 3,736,434 | 137       | 3,736,473 |      | CLASS 328 | 31R       | 3,736,548 | 854       | 3,736,592 |           |
| CLASS 285 |           | 252       | 3,736,443 | 234R      | 3,736,474 | 55   | 3,736,514 | 75MP      | 3,736,549 |           | CLASS 346 |           |
| 31        | 3,736,007 | 290       | 3,736,444 |           | 3,736,475 | 134  | 3,736,516 | 265F      | 3,736,550 | 74MT      | 3,736,046 |           |
| 342       | 3,736,008 | 308       | 3,736,445 | 235R      | 3,736,477 | 143  | 3,736,515 |           | 3,736,550 | 75        | 3,736,593 |           |
| CLASS 287 |           |           | 3,736,446 |           | 3,736,478 | 167  | 3,736,517 | CLASS 340 |           | 139C      | 3,736,594 |           |
| 54C       | 3,736,009 | 10        | 3,736,033 | CLASS 318 |           |      | CLASS 330 | 3R        | Re.27,630 |           |           |           |
| 62        | 3,736,010 | 137       | Re.27,651 | 51        | 3,736,480 | 4    | 3,736,518 | 5MP       | 3,736,552 |           | CLASS 350 |           |
| 103A      | 3,736,011 | 213       | 3,736,034 | 245       | 3,736,479 | 18   | 3,736,519 | 5R        | 3,736,551 | 3.5       | 3,736,039 |           |
| 189.35    | 3,736,013 | CLASS 310 |           | 331       | 3,736,481 | 29   | 3,736,520 | 6R        | 3,736,553 |           | 3,736,040 |           |
| 189.36A   | 3,736,012 | 8         | 3,736,446 | 338       | 3,736,482 | 35   | 3,736,521 | 7S        | 3,736,554 | 87        | 3,736,041 |           |
| CLASS 292 |           | 11        | 3,736,447 | 469       | 3,736,483 |      | 3,736,522 | 8         | 3,736,555 | 95        | 3,736,042 |           |
| 256.5     | 3,736,014 | 15        | 3,736,448 | 587       | 3,736,484 |      | CLASS 331 | 15.5EC    | 3,736,556 | 160LC     | 3,736,047 |           |
| 281       | 3,736,016 | 171       | 3,736,449 | 594       | 3,736,485 | 64   | 3,736,523 | 16R       | 3,736,557 | 160R      | 3,736,043 |           |
| 317       | 3,736,017 | 178       | 3,736,450 | 624       | 3,736,486 | 94.5 | 3,736,524 | 18LD      | 3,736,558 | 161       | 3,736,044 |           |
| CLASS 294 |           | 18D       | 3,736,468 | 696       | 3,736,487 |      | 3,736,525 | 27R       | 3,736,559 |           | 3,736,045 |           |
| 88        | 3,736,018 | CLASS 311 |           |           | 3,736,488 |      | 3,736,526 | 147P      | 3,736,561 | 186       | 3,736,048 |           |
| CLASS 296 |           | 107       | 3,736,035 | CLASS 312 |           | 1075 | 3,736,527 | 149K      | 3,736,562 | 289       | Re.27,653 |           |
| 23MC      | 3,736,019 | 285       | 3,736,036 | 35        | 3,736,489 | 143  | 3,736,528 | 172.5     | 3,736,563 | 316       | 3,736,050 |           |
| 63        | 3,736,020 | 351       | 3,736,037 | 39        | 3,736,490 |      | CLASS 332 |           | 3,736,564 |           | CLASS 352 |           |
| CLASS 297 |           | CLASS 313 |           | 14        | 3,736,491 | 18   | 3,736,529 |           | 3,736,565 | 72        | 3,736,051 |           |
| 42        | 3,736,021 | 32        | 3,736,451 | 45R       | 3,736,492 |      | CLASS 333 |           | 3,736,566 | 166       | 3,736,052 |           |
| 118       | 3,736,023 | 115       | 3,736,452 |           | 3,736,493 |      |           |           | 3,736,567 |           | CLASS 355 |           |
| 217       | 3,736,024 | 146       | 3,736,453 |           | 3,736,494 |      | 3,736,530 |           | 3,736,568 |           | 3,736,053 |           |
| 369       | 3,736,025 | 243       | 3,736,454 | CLASS 323 |           | 30R  | 3,736,532 | 173CR     | 3,736,571 | 3         | 3,736,056 |           |
| 379       | 3,736,026 | 274       | 3,736,455 | 17        | 3,736,495 | 30   | 3,736,533 | 173DR     | 3,736,572 | 8         | 3,736,054 |           |
| 453       | 3,736,027 | 274       | 3,736,456 | 22T       | 3,736,496 | 31A  | 3,736,535 | 173R      | 3,736,570 | 14        | 3,736,055 |           |
| CLASS 299 |           | 313       | 3,736,457 | 80        | 3,736,497 | 31R  | 3,736,534 |           | 3,736,573 |           | CLASS 356 |           |
| 25        | 3,736,028 | 344       | 3,736,458 | CLASS 324 |           | 73R  | 3,736,536 |           | 3,736,574 | 4         | 3,736,057 |           |
| CLASS 301 |           | CLASS 315 |           | 29.5      | 3,736,498 |      | CLASS 335 | 174EB     | 3,736,575 |           | 3,736,058 |           |
| 39R       | 3,736,029 | 11        | 3,736,459 | 34R       | 3,736,499 | 135  | 3,736,537 | 174HA     | 3,736,578 | 86        | 3,736,059 |           |
| CLASS 303 |           | 12        | 3,736,461 | 37        | 3,736,501 | 160  | 3,736,538 | 174PW     | 3,736,576 | 124       | 3,736,060 |           |
| 6C        | 3,736,030 | 84.6      | 3,736,462 | 43R       | 3,736,502 | 216  | 3,736,539 | 174TF     | 3,736,577 | 151       | 3,736,061 |           |
| 3,736,031 | 209SC     | 209T      | 3,736,463 | 51        | 3,736,503 | 279  | 3,736,540 |           | 3,736,579 | 160       | 3,736,063 |           |
| CLASS 305 |           | 239       | 3,736,464 | 74        | 3,736,504 | 70   | 3,736,542 | 174.1A    | 3,736,581 | 195       | 3,736,064 |           |
| 34        | 3,736,032 | CLASS 316 |           | 133       | 3,736,505 | 84   | 3,736,541 | 174.1H    | 3,736,582 | 239       | 3,736,065 |           |
| CLASS 307 |           | 26        | 3,736,038 | 158R      | 3,736,506 | 200  | 3,736,543 |           | 3,736,580 |           | CLASS 404 |           |
| 10R       | 3,736,435 | CLASS 317 |           | 30        | 3,736,507 |      | CLASS 336 | 240       | 3,736,583 | 117       | 3,736,066 |           |
| 88TE      | 3,736,436 | 11A       | 3,736,466 | 38B       | 3,736,508 | 282  | 3,736,544 | 258A      | 3,736,584 |           | CLASS 408 |           |
| 93        | 3,736,437 | CLASS 318 |           | 134       | 3,736,510 |      | CLASS 337 | 324R      | 3,736,585 | 79        | 3,736,067 |           |
| 130       | 3,736,438 | 22        | 3,736,467 | 143       | 3,736,509 | 13   | 3,736,545 | 347NT     | 3,736,586 |           | CLASS 415 |           |
| 135       | 3,736,439 | 27R       | 3,736,469 | 321       | 3,736,511 | 15   | 3,736,546 | 351       | 3,736,587 | 89        | 3,736,068 |           |
| 140       | 3,736,440 |           |           |           |           |      | CLASS 338 | 378R      | 3,736,588 | 115       | 3,736,069 |           |
|           |           |           |           |           |           |      |           | CLASS 343 | 17.1R     | 3,736,589 | 147       | 3,736,070 |



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|               |           |           |               |           |           |
|---------------|-----------|-----------|---------------|-----------|-----------|
| 1 : 3,735,803 | 3,735,806 | 3,736,275 | 9 : 3,736,584 | 3,735,954 | 3,736,112 |
| 4 : 3,735,068 | 3,735,840 | 3,736,314 | 3,735,489     | 3,736,147 | 3,736,113 |
| 3,735,466     | 3,735,866 | 3,736,322 | 3,735,519     | 3,736,254 | 3,736,137 |
| 3,735,484     | 3,735,869 | 3,736,333 | 3,735,565     | 3,735,928 | 3,736,155 |
| 3,735,485     | 3,735,871 | 3,736,341 | 3,735,569     | 3,735,951 | 3,736,218 |
| 3,735,549     | 3,735,891 | 3,736,344 | 3,735,603     | 3,735,419 | 3,736,248 |
| 3,735,717     | 3,735,895 | 3,736,363 | 3,735,627     | 3,735,428 | 3,736,251 |
| 3,736,299     | 3,735,898 | 3,736,376 | 3,735,660     | 3,735,445 | 3,736,252 |
| 3,736,377     | 3,735,915 | 3,736,386 | 3,735,723     | 3,735,457 | 3,736,280 |
| 6 : 3,735,427 | 3,735,923 | 3,736,387 | 3,735,762     | 3,735,474 | 3,736,284 |
| 3,735,435     | 3,735,933 | 3,736,388 | 3,735,914     | 3,735,497 | 3,736,303 |
| 3,735,447     | 3,735,935 | 3,736,394 | 3,736,156     | 3,735,509 | 3,736,313 |
| 3,735,449     | 3,735,940 | 3,736,397 | 3,736,204     | 3,735,518 | 3,736,357 |
| 3,735,459     | 3,735,952 | 3,736,402 | 3,736,224     | 3,735,535 | 3,736,381 |
| 3,735,465     | 3,735,953 | 3,736,403 | 3,736,229     | 3,735,542 | 3,736,383 |
| 3,735,472     | 3,735,956 | 3,736,409 | 3,736,243     | 3,735,547 | 3,736,480 |
| 3,735,473     | 3,735,965 | 3,736,410 | 3,736,282     | 3,735,553 | 3,736,487 |
| 3,735,496     | 3,735,985 | 3,736,411 | 3,736,395     | 3,735,587 | 3,736,491 |
| 3,735,502     | 3,736,010 | 3,736,413 | 3,736,460     | 3,735,609 | 3,736,513 |
| 3,735,514     | 3,736,011 | 3,736,430 | 3,736,523     | 3,735,646 | 3,736,544 |
| 3,735,522     | 3,736,013 | 3,736,432 | 3,736,111     | 3,735,663 | 3,736,549 |
| 3,735,523     | 3,736,018 | 3,736,433 | 3,736,181     | 3,735,694 | 3,736,561 |
| 3,735,524     | 3,736,019 | 3,736,453 | 3,736,209     | 3,735,700 | 3,736,570 |
| 3,735,534     | 3,736,040 | 3,736,472 | 3,736,283     | 3,735,711 | 3,736,593 |
| 3,735,546     | 3,736,047 | 3,736,504 | 3,736,293     | 3,735,749 | 3,736,279 |
| 3,735,552     | 3,736,054 | 3,736,506 | 3,736,311     | 3,735,754 | 3,736,372 |
| 3,735,568     | 3,736,060 | 3,736,510 | 3,736,385     | 3,735,755 | 3,736,392 |
| 3,735,598     | 3,736,061 | 3,736,511 | 3,735,979     | 3,735,796 | 3,736,393 |
| 3,735,601     | 3,736,064 | 3,736,512 | 3,735,983     | 3,735,800 | 3,736,388 |
| 3,735,604     | 3,736,066 | 3,736,522 | 3,736,058     | 3,735,842 | 3,736,443 |
| 3,735,628     | 3,736,110 | 3,736,526 | Re. 27,646    | 3,735,843 | 3,736,448 |
| 3,735,629     | 3,736,129 | 3,736,534 | 3,735,433     | 3,735,865 | 3,736,484 |
| 3,735,639     | 3,736,135 | 3,736,536 | 3,735,503     | 3,735,876 | 3,736,501 |
| 3,735,649     | 3,736,142 | 3,736,541 | 3,735,643     | 3,735,878 |           |
| 3,735,651     | 3,736,154 | 3,736,542 | 3,735,748     | 3,735,885 |           |
| 3,735,654     | 3,736,163 | 3,736,548 | 3,735,819     | 3,735,892 |           |
| 3,735,655     | 3,736,185 | 3,736,551 | 3,735,839     | 3,735,894 |           |
| 3,735,659     | 3,736,193 | 3,736,553 | 3,735,841     | 3,735,896 |           |
| 3,735,666     | 3,736,195 | 3,736,565 | 3,735,859     | 3,735,907 |           |
| 3,735,668     | 3,736,199 | 3,736,582 | 3,735,976     | 3,735,909 |           |
| 3,735,707     | 3,736,200 | 3,736,633 | 3,736,104     | 3,735,926 |           |
| 3,735,710     | 3,736,202 | 3,736,671 | 3,736,152     | 3,735,949 |           |
| 3,735,724     | 3,736,205 | 3,736,673 | 3,736,489     | 3,735,955 |           |
| 3,735,728     | 3,736,207 | 3,736,704 | 3,736,520     | 3,735,960 |           |
| 3,735,737     | 3,736,212 | 3,736,872 | 3,736,528     | 3,735,964 |           |
| 3,735,738     | 3,736,214 | 3,736,167 | 3,736,591     | 3,735,973 |           |
| 3,735,752     | 3,736,215 | 3,736,238 | 3,735,439     | 3,735,986 |           |
| 3,735,753     | 3,736,221 | 3,736,247 | 3,735,441     | 3,735,989 |           |
| 3,735,765     | 3,736,231 | 3,736,382 | 3,735,716     | 3,735,993 |           |
| 3,735,772     | 3,736,233 | 3,736,425 | 3,735,788     | 3,736,009 |           |
| 3,735,779     | 3,736,255 | 3,736,581 | 3,735,802     | 3,736,029 |           |

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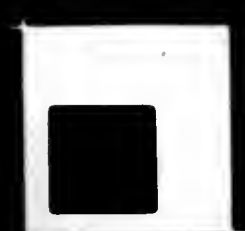
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| 23 : | 3,736,253  | 3,736,560 | 3,736,287  | 3,736,133 | 3,736,312  | 44 :       | 3,735,576 |
| 24 : | Re. 27,652 | 3,736,562 | 3,736,289  | 3,736,140 | 3,736,328  |            | 3,735,670 |
|      | 3,735,425  | 3,735,470 | 3,736,309  | 3,736,141 | 3,736,337  | 45 :       | 3,735,831 |
|      | 3,735,532  | 3,735,516 | 3,736,310  | 3,736,151 | 3,736,353  |            | 3,735,901 |
|      | 3,735,566  | 3,735,528 | 3,736,317  | 3,736,160 | 3,736,401  |            | 3,736,153 |
|      | 3,735,988  | 3,735,557 | 3,736,335  | 3,736,170 | 3,736,407  | 47 :       | 3,735,602 |
|      | 3,736,014  | 3,735,913 | 3,736,339  | 3,736,172 | 3,736,446  |            | 3,735,693 |
|      | 3,736,016  | 3,735,932 | 3,736,345  | 3,736,183 | 3,736,458  |            | 3,735,715 |
|      | 3,736,131  | 3,736,046 | 3,736,349  | 3,736,188 | 3,736,490  |            | 3,735,736 |
|      | 3,736,187  | 3,736,134 | 3,736,366  | 3,736,189 | 3,736,498  |            | 3,735,887 |
|      | 3,736,194  | 3,736,148 | 3,736,373  | 3,736,208 | 3,736,516  |            | 3,735,897 |
|      | 3,736,320  | 3,736,219 | 3,736,379  | 3,736,222 | 3,736,559  | 40 :       | 3,736,262 |
|      | 3,736,507  | 3,736,291 | 3,736,406  | 3,736,257 | Re. 27,647 |            | 3,736,405 |
|      | 3,736,515  | 3,736,298 | 3,736,412  | 3,736,265 | 3,735,756  | 48 :       | 3,735,456 |
|      | 3,736,575  | 3,736,398 | 3,736,442  | 3,736,288 | 3,735,768  |            | 3,735,471 |
|      | 3,736,589  | 3,736,399 | 3,736,469  | 3,736,290 | 3,735,770  |            | 3,735,480 |
| 25 : | 3,735,431  | 3,735,486 | 3,736,478  | 3,736,300 | 3,735,815  |            | 3,735,594 |
|      | 3,735,453  | 3,735,947 | 3,736,492  | 3,736,301 | 3,735,818  |            | 3,735,597 |
|      | 3,735,507  | 3,735,513 | 3,736,493  | 3,736,306 | 3,736,307  |            | 3,735,623 |
|      | 3,735,563  | 3,735,607 | 3,736,494  | 3,736,321 | 3,736,352  |            | 3,735,658 |
|      | 3,735,578  | 3,735,720 | 3,736,495  | 3,736,323 | 3,736,346  |            | 3,735,774 |
|      | 3,735,618  | 3,735,958 | 3,736,496  | 3,736,368 | 41 :       | 3,735,430  | 3,735,775 |
|      | 3,735,644  | 3,735,967 | 3,736,525  | 3,736,369 | 3,735,452  |            | 3,735,787 |
|      | 3,735,678  | 3,736,122 | 3,736,533  | 3,736,370 | 3,735,740  |            | 3,735,813 |
|      | 3,735,680  | 3,736,123 | 3,736,539  | 3,736,396 | 3,736,067  |            | 3,735,814 |
|      | 3,735,684  | 3,736,239 | 3,736,543  | 3,736,414 | 42 :       | Re. 27,645 | 3,735,820 |
|      | 3,735,685  | 3,736,343 | 3,736,552  | 3,736,419 | Re. 27,649 |            | 3,735,825 |
|      | 3,735,690  | 3,736,391 | 3,735,574  | 3,736,431 | 3,735,432  |            | 3,735,827 |
|      | 3,735,785  | 3,736,436 | 3,736,429  | 3,736,444 | 3,735,463  |            | 3,735,828 |
|      | 3,735,836  | 3,736,568 | 3,736,459  | 3,736,459 | 3,736,469  |            | 3,736,007 |
|      | 3,735,860  | 3,735,488 | 3,736,461  | 3,736,461 | 3,735,477  |            | 3,736,101 |
|      | 3,735,880  | 3,736,250 | Re. 27,650 | 3,736,466 | 3,735,478  |            | 3,736,102 |
|      | 3,735,890  | 3,735,418 | 3,736,467  | 3,736,467 | 3,735,512  |            | 3,736,245 |
|      | 3,735,902  | 3,735,882 | 3,735,422  | 3,736,475 | 3,735,520  |            | 3,736,249 |
|      | 3,735,908  | 3,736,427 | 3,735,423  | 3,736,477 | 3,735,538  |            | 3,736,256 |
|      | 3,736,006  | 3,735,732 | 3,735,424  | 3,736,481 | 3,735,545  |            | 3,736,271 |
|      | 3,736,036  | 3,736,028 | 3,735,444  | 3,736,486 | 3,735,562  |            | 3,736,296 |
|      | 3,736,125  | 3,736,166 | 3,735,454  | 3,736,488 | 3,735,600  |            | 3,736,417 |
|      | 3,736,177  | 3,736,530 | 3,735,467  | 3,736,500 | 3,735,605  |            | 3,736,428 |
|      | 3,736,184  | 3,736,531 | 3,735,483  | 3,736,509 | 3,735,626  |            | 3,736,556 |
|      | 3,736,186  | 3,735,440 | 3,735,491  | 3,736,519 | 3,735,634  |            | 3,736,558 |
|      | 3,736,190  | 3,735,448 | 3,735,492  | 3,736,521 | 3,735,638  | 49 :       | 3,735,595 |
|      | 3,736,237  | 3,735,455 | 3,735,499  | 3,736,524 | 3,735,650  |            | 3,735,998 |
|      | 3,736,267  | 3,735,482 | 3,735,505  | 3,736,527 | 3,735,705  |            | 3,736,206 |
|      | 3,736,292  | 3,735,536 | 3,735,526  | 3,736,532 | 3,735,718  |            | 3,736,264 |
|      | 3,736,426  | 3,735,539 | 3,735,527  | 3,736,566 | 3,735,722  | 50 :       | 3,735,468 |
|      | 3,736,514  | 3,735,558 | 3,735,554  | 3,736,569 | 3,735,733  |            | 3,735,493 |
|      | 3,736,535  | 3,735,588 | 3,735,559  | 3,736,572 | 3,735,763  |            | 3,735,911 |
|      | 3,736,555  | 3,735,635 | 3,735,560  | 3,736,573 | 3,735,804  |            | 3,736,027 |
|      | 3,736,571  | 3,735,702 | 3,735,577  | 3,736,577 | 3,735,848  |            | 3,736,574 |
|      | 3,736,576  | 3,735,734 | 3,735,576  | 3,736,587 | 3,735,854  | 51 :       | 3,735,550 |
|      | 3,736,594  | 3,735,784 | 3,735,677  | 3,735,677 | 3,735,893  |            | 3,736,024 |
| 26 : | 3,735,420  | 3,735,807 | 3,735,681  | 3,736,304 | 3,735,906  |            | 3,736,211 |
|      | 3,735,461  | 3,735,837 | 3,735,682  | 3,736,473 | 3,735,944  |            | 3,736,502 |
|      | 3,735,475  | 3,735,862 | 3,735,689  | 3,736,012 | 3,736,035  |            | 3,736,590 |
|      | 3,735,479  | 3,735,864 | 3,735,696  | 3,736,065 | 3,736,035  |            | 3,736,592 |
|      | 3,735,612  | 3,735,867 | 3,735,697  | 3,736,164 | 3,736,065  | 53 :       | 3,735,434 |
|      | 3,735,619  | 3,735,875 | 3,735,703  | 3,736,171 | 3,736,164  |            | 3,735,555 |
|      | 3,735,645  | 3,735,889 | 3,735,726  | 3,736,171 | 3,736,171  |            | 3,735,662 |
|      | 3,735,691  | 3,735,905 | 3,735,735  | 3,736,182 | 3,736,171  |            | 3,735,838 |
|      | 3,735,712  | 3,735,918 | 3,735,751  | 3,736,227 | 3,736,182  |            | 3,735,900 |
|      | 3,735,758  | 3,735,948 | 3,735,771  | 3,736,258 | 3,736,227  |            | 3,736,159 |
|      | 3,735,852  | 3,735,982 | 3,735,794  | 3,736,272 | 3,736,258  |            | 3,736,196 |
|      | 3,735,863  | 3,736,042 | 3,735,834  | 3,736,272 | 3,736,272  |            | 3,736,235 |
|      | 3,735,883  | 3,736,042 | 3,735,861  | 3,736,286 | 3,736,286  |            | 3,736,261 |
|      | 3,735,916  | 3,736,056 | 3,735,874  | 3,736,318 | 3,736,318  | 54 :       | 3,736,325 |
|      | 3,735,957  | 3,736,070 | 3,735,884  | 3,736,324 | 3,736,324  | 55 :       | 3,735,464 |
|      | 3,735,972  | 3,736,097 | 3,735,917  | 3,736,336 | 3,736,336  |            | 3,735,490 |
|      | 3,735,980  | 3,736,105 | 3,735,936  | 3,736,358 | 3,736,358  |            | 3,735,494 |
|      | 3,735,997  | 3,736,118 | 3,735,941  | 3,736,367 | 3,736,367  |            | 3,735,551 |
|      | 3,736,032  | 3,736,120 | 3,735,962  | 3,736,390 | 3,736,390  |            | 3,735,766 |
|      | 3,736,107  | 3,736,138 | 3,735,975  | 3,736,400 | 3,736,400  |            | 3,735,829 |
|      | 3,736,150  | 3,736,149 | 3,735,978  | 3,736,420 | 3,736,420  |            | 3,735,830 |
|      | 3,736,157  | 3,736,158 | 3,735,994  | 3,736,421 | 3,736,421  |            | 3,735,858 |
|      | 3,736,277  | 3,736,161 | 3,736,015  | 3,736,434 | 3,736,434  |            | 3,735,996 |
|      | 3,736,279  | 3,736,165 | 3,736,033  | 3,736,438 | 3,736,438  |            | 3,736,020 |
|      | 3,736,372  | 3,736,197 | 3,736,043  | 3,736,447 | 3,736,447  |            | 3,736,022 |
|      | 3,736,392  | 3,736,216 | 3,736,044  | 3,736,468 | 3,736,468  |            | 3,736,037 |
|      | 3,736,393  | 3,736,240 | 3,736,045  | 3,736,477 | 3,736,477  |            | 3,736,103 |
|      | 3,736,443  | 3,736,242 | 3,736,050  | 3,736,494 | 3,736,494  |            | 3,736,178 |
|      | 3,736,445  | 3,736,259 | 3,736,051  | 3,736,508 | 3,736,508  |            | 3,736,380 |
|      | 3,736,448  | 3,736,266 | 3,736,057  | 3,736,513 | 3,736,513  |            | 3,736,470 |
|      | 3,736,484  | 3,736,274 | 3,736,100  | 3,736,538 | 3,736,538  |            | 3,736,505 |
|      | 3,736,501  | 3,736,281 | 3,736,115  | 3,736,550 | 3,736,550  | 56 :       | 3,735,822 |
|      |            | 3,736,285 | 3,736,130  | 3,736,223 | 3,735,933  |            | 3,735,933 |



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